Return migration and self-employment: Is there a 'jack-of-all-trades' effect?

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Abstract

With reference to Lazear's Jack-of-all-Trades Hypothesis, I examine whether migrants are more likely to choose self-employment upon return because of the diverse work experience they gained abroad. The endogeneity between migration, human capital investment and self-employment is addressed by exploiting plausibly exogenous cohort and regional variation in the decision to migrate in the context of Egypt, retrospective and parental labor market information. Return migrants' higher propensity to be and to generate jobs as self-employed is shown to proceed from participating in significantly more occupations over their work history than non-migrants. In line with Lazear's framework, estimates confirm that entrepreneurship can be learned, and that exposure to multiple occupations matters for being and creating jobs as self-employed.

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1 Introduction

The objective of this paper is to contribute to the debate on the consequences of out-migration on source communities by analyzing how working abroad affects the decision to be self-employed upon return. There is evidence suggesting that migrants are more likely to be self-employed on return than non-migrants (Piracha and Vadean, 2010; Marchetta, 2012; Wahba and Zenou, 2012; Wahba, 2015; Batista et al., 2017). In the absence or inefficiency of markets, savings accumulated during migration and remittances could facilitate access to financial capital, and widen opportunities to set up or expand a firm (Dustmann and Kirchkamp, 2002; Woodruff and Zenteno, 2007). The wealth gained abroad is also posited to overcompensate a loss of social capital following migrants' absence from their origin communities (Wahba and Zenou, 2012).

Apart from the opportunity provided by migration to accumulate wealth, a possible explanation for these findings might be that moving, living abroad or returning 'home' could impart a variety of skills needed in entrepreneurship. Entering into and persisting in self-employment involve diverse tasks that demand multiple skills, such as tolerance for risk, perseverance, planning, budgeting and communicating across cultures. Entrepreneurial human capital or entrepreneurial abilities[1] have been recognized as an essential, if often elusive, determinant of entrepreneurship (Hessels et al., 2014). Still, there is no consensus on whether one is born with innate entrepreneurial abilities or whether entrepreneurial abilities can be taught (Silva, 2007). And, despite a few works, such as Black and Castaldo (2009), Démurger and Xu (2011) or Chen and Hu (2012), the relative importance of the abilities gained during migration compared to remittances and repatriated savings in returnees' choice of occupation remains unclear.[2]

Does migration experience develop entrepreneurial abilities? I examine whether migrants are more likely to choose self-employment upon return to their origin country because of the diverse work experience gained abroad, with reference to Lazear's (2005) Jack-of-all-Trades

[1] Entrepreneurial abilities are defined as 'entrepreneurs' competencies, knowledge, and associated technical skills', e.g. general business skills and basic skills to set up a firm (Valerio et al., 2014, p. 38).

[2] For instance, Gibson and McKenzie (2012) conclude from micro-economic evidence from five islands that, although return migration of the highly skilled is common, their involvement in self-employed activities once back to origin countries is seldom, in contrast with Wahba and Zenou's (2012) findings.

Hypothesis. According to Lazear (2004, 2005), entrepreneurial abilities can be learned, not only through education but also experience. Entrepreneurs need a generalist, rather than specialized, skill mix profile. They need to be 'jacks-of-all-trades' – being exposed to a range of activities and contexts. Without acquiring a varied set of skills, one would be less likely to opt for self-employment, and less successful in starting up a firm. This prediction of the Jack-of-all-Trades Hypothesis can be tested by looking at human capital investment patterns of self-employed and employed. Entrepreneurs should have a well-balanced attitude to human capital. This analysis allows to determine whether overseas labor experience is conducive to the development of entrepreneurial abilities. It contributes to the growing empirical evidence on testing Lazear's (2005) Hypothesis,[3] by examining whether migration is a process that can affect the likelihood of returnees becoming self-employed; and if so, whether this is due to a migration-induced jack-of-all-trades effect on skill set balance.

The country of interest, Egypt, was one of the biggest labor exporters of the Middle East and North Africa region at the time of the survey. Simultaneously, micro- and small enterprises represent the majority of enterprises, and provide significant employment.[4] This study is relevant as labor migration tends to be a survival strategy to escape poor social and economic development in Egypt; and self-employment, an activity often seen as a vehicle to tackle high (youth) unemployment and low real wages.[5] That migrating plays a role in forming entrepreneurial abilities could thus be informative for better supporting fledgling entrepreneurs.

A major empirical issue in studying the link between return migration and labor market outcomes is that endogeneity might affect this relationship. Omitted variables could simultaneously explain the decision to migrate temporarily and self-employment on return to origin countries, as both involve taking risk (Marchetta, 2012). Bringing back resources accumulated abroad could also be driven by the will to set up or expand a business at home before out-migrating (Wahba and Zenou, 2012; Batista et al., 2017). Similarly, those with a taste for professional variety might seek a greater exposure to different occupations, sectors or jobs to acquire varied skills, and might be more inclined to opt for self-employment because of

[3] For a recent review, see Hessels et al. (2014).

[4] From 2003 to 2011, micro- and small firms constituted almost 99% of Egypt's total enterprises, and around 80% of total employment, providing work for about 75% of new entrants into the job market (Ghanem, 2013).

[5] Youth unemployment represented around 95% of Egypt's unemployed in 2008.

their own, innate preferences (Silva, 2007), a case of self-selection. This suggests that a naïve, Ordinary Least Squares, estimation of the impact of return migration on labor market outcomes through skill set development might be biased.

To recover the causal effect of return migration on the propensity to be self-employed via the human capital channel, I estimate the reduced-form of two structural equations, linking (i) return migration to labor experience variety, and (ii) labor experience variety to self-employment, in which exclusion restrictions play the role of instrumental variables. To identify the relationship between return migration and labor experience, this instrumental variable strategy exploits plausibly exogenous cohort and regional variation in the decision to migrate in the context of Egypt, where, at the time of the survey, most of out-migration was temporary in nature because of destination countries' legal environment. This is along the lines of Bohme et al. (2015), who study the impact of out-migration on the health of elderly parents, and Dustmann et al. (2015), who analyze the effect of out-migration on wages. The relationship between labor experience and self-employment is identified by taking advantage of respondents' and parental retrospective labor market information.

Formally, the effect of return migration on self-employment through skill set balance is dis-aggregated by occupational experience. Descriptive statistics and reduced-form estimates indicate that migrants work in more diverse occupations than non-migrants over their job history. Baseline reduced-form estimates indicate that return migration is associated with an increase of 3.01 percentage points in the probability to be self-employed on return to Egypt in a one-unit increase in occupational experience. The identification strategy is shown to be robust. The effect of having worked in various industries as a result of migration decreases the propensity to be self-employed, suggesting that sectoral experience might foster specialization, and that simply changing jobs might not contribute to the development of a balanced skill profile.

Analyzing effect heterogeneity indicates that this link is driven by men, individuals working in non-agricultural sectors and those living in rural areas. This is consistent with the setting studied, where there is important gender segregation on the labor market; the agricultural sector is rather traditional and fragmented; and self-employment might be more desirable in rural

areas. The effect of return migration on entrepreneurial abilities is found to be identified only for individuals who are financially constrained. While the effect on profits is inconclusive, return migrants appear more likely to generate jobs as self-employed, because of a more varied occupational experience.

Besides providing evidence to the current debate on the development impacts of migration on origin communities, findings contribute to the literature on migration and human capital accumulation by analyzing, empirically, whether migration experience shapes entrepreneurial skills. This study builds on existing research on return migration and self-employment, in particular Wahba and Zenou (2012), who show theoretically and empirically that the wealth acquired abroad and overseas upward occupational mobility are related to migrants' greater propensity to be self-employed on return to their origin countries, Egypt. My analysis differs from theirs conceptually by studying how *diverse* occupational experience, measured through ISCO-88 skill level and O*NET task content scales, rather than occupational *mobility*, explains return migrants' likelihood to be self-employed.

By assessing whether migration-induced labor experience develops entrepreneurial abilities, this analysis specifically relates to Reinhold and Thom (2013), who find that occupation-specific work experience in the United States (U.S.) accounts for much of the positive relationship between earnings in wage employment and return migration to Mexico. It also complements Démurger and Xu (2011), who argue that returnees are more likely to engage in self-employed activities than stayers, because of job turnover; and Chen and Hu (2012), who suggest that, among internal migrants in China, the variety of skills accumulated during migration to more industrialized urban areas increases returnees' likelihood to be self-employed compared to those migrating to rural areas. I expand their findings by suggesting that the exposure to multiple occupations, rather than job turnover or upward occupational mobility, might explain returnees' greater likelihood to be self-employed in comparison to non-migrants, beyond any effect on earnings, and in the absence of wealth (savings) effects.

In unpacking migration as a learning process, estimates are also in line with Lazear's (2005) framework, as they confirm that entrepreneurship can be learned, and that learning-by-doing and experiential learning matter in entering into and persisting in self-employment

(Hessels et al., 2014), in a developing economy with significant international migration such as Egypt. This analysis contributes to the scarce literature on empirically testing Lazear's (2005) Jack-of-all-Trades Hypothesis in developing economies where international migration is a prevalent labor market alternative. While recent empirical research has supported and refined his findings in developed settings,[6] the self-employed evolve in underdeveloped, ill-functioning market-supporting institutions in less advanced economies. They need to be much more generalist to be able to handle almost all dimensions of business management. In this regard, migration could be seen as a process part of a dynamic, life-cycle sequence of learning and experimentation. By entailing a change in occupations or sectors, migration could act as an 'experience good', nudging migrants to discover the best allocation of their capital and labor resources. In such a case, the accelerated, condensed labor market experience caused by migration to self-employment could help shape entrepreneurial abilities.

The rest of this paper is structured as follows. Section 2 describes the data, followed by the empirical strategy in section 3. Section 4 presents estimation results. Section 5 concludes.

2 Data

2.1 Context

Egypt has been a labor exporter since the 1970s economic reforms and opening of the country; it is one of the biggest of the Middle East and North Africa (MENA) region (Wahba, 2014). Two main trends have characterized Egyptian out-migration: (i) temporary migration to MENA countries, typically involving male household heads, for one to five years; and (ii) rather permanent migration to Western countries, involving the entire nuclear family. Egyptians' first destinations were labor-importing MENA countries, in particular the oil-producing Gulf States, Libya and Iraq because of labor shortages.[7]

Egypt's international migration comprises both low- and high-skilled migrants (Wahba,

[6] See for instance Astebro and Thompson (2011), Lechmann and Schnabel (2014), Hessels et al. (2014) or Alden et al. (2017).

[7] Since the 1980s and 1990s, the political instability some experienced and the replacement of Arab with Asian workers have had a significant effect on emigration destinations of Egyptians. However, the majority, around 70%, was still heading to MENA States in 2000 (Wahba, 2009).

2014). The early 1980s saw highly educated professionals (physicians, health workers, teachers), and less educated workers, usually working in construction, temporarily leaving for MENA countries. Nowadays, the proportion of less educated Egyptian migrants has decreased relative to the proportion of more educated workers, as demand from labor-importing MENA countries has decreased with increasing inflows of Asian workers. Emigration flows have thus become more educated on average. Gulf States and Western countries tend to host the most educated Egyptian workers, whereas Libya, Jordan and Iraq host the least.

2.2 Data source

This paper uses the last wave of a longitudinal and nationally representative household survey, the 2012 Egypt Labor Market Panel Survey (ELMPS) (ERF and CAPMAS, 2013). The ELMPS consists of four cross-sections – 1988, 1998, 2006 and 2012 – the last three constituting a three-round panel. The 2012 round covers 12,060 households and 49,186 individuals, tracking households and individuals surveyed in 2006, plus a refresher sample or people interviewed in 1998.[8]

The ELMPS contains information on a variety of topics. For this analysis, modules on labor market outcomes, residential mobility, current and return (international) migration are of particular interest. I use the last wave of this survey as a cross-section since, first, variables of interest were only collected in its last wave. The newly added module identifying return migrants surveys individuals between 15 and 59 years old, and defines as return migrants those who worked abroad for at least six months. This module offers better quality data on return migration compared to studies using previous rounds of the ELMPS, such as Wahba and Zenou (2012) or Marchetta (2012) who inferred labor migration based on respondents' two previous job spells. Second, by asking retrospective information on job history up to the four last job spells, the 2012 wave gives greater insight into respondents' migration and work history compared to using the panel structure of the 1998, 2006 and 2012 waves.

Empirical research on return migration and labor market outcomes in Egypt has mainly used the ELMPS. Overseas savings and upward occupational mobility experienced during migration

[8] More details on data collection are available in Assaad and Kraft (2013).

were shown to be positively related to the propensity to be self-employed upon return by more than compensating for their potential loss of social capital (Wahba and Zenou, 2012). Marchetta (2012) finds that being a return migrant increases the survival of self-employed activities in Egypt; Bensassi and Jabbour (2017), that business units managed by returnees display higher revenues. El-Mallakh and Wahba (2018) show that temporary overseas labor experience raises the propensity of upward occupational mobility for highly skilled returnees. The role of migration as a learning experience for self-employment thus remains unclear. Being self-employed upon return to Egypt could occur due to wealth effects – remittances and repatriated savings – or to the development of a balanced skill set, a jack-of-all-trades effect.

2.3 Descriptive statistics

The estimation sample includes individuals born before 1990, as no return migrants are reported for individuals born on or after 1990. Individuals who changed jobs after the January 2011 Uprising are excluded to ensure estimates are not affected by critical events in the aftermath of the Uprising (El-Mallakh and Wahba, 2018). The sample is also limited to those whose first destination country was a MENA country, as listed in Bertoli and Marchetta (2015) – Algeria, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Syria, the United Arab Emirates and Yemen. This helps focus better on the effects induced by return migration since (i) Egyptians out-migrating to Western countries tend to stay permanently, but migration to MENA countries is temporary in nature because of the legal environment in these countries (Kandil and Metwally, 1992; Bauer and Gang, 2002); and (ii) at the time of the survey, the majority of Egyptians out-migrated to MENA countries.

Table 1 and Table A1 in more details present estimation sample descriptive statistics. The outcome of interest is a binary variable taking value 1 if a working-age (16-64 year-old) individual is self-employed owner of an economic unit or employer; value 0, if employed, as in Wahba and Zenou (2012).[9,10]I adopt this definition to study business set up and growth-

[9] This is also in line with Lazear's (2005) definition of entrepreneurship, measured as those who answered 'yes' when asked whether they were among those who initially established the business.

[10] While it could be argued that deciding to be self-employed is a means to escape unemployment, there are relatively few unemployed for this age range in Egypt, at the time of the survey. Including them in the estimation sample does not alter results. Moreover, Figure A1 indicates that the relationship between self-employment and

enhancing self-employment. Out of 11,224 observations, 22.84% are self-employed. Table A1 indicates that trade and agriculture are the two most common economic activities of the businesses; and that 53.2 and 46.8% are respectively employers and own-account workers.

Skill profiles are measured as occupational experience, a continuous variable capturing the *number of occupations* an individual has accumulated over the four last spells of his job history. To keep categories manageable and self-explanatory, and following the International Standard Classification of Occupations (ISCO-88), used by the ELMPS, occupations are classified in terms of skill level and skill specialization, forming four skill levels, in the lines of Chen and Hu (2012) and El-Mallakh and Wahba (2018): (1) low-skilled blue-collar occupations correspond to skill level 1 occupations (plant and machine operators and assemblers and elementary occupations); (2) high-skilled blue-collar to skill level 2 (skilled agricultural and fishery workers and craft and related trades workers); (3) low-skilled white-collar to skill level 3 (clerks and service workers and shop and market sales workers); and (4) high-skilled white-collar occupations to skill level 4 occupations (legislators, senior officials and managers, professionals and technicians and associate professionals).

In Table 2, I characterize the 'task content' of these four broad skill levels, following Autor et al. (2003) and Acemoglu and Autor (2011). I use the Occupational Information Network (O*NET) to impute task measures associated with individual ELMPS data according to ISCO-88 categories, applying the routine developed by Hardy et al. (2018). O*NET data are used to assess major skill content differences across these broad occupational groups.[11] I distinguish five tasks: non-routine cognitive analytical, non-routine cognitive interpersonal, routine cognitive, routine manual and non-routine manual physical. I proxy for job tasks by directly working with the ELMPS and ISCO-88 categories. High-skilled white-collar workers tend to be specialized in abstract, non-routine cognitive tasks; low-skilled white-collar in routine cognitive tasks; high-skilled blue-collar workers, in routine manual tasks; and low-

unemployment was stable from 1990 to 2012.

[11] The task content measures from the O*NET, in Table 2, were constructed by Autor et al. (2003) – they have been amply used in the literature since then (e.g. Acemoglu and Autor (2011) and Hardy et al. (2018), on which the construction of O*NET task content indices in this analysis is based. Following Hardy et al. (2018), to estimate the task content of jobs, I first mapped O*NET task items to the corresponding occupations in SOC and afterwards, using the official ILO crosswalk, I converted all SOC-based occupations into ISCO. The procedure to merge data and calculate O*NET-ISCO-specific task content indices are described in the Appendix.

skilled blue-collar, in non-routine manual tasks.

However, it is worth noting that, while this approach helps refine the many occupational titles found in conventional data sources into a relatively small number of task dimensions, the O*NET is composed of a great number of task scales: it is not necessarily clear which measure best represents a given task construct.[12] Using O*NET classification to assess occupation-specific task content also assumes that Egypt's occupational structure, a low middle-income country, is the same as the occupational structure, and occupation-specific skill and task content as the U.S. For this reason, job equivalence in Egypt and the U.S. should not be assumed as such, but U.S. occupational structure and task content measures should be viewed as proxies for broad task intensity distribution across occupations.

Table 2 presents employment-weighted means across the detailed occupations within each broader category.[13] As expected, Table 2 shows that the intensity of use of non-routine cognitive (analytical and interpersonal) tasks is the highest in white-collar high-skill occupations, and the lowest in blue-collar low-skill occupations. The means of -1.087 and 1.096, respectively, for low-skill blue-collar and high-skill white-collar suggest a two standard deviation ($-1.087 - 1.096 \approx 2$) average gap in non-routine cognitive analytical – abstract such as mathematics and formal reasoning – task intensity these two categories, in line with Acemoglu and Autor (2011). This pattern is similar for non-routine interpersonal and managerial tasks. The next two rows give routine task content indices. The highest level of routine cognitive task intensity is found among low-skill white-collar workers, while routine manual tasks appear the most used among high-skill blue-collar workers. Last, non-routine manual tasks seem the most common in low-skilled blue-collar occupations.

Task content patterns presented in Table 2 thus appear in line with the task content characterization of these four broad occupational categories. Albeit these occupations combine elements from each task category, and task intensities vary among detailed occupations within these broad groups (and among workers in these occupations), these patterns suggest that these

[12] The O*NET contains 400 separate scales.

[13] The number 4-digit ISCO-88 occupations in each category is provided in the last row. For readers to interpret the extent of these differences, all task measures in Table 2 were standardized to have a mean of zero and a cross-occupation standard deviation of one in 2012 across the 296 consistently coded occupations used in this classification.

four categories capture key trends of the data, and provide a useful mnemonic for parsing the evolution of job task structure.

Sectoral experience, a continuous variable representing the *number of 1-digit industries* (or sectors) an individual has worked in over the four last spells of his job history,[14] is used alternatively to assess the robustness of migration-induced jack-of-all-trades effects. These two measures of skill set profile are not aggregated as the human capital acquired through these channels might differ. This is supported by pairwise correlations, presented in Table A2. They suggest a positive, statistically significant relationship between self-employment, return migration and occupations. The linear correlation between self-employment and sectors, positive and significant, is much weaker. That correlations are not similar for both dimensions supports the idea that they might not capture similar aspects of one's skill mix profile.

Let's take two examples, Hussein and Fahad. Before leaving Egypt, Hussein worked as a driver for a truck company. Abroad, he drove diplomats and high level officials. Upon return to Egypt, and now armed with driving experience in different sectors, he decided to become a self-employed taxi-man. On the other hand, Fahad, initially trained as a civil engineer, worked as a civil servant at the Ministry of Transportation, contributing to developing the domestic road networks. He then decided to out-migrate to work in a private firm, in which he managed administratively varied infrastructure projects. He eventually returned to Egypt to become a successful consultant, offering his services to governmental, international and private organizations, now that he acquired diverse occupational and sectoral experience, ensuring a broad range of clients. In these two cases, out-migrating helped develop entrepreneurial abilities, by accumulating sectoral but specializing in a occupation (Hussein) and occupational experience (Fahad). As a result, job turnover might not automatically induce a change in occupation – it might not lead to the same type of skill acquired by exposure to various occupations.

That retrospective labor market information is only recorded for the last four job spells might limit the identification of unique skill profile. It is possible that two individuals display a similar number of occupations and sectors in the last four jobs, but one might have had more than four

[14] As classified by the International Standard Industrial Classification of all economic activities (ISIC4)

jobs with different occupations or sectors before. Although this might not affect the measure of occupational experience, bounded to four, the number of sectors might be mismeasured. This will result in the impossibility to identify unique skill profiles based on sectoral experience. By identifying an exogenous source of variation in explaining the relationship between skill mix profile and self-employment, the empirical strategy of this paper will allow controlling for endogeneity due to measurement errors.

Table 1 reveals that, on average, respondents have a relatively low degree of skill mix balance. They have accumulated 1.30 occupations, and worked in 1.20 sectors over their last four job spells. There are notable differences between self-employed and employees. In particular, those self-employed have accumulated significantly more occupational (1.38) and sectoral (1.22) experience, compared to employees (respectively 1.28 and 1.20), as illustrated by Figure 1. Respondents who are self-employed display more diverse skill mix profiles than employees, which confirms Lazear's 2005 Hypothesis.

Being a return migrant is defined as a binary variable, taking value 1 if an individual has out-migrated at 15 years old or older for work for at least six months, and returned to Egypt at the time of the survey; 0, otherwise. About 10% of the estimation sample are return migrants who, on average, spent 4.55 years abroad. Returnees show a significantly higher rate of self-employment: 33.12 compared to 21.74% of stayers, the rest being wage-employed. Return migrants also display a significantly greater number of occupations and sectors, accumulated over their work experience. Return migrants have worked, on average, in 1.58 occupations and 1.65 sectors, compared to 1.27 and 1.16 for non-migrants, as supported by Figure 2. These statistics support the idea that working abroad leads to the accumulation of a labor market experience more diverse than the one obtained by staying home.

Limiting the sample to working-age self-employed, self-employed who temporarily migrated have acquired substantially more occupational experience (1.56), and worked in more sectors (1.55) than self-employed who have not migrated (respectively 1.35 and 1.17). This is evidenced by Figure 3. Even among respondents who are self-employed, self-employed who temporarily migrated thus present greater skill mix variety than self-employed who did not.

Transition matrices suggest that return migrants who worked in relatively high (low) skill

occupations before leaving Egypt, tend to work in occupations with lower (higher) skill levels abroad (Tables A4, A6-A8). However, while return migrants self-employed at the time of the survey tend to experience downward occupational mobility when working abroad, they often switch to occupations requiring higher levels of skill upon return to Egypt (Tables A5, A9-A11). These statistics suggest that migrants tend to experience *downward* occupational mobility when working abroad, but *upward* occupational mobility when returning to Egypt, specifically for those self-employed at the time of the survey, which questionsWahba and Zenou's (2012) use of upward occupational mobility abroad as a proxy for human capital acquired abroad.[15]

In contrast, looking at the labor experience of non-migrants who are self-employed at the time of the survey (Table A12), it seems that, over the last four reported job spells, non-migrants progress towards managerial occupations, without experiencing migrants' downward mobility. This might signal that, in the context of highly regulated, temporary migration to MENA countries, labor migration could act as a 'condensed', accelerated labor experience, by enabling migrants to work in, experiment and learn from various contexts, highlighting the value of international migration for broadening entrepreneurial skills.

3 Estimation strategy

A major analytical issue in studying the relationship between return migration and self-employment is that endogeneity might influence this relationship. Deciding to migrate temporarily is subject to self-selection due to unobservable features that are likely to affect, at the same time, self-employment upon return (Marchetta, 2012). Return migrants may be more endowed – they might have a more balanced skill set, for instance – before departure than non-migrants. They might be innately more risk-taking, and more likely to set up a firm. Estimates would also be biased if returnees' decision to be self-employed was determined by a lack of social capital on return to origin countries, and as an escape from unemployment (Wahba and Zenou, 2012).[16] Out-migrating itself could be driven by the desire to set up an

[15] In addition, their variable assumes by construction that non-migrants do not experience any occupational mobility over their labor market history, which is unlikely to be the case.

[16] However, with regard to the depreciation of social capital because of migrants' stay abroad, it could be argued that, in Egypt, a rather traditional society, connections might be easily resurrected upon return because of

enterprise at home. They could be simultaneous decisions, and temporary migration part of would-be entrepreneurs' business strategies (Batista et al., 2017).

The relationship between human capital investment and self-employment might similarly be biased. Individuals with a taste for professional variety might seek a greater exposure to different occupations, sectors or jobs to acquire varied skills, and might simultaneously be more inclined to opt for self-employment because of their own, innate preferences (Silva, 2007). This would result in self-selection: gathering expertise across various positions would not increase the likelihood of becoming an entrepreneur. Alternatively, how (un)balanced one's skill set is might be a conscious effort to reach a well-defined wage or self-employed position – an instance of reverse causality. As a result, naïvely estimating the effect of return migration on the propensity to be self-employed through skill set development via Ordinary Least Squares might be biased.

To tackle endogeneity in assessing, and recovering, the causal effect of migration experience on self-employment *via human capital diversity*, I estimate the reduced forms of two structural equations linking (i) return migration to labor experience variety:

$$Experience_i = \alpha_{00} + \alpha_{01} X_{Ei} + \alpha_{02} Returnee_i + \epsilon_{0i} \tag{1}$$

And (ii) labor experience to self-employment:

$$SelfEmployed_i = \beta_{00} + \beta_{01} X_{SEi} + \beta_{02} Experience_i + \eta_{0i} \tag{2}$$

where $Returnee$ is a binary variable, taking unity if a working-age individual i has worked at least six months abroad; 0 otherwise. $Experience$ is a continuous variable measuring the number of different occupations accumulated over the last four job spells. $SelfEmployed$ is a binary variable taking unity if an individual is currently self-employed; 0 otherwise.

X_E is a vector of individual and household characteristics thought to influence skill mix profiles – gender, education, whether an individual's father was self-employed when respondents were 15, whether respondents have prior self-employed experience, whether their

extended family networks.

first job was self-employed and governorate fixed effects.[17]

X_{SE} controls for gender, whether respondents' mothers were literate,[18] child dependency ratio, marital status, vocational training, whether an individual's father was self-employed, whether their first job was self-employed, years of unemployment and governorate fixed effects.

Rewriting these systems in their reduced forms yields:

$$Returnee_i = \alpha_{10} + \alpha_{11} X_{Ei} + \alpha_{12} Z_{Ri} + \epsilon_{1i} \tag{3}$$

$$Experience_i = \alpha_{20} + \alpha_{21} X_{Ei} + \alpha_{22} Z_{Ri} + \epsilon_{2i} \tag{4}$$

$$Experience_i = \beta_{10} + \beta_{11} X_{SEi} + \beta_{12} Z_{Ei} + \eta_{1i} \tag{5}$$

$$SelfEmployed_i = \beta_{20} + \beta_{21} X_{SEi} + \beta_{22} Z_{Ei} + \eta_{2i} \tag{6}$$

Equations (3) and (4) represent the first-stage and reduced forms of the first system, respectively; equations (5) and (6), of the second system. Z_R and Z_E act as exclusion restrictions. Z_R and Z_E being unique to each system, the above model can be solved, and its structural parameters uniquely identified.

In practice, I estimate a linear probability model via a generalized simultaneous equations model (GSEM) estimator.[19] Standard errors are clustered at the household level to account for potential correlation in migration and labor market behaviors within families.

Under this framework, the structural parameter of interest of the first system is the change in occupational variety in an exogenous change in return migration:[20]

$$\frac{\partial Experience_i}{\partial Returnee_i} = \frac{\frac{\partial Experience_i}{\partial Z_{Ri}}}{\frac{\partial Returnee_i}{\partial Z_{Ri}}} = \frac{\alpha_{22}}{\alpha_{12}} \tag{7}$$

[17] A governorate is the first level of Egypt's administrative subdivision.

[18] Mother's education proxies potential inequalities of opportunities that individuals might face based on their family background (Paxson and Schady, 2004, 2007).

[19] See Angrist (2001) on the use of linear probability models to estimate causal effects in models with binary outcomes.

[20] This estimate is equivalent to the covariate-adjusted IV estimator, i.e. the Wald estimate of the effect of return migration on labor experience variety.

The structural parameter of interest of the second system is the change in the probability of being self-employed in an exogenous change in accumulating occupational or sectoral experience:[21]

$$\frac{\partial SelfEmployed_i}{\partial Experience_i} = \frac{\frac{\partial SelfEmployed_i}{\partial Z_{Ei}}}{\frac{\partial Experience_i}{\partial Z_{Ei}}} = \frac{\beta_{22}}{\beta_{12}} \tag{8}$$

Migration-induced jack-of-all-trades effects on self-employment, that is the change in the probability of being self-employed in an exogenous change in return migration through skill development, are given by multiplying these two estimates:

$$\frac{\partial SelfEmployed_i}{\partial Returnee_i} = \frac{\partial SelfEmployed_i}{\partial Experience_i} \cdot \frac{\partial Experience_i}{\partial Returnee_i} = \frac{\beta_{22}}{\beta_{12}} \cdot \frac{\alpha_{22}}{\alpha_{12}} \tag{9}$$

Z_R, exclusion restriction for the first system of equation, is the interaction between (i) the real price of oil at 18 years old in USD, and (ii) the inverse average distance to estimation sample destination countries in 1,000 kilometers.

As in Wahba and Zenou (2012), Bertoli and Marchetta (2015) or El-Mallakh and Wahba (2018), changes in the real price of oil are used to obtain an exogenous source of variation in the probability of return migration. Inflation-adjusted prices of oil are assumed to drive the demand for non-native labor in response to changes in local economic conditions either directly in oil-producing countries – through employer-based immigration policies – or indirectly in non oil-producing countries, such as Jordan or Lebanon, as replacement workers. As argued by these authors, fluctuations in the historical real price of oil at a potential age of out-migration should influence the decision to migrate, but should not be directly related to current labor market outcomes upon return.[22]

In addition, because migration to MENA countries tends to be temporary as it is related to visa schemes sponsored by employers, predicting out-migration should suffice to instrument for return migration. This, together with limiting the sample to individuals born before 1990, should control for potentially failed migration project, as applying for such schemes help

[21] That is the Wald estimate of the effect of labor experience variety on self-employment.

[22] This is supported by Figure A1, depicting no association between trends in rates of gross domestic product (GDP) growth, self-employment, wage employment, unemployment and inflation-adjusted oil prices in USD, from 1990 to 2012.

migrants obtain more information on what type of job and life to expect abroad.

Following Bertoli and Marchetta (2015), selecting the age at which individuals have to be matched to the real oil price relies on an optimality criterion, chosen out of seven alternatives, from age 18 to 25.[23] Equation (1) is estimated, and the strength of this instrument examined at different matching ages, ranging from age 18 to 25. This is achieved by testing the null hypothesis that the estimated coefficient on the real price of oil equals zero through a Wald test for each alternative. The age of potential out-migration giving the highest F-statistic is then selected.

Figure 4 depicts the values of the F-statistics for equation (1), at each age, as well as Stock and Yogo's (2005) rule of thumb. The F-statistic is the highest for age 18 for being a return migrant, close to Bertoli and Marchetta's (2015) choice of age 20, but below 10 for 26, the age selected by Wahba and Zenou (2012) and El-Mallakh and Wahba (2018). The real price of oil is thus selected when individuals were 18 as an instrument for return migration to MENA countries. Table 1 supports the selection of 18 as matching age. Real oil prices were, on average, statistically significantly higher for return migrants (USD49.87) at age 18 than for stayers (USD43.45), confirming the rationale behind this instrument.

Along the lines of Bertoli and Marchetta (2015), Figure 5 shows the relationship between the share of returnees of the estimation sample at their year of birth and the real price of oil when they were 18 years old, from 1950 to 1990. The proportion of return migrants is the highest, approximately 25% for those born in the mid-1950s and early 1960s, who might have out-migrated following the sharp increases in oil prices in the 1970s and 1980s. The proportion of returnees then falls, until the end of the series, 1989.[24] The steady decrease in the share of returnees does not match the rise in real oil prices starting in the late 1980s. Egyptians, born in the late 1970s or onward, who out-migrated to MENA countries in the early 2000s may not have returned to Egypt yet. Those who have already returned may have failed their migratory project. They may not represent well the pool of Egyptians who left in the 2000s, which could

[23] The age at which individuals are matched to the real oil price is selected out of seven alternatives, from 18 to 25, instead of 11, that is up to 28 as in Bertoli and Marchetta (2015) because the number of respondents to be matched decreases from age 26 onward, limiting comparability.

[24] No return migrants born in 1990 or later were surveyed. The estimation sample thus only includes individuals with no missing information, who were born in 1989 or before.

induce bias. This is later assessed in checking the robustness of the identification strategy.

This cohort-based instrument is interacted with a variable varying across space, along the lines of Bohme et al. (2015) and Dustmann et al. (2015), who analyze the effect of out-migration on parents' health and wages, respectively. That is, the effect of this 'shock' on the likelihood to migrate temporarily is allowed to differ across Egypt through cross-governorate heterogeneity in migration costs to the average potential destination country. Differences in migration costs could be explained by differences in historical ties with receiving countries (Kraetke, 1999), variation in the current share of out-migrants in each receiving countries (network effects) (McKenzie and Rapoport, 2007), or differences in geographical proximity; all are likely to induce cross-country heterogeneity in the effect of oil price on migration.

Cross-country variation in migration is captured by the average distance from the capital of a respondent's governorate of birth to estimation sample destination country capitals in 1,000 kilometers.[25,26,27] Migrants are more likely to migrate, the lower their costs to migrate, as measured by geographical proximity. The effect of oil prices on the probability to temporarily migrate is thus allowed to differ across governorates through regional heterogeneity in migration costs to each potential destination. This interaction generates variation across time, via the cohort-based oil price, and across space, via the average distance from governorate of birth to destinations.

Figure 6 presents the average distance to potential destination country capitals by governorate of birth in kilometers. Table 1 indicates that this variable is significantly lower for return migrants compared to non-migrants. This is in line with distance as a proxy for migration costs – the closer the average distance to destination countries, the greater the likelihood to migrate. It is plausible to think that average distance to potential destination country capitals is exogenous with regard to labor market outcomes recorded before January 2011 since it is based on governorate of birth, and governorate fixed effects were included in the $SelfEmployed$ equation. Moreover, as Figure A1 suggests, trends in rates of GDP growth, self-employment,

[25] Respondents who were not born in Egypt were assigned an average distance based on their first governorate of residence in Egypt.

[26] Table A13 provides information on the construction of distances.

[27] The average distance is also weighted by the share of migrants by destination countries. This yields similar results. Estimates are available on request.

wage employment or unemployment have remained relatively steady from 1990 to 2012.

Z_E, exclusion restriction of the second system of equation, captures resemblance to respondents' fathers' occupations when they were 15 years old.[28] It is a binary variable taking unity if an individual has worked in at least two (broad) occupations different from their parents' (broad) occupations when they were adolescents; 0, otherwise. The idea behind this exclusion restriction is that a factor that might leverage skill acquisition – and how varied acquired skills are – is occupational transmission. Parents' choices of professions when respondents were children or adolescents is likely to influence their occupations in adulthood because of indirect investment through formal human capital (e.g. education), family networking or nepotism (favoritism), by helping limit time necessary to get contacts or practical experience, which would, eventually, lower entry barriers and increase early profits, as the literature suggests (Becker and Tomes, 1979, 1986; Laband and Lentz, 1983, 1992; Aina and Nicoletti, 2018).

Individuals with no family members in their current/past occupations and individuals who gained experience in a sufficient number of occupations should thus have acquired more varied skills than individuals who have only had the same professions as their parents'. Having the same occupations as their parents' when they were adolescents can be interpreted as occupational specialization, since individuals would specialize in those occupations they were exposed to during their childhood and adolescence, and for which they had lower (entry) costs to work in, i.e. they had a greater propensity to opt for. On the other hand, having worked in occupations that differ from their parents' might suggest individuals acquire a rather varied set of skills, as, not only have they gained experience from working in different occupations themselves, but they were also exposed to their parents' jobs earlier in life, and might have been transmitted some knowledge of their parents' professions.

Importantly, dissimilarity between respondents' and their parents' occupations should not directly affect the decision to be self-employed, but rather indirectly, through the development of a varied set of skills; moreover that the vector of control variables X_{SE} includes a variable taking value 1 if respondents' fathers were self-employed at 15 years old. In addition, this

[28] When information on respondents' fathers was missing, mothers' labor market information was imputed.

variable is not continuous but binary, so that it does not mechanically increase in the number of occupations individuals worked in the past.

Table 1 shows that self-employed are significantly more likely to have worked in occupations different from their parents' than employees (11.3 against 9.1%); and Table 4, that occupational distance from parents' occupations is strongly and positively related to occupational experience over one's last four job spells.

4 Results

4.1 Baseline estimates

First, Table 3 presents estimates on the relationship between return migration and occupational experience. Naïve, OLS estimates, in Column (1), indicate that return migration is positively and significantly related to gaining experience in various occupations. Columns (2)-(3) present reduced-form estimates. It gives an estimate of the structural parameter of interest of the first system of equation – the change in occupational variety in an exogenous change in return migration, i.e. the effect of return migration on labor experience variety, $\frac{\alpha_{22}}{\alpha_{12}}$. Inflation-adjusted price of oil at age 18 weighted by the inverse average distance to destination countries is a positive, strong and statistically significant instrument for return migration. Despite the rather small magnitude of its coefficient estimates, it is close to what Wahba and Zenou (2012), Wahba (2015) and Bertoli and Marchetta (2015) obtain. Return migration is found to increase occupational experience by 0.35 occupations. With a greater magnitude than the former result, it also suggests a negative bias in the OLS specification.

Second, Table 4 and Table A3 in more details present reduced form coefficient estimates of a linear probability model of return migration, occupational experience and self-employment, robust to the endogeneity of migration and human capital investment. *Occupational distance* (from parents' occupation when respondents were 15 years old) is positively correlated with occupational experience. This is consistent with the idea that the more diverse children's labor market experiences compared to their parents', the more varied their skill set profiles.

The average marginal effect of return migration on self-employment through the variety of

labor experience is displayed at the bottom of Table 4. On average, having migrated temporarily significantly increases the probability of self-employment upon return, in a one-unit increase in occupational experience by 3.01 percentage points.

The average marginal effect of migration on self-employment through the accumulation of sector, in Table 5, has a negative, statistically significant effect.[29] This suggests that working in several sectors as a result of migration might not lead to the development of a varied, balanced skill profile, but, rather, increases the likelihood to be employed as a result of greater specialization. These contrasting results also highlight that job turnover as such might not be sufficient to broaden abilities for self-employment.

Using a continuous variable measuring return migration, years abroad, as in Table 6, yields estimates similar in sign and significance, albeit of a smaller magnitude. An additional year abroad increases the likelihood of being self-employed on return by 0.51 percentage points in a one-unit increase in occupational experience.

These results suggest that migration could contribute to the formation of entrepreneurial abilities by building skills through varied occupations and industrial sectors, thus expanding Chen and Hu's (2012) findings for migrants and non-migrants. They complement Reinhold and Thom's (2013) by suggesting that occupation-specific experience resulting from working abroad affects the decision to be self-employed, beyond earnings themselves, by developing skill set balance. Findings also qualify Wahba and Zenou's (2012) conclusions, as they show that working in diverse occupations, rather than upward occupational mobility, might explain return migrants' greater propensity to be self-employed compared to non-migrants.

4.2 Robustness checks

The robustness of the identification strategy is checked as in Bertoli and Marchetta (2015). Figure 5 showed that the steady decrease in the share of returnees from 1980 till the end of the series, in 1989, does not match the peak in real oil price starting in the late 1980s. It is possible that Egyptians born in 1980 or later, and who out-migrated to MENA countries in the early 2000s have not yet returned to Egypt. Alternatively, if they have, they may not be

[29] *Sectoral distance* is constructed as *occupational distance* is. It is a binary variable, taking value 1 if respondents worked in at least two sectors different from their parents' when they were 15; 0, otherwise.

representative of the pool of Egyptians who left in the 2000s. In this sense, such a change in trend might not mirror a change in the relationship between historical real price of oil and out-migration.

As in Bertoli and Marchetta (2015), Table 6 presents estimates of a sample limited to working-age individuals born before 1980, applying the same selection criterion for instrument selection as above. Coefficient estimates and marginal effects of return migration on self-employment do not differ in sign from baseline results, only their magnitude and statistical significance slightly decrease. Having migrated increases the likelihood of self-employment upon return to Egypt with experience in an additional occupation by 2.34 percentage points, among those born before 1980. The robustness of these results confirm the choice of this exclusion restriction to obtain an exogenous source of variation in explaining out-migration, and suggests that the change in oil price trend evidenced graphically might not mirror a change in the structural relationship between historical real price of oil and out-migration. Rather, it is possible that Egyptians born in 1980 or later, and who out-migrated to MENA countries in the early 2000s have not yet returned to Egypt. Alternatively, if they have, they may not be representative of the pool of Egyptians who left in the 2000s; or, they might be experiencing labor market conditions different from their elder cohorts'.

Second, if the historical price of oil is assumed to drive the demand for non-native labor directly, in oil-producing countries, and indirectly, in non-oil producing countries, it could be argued that the latter effect is weaker. People who first out-migrated to non-oil producing countries – Jordan, Lebanon, Syria and Yemen – are excluded from the estimation sample. Table 6 shows that coefficient estimates and marginal effects of return migration on self-employment follow the same pattern as baseline results in oil-producing countries. Return migration significantly increases the likelihood of self-employment with occupational experience by 2.40 percentage points.

In contrast, results do not hold for non-oil producing countries, as the last set of row of Table 6 suggests.[30] Despite not being precisely estimated, signs are negative, indicating that migration to non-oil producing countries, i.e. as replacement workers, could decrease the probability to

[30] Regressions could not be separately run for each destination country since too few respondents migrated to each country.

be self-employed on return to Egypt, the more varied migrants' skill mix is compared to non-migrants. These results confirm the choice of inflation-adjusted oil prices as a determinant of out-migration only directly to oil-producing countries.

4.3 Heterogeneity

In Table 7, the sample is split up by gender, sector of occupation, location and possession of savings, to understand which subgroups drive the effect of migration on self-employment that was found.

First, labor force participation of women in Egypt is one of the lowest, with 19% engaged in paid work in 2010 (World Bank, 2017). The development of male-dominated non-trade sectors over traditional export sectors, combined with the interruption of an employment guarantee scheme for higher education graduates in the 1990s that offered women attractive working conditions, have triggered growing unemployment, and led to a defeminization of its labor force. The 2008 economic crisis and the economic slowdown following the January 2011 Uprising have accentuated these trends. At the same time, tradition limits women's mobility, and restricts them to the domestic sphere or to small home-based income-generating activities with few opportunities to expand (Sadania, 2017).[31] As Table 7 indicates, results are only statistically significant for men, which is in line with the Egyptian labor market being gender differentiated.

Second, the positive effect of a migration-induced jack-of-all-trades effect on self-employment is driven by those working in non-agricultural sectors. Table 7 points to an insignificant relationship between return migration and self-employment through the development of a balanced skill set in agriculture. This suggests that self-employment in agriculture might not require the same set of abilities as non-agricultural sectors, but a rather specialized skill mix. Alternatively, it could mean that return migration affects self-employment in agricultural sectors through channels other than the accumulation of human capital, e.g. monetary flows. This would support McCormick and Wahba's (2001) findings that overseas

[31] As a result, the labor market tends to be segmented for women between public sector (44% of Egyptian women engaged in public sector work in 2012), private sector (32) and household work (24). This is because if working in the public sector is accepted by Egyptian society for the most educated women, engaging in private work – self-employment – outside the household is seen as degrading (Sadania, 2017).

savings have a stronger effect on self-employment in agriculture than human capital, if the self-employed in agriculture have lower educational attainment, or did not change occupations while away or upon return – if migrating did not give them the opportunity to accumulate diverse enough skills.

Differences in results may also reflect the fact that the Egyptian agricultural sector has a rather traditional structure, marked by a high degree of land fragmentation (Morsy et al., 2014). As a consequence, a substantial part of individual farmers work on small low-productivity plots, and are unable to benefit from economies of scale. Working in agriculture may not require the experience gathered while working abroad. In other words, the skills gained while working abroad may not be relevant enough, as it may not provide the capital necessary to start agricultural activities (or access land).

Third, job opportunities in rural areas tend to differ from those in urban areas because farming might not be an option in the latter, while in the former, it might be the main activity. In addition, self-employment in cities might not be the most desirable option if wage works are offered and are more socially rewarded, as it is the case in Egypt. Table 7 indicates that return migration significantly increases the likelihood of self-employment with occupational experience in rural areas. This suggests that return migration in Egypt might affect rural off-farm self-employment, potentially contributing to the structural reallocation of its labor force.

Fourth, since return migrants are significantly more likely to have savings (9.27%) than non-migrants (7.23) (Table A1), not accounting for savings acquired abroad could bias the estimates. In the absence of an additional instrumental variable, the financial and human capital channels are disentangled by running the above linear probability model on two sub-samples, according to possession of savings. Table 7 reveals that having migrated increases the probability of being self-employed upon return by developing a balanced skill mix only for those who do not have savings. These estimates support the previous set of result for individuals without savings, indicating the development of migration-induced entrepreneurial human capital in particular for those financially-constrained, and complement Wahba and Zenou's (2012) findings.

4.4 Jacks of all trades, masters of none?

With reference to benchmark specifications (Table 4), whether return migration influences entrepreneurship is assessed through the formation of a varied skill set in terms of productivity, as a measure of entrepreneurial performance. Not all entrepreneurial activities have lasting impacts on economic development. *Being self-employed* might not be a good indicator of entrepreneurship, since most self-employed neither innovate much nor generate jobs; many fail.

Whether return migrants survive in their entrepreneurial activities or how much profitable returnees' businesses are have received relatively little attention in the literature.[32] Business survival and business profits might be a precondition for a lasting, positive effect of migrants' activities upon return, in particular in a developing country context such as Egypt, where the turnover of micro- and small enterprises is high (Marchetta, 2012).

Table 8 considers the productivity of self-employed activities. Because self-employed activities tend to cluster at earning levels where there are jumps in the marginal tax rate, earnings might be reported incorrectly (Alden et al., 2017). If the scale of misreporting varies over the probability of being a return migrant, the effect of return migration on self-employed earnings might be inaccurately estimated. Therefore, earnings should be read only as an imperfect proxy for self-employment productivity, and three alternative measures of performance are used: the natural logarithm of average net earnings per month, length in self-employment, and whether self-employed are own-account workers or employers.

The first row of Table 8 presents average net earnings per month in the past year from self-employed activities.[33] Estimates of return migration on self-employed earnings through the accumulation of occupations are negative. Albeit imprecisely estimated, this questions whether the development of a balanced skill set during migration contributes to setting in place successful entrepreneurial ventures. By differing from Bensassi and Jabbour (2017), estimates suggest that returns on migrants' family enterprises the authors find might not result from any

[32] Only Marchetta (2012) has specifically studied the persistence of returnees' entrepreneurial activities; Bensassi and Jabbour (2017) the profits of returnees' family enterprises.

[33] In natural logarithm plus 1. The estimation sample is restricted to self-employed respondents in all sectors who reported non-missing earnings.

migration-induced jack-of-all-trades effects, but rather the accumulation of financial capital abroad, as they put forth.

Using the number of years (tenure) of the current self-employed position as dependent variable, the second set of rows suggests that having migrated increases only slightly the number of years of current self-employment with occupational experience by 0.20, or the average tenure of self-employment[34] by 0.02.

However, gaining experience in diverse occupations significantly increases the propensity to be employer as well as to be own-account worker upon return by, respectively, 1.57 and 3.36 percentage points.

Although the effect with regard to profits is inconclusive, these estimates, in addition to descriptive statistics revealing upward occupational mobility for migrants upon return to Egypt, confirm the influence of migration in developing human capital critical for entrepreneurship, in particular to generate jobs as self-employed.

5 Concluding remarks

This study explores whether migration leads to a more balanced skill set, resulting in a greater propensity to be self-employed for return migrants. Using data from Egypt, descriptive statistics and reduced-form estimates indicate that labor migration contributes to broaden skills – occupational experience. Baseline estimates suggest that return migration is associated with an increase of 3.01 percentage points in the probability to be self-employed upon return in a one-unit increase in occupational experience. However, working in various sectors as a result of migration is found to decrease the probability to be self-employed by 10.93 percentage points. These contrasting results indicate that sectoral experience might foster specialization, and that job turnover as such might not be sufficient to acquire entrepreneurial abilities.

Heterogeneous effect analysis indicates that this relationship is driven by men, reflecting a major level of gender segregation proper to the Egyptian labor market. It is also explained by individuals working in non-agricultural sectors, in comparison to a traditional, highly

[34] Measured as the number of years as self-employed divided by number of jobs over a maximum of four job spells.

fragmented agricultural sector; and those living in rural areas, where self-employment might be more desirable. The estimated effect of return migration on self-employment by developing entrepreneurial abilities is only identified for individuals who do not have any savings, that is who are financially constrained. Last, suggestive evidence of such a link is found for job creation as self-employed.

The results of this analysis provide evidence on an understudied mechanism linking temporary labor migration to self-employment in origin countries. They support the idea that labor migration is a learning experience, by showing that not only the wealth, but also the work experience gained abroad *per se*, might affect migrants' labor market behaviors upon return. In facilitating the formation of diverse occupational knowledge, migration could be seen as a process shaping entrepreneurial abilities. This suggests that migration is part of a dynamic, life-cycle sequence of learning and experimentation, and confirms that entrepreneurship can be learned.

Findings have implications for entrepreneurship policies in developing economies, with prevalent international migration, where understanding the development potentials of out-migration is key for economic development. They suggest some new considerations in this debate. Because self-employed evolve in underdeveloped, ill-functioning market-supporting institutions in those contexts, they need to be much more generalist to handle almost all dimensions of business management. As migrating tends to occur out of necessity, that migration offers learning opportunities beneficial for self-employment might be of particular interest to policymakers, since the micro and small enterprise sector has often been thought of as a solution to high youth unemployment.[35]

This analysis indicates that entrepreneurship support policies should focus on widening the work experience of potential, fledgling entrepreneurs, accounting for differences in industries (farm and off-farm) and location (rural and urban). Specifically, agricultural entrepreneurship might be facing institutional and geography-specific challenges. It might require easier access to land as well as skill specialization rather than diversification for successful entrepreneurship.

[35] When high unemployment and low real wages necessitate increasing labor demand and alternative sources of income, stimulating enterprise creation becomes a vehicle of social and economic development. Entrepreneurship has emerged as a priority for governments, based on the evidence that creating new businesses matters for economic development.

Easier access to land, land consolidation and modernization of the farming sector could enable farmers to move away from subsistence farming towards higher efficiency. It could allow them to reallocate labor towards sectors of higher productivity – potentially seizing more of what migration could bring.

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Figure 1: Skill mix profile of employed and self-employed

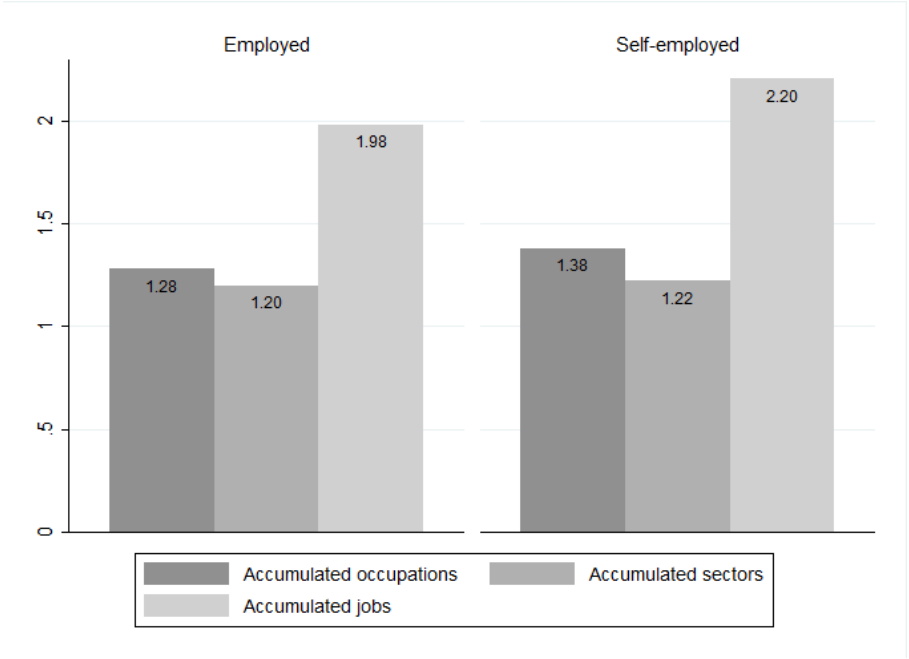

Figure 2: Skill mix profile of non-migrants and return migrants

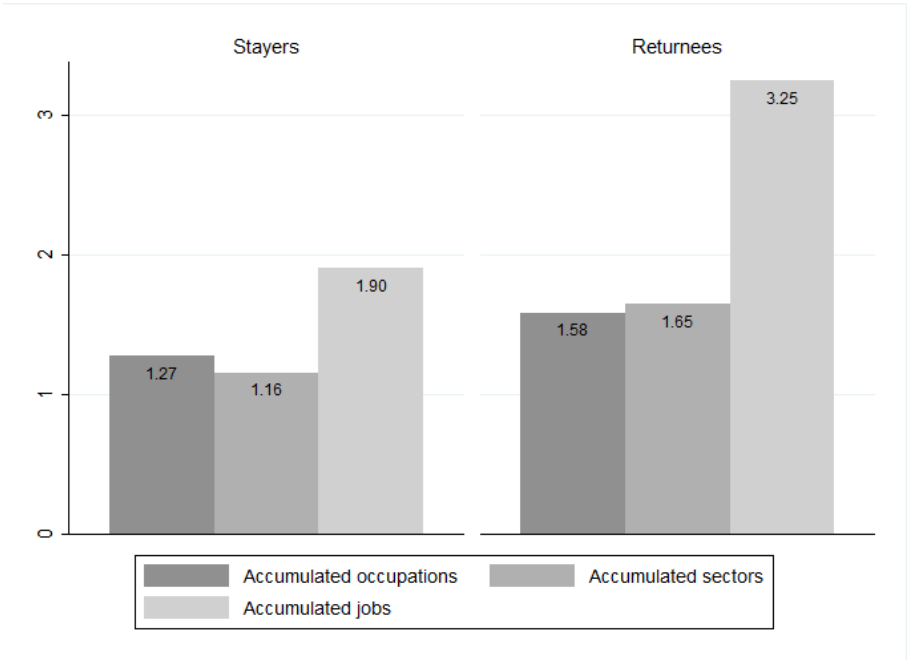

Figure 3: Skill mix profile of self-employed: Non-migrants and return migrants

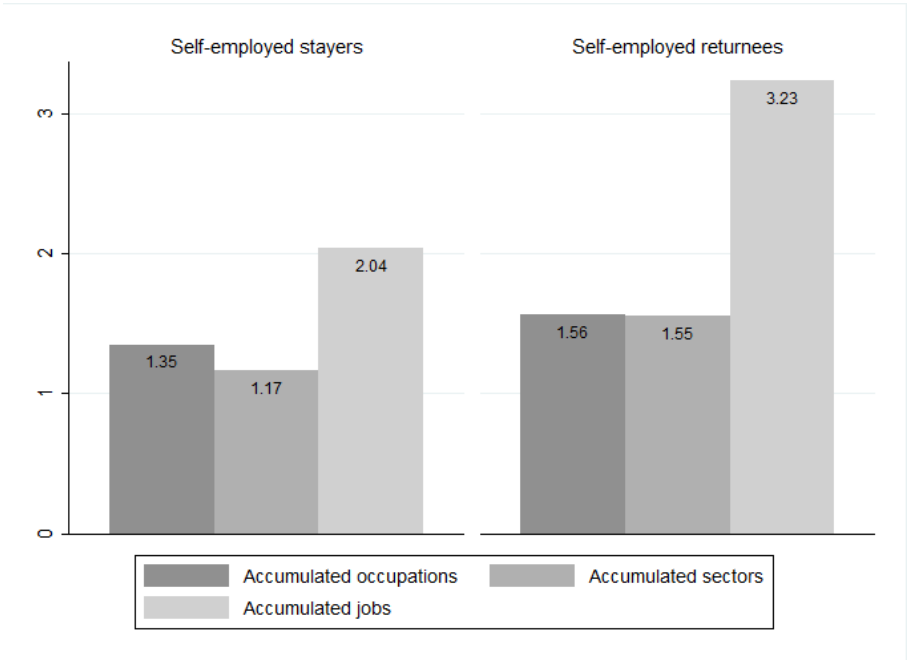

Figure 4: First stage test statistics for the real oil price at different ages

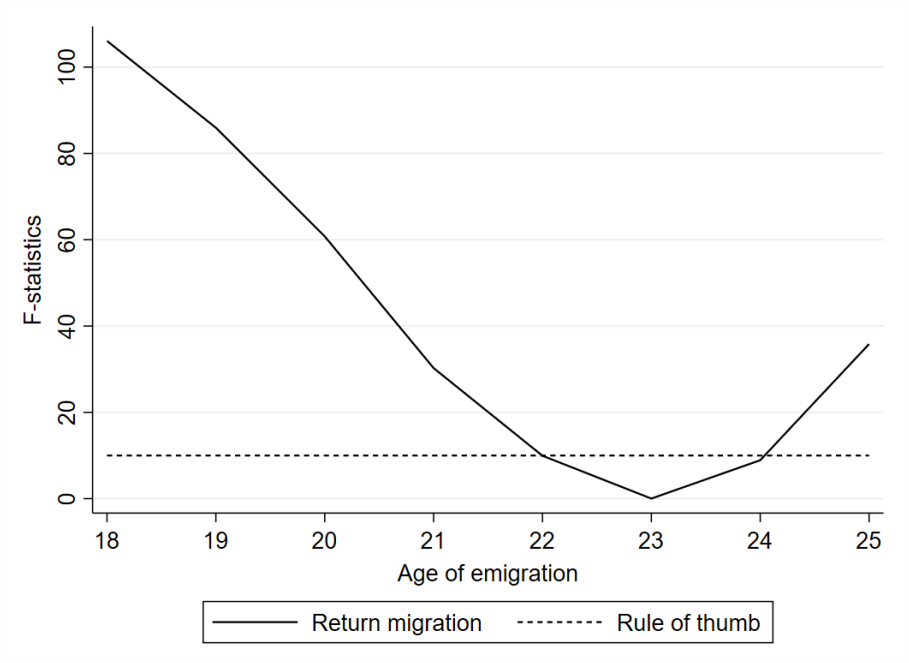

Figure 5: Share of returnees by year of birth and real oil price at age 18

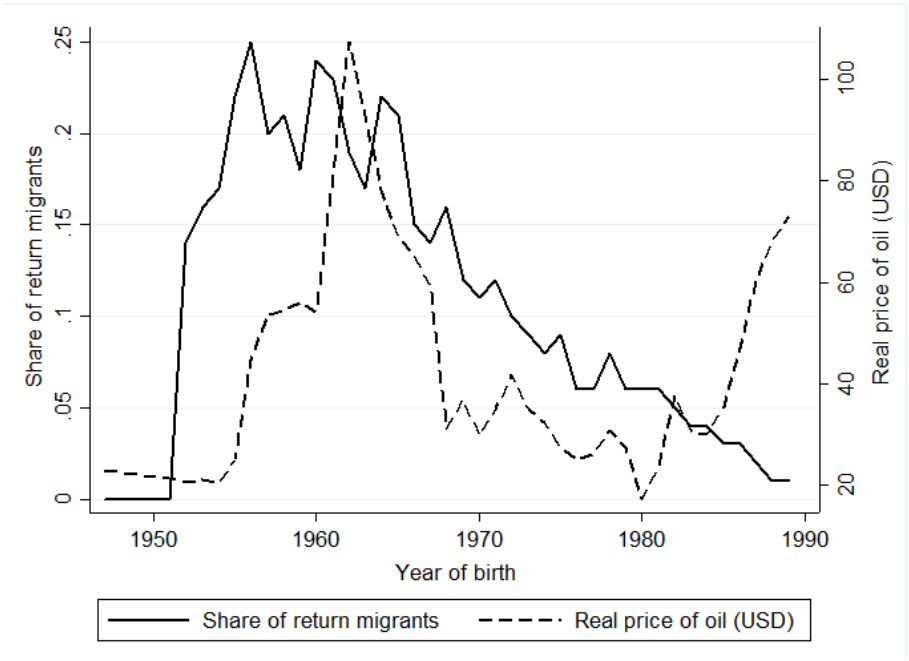

Figure 6: Average distance from governorate of birth to destination countries in kilometers

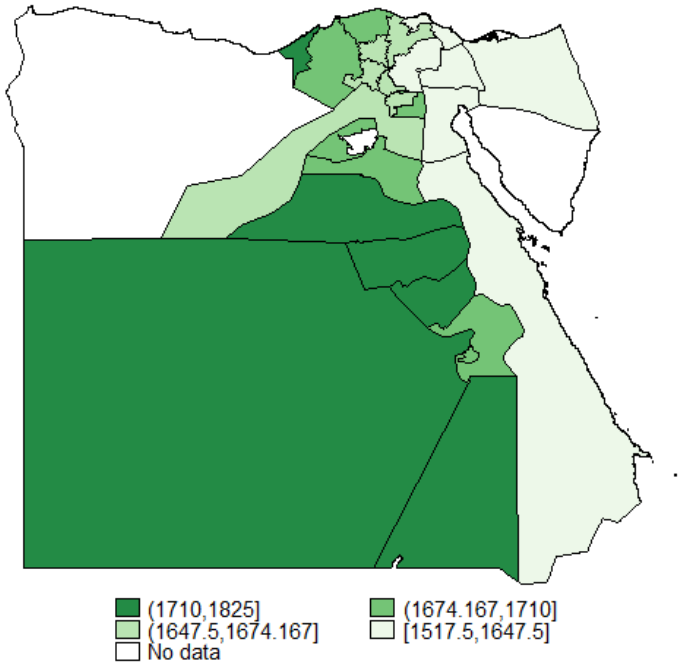

Table 1: Descriptive statistics of estimation sample

	Full sample		Employed	Self-employed		Non-migrant	Returnee		Self-employed		
	Mean	SD	Mean	Mean		Mean	Mean		Non-migrant Mean	Returnee Mean	
	(1)	(2)	(3)	(4)	(3)-(4)	(5)	(6)	(5)-(6)	(7)	(8)	(7)-(8)
Self-employed	0.228	0.420	0.000	1.000	-	0.217	0.331	-0.114***	1.00	1.00	-
Return migrant	0.097	0.296	0.084	0.141	-0.057***	0.00	1.00	-	0.00	1.00	-
Years abroad	0.442	2.020	0.343	0.779	-0.436***	0.000	4.554	-	0.00	5.532	-
Occupations	1.303	0.510	1.281	1.379	-0.099***	1.273	1.584	-0.311***	1.350	1.562	-0.213***
Sectors	1.204	0.471	1.199	1.220	-0.021*	1.156	1.650	-0.493***	1.165	1.554	-0.389***
Jobs	2.034	0.877	1.983	2.205	-0.222***	1.903	3.248	-1.345***	2.037	3.230	-1.193***
Oil price	44.075	21.964	44.705	41.949	2.756***	43.452	49.867	-6.415***	40.779	49.086	-8.308***
Distance (1,000 kms)	1.684	0.038	1.684	1.686	-0.002***	1.685	1.681	0.004***	1.687	1.681	0.006***
Occupational distance[a]	0.097	0.295	0.091	0.113	3.30***	0.086	0.189	10.90***	0.105	0.165	3.31***
Sectoral distance[a]	0.026	0.159	0.030	0.012	-5.14***	0.024	0.045 0.000	4.21***	0.011	0.020	1.46
Observations	11,224		8,660	2,564		10,134	1,090		2,203	361	

Notes: Summary statistics of the full estimation sample for variables included in the analysis, after dropping observations with missing information. The sample consists of 16-64 year-old individuals (N=11,224). *** p<0.01, ** p<0.05, * p<0.1 indicate the statistical significance of differences in means.

[a] Based on 10,940 non-missing observations.

Table 2: Means and standard deviation of standardized O*NET task measures for four broad ISCO-88 skill levels in 2012 ELMPS

	White-collar		Blue-collar	
	High-skill	Low-skill	High-skill	Low-skill
Non-routine cognitive (analytical)	1.096	-0.298	-0.258	-1.087
	(0.909)	(0.685)	(0.423)	(0.714)
Non-routine cognitive (interpersonal)	0.972	-0.088	-0.289	-0.931
	(1.050)	(0.595)	(0.514)	(0.803)
Routine cognitive	0.088	0.745	-0.372	0.335
	(1.060)	(1.112)	(0.833)	(0.735)
Routine manual	-1.088	-0.090	0.567	0.458
	(0.653)	(0.676)	(0.605)	(1.017)
Non-routine manual (physical adaptability)	-1.213	-0.154	0.562	0.770
	(0.620)	(0.618)	(0.503)	(0.754)
Number of detailed occupations	122	34	70	70

Source: O*NET and ISCO. Task content indices are measured according to the procedure detailed in the appendix.

Table 3: Return migration and occupational experience

Variables	OLS	Reduced form	
	Occupational experience	Occupational experience	Returnee
	(1)	(2)	(3)
Return migration	0.2163***		
	(0.0202)		
Oil price / Distance		0.0010**	0.0028***
		(0.0004)	(0.0003)
$\frac{\alpha_{22}}{\alpha_{12}}$		0.3496**	
		(0.1413)	
Covariates	Yes	Yes	Yes
Observations	10,339	10,339	
F-statistic			106.89***
			(0.0000)

Notes: Observations are working-age individuals, excluding individuals living in a household with members currently abroad and those living in a household with members who returned from migration abroad. Governorate fixed effects are included in all columns. Column (1) presents OLS coefficient estimate, and Columns (2)-(3), GSEM coefficient estimates of the reduced form of the system of equation linking occupational experience to return migration, $\frac{\alpha_{22}}{\alpha_{12}}$. Standard errors clustered at the household level are in parentheses. Below coefficient estimates, the F-statistic of the first-stage of the system of equation is presented (statistical significance in parentheses). *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Baseline estimates

Variables	Self-employed	Occupational experience	Occupational experience	Returnee
	(1)	(2)	(3)	(4)
Occupational distance	0.0785***	0.9115***		
	(0.0147)	(0.0155)		
Oil price / Distance			0.0010**	0.0028***
			(0.0004)	(0.0003)
$\frac{\beta_{22}}{\beta_{12}} \cdot \frac{\alpha_{22}}{\alpha_{12}}$		0.0301**		
		(0.0133)		
Covariates	Yes	Yes	Yes	Yes
Observations		10,339		

Notes: Observations are working-age individuals, excluding individuals living in a household with members currently abroad and those living in a household with members who returned from migration abroad. Governorate fixed effects are included in all columns. Columns (1) and (2) present GSEM coefficient estimates of the reduced form of the system of equation linking self-employment to occupational and sectoral experience; columns (3) and (4), of the system of equation linking experience to return migration. Standard errors clustered at the household level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Robustness checks: Sectoral experience

Variables	Self-employed	Sectoral experience	Sectoral experience	Returnee
	(1)	(2)	(3)	(4)
Sectoral distance	-0.0728***	0.4275***		
	(0.0201)	(0.0448)		
Oil price / Distance			0.0018***	0.0028***
			(0.0004)	(0.0003)
$\frac{\beta_{22}}{\beta_{12}} \cdot \frac{\alpha_{22}}{\alpha_{12}}$		-0.1093***		
		(0.0408)		
Covariates	Yes	Yes	Yes	Yes
Observations		10,339		

Notes: Please, refer to Table 3.

Table 6: Robustness checks: Identification strategy

	Occupational experience (1)	Observations (2)
Years abroad	0.0051**	10,339
	(0.0023)	
Born before 1980	0.0234*	6,340
	(0.0122)	
Oil-producing countries	0.0240*	10,159
	(0.0124)	
Non oil-producing countries	-0.1824	9,440
	(0.3795)	

Notes: Column (1) presents the average marginal effect of return migration on the propensity to be self-employed through skill set development, $\frac{\beta_{22}}{\beta_{12}} \cdot \frac{\alpha_{22}}{\alpha_{12}}$, obtained from GSEM estimates. Column (2) indicates the number of observations of each regression. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Heterogeneous effects

	Occupational experience (1)	Observations (2)
Men	0.0305**	8,827
	(0.0126)	
Women	-0.1100	1,512
	(0.3705)	
Agriculture	0.0006	1,555
	(0.0052)	
Non agriculture	0.0482**	8,784
	(0.0217)	
Urban	0.0033	5,008
	(0.0294)	
Rural	0.0363**	5,331
	(0.0166)	
With savings	-0.0126	785
	(0.0302)	
Without savings	0.0348**	9,554
	(0.0146)	

Notes: Please, refer to Table 6.

Table 8: Productivity of entrepreneurial activities

	Occupational experience (1)	Observations (2)
Log of average net earnings per month	-0.0326	1,673
	(0.0439)	
Length of current self-employment	0.1949	10,339
	(0.1193)	
Average tenure of self-employment	0.0166	10,307
	(0.0451)	
Employer	0.0156*	9,216
	(0.0083)	
Own-account	0.0336**	9,052
	(0.0140)	

Notes: In the first set of row, the dependent variable is a continuous variable measuring the average net earnings per month in the past year of those self-employed (in natural logarithm plus 1). In the second set of row, the dependent variable is a continuous variable measuring the number of years of current self-employed activities; in the third, the number of years as self-employed divided by number of jobs over a maximum of four job spells; in the fourth, a binary variable taking unity if a working-age individual is an employer; and in the fifth, if s/he is an own-account worker, and 0, if employed, wage-employed or unpaid, contributing to family work. Observations are working-age individuals, excluding individuals living in a household with members currently abroad, and those living in a household with members who returned from migration abroad. The estimation sample excludes respondents who are not self-employed in the first row.The estimation sample excludes own-account workers in the fourth, and employers in the fifth. Column (1) presents the average marginal effects of return migration on the associated row dependent variables through the accumulation of occupations. Column (2) indicates the number of observations of each regression. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Appendices

Figure A1: Aggregate indicators and real price of oil

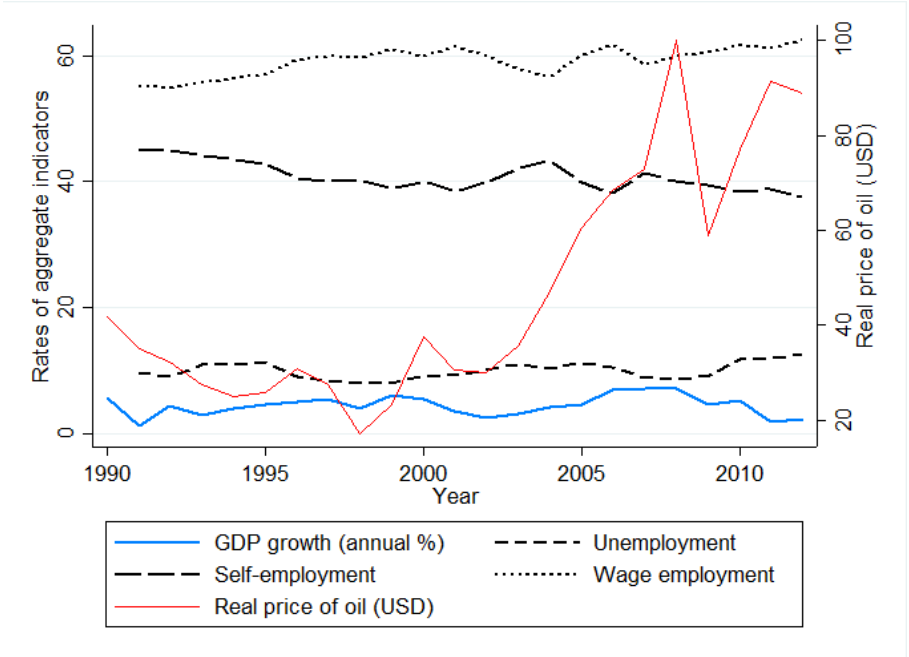

Table A1: Descriptive statistics of estimation sample

	Full sample		Employed	Self-employed		Non-migrant	Returnee		Self-employed		
	Mean	SD	Mean	Mean		Mean	Mean		Non-migrant Mean	Returnee Mean	
	(1)	(2)	(3)	(4)	(3)-(4)	(5)	(6)	(5)-(6)	(7)	(8)	(7)-(8)
Self-employed	0.228	0.420	0.000	1.000	-	0.217	0.331	-0.114***	1.000	1.000	-
Employer	0.121	0.327	0.000	0.532	-	11.25	20.46	8.88***	51.75	61.77	3.55***
Own-account worker	0.107	0.309	0.000	0.468	-	10.49	12.66	2.20**	48.25	38.23	-3.55***
Returnee	0.097	0.296	0.084	0.141	-0.057***	0.000	1.000	-	0.000	1.000	-
Years abroad	0.442	2.020	0.343	0.779	-0.436***	0.000	4.554	-	0.000	5.532	-
Occupations	1.303	0.510	1.281	1.379	-0.099***	1.273	1.584	-0.311***	1.350	1.562	-0.213***
Sectors	1.204	0.471	1.199	1.220	-0.021*	1.156	1.650	-0.493***	1.165	1.554	-0.389***
Jobs	2.034	0.877	1.983	2.205	-0.222***	1.903	3.248	-1.345***	2.037	3.230	-1.193***
Male	0.837	0.369	0.822	0.887	-0.065***	0.821	0.983	-0.161***	0.870	0.992	-0.122***
Married	0.825	0.380	0.808	0.881	-0.072***	0.810	0.960	-0.149***	0.866	0.972	-0.107***
Illiterate	0.186	0.390	0.135	0.361	-0.226***	0.183	0.217	-0.034***	0.361	0.363	-0.002
Literate (w/o diploma)	0.045	0.206	0.038	0.066	-0.028***	0.042	0.067	-0.025***	0.065	0.069	-0.004
Elementary sch.	0.095	0.293	0.087	0.122	-0.035***	0.094	0.098	-0.004	0.123	0.114	0.010
Middle sch.	0.050	0.219	0.050	0.050	0.000	0.050	0.050	0.001	0.050	0.053	-0.003
High sch.	0.356	0.479	0.385	0.261	0.124***	0.350	0.416	-0.066***	0.253	0.305	-0.051***
Post-sec., uni. and higher	0.267	0.443	0.305	0.140	0.165***	0.280	0.152	0.128***	0.147	0.097	0.050**
Literate mother	0.213	0.409	0.235	0.137	0.098***	0.223	0.122	0.101***	0.144	0.094	0.050**
Child dep. ratio	0.296	0.231	0.291	0.312	-0.021***	0.293	0.320	-0.026***	0.310	0.325	-0.015
Vocational sch.	0.334	0.472	0.362	0.238	0.124***	0.327	0.399	-0.072***	0.229	0.296	-0.068***
Father self-employed	0.357	0.479	0.303	0.537	-0.234***	0.346	0.454	-0.108***	0.536	0.546	-0.010
Past self-employment	0.038	0.192	0.027	0.078	-0.051***	0.032	0.095	-0.063***	0.062	0.175	-0.113***
First job was self-employed	0.062	0.241	0.013	0.227	-0.214***	0.066	0.027	0.039***	0.256	0.047	0.209***
Years of unemployment	0.688	1.962	0.768	0.415	0.353***	0.700	0.572	0.127***	0.418	0.396	0.022
Savings	0.077	0.267	0.075	0.085	-0.010*	0.075	0.093	-0.017**	0.083	0.097	-0.014
Urban	0.482	0.500	0.507	0.397	0.110***	0.495	0.355	0.140***	0.414	0.294	0.120***
Agriculture	0.152	0.359	0.096	0.340	-0.244***	0.145	0.211	-0.066***	0.330	0.402	-0.072***
Mining	0.002	0.050	0.003	0.000	0.003**	0.002	0.003	-0.000	0.000	0.000	0.000
Manufacturing	0.127	0.333	0.139	0.088	0.050***	0.131	0.091	0.040***	0.090	0.078	0.012
Utilities	0.020	0.139	0.026	0.000	0.026***	0.020	0.017	0.004	0.000	0.000	0.000
Construction	0.113	0.317	0.128	0.062	0.066***	0.109	0.148	-0.038***	0.055	0.102	-0.047***
Trade	0.169	0.375	0.115	0.352	-0.237***	0.173	0.131	0.042***	0.366	0.263	0.103***
Transport	0.089	0.284	0.091	0.080	0.011*	0.088	0.098	-0.010	0.076	0.108	-0.032**
Business services	0.036	0.185	0.037	0.032	0.005	0.037	0.027	0.010*	0.034	0.022	0.011
Government	0.258	0.438	0.332	0.007	0.325***	0.260	0.243	0.016	0.008	0.003	0.005
Personal services	0.035	0.184	0.034	0.038	-0.004	0.035	0.031	0.004	0.041	0.022	0.019*
Extraterrit. org.	0.000	0.016	0.000	0.000	0.000	0.000	0.001	-0.001	0.000	0.000	0.000
Oil price (18)	42.092	20.627	42.408	41.025	1.383***	41.393	48.591	-7.198***	39.720	48.992	-9.272***
Distance (1,000 kms)	1.684	0.038	1.684	1.686	-0.002***	1.685	1.681	0.004***	1.687	1.681	0.006***
Occupational distance[a]	0.097	0.295	0.091	0.113	3.30***	0.086	0.189	10.90***	0.105	0.165	3.31***
Sectoral distance[a]	0.026	0.159	0.030	0.012	-5.14***	0.024	0.045 0.000	4.21***	0.011	0.020	1.46
Observations	11,224		8,660	2,564		10,134	1,090		2,203	361	

Notes: Summary statistics of the full estimation sample for variables included in the analysis, after dropping observations with missing information. The sample consists of 16-64 year-old individuals (N=11,224). *** p<0.01, ** p<0.05, * p<0.1 indicate the statistical significance of differences in means.

[a] Based on 10,940 non-missing observations.

Table A2: Pairwise correlations

	Self-employed	Returnee	Occupations	Sectors
Self-employed	1.0000			
Returnee	0.0803***	1.0000		
Occupations	0.0812***	0.1808***	1.0000	
Sectors	0.0183*	0.3099***	0.4848***	1.0000

Notes: Pairwise correlations. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Baseline estimates

Variables	Self-employed	Occupational experience	Occupational experience	Returnee
	(1)	(2)	(3)	(4)
Occupational distance	0.0785***	0.9115***		
	(0.0147)	(0.0155)		
Married	0.0408***	0.0659***		
	(0.0102)	(0.0110)		
Literate mother	-0.0593***	-0.0440***		
	(0.0089)	(0.0099)		
Under 15 dependency ratio	0.0052	0.0082		
	(0.0184)	(0.0199)		
Vocational high-school	-0.0959***	0.0297***		
	(0.0077)	(0.0089)		
Years of unemployment	-0.0046**	-0.0072***		
	(0.0018)	(0.0019)		
First job was self-employed	0.6406***	-0.1595***	-0.2397***	-0.1025***
	(0.0146)	(0.0134)	(0.0149)	(0.0084)
Past self-employment	-0.0514*	0.2912***	0.4293***	0.1579***
	(0.0287)	(0.0263)	(0.0304)	(0.0209)
Father was self-employed	0.1291***	0.0482***	0.0331***	0.0207***
	(0.0086)	(0.0090)	(0.0105)	(0.0065)
$\frac{\beta_{22}}{\beta_{12}} \cdot \frac{\alpha_{22}}{\alpha_{12}}$		0.0306**		
		(0.0134)		
Observations		10,339		
Variance of errors	0.1426***	0.1688***	0.2392***	0.0859***
	(0.0022)	(0.0028)	(0.0042)	(0.0021)

Notes: Please, refer to Table 4.

Table A3: Baseline estimates (continued)

Variables	Self-employed	Occupational experience	Occupational experience	Returnee
	(1)	(2)	(3)	(4)
Male	0.0614***	0.1732***	0.2522***	0.0961***
	(0.0090)	(0.0080)	(0.0096)	(0.0049)
Literate (without diploma)			0.1429***	0.0251
			(0.0286)	(0.0173)
Elementary school			0.0917***	-0.0124
			(0.0203)	(0.0119)
Middle school			0.0343	-0.0056
			(0.0252)	(0.0149)
High school			0.0733***	0.0159*
			(0.0143)	(0.0090)
Post-secondary, university			-0.0550***	-0.0215**
			(0.0146)	(0.0088)
Oil price / Distance			0.0010**	0.0028***
			(0.0004)	(0.0003)
Constant	0.0762***	1.0201***	1.0442***	-0.0910***
	(0.0152)	(0.0165)	(0.0238)	(0.0135)
$\frac{\beta_{22}}{\beta_{12}} \cdot \frac{\alpha_{22}}{\alpha_{12}}$		0.0301**		
		(0.0133)		
Observations		10,339		
Variance of errors	0.1426***	0.1688***	0.2392***	0.0859***
	(0.0022)	(0.0028)	(0.0042)	(0.0021)

Notes: Please, refer to Table 4.

Table A4: Occupations of returnees, before, during and after migration (%)

	Before	During	After
M	1.60	0.98	8.98
Prof	8.24	6.77	8.86
T	6.03	5.29	11.19
Clerk	0.98	1.23	2.34
S	5.78	10.33	5.17
A	37.88	14.15	24.60
Craft	31.37	50.43	21.40
Plant	6.15	7.26	11.07
E	1.97	3.57	6.40
Observations	813	813	813
%	100.00	100.00	100.00

Notes: Entries represent shares of returnees' occupations before, during and after migration (i.e. upon return to Egypt). Entries are computed with information available for returnees before and after migration. M stands for managers; Prof, professionals; T, technicians; Clerk, clerical support; S, service workers; A, skilled agriculture; Craft, craft worker; Plant, plant and machinery; E, elementary occupations.

Table A5: Occupations of returnees self-employed at the time of the survey, before, during and after migration (%)

	Before	During	After
M	3.42	0.68	20.89
Prof	1.71	2.40	1.37
T	2.40	3.42	4.11
Clerk	0.00	1.03	0.00
S	6.16	8.56	4.79
A	48.97	18.49	43.49
Craft	31.16	52.74	14.38
Plant	5.14	7.88	9.93
E	1.03	4.79	1.03
Observations	292	292	292
%	100.00	100.00	100.00

Notes: Please, refer to Table A4.

Table A6: Occupational transition of returnees, before and after migration (%)

		After									
		M	Prof	T	Clerk	S	A	Craft	Plant	E	%
Before	M	**76.92**	7.69	0.00	0.00	0.00	0.00	7.69	7.69	0.00	100.00
	Prof	7.46	**77.61**	5.97	1.49	1.49	0.00	2.99	1.49	1.49	100.00
	T	14.29	4.08	**73.47**	2.04	0.00	0.00	4.08	2.04	0.00	100.00
	Clerk	0.00	12.50	12.50	**62.50**	0.00	0.00	0.00	12.50	0.00	100.00
	S	14.89	6.38	12.77	2.13	**29.79**	4.26	10.64	10.64	8.51	100.00
	A	3.90	2.27	4.87	0.32	4.55	**59.09**	8.12	7.14	9.74	100.00
	Craft	10.20	1.18	9.41	3.14	4.71	5.10	**52.55**	9.02	4.71	100.00
	Plant	10.00	0.00	10.00	4.00	0.00	6.00	4.00	**62.00**	4.00	100.00
	E	6.25	18.75	0.00	0.00	6.25	0.00	18.75	31.25	**18.75**	100.00
	Observations	73	72	91	19	42	200	174	90	52	813
	%	8.98	8.86	11.19	2.34	5.17	24.60	21.40	11.07	6.40	100.00

Notes: Entries represent correlations between returnees' occupations before migrating and upon return to Egypt. Entries are computed with information available for returnees before and after migration. Below diagonal, upward occupational mobility from before to after migration. Above diagonal, downward occupational mobility from before to after migration. M stands for managers; Prof, professionals; T, technicians; Clerk, clerical support; S, service workers; A, skilled agriculture; Craft, craft worker; Plant, plant and machinery; E, elementary occupations.

Table A7: Occupational transition of returnees, before and during migration (%)

		During									
		M	Prof	T	Clerk	S	A	Craft	Plant	E	%
Before	M	**15.38**	7.69	7.69	0.00	23.08	0.00	38.46	7.69	0.00	100.00
	Prof	1.49	**68.66**	5.97	1.49	8.96	1.49	10.45	1.49	0.00	100.00
	T	4.08	4.08	**55.10**	2.04	16.33	4.08	6.12	8.16	0.00	100.00
	Clerk	0.00	12.50	0.00	**25.00**	50.00	0.00	12.50	0.00	0.00	100.00
	S	0.00	4.26	2.13	2.13	**31.91**	8.51	42.55	6.38	2.13	100.00
	A	0.32	0.32	1.62	0.97	9.09	**31.82**	46.43	4.55	4.87	100.00
	Craft	0.39	0.39	0.78	0.39	5.10	2.35	**83.53**	3.53	3.53	100.00
	Plant	2.00	0.00	6.00	2.00	10.00	8.00	16.00	**50.00**	6.00	100.00
	E	0.00	6.25	0.00	0.00	12.50	0.00	62.50	12.50	**6.25**	100.00
	Observations	8	55	43	10	84	115	410	59	29	813
	%	0.98	6.77	5.29	1.23	10.33	14.15	50.43	7.26	3.57	100.00

Notes: Please, refer to Table A6.

Table A8: Occupational transition of returnees, during and after migration (%)

		After									
		M	Prof	T	Clerk	S	A	Craft	Plant	E	%
During	M	**25.00**	25.00	25.00	0.00	12.50	0.00	0.00	12.50	0.00	100.00
	Prof	14.55	**70.91**	5.45	3.64	1.82	0.00	1.82	1.82	0.00	100.00
	T	18.60	6.98	**62.79**	0.00	0.00	4.65	4.65	0.00	2.33	100.00
	Clerk	10.00	10.00	10.00	**40.00**	10.00	20.00	0.00	0.00	0.00	100.00
	S	11.90	10.71	15.48	5.95	**9.52**	16.67	5.95	10.71	13.10	100.00
	A	2.61	0.87	7.83	1.74	7.83	**57.39**	6.96	3.48	11.30	100.00
	Craft	7.32	4.15	7.80	1.46	4.15	24.39	**36.10**	8.54	6.10	100.00
	Plant	11.86	0.00	5.08	0.00	3.39	11.86	5.08	**62.71**	0.00	100.00
	E	13.79	0.00	3.45	0.00	10.34	31.03	24.14	10.34	**6.90**	100.00
	Observations	73	72	91	19	42	200	174	90	52	813
	%	8.98	8.86	11.19	2.34	5.17	24.60	21.40	11.07	6.40	100.00

Notes: Please, refer to Table A6.

Table A9: Occupational transition of returnees self-employed at the time of the survey, before and after migration (%)

		After									
		M	Prof	T	Clerk	S	A	Craft	Plant	E	%
Before	M	**90.00**	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	100.00
	Prof	20.00	**40.00**	0.00	0.00	20.00	0.00	0.00	20.00	0.00	100.00
	T	71.43	0.00	**14.29**	0.00	0.00	0.00	14.29	0.00	0.00	100.00
	Clerk	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	100.00
	S	38.89	5.56	5.56	0.00	**16.67**	5.56	0.00	22.22	5.56	100.00
	A	7.69	0.70	0.00	0.00	3.50	**78.32**	1.40	6.99	1.40	100.00
	Craft	26.37	0.00	9.89	0.00	4.40	12.09	**40.66**	6.59	0.00	100.00
	Plant	20.00	0.00	6.67	0.00	0.00	20.00	6.67	**46.67**	0.00	100.00
	E	33.33	0.00	0.00	0.00	33.33	0.00	0.00	33.33	**0.00**	100.00
	Observations	61	4	12	0	14	127	42	29	3	292
	%	20.89	1.37	4.11	0.00	4.79	43.49	14.38	9.93	1.03	100.00

Notes: Please, refer to Table A6.

Table A10: Occupational transition of returnees self-employed at the time of the survey, before and during migration (%)

		During									
		M	Prof	T	Clerk	S	A	Craft	Plant	E	%
Before	M	**10.00**	10.00	0.00	0.00	30.00	0.00	40.00	10.00	0.00	100.00
	Prof	0.00	**80.00**	0.00	0.00	20.00	0.00	0.00	0.00	0.00	100.00
	T	0.00	14.29	**57.14**	14.29	0.00	0.00	0.00	14.29	0.00	100.00
	S	0.00	5.56	0.00	0.00	**27.78**	11.11	50.00	5.56	0.00	100.00
	A	0.70	0.00	2.10	1.40	8.39	**33.57**	41.96	5.59	6.29	100.00
	Craft	0.00	0.00	2.20	0.00	3.30	2.20	**83.52**	5.49	3.30	100.00
	Plant	0.00	0.00	6.67	0.00	6.67	13.33	26.67	**40.00**	6.67	100.00
	E	0.00	0.00	0.00	0.00	0.00	0.00	33.33	33.33	**33.33**	100.00
	Observations	2	7	10	3	25	54	154	23	14	292
	%	0.68	2.40	3.42	1.03	8.56	18.49	52.74	7.88	4.79	100.00

Notes: Please, refer to A6.

Table A11: Occupational transition of returnees self-employed at the time of the survey, during and after migration (%)

		After								
		M	Prof	T	S	A	Craft	Plant	E	%
During	M	**100.00**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
	Prof	57.14	**14.29**	0.00	14.29	0.00	0.00	14.29	0.00	100.00
	T	50.00	0.00	**20.00**	0.00	20.00	10.00	0.00	0.00	100.00
	Clerk	33.33	0.00	0.00	0.00	66.67	0.00	0.00	0.00	100.00
	S	36.00	8.00	0.00	**8.00**	36.00	4.00	4.00	4.00	100.00
	A	5.56	0.00	0.00	3.70	**79.63**	1.85	7.41	1.85	100.00
	Craft	18.83	0.65	6.49	4.55	38.31	**23.38**	7.14	0.65	100.00
	Plant	17.39	0.00	0.00	4.35	21.74	8.70	**47.83**	0.00	100.00
	E	28.57	0.00	0.00	7.14	50.00	7.14	7.14	**0.00**	100.00
	Observations	61	4	12	14	127	42	29	3	292
	%	20.89	1.37	4.11	4.79	43.49	14.38	9.93	1.03	100.00

Notes: Please, refer to Table A6.

Table A12: Occupational experience of non-migrants and return migrants self-employed at the time of the survey (%)

	Job 1		Job 2		Job 3		Job 4		Current job	
	Non-migrants	Return migrants	Non-migrants	Return migrants	Non-migrants	Return migrants	Non-migrants	Return migrants	Non-migrants	Return migrants
M	9.16	3.15	21.73	2.35	20.94	11.59	29.50	14.61	27.08	22.44
Prof	3.40	1.26	5.15	4.31	4.30	3.96	5.40	1.37	3.81	2.49
T	1.04	0.95	3.23	5.10	2.64	2.74	6.12	5.94	2.56	4.43
Clerk	0.58	0.00	0.09	1.18	0.55	0.00	0.72	0.91	0.05	0.00
S	15.04	5.05	14.40	9.80	11.93	6.71	7.91	5.48	11.39	5.54
A	41.38	53.31	26.44	18.43	27.74	35.98	21.22	27.85	31.37	39.89
Craft	20.52	31.23	16.75	48.24	17.61	30.18	17.63	31.51	13.32	13.57
Plant	3.92	3.15	7.59	7.06	9.02	6.71	8.63	9.59	6.27	9.97
E	4.96	1.89	4.62	3.53	5.27	2.13	2.88	2.74	4.14	1.66
Observations	1,735	317	1,146	255	721	328	278	219	2,072	361
%	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Notes: Entries are computed with information available for respondents by reported job spells, i.e. the number of observations varies if respondents do not report prior work experience. In the upper panel, entries represent shares of non-migrants and returnees' occupations over their last four job spells. M stands for managers; Prof, professionals; T, technicians; Clerk, clerical support; S, service workers; A, skilled agriculture; Craft, craft worker; Plant, plant and machinery; E, elementary occupations.

Table A13: Distances between capitals of governorates of birth and capitals of estimation sample destination countries in kilometers

Governorates of birth		Destination countries: Iraq Baghdad	Saudi Arabia Riyadh	Libya Tripoli	Jordan Amman	Kuwait city Kuwait city	UAE Abu Dhabi	Lebanon Beirut	Qatar Doha	Algeria Algiers	Oman Muscat	Yemen Sana'a	Syria Damascus	Average distance from birth governorate
Alexandria	Alexandria	1370	1790	1590	570	1740	2510	600	2210	2540	2930	2280	650	1731.7
Aswan	Aswan	1510	1400	2160	920	1600	2170	1120	1890	3170	2590	1530	1100	1763.3
Asyut	Asyut	1430	1570	1850	700	1660	2340	860	2040	2840	2760	1880	860	1732.5
Beheira	Damanhur	1330	1740	1640	530	1690	2460	570	2160	2600	2870	2230	610	1702.5
Beni Suef	Beni Suef	1350	1620	1760	560	1640	2360	680	2060	2740	2780	2030	700	1690
Cairo	Cairo	1300	1630	1740	490	1620	2370	590	2060	2710	2780	2100	610	1666.7
Dakahlia	Mansoura	1240	1660	1730	440	1600	2370	500	2070	2680	2790	2170	530	1648.3
Damietta	Damietta	1200	1640	1760	390	1570	2340	440	2040	2700	2760	2180	480	1625
Faiyum	Faiyum	1360	1660	1720	570	1660	2390	670	2090	2710	2810	2070	700	1700.8
Gharbia	Tanta	1290	1680	1700	490	1640	2410	550	2100	2660	2820	2170	580	1674.2
Giza	Giza	1300	1640	1740	500	1620	2370	590	2070	2710	2790	2100	620	1670.8
Ismailia	Ismailia	1180	1560	1830	380	1520	2280	480	1980	2770	2690	2090	500	1605
Kafr El Sheikh	Kafr El Sheikh	1280	1710	1680	480	1650	2410	530	2110	2640	2840	2200	570	1675
Luxor	Luxor	1420	1410	2050	770	1570	2190	950	1900	3050	2610	1660	940	1710
Matruh	Marsa Matruh	1620	2050	1340	820	2000	2770	820	2470	2300	3180	2470	880	-
Minya	Minya	1420	1630	1770	660	1680	2380	790	2090	2760	2810	1970	800	1730
Monufia	Shibin El Kom	1290	1670	1700	490	1640	2400	560	2100	2664	2810	2160	590	1672.8
New Valley	Kharga	1600	1630	1880	890	1770	2400	1050	2100	2890	2820	1810	1050	1824.2
North Sinai	Arish	1020	1460	1950	220	1370	2150	350	1850	2890	2560	2040	350	1517.5
Port Said	Port Said	1160	1590	1810	350	1520	2290	420	1990	2750	2710	2150	450	1599.2
Qalyubia	Banha	1280	1650	1730	480	1620	2380	560	2080	2690	2790	2140	590	1665.8
Qena	Qena	1380	1410	2030	720	1540	2180	900	1890	3030	2600	1690	890	1688.3
Red Sea	Hurghada	1220	1320	2080	560	1410	2080	750	1780	3070	2510	1700	730	1600.8
Sharqia	Zagazig	1250	1630	1750	450	1590	2350	530	2050	2710	2770	2130	560	1647.5
Sohag	Sohag	1430	1510	1920	730	1630	2280	890	1990	2920	2710	1800	890	1725
South Sinai	El Tor	1170	1360	2020	470	1400	2110	650	1810	3000	2530	1790	640	-
Suez	Suez	1180	1510	1870	390	1490	2240	520	1940	2830	530	2010	2650	1596.7

Notes: A cell should be read as the distance in kilometers between the capital of a respondent's governorate of birth and the capital of one of the 12 estimation sample destination countries. The second and third columns list Egyptian governorates and their respective capitals. Columns (4)-(15) present distances from each birth governorate capital to each destination country capital. The last column presents average migration distances from each birth governorate capital to estimation sample destination country capitals. Distances were measured using Google Maps.

Construction of O*NET-based task content measure[36]

O*NET task measures used in this analysis are composite measures of O*NET *work activities* and *work contextimportance* scales:

- Non-routine cognitive analytical
  - Analyzing data/information
    - Thinking creatively
    - Interpreting information for others
- Non-routine cognitive interpersonal
  - Establishing and maintaining personal relationships
    - Guiding, directing and motivating subordinates
    - Coaching/developing others
- Routine cognitive
  - Importance of repeating the same tasks
    - Importance of being exact or accurate
    - Structured versus unstructured work
- Routine manual
  - Pace determined by speed of equipment
    - Controlling machines and processes
    - Spend time making repetitive motions
- Non-routine manual physical
  - Operating vehicles, mechanized devices or equipment
    - Spend time using hands to handle, control or feel objects, tools or controls

[36] This section heavily relies on Acemoglu and Autor (2011) and Hardy et al. (2018).

- Manual dexterity
- Spatial orientation

Task content indices are constructed using the O*NET-SOC occupational classification scheme, collapsed into SOC occupations, and assigned to their corresponding 4-digit ISCO-88 categories, the classification system used in the 2012 ELMPS. Task items are standardized to have mean zero and standard deviation one, using labor supply weights from the cross-sectional 2012 ELMPS, which provides the most updated labor market information for Egypt. Standardized task items are then aggregated to generate five task content indices: non-routine cognitive analytical, non-routine cognitive interpersonal, routine cognitive, routine manual and non-routine manual physical (see above for the list of task items used). They are equal to the summation of their respective constituent scales. These main task content indices are standardized to mean zero and standard deviation one using the 2012 ELMPS occupational structure information. This allows interpreting a unit difference in the mean values of task contents between occupations as a one standard deviation difference. Standardizing composite indices is also necessary since these measures use various numbers of items that might have differing ranges Acemoglu and Autor (2011). Note that in order to merge O*NET-SOC task measures with the 2012 ELMPS data, the task measures are collapsed to the ISCO-88 code level using the 2012 ELMPS labor supply weights, and then collapsed to the 309 consistent occupations, using 2012 ELMPS labor supply weights. Crosswalks developed by Hardy et al. (2018) were used to get the appropriate O*NET-SOC based task items to their corresponding ISCO-88 categories.