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**SHORT-AND LONG-TERM IMPACTS
OF EMIGRATION ON ORIGIN HOUSEHOLDS:
THE CASE OF EGYPT**

Anda David and Joachim Jarreau

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Abstract

This paper studies the impacts of emigration on income inequality and wealth in Egypt. Using three waves of a longitudinal survey covering the 1998-2012 period, we first study the impact of remittances on incomes in origin households, using a selection-correction model to estimate counterfactual home earnings of emigrants. In this exercise, we find a limited, inequality-increasing impact of remittances. We then turn to estimating the impact of migration episodes on households' permanent income in the longer term, using the panel structure of the data. Results show that migrant departures significantly increase standards of living in origin households, suggesting that returns to migration through human capital accumulation, savings and investment outweigh those from remittances only. Benefits from migration appear to be larger and more tilted toward poor households in rural areas.

JEL Classification: O15; J61; D31

Keywords: Emigration, inequality, remittances, network effects, income mobility.

ملخص

تدرس هذه الورقة تأثير الهجرة على عدم المساواة في الدخل والثروة في مصر. باستخدام ثلاث موجات من دراسة طولية تغطي الفترة 1998-2012، علينا أولاً دراسة تأثير التحويلات على دخل الأسر في الأصل، وذلك باستخدام نموذج اختيار تصحيح لتقدير الأرباح المنزلية المغايرة لواقع المهاجرين. في هذا التمرين، نجد أن هناك تأثير محدود للتحويلات وزيادة عدم المساواة. ننتقل بعد ذلك إلى تقدير تأثير حلقات الهجرة على دخل الأسر الدائم على المدى الطويل، وذلك باستخدام هيكل لوحة البيانات. وتشير النتائج إلى أن مغادرة المهاجرين يؤدي لزيادة كبيرة في مستويات المعيشة في الأسر الأصلية، مما يدل على أن العائد من الهجرة من خلال تراكم رأس المال البشري والادخار والاستثمار تفوق تلك من التحويلات المالية فقط. تظهر الفوائد من الهجرة تكون أكبر وتميل أكثر نحو الأسر الفقيرة في المناطق الريفية.

1. Introduction

The impact of international emigration on development and growth is a question of importance for developing countries. The World Bank estimates that international remittances reached \$583 billion in 2014, which represents more than twice the amount of official development aid in the same year. Many developing countries have therefore adopted policies encouraging work emigration, based on the view that the benefits from migration, through transfers as well as other channels, such as investment and human capital accumulation, represent an opportunity for development at home.

Empirical evidence regarding this impact is therefore necessary. A recent literature has used microeconomic data to study the relation between emigration and remittances, and the poverty and income level of origin households (Adams, 2011; Mendola, 2012). To establish a causal link between emigration and incomes at origin is difficult, as the migration and transfer decisions are potentially endogenous. In addition, one needs to assess the different channels through which the benefits of migration may materialize: beyond remittances, human capital accumulation during migration, savings, and investment after return, may all contribute to the medium-term benefits of migration. Such benefits may not be taken into account if focusing only on remittances received while an emigrant is abroad, as most studies do.

In this paper, we use a longitudinal household survey for Egypt, the Labor market panel survey (ELMPS), covering the period 1998-2012 in three waves, to study the impact of emigration on earnings and standards of living in origin households. Egypt had an estimated 3.7 million migrants in 2010, and the amount of remittances received that year from abroad amounted to \$7.7 billion (4% of GDP). Using this data allows us to control for unobserved determinants of emigration at the household level when assessing the impacts of emigration. We adopt two complementary approaches to study the impact of emigration on incomes at origin.

First, we follow the recent literature on the subject [Barham and Boucher, 1998; Gubert et al. 2010] to estimate the impact of remittances on the distribution of household incomes in Egypt, using a static approach. We estimate potential home earnings of emigrants, in a model accounting for the double selection into migration and into employment. This allows to construct a counterfactual distribution of household incomes, in a no-migration scenario; and to compare this distribution to the actual distribution in the data, to assess the impact of transfers on the distribution of household incomes.

Second, we exploit the panel structure of the data to estimate the benefits of emigration episodes to origin households, beyond remittances: by following households in time, we are able to test if the departure of a migrant is associated with a change in the household's long-term income (as proxied by asset wealth), controlling for pre-departure characteristics.

We obtain the following results. Remittances have a small impact on the income distribution in Egypt: the amounts transferred are, on average, comparable to potential home earnings of emigrants, so that the measured static "net gains" from migration are small. This suggests that one has to consider a wider range of potential benefits from migration - not only remittances - in order to assess the impact of migration episodes on the economic well-being of origin households.

This leads us to consider our second approach, where we measure changes in household long-term income level associated to emigration. First, we find a significant positive impact of emigration on household wealth (our proxy for permanent income). This impact is detected both in the case of finished spells (return migration), and of current migration with remittance-sending migrants. The positive impact is confirmed when instrumenting migration, with IV estimates yielding a larger positive effect; this suggests that OLS estimates provide a lower bound estimate of the impact of interest.

The impact varies with the type of households. Among urban households, we detect an increase in wealth during migration only: households with a return migrant have no significantly higher wealth than pre-departure levels, which may be due to negative selection of returnees. Among rural households, both current and current migration is associated with higher wealth. This suggests that return migrants in rural areas have a higher propensity to use their savings for common goods to the family. In particular, land ownership tends to increase following migration episodes. We also find that the benefits to migration are larger among poorer households. This suggests a potential reduction of inequality with migration, which is in contrast with the results using remittances only. Comparing the two methods suggests that a focus on remittances only, as a measure of the returns to migration episodes, may be too restrictive.

An important literature has studied the impact of migration on inequality in origin (developing) countries, following the contribution by Barham and Boucher (1998), who showed the importance of accounting for potential home earnings of migrants in this exercise. These authors found remittances to increase income inequality among households in a high-migration community of Nicaragua. By contrast, Gubert et al. (2010) find that remittances reduce poverty and inequality in Mali; and Margolis et al. (2015) also find that remittances decrease poverty rates and inequality in two regions of Algeria (but with important differences across regions). Differences in results across this literature, which uses relatively similar methodologies, may be due in part to variations across regions/countries in the prevalence and distribution of migration among households. There is to our knowledge no equivalent exercise in the case of Egypt. Our results indicate a relatively small impact, and suggest that a focus on remittances only is too restrictive to assess the gains from migration in this country.

Several recent studies have examined the impacts of emigration in Egypt, mostly by focusing on returnees (McCormick and Wahba, 2003; Wahba, 2007; Wahba and Zenou, 2012; Marchetta, 2012). These studies point to benefits to the migration experience for returnees, in the form of higher wages (Wahba, 2014), and of a more successful entrepreneurial activities. Our results confirm the importance of considering medium-term (in particular, post-return) impacts of migration. They suggest that, in the case of Egypt, these impacts have a larger impact on the well-being of origin households than is apparent when looking at amounts remitted only.

The rest of the paper is organized as follows. Section 2 presents the data used and summary statistics. The empirical methodology is then presented in section 3. Section 4 then presents the results; we conclude in the last section.

2. Data and Descriptive Statistics

We use data from the Egyptian labor market panel survey (ELMPS), provided by the Economic research forum (ERF). The data consists of three waves of a representative household longitudinal survey conducted in 1998, 2006 and 2012; details on the data collection and representativeness are provided in Assaad and Krafft (2013).

The survey is especially suited for studying migration in Egypt: first, the 2012 wave was designed to over-sample areas with high migration rates, in order to increase the representation of migrants in the sample. Second, a number of questions are devoted to current and return migration. This enables us to use identify households where one member has emigrated at the time of the survey, as well as household members who have had emigration experience in the past. In both cases, detailed information is available on the migration spell (i.e. destination,

time of departure and return, occupation and sector abroad, etc.).¹ Note that we therefore focus on temporary migration, as migrants having emigrated with their family should not be present in the survey.²

In addition, the panel structure of the data allows us to estimate the impacts of emigration for origin households more precisely than in most previous studies on the topic (Adams, 2011). Namely, by using information on households over successive periods, we can disentangle the selection effects from the subsequent impacts of emigration.

We will be using two approaches. First, we will rely on the 2012 data to construct a counterfactual distribution of household incomes, in a no-migration scenario: in this scenario, we suppress remittances and attribute to current emigrants their potential home earnings.³ All households present in 2012 are used in this exercise; there are 12,060 such households.

Second, we will turn to a panel estimation of the impacts of emigration episodes on household wealth. Compared to the first approach, this will go beyond remittances and encompass a potentially wider range of benefits from migration (wage premium after return, use of savings and remittances for investment).

To do this, we will focus on households observed at least for two consecutive periods, in order to control for initial, pre-migration characteristics. This can be done thanks to the low rates of attrition in the survey: for example, among households interviewed in 2012, 83.4% (10,060 households) were present in the 2006 wave; the rest being a refresher sample. The corresponding number in 2006 is 70.09% (5,853 households). Among these, we focus in our regressions on households not resulting from a “split” from the origin household, as the structure of the household changes in this case. This leaves us with a main sample of 10,429 household-year observations (3,678 in 2006, 6,751 in 2012), for which we observe characteristics in the previous survey year (1998 or 2006, respectively).

2.1 Descriptive statistics

Table 1 displays the distribution of migrant characteristics among current migrants in the 2012 survey. Migrants are almost exclusively men, of age 35 in average. A large majority of them goes to oil producing countries in the Gulf region, to work there in the construction and agricultural sectors. Their stay is generally short: the median duration (among returned migrants) is 2 years. The average reported monthly wage earned by migrants, in 2012, is 3100 Egyptian pounds, almost 3 times the average wage earned in Egypt in 2012 (1100 EGP).

Table 2 documents the distribution of the main variables of interest and controls used in our panel sample of households. Our main variable of interest is migrant departure, denoting whether a household had a member emigrating during one of the two periods considered: 1999-2006 and 2007-2012. About 5% of households in our data had a member emigrating. The lower panel of the table summarizes the main household variables used as controls in our empirical model.

3. The Empirical Methodology

We adopt two methodological approaches to the migration-inequality question. We start with the evaluation of the impact of remittances on income inequality, using a counterfactual exercise (no-migration scenario), where home earnings are imputed to migrants; this is the method adopted by most recent studies on the subject since (Barham and Boucher, 1998). Then, we exploit the panel dimension of our data to measure the impact of emigration on households

¹ Note that this allows us to identify households with a migrant directly, contrary to other data where only households receiving transfers can be identified. The difference is important for the estimated impacts of emigration, as shown by Bertoli and Marchetta (2014).

² According to CAPMAS, the Egyptian statistical agency, temporary migrants represent 70% of Egyptian emigrants.

³ This exercise can be done on 2012 data only, as information on current migrants in the 2006 survey is much more limited.

long-term income; this allows us to encompass a wider range of potential effects of migration, beyond remittances. We present here the two methods in detail.

3.1 Migration and income inequality

Recent studies of the migration-inequality relationship have followed the approach proposed by Barham and Boucher (1998), in which the counterfactual income of migrants (i.e., their income in the home country, had they not emigrated) is estimated. The actual distribution of household incomes is then compared to the one which would be observed in a no-migration scenario, in which the migrants' contribution to household income would be their counterfactual income, instead of the remittances they send.

The first step in this exercise is the estimation of a model of incomes for non-migrants. Both the decision to emigrate, and the decision to participate to the labor market, for those not migrating, might be correlated with unobservables that matter for potential earnings. For this reason, the model has to allow for these two types of selection.

Results from this estimation allow to produce estimates of the potential home earnings of migrants, taking into account the selection of migrants. These estimates are then used to construct a counterfactual distribution of household incomes, in the no-migration scenario.

In this exercise, we rely on data from the 2012 survey only. We do so because this is essentially a static exercise, where we compare two income distributions for the same year. In addition, computation of household incomes is not warranted with the 2006 data, in which information on earnings from household enterprises is not available.

For estimation of individual earnings, we use the following model:

$$\ln w_i = \beta_1 \cdot X_i + \varepsilon_i$$

$$Work_i = (\beta_2 \cdot X_i + v_i > 0)$$

$$NoMigr_i = (\beta_3 \cdot Z_i + \mu_i > 0),$$

where $(\varepsilon_i, v_i, \mu_i) : N(0, \Sigma)$, $diag(\Sigma) = (\sigma, 1, 1)$, $\sigma > 0$, and Σ is symmetric with possibly non-zero non-diagonal terms.

All variables are observed in 2012. X_i is a set of explanatory variables, including age (we use categorical variables for 4 age groups), education (4 groups), marital status, household wealth, urban/rural residence, and the individual's governorate of residence. $NoMigr_i$ is a binary variable indicating that the individual i is not an emigrant abroad, in 2012. $Work_i$ indicates that i is employed (for non emigrants).⁴ Z_i denotes a set of variables which strictly includes X_i . In practice, we use past migration prevalence at the district (*qism*) level as an instrument of the migration decision: this variable acts as a proxy for migration networks, and we make the assumption that it impacts an individual's propensity to emigrate, without directly impacting current earnings of non-migrants.⁵

Finally, ε_i , v_i , μ_i denote error terms in the three equations, which are potentially correlated. In practice, we estimate the double selection model (into emigration, into work) using the procedure known as the Heckman probit model. The predicted probabilities, of emigration, and

⁴ As the purpose here is to evaluate potential home earnings of migrants, we do not model the labor status of current emigrants abroad.

⁵ We use migration prevalence computed on pre-2006 departures.

of working, are computed. As shown by Tunali (1986), unbiased estimates of the parameters of the wage equation can then be obtained by using the following model :

$$\ln w_i = \beta.X_i + \lambda_{1i} + \lambda_{2i} + \varepsilon_i$$

where the terms λ_1 and λ_2 are the analogues of the Mills' ratio in the Heckman selection model.⁶

Once the parameters of this model are obtained, we use it to compute the predicted probabilities of employment and wages of 2012 emigrants; this allows to construct the counterfactual, no-migration distribution of household earnings, where remittances are replaced by imputed home earnings.

3.2 Impact of emigration on wealth

In this part, we move away from the static framework and exploit the panel dimension of the data. This allows to test the impact of emigration episodes on the standard of living of Egyptian households. The difficulty facing most studies on this question is that the relation between these two variables may run in both directions: a household's wealth may be a determinant of the ability to send a migrant abroad, as much as the subsequent level of wealth may increase because of the migration experience.

One novelty of our approach is that we can use the longitudinal dimension of our data to disentangle these two directions: specifically, we can control for a household's wealth level (and other characteristics) before a migrant's departure, then measure the subsequent change in wealth.

We use the following baseline specification:

$$W_{i,t+1} = \alpha.W_{it} + \lambda.Mig_{it} + \beta.X_{it} + \delta_t + \varepsilon_{it}, \quad (1)$$

In this equation, i denotes a household and t one of two periods: 1998-2006 or 2006-2012. Right-hand side variables are measured at the beginning of the period (1998 or 2006) and the left-hand side variable $W_{i,t+1}$ is measured at the end of it (2006 or 2012). Mig_{it} is a binary indicator equal to 1 if one member of the household has migrated abroad between t and $t+1$ (i.e., if his/her year of first departure is between these dates); the migrant may have returned home by $t+1$, we do not make the distinction for now. W_{it} is a measure of the household's standard of living; we will principally rely on an indicator of asset wealth, computed as the first component of a vector of assets and non-durable goods. This type of indicator has been shown to provide a good proxy for household's long-term income, in particular as it is more stable than income itself or expenditures (Filmer and Pritchett, 2001).

X_{it} denotes a vector of control variables at household level, including its demographics (size, number of men under 40), number of working-age unemployed men, the gender and years of education of the head, and a dummy for the governorate of residence.

This empirical strategy mitigates partly the reverse causality problem in the wealth-migration relationship. If household wealth is a determinant of migration (through the ability to finance migration costs), then this specification controls explicitly for this. It tests whether migration impacts the end-of-period wealth level for a given initial level, or equivalently, the growth rate of wealth during the period.

⁶ $\lambda_1 = \phi(\hat{p}_1)/\Phi(\hat{p}_1)$ with ϕ , Φ the pdf and cdf of the normal distribution taken at \hat{p}_1 , \hat{p}_1 being the predicted probability of non-migration. λ_2 is computed in the same way with the probability of employment.

With respect to the counterfactual approach presented in the previous section, the estimation method here allows to capture more diverse effects of migration, beyond remittances: in particular, potential benefits to migration experience, such as enhanced human capital, savings abroad, investment upon return, may exist and have an impact on the home income distribution; they can be captured in the model here.

Note however that some endogeneity risk remains in this model. One possibility is that households sending migrants are those with more entrepreneurial members (or generally with characteristics correlated with economic success).

To address this risk, we will instrument the migration variable using a set of instruments based on the network effects of migration. This strategy exploits the persistence of migration flows by locality of origin, causing departures to be more frequent in places where historic migration rates have been higher.

3.3 Instrumental variables

We construct a set of instrument variables to address endogeneity of emigration. The first set of instruments is based on the network effect of emigration. As has been documented in a number of other contexts, the propensity to emigrate is significantly higher in localities where past migration was higher. We attribute this to the fact that earlier emigrants provide information and support (possibly both at destination and at origin) to prospective and current emigrants. This reduces the cost of emigration. If past migration has no direct effect on household wealth and income, then it can be used as an instrument for more recent emigration events. This requires in particular that current economic conditions in a locality be not affected by past emigration through general equilibrium effects.

Therefore, we use the lagged emigration rate at the village level, based on departures more than 8 years older than the period considered⁷. We verify the validity of our instruments using Hansen's J test.

Our second instrument also relies on network effects, and is similar to the so-called shift-share instruments, initially used by Card (1990). We compute past emigration rates by locality of origin (village) and destination country, and multiply each rate by the contemporary, Egypt-level rate of emigration to each destination. We also interact each of these instruments with household wealth (pre-migration wealth level), using the fact that network effects are significantly decreasing with household wealth.

4. Empirical Results: Remittances and Inequality

4.1 Estimation of emigrants' counterfactual incomes

Results of the model presented in section 4.2 are displayed in table 7. The model is estimated on the sample of men, migrants and non-migrants, between 17 and 60 of age; this includes 95% of all current migrants in 2012. The probability of being an emigrant is higher for younger men, for the more educated ones, and for those coming from rural areas. Household wealth also increases the propensity to emigrate. As expected, an individual's prospective migrant network, as proxied with past migration prevalence, strongly increases the probability of emigration.

The probability of employment increases with education, and decreases with household wealth; this is due to labor market participation decreasing with wealth.⁸

The estimated correlation between the error terms in the two selection equations is negative, but not significant. This suggests a positive association between emigration and the probability

⁷ Thus we use pre-90 emigration as instrument for emigration in the 1998-2006 period and pre-98 emigration for the 2006-2012 period.

⁸ This is confirmed by estimating a similar model with participation as a dependent variable.

of employment (i.e., that emigrants tend to be positively selected on unobservables that positively influence employment).

Turning to the wage equation, results of the selection-corrected model show no significant education premium. Comparing with results from the model without correction for selection (col. 3) helps explain this result: education commands a significant premium in the non-corrected setting, indicating that educated individuals who do have work are paid a higher wage. However, these individuals' wages are higher than the potential wage of those not working/not participating (i.e., the error terms in the employment and wage equations are positively correlated). Hence, actually observed wages are positively selected - accounting for this selection reduces the size of the measured education premium. This is consistent with the hypothesis of a rationing of qualified jobs (Assaad, 2013), such that only a share of the educated have access to jobs matching their skills, while those who have not do not find a job or stop searching.⁹

4.2 Impact of remittances on inequality

We now turn to the counterfactual exercise, in which we compare the actual distribution of household incomes, to the one that would prevail in a no-migration scenario. In this scenario, we assume that migrants abroad would be living at home instead, and that their contribution to household income would be their earnings in the home labour market, instead of the remittances they send.¹⁰

Table 4 displays the results: inequality indices are computed on actual incomes per capita, on row 1; on counterfactual incomes, imputing potential home earnings to migrants, on row 2.

Results show migrants remittances to have little impact on inequality of income, measured either with the Gini or the Theil index.¹¹ Migrant remittances tend to increase inequality, relative to a no-migration scenario; but by a very small degree.

Decomposing the Theil index by governorates shows that remittances increase within-governorate inequality, while decreasing inequality between governorates. This is consistent with emigrants generally coming from poorer governorates in particular rural ones. Focusing on the two highest-migration governorates, Sohag and Asyut (table 5), shows that the positive effect on inequality is more apparent in these regions.

There are two main reasons for the small measured impact on inequality. First, the share of households with a current migrant (6.2%), or with a remitting one (4.3%), is relatively small, compared to those in the contexts of previous studies on migration and inequality. For example, in the data used by Barham and Boucher (1998) in Nicaragua, 57% households have a migrant, and 33% send one. In the data of Gubert et al. (2010) for Mali, 22% of individuals live in a remittance-receiving household.

Second, remittances are relatively small compared to potential home earnings of migrants. The average monthly transfer sent by a migrant is 680 Egyptian pounds, which is less than the average wage income for men, at 1,164 pounds. This gives a sense of the magnitude of the "net gains of migration" to households, (i.e., the additional income earned from transfers), relative to a case where the migrant would have stayed home.

⁹ Selection into employment is driving this effect, while selection into migration has less bearing on the results of the wage model, as indicated by the fact that the coefficient on the corresponding Mills' ratio is non-significant.

¹⁰ A number of households in the data declare receiving transfers from migrants abroad who are not identified in the section on migrants (probably because they are not considered as actual members of the household). Thus, we have no information on these migrants and cannot include them in the counterfactual exercise. Therefore, in this exercise, we include here all identified emigrants. There are 750 households with an identified emigrant, and 136 households receiving transfers from a non-identified individual.

¹¹ Computation of the Theil index requires to restrict to non-zero incomes. The numbers here are computed on the sample of households with non-zero income excluding remittances.

We now examine the distribution of these net gains more in detail. Table 6 present summary statistics on the distribution of the net gains from migration, defined as the monthly amount of remittances received less potential home earnings of migrants¹². These figures show that gains from migrations defined in this way are small and even negative for a large number of the migrant households. On average, remittances increase incomes per capita by 17% in origin households; for more than half of receiving households, this number is negative.

In order to put these figures in perspective, it is useful to look at the ratio of remittances to earnings abroad: this ratio has a median of 0.16 and a mean of 0.24, among remittance-sending migrants. This suggests that the level of earnings abroad is not the primary factor driving the relatively low level of remittances observed. Rather, one possibility is that migrants use a larger part of their earnings in savings than in remittances.

Our results so far suggest that migration has on average a relatively small impact on income in origin households, when focusing on remittances sent. This leads us to ask whether migration episodes may have an impact through other channels. A classic theoretical framework would predict that migration should be undertaken when expected net benefits are positive, which suggests that our measure of the net gains from migration, based on remittances only, may be incomplete. Moreover, the literature on Egyptian migration has found evidence of positive benefits to migration spells after return, in the form of a wage premium (Wahba, 2014) and of more successful entrepreneurial activities (Marchetta, 2012). This also suggests that a focus on remittances may underestimate the overall benefits to migration.

Therefore, we turn to the estimation of the gains from migration using a different method, in which we follow households over time and look at the impact of migrant departures on economic well-being at origin. We use the index of asset wealth as a proxy for households' long-term standard of living. Details of the methodology are presented in section 3.2.

4.3 Impact of migration on wealth

Table 7 displays results from the estimation of the impact of migration on wealth, based on equation 2. In the estimation sample we retain households which are followed at least two consecutive survey years - allowing us to control for initial household characteristics and wealth level (in 1998 or 2006) when estimating the impact on subsequent wealth (in 2006 or 2012). We drop split households (i.e., resulting from a split from an origin household). Variable *Emigrant* denotes the departure abroad of a household member during the period (1998-2006 or 2006-2012).

The departure of a migrant is positively associated with household wealth growth. Estimation on the whole sample, in column 1, indicates that an emigration episode is associated in average to a post-departure wealth level higher by 0.13 standard deviation, relative to pre-migration level (recall that the wealth index has by definition a mean of 0 and standard deviation of 1).

In columns 2 and 3, we estimate the impact separately for the urban and rural populations. This allows, in particular, to use urban/rural-specific measures of *wealth*, which arguably are more precise in accounting for the value of some assets. The results show a slightly larger impact on households in rural areas.

In columns 4 and 5, we distinguish between return (if the migrant has returned to the household, by the end of the period) and current migration (if the migrant is still abroad). We further partition the "current emigrant" variable in two subcases: whether the migrant is sending remittances to the household, or not (based on household members' declarations). As expected, we find no impact on wealth when emigrants are still abroad and do not send remittances. When they do, we find a positive impact on wealth. This may seem surprising, given results from the

¹² Home earnings are computed as the potential wage times probability of employment.

previous section, where we found that remittances were in general relatively small, and comparable to potential home earnings of migrants. One potential explanation is that such seemingly small transfers still allow households to improve their standard of living, as they are net of the migrants' living expenses: they can thus be used entirely for consumption or investment purposes of non-migrant members.

Finally, the presence of a return migrant is associated to a positive impact on wealth, only for rural households. This suggests that emigration may be beneficial to households not only through remittances but also through financial or human capital brought back by migrants. It also seems to correspond to differences in behaviour of rural and urban migrants: for example, a larger share of rural return migrants cite "helping the family financially" as one purpose of their migration (25% for rural migrants vs. 13% among urban ones).

In the last four columns of the table, we test whether the impacts vary depending on initial relative wealth of households. We split each sample (urban and rural) in the median value of initial wealth and estimate the model on each half-sample. Results confirm that the positive impact of return migrants is identified only for rural households. Among urban households, we find similar effects of current emigration on the two half-samples. By contrast, results for rural households indicate that the benefits from both current and return emigration are concentrated on less wealthy households. This is consistent with the hypothesis of an inequality-reducing impact of emigration in rural areas.

In the model used here, household control variables, including wealth, are observed at the start of the period, before the departure of an emigrant - this reduces the risk of endogeneity in the model. However, there remains the risk of omitted variables influencing both the growth of household wealth, and the capacity to finance migration; this could for example include unobserved shocks to income.

To address this endogeneity risk, we now turn to instrumented regressions. Table 8 displays results from the same model, instrumenting for the emigration variable. We use two sets of instruments, based on past prevalence of emigration at the village level as a proxy of migration networks.

Emigration is still associated with higher household wealth after departure, with a coefficient higher than in the OLS model. This tends to downplay the risk of omitted variables causing an upward bias in the OLS: if anything, these estimates appear to provide a lower bound of the effect. This tends to confirm the positive impact of emigration on wealth.¹³ Distinguishing between current and return emigration yields a significant positive effect for current emigration only.

Previous results have identified the impact of emigration on wealth, measured with an asset-based index. In particular, we found a positive effect on the wealth of rural households, which appears to be concentrated among the relatively less rich households. We now attempt to examine which components of wealth are impacted. In the case of rural households, land ownership is an important component of wealth inequality (land ownership is highly concentrated among rural households, 30% own land). Therefore, in table 9, we restrict the sample to rural households, and ask whether land ownership is affected by emigration.

Controlling for initial wealth (column 1), or initial ownership of land (col. 2) at the beginning of the period, an emigration event is associated with a significant increase of land holdings by the end of the period. The increase is of about 16 to 26 kirat¹⁴; as before, the measured impact

¹³ One potential explanation of the difference between the IV and OLS estimates could lie in a locally larger effect in "complier" localities (i.e., those with high migration networks), captured by our instrument.

¹⁴ One kirat=75 sq. meters.

is much larger when instrumenting for emigration, indicating a possible downward bias in the OLS estimates. The standard deviation of land holdings is 85 kirat.

5. Conclusion

This paper examines the impact of migration abroad on incomes and inequality in Egypt. With an estimated 3.7 million migrants in 2010, and an amount of \$7.7 billion received in remittances (4% of GDP), migration represents an important source of income to the country, and a potential factor of development. However, the development impact of migration depends on the distribution of the returns to migration in the population. In a companion paper (David and Jarreau (2015)), we consider the determinants of migration, and show that emigrants generally come from relatively affluent households. This raises the possibility of migration increasing inequality.

The first issue to address here is the measure of the benefits from migration. A first possibility is to focus on remittances only, and to ask whether remittances received exceed the potential home earnings of emigrants. We start by adopting this approach to compute a counterfactual distribution of household incomes, in a no-migration scenario, following the literature on the subject. We find small impacts on the income distribution, as transfers are relatively comparable to potential home wages. Indeed, this approach ignores potential benefits of migration beyond transfers, which can materialize through higher post-return earnings.

Therefore, we adopt a second approach where we test the impact of emigration episodes on households long-term income (proxied by asset wealth), controlling for pre-departure household characteristics. Using this model, we find a significant positive impact of migration on wealth, both for current, remitting migrants, and to returnees. Impacts appear to differ for rural and urban households. Among urban households, there is no evidence of a significant impact after return (this may be due to negative selection of returnees). For rural households, we detect a gain to migration after return; we also find that the gains to migration (both current and return) are higher among poorer households.

Overall, our results suggest that the impact of migration on inequality depends on whether one focuses on remittances, or considers instead longer-term returns to migration experience. In the context under study here, remittances alone tend to have a small, inequality increasing impact on incomes of origin households. By contrast, post-migration impacts on households long-term income appear to be positive and more significant, with some evidence of larger benefits for poorer households in rural areas.

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Table 1: Descriptive Statistics

Characteristics of current migrants (2012)	Obs.	Pct.
Male	2,924	97.50
Female	75	2.50
Age	35.2	9.7
Married	2,301	76.73
never married	677	22.57
divorced/widowed	21	0.70
Main destinations		
Saudi Arabia	1,314	43.81
Jordan	439	14.64
Kuweit	423	14.10
Education level		
Less than primary	836	27.88
Secondary	1,517	50.58
University/college	646	21.54
Main sectors of empl. abroad		
Construction and building	1,299	44.66
Growing of cereals	296	10.18
Retail	150	5.16
Total	2,999	100

Table 2: Descriptive Statistics

Panel sample of migrant departures	1999-2006	2007-2012
All departures	171	343
	4.65%	5.08%
Returnees	63	74
	1.71%	1.10%
Current	112	273
	3.05%	4.04%
Total nb. of households	3,678	6,751
Household characteristics	Mean	Std. dev.
Urban	.58	.49
HH. size	4.84	2.36
Sex, hh. head (1=male)	.84	.36
Years of education, head	7.25	5.9
Nb of men btw. 15 and 40	1.05	.99
HH. share of unemployed	.04	.10
Total obs.		10429

Table 3: Emigration and Wealth

	P[work]		Log wage
Age < 25	-0.20 (0.00)	-0.13 (0.01)	-0.21 (0.00)
Age ∈ [25,34]	0.39 (0.00)	-0.25 (0.00)	-0.15 (0.00)
Age ∈ [35,44]	0.17 (0.00)	-0.14 (0.00)	-0.09 (0.00)
Primary education	0.12 (0.00)	0.00 (1.00)	0.03 (0.18)
Secondary education	0.39 (0.00)	-0.01 (0.80)	0.09 (0.00)
Tertiary education	0.68 (0.00)	0.05 (0.55)	0.22 (0.00)
Married	0.61 (0.00)	-0.01 (0.86)	0.15 (0.00)
Divorced	0.20 (0.10)	0.15 (0.07)	0.20 (0.01)
Household wealth	-0.21 (0.00)	0.23 (0.00)	0.17 (0.00)
Rural	-0.03 (0.39)	0.02 (0.23)	0.02 (0.32)
Inv. mills ratio 1 (no migration)		0.01 (0.96)	
Inv. mills ratio 2 (work)		-0.51 (0.04)	
Probability of non emigration			
Age < 25	0.39 (0.00)		
Age ∈ [25,34]	-0.28 (0.00)		
Age ∈ [35,44]	-0.24 (0.00)		
Primary education	0.08 (0.26)		
Secondary education	0.27 (0.00)		
Tertiary education	-0.14 (0.01)		
Married	0.06 (0.24)		
Divorced	0.05 (0.83)		
Household wealth	-0.18 (0.00)		
Rural	-0.38 (0.00)		
Migrant network	-2.83 (0.00)		
rho	-0.43 (0.21)		
Observations	14316	8310	8310
R^2		0.163	0.163

Notes: p -values in parentheses. Col 1: 2-step probit model. The probability of being employed in 2012, P[work], is modeled as a probit, for non-emigrant individuals.

Table 4: Emigration and Income Inequality

	Gini	Theil	Theil: by governorate	
			Within	between
Observed income per cap.	0.623	0.448	0.424	0.033
Counterfactual: no emigration	0.620	0.441	0.412	0.032
Nb. Obs.	12,060	8,780	8,780	

Table 5: Emigration and Income Inequality: High-Migration Governorates

	Gini	Theil
Sohag		
Observed income per cap.	0.445	0.385
Counterfactual: no emigration	0.414	0.324
Asyut		
Observed income per cap.	0.461	0.427
Counterfactual: no emigration	0.442	0.393

Table 6: Emigration and Income Inequality

	Obs.	Median	mean	Std. dev.
Net gain per cap. (EGP)	750	-70.7	-39.5	486.8
Net gain per cap. (EGP) (receiving HHs only)	518	-21.0	57.5	535.5
Relative net gain per cap.	518	-0.08	0.17	1.42

Notes: Net gains: monthly remittances received net of migrants' potential home earnings. Amounts in Egyptian pounds. Relative net gain: as ratio of non-remittance household income (incl. imputed migrants income).

Table 7: Emigration and Wealth

Relative HH. wealth	Dep. var.: household wealth								
	Urban	Rural	Urban	Rural	Urban poor	rich	Rural poor	rich	
Emigrant	0.13 (0.00)	0.13 (0.02)	0.16 (0.00)						
Emigrant: returnee				0.02 (0.78)	0.23 (0.02)	-0.05 (0.63)	0.06 (0.58)	0.37 (0.01)	0.06 (0.59)
Current emigrant, remitting				0.23 (0.00)	0.17 (0.01)	0.22 (0.05)	0.24 (0.02)	0.19 (0.04)	0.12 (0.26)
current emigrant, non remitting				0.10 (0.37)	0.07 (0.49)	0.06 (0.71)	0.07 (0.59)	-0.01 (0.93)	0.12 (0.40)
HH. wealth	0.54 (0.00)	0.56 (0.00)	0.48 (0.00)	0.56 (0.00)	0.48 (0.00)	0.45 (0.00)	0.64 (0.00)	0.44 (0.00)	0.58 (0.00)
Nb. of men under 40	0.00 (0.96)	-0.00 (0.83)	0.00 (0.89)	-0.00 (0.79)	0.00 (0.88)	0.01 (0.35)	-0.02 (0.24)	0.04 (0.11)	-0.03 (0.20)
HH. unemployed share	-0.09 (0.23)	-0.21 (0.01)	0.17 (0.31)	-0.21 (0.01)	0.17 (0.30)	-0.14 (0.21)	-0.24 (0.05)	0.32 (0.22)	0.04 (0.84)
HH size	0.02 (0.00)	0.02 (0.00)	0.03 (0.00)	0.02 (0.00)	0.03 (0.00)	0.02 (0.01)	0.03 (0.00)	0.05 (0.00)	0.01 (0.25)
HH. head male	-0.03 (0.11)	-0.06 (0.02)	0.01 (0.83)	-0.06 (0.02)	0.01 (0.83)	0.00 (0.95)	-0.12 (0.00)	-0.01 (0.83)	0.03 (0.66)
HH. head yrs. of education	0.04 (0.00)	0.04 (0.00)	0.04 (0.00)	0.04 (0.00)	0.04 (0.00)	0.04 (0.00)	0.04 (0.00)	0.04 (0.00)	0.04 (0.00)
year:2006	-0.02 (0.12)	-0.06 (0.00)	-0.04 (0.15)	-0.06 (0.00)	-0.04 (0.14)	-0.07 (0.01)	-0.01 (0.63)	0.03 (0.47)	-0.12 (0.00)
Urban	0.18 (0.00)								
Fixed effects	Period, governorate								
Observations	10429	6012	4311	6012	4311	3006	3006	2155	2156
R ²	0.604	0.580	0.410	0.581	0.411	0.367	0.412	0.226	0.301

p-values in parentheses. Survey weighted linear regression. Linearized standard errors. Regressions of end-of-period household wealth index on emigration events (departure of a migrant during the period) and initial household wealth level and controls. Data: ELMPS panel, 1998, 2006, 2012 waves. Sample includes two periods 1998-2006 and 2006-2012. In columns 6 to 9, the samples of 'poor' ('rich') households indicate below-median (above median) value of initial wealth.

Table 8: Emigration and Wealth: IV Estimations

	Dep. var.: household wealth		
Emigrant	2.70 (0.01)	2.06 (0.02)	
Emigrant: current			3.59 (0.03)
Emigrant: returnee			-2.39 (0.55)
HH. wealth	0.52 (0.00)	0.53 (0.00)	0.53 (0.00)
Urban	0.20 (0.00)	0.19 (0.00)	0.20 (0.00)
Nb. of men under 40	-0.05 (0.05)	-0.04 (0.09)	-0.07 (0.07)
HH. unemployed share	-0.00 (1.00)	-0.02 (0.88)	0.04 (0.74)
HH size	0.02 (0.00)	0.02 (0.00)	0.03 (0.00)
HH. head male	-0.01 (0.81)	-0.01 (0.64)	-0.03 (0.45)
HH. head yrs. of education	0.04 (0.00)	0.04 (0.00)	0.04 (0.00)
i2006	-0.01 (0.62)	-0.02 (0.42)	-0.03 (0.28)
IV set	A	B	B
Hansen J test, Chi-sq. P-val	0.92	0.27	0.52
Cragg-Donald Wald F	12.33	9.82	1.93
Fixed effects		Period, governorate	
Observations	7973	7973	7973
R^2	0.339	0.456	0.164

Notes: p-values in parentheses. Regressions of end-of-period household wealth index on emigration events (departure of a migrant during the period) and initial household wealth level and controls. Data: ELMPS panel, 1998, 2006, 2012 waves. Sample includes two periods 1998-2006 and 2006-2012. IV sets: A: village-level lagged total emigration rate (pre-90, pre-98 emigration respectively) and sum of lagged emigration rates by destination country weighted by national rates of emigration to the country. B: A + interaction lagged emigration rate * household wealth.

Table 9: Emigration and Land Ownership

	Dep. variable: Owned land area		
Emigrant	16.66 (0.03)	26.35 (0.01)	226.28 (0.04)
HH. wealth	9.13 (0.00)		
Initial land holdings		0.34 (0.00)	0.23 (0.00)
Hansen J test, Chi-sq. P-val			0.49
Cragg-Donald Wald F			16.12
Fixed effects		Period, governorate	
Observations	4360	3170	1640
R^2	0.050	0.031	0.04

Notes: Standard errors robust to heteroskedasticity. p-values in parentheses. Data: ELMPS panel, 1998, 2006, 2012 waves. Sample: rural households, two periods 1998-2006 and 2006-2012. IV are village-level lagged emigration rate and interaction with hh wealth.