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Causes and impacts of remittances: Household survey evidence from Egypt

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Causes and Impacts of Remittances: Household Survey Evidence from Egypt

Mohammad Reza Farzanegan, Sherif Maher Hassan and Ribal Abi Raad¹

2017

Abstract

This research provides a qualitative and empirical investigation of the microeconomic causes and impacts of remittances in Egypt. We use data from a field study, involving interviews of 304 remittance-receiving families across 16 Egyptian governorates during May 2015–May 2016. Our Ordinary Least Square (OLS) and Tobit regressions show that the duration of migration, migrant's age, household income, and household head's job are the most important predictors of the level of remittances. The first three variables induce the value of received remittances, while the final variable, household head's job, acts to the contrary and reduces remittances. In terms of remittances allocation, everyday expenses and real estate investments absorb the vast majority of channeled remittances. Most of the respondents (85%) do not invest remittances, and those who invest remittances mainly reside in Upper and Lower Egypt due to the low living costs in these regions.

Keywords: remittances; Egypt; altruistic; self-interest; Tobit.

JEL Classification: D14; J6; O15.

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1. Introduction

The political and economic unrest after the 2011 revolution has prompted an increasing number of Egyptians to migrate. This situation corresponds with an increasing inflow of remittances to Egypt (World Bank, 2016a). In 2015, US\$19.7 billion worth of received international remittances meant that Egypt was classified as the largest recipient country in the MENA region in numerical terms and the fifth largest recipient relative to GDP (World Bank, 2017). Remittances to Egypt are three times higher than the foreign exchange revenue from the Suez Canal and substantially higher than FDI and ODA (see Figure 1). However, the amounts of received remittances represent only the officially recorded figures. Informal remittances have been estimated to range from 20 to 35% of total remittances (Amuedo-Dorantes et al., 2005b).

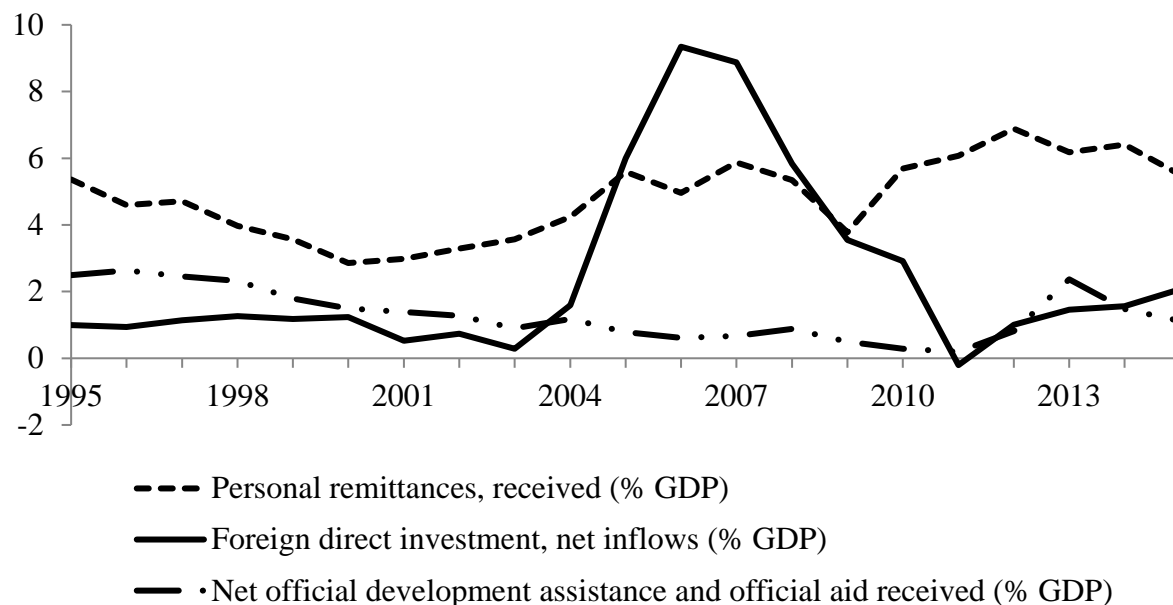


Figure 1: Remittances, ODA, and FDI to Egypt (1995–2015)

Source: World Bank, (2017).

There is an urgent need to understand more clearly the dynamics of received remittances as a developmental tool; namely, a catalyst of private savings and investment stimulus (Billmeier and Massa, 2009; Yang, 2008). This urgency is highlighted by the need to address the drawbacks in

conventional capital inflow such as FDI in response to the adverse economic and political environments in Egypt following the 2011 revolution (see Figure 1). In the context of these adverse conditions, remittances are substantially larger, more stable, and countercyclical to economic and political downturns compared with conventional capital inflow (World Bank, 2016a).

This study aims to fill a gap in the literature of the microanalysis of remittances in Egypt by collecting unique remittance-focused data from 304 recipient families across 16 Egyptian governorates during May 2015–May 2016. We then use this information to study the allocation of received remittances across different items consumed by households at various levels of income, education, geographical location, and other socioeconomic factors. Further, we empirically model the collected data to identify the major microeconomic determinants of remittances.

Despite the importance of remittances for Egypt, applied research on the determinants of remittances is limited. Household surveys that investigate the allocation of remittances and the casual factors of remittance behavior are either small-scale or classified as general population surveys that do not explicitly focus on remittance recipients and their characteristics (see section 2 for a review of the qualitative literature). Further, officially reported data about the distribution and size of remittances to Egypt has several shortcomings in terms of quantity, quality, breakdown, and reliability. Moreover, large discrepancies exist between migrant numbers as recorded by the destination countries, namely OECD countries, and the numbers that appear in official country-of-origin statistics (World Bank, 2010).

As far as we know, the only empirical study that has investigated the micro-determinants of remittances in Egypt, together with those of Turkey and Morocco, is that of Van Dalen et al. (2005). The authors distinguish between self-interest and altruism remittance models in terms of the use of cross-sectional household surveys based on the Push and Pull Factors of International Migration (PPFIM) project of 1997. Departing from the norm of examining the determinants of

remittances from the migrants' side, the authors investigate these determinants from the recipients' perspective in a similar way to this current study's approach (Agarwal and Horowitz, 2002; Vanwey, 2004). They use a logistic regression specification and regress a binary variable of one if the family received remittances in the last year and zero otherwise on a range of control variables that capture the characteristics of migrant-sending households, their individual members, and their migrant members abroad.

Unlike the current study, which reports the numerical values of remittances, income, and expenditure of recipient families based on a recent field study, the foregoing analysis relies on subjective rather than numerical measures. For instance, instead of asking the household about its total income, Van Dalen et al. (2005) ask it to rank the adequacy of the existing financial resources on a scale of sufficient, barely sufficient, insufficient, and so on. Such a technique, according to the authors, reduces the sensitivity of the questions and increases the response rate; however, it also affects the stability and robustness of the authors' interpretations. They conclude that it is hard to distinguish between altruism and self-interest models because these are triggered by the same variables. Nonetheless, they find that the strength of family ties and the ability and willingness of migrants to generate remittances are more crucial factors for increasing the probability of receiving remittances than the economic needs of the migrant-sending households.

The remainder of this paper is structured as follows. Sections 2 and 3 provide brief discussions of the qualitative evidence about remittances in Egypt and the theories describing remittance behavior, respectively. Section 4 reviews the survey's methodology followed by an overview of the survey's contents and its main highlights in section 5. Section 6 presents the empirical results and a discussion. Section 7 concludes this paper.

2. Review of the qualitative literature on remittances in Egypt

The latest qualitative study about remittances in Egypt was conducted by the IOM in 2010. This field study comprises structured interviews for 200 remittance-receiving households across four Egyptian governorates, specifically families who have migrants in the Kingdom of Saudi Arabia

(IOM, 2010). However, the study does not contain an empirical model of the determinants of remittances. Moreover, it covers a limited number of Egyptian governorates, unlike the current study, which interviews families originating from 16 Egyptian governorates representing the four main regions in Egypt: Greater Cairo, North Egypt, Lower Egypt, and Upper Egypt. The timing of the IOM analysis also means that it does not capture the overall deterioration of the Egyptian economy, which has adversely affected the living status of Egyptian families and their demand composition, following the 2011 revolution (Hosny et al., 2014; Economic Research Forum [ERF], 2016). Among the challenges that families face are the high and volatile inflation rate and the devaluation of the Egyptian currency. Both of these are generally perceived in Egypt as important drivers of remittances (El Sakka and McNabb, 1999).

Another small-scale field study (around 45 interviews) by the European Investment Bank (EIB) analyzes the usage of remittances across budget items in selected MENA countries, including Egypt. However, the study's analysis is limited to bilateral migration corridors and particularly focuses on remittances channeled through the Egypt–Italy migration corridor (EIB, 2006).

Another example of the qualitative literature about Egypt is aggregate household surveys. The only example of a nationally representative longitudinal survey is the Egypt Labor Market Panel Survey (ELMPS) that is conducted by the ERF and the Central Agency for Public Mobilization and Statistics (CAPMAS) for 1988, 1998, 2006, and 2012. However, the survey does not focus specifically on remittance-receiving families. Nonetheless, it collects general information on various social and demographic characteristics of Egyptian households; for instance, information on job characteristics, mobility, earnings, and women's status and work.

A particular ELMPS survey, that of 2006, contains a section that gathers information on international migration history together with data on current migrants, the value of their channeled remittances, remittance types, and remittance frequency (ERF, 2007). ELMPS 2006 resembles the current study's objective to collect, by way of a survey, basic social and demographic information, such as age, dwelling, education, and employment, about Egyptian

migrants and their families. However, it does not elaborate on the impact of remittances on the demand composition of remittance-recipient families across different budget items, especially educational and health expenditure.

3. Review of the literature on the determinants of remittances and remitting behavior

Since the 1980s, and with the introduction of the role of information and social interaction to explain remittance behavior, the microeconomic analysis of remittances has witnessed profound changes in how economists define remittance-decision determinants. It is extremely difficult to differentiate between the various theories behind remittance behavior, mainly because these theories imply the use of the same factors that exercise homogenous influence on remittance decisions (Rapoport and Docquier, 2006).

According to Lucas and Stark (1985), migrants' intentions to remit range from pure altruism to pure self-interest, with several interdisciplinary motives existing within this wide range. First, consider Lucas and Starks' (1985) purely altruistic theoretical model that was elaborated by Nwosu et al. (2012). In this model, migrants' non-selfish altruistic motives are primarily derived from the per capita consumption of those left behind, the size of the household, and its existing sources of income. In other words, a migrant's utility and, correspondingly, the value of remittances, are derived from the migrant's family utility. In this framework, remittances are viewed as a compensatory source of finance in times of a poorly performing economy, unemployment, inflation, and any other adverse issue that affects a migrant's family status at home. Other factors that also influence altruistic remittance behavior are the duration of the migration project, the level of integration in the destination country, and the status of the existing family ties. In this context, Van Dalen et al. (2005) suggest that as a migrant's duration abroad extends, this implies the decay of his family ties and a consequent reduction in received remittances.

Conversely, a self-interested migrant is influenced by other factors that are eventually in his favor. Such a migrant's remittance decision is driven by two main reasons. First, if a migrant

invests in existing assets, land, buildings, or businesses in the home country, remittance is nothing but an investment decision. This decision is determined by the rate of return on such an investment, the migrant's income and savings, and the migrant's ability to apply a new business model adopted from abroad (Gallina, 2006; Nwosu et al., 2012). Another motivation for a self-interested migrant to remit is the intention to return home. In this regard, a migrant sends money to invest in a better dwelling, ensure higher relative prestige, or own a business (Nwosu et al., 2012).

Remitting may also be a form of complex social contract that is governed by several factors based on the negotiations of a migrant with his or her family. Accordingly, remittances are considered another source of household income that is not motivated by selfish or altruistic needs. Gallina (2006) introduces another behavior that stands between pure altruism and pure self-interest: "the co-sharing and insurance approach." In this regard, a family sends one of its members abroad as a form of insurance against adverse conditions in the home country and to secure a stable income. The remitter also sends money to maintain family ties and guarantee the possibility of a return in case the migration project fails. This approach can take either the form of a family contract (implicit), whereby the family invests in the migrant's educational and migration costs, or a contract (explicit) in the form of a loan that is repaid once the migrant settles and starts earning enough (Gallina, 2006).

The remittance behavior in this framework mainly depends on the degree of integration of a migrant in the destination country and the migrant's saving capacity. According to this approach, remittances should not decrease during a given (contract) period; however, a sharp decline is expected after the repayment has been completed and/or when the contract expires (Van Dalen et al., 2005). Within this framework, social variables such as *age*, *educational profile*, *gender*, and a *migrant's authority* play important moderating roles (Gubert, 2002). Other moderating socioeconomic factors, according to Russell (1986) and Ilahi and Jafarey (1999), are the time spent abroad, educational level, work experience, and a migrant's marital status, together with the recipients' income levels, employment profiles, number of children, and educational levels.

To recap, most microeconomic variables that influence remittances do not operate in vacuums or stay constant; instead, they are influenced by the dynamic social, political, and economic environments that affect migrants and their families. This issue has been raised by Gallina (2006), who sketches a graph hypothesizing that different approaches could exist for one migrant, depending on his or her current migration phase. The initial phase of a migrant project (0–5) years is characterized by altruism and co-sharing behavior. The flow of savings is high in this phase: up to 60% of a migrant’s income. If a migrant stays longer (12 years and more), he or she tends to remit less because of higher inclusion in society. Thus, a migrant’s spending becomes more directed toward a settlement in the destination area, especially if his or her family has moved with him. Another scenario can emerge when a migrant decides to return home. In this context, remittances prior to the migrant’s return tend to be high in order to secure future savings, set up a business, or own a home.

Table A.1 (see Appendix A) summarizes the behavior of the main microeconomic determinants of remittances discussed in the literature within the context of the two general theories of altruism and self-interest.

4. Background of the survey

4.1. Operationalization of the survey

One of the biggest challenges when conducting migrant-related surveys is locating households that have migrant members (World Bank, 2009b). Because there is no official data on the number or distribution of households that receive remittances in Egypt, this study employs the snowball sampling technique that is useful when dealing with a rarely approached population (World Bank, 2009b).² The major drawback of snowball sampling is that it seldom leads to a representative sample because of the lack of definite knowledge about whether or not the

² Snowball sampling (also known as chain sampling, chain-referral sampling, and referral sampling) is a non-probability sampling technique whereby existing participants recruit future subjects from among their networks. Thus, the sample group appears to grow like a rolling snowball.

selected sample is an accurate reading of the target vogue population. However, the best possible compensation against this drawback is, to begin with, a set of initial informants that are as diverse as possible (Morgan and Guevara, 2008).

The sampling strategy in this study is single-staged geographically clustered sampling. Thus, the population is divided into heterogeneous groups that are four geographical areas: Greater Cairo, North Egypt, Lower Egypt, and Upper Egypt. Because data on remittance-receiving households and migrants across Egyptian regions is deficient, the random sample is drawn from remittance-receiving households proportional to the population of each region, based on the population census of CAPMAS (2016). Of the participants, 20% are from Greater Cairo, 10% from North Egypt, 40% from Lower Egypt, and 30% from Upper Egypt, as shown in Table 1.³ This approach corresponds with the World Bank's (2009b) sampling strategy of similar studies that incorporate vogue populations in Senegal, Uganda, and Nigeria.

Table 1: Geographical distribution of interviewed households

Geographical region	Population (millions)	Percentage of total Egyptian population	Number of interviewed households	Governorates
Greater Cairo	18.3	20%	62	Cairo and Giza
North Egypt	9.2	10%	40	Alexandria, Ismailia, Suez, and Port Said
Lower Egypt	36.5	40%	124	Sharkia, Kafr El Sheikh, Dakahilia, Gharbia, and Qalyobia
Upper Egypt	27.4	30%	78	Asute, Minya, Beni Suief, Fayoum, and Menofeya,
Total	91.4	100	304	16

³ This study excludes the Sinai area (Marsa Matoruh, North Sinai, South Sinai, and the New Valley) because of security issues related to recent terrorist attacks. Moreover, the total number of people living in these governorates is insignificant, around 1 million (1% of the Egyptian population).

The survey's languages are Arabic and English. Every household head was interviewed in his or her preferred language. All 285 face-to-face interviews were conducted in Arabic, while the 19 online surveys were completed in both languages. The survey consists of two main parts with a total of 41 questions. The first part has a series of questions intended to gather socioeconomic and demographic information about a household and its migrant(s), covering various dimensions such as age, sex, employment, household composition, education, dwelling, destination country, reasons for migration, and duration of stay.

The second part gathers information on a household's income sources and consumption expenditure. This section includes data on remittance values, currencies, frequency, and channels. It also has the distribution of remittances across various household expenditure components: education, health, debts, food and drink, mobiles, laptops, cars, and investments. This study avoids the use of ranges in income and expenditure questions in order to cover all possible answers and facilitate data processing. Technical Appendix B provides further details of data collection, survey design, the questionnaire sample, sensitivity analysis, and limitations.

4.2. Description of survey results

This section is divided into three subsections. The first and second describe the demographic and socioeconomic characteristics of the households and the migrants respectively. The final subsection illustrates the income and expenditure data of the households and the characteristics of received remittances.

a. Household demographic and socioeconomic characteristics

The remittance-receiving households in the sample are female dominated, with around 70% of the household heads female (N=215) and 30% male (N=89). In terms of the social ties with migrants, marriage is at the top of the list: 208 of the 304 respondents are migrants' spouses. Moreover, 82 of the household heads are parents. Figure A.1 (see Appendix A) presents the age distribution of the respondents and shows that most female household heads who receive

remittances from their husbands are within the 29–40 age bracket, while older age cohorts, 55+, mainly reflect those household heads who receive remittances from their children.

Of the respondents, 50% have received formal education. Half of these are high school graduates and the others are university graduates. Almost 13% have no formal education. Respondents with lower educational attainments are concentrated in Lower and Upper Egypt, while those with better qualifications reside mainly in Greater Cairo and North Egypt. Additionally, 20% of the respondents who reside in the Upper and Lower Egypt regions have completed a vocational or technical school qualification, as shown in Table A.2 of Appendix A.

In spite of the large population densities (70% of the total population) in the Upper and Lower Egypt governorates, both areas have relatively low educational attainments, which reflects the welfare and poverty inequality across Egyptian governorates. The Cairo and North Egypt governorates have better public infrastructure, private capital accumulation, and investment in human capital compared with the Upper and Lower Egypt regions, which have always been ignored by policymakers and received less attention in terms of developmental initiatives and public spending. Accordingly, the latter regions have suffered from a continuous deterioration of living standards and an escalation of poverty and deprivation relative to the other regions (Egypt Network for Integrated Development [ENID], 2015).

Most household heads (57%) work full-time, while almost 15% are not employed and not looking for a job. Of the 89 males who are household heads, 52 are self-employed as farmers. With regard to the ways in which remittances affect employment decisions and the labor force participation of recipients, the results provide a counterargument to the hypothesis that a steady flow of non-labor income, for example remittances, discourages recipients to be economically active (Cox-Edwards and Rodriguez-Oreggia, 2009). Nearly all the respondents kept their jobs after receiving remittances. Those that left their jobs (approximately 6%) have retired or state that there is no need for extra income and they prefer to have more time for their families.

b. Migrant demographic and socioeconomic characteristics

Migration in the sample is male-dominated. Most of the migrants are aged 25–45. Around 50% reside in the MENA region, namely Jordan, while 35% reside in Gulf Cooperation Council (GCC) countries such as Saudi Arabia. The average duration of migration is five years. More than 90% of migrants have medium-sized families with one or two children, regardless of their residential environment, educational level, and income. The average age of a migrant's first-born child is 10 years; the median is 8 years.

With regard to the migrants' educational profiles, 50% hold a bachelor's degree, while 25% have finished vocational training and 18% have a diploma. Those migrants who are unwilling to return to their home countries represent 70% of the total; the remaining 30% say that their return is conditional on a well-paid job in Egypt. These findings correspond with Egypt's ranking as the eighth country ranked among 132 in terms of tertiary unemployment rates. In addition, Egypt suffers from high youth unemployment, which classifies it as the country with the seventh highest rate of youth unemployment in the MENA region and the twenty-fourth among 172 countries worldwide (World Bank, 2017). The construction and service sectors are the largest recruiters of Egyptian migrants, as shown in Table 2. Approximately 33% of migrants work as technicians, 27% work in the service and sales sectors, while 28% work in the housing and construction sectors. Before migrating, 20% of the migrants (N=58) were unemployed.

Table 2: Migrants' qualifications vis-à-vis their current jobs

Education / Job at destination	Academic	Manager	Technician	Service and sales	Armed force	Housing and construction	Total	Percent.
Preparatory	0	0	0	2	0	0	2	0.6
High school	0	0	0	3	0	9	12	3
Vocational	1	0	1	25	0	48	75	25
Diploma	0	1	18	11	0	24	54	18
Bachelor	4	18	80	35	0	8	145	48
Post graduate	24	0	0	1	1	0	14	5.4
Total	17	19	99	77	1	89	304	100
Percentage	5.5	6.2	33	27	0.3	28		100

Source: Authors' calculation.

c. Income and expenditures data

Of the 215 female household heads, 52 (25%) state that remittances are their only source of income. Other respondents (N=252) report other sources of income with an annual mean of EGP 16,476 and a maximum of EGP 200,000 per year.⁴ Families with larger income profiles reside in North Egypt and Greater Cairo. The mean income of such families is nearly double that of families in Upper Egypt and Lower Egypt.

The mean annual value of received remittances is EGP 48,708 with a minimum value of EGP 6000 and a maximum of EGP 1,000,000. Nearly 95% of the interviewed households report that remittances are a significant source of non-labor income, with an average value that exceeds the

⁴ The average official exchange of the Egyptian pound against the US dollar during the survey period is US\$1=EGP 7.93.

average of other income sources (Figure 2). There are some outliers in reported remittances that could bias the average estimates; thus, the medians of remittances and other sources of income are plotted across regions in Figure A.2. Households in Greater Cairo and North Egypt tend to receive larger remittance values compared with households in other regions, mainly because of the relatively higher cost of living.

Migrants outside the MENA region send remittances with larger values compared with migrants inside the region because, in the sample, most migrants who work outside the region acquire academic and managerial positions that generate higher salaries and correspondingly larger remittances. Another reason is the state of uncertainty faced by many Arab migrants in the GCC region. This situation is mainly due to oil price fluctuations and the implementation of nationalization policies in the GCC that substitute foreign workers with nationals, thus affecting adversely the remittance behavior of the Egyptian diaspora (Hassan, 2016).

The US dollar is the dominant currency of remittances. Of the respondents, 39% receive remittances twice a year, 37% receive them three times a year, and 18% receive them each quarter. Since most migrants reside inside the region, the preferred way to send remittances is through banks. Approximately 60% of the respondents receive remittances via bank transfers. The second most popular way is informal channels. In this regard, 37% of the respondents report that remittances were hand-delivered by the migrant, a relative, or a close friend. These numbers correspond to the estimates of Amuedo-Dorantes et al. (2005b), who say that the informal delivery of remittances ranges between 20 to 35% of total remittances.

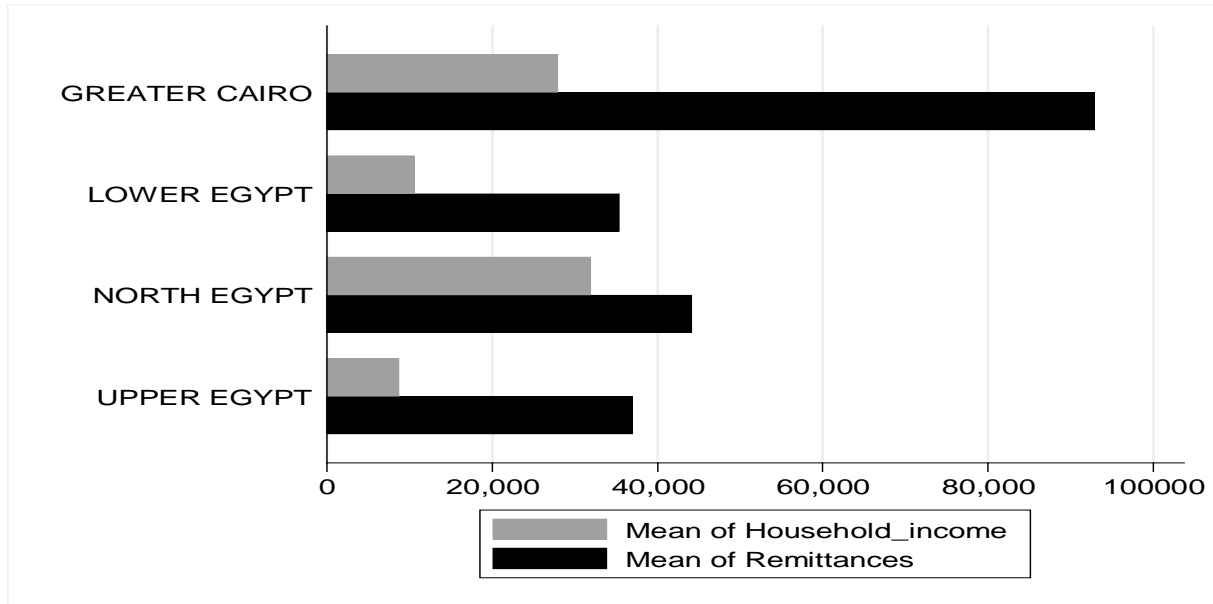


Figure 2: The mean of remittances compared with the mean of households' other income sources

Source: Authors' calculation

The survey asked the respondents to report their average monthly expenses taken from remittances on selected budget items. Figure 3 shows that food, education, and real estate (land and house acquisitions) tend to be the main items on which remittances are spent. On a monthly basis, families tend to spend from received remittances an average of EGP 2,086 on food, EGP 1,583 on education, and EGP 3,094 on real estate. These figures correspond with the plausible findings in the qualitative and empirical literature that everyday expenses, represented mainly by food, and real estate investments absorb most of the remittances (IOM, 2010; Farzanegan and Hassan, 2016; Clément, 2011).

Most respondents (85%) do not invest remittances. Those who do invest remittances mainly reside in the Upper and Lower Egypt regions. This circumstance is explained by the relatively higher cost of living in Cairo and North Egypt, which hinders the usage of remittances for

investments in these regions.⁵ “Income constraints” comes at the top of the factors that prevent respondents from investing remittances, followed by “limited information on how and where to invest,” and then “profitable investment opportunities in destination countries.” When asked to choose whether they prefer to invest remittances in the form of “bank deposits with returns” or “projects,” 84% of respondents choose bank deposits and most who choose “projects” reside in Upper and Lower Egypt.

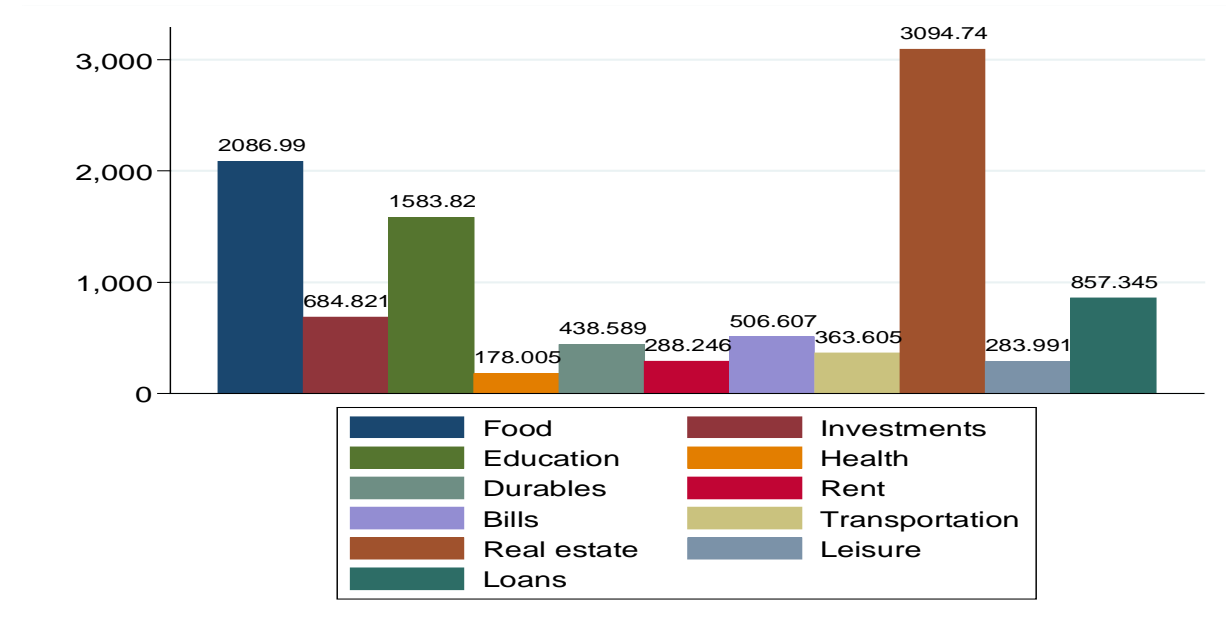


Figure 3: The average monthly expenses for which remittances are used *Source: Authors’ calculation*

d. Remittances impact on educational outcomes

The average annual educational expenditure in the sample is EGP 7,675. However, when the figures are categorized geographically, it is clear that families residing in the Greater Cairo and North Egypt regions tend to spend larger proportions of their income and remittances on education relative to families in other regions, as shown in Figure A.3, Greater Cairo households

⁵ For policy recommendations and suggestions to improve the investment usage of Arab diaspora remittances, see Hassan (2016).

spend an average of EGP 22,260 on education annually, compared with EGP 3,297 in Lower Egypt, EGP 7,975 in North Egypt, and EGP 2,449 in Upper Egypt. According to 83% of the respondents, the pattern of their educational spending has changed positively after receiving remittances. This finding corresponds with those of Yang (2008) and Acosta (2011) who show that remittance-receiving families tend to spend more on education compared with their peers in El Salvador and the Philippines who do not receive remittances.

In turn, the respondents were asked to choose one of four options that best describes the transformation caused by receiving remittances. After receiving remittances, 50% of the households report that they direct more resources toward private tutoring, while 20% have moved their children from public to private or international schools in order to obtain better educational services. Remittances for 17% of the respondents have freed more resources for improving the cognitive and physical skills of their children; for instance, by buying their children laptops and games that enhance mental faculties, by enabling participation in clubs and sports, by providing healthier diets, and by offering their children training in other languages and soft skills. Only 12% of the respondents selected all four options.

It is also relevant to understand clearly how the latter transformations have influenced not only the value of educational expenditure but also the quality of education for children. Assessing the quality of education is not straightforward because of its non-quantifiable, subjective, and interdisciplinary nature (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2015). Thus, the respondents were asked to rate, on a scale from 0 to 3 (0 implies no effect, while 3 implies high effect), the educational effect of remittances on the following dimensions: children's grades, speaking and writing skills, mathematical skills, independent learning skills, cognitive and mental skills, and social and communication skills. Table 3 shows that more than half the households report that the children's grades and their speaking and writing skills have been "highly" affected by the new pattern of educational spending. In addition, 60% of the households state that their children's mathematical skills, independent learning, and mental abilities are affected to a "medium" degree. An equal percentage of

households also report that their children’s social skills are affected to “medium” and “high” degrees.

There is no better way to identify the factors that influence the quality of educational services in schools than to ask students or their families. Given that most migrants’ children in the sample are of school age, this study exploits such an opportunity to investigate the issue of quality in more detail. The respondents were asked to rate, on the same scale from 0 to 3, the impact of the following factors on the quality of the educational experienced by their children: the pupil–teacher ratio (the number of students per teacher), the size of classes (the number of children in a classroom), the availability of schools, and the availability of adequate means of transportation to and from schools. The largest fraction of respondents rate pupil–teacher ratio and size of class as “high” moderating factors, while the availability of schools in residential areas and the quality of transportation are rated as “medium” factors, as shown in Table 4. Moreover, in spite of the respondents’ diversity, they consider all these factors as important determinants of the quality of education.

Table 3: Respondents’ ratings of the impact of remittances on the quality of education

Dimensions	Percentage of the respondents and their ratings			
	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>No effect</i>
Grades	75%	25%		
Speaking and writing skills	63%	36%	0.54%	0.46%
Mathematical skills	22%	75%	3%	
Ability to learn independently	22%	64%	12%	2%
Mental and cognitive skills	20%	50%	20%	
Social and communication skills	43%	44%	13%	

Source: Authors’ calculation.

Table 4: Determinants of the quality of education

Dimensions	Percentage of the respondents and their ratings			
	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>No effect</i>
Pupil-teacher ratio	44%	33%	10%	14%
Size of class	47%	41%	13%	0.5%
Availability of schools	31%	45%	17%	6%
Transportation	20%	52%	22%	5%

Source: Authors' calculation.

e. Remittances impact on health expenditures

Families tend to allocate smaller fractions of their income to health expenditures compared with educational expenditure. The respondents spend an average annual amount of EGP 1,436 on health. This includes spending on medicines, therapeutic appliances, and other health-related services. The existence of chronic diseases in family members influences the amount of health spending. Of the households, 50% report having no chronic diseases, while the remaining households have one or more family members suffering with hypertension or diabetes, both of which are highly prevalent in Egypt (Ministry of Health, 2006). In this context, the question considered here is as follows: Does the pattern of health expenditure change after remittances start to be received? Of the respondents, 73% answer this question with “yes” and the rest say “no.” With regard to this change in expenditure, 42% of the respondents use the extra resources to consume healthier diets and acquire club memberships, 38% organize surgical operations, 5% adopt private health schemes with better coverage and services, and 15% choose all the foregoing options.

5. Empirical analysis of micro-determinants of remittances

This study's empirical analysis aims to answer two questions: i) What are the main microeconomic variables that influence the flow of remittances? ii) Which theory, altruism or

self-interest, describes the remittance behavior of the migrants in the sample more accurately? In order to address these questions, this study uses a unique cross-sectional data set that contains information from 304 remittance-receiving Egyptian families during May 2015–May 2016. This data set is single-staged and geographically clustered with only one strata, where the four Egyptian geographical regions are the primary sampling units (PSUs) and households are the secondary sampling units (SSUs).

The sample is limited in number and does not account for the fraction of migrants who do not remit or who remitted and then stopped. This situation implies that the sample is a nonrandom subsample of the migrant population. The survey also examines the determinants of remittances only from the households' perspective. Thus, it misses important information on the migrant side such as income, expenditure, savings, and the existence of dependents in the destination country. This approach could be a problem if the results are generalized for the entire population (Hoddinott, 1994). However, this study's objective is mainly to make inferences about the main socioeconomic drivers of remittances and define which theory best describes the remittance behavior among migrants in the sample.

This study's model contains the *level of remittances* as the dependent variable regressed against a set of predictors that capture the migrants' and recipients' characteristics. There is a common debate in the empirical literature of remittances about the discrepancies between the value of remittances and the decision to remit, and whether or not these two issues are derived from the same mechanisms (Nwosu et al., 2012). However, the current study does not compare the spending patterns of remittance-receiving and non-receiving households because it only collects information from families who have been constantly receiving remittances. Thus, Tobit is the preferred methodology to study this one-stage decision, treating the remitting probability and the value of remittances as one (Gubert, 2002; Amuedo-Dorantes and Pozo, 2006; Hagen-Zanker and Siegel, 2007). Tobit censoring is also useful when dealing with a variable that has several outlying observations such as *remittances*. Hence, the censoring limits were set at values of

10,000 and 150,000 in order to converge data ranges into the largest cloud of observations. The cross-sectional equation is as follows:

$$remittances_i = cons. + \sigma_1 \sum migrant_i + \sigma_2 \sum recipient_i + \varepsilon_i \quad (1)$$

The dependent variable *remittances* is regressed against a set of quantitative and binary control variables based on the literature discussed in section 3, which includes Gallina (2006), Gubert (2002), and Nwosu et al. (2012). These variables are classified into the vector *migrant*, which controls for the following migrant-related variables: *migrant's age*, *migrant's education*, *duration of migration*, *return decision*, *destination region*, and *job category at destination* (*academia*, *management*, *technical*, and *sales*). The second vector, *household*, comprises the household-related variables: *household income*, *household job*, *children*, *household head's education*, *settlement area*, and *dwelling type*. The variables' descriptive statistics and definitions are presented in Tables A.3 and A.4 (see Appendix A).

Since the independent variables have different measurement units, the standardized regression coefficients of all the control variables are reported in Table 5. The Ordinary least square (OLS) beta coefficients are all measured in standard deviations instead of the variables' units. Thus, these predictors can be compared and the relative strength of each one assessed in terms of its influence on the dependent variable, *remittances*.

The nature of this study's data collection mitigates the issue of reverse causality that arises when using *remittances* as the dependent variable. Some variables may look endogenous, such as household's *income* or *job*, because remittances may influence a migrant's family income and the employment choice of the household head. Regarding the impact on household income, the corresponding survey question is structured in such a way that respondents report only other secondary sources of income excluding remittances. This approach explains the existence of several zeros in the variable, signaling those families who have no other sources of income but remittances. With regard to the household head's job, the cross-tabulations and descriptive statistics described in section 4.2, subsection a, show that nearly all the respondents kept their

jobs after starting to receive remittances, suggesting that remittances do not influence the household head's employment choices.

The data collection process was primarily completed using face-to-face interviews; however, 19 questionnaires were conducted online. This methodological shift could bias the estimations. Thus, to check the robustness of the results, the regressions are repeated after excluding the 19 observations. The estimation results hold, regardless of the sample used. These estimates are available upon request.

6. Empirical results and discussion

The Tobit regressions appear in Table 5. The dependent variable is *remittances* in absolute terms. The independent variables are classified into two groups, migrant-related variables and household-related variables. This study follows the specific to the general approach because each set of explanatory variables is estimated separately and then grouped in model 5.3.

With regard to the ranking of the control variables' relative strengths, the four most important predictors of remittances are *duration of migration*, *migrant's age*, *household income*, and *household job* because they have the largest beta coefficients in model 5.5. A one standard deviation increase in the first three predictors leads to 0.308, 0.215, and 0.211 standard deviation increases in remittances respectively. With regard to *household job*, a one standard deviation increase reduces remittances by a 0.193 standard deviation.

6.1. Households' characteristics

Tobit regression results show that *household income* has a positive and small impact on remittances; thus, a one unit increase in household income increases remittances by EGP 0.69 at the 1% level in model 5.3. This result is unexpected and confusing; however, the small coefficient suggests the existence of a problem in the variable's coding. This variable represents secondary sources of income for a migrant's family. The respondents were not asked to separate the different types of secondary income that they possess; instead, they were asked to report the

average annual household income, excluding remittances. Consequently, this variable captures every possible source of income that a family receives. Such income can be wealth, transitory income, labor income, savings, holdings, and financial assets.⁶

However, to test if this result holds, the impact of steady labor earnings on *remittances* was separated from other secondary sources of household income. A dummy variable, *household head's job* (which takes a value of 1 if a household head is employed and 0 otherwise), was also used. Employment status refers to a full-time job, part-time job, or self-employment. The value of the coefficient reverts to the expected negative sign, whereby the employment status of the household head reduces *remittances* by EGP 17,139 at the 5% level in model 5.3. The negative coefficient of *household head's job* holds in model 5.4 when the squared term of household income is included, while both the linear and squared coefficients of *household income* become insignificant. Several studies such as those of Osili (2007) and Osaki (2003) have found similar results regarding the negative association between household income and the value of received remittances that accord with altruism theory's predictions and signal the relative importance of migrants' remittances in financing families' needs. This finding is also supported by the outcome of one of the survey's questions, which shows that nearly 95% of the respondents state that remittances are a significant source of income (section 4.2, subsection c).

When the household head has an additional year of education, this tends to increase remittances by EGP 1134 at the 10% level in model 5.3. Most household heads in the sample are mothers of migrants' children, as reported in section 4.2, subsection a. This result follows the plausible finding that better educated mothers care more about the educational attainments of their

⁶ One explanation of this positive correlation is a migrant's expectation of having a higher share in his or her family's bequest. This in turn can encourage some migrants who originate from wealthy families to remit more because they assume that inheritance is conditional on behavior. Lucas and Stark (1985) find evidence for this bequest motive in Botswana, where sons remit more to families that have larger herds and income. Similar results have been found by Pleitez-Chavez (2004) and Schrieder and Knerr (2000). This theory holds when most recipients are migrants' parents and remittances are transferred to the migrants' families, unlike most migrants in the current study's sample who send remittances to their wives.

children relative to less educated mothers (Case and Deaton, 1999; Brown, 2006). In particular, this study's qualitative analysis shows that better educated household heads mainly reside in the Greater Cairo and North Egypt regions, which are characterized by high living expenses, including education. This situation requires larger remittances from migrants in order to finance their children's educational expenditure. This result corresponds with the positive coefficient for *children* in the household because one extra child increases *remittances* by EGP 2971 at the 10% level in model 5.3. However, this effect is not robust in all models. Similar results are found by Amuedo-Dorantes and Pozo (2006) in Mexico and Gubert (2002) in Mali.

2.6.2. *Migrants' characteristics*

Among the migrant-related control variables, *migrant's education* and *migrant's age* are the main triggers of remittances. These findings accord with the altruism theory, which suggests that as time goes by, migrants become more experienced, especially those who are highly educated, and become better able to generate sufficient income and consequently remit more to meet the financial needs of their families left behind (Van Dalen et al., 2005; Hagen-Zanker and Siegel, 2007; Hoddinott, 1994). The *age-squared* variable is used in model 5.4 to test the non-linearity of the impact of age on remittances. As argued by Hoddinott (1994), a quadratic formulation of age is possible because of the motives of those sons who migrated in the past to stay in the sub-location of their elderly parents, especially when some may have retired or are about to retire. Nevertheless, the *age-squared* variable is insignificant. This result is more likely due to the low age profile of most migrants in the sample (the mean migrant age is 38 years), which suggests they are still at the beginning of their migration phase. Moreover, most migrants in the sample send money to their wives, not their parents.

When one year is added to the *duration of migration*, remittances increase by EGP 703 at the 1% level in model 5.3. This result points toward the self-interest or insurance models of remittance (Gubert, 2002), unlike altruism theory's predictions that foresee a gradual decrease of remittances as family ties decay over time and distance.

Surprisingly, *destination region* carries a negative sign in models 5.1 and 5.4, implying that Egyptian migrants outside the MENA region remit more relative to those inside the region. In spite of the increasing number of Egyptian migrants inside the region, specifically the GCC, remittances to Egypt decline during the survey's time span from mid-2015 to mid-2016 (World Bank, 2017). This period has two distinctive events that adversely impacted the flow of remittances from intraregional migrants. These are the fall of oil prices (Organization of the Petroleum Exporting Countries [OPEC], 2017) and the launch of the nationalization employment policy (the Nitiqat program) in Saudi Arabia, the largest employer of Arab expatriates. This program seeks to increase the number of Saudi nationals employed in the private sector (Al-Dosary and Rahman, 2005) and has led to the dismissal of large numbers of diaspora and raised the probability of repatriation for others (World Bank, 2015).

Migrants who face such insecurity may react by moving to cheaper homes, reducing their spending, and shrinking their savings; consequently, they remit less. Some migrants may adopt a different strategy by choosing to remit all their savings in preparation for returning home (Jha et al., 2010). However, given the adverse economic situation and high unemployment rates in Egypt, it seems as though most Egyptian migrants inside the region have chosen the first strategy of mitigating the amount of remittances allocated for their families back home.

A migrant's job category seems to play a minimal role in terms of remittances, possibly because of the limited number of observations and the concentration of most migrants in the model in the technical sector. This situation explains why, among the job categories, the only positive and significant coefficient is for *technical*.

To recap, it is challenging to argue in favor of only one theory to explain remittance behavior. Even someone who is driven purely by altruistic intentions may act in accordance with some kind of social contract. Hence, distinguishing between the theories and pinpointing the pure altruists among remitters is perhaps impossible (Van Dalen et al., 2005). Nevertheless, the findings generally support the altruistic remittance behavior of the migrants in the sample. For

instance, the negative impact of the household head's job on remittances points in this direction. Moreover, the positive coefficients for migrant's age and migrant's education support the altruism theory. Further, altruistic migrants are supposed to remit more in adverse times because their primary objective is to support their families back home, regardless of whether the shock occurs at the individual or country levels (Combes and Ebeke, 2011). In the questionnaire, this study tries to provide a proxy for such behavior by asking the participants, "Have remittances increased after the 2011 revolution?" The answer is either "yes" or "no." Nearly 64% answer the question with "yes." This result signals the positive reaction of remittances to adverse shocks and supports the theory of migrants' altruistic behavior.

Table 5: OLS standardized coefficients and Tobit regressions

	Dependent variable: remittances				
	(5.1) <i>Tobi</i> <i>Recipients'</i> <i>control</i>	(5.2) <i>Tobit</i> <i>Migrants'</i> <i>control</i>	(5.3) <i>Tobit</i> <i>Complete</i> <i>model</i>	(5.4) <i>Tobit</i> <i>Non-linear</i>	(5.5) <i>OLS beta</i> <i>coefficients</i>
<u>Household-related variables</u>					
<i>household income</i>	0.365*** (4.87)		0.693*** (6.89)	0.113 (0.32)	0.211 (4.16)
<i>household head job</i>	-19292.3* (-1.91)		-17139.8** (-2.24)	-11384*** (-3.26)	-0.193 (-3.24)
<i>settlement area</i>	5732.1 (1.06)		-1891.2 (-0.46)	-729.7 (-0.27)	-0.014 (-0.25)
<i>children</i>	13667.4 (1.57)		2971.2* (1.66)	3507.9 (1.64)	0.079 (1.35)
<i>dwelling type</i>	-13424.4** (-2.57)		-4539.0 (-1.61)	-2086.0 (-0.79)	-0.048 (-1.01)
<i>household head education</i>	2353.3* (1.84)		1134.1* (1.84)	1266.0** (2.10)	0.132 (1.64)
<u>Migrant related variables</u>					
<i>return decision</i>		3181.6* (1.74)	-1292.1 (-0.98)	-1142.4 (-0.88)	-0.017 (-0.38)
<i>destination region</i>		-43710.6** (-1.99)	-28303.5 (-1.42)	-34039.9* (-1.77)	-0.073 (-1.67)
<i>migrant age</i>		1384.9** (2.14)	1639.0** (2.18)	-4703.6 (-1.25)	0.215 (2.33)
<i>migrant education</i>		3061.1*** (2.96)	1287.7** (2.30)	980.2** (2.39)	0.121 (1.93)
<i>duration of migration</i>		1365.5** (2.34)	730.7*** (3.35)	-124.4 (-0.34)	0.308 (3.47)
Migrant Job category:					
<i>academia</i>		-822.6 (-0.15)	2337.8 (0.53)	-3068.0 (-0.68)	0.133 (2.37)
<i>management</i>		6664.6 (0.80)	7553.8 (0.83)	6418.2 (0.74)	0.016 (0.27)
<i>technical</i>		2910.3** (2.55)	3498.7*** (2.89)	5044.7** (2.36)	0.031 (0.46)
<i>services and sales</i>		79.31 (0.05)	-586.6 (-0.35)	-899.3 (-0.60)	-0.018 (-0.36)
<i>household income (squared)</i>				0.00000848 (1.54)	
<i>age (squared)</i>				79.88 (1.53)	
N	302	279	277	277	
Log Psuedolikelihood	-3285	-3038	-2979	-2970	
Psuedo R2	0.02	0.03	0.04	0.05	
Uncensored	284	268	266	266	
Right censored	12	10	10	10	
Left-censored	6	1	1	1	

t Statistics shown in parenthesis. Significantly different from zero at *10%, **5%, and *** 1%. The constant term is included (not reported). The upper and lower limits of Tobit are, 10,000 and 150,000 respectively, wherein majority of remittance values lie within this range

2.7. Conclusion

This study provides a double-edged analysis for the microeconomic determinants and causes of remittances in Egypt. It presents a qualitative exploration and empirical investigation from the perspective of 304 migrant households located across 16 Egyptian governorates. The empirical regression of the micro-determinants of remittances shows that the *duration of migration*, *migrant's age*, *household income*, and *household head's job* are the most important predictors of the level of remittances. The first three variables induce the value of received remittances; the final variable, *household head's job*, acts to the contrary and reduces remittances.

The results suggest that the remittance behavior of the migrants in the sample is best modeled in accordance with altruistic motives, implying that the migrants remit because they care about their families. This situation is especially the case because of the adverse political and economic environments that have prevailed in Egypt following the 2011 revolution, which have increased hardship for many Egyptian families.

In terms of policy implications for promoting the favorable impact of remittances on the national economy, the qualitative analysis shows that recipient households prefer safer investment tools for their overseas transfers, choosing “bank deposits with returns” rather than “projects.” Families in Upper and Lower Egypt also have a higher tendency to invest and save remittances because of the low living costs in these regions compared with families residing in the high-cost regions of Greater Cairo and North Egypt. This finding suggests that policymakers and the Central Bank of Egypt (CBE) should target migrants' families, especially those families in Upper and Lower Egypt, with specific, tailored financial and investment programs in order to attract their foreign currency savings. This suggestion is particularly relevant when the second most significant constraint against investing remittances is “do not know where and how to invest.” From one perspective, such investment programs would improve the foreign currency base and the lending capacity of national banks. From another perspective, the savings would generate steady incomes for families that help to protect them against volatile and increasing inflation.

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Appendix A

Table A.1: The behavior of the main microeconomic determinates of remittances

Main explanatory variables / Model	Altruism Model	Self-interest model
Migrant Characteristic		
Income	+	+
Education	Nde	+
Duration of stay	-	+
Recipient's Characteristic		
Size of the family	+	Nde
Education	+	+
Permanent Income	-	Nde
Transitory income	+	+

Wealth	-	+
Family ties	+	Nde
Adverse shocks	+	-

Notes: The impact of adverse shocks on the remitting behaviour of the migrant has not been elaborated deeply in the literature. However, there exists a general consent on the macroeconomic level that remittances tend to increase in bad political or economic times, though no microeconomic evidence exists to support this hypothesis. nde = no direct effect maybe + or -

Source: Van Dalen et al., (2005) and author's interpretations.

Table A.2: Educational level of respondents vis-à-vis geographical regions

Education level/ geographical regions	Greater Cairo	Lower Egypt	North Egypt	Upper Egypt	Total	Percentage
No formal education	1	16	0	11	28	10
Alphabetization	1	11	0	2	12	3
Primary	0	8	1	10	19	7
Preparatory	6	9	4	10	29	10
High school	13	30	7	21	71	24
Vocational	10	26	6	14	56	20
Diploma	0	2	0	0	2	0.6
Bachelor	28	21	16	10	75	25
Post graduate	3	1	6	0	10	0.4
Total	62	124	40	78	304	100

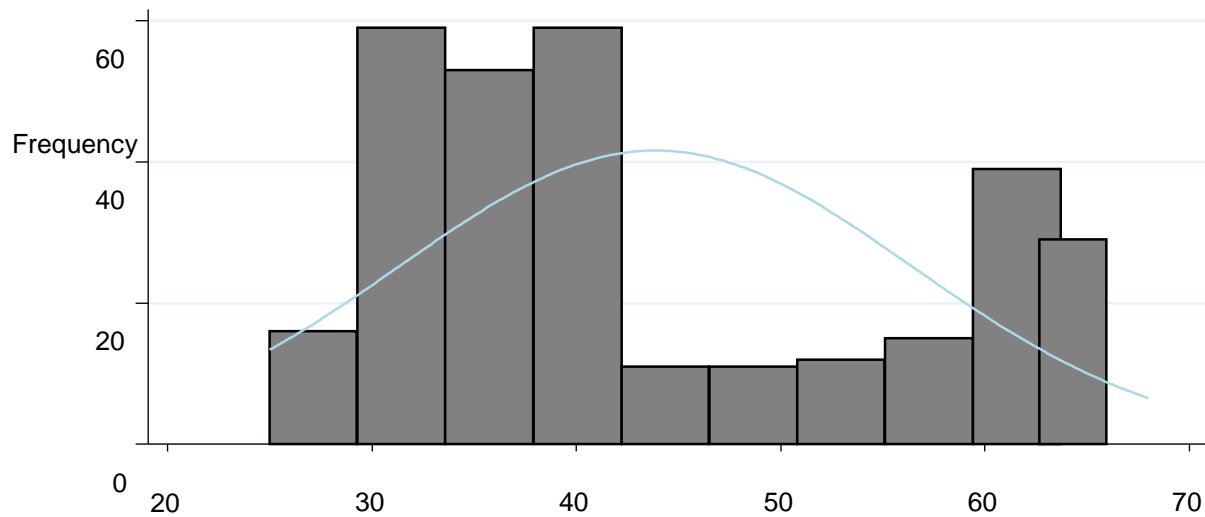
Source: Authors' calculation.

Table A.3: Variable's definitions and coding

Variable	Definition	Type
<i>migrant age</i>	Migrant age	Continuous
<i>migrant education</i>	The migrant's level of education measured in number of his schooling years in Egypt. Completion of primary school 6 years, preparatory school 9 years, secondary school 12, university 16 and post graduate 20 +	Continuous
<i>children</i>	Number of children living in the migrant's household who benefit from remittances	Continuous
<i>duration of migration</i>	The number of years spent abroad	Continuous
<i>return decision</i>	The migrants decision of returning to Egypt	Binary: takes value of 1 if the migrant is willing to return, and 0 otherwise.
<i>destination</i>	The settlement region of the migrant	Binary: takes value of 1 if the migrant is staying inside the MENA and GCC region and 0 otherwise
<i>migrant job</i>	The migrant job type	Nominal: takes value of 1 if the migrant works in academic and research, 2 manager, 3 technician , 4 Service and sales.
<i>household head income</i>	Other sources of family income excluding remittances	Continuous
<i>house hold head education</i>	Household head level of education measured in years of his/her schooling years in Egypt. Completion of primary school 6 years, preparatory school 9 years, secondary school 12, university 16 and post graduate 20 +.	Continuous
<i>settlement area</i>	Describing the settlement area of the migrant's family	Binary: takes value of 1 if they settle in urban surrounding and 0 otherwise
<i>house hold head job</i>	The household head employment status	Binary: takes value of 1 if the household head is employed at the time of the survey and 0 otherwise
<i>dwelling type</i>	The migrants' family dwelling type.	Binary: takes value of 1 if their dwelling is not yet owned and they are paying installments, and 0 otherwise

Table A.4: Variable's descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Minimum	Maximum
<i>children</i>	304	1.42105	0.88647	0	4
<i>household income</i>	304	16476.6	21011.7	0	200000
<i>remittances</i>	304	48708.9	67896.8	6000	1000000
<i>household head job</i>	304	0.59868	0.49097	0	1
<i>return decision</i>	304	0.26974	0.44455	0	1
<i>settlement area</i>	304	0.8125	0.39096	0	1
<i>destination region</i>	304	0.95066	0.21694	0	1
<i>migrant age</i>	304	38.6086	8.29657	24	61
<i>household head education</i>	302	10.8378	5.17824	0	20
<i>duration of migration</i>	279	5.00358	3.78229	1	26
<i>dwelling type</i>	304	0.13399	0.3412	0	1
<i>migrant education</i>	304	14.38487	2.492213	9	20

**Figure A.1: Frequency of the household head age**

Source: Authors' calculation

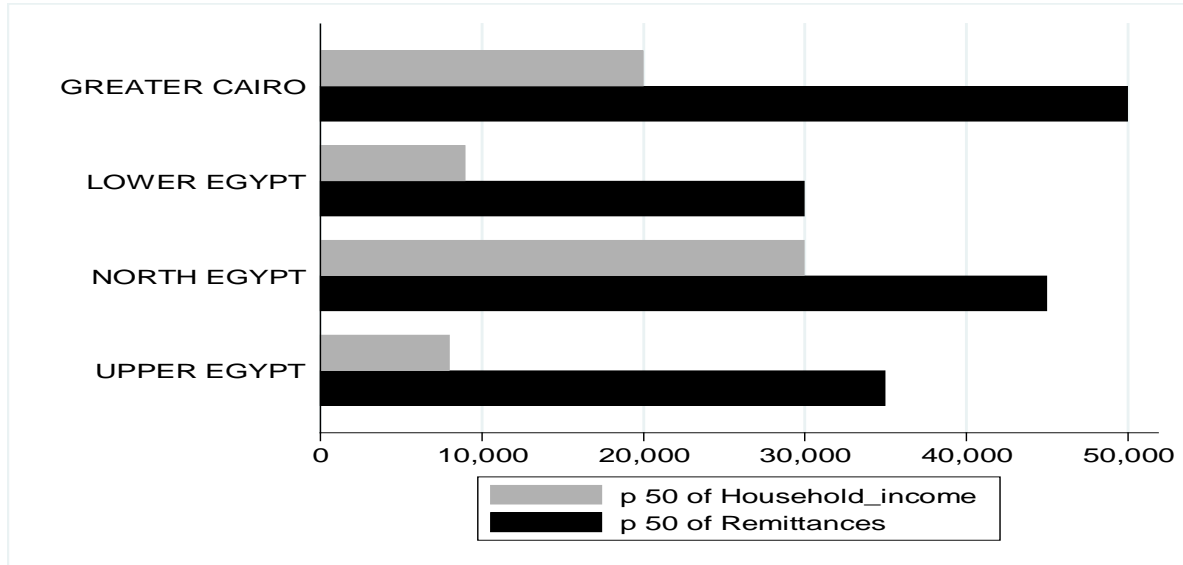


Figure A.2: Median of remittances and other sources of household income across regions
Source: Authors' calculation

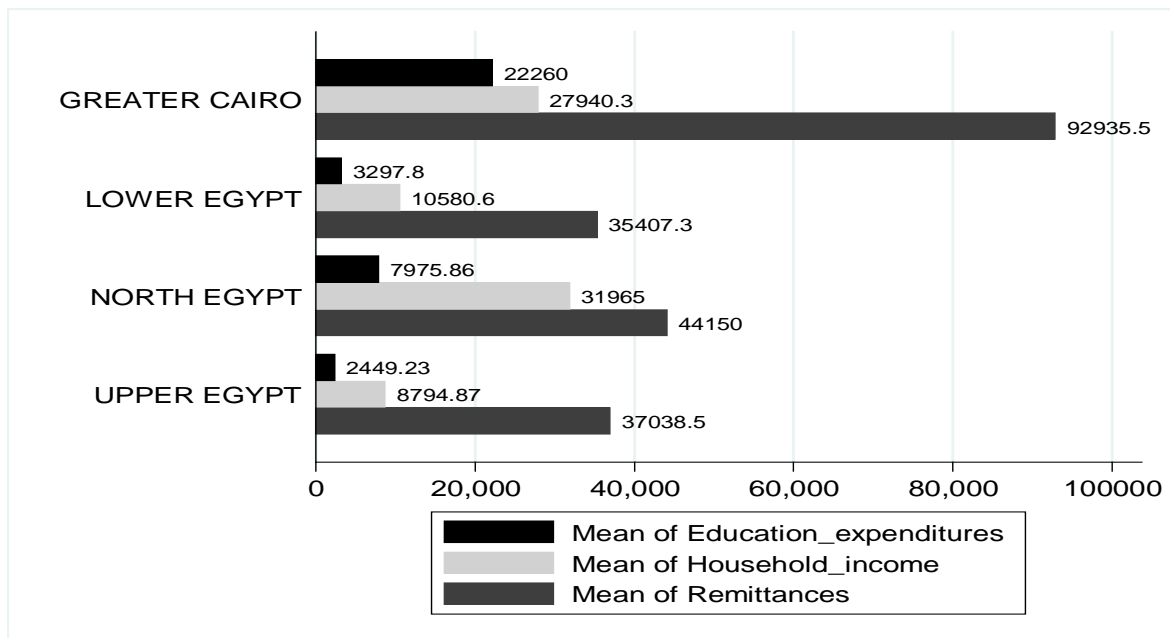


Figure A.3: Mean of educational expenditures against mean of household income and remittances
Source: Authors' calculation

Appendix B (Technical Appendix)

B.1. Data collection

For this study, a single round, cross-sectional survey was implemented. Information was gathered through an online survey questionnaire (using SurveyMonkey), with semi-structured in-depth interviews (IDI).⁷ The total number of interviewed households was 304.^{8, 9} Respondents in each region were selected following the initial respondents' referrals and chosen randomly from different venues with a high prevalence of migrants' families such as banks, nurseries, Western Union agencies, universities, and clubs. Prior appointments were made with target respondents. Stationary gifts were offered to families who undertook the interviews, primarily because the survey contained sensitive questions and was relatively long. Gift items included calendars, clocks, block notes, and glass kits.

Data collection was undertaken between May 2015 and May 2016. In total, 110 online questionnaires were created and distributed via SurveyMonkey and 285 face-to-face interviews were undertaken. Ravallion (2003) argues that households tend to underreport received remittances because of confidentiality issues. However, this bias does not have a significant impact as long as there has been no major shock to a country during the survey period. Only one year was chosen for analysis because households are less likely to remember the correct amounts for longer periods of time. In order to collect the data, 16 local researchers, mostly females, were allocated across 16 governorates covering the Greater Cairo, North Egypt, Lower Egypt, and

⁷ A semi-structured interview covers broad topics of discussion that include open-ended and closed questions to allow the interviewee to explore different thoughts, feelings, et cetera.

⁸ The sample size formula is $= \frac{Z^2 * (p) * (1-p)}{C^2}$, where: Z = Z value (e.g., 1.96 for a 95% significance interval), p=percentage of choice occurrence, and C=confidence level (e.g., 0.05=±5).

⁹ The population is Egyptian households who have at least one migrant abroad. The latest estimate of Egyptians abroad is 3.3 million in 2015 (IOM, 2016). Assuming that each migrant has at least one family in Egypt that he or she constantly remits to, there are approximately 3.3 million affected households. The required sample size is 307 households based upon a 5% confidence interval, 50% response distribution, and 5.6% margin of error.

Upper Egypt regions.¹⁰ Researchers were selected among those working in public domain fields, such as journalism and teaching, and who also had work experience with similar research projects. The researchers received training on the study's topic and objective. The chosen method of administering the questionnaires aimed to maximize the answers to the questions and probe for deeper narratives from migrants' families. The interviews were conducted jointly by two researchers, one of whom took notes while the other asked the questions. The duration of each interview ranged from 30 to 60 minutes.

There is an inherent methodological limitation with this type of research because the issues of income and expenditure in private households are generally sensitive and require considerable trust between the researcher and the respondent. Consequently, in order to address this issue in the questionnaires that were distributed online, it was explicitly highlighted that it would be impossible to reveal the respondents' identities because no personal information was required. Moreover, the data would be analyzed collectively not individually. This point raised the importance of face-to-face interviews because it is impossible to identify an online respondent and ensure that he or she is the target respondent. In addition, there were several cases where online respondents omitted important sensitive questions. This is the reason for rejecting more than 80% of the 110 collected online questionnaires, leaving only 19 valid questionnaires.

B.2. Definitions

For the purpose of this survey, a number of concepts and definitions based on the guidance of the World Bank (2009b) are adopted as follows. a) A household is a group of related persons who live together in the same house and have common cooking and financial arrangements. b) A household head who still lives in the migrant's country of origin, and who allocates the transferred remittances in order to manage the household's living and financial conditions. c) A migrant is a person who used to live in a household in the country in which the interview is being conducted but left before the interview to live abroad for at least six months. d) Remittances are international (cross-border) personal monetary transfers sent by migrants to their families.

¹⁰ The 16 Egyptian governorates are Cairo, Giza, Ismailia, Port Said, Alexandria, Suez, Asute, Minya, Beni Suef, Fayoum, Menofeya, Sharkia, Kafr El Sheikh, Dakahilia, Gharbia, and Qalyiobia.

B.3. Software

Microsoft Office Excel 2013 was used for data entry and coding. STATA 11 was used for data analysis, statistical testing, and the production of frequency tables and figures for the variables.

B.4. Sensitivity analysis

A pilot test was carried out at the start with eight respondents: six housewives and two expatriates. Each interview lasted approximately 60 minutes. The respondents started well but became reticent when financial questions were asked. The respondents grew nervous and answers became distorted. This reaction is understandable given the questions' sensitivity and the current adverse political and social climate in Egypt. However, after assuring the respondents that anonymity and confidentiality would be adhered to and no contact information would be needed, the tension disappeared. Confidentiality was maintained by assigning a unique code to each questionnaire. Responses were only linked to personal information through this code. Consequently, the names of respondents and personal contact data will not appear in any reports or publications.

An experienced team applied a callback rate to completed questionnaires in order to ensure their validity. When there was an error margin exceeding 6%, the specific interviewer's work was checked thoroughly. Normally, data on questionnaires need different types of check that include range checks, skip checks, consistency checks, checks against reference data, and typographic checks (World Bank, 2009b). All questionnaires were subject to a review process and were inspected for logical coherence and completeness to ensure the robust quality of the analyzed data. Moreover, the project supervisors performed fieldwork in the context of unannounced visits with researchers at a rate of 20%.

B.5. Limitations

In a similar way to general sample surveys, surveys of migrants have some methodological and data limitations that affect the generated estimates (World Bank, 2009b). First, the current survey is a cross-sectional survey and only provides information at one point in time. Second, the limited sample size does not fully reflect the true population of migrants' families in each of the four regions. Third, the issue of sample representativeness is not fully controlled given the

limited resources and scarce information on the number and distribution of the target population in Egypt.

B.6. Questionnaire sample

Part one: Socioeconomic information about the household and the migrant

-**The Household Head:** is a close relative to the migrant (Father, Mother, Wife, Son, etc...) who is responsible for managing the household living and financial conditions.

- **Migrant:** is someone who used to live in Egypt and left the country for longer than 6 months.

-In case more than one migrant exists for this household, we are concerned with the one whom the household depends primarily upon his/her money transfers.

1- What is the gender of the household head?

1. Male
2. Female

2- What is the migrant gender?

1. Male
2. Female

3-What is the household head age?

4-What is the Migrant age?

5-What is the household head relation to the migrant?

1. Wife /husband
2. Son /daughter
3. Father /mother
4. Brother /sister
5. Other, specify

6- Which of the following best describes the migrant relationship status?

1. Married
2. Engaged
3. Widowed
4. Divorced
5. Separated
6. Single

7- Time spent in Egypt by the household

1. All of my life

2. Big portion of my life
3. Occasionally

8- Household head highest level of education

1. No formal education
 2. Alphabetization
 3. Primary
 4. Preparatory
 5. High school degree
 6. Vocational or technical school
 7. Diploma
 8. Bachelor
 9. Post graduate: Master-Doctoral degree
- Indicate the number of total schooling years,

9-Migrant highest level of education

1. No formal education
 2. Alphabetization
 3. Primary
 4. Preparatory
 5. High school degree
 6. Vocational or technical school
 7. Diploma
 8. Bachelor
 9. Post graduate: Master-Doctoral degree
- Indicate the number of total schooling years,

10-Which of the following categories best describes the household head current employment status

1. Employed, working full time
2. Employed, working part time
3. Full time student
4. Not employed, looking for job
5. Not employed, not looking for a job
6. Retired
7. Disabled
8. Self Employed, please specify what type of activity

11-Has the Household head employment activity changed after starting to receive remittances?

1. Yes

2. No

If Yes, specify how and why?

12-What is the migrant profession before leaving the household?

1. Employed, working full time
2. Employed, working part time
3. Full time student
4. Not employed, looking for job
5. Not employed, not looking for a job
6. Retired
7. Disabled
8. Self Employed, please specify what type of activity

13-What is the migrant profession at destination country?

1. Academic and research
2. Manager
3. Technician
4. Service and sales
5. Self-employment
6. Armed force occupations
7. Housing and construction

14-Type of dwelling

1. Owned (Totally Paid for)
2. Owned (Paying installments)
3. Rent (new law)
4. Rent (Old law)
5. Other specify

15-Type of current settlement area

1. Formal urban
2. Informal urban
3. Rural

16-Destination country of the migrant

1. GCC
2. Other Middle East and North Africa countries
3. Outside Middle East and North Africa region

17-Specify the duration of the migrant stay abroad

18-Reason for migration (Chose all that apply)

1. Financial

2. Conflict
3. Family
4. Education
- Other specify

19-Does the migrant intent to return?

1. Yes
2. No

Specify, what factors affect his return/stay decision?

20-No. of adult people (who benefit from the received remittances) living in the household, other than the household head

21-Fill the following table about the household children, age, and school grade (use the below coding and numbers to fill the table)

Gender of children	Age	Which grade?	Migrant's child or Not	Type of School/University (Public, private, technical institute, Azhar, etc...)
1.Male 2.Female	Number	Number	1.Yes 2. No	1. Younger than age of school 2. Drop outs 3. Public kindergarten, school, university 4. Private kindergarten, school, university 5. Technical and vocational 6. Azhar

For the researcher information: We are solely concerned with the household children who benefit from remittances. Please use numerical grade classification (Primary school from first till sixth grade- Preparatory school from seventh till ninth grade- secondary school from tenth until twelve grade. For post school education, more than 12)

Part Two: Household Expenditures and received Remittances

22-How much is the average total household income (without remittances)? (Annual-Egyptian pounds)?

23-How much do you estimate the total remittances received during the last year? (Egyptian pounds/Annual)

24-In the last 12 months, how many times did the migrant send money to the household?

25-How do you frequently receive the transferred money? (Chose all that apply)

1. Western Union, Money Gram, etc...
2. Bank
3. Direct cash transfers (Migrant, relatives and friends)
4. Other, specify

26-In what currency did you receive the money?

1. Saudi Riyal
2. Euro
3. US Dollar
4. Emirati Dirham
5. Other, specify

27-Does the transferred money represent a significant percentage of the household income?

1. Yes
2. No

28-Has the the transferred money increased after 2011 revolution?

1. Yes
2. No

For the researcher information: If the household children are not at age of school, skip

29-How much do you estimate the average total household education expenditures (include tuition fees, Droos khsosya, studying materials, transportation fees, etc.) (Annual-Egyptian pounds)?

30-Does the pattern of educational expenditures changed after starting to **RECEIVE REMITTANCES**?

1. Yes
2. No

If Yes, clarify what has changed: (choose all that apply)

1. Return children to schools after dropping out
2. Movement from public to private or international schools
3. More money directed towards private classes (Droos khsosya)
4. More resources available to improve the cognitive and physical skills of the children, e.g. electronic appliances like laptops, mental games, club membership, sports, healthier food, other languages, soft skills training, etc...
5. All of above
6. Other

31-If the answer for previous question was yes, how do you rate the implications of the previous change on the following educational dimensions?

	High (3)	Moderate (2)	Low (1)	No effect (0)
Grades				
Speaking and writing skills				
Mathematical skills				
Ability to learn independently				
Mental and cognitive skills				
Social and communication skills				

32-How much do the school results of your children influence your decision of continuing their education?

- ☐ High (3)
- ☐ Moderate (2)
- ☐ Low (1)
- ☐ No effect (0)

33-How much does the gender of your children influence your decision of continuing their education?

- ☐ High (3)
- ☐ Moderate (2)
- ☐ Low (1)
- ☐ No effect (0)

34-How important are the following dimensions on the quality of education for your children,

	High (3)	Moderate (2)	Low (1)	No effect (0)
pupil/teacher ratio (No. of school teachers to No. of children in school)				

Size of class (Number of students in the class)				
Transportation Infrastructure (Bus, Tram, road, etc...)				
Availability of schools in the settlement area				

If other factors, specify

35-Do you or any of the household members have chronic diseases? (Chose all that apply)

1. Hypertension
2. Diabetes
3. Cardiac disorders
4. Arthritis
5. HIV/AIDS
6. Ulcers
7. Gout
8. Cancer
9. Other, specify,

36-How much do you estimate the average total household health expenditures (includes pharmaceuticals, therapeutic appliances and other goods and services that are related to health condition)? (Annual-Egyptian pounds)

37-What kind of health coverage scheme is utilized by the household?

1. Public
2. Private
3. Both, public and private
4. None

38-Does the pattern of health expenditures changed after starting to **RECEIVE REMITTANCES**?

1. Yes
2. No

If Yes, clarify what has changed: (choose all that apply)

1. Movement from public to private health scheme

2. More money directed towards healthier diet, appliances, sports, club memberships, etc....
3. Required surgical operations
4. All of above
5. Other,

39-how do you describe the spending pattern of **TRANSFERRED REMITTANCES**

	Amount (In local currency)	50 %	30 %	15%	5%	No spending
Household Food Consumption (bread, vegetables, Meat, chicken,...)						
Durable Household Consumption (furniture, appliances, electronic devices,...)						
Rent						
Bills (electricity, gas, water,...)						
Personal Electronic Consumption (laptops, cell phones,...)						
Transportation costs (cars, bikes, taxis,etc)						
Real Estate (Land, house, apartment,...)						
Leisure (restaurant, holiday expenses,...)						
Official Investments (savings account, stocks, business,...)						
Education (tuition fees, books, stationary,						
Health (medicine, hospital bills,...)						
Loan Repayment (Apartment installments, car installments, bank loan,...)						
Community service (Charity,...)						

For the researcher information: write down the numerical values, if the respondent finds it difficult to remember then ask him in percentages.

40-Do you invest part of the transferred remittances?

1. Yes
2. No

If, No, could you please select the factors that prevent you from investing the money
(Chose all that apply)

1. Legal constraints

2. Against religious beliefs
3. Corruption
4. Too risky
5. Income constraints
6. Do not have enough information on how and where to invest
7. It is more profitable to invest in country of migration (destination)
8. Lack of profitable opportunities in my area
9. Bureaucratic hassles
10. Taxes and official fees are too high
11. Other

If Yes, could you specify at what areas do you invest remittances, (Chose all that apply)

1. Gold
2. Real estate
3. Stocks and bonds
4. Self-employment (family business, project,)
5. Other

41-In which of the following do you prefer to invest the received remittances

1. Projects
2. Bank deposits with interest