

## Remittances and Migrants' Education: Do Higher-Educated Current Migrants Send More Flow of Remittance? Evidence from Egypt

Amany Yashoa Gad<sup>1\*</sup>

<sup>1</sup> Associate Professor of Statistics, college of administration business, economic and information systems, Misr University for Science and Technology, Egypt.

\* **Correspondence:** [amanygad@yahoo.com](mailto:amanygad@yahoo.com)

**Abstract:** The relationship between the issue of migration and development has been discussed since the 1980s; The highly skilled migration affects the sending country, in particular, it has been suggested that remittances, as the main positive effect, while the loss of human capital as a main negative effect. Theoretically, there are several reasons to believe that there will be differences between the remitting patterns of higher-educated emigrants and less-educated emigrants. On one hand, several factors would tend to lead highly skilled migrants to be more likely to remit a larger amount of remittances. This study aims to address the experimental research question as to whether the remittance inflows to Egypt increase with migrants' education level that means do higher-educated current migrants send more remittance flows comparing with less-educated migrants? using The Egypt Household International Migration Survey (Egypt-HIMS 2013). This study applies two multiple regression models. The main finding of this study is that there is a significant positive effect of education on remittances that means more educated migrants remit more. This result due to that higher-educated current migrants are likely to work better jobs and earn more comparing with less-educated current migrants. Also, higher-educated (skilled) migrants are less likely to be illegal migrants, and more likely to have “bank accounts, lowering the financial transactions costs of remitting”. Besides, the vice majority of Egyptian current migrants go to Arab countries and unaccompanied by their families, so they have to send remittances to share their earnings abroad with their household members.

**Keywords:** Short Dynamic Panel, Mixed Frequency, Mixed Data Sampling (MIDAS), Generalized Method of Moments.

Mathematics Subject Classification: 94A20; 20K21; 90C56; 78M05.

Received: 30 August 2023; Revised: 20 September 2023; Accepted: 15 October 2023; Online: 20 October 2023.



Copyright: © 2023 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license.

## 1. Introduction

Migration in a globalized world is on the increase, especially, migration of the highly skilled (highly-educated), which usually called "Brain Drain", tends to be restricted to persons with tertiary education\*. It has increased dramatically since the 1970s and has already been a higher priority during the development debates at the same period that followed by raising interest among academics and at the level of international organizations like OECD<sup>†</sup>, . . . , etc.

The relationship between the issue of migration and development has been discussed since the 1980s; The highly skilled migration affects the sending country, in particular, it has been suggested that remittances, as the main positive effect, while the loss of human capital as a main negative effect. Remittances<sup>1</sup> are means by which workers can boost development at home. The global volume of remittances is significant and increasing rapidly. Remittances represent a sizable share of Gross Domestic Product (GDP) in many countries and usually exceed foreign aid. However, the impact of remittances by highly skilled workers should be overstated. Such workers integrate readily into the society of the host country, and because they often tend to bring their families with them, are less likely to remit over time (Faini, [7]). Moreover, they tend to come from better-off families whose demand for remittances is lower relative to poorer ones.

The most recent literature has focused on the link between highly-skilled migration (higher-educated) and the impact of remittances on the economy in their home countries. Several studies relate the amount of remittances received at a country level to the share of migrants with higher education, try to answer the very important question "do more educated migrants remit more or less?". The theory provides reasons why the relationship between the amount remitted and education could be positive or negative. The negative effects of highly skilled migration concentrated on the loss of investment of public spending on education of emigrants, loss of human capacity of innovation and the adoption of modern technologies, which lead to a wider increase and an inequality at the international level (rich countries becoming richer at the expenses of poor countries).

Several studies indicate that there is a negative impact of tertiary (higher) education on remittances, like, Niimi et al. [18], presented a study that contributed to a much-debated issue, namely whether remittances increase or decrease with migrants' level of education. The main finding of this study is that remittances decrease with the share of migrants with tertiary education. This provides a reason for which source countries would prefer unskilled to skilled labor migration. Also, in the studies conducted by Faini ([7] & [8]) which developed a simple model showing that skilled migrants may have indeed a lower propensity to remit home out of a given flow of earnings abroad, derived an empirical equation of remittances and estimated it on a large panel of developing countries. As a measure of the brain drain, he used the dataset by Docquier et al. [4, 5] that in turn builds on the pioneering work of Carrington and Detragiache [2]. The conclusion resulted in considerable evidence that the brain drain is associated with a smaller flow of remittances.

The study conducted by Lowell [15], this study showed the extent to which highly educated emigrants from developing countries represent an economic loss or "brain drain", using available data

\*1Remittances, that is, of transfers in cash or kind from migrants to household residents in the country of origin. The main sources of official data on migrants' remittances are the annual balance of payments records of countries, which are compiled in the Balance of payments yearbook published by the International Monetary Fund (IMF) (ILO, 1997). 2 World Migration (2008), "Highly Skilled Migration".

<sup>†</sup> 3 Organization for Economic Co-Operation and Development, (OECD).

on international mobility. It examined the economic analysis of the direct effects of brain drain on economic development and finished by considering the major favorable feedback effects generated by highly skilled emigration.

Groizard et al. [12], tested the traditional models of brain drain which stressed its negative impact on the welfare and growth of sending economics. Also, the new models which introduce the possibility of "brain drain" through several channels (human capital, remittances, return migration, or trade linkages) tested by estimation cross-country individual regression for each channel, and a system of the equation to assess the overall effect of brain drain on economic growth. The results of this study suggest a negative effect on human capital stock, negligible on remittances, and a negative effect on trade. The net impact of skilled migration on economic growth remains ambiguous.

In the study conducted by Bollard, et. al, (2009), the relationship between education and remitting behavior are reconsidered using microdata from surveys of immigrants in eleven major destination countries. The data show a mixed pattern between education and the likelihood of remitting, and a positive relationship between education and the amount remitted conditional on remitting. The microdata then allows investigation as to why the more educated remit more. They find the higher income earned by migrants, rather than characteristics of their family situations explains much of the higher remittances.

Egyptians being the largest labor exporter in the region. In 2017 according to the Census, there were about 9.5 million Egyptian abroad (about 65% to Arab countries). The evidence for the study about the international migration in Egypt conducted by Wahba [21] using The Egypt Labor Market Panel Survey (ELMPS 2012), she suggests that a substantial proportion of Egyptian emigrants to the West are highly educated but the emigration rate among the highly educated is still quite low. Thus, given the high proportion of educated workers in Egypt, this suggests that Egypt is not experiencing a brain drain problem. "Comparing the education levels of migrants to non-migrants (15-59 years of age) shows that migrants are more educated compared to non-migrants, even after controlling for age, gender, and urban/rural origin. This may echo the concern of a few developing countries about the emigration of their skilled workers, referred to as the "brain drain". There has always been a concern in the literature about emigration leading to brain drain in Egypt, e.g. Zohry and Harrell-Bond [22] and Nassar [17]".

According to the last figures of the International Organization for Migration (2020), Egypt ranks fifth among the top remittance-receiving countries, after India, China, Mexico, Philippines, and it ranks first among the Arab countries, it amounted to \$26.751 billion in 2019 (8.9% GDP) (Migration and Remittances, Fact Book, 2020).

Theoretically, there are several reasons to believe that there will be differences between the remitting patterns of higher-educated emigrants and less-educated emigrants. On one hand, several factors tend to lead highly skilled migrants to be more likely to remit a larger amount of remittances. In this study, we will address the experimental research question as to whether the remittance inflows to Egypt increase with migrants' education level that means do higher-educated current migrants send more remittance flows comparing with less-educated migrants? using The Egypt Household International Migration Survey (Egypt-HIMS 2013).

### 1.1 Research Question

For reviewing evidence on how highly educated migrations to contribute to the development of their origin countries, we will address the experimental research question as to whether the remittance in-

flows to Egypt increase with migrants' education level that means do higher-educated current migrants send more remittance flows comparing with less-educated migrants?

## 1.2 The Objectives of the Study

The objectives of this study are:

1. To identify the characteristics of current migrants that can affect remittance behavior differs between higher-educated and less-educated Egyptian migrant workers.
2. To examine the level of contribution of current migrants' education on the remittance flows to Egypt and if the higher-educated current migrants send more remittance flows than less-educated migrants.

## 1.3 Testing Hypotheses:

The null hypotheses based on objectives are:

$H_{0(1)}$ : Migrants' education has a significant correlation with the remittance flows to Egypt.

$H_{0(2)}$ : Higher-educated current migrants send more remittance flows than less-educated current migrants.

## 2. Data Source

The data used in this study come from data collected in the 2013 Egypt Household International Migration Survey (Egypt-HIMS). "The survey was implemented by the Central Agency of Public Mobilization and Statistics (CAPMAS) as part of the MED-HIMS program which is a joint initiative of the European Commission/ Eurostat, the World Bank, UNHCR, UNFPA, ILO [13], IOM [14], and the League of Arab States". "The Egypt-HIMS methodology is designed to provide information on why, when, where and how migration has occurred, and to deal with various dimensions of international migration and mobility by the collection of representative multi-topic, multi-level, retrospective and comparative data on out-migration from Egypt, return migration to Egypt, intentions to migrate, and forced migration of citizens of other countries residing in Egypt. The target population includes four groups: current migrants, return migrants, non-migrants, and forced migrants. "The Egypt-HIMS utilized the following six questionnaires: Household Questionnaire, Individual Questionnaire for Current Migrant, Individual Questionnaire for Return Migrant, Individual Questionnaire for Non-Migrant, Individual Questionnaire for Forced Migrant, Household Socioeconomic Characteristics Questionnaire". 5259 households reported to having 5855 of their members residing abroad, of whom 5847 were successfully interviewed; 4,695 households were identified as having 5135 of their members as return migrants, who last returned to Egypt since the beginning of the year 2000 and who were 15 years of age or more on last return, of whom 5085 were successfully interviewed; A total of 11,969 non-migrants aged 15-59 were identified as eligible to be interviewed with the individual questionnaire for non-migrants, of whom 11,703 were successfully interviewed" (Farid and El Batrawy, [10]). This study is only focused on current migrants.

## 3. Methodology

To achieve the objects of this study, two approaches are used: Bivariate Analysis included: cross-tabulation, chi-square test, correlation analysis, and Multivariate Statistical Analysis using the Multiple Regression Model.

### First Approach: Bivariate Analysis:

To identify the characteristics of current migrants that can affect remittance behavior differs between higher-educated and less-educated Egyptian migrant workers, we use cross-tabulation analysis, chi-square test, and correlation analysis.

### Second Approach: The Multivariate Statistical Analysis:

To Examine the level of contribution of current migrants' education on the remittance flows to Egypt and if the higher-educated migrants send more remittance flows than less-educated migrants, this study uses two multiple regression models due to the nature of the dependent variable "Log amount of remittances sending last 12 months" which is a continuous variable. Two regression models are conducting, the independent variables of the first model contain the mixed characteristics set of current migrant workers (like age, place of residence, marital status, work status, intention to stay in current country, etc...), household variables (like the number of sons in his origin country (Egypt), the number of daughters in his origin country (Egypt),...), and interaction terms between the work status and sending remittance inflows to Egypt, work status and employer benefits, besides the "less than preparatory (not completed the basic education)" as the independent variable of education level related to the less-educated migrants. The independent variables of the second model are the same as the first model, but assets the "higher and above" as the independent variable of education level related to the higher-educated migrants.

The previous two regression models including both categorical (especially, nominal variables) and continuous variables. "To treat categorical variables (nominal or qualitative) as independent variables in the multiple regression. The independent variables can be presented by sets of independent variables known as code variables using the coding system. A nominal independent variable  $G$  that parities observations into  $g$  groups can be represented as  $(g-1)$  independent variables, each represents one aspect of the distinctions among  $g$  groups" (Cohen et al. [3]). Regarding the nominal independent variables including in the two models like the place of residence ( $g=2$  categories): urban and rural areas, then "rural" will be introduced as a code variable, ( $g-1=1$ ), and we select rural because of around 80% of the current migrants in the total sample comes from household residing in rural areas), in the two models. In the same way, marital status ( $g=2$  categories): single and married, then "married" will be introduced as a code variable, ( $g-1=1$ , and we select "married" because around 65% of the total sample are married), in the two models. Also, the host country of the current migrants ( $g=2$  categories): Arab countries, other countries in the world), then "Arab countries" will be introduced as a code variable, ( $g-1=1$ , and we select "Arab countries" because around 95% of the total sample go to Arab countries), in the two models. Besides, intention to stay in their host country ( $g=3$  categories): yes, no, and don't know), then "yes" and "no" will be introduced as a code variable, ( $g-1=2$ ), in the two models. To measure the benefit provided to migrants by the current employer, the respondents (current migrants) were asked (an example) if they received housing, overtime work, covered with health insurance, compensation for work accidents, retirement pension, paid annual leave, paid of sick leave, and maternity/paternity leave. Each question has two main outcomes (yes/no). An index was computed and it's classified by low, middle, and high. Low has at least two scores (at least two outcomes are yes), the middle has scored between 3 and 5 (at least 3 or 4 or 5 outcomes are yes) and high has scored between 6 and 8 (at least 6 or 7 or 8 outcomes are yes).

In a general form, the multiple regression models with a set of socio-economic factors that affect remittance inflows to Egypt are taking the following forms:

The first Equation is:

$$\begin{aligned} \text{LogREM}_i = & \alpha + \beta_1 \text{Age}_i + \beta_2 \text{PR}_i + \beta_3 \text{HC}_i + \beta_4 \text{IS}_i + \beta_5 \text{MS}_i + \beta_6 \text{Edu}_i + \beta_7 \text{NS}_i + \beta_8 \text{ND}_i + \\ & \beta_9 \text{TS}_2 + \beta_{10} \text{TS}_3 + \beta_{11} \text{WF12}_i + \beta_{12} \text{WF13} + \varepsilon_i, i = 1, \dots, N \end{aligned} \quad (3.1)$$

$$\begin{aligned} \text{LogREM}_i = & \alpha + \beta_1 \text{Age}_i + \beta_2 \text{PR}_i + \beta_3 \text{HC}_i + \beta_4 \text{IS}_i + \beta_5 \text{MS}_i + \beta_6 \text{Edu}_i + \beta_7 \text{NS}_i + \beta_8 \text{ND}_i + \\ & \beta_9 \text{TS}_1 + \beta_{10} \text{WF11}_i + \beta_{11} \text{WF12} + \varepsilon_i, i = 1, \dots, N \end{aligned} \quad (3.2)$$

Where:  $\text{REM}_i$ ; remittances (total amount of money sent in the past 12 months),  $\text{Age}_i$  is the current migrant age,  $\text{PR}_i$  is the place of residence (rural),  $\text{HC}_i$  is the host country (Arab Countries),  $\text{IS}_i$  is the intention to stay in the host country,  $\text{MS}_i$  is the marital status (married),  $\text{Edu}_i$  is the education level (in equation (1): less than preparatory, while in equation (3.2): higher and above),  $\text{NS}_i$ ,  $\text{ND}_i$  is the number of sons and daughters living in the origin country, [the interaction terms are:  $\text{TS}_1$ ,  $\text{TS}_2$ ,  $\text{TS}_3$  are the interaction between the variable of “ever send money in the past 12 months (yes)” and if the work status is “permanent” or “temporary” or “day Labor” respectively, Also,  $\text{WF11}_i$ ,  $\text{WF12}_i$ ,  $\text{WF13}_i$  are the interaction between the variable about the work status if it is “permanent” and the index of the benefit provided to migrants by the current employer if is “low” or “middle” or “high” respectively, and  $\varepsilon_i$  is an error term.

#### 4. Higher-Educated (Highly-Skilled) Migrants and Less-Educated (Less-skilled) Migrants

In this section, we will first present a formal definition of the higher-educated (highly skilled) migrants and less-educated (less-skilled) migrants.

##### 4.1 The Definition of the Higher-Educated and Less-Educated

The public education system in Egypt consists of three levels: the basic education stage, primary school that begins at age six and takes six years, and preparatory school for another three years. Education is made compulsory for 9 academic years (primary and preparatory). At the end of which a basic education completion certificate is awarded. Then, the secondary education stage is for three years, in the same way, at the end of which a secondary education completion certificate is awarded, followed by higher education. In this study, we divided the Egyptian current migrants' educational levels into four groups.

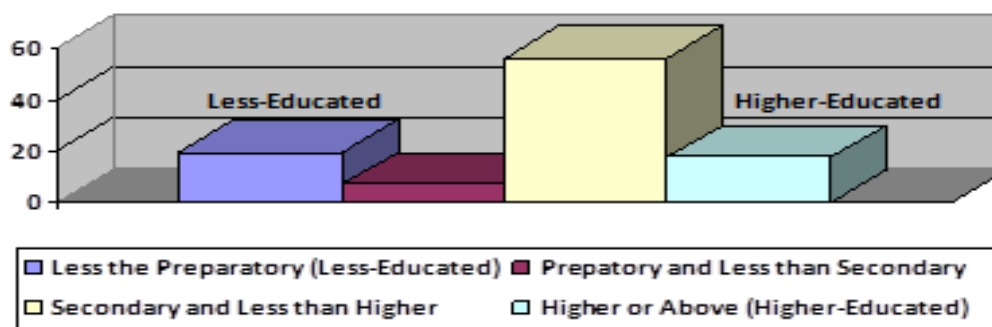
1. Less than preparatory education (illiterate or did not complete the basic education stage and did not obtain any educational certificate), which is referred to as less-educated (less-skilled).
2. Preparatory and less than Secondary education.
3. Secondary and less than higher education.
4. Higher education or above, which is referred to as higher-educated (highly-skilled).

#### 5. Statistical Analysis

The percentage distribution of the current migrants in the whole sample according to the previous four groups of the education levels is presented in figure 1. The figure shows that 19.6 % of current



migrants are less than preparatory education (less-educated), 6.7% have preparatory education, and less than secondary, while the majority by about 56% have secondary and less than higher education. The proportion of migrants who have reached higher education or above (higher-educated) is 17.3%. The percentage of high-educated is somewhat close to the percentage of less-educated migrants.



**Figure 1.** The Percentage Distribution for the Current Migrants in the Whole Sample According to Education Level, 2013, Egypt

Source: Egypt Household International Migration Survey (Egypt-HIMS), 2013.

### 5.1. Bivariate Analysis

This section is devoted to identifying the characteristics of current migrants that can affect remittance behavior differs between higher-educated and less-educated Egyptian migrant workers, by using descriptive statistics, cross-tabulation analysis, chi-square test, and correlation analysis.

#### **Table 1 about here:**

Table 1 presents summary descriptive statistics of the selected variables for the current migrants according to education level. The results of this table indicate that the mean annual of log total remittances for higher-educated current migrants of about 3.76 (the largest value), while it is 3.620 (the lowest value) for less-educated current migrants. The average age for current migrants in the total sample by education level is between 31.57 and 34.93 years, the average age for higher-educated current migrants is 33.97 years, while it is 34.93 for less-educated current migrants. The average number of sons living in the origin country for the higher-educated current migrants is 1.32, while it is 1.58 for less-educated current migrants, and the average number of daughters living in the origin country for the higher-educated current migrants is 1.25, while it is 1.60 for less-educated current migrants. The key result in Table 1 is that more educated migrants remit more.

Source of Table 1: computed by the researcher using Egypt Household International Migration Survey (Egypt-HIMS), 2013.

#### 1. The Association between Selected Characteristics of Current Migrants and Education Level:

#### **Table 2 about here:**

Table 2 presents the selected characteristics of current migrants according to education level. The results indicate that the total sample of current migrants is predominantly male, only about two percent of current migrants are females, this is approximately the same pattern according to education level,

**Table 1.** Summary Descriptive Statistics of the Selected Variables for the Current Migrants According to Education Level, Egypt, 2013

Selected Variables	N	Mean	S. D.
Log REM:			
-Less than Preparatory (Less-Educated)	756	3.62	0.539
- Preparatory and Less than Secondary	223	3.65	0.558
- Secondary and Less than Higher	1995	3.653	0.566
- Higher or Above (Higher-Educated)	499	3.755	0.569
Current Migrant Age:			
-Less than Preparatory (Less-Educated)	991	34.93	10.68
- Preparatory and Less than Secondary	337	31.57	10.64
- Secondary and Less than Higher	2845	32.19	8.43
- Higher or Above (Higher-Educated)	873	33.97	9.77
Number of Sons Living in the Origin Country:			
-Less than Preparatory (Less-Educated)	677	1.58	1.03
- Preparatory and Less than Secondary	181	1.62	1.141
- Secondary and Less than Higher	1526	1.44	1.037
- Higher or Above (Higher-Educated)	392	1.32	0.917
Number of Daughters Living in the Origin Country:			
-Less than Preparatory (Less-Educated)	677	1.6	1.294
- Preparatory and Less than Secondary	181	1.4	0.953
- Secondary and Less than Higher	1526	1.31	1.071
- Higher or Above (Higher-Educated)	392	1.25	1.093

only 0.6, 3.0, 1.2, and 6.6 percent of current migrants having less than preparatory (less-educated), preparatory and less than secondary, secondary and less than higher, and higher or above (higher-educated) respectively are females, the largest percentage for higher-educated current migrants and the lowest for less-educated current migrants. Also, the majority percentage of current migrants in the total sample come from rural areas 78.2%, while 21.8% come from urban areas, this is approximately the same pattern according to education level, 85.8, 80.7, and 81.8 of current migrants having less than preparatory (less-educated), preparatory and less than secondary, and secondary and less than higher respectively come from rural areas, while it differs for higher-educated current migrants with 57.5 percent come from rural areas, the largest percentage for less-educated current migrants and the lowest for higher-educated current migrants. Regarding the marital status of the current migrants, in the total sample, about 60 percent are married, according to educational level, the pattern is somewhat close to the total sample for current migrants having preparatory and less than secondary, and secondary and less than higher 57.3%, and 59.4% respectively are married, while there are differences for less-educated with 71.9% and higher-educated current migrants with 50.5% are married, the largest percentage for less-educated current migrants and the lowest for higher-educated current migrants.

Source of Table 2: computed by the researcher using Egypt Household International Migration Survey (Egypt-HIMS), 2013.

Besides, about half of the total current migrants' sample having work permanent, and about a quar-



**Table 2.** Selected Characteristics of Current Migrants According to Education Level, Egypt, 2013

	Less the Preparatory (Less-Educated)	Preparatory and Less than Secondary	Secondary and Less than Higher	Higher or Above (Higher-Educated)	Total	P-Value
<b>Socio-Economic Background Characteristics</b>						
Sex:						
- Male	99.4	97	98.8	93.4	97.9	
- Female	0.6	3	1.2	6.6	2.1	0
Residence:						
- Urban	14.5	19.3	18.2	42.5	21.8	
- Rural	85.8	80.7	81.8	57.5	78.2	0
Marital Status:						
-Single	28.1	42.7	40.6	49.5	39.8	
- Married	71.9	57.3	59.4	50.5	60.2	0
Work Status:						
-Permanent	46.2	51.5	52	65.2	53	
- Temporary	23.8	19.2	25.5	28.6	25.3	
- Day Labor	30	29.3	22.5	6.2	21.7	0
Benefit Provided by Current Employer Index:						
-Low	52.3	52.2	50.3	25.3	46.6	
- Middle	38	36	36.2	40.4	37.3	
- High	9.7	11.8	13.5	34.3	16.1	0
Current Country:						
-Arab Country	97.1	95.3	95.1	90.3	94.7	
- Others	2.9	4.7	4.9	9.7	5.3	0
Intention to Stay in the Current Country:						
-Yes	64	57.3	61.4	58.5	60.1	-0.004
- No	17.2	22.2	16.6	21.1	18.9	
- Don't Know	18.8	20.5	22	20.4	21	

tile have work temporary and day labor work. According to education level, the pattern is somewhat close to the total sample, 46.2%, 51.5%, and 52% of current migrants having less than preparatory (less-educated), preparatory and less than secondary, and secondary and less than higher respectively having work permanent, while it differs for higher-educated current migrants with 65.2 percent having work permanent. Regarding the work benefits provided by the current employer, about half a percent of the total current migrants' sample have associated with a low index (about 47%). According to education level, the pattern is somewhat close to the total sample, 52.3%, 52.2%, and 50.3% of current migrants having less than preparatory (less-educated), preparatory and less than secondary, and secondary and less than higher respectively have associated with a low index, while it differs for higher-educated current migrants, only 25.3% have associated with a low index, 40.4% have associated with a middle index, and 34.3% have associated with a high index.

Also, the vast majority of current migrants (about 95%) go to Arab countries, while only about 5% go to other countries (Europa, North America, and Australia), the same pattern for current migrants in all educational levels, this pattern indicates that the migration to Arab countries is dominated. Finally, about 60 percent of current migrants intend to stay in their current host country, about 19 percent intend

to return to Egypt, while 21 percent were not sure whether or not to return, these results are similar for current migrants in all educational levels.

The key results of Table 2 can be summarized that previously selected characteristics of current migrants are a significant association with the educational levels.

### 1. The Characteristics of Current Migrants that Can Affect Remittance Behavior:

To test the statistical significance of the relationship between the dependent variable and the independent variables, the correlation analysis, which is considered the first step in the application of the regression models, was used. In this analysis, the educational levels of the current migrants enter independently.

#### **Table 3 about here:**

Regarding the values of correlation coefficients, the results show that all independent variables were significant at 1% or 5%, except the sex of current migrants, and current migrants' education level (preparatory and Less than secondary and secondary and less than higher).

**Table 3.** Correlation Coefficients of the Determinants of Amount of Remittances, Egypt, 2013 (Dependent Variable- Log Total Remittances)

Independent Variables	Correlation Coefficients
<b>Socio-Economic Background Characteristics:</b>	
Residence (Urban/Rural)	-0.066**
Age of Current Migrant	0.159**
Sex of Current Migrant	-0.23
<b>Current Migrant' Education Level:</b>	
- Less the Preparatory (Less-Educated)	-0.034*
- Preparatory and Less than Secondary	-0.004
- Secondary and Less than Higher	-0.026
- Higher or Above (Higher-Educated)	0.069**
Marital Status (Single/ Married)	0.079**
Number of Sons Living in the Origin Country	0.086**
Number of Daughters Living in the Origin Country	0.098**
Work Status (Permanent / Temporary/Day Work)	-0.034**
Work Benefits Index (Low/Middle/ High)	0.121**
Current Host Country (Arab Countries' / Others)	-0.046**
Intention to Stay in the Host Country	-0.061**

Source of Table 3: computed by the researcher using Egypt Household International Migration Survey (Egypt-HIMS), 2013.

Results in Table 3 show that age of current migrant, marital status, number of both sons and daughters, and work benefits have a significant positive correlation with log total remittances, while, residence, work status, current host country, and intention to stay in the host country have a negative significant correlation with log total remittances.

The key results of Table 3 are that the current migrants' education level (less –educated) has a significant negative correlation with log total remittances, while the current migrants' education level

(higher-educated) has a significant positive correlation with log total remittances.

To conclude, using the bivariate analysis to identify the characteristics of current migrants that can affect remittance behavior differs between higher-educated and less-educated Egyptian migrant workers. The key results are that the current migrants' education level (less-educated) has a significant negative correlation with log total remittances, while the current migrants' education level (higher-educated) has a significant positive correlation with log total remittances. Based on the previous results, there is enough evidence to accept the null hypothesis that migrants' education has a significant correlation with the remittance flows to Egypt. These results are supported by the results of (Bollard et al. [1]). To examine the impact of these factors (characteristics) especially education level (less-educated and higher-educated) on log total remittances, the multiple regression models will be used in the next section.

## 5.2. Multivariate Analysis

To Examine the level of contribution of current migrants' education on the remittance flows to Egypt and if the higher-educated migrants send more remittance flows than less-educated migrants, this study uses two multiple regression models.

In model (1): we examine whether less-educated current migrants send more remittance flows than higher-educated current migrants. In model (2), we examine whether higher-educated current migrants send more remittance flows than less-educated current migrants. The results of model (1) and model (2) indicate that age of current migrants, current migrant' education level (less-educated), place of residence (rural), the number of both sons and daughters living in the origin country, current host country (Arab countries), and intention to stay in the host country (yes) are significant at 5% level. Also, the results of model (1) in the aspect of interaction term: the variable of sending remittance during the last 12 months "yes", and the work status is "day labor". Besides, the other interaction term about the variable: work status if it is "day labor" and the index of the work benefits provided to migrants by the current employer is "low" are positively significant at 5% level. While the variable of sending remittance during the last 12 months "yes", and the work status is "permeant", in addition to, the variable about the work status if it is "permeant" and the index of the work benefits provided to migrants by the current employer is "low" are positively significant at 5% level in model (2).

Source of Table 4: computed by the researcher using Egypt Household International Migration Survey (Egypt-HIMS), 2013.

Also, the results of Table 4 indicate that in model (1), the coefficient of current migrants' education level (less-educated) has a significant negative effect on log total remittances, while the results of model (2) show that the coefficient of current migrants' education level (higher-educated) has a significant positive effect on log total remittances. The rest of the regression coefficients values of the independent variables like the number of sons and daughters living in the origin country, current migrants age, current host country, and intention to stay in the host country (yes) are approximately the same in both models.

The multiple regression analysis and fit model (1) is shown by the following equation:

$$\text{Log REM} = 3.357 - 0.063 \text{ PR (Rural)} + 0.127 \text{ Age} - 0.092 \text{ Education Level (less-educated)} + 0.042 \text{ Number of Sons Living in the Origin Country} + 0.051 \text{ Number of Daughters Living in the Origin Country} + 0.158 \text{ Current Host Country (Arab)} + 0.071 \text{ Intention to stay in the Host Country (Yes)} + 0.085 \text{ Sending Remittance during the Last 12 Months (Yes)}, \text{ and the Work Status is "Day Labor"} + 0.131 \text{ Work Sta-}$$

**Table 4.** Estimated Regression Coefficients of Model (1) and Model (2), Egypt, 2013

Independent Variables	Model (1)			Mode (2)		
	$\beta$	t-value	Sig.	$\beta$	t-value	Sig.
<b>Socio-background Characteristics:</b>						
Place of Residence Rural:						
Rural	-0.063	-2.236	0.025	-0.052	-2.039	0.042
Current Age	0.127	4.888	0	0.101	4.657	0
Marital Status:						
-Married	-0.075	-0.627	0.53	-0.111	-1.083	0.279
Education Level:						
Less than Preparatory (Less-Educated)	-0.092	-3.645	0	-	-	
Higher or Above (Higher-Educated)	-	-	-	0.09	2.828	0.005-
The Number of Sons Living in the Origin Country	0.042	3.824	0	0.04	4.263	0
The Number of Daughters Living in the Origin Country	0.051	5.079	0	0.039	4.691	0
Current Host Countries:						
-Arab Countries	0.158	2.95	0.003	0.137	2.678	0.007
Intention to Stay to the Host Country:						
-Yes	0.071	2.456	0.014	0.062	2.477	0.013
-No	0.055	1.857	0.12	0.059	1.92	0.55
<b>Interaction Terms:</b>						
Sending Remittances: 'Yes', and Work Status: "Permeant"	-	-	-	0.045	1.991	0.047
Sending Remittances: 'Yes', and Work Status: "Temporary"	-0.047	1.877	0.169	-	-	-
Sending Remittances: 'Yes', and Work Status: "Day Labor"	0.085	1.97	0.048	-	-	-
Work Status: "Permeant", and Work Benefits Index "Low"	-	-	-	0.101	4.632	0
Work Status: "Temporary", and Work Benefits Index "Low"	0.019	0.424	0.672	-0.028	-0.843	0.399
Work Status: "Day Labor", and Work Benefits Index "Low"	0.131	4.753	0.006	-	-	-
Constant	3.357	13.047	0	3.804	17.154	0
Number of Observations	2324			2913		
Durbin-Watson Statistic*	1.8			1.715		

tus is "Day Labor" and the Index of the Work Benefits Provided to Migrants by Current Employer is "Low" +  $\varepsilon$

#### **Table 4 about here**

The multiple regression analysis and fit model (2) is shown by the following equation:

$\text{Log REM} = 3.804 - 0.052 \text{ PR (Rural)} + 0.101 \text{ Age} + 0.090 \text{ Education Level (Higher-educated)} + 0.040 \text{ Number of Sons Living in the Origin Country} + 0.039 \text{ Number of Daughters Living in the Origin Country} + 0.137 \text{ Current Host Country (Arab)} + 0.062 \text{ Intention to stay in the Host Country (Yes)} + 0.045 \text{ Sending Remittance during the Last 12 Months (Yes), and the Work Status is "Permeant"} + 0.101 \text{ Work Status is "Permeant" and the Index of the Work Benefits Provided to Migrants by Current Employer is "Low"} + \varepsilon$

To conclude, using the multiple regression models to examine the level of contribution of current

migrants' education on the remittance flows to Egypt. The key results are that the coefficient of current migrants' education level (less-educated) has a significant negative effect on log total remittances, while the results of model (2) show that the coefficient of current migrants' education level (higher-educated) has a significant positive effect on log total remittances. Based on the previous results, there is enough evidence to accept the null hypothesis that higher-educated current migrants send more remittance flows than less-educated current migrants.

The main results of this study are that there is a significant positive effect of education on remittances that means more educated migrants remit more. This result due to that higher-educated current migrants are likely to work better jobs and earn more comparing with less-educated current migrants. Also, higher-educated (skilled) migrants are less likely to be illegal migrants, and more likely to have "bank accounts, lowering the financial transactions costs of remitting". These results are supported by the results of (Bollard et al. [1]), but it contradicted a study of (Faini, [7] & [8]). Besides, the vice majority of Egyptian current migrants go to Arab countries and unaccompanied by their families, so they have to send remittances to share their earnings abroad with their household members.

## 6. Conclusion and Policy Implications

### 6.1. Conclusion

The relationship between the issue of migration and development has been discussed since the 1980s; The highly skilled migration affects the sending country, in particular, it has been suggested that remittances, as the main positive effect, while the loss of human capital as a main negative effect. Remittances are means by which workers can boost development at home. The global volume of remittances is significant and increasing rapidly. Remittances represent a sizable share of Gross Domestic Product (GDP) in many countries and usually exceed foreign aid. However, the impact of remittances by highly skilled workers should be overstated. Such workers integrate readily into the society of the host country, and because they often tend to bring their families with them, are less likely to remit over time (Faini, [7]). Moreover, they tend to come from better-off families whose demand for remittances is lower relative to poorer ones.

Theoretically, there are several reasons to believe that there will be differences between the remitting patterns of higher-educated emigrants and less-educated emigrants. On one hand, several factors would tend to lead highly skilled migrants to be more likely to remit a larger amount of remittances. This study aims to address the experimental research question as to whether the remittance inflows to Egypt increase with migrants' education level that means do higher-educated current migrants send more remittance flows comparing with less-educated migrants? using The Egypt Household International Migration Survey (Egypt-HIMS 2013).

To conclude, using the bivariate analysis to identify the characteristics of current migrants that can affect remittance behavior differs between higher-educated and less-educated Egyptian migrant workers. The key results are that the current migrants' education level (less –educated) has a significant negative correlation with log total remittances, while the current migrants' education level (higher –educated) has a significant positive correlation with log total remittances. Based on the previous results, there is enough evidence to accept the null hypothesis that migrants' education has a significant correlation with the remittance flows to Egypt. These results are supported by the results of (Bollard et al. [1]).

To summarize the results, using the multiple regression models to examine the level of contribution of current migrants' education on the remittance flows to Egypt. The key results are that the coefficient of current migrants' education level (less-educated) has a significant negative effect on log total remittances, while the results of model (2) show that the coefficient of current migrants' education level (higher-educated) has a significant positive effect on log total remittances. Based on the previous results, there is enough evidence to accept the null hypothesis that higher-educated current migrants send more remittance flows than less-educated current migrants.

The main results of this study are that there is a significant positive effect of education on remittances that means more educated migrants remit more. This result due to that higher-educated current migrants are likely to work better jobs, earn more comparing with less-educated current migrants. Also, higher-educated (skilled) migrants are less likely to be illegal migrants, and more likely to have "bank accounts, lowering the financial transactions costs of remitting". These results are supported by the results of (Bollard et al. [1]), but it contradicted a study of (Faini, [7] & [8]). Besides, the vice majority of Egyptian current migrants go to Arab countries and unaccompanied by their families, so they have to send remittances to share their earnings abroad with their household members.

## 6.2 Policy Implications:

Based on the above main findings derived from this study, the following ideas can be transferred to policy implications:

1. Enhancing a greater role for civil society institutions and NGOs in addition to government efforts in eliminating this imminent danger called illiteracy - and putting it as a top priority in the development of education, as illiteracy is the most important problem for development - and by raising awareness of the importance of education and providing financial assistance to cover expenses tuition, especially for families who are financially unable.
1. Improving the quality of education, especially the basic, and there is no exaggeration when saying that a radical reform of basic education is required to generalize to reach everyone but it is also an improvement so that students of this stage can obtain basic knowledge and be able to obtain a suitable job opportunity so that he can save part of his income and sending it as transfers to his home country
1. Maximizing the positive effect of higher-educated migration on remittances by using the concept of social remittances; which means transferring of knowledge and ideas (World Bank [19, 20]); throw the networked approach between the emigrants and their Arab home countries and forced by governments especially with, the academic and scientific institutions, offering consultancies to turn the brain drain to be brain gain, (ex. Mexican Talent Network) and (Magdi Yacoub Initiative in Egypt, throw Chain of Hope).
2. Establishing databases for job opportunities and the pool of Egyptian candidates especially for Arab countries, to ensure an efficient process of labor-matching and to increase the benefits of regional migration between the origin Arab countries and host Arab countries to achieve one of the aspects of the integration between Arab countries, and to overcome the problems of different culture between the host Arab countries and (for ex.) the Asian origin countries.
3. The government should encourage migrants to remit through official channels by lowering the financial transaction costs of remitting.



4. Encouraging highly skilled migration, which has a positive impact on the local economic growth of the origin countries, to supply the demand for this labor market in destination countries to achieve Arab regional integration.
5. The government, represented by the Ministries of Manpower [16] and Immigration, should seek to conclude agreements with Arab countries receiving Egyptian workers to “*creating a safe, fair and stable work environment for Egyptian workers*”, such as the agreement signed with Jordan in 2016 (Global Forum on Migration and Development, [11]).

\*\*Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

Note: Dependent variable: log total remittances.

1. The statistic that tests of out-correlation in the residuals from a statistical regression namely “The Durbin-Watson Statistic” is always between 0 and 4. A value of 2 means there is no correlation in the sample. 0 means negative out-correlation and 4 means positive out-correlation.

## References

1. Bollard, A., McKenzie, D., Morten, M., and Rapoport, H. (2009). “Remittances and the Brain Drain Revisited: The Microdata Show That More Educated Migrants Remit More”, *Institute for the Study of Labor (IZA)*, Discussion Paper, No.4534: 1-37.
2. Carrington, W. J., and Detragiache, E. (1998). “How Big is The Brain Drain?”. *A Working Paper of the International Monetary Fund*, Washington, D.C, No. 98/102:1-27.  
  
Central Agency for Public Mobilization and Statistics (2005). *Labor Force Sample Survey 2004*, (Cairo: Central Agency for Public Mobilization and Statistics).
3. Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* (3rd ed.). Lawrence Erlbaum Associates Publishers.
4. Docquier, F., and A. Marfouk (2004). “Measuring the International Mobility of Skilled Workers (1990-2000)”, *Policy Research Working Paper*, No. 3381:1-38, The World Bank, Washington.
5. Docquier, F. M. A.(2006)“International Migration by Educational Attainment (1990-2000)” In. *International Migration, Remittances and Development*.
6. Economic Research Forum and Population Council (2006). *Egypt Labor Market Survey, 2006*.
7. Faini, R. (2006). “Remittances and the Brain Drain”, *Universita di Tor Vergata, Centro Studi Luca d’ Agliano, IZA and CEPR, Development Studies*, Working Paper, No. 214::1-21.
8. Faini, R. (2007). Remittances and the Brain Drain: Do more skilled migrants remit more?. *The World Bank Economic Review*, 21(2), 177-191.
9. Fargues, P. (2006). “International Migration in the Arab Region: Trends and Policies”, *United Nations Experts Group Meeting on International Migration and Development in the Arab Region*, Beirut, May 2006, 9:1-41.

10. Farid, S., and EL-Batrawy, R. (2016). “Determinants of International Migration in Egypt: Results of the 2013 Egypt-HIMS Survey”, Conference of European Statisticians, Economic Commission for Europe, Work Session on Migration Statistics, Working Paper, 11:1-33.
11. Global Forum on Migration and Development, Egyptian-Jordanian Cooperation in the Field of Labor-Management, 2016, available online at [https:// www.gfmd.org/pfp/ppd/10277](https://www.gfmd.org/pfp/ppd/10277) (Date Shared: August 10, 2018).
12. Groizard, L. Jose, and Llull, Joan (2007). “Skilled Migration and Sending Economies. Testing Brain Drain and Brain Gain Theories”, Universitat de les Illes Balears, Spain.
13. ILO (International Labour Organization). (1997). International Migration Statistics, Guidelines for Improving Data Collection Systems, International Labor Office, Geneva.
14. IOM (International Organization for Migration). (2020). World Migration, 2020.
15. Lowell, Lindsay (2001). “Some Developmental Effects of the International Migration of Highly Skilled Persons”, *International Migration Papers*, No. 46:1-35, International Migration Branch, International Labour Office, Geneva.
16. Ministry of Manpower & Migration (2003-a). ”Contemporary Egyptian Migration, (Cairo: Ministry of Migration & Manpower).
17. Nassar, H., (2008). Temporary and Circular Migration: The Egyptian Case, CARIM Analytic, and Synthetic Notes, No. 2008/2009: 1-25, *Circular Migration Series*, Demographic and Economic Module.
18. Niimi, York, Ozden, Caglar, and Schiff, Maurice (2008). “Remittances and the Brain Drain: Skilled Migrants Do Remit Less”, No. 3393: 1-26, *The World Bank*.
19. The World Bank, (2020). Economic Implication of Remittances and Migration.
20. The World Bank, (2020). Migration and Remittances Fact Book, 2020.
21. Wahba, J. (2014). “Through the Keyhole: International Migration in Egypt”, *The Economic Research Forum (ERF)*, Working Paper 830.
22. Zohry, A., and B. Harrell-Bond (2003). Contemporary Egyptian Migration: An Overview of Voluntary and Forced Migration. Country Background Papers (WP-C3). Development Research Center on Migration, Globalization, and Poverty, University of Sussex, England.



© 2023 , licensee the scientific association for studies and applied research (SASAR). This is an open access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>)