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DETERMINANTS OF EMIGRATION: EVIDENCE FROM EGYPT

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Abstract

This paper analyzes the determinants of emigration at the individual and household level, using three waves of the Egyptian labor market panel survey (ELMPS) covering the 1998-2012 period. Exploiting the panel structure of the data allows us to reduce the risk of reverse causality, and to estimate the effect of migrant networks more accurately than in existing studies based on cross-sectional data. We confirm, in the Egyptian context, that migrants abroad are positively selected on the wealth of the origin household, due to migration costs; and that the growth of a network of past emigrants from the same community mitigates this positive selection, increasing the propensity to migrate among poorer households. We also offer a novel insight on the linkages between emigration decision and home country's labor market conditions. We show that unemployment and informal employment appear as the main incentives to emigrate. This suggests that the scarcity of "quality jobs", in particular on the skilled labor market, is one important factor driving emigration flows in Egypt.

JEL Classificatios: C68, J61, D85.

Keywords: International migration, networks, income effects, Egypt.

ملخص

تحلل هذه الورقة محددات الهجرة على المستوى الفردي والأسري، وذلك باستخدام ثلاث موجات للمسح التتبعى لسوق العمل في مصر (ELMPS) التي تغطي الفترة 1998-2012. وباستغلال هيكل البيانات يتيح لنا أن نقلل من خطر السببية العكسية، وتقدير تأثير شبكات المهاجرين بدقة أكثر من الدراسات القائمة على أساس بيانات مقطعية. ونؤكد في السياق المصري، أن المهاجرين في الخارج يتم اختيارهم بناء على الثروة للأسرة والمنشأ، وذلك بسبب تكاليف الهجرة؛ وأن نمو شبكة من المهاجرين في الماضي من نفس المجتمع يخفف إيجابية هذا الاختيار، وزيادة الميل إلى الهجرة بين الأسر الأكثر فقرا. نقدم أيضا نظرة جديدة على الروابط بين قرار الهجرة وظروف سوق العمل في البلد المضيف. وتبين لنا أن البطالة والعمالة غير الرسمية تظهر مثل الحوافز الرئيسية للهجرة. وهذا يشير إلى أن ندرة "وظائف جيدة"، ولا سيما في السوق العمالة الماهرة، وهي أحد العوامل الهامة والقيادية لتدفقات الهجرة في مصر.

1. Introduction

International migration has become a prominent feature of the Egyptian economy since its start in the 1970s. According to CAPMAS, the Egyptian statistical agency, there were 3.7 million Egyptian emigrants in 2010. The majority are temporary migrants (70%, according to CAPMAS), who spend 6-7 years in average in oil economies of the Gulf, Libya and Jordan, for work. The amount of remittances sent by migrants amounted in 2010 to 7.7 bn.$, representing 4% of the GDP. Beyond the flows of remittances, potential benefits in the form of savings and human capital accumulation during migration, and investment upon return, imply that migration is seen as a potential factor of development for the origin country.

However, the development impact of migration depends on the distribution of migration and its benefits in the population. Access to migration depends on the costs of migration and on the capacity of households to finance them. In addition, the distributional impacts of emigration also depend on the selection of migrants on education. In the case of Egypt, this selection is positive; the share of migrants with middle- and high education is higher than in any other Mediterranean Arab countries (according to the estimates of Docquier and Marfouk, 2000).

This article examines the determinants of emigration for the Egyptian case, using a rich panel survey of households, the Egyptian Labor Market Panel Survey (ELMPS), which allows to explore in detail the emigration determinants at the individual and household levels. The survey provides information on temporary (current and return) migrants. Throughout the paper we focus on temporary migration, which represents the major part of Egyptian emigration.

We estimate the relation between households' levels of wealth (as a proxy for permanent income) and migration propensities. We also consider how the buildup of migrant networks, by reducing the costs of migration, affects the selection of migrants on wealth. In a country context with high unemployment and informality rates [3, 24, 2], we highlight the role played by labor market conditions in the migration decision making process. We find labor market outcomes - unemployment and informal employment - to feature prominently among the drivers of emigration.

The survey data used here is well-suited to test the role played by networks in the migration process, but also to capture the househod and individual level incentives related to the labor market behavior. The importance of networks in favoring migration is now well identified in the literature, both at the micro (Munshi, 2003) and macro (Beine, Docquier and Ozden, 2011) levels. However, identification of the network impact on migration decision is plagued by the reflection problem, insofar as common determinants are driving the migration decision of an individual and of the members of his network. As explained by Munshi (2015), the use of panel data allows to reduce this endogeneity bias, by focusing on the impact of network growth over time, on subsequent migration decisions. To our knowledge, few papers have used panel data in analyzing network impact on migration decisions at the micro level. [1]

Therefore, we use a two-period version of the model of migration used by McKenzie and Rapoport (2007), in which we exploit the panel structure of the data to control for unobserved determinants of migration at the locality level. In addition, we are able to use pre-departure observations of migration determinants, which allows to avoid reverse causality bias. Using this model, we confirm the positive impact of household resources on the probability of migrating. We also find that the growth of the migrant network in a community reduces the selectivity of migrants on wealth.

These results show the importance of networks also for temporary migration in the Gulf countries, which represents the major part of Egyptian emigration. This is consistent with

[1] Macro level studies using panel data include [Pedersen, Pytlikova, and Smith (2008), Kim and Cohen (2010), Mayda (2010)]. (Munshi, 2003) studies the impact of networks on labor market integration of Mexican migrants in the US. Davis, Stecklov and Winters (2002) use a 2-year panel sample of households in Mexico to study choices of internal versus migration abroad.

Gruntz (2014), who shows, in her work on Egyptian migrants in the UAE, the role played by the Egyptian communities already in place in providing logistical help to newcomers.

Regarding the incentives to emigrate, we find that a significant impact of labor market outcomes on the probability of emigrating. Unemployed young men, and those employed in the informal sector, are more likely to emigrate; those employed in the public sector are less likely to do so. In the context of Egypt, characterized by a "dual" labor market (Assaad, 2013), these findings suggest that the scarcity of quality jobs, in particular for educated youth, acts as a driver of migration flows.

The importance of international migration in Egypt is highlighted by the extensive research on the impact of migration on the Egyptian labor market, both in terms of entrepreneurship and labor market outcomes of returnees [17, 18, 26, 25, 29] and of impacts on non-migrants [9, 8]. Comparatively, less work has been devoted to the determinants of departures. Amer and Fargues (2014) analyze migration intentions of young Egyptians after the 2011 uprising and find that the perception of increased insecurity and political instability following the revolution act as a new push factor for migration. This paper, focused on the economic drivers, shows the importance of local economic conditions as a driver of emigration. Recent reports (World Bank, 2014) highlight the increasing difficulty of graduates to find jobs matching their qualifications, as the reduction of public sector jobs has not been compensated by private sector job growth. The results presented here suggest this feature of the labor market to be one important driver of Egyptian emigration flows.

The paper is organized as follows: section 2 presents the data we use and describes our methodological approach, section 3 presents our findings and section 4 concludes.

2. Data and methodology

2.1 Data and descriptive statistics

We use the 1998, 2006 and 2012 waves of the Egyptian Labor market panel survey (ELMPS)[2], a nationally-representative household survey carried out by the Economic Research Forum (ERF), in cooperation with the Central Agency for Public Mobilization and Statistics (CAPMAS).

The survey provides information on past migration as well as on current migration (2006 and 2012 waves); in addition, the 2012 survey contains a detailed module on migration; the 2012 refresher sample was also designed to oversample high-migration areas. These characteristics make this survey particularly well suited for the study of migration issues. In this paper, we will exploit the longitudinal structure of the data, which allows to look at pre-departure determinants of emigration (at the individual and household levels); this mitigates the reverse causality issues which arise when using cross-sectional data to study these questions. [3]

Current migrants have an average length of stay abroad of around 6-7 years (Table 1). The main destinations of current migrants are the oil-exporting countries in the Gulf, Libya, and Jordan. We observe a significant decrease between 2006 and 2012 of the share of emigrants in Libya, due to the civil war that started in 2011 in the context of Arab uprisings. Finally, the considerable share of individuals who are working during their stay abroad (94.5%) confirms that the Egyptian migration is almost exclusively labor migration.

In order to study the determinants of emigration, we construct two different samples. In the first, we match household characteristics in 1998 and 2006 to later departures of a member. We use information from the following survey wave (2006 and 2012, respectively) on current and return migrants, to identify households where a member emigrated between one survey year

[2] For a detailed description of the ELMPS data, see (Assaad, 2013) and (Barsoum 2007).

[3] Wahba (2014) draws a complete overview of the patterns and trends of Egyptian international migration.

and the next (by the next survey year, the migrant may have returned or not). By matching emigration episodes to pre-departure variables, we are able to study the determinants of emigration, while avoiding reverse causality: this is particularly important when looking at household wealth as a determinant of migration. This sample thus has a 2-period panel structure.

The second sample consists of observations for individuals living in Egypt in 2006, where we use the information in the following 2012 survey to identify those who emigrated after 2006 (i.e. between 2006 and 2012). We use this sample to look at the pre-departure determinants of emigration, at the individual and household level. Knowing the composition of the migrant population, we retain in this sample only men of age between 17 and 60, i.e. potential emigrants. The advantage of this sample is that we can look at the impact of individual characteristics, such as education, age, and employment, on emigration decisions; while in the first sample we use only household-level variables. The limitation, however, is that we cannot build a similar sample for individuals emigrated between 1998 and 2006, as the 2006 survey provides little information on current migrants in that year (gender and age are not available). Therefore, the individual sample built here uses only 2006-2012 data, and has a cross-sectional structure.

Statistics on the household sample are presented in table 2. Households with a member emigrating in the following years appear very similar to other households, in terms of education of the head, wealth (measured using an asset-based index; see next section) and dependency ratio (measured as the share of non-working individuals in the household). However, migrant households are more often rural; they are significantly larger, and they have a significant lower shares of members employed in the formal and public sectors.

Table 3 presents descriptive statistics for the second, individual sample: focusing on men aged between 17 and 60 in 2006, it compares the characteristics of individuals who emigrated after 2006, to those who did not. Future emigrants are markedly more educated than the average. More than half of them have secondary education, and a quarter have tertiary education. We have here a first indication of the positive selection of Egyptian emigrants, which is also highlighted in Wahba (2014). In terms of labor market outcomes, future emigrants appear to have significantly higher unemployment rates, and their jobs are more often in the informal sector. This confirms the negative association between formal employment and migration, already shown in the household data. We will thus give a particular attention to these aspects in the analysis of factors determining the migration decision.

2.2 Empirical approach

2.2.1 Household level determinants of the migration decision

The relationship between migration and inequality depends importantly on the costs of migration, which generate a selection of migrants on wealth and income. McKenzie and Rapoport (2007) develop a theoretical and empirical model aiming to study how the degree of selection depends on the presence of migration networks: as such networks increase migrants' socioeconomic integration, they lower migration costs. Therefore, existing networks increase the propensity to send a migrant, the more so for less affluent households.

We employ an empirical model similar to McKenzie and Rapoport (2007) to determinants of migration at the household level; with the difference that we use pre-departure observations of the determinants, which avoids reverse causality between migration and household variables (such as wealth). In addition, we use a panel, 2-period sample, which allows to control for unobserved determinants of migration at the locality level.

The model we estimate is the following:

$$Mig_{i,t+1} = \alpha + \beta \cdot W_{i,t} + \chi \cdot N_{i,t} + \delta \cdot N_{i,t} \cdot W_{i,t} + \gamma \cdot X_{i,t} + \varepsilon_{i,t} \quad (1)$$

with t = {1998; 2006} and $Mig_{i,t+1}$ the dummy variable taking the value 1 if the household i participated in international migration (i.e. at least one member in the household emigrated) between 1999 and 2006 (if t=1998) or between 2007 and 2012 (if t=2006) and 0 if not. $X_{i,t}$ is a set of household-level variables, including its size, share of dependents, share of working-age men, and the gender and education level of the head.

Migration networks are proxied by the migration prevalence at the district (*kism*) level $N_{i,t}$, measured as the share of households with a member who emigrated before t.

The wealth indicator W is a composite asset-based index of wealth, computed as the first component of a vector of assets and non-durable goods. As Filmer, Deon and Pritchett (2001) show, this type of indicator is a more stable measure of a household' standard of living than income; they advocate its use as a proxy for household's long-term income.[4] Since we restrict the migration timing to the period after the wealth (as well as the other household characteristics) was observed, we avoid the reverse causality bias due to migration impacting wealth.[5]

Our measure for the migration network, N, is the migration rate at the district level, measured on the period preceding the survey year. [6] Through the networks effect, an individual living in a district with a high migration rate, should be more prone to migrate since it can benefit from lower migration costs. Using lagged migration rates reduces the risk of omitted variables driving both our measure of networks, and future departures; however such a bias may still exist, if district-level determinants of migration are persistent in time. Therefore, we use an instrumental variable approach and we instrument the migration prevalence using older migration rates, using the fact that departures tend to be more frequent in places where historic migration rates have been higher. For this model, we use the migration networks computed from the previous survey round. Precisely, if t=2006, we instrument the migration prevalence measured for 2006 using the migration before 1998[7].

Along the lines of McKenzie and Rapoport (2007), we introduce a interaction term between wealth and network. They argue that in a situation with low migration costs, when the network increases, the initial level of wealth necessary to migrate decreases. Thus, the coefficient for the interaction terms should be negative. In the case of Egypt, Zohry (2005) implies that migration costs are rather high, especially for Gulf countries where workers need to pay their work contracts. We are thus interested in seeing whether the coefficient of the interaction term is similar or not to that estimated by McKenzie and Rapoport (2007).

For this specification, we run the estimations on the pooled data and afterward we use the panel dimension and add household fixed effects.

2.2.2 Individual determinants of the migration decision

In a second approach, we use our sample of individuals. As explained in section 2.1, we focus here on the cross-section men of working age observed in 2006, among who we identify individuals who emigrated after this date. This allows us to estimate the probability of

[4] Data on expenditure are not available in the survey.

[5] One possibility of reverse causation is that the household prepares the migration episode by saving money or selling assets, which would bias downward the coefficient estimate on wealth. In unreported results, we compare our model to a simultaneous model, similar to the one used in (McKenzie and Rapoport. 2007), in which recent migration episodes (not older than 1 year) are regressed on household wealth. We find larger coefficient on wealth in our lagged model, which confirms the downward bias in the simultaneous model.

[6] For $t = 2006$, we use the migration rate for the 1999-2005 period; for $t = 1998$, the 1990-1997 period.

[7] Similarily, for if t =1998, we instrument the 1998 migration prevalence with the one measured before 1990.

emigration (between 2007 and 2012), given the pre-migration characteristics. The model we estimate is the following:

$$Mig_{i,2007-2012} = \alpha + \beta \cdot W_{i,2006} + \chi \cdot N_{i,2006} + \delta \cdot N_{i,2006} \cdot W_{i,2006} + \gamma \cdot X_{i,2006} + \varepsilon_{i,2006} \qquad (2)$$

with $Mig_{i,2007-2012}$ a dummy variable taking the value 1 if an individual observed in 2006 had emigrated between 2007 and 2012 and 0 if not. $W_{i,2006}$ is the wealth indicator of the household to which the individual i belongs to, $N_{i,2006}$ is the migration network, for which we use the same instrumentation as detailed above, and $X_{i,2006}$ a vector of individual characteristics and interactions.

In order to capture the labor market failures that might act as push factors, we will add a special focus on unemployment and public employment.

3. Results

3.1 Household model

First of all, we analyze the determinants of migration decision at the household level. We thus estimate the impact of the households' characteristics in 1998 and 2006 on the probability of sending a migrant in the period 1999-2006 and 2007-2012 respectively. In column 1 of the Table 4 we estimate the basic model, without correcting for endogeneity, and column 2 and 3 present the results for the instrumented regression, where the instruments are the historical migration rates (for the network in 2006 we use the district migration rates pre-98 and for the network in 1998 we use the pre-90 district migration rates), adding fixed effects for governorates and district levels respectively. These fixed effects allow us to control for local economic situation that might be correlated with the emigration decision and the network. Results for urban and rural areas are presented separately in columns 4 and 5. The last two columns present the results for the model taking into account the panel dimension and adding random effects (column 6) and household fixed effects (column 7).

We find that the pre-migration network increases the probability for the household to send a migrant abroad. Similarly, the coefficient of the wealth score is positive and significant, suggesting that a wealthier household can more easily overcome the costs of migration and is thus more prone to send a migrant abroad. The significant negative coefficient of the interaction between wealth and network suggests that when the network increases, poorer households can afford to send migrants as well. This finding confirms the results of McKenzie and Rapoport (2007) on how migrant networks lower the cost of migration, thus allowing more modest households to migrate.

Furthermore, household size significantly increases the probability to send a migrant. The share of working-age men living in the household, another proxy for the pool of potential migrants, is also a strong determinant of migration probability and its coefficient is robust to the different specifications. The household's dependency ratio, computed as the ratio between economically inactive and active members increases the propensity to migrate, suggesting that a higher economics burden acts as an additional incentive to search a job abroad. At the household level, the education level, proxied here by the head of household's years of schooling, does not impact the migration propensity and this might be due to the fact that it is correlated to the wealth index.

In terms of labor market indicators, we find that the share of formal employment among household members decreases the probability to send a migrant abroad. One might expect the access to formal jobs to influence migration decisions in two ways. On one hand, it could facilitate migration, if wages paid in the formal sector are higher, or if formality reduces credit constraints, making the payment of migration costs easier. On the other hand, benefits to formal

jobs, including non-pecuniary ones, may act as a disincentive to leave. This seems particularly relevant in the context of Egypt, where a large share of formal jobs consist of public jobs (68%, as of 2012); and where the market for skilled employment in the public sector is characterized by heavy rationing (Assaad, 2013). Our results suggest that the second effect dominates. We examine further the role of labor market outcomes in what follows.

In table 5, we add specific controls for the share of unemployment and of formal jobs among household members and interact them with the migrant network. Concerning unemployment, our results show that a higher share of unemployment decreases the migration propensity, with the effect reversed when the network increases. This suggests that unemployment acts as an incentive to emigrate, but also limits the capacity to finance migration; so that a more developed migrant network allows high-unemployment households to send migrants abroad. Specifically, the mean value of networks in the sample is 0.031: this corresponds approximately to the value at which the overall impact of unemployment becomes positive. In other words, in districts with above-average migration prevalence, households with high unemployment tend to send more migrants; the opposite is true in low-network areas.

By contrast, the household share of formal workers decreases migration, the more so in high-network areas, without evidence of a positive effect at low or zero network value; this confirms that formal employment acts mainly as a disincentive for migration.

At the household level, we find interesting results on the links between labor market outcomes and emigration, therefore, given that employment and migration are individual decisions, we push our analysis further and explore the individual dimension of international migration determinants in the next section.

3.2 Individual model

The results for the individual model are presented in Table 6. The regressions were conducted on the subsample of men between 16 and 60 years old in order to eliminate the bias that might appear due to the low labor participation of women. The first column contains the results of baseline model, to which an interaction between wealth and network is added in column 2. We add controls for the labor market status in column 3 and we run the regression on the subsample of low education (primary education or less) in column 4 and on the subsample of educated (secondary and tertiary education) in column 5. Column 6 presents the model's results only for those who were employed, adding a dummy for the formal sector, while columns 7 and 8 add interactions between the formal sector and education and network (only for the educated individuals) respectively. For the non-instrumented regression and the first stage results, see Table 8 in the appendix. Finally, column 9 presents the results of the model adding controls for the type of sector in which individuals work (private vs. non-private).

As expected, we find a strong positive impact of the network in time T on the probability of emigrating in T+1, confirming its strong "pull" effects. The effect appears to be slightly stronger for the subsample of educated individuals (columns 5 and 8). A potential explanation would be that educated individuals have a better anticipation of the benefits and the opportunities that the diaspora could bring them. Interestingly, at the individual level, the household wealth score does not appear to be a strong determinant of the probability to emigrate, especially when we add the interaction between wealth and network. The reason behind this lack of significance might be that the household wealth index and individual education level and labor market outcomes are correlated and these variables capture the wealth effect. We would have expected the interaction between network and wealth to be significant, such as it is the case in the literature when the household level is used, but we find very limited evidence for this effect. Indeed, the interaction is significant, but at the 10 percent level, only for the educated individuals (column 5).

Unsurprisingly, the size of the household is not a determinant of the individual's decision to emigrate, but education is and the probability of migration increases with the educational level. Age is also a strong determinant of migration, with the young being more prone to migrate. However, when we restrict the sample to those who were employed, age seems to decrease the probability of migrating, thus suggesting a higher risk adversity even for the youth.

If we focus now on how labor market status impacts the probability to migrate, we notice that those who participate in the labor market (either employed or unemployed), have a higher probability of emigrating compared to the inactives[8] (column 3), especially for the educated (column 5). These results suggest that having a job, on the one hand, dissuades individuals from migrating, only if the alternative is being unemployed. In order to better understand the linkages between employment and migration, we restrict the sample to employed individuals and we find that, among them, those who work in the formal sector have a lower probability of emigrating. The negative effect of working in the formal sector is stronger for the educated individuals (column 7) and when the network increases (column 8).

3.3 Selection of migrants on unobservables

Previous results have brought evidence on the selection of emigrants on observable characteristics. In particular, they show Egyptian emigrants to be positively selected, on the basis of education; this is a particular feature of Egyptian emigration, which contrasts with migration patterns in other MENA countries (Marchetta, 2012). We also found that unemployment acts as an incentive to emigrate, and that, for those employed, formal and public employment reduce the propensity to emigrate.

This leads to ask whether emigrants are also positively selected on unobservable determinants of labor market outcomes. One possibility is that, in a rationed market for skills, only the most talented candidates manage to access a formal job. Those remaining unemployed, or employed in informal jobs, have an incentive to migrate. This would lead to expect a negative selection of emigrants. Alternatively, if access to emigration is also selective on talent, or on unobserved quality of education, then one might expect the opposite result. Which selection mechanism is at play is important to assess the impact of emigration at origin; in particular, positive selection of emigrants implies the risk of a brain drain for Egypt.

We test these mechanisms using a selection-correction framework, in which labor market outcomes are modeled jointly with the decision to migrate. The probability of being an emigrant, in 2012, and the probability of being employed, by the same date (or, of being employed in the formal sector) are modeled as two dependent probit equations. The error terms in the two equations follow a bivariate normal distribution. This allows to test the hypothesis of a correlation between unobserved determinants of migration and labor market outcomes. For identification we rely on the use of the lagged migration network (at district level) as instrument for migration, based on the assumption that this variable does not impact employment prospects.[9]

Results are presented in table 7. In column 1, we consider the probability of employment in 2012, jointly with the migration decision. In columns 2 and 3, we model the probability of formal employment jointly with migration; either on the sample of (non-migrant) individuals employed in 2012 (col.2), or on the sample of all non-migrants, including those unemployed in 2012 (col. 3). Results indicate little correlation between employment and migration (beyond observables): the estimated correlation between the two error terms is non significant. [10]

[8] The group of inactives is mainly composed of students and a category "other" for which the survey does not offer any further details.

[9] The proxy for the network of migrants is thus based on pre-2006 departures from the district, while employment variables are observed in 2012.

[10] This also implies that the coefficients of the employment model are little affected by correcting for the selection on migration.

By contrast, results in columns 2 and 3 indicate a negative correlation between the error terms in the equations for formal employment and for non-emigration; indicating a *positive* correlation between the propensity to emigrate, and the probability of obtaining a formal job. In other words, unobserved determinants of emigration tend to correlate positively with the drivers of formal employment.

This suggests that emigrants tend to be positively selected on characteristics associated with better labor market outcomes at home. This may seem surprising, given that those who do hold a formal job have a lower propensity to migrate. One explanation might be that, in a context of increasing scarcity of formal (in particular, public) jobs (World Bank, 2014), individuals who initially invested in skills specific to these jobs, but who fail to obtain one, are turning to emigration as an alternative.

In the last columns, we estimate a model for wages in a selection-correction framework. This allows to test the relationship between the propensity to emigrate, and potential home wages. The model accounts for selection into non-emigration and into employment.

To do this, we use the estimated probabilities from the two-step selection model estimated in column 1; as shown by Tunali (1986), the wage equation can then be corrected for this double selection by including the two corresponding inverse Mills' ratios in the equation, similarly to the Heckman-type model.[11]

Results show that unobserved determinants of wages correlate negatively with those of employment and of emigration.(Note that the sign of the correlations is given by that of the coefficients on inverse Mills ratios). [12]

4. Conclusion

Egypt is considered the largest labor exporter in the Middle East (Wahba, 2009), yet various aspects of Egyptian migration are still understudied. Using three rounds of recent data from the ELMPS, we analyze the determinants of the decision to migrate at the household and individual level. The panel structure of the data allows us to mitigate endogeneity issues, and to test the impact of migrant networks growth over time. Given the detailed information on the labor market outcomes of both the individual and his family, we are able to identify the role played by unemployment and informality in the migration decision process.

We find that Egyptian migrants tend to come from relatively affluent households. A one standard deviation increase in household's permanent income, as measured by asset wealth, is associated with a probability about 2% higher to send a migrant abroad. In line with McKenzie and Rapoport (2007), we find that the growth of the network of past migrants from the same community tends to favor migration, and to reduce the importance of household wealth. This effect is also present when controlling for locality fixed-effects. It confirms that migrant networks, by reducing the costs of migration, increase the propensity to migrate among poorer households.

Regarding the incentives to emigrate, we identify labor market outcomes as one important driver of emigration. Unemployed young men are relatively more likely to emigrate, as are those employed in the informal sector. In the context of Egypt, with rationing on the skilled labor market (Assaad, 2013), these results suggest that the lack of perspectives in the country for young graduates is one driver of migration flows.

[11] This method is similar to the model used in (Barham and Boucher, 1998), with the difference that they use a static model, where migration, employment and wages are explained by contemporaneous variables; whereas in our model, outcomes in 2012 are explained by lagged (2006) variables.

[12] This runs counter to the results of Wahba (2014), who finds emigrants to be positively selected. This difference may be due to the different instruments used.

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Table 1: Descriptive Statistics: Current Migrants

		2006	2012
Average migration duration (years)		6	7
Age			35.1
Main destination			
	Saudi Arabia	36.7%	43.3%
	Jordan	15.7%	13.1%
	Kuwait	11.8%	12.8%
	Libya	13.0%	6.4%
Labor status abroad			
	Working		94.5%
	Unemployed		1.7%
	Inactive		1.6%
	Unknown		2.2%
Men			96%
Nb. obs.		390	818

Table 2: Descriptive Statistics at the Household Level, Pooled Sample

		Migrant households	Non-migrant households
Male-headed household		83.30%	82.80%
Household size		5.7	4.8
Urban		30.60%	49.10%
Years of schooling (household head)		6.6	7.0
Wealth score		- 0.008	- 0.007
Dependency ratio		0.7	0.7
Share of members working in the formal sector		0.118	0.155
Share of members working in the public sector		0.076	0.106
Number of observations		467	9 937
	1998	124	3 534
	2006	343	6 403

Table 3: Descriptive Statistics at the Individual Level, 2006 Survey Round

		Migrants	Non-migrants
Education			
	Primary or less	24.1%	41.9%
	Secondary	50.8%	34.1%
	Tertiary	25.2%	24.0%
Married		76.1%	71.0%
Labor status (before migration)			
	Working	70.4%	77.0%
	Unemployed	22.9%	4.9%
	Inactive	6.7%	18.1%
Formal work (before migration)		13.7%	35.1%
Number of observations		444	8 550

Table 4: Household Determinants of The Probability to Send A Migrant

	OLS	IV	IV	IV urban	IV rural	IV, household panel random effects	IV, household panel fixed effects
	(1)	(2)	3	(4)	(5)	(6)	(7)
Network	0.186**	0.813***	0.502*	0.411**	1.183***	0.787***	0.644**
	(0.091)	(0.200)	(0.274)	(0.190)	(0.369)	(0.100)	(0.298)
Network x wealth	-0.059	-0.218***	-0.144*	-0.224***	0.001	-0.157**	-0.093
	(0.042)	(0.075)	(0.073)	(0.079)	(0.134)	(0.071)	(0.121)
Wealth	0.017***	0.022***	0.020***	0.022***	0.010	0.019***	0.002
	(0.003)	(0.005)	(0.005)	(0.005)	(0.009)	(0.004)	(0.008)
Household size	0.005***	0.005***	0.005***	0.004***	0.005***	0.004***	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Share of working-age men	0.104***	0.110***	0.111***	0.068***	0.166***	0.111***	0.110***
	(0.015)	(0.015)	(0.016)	(0.015)	(0.030)	(0.012)	(0.023)
Dependency rate	0.020*	0.030**	0.026**	0.033**	0.038*	0.030**	0.031
	(0.012)	(0.012)	(0.012)	(0.013)	(0.021)	(0.013)	(0.024)
Yrs of schooling, HH. head	0.000	0.000	0.000	0.000	0.001	-0.000	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.002)
Urban household	-0.024***	-0.020***	-0.014	0.000	0.000	-0.021***	-0.042
	(0.006)	(0.007)	(0.011)	(0.000)	(0.000)	(0.005)	(0.046)
Male hh. head	-0.021***	-0.020***	-0.022***	-0.026***	-0.013	-0.024***	0.004
	(0.007)	(0.007)	(0.007)	(0.008)	(0.011)	(0.006)	(0.014)
Year=2006	0.006	-0.031**	-0.019	-0.009	-0.056**	-0.027***	-0.023
	(0.007)	(0.012)	(0.015)	(0.008)	(0.027)	(0.006)	(0.016)
Formal employment	-0.038***	-0.027*	-0.030**	0.006	-0.075***	-0.021	0.018
(share)	(0.014)	(0.014)	(0.014)	(0.016)	(0.027)	(0.014)	(0.030)
Fixed effects	**governorates**		**qism**	**gov.**	**gov.**		
Observations	10,404	10,404	10,404	6,045	4,359	10,404	10,404
R-squared	0.033	0.008	0.056	0.013			
Number of hholds						7,373	7,373

Notes: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5: Determinants of Migration: Unemployment and Formality (IV Estimates)

	(1)	(2)
Network	0.743***	0.890***
	(0.196)	(0.194)
Unemployment	-0.065*	-0.063*
(share)	(0.036)	(0.036)
Unempl. x Network	1.909*	1.901*
	(1.080)	(1.073)
Formal employment	-0.043***	-0.002
(share)	(0.013)	(0.019)
Formal empl. x Network		-1.155***
		(0.395)
Wealth	0.012***	0.012***
	(0.003)	(0.003)
Household size	0.005***	0.005***
	(0.001)	(0.001)
Yrs of schooling,	0.000	0.000
HH. head	(0.001)	(0.001)
Observations	10,404	10,404
R-squared	0.012	0.012

Notes: Controls: Urban, year, share of working-age men, Male hh. head. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6: Individual Determinants of the Emigration Decision

	(1) All	(2) All	(3) All	(4) Educated	(5) Non-educated	(6)	(7) Employed individuals	(8)	(9)
Network	1.241***	1.192***	1.161***	0.637***	1.675***	1.184***	1.183***	1.559***	1.175***
	(0.327)	(0.350)	(0.349)	(0.222)	(0.532)	(0.357)	(0.353)	(0.347)	(0.357)
Network*Wealth		-0.136	-0.153	0.095	-0.980*	-0.021	-0.017	0.197	-0.046
		(0.243)	(0.253)	(0.206)	(0.549)	(0.321)	(0.319)	(0.339)	(0.324)
Household	0.009**	0.015	0.016	0.002	0.053**	0.011	0.011	0.000	0.011
wealth score	(0.004)	(0.012)	(0.013)	(0.011)	(0.026)	(0.016)	(0.015)	(0.038)	(0.015)
Primary	-0.001	-0.001	-0.000	-0.006	0.000	-0.003	-0.019*	-0.003	-0.004
education	(0.008)	(0.008)	(0.008)	(0.006)	(.)	(0.008)	(0.011)	(0.008)	(0.008)
Secondary	0.024**	0.025***	0.021**	0.000	-0.012	0.025**	0.039**	0.023**	0.024**
education	(0.009)	(0.009)	(0.009)		(0.009)	(0.012)	(0.016)	(0.011)	(0.012)
Tertiary	0.019**	0.019**	0.022**	0.000	0.000	0.029**	0.039*	0.028**	0.028**
education	(0.009)	(0.009)	(0.009)			(0.012)	(0.020)	(0.012)	(0.012)
Employed			0.075***	0.025***	0.105***				
			(0.010)	(0.010)	(0.016)				
Unemployed			0.190***	0.104**	0.215***				
			(0.022)	(0.042)	(0.025)				
Formal sector						-0.021**		0.030*	
						(0.009)		(0.017)	
Formal *							-0.012		
no educ.							(0.010)		
Formal *							0.025*		
primary educ.							(0.015)		
Formal *							-0.047***		
secondary educ.							(0.014)		
Formal *							-0.032		
tertiary educ.							(0.021)		
Formal*network								-1.076***	
								(0.352)	
Public sector									-0.019**
									(0.008)
Household	-0.001	-0.001	-0.000	-0.002	0.002	0.000	0.000	0.002	0.000
size	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
Urban	-0.002	-0.000	-0.001	0.003	-0.005	-0.009	-0.009	-0.022	-0.008
	(0.011)	(0.012)	(0.012)	(0.008)	(0.018)	(0.011)	(0.011)	(0.019)	(0.011)
Observations	8,988	8,988	8,988	3,585	5,403	6,892	6,892	6,892	6,889
R-squared	0.008	0.008	0.041	0.044	0.013	0.021	0.025	0.027	0.021

Notes: Model includes age controls. Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7: Migration and Labor Market Outcomes: Selection-Corrected Models

	(1)	(2)	(3)	(4)
	Employment	**Formal empl.**		**Wages**
Primary educ.	0.098*	0.405***	0.328***	-0.014
	(0.057)	(0.056)	(0.051)	(0.033)
Secondary educ.	0.198***	0.868***	0.770***	0.066**
	(0.052)	(0.050)	(0.046)	(0.033)
Tertiary educ.	0.218***	1.358***	1.169***	0.236***
	(0.061)	(0.062)	(0.054)	(0.038)
Age $\in (25,34)$	0.737***	0.450***	0.545***	-0.065
	(0.053)	(0.048)	(0.043)	(0.068)
Age $\in (35,44)$	0.699***	0.873***	0.913***	0.118*
	(0.062)	(0.066)	(0.053)	(0.069)
Age ≥ 45	-0.455***	0.921***	0.541***	0.649***
	(0.045)	(0.074)	(0.053)	(0.080)
Household wealth	-0.097***	0.191***	0.123***	0.120***
	(0.025)	(0.023)	(0.021)	(0.016)
Household size	0.007	-0.023***	-0.018***	-0.016***
	(0.008)	(0.007)	(0.006)	(0.004)
Urban	-0.120***	-0.013	-0.051	0.005
	(0.044)	(0.041)	(0.036)	(0.027)
Inv. Mills ratio 1				0.355*
				(0.196)
Inv. Mills ratio 2				-0.974***
				(0.320)
	Selection: P[no migration]			
Migration network	-2.524***	-2.474***	-2.306***	
	(0.364)	(0.376)	(0.358)	
Primary educ.	0.209**	0.167	0.133	
	(0.097)	(0.103)	(0.101)	
Secondary educ.	-0.173**	-0.223***	-0.253***	
	(0.073)	(0.082)	(0.079)	
Tertiary educ.	-0.109	-0.132	-0.149	
	(0.088)	(0.092)	(0.090)	
Age $\in (25,34)$	0.104*	0.174***	0.083	
	(0.055)	(0.056)	(0.055)	
Age $\in (35,44)$	0.579***	0.637***	0.530***	
	(0.082)	(0.084)	(0.083)	
Age ≥ 45	1.248***	1.209***	1.214***	
	(0.137)	(0.143)	(0.137)	
Household wealth	-0.100***	-0.108***	-0.076**	
	(0.035)	(0.035)	(0.034)	
Household size	0.004	0.003	0.001	
	(0.010)	(0.010)	(0.009)	
Urban	0.322***	0.317***	0.322***	
	(0.061)	(0.062)	(0.060)	
rho	-0.906	-0.624**	-0.824***	
Fixed effects		Governorates		
Observations	8778	7614	8778	5282
R^2				0.138

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix

Table 8: Non-instrumented Model and First Stage Results for the Individual Model

	(1) Baseline OLS	(2) 1st stage network	(3) 1st stage network with interaction	(4) 1st stage interaction
Network	0.311***			
	(0.082)			
Old network		0.239***	0.251***	-0.121***
		(0.057)	(0.056)	(0.025)
Old network*Wealth			-0.079***	0.215***
			(0.022)	(0.047)
No education	0.007	0.007***	0.007***	-0.005**
	(0.007)	(0.002)	(0.002)	(0.002)
Secondary education	0.030***	0.004**	0.004**	0.001
	(0.009)	(0.002)	(0.002)	(0.002)
Tertiary education	0.021***	-0.002	-0.002	-0.007***
	(0.008)	(0.002)	(0.002)	(0.003)
(Ref. primary education)				
Age cohort 15-24	0.062***	-0.000	-0.000	0.001
	(0.009)	(0.002)	(0.002)	(0.002)
Age cohort 25-34	0.045***	0.002	0.002	0.002
	(0.009)	(0.002)	(0.002)	(0.002)
Age cohort 45-60	-0.014**	0.000	0.000	0.000
	(0.005)	(0.002)	(0.002)	(0.002)
(Ref. age cohort 35-44)				
Household wealth score	0.009**	-0.001	0.006**	0.033***
	(0.004)	(0.002)	(0.003)	(0.005)
Total no. of indiv. in the hh	-0.000	0.000	0.000	0.001
	(0.001)	(0.000)	(0.000)	(0.001)
Urban/Rural	0.021***	0.022***	0.023***	0.002
	(0.007)	(0.007)	(0.007)	(0.003)
Constant	-0.073***	-0.025***	-0.029***	-0.021***
	(0.015)	(0.007)	(0.008)	(0.007)
Observations	8,988	8,988	8,988	8,988
R-squared	0.050	0.440	0.448	0.490

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1