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ABSTRACT

Out of Sight, Out of Mind: Migration, Entrepreneurship and Social Capital*

The aim of this paper is to investigate whether return migrants are more likely to become entrepreneurs than non-migrants. We develop a theoretical search model that puts forward the trade off faced by returnees since overseas migration provides an opportunity for human and physical capital accumulation but, at the same time, may lead to a loss of social capital back home. We test the predictions of the model using data from Egypt. We find that, even after controlling for the endogeneity of the temporary migration decision, an overseas returnee is more likely to become an entrepreneur than a non-migrant. Although migrants lose their original social networks whilst overseas, savings and human capital accumulation acquired abroad over-compensate for this loss. Our results also suggest that social networks have no significant impact on becoming entrepreneurs for returnees but matter for non-migrants.

JEL Classification: L26, O12, O15

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1 Introduction

What makes an entrepreneur? This question has been the focus of few previous studies which have tried to understand the determinants of self-employment in developed countries (see, for example, Blanchflower and Oswald, 1998; Evans and Jovanovic, 1989; and Evans and Leighton, 1989). Yet, very few studies have attempted to study this question for developing countries. Meanwhile, the wealth and poverty of developing countries are linked to the entrepreneurial nature of their economies. Entrepreneurship plays an important role in economic growth, innovation, and competitiveness as first highlighted by Schumpeter in 1911 (see Schumpeter, 1934) and it may also play a role in poverty alleviation (Landes, 1998). It is thus important to understand what makes an entrepreneur in developing countries.

The rather small literature on entrepreneurship in developing countries has put forward the importance of financial constraints in becoming an entrepreneur. Access to credit is seen as a major obstacle for entrepreneurship. Limited personal and family savings and lack of access to credit are seen to severely limit the growth prospects of promising startups in developing countries. Thus, policy makers and international organizations interested in economic development have supported micro-credit programs in developing countries as a means to encourage entrepreneurship. More recently, international migration has played an important role in allowing this liquidity constraint to be overcomed. Temporary migration has been a conduit through which individuals are able to have the opportunity to accumulate savings, which can be used upon their return for setting up businesses.

Several studies have been interested in how international migration provides a channel for accessing credit through overseas savings and focused on the impact of savings on the occupational choice of returnees and in particular on self-employment and entrepreneurship. Ilahi (1999), using cross-sectional data from Pakistan, finds that upon return, savings become a significant factor in the choice of self-employment over waged employment. Mesnard (2004) models migration as a way to overcome credit constraints in the presence of capital markets imperfections. She finds that the majority of entrepreneurial projects started by Tunisian returnees were totally financed through overseas savings.[1] Dustmann and Kirchkamp (2002) develop a model where migrants decide simultaneously on the optimal migration duration and their after return activities. They find that among Turkish returnees more than half

[1] In another paper, Mesnard and Ravaillon (2006) examine not only the effect of credit constraints (wealth) but also wealth inequality among return migrants in Tunisia.

of them are economically active and most of them engage in entrepreneurial activities. McCormick and Wahba (2001) add a different insight by showing that savings matter more than human capital acquisition for the probability of entrepreneurship of illiterate Egyptian returnees. However, for the educated returnees, both access to credit, through overseas savings, and human capital accumulation are significant determinants of entrepreneurship upon return. Woodruff and Zenteno (2007) find that migration networks help to overcome capital constraints in Mexico. Using a survey of self-employed workers and small firm owners in Mexico that have access to remittance flows, they estimate the impact of attachment to migration networks on the level of capital investment, the capital–output ratio, sales, and profits of microenterprises. However all of those studies limit their analysis to only return migrants, whilst Woodruff and Zenteno (2007) consider households of migrants receiving remittances rather than return migrants. Yet, one important question is whether return migrants are more likely than non-migrants to become entrepreneurs. Temporary migration might enable individuals to accumulate human and physical capital thereby increasing their potential of becoming entrepreneurs. The issue of whether return migrants are more or less likely to become entrepreneur has not been addressed before.

In addition, although physical capital is an important determinant of entrepreneurship and has been seen as an important factor by economists, there are potentially other factors that may impact on the individual's decision of setting up a business. Sociologists have stressed the importance of social capital as a determinant of entrepreneurship: entrepreneurs rely on their contacts for information and services (see, e.g., Greve and Salaff, 2003). This is an issue that has not really been focused on by economists. Indeed, several economic studies have examined the role of social networks in migration in developing countries (see e.g. Munshi, 2003; McKenzie and Rapoport, 2009) and others have studied the role of social networks in job acquisition (see e.g. Wahba and Zenou, 2005). All of this literature has focused on the role played by social networks in the migration decision through reducing migration cost for example and in finding jobs upon arrival in the host country. However, the role played by the *origin* social networks in entrepreneurship has attracted very little previous attention. Moreover, no one has examined the possible loss of social capital at the country of origin as a result of emigration and whether this impacts on the entrepreneurial decision upon return.

The aim of this paper is to study what makes an entrepreneur in Egypt and address

the following questions. Are return migrants more likely to become entrepreneurs than non-migrants? Does emigration result in loss of social capital, hence out of sight, out of mind, and thus affect the entrepreneurship decision negatively? Thus, this paper attempts to address this important policy question regarding the determinants of entrepreneurship and whether return migrants are more likely to become entrepreneurs compared to non-migrants. This should impact on policies directed towards encouraging entrepreneurship and providing micro-credit in many developing countries.

To answer the above questions, one needs to control for the potential endogeneity of the temporary migration decision and the entrepreneurial decision upon return. On the one hand migration might increase the probability of entrepreneurship, but it could be that individuals planning to be an entrepreneur are more likely to migrate. First, we develop a theoretical search model where we endogenize the temporary migration and the entrepreneurship decisions and show the trade off faced by returnees since overseas migration provides an opportunity for human and physical capital accumulation but, at the same time, may lead to a loss of social capital back home. Then, we test the predictions of the model using the Egyptian Labour Market Survey in 1998 by looking at both overseas returnees and non-migrants. We control for the potential endogeneity between migration and entrepreneurship. We find that controlling for the return migration decision, a returnee is more likely to become an entrepreneur than a non-migrant. Although migrants lose social networks back home whilst abroad, savings and human capital accumulation acquired overseas over compensate for this loss.

The paper is organized as follows. Section 2 develops the theoretical model. In section 3 we describe the data, whilst the econometric model is presented in section 4. The empirical findings are examined in Section 5 and further robustness checks are discussed in this section. Section 6 concludes.

2 Theory

Consider a continuum of individuals whose mass is n in a given country (Egypt in the data). There are two types of individuals who can either be a *returnee* (i.e. someone who has migrated to another country and came back) or a *non-migrant* (i.e. someone who has never emigrated overseas). An individual i is identified with the subscript $i = re$ in the former

case and $i = nm$ in the latter. The mass of returnees and non-migrants are denoted by n_{re} and n_{nm}, with $n_{re} + n_{nm} = n$. Each individual $i = re, nm$ can either be an entrepreneur or a worker but not both. If individual i decides to become an entrepreneur, then he/she can create and manage α_i jobs. In our model, α_i also represents the capacity of individual i of becoming an entrepreneur. We assume that:

$$\alpha_i = t\, H_i + S_i \tag{1}$$

where t is the innate entrepreneurship *talent* of an individual, H_i captures both the human and physical capitals of individual i, and S_i is the size and quality of his/her origin *social network*. In other words, this formulation (1) captures the fact that what matters to be an entrepreneur for individual i is his/her human and physical capitals H_i as well as the size and quality of his/her social network S_i. First, the innate entrepreneurship talent is not indexed by i since people are born with it and does not depend on any migration decision. Talent t is drawn from a cumulative distribution $F(t)$, which is continuous on the support interval $\left[\underline{t}, \overline{t}\right]$. We assume that returnees and non-migrants are born with exactly the same exogenous ability t. Second, because returnees have accumulated human capital and savings (physical capital) through their experience abroad, it is assumed that $H_{re} > H_{nm}$. Third, S_i is capturing the social network that individuals have, an important feature of the Egyptian labor market (Wahba and Zenou, 2005). S_i captures both the number and the quality (i.e. human capital, connections, etc.) of the social network.[2] We assume that $S_{nm} > S_{re}$, which captures the idea that people who migrate lose part of their social network. This is a reasonable assumption since a person who has left a country for say four or five years is less likely to keep all his/her social contacts compared to someone who has not migrated.[3]

In this model, once an individual i has decided to become an entrepreneur or a worker, then there is no difference between returnees and non-migrants in terms of productivity, wages, etc. Having migrated or not only changes the α_i, the capacity of becoming entrepre-

[2]We do not model explicitly the social network as, for example, in Calvó-Armengol and Jackson (2004) because we do not have this information in our dataset.

[3]In a previous version of this paper, we differentiated between strong and weak ties, assuming that migrants lose their weak ties but not their strong ties when leaving the country. Since we do not have information on weak and strong ties in our dataset, we have here focused only on the size and quality of the network, assuming that the size reduces when someone live a country (which could be interpreted as the fact that the migrant mainly loses his/her weak ties).

neur but then, once a decision has been made, all individuals are assumed to be identical.[4]

Apart from the initial talent t, there is a second dimension of heterogeneity for individuals. We assume that individuals have different migration costs c. The migration cost c is drawn from a cumulative distribution $G(c)$, which is continuous on the support interval $[\underline{c}, \overline{c}]$. We assume that there are no correlations between $F(t)$ and $G(c)$ so that, for example, a very talented person may have a very high migration cost because he/she has a large family.[5]

The timing of the model is as follows. In the first stage, each individual of type (t, c) has to decide whether to migrate or not. After the first stage, the individual becomes of type re if he/she has migrated and returned to the home country and of type nm if he/she has stayed home. Then, in the second stage, each individual of type (i, t) has to decide to become an entrepreneur or a waged worker. As usual, we solve this game backwards and thus we start by solving the second stage.

2.1 Second stage: The decision of becoming an entrepreneur

We use a standard search-matching model (Mortensen and Pissarides, 1999; Pissarides, 2000) to describe the labor market.

Matching function A firm (created by an entrepreneur) is a unit of production that can either be filled by a worker whose production is y units of output or be unfilled and thus unproductive. In order to find a worker, a firm posts a vacancy. A vacancy can be filled according to a random Poisson process. Similarly, workers searching for a job will find one according to a random Poisson process. As a result, at any moment of time, there will be $m + v$ jobs, with m of them occupied by workers and v of them vacant, and $m + u$ workers, m of them employed and u of them unemployed. In aggregate, these processes imply that there is a number of contacts per unit of time between the two sides of the market that are determined by the following matching function:

[4]Fonseca et al. (2001) model the capacity of individual i of becoming an entrepreneur in a similar way but do not have social networks and do not model the migration decision.

[5]We could assume that these two distributions are correlated in some way. This would make the analysis easier but also less interesting.

$$M = M(m+u, m+v) \tag{2}$$

As in the standard search-matching model (Mortensen and Pissarides, 1999, and Pissarides, 2000), we assume that M is increasing both in its arguments, concave and homogeneous of degree 1 (or equivalently has constant return to scale). Given the matching function (2), we can determine the rate at which vacancies are filled. It is equal to: $M(m+u, m+v)/(m+v) \equiv q(\theta)$ where $\theta \equiv (m+v)/(m+u)$ is the *labor market tightness*. By using the properties of M, it is easily verified that $q'(\theta) \leq 0$: the higher the labor market tightness, the lower the rate at which firm fill their vacancy. Similarly, the rate at which an unemployed worker leaves unemployment is $M(m+u, m+v)/(m+u) \equiv \theta q(\theta)$. Again, by using the properties of M, it is easily verified that $[\theta q(\theta)]' \geq 0$: the higher the labor market tightness, the higher the rate at which workers leave unemployment since there are relatively more jobs than unemployed workers. Finally, the rate at which jobs are destroyed is exogenous and denoted by δ.

Expected utilities and wages Agents discount the future at rate r, are risk neutral, have rational expectations and live infinitely. In steady-state, the discounted expected utility of employed and unemployed workers are respectively given by:[6]

$$rI_L = w_L - \delta(I_L - I_U) \tag{3}$$

$$rI_U = w_U + \theta q(\theta)(I_L - I_U) \tag{4}$$

with

$$I_L - I_U = \frac{w_L - w_U}{r + \delta + \theta q(\theta)} \tag{5}$$

By plugging (5) into (3) and (4), we finally get:

$$rI_L = \frac{\delta w_U + [r + \theta q(\theta)] w_L}{r + \delta + \theta q(\theta)} \tag{6}$$

[6] I_L and I_U are the steady-state expected utilities of employed and unemployed workers who have decided not to become entrepreneurs. These are the waged workers.

$$rI_U = \frac{(r+\delta)\, w_U + \theta q(\theta) w_L}{r+\delta+\theta q(\theta)} \tag{7}$$

Let us denote by I_F and I_V the intertemporal profit of an entrepreneur with a filled job and a vacancy, respectively. If γ is the search cost for the firm per unit of time and y is the product of a match, then, at the steady-state, I_F and I_V can be written as:

$$rI_F = y - w_L - \delta(I_F - I_V) \tag{8}$$

$$rI_V = -\gamma + q(\theta)(I_F - I_V) \tag{9}$$

which implies that:

$$I_F - I_V = \frac{y - w_L + c}{r+\delta+q(\theta)} \tag{10}$$

By plugging (10) into (8) and (9), we obtain:

$$rI_F = \frac{[r+q(\theta)]\,(y-w_L) - \delta\gamma}{r+\delta+q(\theta)}$$

$$rI_V = \frac{q(\theta)\,(y-w_L) - (r+\delta)\,\gamma}{r+\delta+q(\theta)} \tag{11}$$

Let us now determine the wage. At each period, the total intertemporal surplus is shared through a generalized Nash-bargaining process between the firm (i.e. the entrepreneur) and the (waged) worker. The total surplus is the sum of the surplus of the workers, $I_L - I_U$, and the surplus of the firms $I_F - I_V$. At each period, the wage is determined by:

$$w_L = \arg\max_{w_L} (I_L - I_U)^{\beta} (I_F - I_V)^{1-\beta} \tag{12}$$

where $0 \leq \beta \leq 1$ represents the bargaining power of workers. By solving (12), we obtain the following sharing rule:

$$(1-\beta)\,(I_L - I_U) = \beta\,(I_F - I_V)$$

Using (3) and (8), this can be written as:

$$rI_U = w_U + \frac{\beta}{1-\beta}\theta\,(\gamma + rI_V)$$

and the wage is finally given by:

$$w_L = (1-\beta)\, w_U + \beta\left[y + \gamma\theta + (\theta - 1)\, rI_V\right] \tag{13}$$

Plugging the wage w_L (13) into (11), we obtain:

$$rI_V = \frac{(1-\beta)\, q(\theta)\,(y - w_U) - [r + \delta + \beta\,\theta q(\theta)]\,\gamma}{(1-\beta)\, q(\theta) + r + \delta + \beta\,\theta q(\theta)} \tag{14}$$

We can also calculate rI_U in a similar way and we obtain:

$$rI_U = w_U + \frac{\beta\theta}{1-\beta}\gamma + \frac{(1-\beta)\,\theta q(\theta)\,(y - w_U + \gamma)}{(1-\beta)\, q(\theta) + r + \delta + \beta\,\theta q(\theta)} \tag{15}$$

Lemma 1 *By totally differentiating (14) and (15), we obtain*

$$\frac{\partial I_V}{\partial \theta} < 0 \qquad \frac{\partial I_V}{\partial y} > 0 \qquad \frac{\partial I_V}{\partial w_U} < 0 \qquad \frac{\partial I_V}{\partial \gamma} < 0 \qquad \frac{\partial I_V}{\partial \delta} < 0$$

$$\frac{\partial I_U}{\partial \theta} > 0 \qquad \frac{\partial I_U}{\partial y} > 0 \qquad \frac{\partial I_U}{\partial w_U} > 0 \qquad \frac{\partial I_U}{\partial \gamma} > 0 \qquad \frac{\partial I_U}{\partial \delta} < 0$$

Occupational choice In the second stage, the type $i = re, nm$ has already been decided in the first stage, and thus each individual i has now to decide whether or not to become an entrepreneur. There is a start-up cost of a new company, which is denoted by K. If individual i becomes an entrepreneur, ex ante he/she will get $\alpha_i I_V - K$ while the expected utility from being a worker is I_U.[7] Hence, individual i becomes an entrepreneur if and only if:

$$\alpha_i I_V - K \geq I_U$$

Using (1), we can therefore define a reservation value of entrepreneurial talent $\widetilde{t}_i$ for type$-i$ individuals as

$$\widetilde{t}_i = \frac{I_U + K}{I_V H_i} - \frac{S_i}{H_i} \tag{16}$$

such that all individuals with $t \geq \widetilde{t}_i$ will be entrepreneurs while the others will be workers. As a result, $F(\widetilde{t}_i)$ will be workers of type i and $1 - F(\widetilde{t}_i)$ will be entrepreneurs of type i.

[7] Indeed, this person is still unemployed when he/she makes the entrepreneur decision. If he/she decides to become a worker, he/she will go to the labor market as an unemployed worker and look for a job.

Equation (16) is the *job creation equation* that gives a relationship between $\widetilde{t}_i$ and θ. In the Appendix, we show that

$$\frac{\partial \left[\frac{I_U+K}{I_V}\right]}{\partial \theta} > 0$$

which implies that (16) defines a *positive* relationship between $\widetilde{t}_i$ and θ. Indeed, when the labor-market tightness θ increases, it is easier for people to find jobs (since $\theta q(\theta)$ increases) and thus they prefer to work rather than to be entrepreneur. As a result, $\widetilde{t}_i$ increases, which reduces the fraction of entrepreneurs of both types in the economy since θ affects the same way each type i of individuals.

Denote by $\eta^y_{I_U}$ and $\eta^y_{I_V}$ the productivity elasticity of the utility of the unemployed and firms with a vacant job, i.e.

$$\eta^y_{I_U} \equiv \frac{\partial I_U}{\partial y}\frac{y}{I_U} > 0 \text{ and } \eta^y_{I_V} \equiv \frac{\partial I_V}{\partial y}\frac{y}{I_V} > 0$$

Denote also by $\eta^\delta_{I_U}$ and $\eta^\delta_{I_V}$ the job destruction elasticity of the utility of the unemployed and firms with a vacant job, i.e.

$$\eta^\delta_{I_U} \equiv -\frac{\partial I_U}{\partial \delta}\frac{\delta}{I_U} > 0 \text{ and } \eta^\delta_{I_V} \equiv -\frac{\partial I_V}{\partial \delta}\frac{\delta}{I_V} > 0$$

We have the following results:

Proposition 1 *Returnees are more likely to be entrepreneur than non-migrants,*

(*i*) *the higher is H_{re}/H_{nm}, the ratio of the human and physical capitals of returnees and non-migrants;*

(*ii*) *the lower is S_{nm} (the size of the social network of non-migrants) and/or the higher is S_{re} (the size of the social network of returnees);*

(*iii*) *the higher is the start-up cost K, the labor-market tightness θ, the unemployment benefit w_U, and/or the cost of creating a single job γ;*

(*iv*) *the lower is the workers' productivity y and/or the job destruction rate if $\eta^y_{I_U} < \eta^y_{I_V}$ and $\eta^\delta_{I_U} < \eta^\delta_{I_V}$.*

2.2 First stage: The migration decision

Let us now solve the first stage, i.e. the migration decision. In the model, as it is the case in our data for Egypt (see below), we are only focussing on *temporary migration*, which means that when an individual decides to migrate, he/she know with certainty that he/she will return to the home country.[8] In this context, individuals will make a migration decision anticipating the second stage (i.e. the decision to become entrepreneur as a returnee or non-migrant). It should be clear that, whatever the migration cost c, if someone is sure *not* to be an entrepreneur when coming back home, i.e. someone whose $t \in \left[\underline{t}, \widetilde{t}_{re}\right]$, then he/she will never migrate because we have assumed that the benefits of migrating is to increase the human capital specific to entrepreneurship (see equation (1)).[9] As a result, the only persons who want to migrate are the ones who are sure to become entrepreneur and are thus ready to pay the two costs associated with migration, that is the migration cost c and the loss of social network (which is $S_{nm} - S_{re}$), in order to gain $H_{re} - H_{nm}$. We thus need to determine the threshold value of c, denoted by $\widetilde{c}$, for which people with a $t \in \left[\underline{t}, \widetilde{t}_{re}\right]$ want to migrate. We need to solve the following equation:

$$-\widetilde{c} + \alpha_{re} I_V = \alpha_{nm} I_V$$

This equation gives the value of $\widetilde{c}$ that makes an individual indifferent between being an entrepreneur returnee and a non-migrant entrepreneur. This equation can be written as:

$$\widetilde{c} = (\alpha_{re} - \alpha_{nm})\, I_V$$

This is very intuitive since it says that for an individual to be indifferent between being an entrepreneur returnee and a non-migrant entrepreneur, it has to be that the cost of migrating is exactly equal to the benefit of migrating, which is $\alpha_{re} - \alpha_{nm}$ for an entrepreneur. Using (1), this equation is given by:

$$\widetilde{c} = \left[t\ (H_{re} - H_{nm}) - (S_{nm} - S_{re})\right] I_V \tag{17}$$

We have the following proposition:

[8] Over 90 percent of Egyptian migration is temporary in nature.

[9] This could be relaxed by assuming that the instantaneous utility of an employed worker is $w_L + H_i$ instead of w_L as in (3). This would make the wage of workers w_L (13) a positive function of H_i. As a result, because $H_{re} > H_{nm}$, some individuals would decide to migrate and become waged workers when coming back home. We have performed this exercise and the results do not change much even though the analysis is more cumbersome. These results are available upon request.

Proposition 2

(*i*) *Whatever the value of the migration cost c, all workers with talent* $t \in \left[\underline{t}, \widetilde{t}_{re}\right]$ *will never migrate.*

(*ia*) *If* $\widetilde{t}_{nm} \leq \widetilde{t}_{re}$*, then among them, workers with talent* $t \in \left[\underline{t}, \widetilde{t}_{nm}\right]$ *will become waged workers and those with talent* $t \in \left[\widetilde{t}_{nm}, \widetilde{t}_{re}\right]$ *will become entrepreneurs.*

(*ib*) *If* $\widetilde{t}_{nm} > \widetilde{t}_{re}$*, then all of them will become waged workers.*

(*ii*) *Workers with migration costs* $c \in [\widetilde{c}, \overline{c}]$ *and talent* $t \in \left[\widetilde{t}_{re}, \overline{t}\right]$ *will never migrate.*

(*iia*) *If* $\widetilde{t}_{nm} \leq \widetilde{t}_{re}$*, then all of them will become waged workers.*

(*iib*) *If* $\widetilde{t}_{nm} > \widetilde{t}_{re}$*, then among them, workers with talent* $t \in \left[\widetilde{t}_{re}, \widetilde{t}_{nm}\right]$ *will become waged workers and those with talent* $t \in \left[\widetilde{t}_{nm}, \overline{t}\right]$ *will become entrepreneurs.*

(*iii*) *Workers with migration costs* $c \in [\underline{c}, \widetilde{c}]$ *and talent* $t \in \left[\widetilde{t}_{re}, \overline{t}\right]$ *will migrate and all of them will become entrepreneurs when coming back home.*

What is interesting for the empirical analysis is under which condition(s) these different cases arise.

Proposition 3

(*i*) *The lower the human capital and physical capital (i.e., savings) returns from migration are (i.e. the smaller is* $H_{re} - H_{nm}$*), the higher the losses in social capital are (i.e. the higher is* $S_{nm} - S_{re}$*), and/or the more the labor market at home is booming (i.e.* θ*,* y*,* w_U *have low values and* δ *is high), the less likely workers will migrate.*

(*ii*) *If we have the contrary, i.e., high* $H_{re} - H_{nm}$*, low* $S_{nm} - S_{re}$*, and/or* θ*,* y*,* w_U *have high values and* δ *is low, then a fraction of workers will migrate and all of them will become entrepreneurs when returning home.*

2.3 Closing the model

Job creation and steady-state equilibrium Let us close the model. First, let us determine the number of jobs created in this economy. Each entrepreneur $i = re, nm$ of type t creates $\alpha_i = t\,H_i + S_i$ jobs, i.e. entrepreneurs create jobs up to the maximum they can manage. Hence, the total number of (filled and unfilled jobs) jobs created by returnee entrepreneurs Δ_{re} is equal to:

$$\begin{aligned}
\Delta_{re} &= \left[1 - F\left(\widetilde{t}_{re}\right)\right] \mathbb{E}\left(\alpha_{re} \mid \alpha_{re} \geq \widetilde{\alpha}_{re}\right) \\
&= \left[1 - F\left(\widetilde{t}_{re}\right)\right] \mathbb{E}\left(t\,H_{re} + S_{re} \mid t\,H_{re} + S_{re} \geq \widetilde{t}_{re}\,H_{re} + S_{re}\right) \\
&= \left[1 - F\left(\widetilde{t}_{re}\right)\right] \mathbb{E}\left(t\,H_{re} + S_{re} \mid t \geq \widetilde{t}_{re}\right) \\
&= \int_{\widetilde{t}_{re}}^{\overline{t}} \left[t\,H_{re} + S_{re}\right]\, f(t)dt
\end{aligned} \tag{18}$$

Similarly, the total number of (filled and unfilled jobs) jobs created by non-migrants Δ_{nm} is:

$$\Delta_{nm} = \int_{\widetilde{t}_{nm}}^{\overline{t}} \left[t\,H_{nm} + S_{nm}\right]\, f(t)dt \tag{19}$$

As a result, the total number of (filled and unfilled) jobs created in the economy is given by:

$$\begin{aligned}
m + v &= \Delta_{re} + \Delta_{nm} \\
&= \int_{\widetilde{t}_{re}}^{\overline{t}} \left[t\,H_{re} + S_{re}\right]\, f(t)dt + \int_{\widetilde{t}_{nm}}^{\overline{t}} \left[t\,H_{nm} + S_{nm}\right]\, f(t)dt
\end{aligned} \tag{20}$$

Let us now determined the number of workers in the economy. We assumed that there are n workers with $n = n_{re} + n_{nm}$. If we denote by u the total number of unemployed workers (which include both types), we have:

$$n = F(\widetilde{t}_{re}) + F(\widetilde{t}_{nm}) + u = m + u \tag{21}$$

since $F(\widetilde{t}_i)$ are the number of employed workers of type i in the economy, which, in equilibrium, has to be equal to m, the number of jobs occupied. Combining (20) and (21), $m = n - u = \Delta_{re} + \Delta_{nm} - v$, which, by using the fact that $F(\widetilde{t}_i) = \int_{\underline{t}}^{\widetilde{t}_i} f(t)dt$, is equivalent to:

$$\begin{aligned}
n - u &= \int_{\underline{t}}^{\widetilde{t}_{re}} f(t)dt + \int_{\underline{t}}^{\widetilde{t}_{nm}} f(t)dt \\
&= \int_{\widetilde{t}_{re}}^{\overline{t}} \left[t\,H_{re} + S_{re}\right]\, f(t)dt + \int_{\widetilde{t}_{nm}}^{\overline{t}} \left[t\,H_{nm} + S_{nm}\right]\, f(t)dt - v
\end{aligned}$$

Observe that, even if returnee and non-migrant entrepreneurs do not create the same number of jobs, the jobs are exactly the same (in terms of wage, productivity) so that workers of any type are indifferent between working in any job. This is why the matching function is written as in (2) and the labor market tightness is equal to $\theta \equiv (m+v)/(m+u)$.

We now need an equation that determines the flows in the labor market. The evolution of employment in terms of the firm's transition rates is:

$$\dot{m} = v\, q(\theta) - m\, \delta$$

which, using (20), is equivalent to:

$$\dot{m} = \left[\int_{\widetilde{t}_{re}}^{\overline{t}} \left[t\, H_{re} + S_{re} \right]\, f(t)dt + \int_{\widetilde{t}_{nm}}^{\overline{t}} \left[t\, H_{nm} + S_{nm} \right]\, f(t)dt - m \right] q(\theta) - m\, \delta \qquad (22)$$

The evolution of employment in terms of the worker's transition rates is:

$$\dot{m} = u\, \theta q(\theta) - (n-u)\, \delta$$

which, using (21), is equivalent to:

$$\begin{aligned} \dot{m} &= (n-m)\, \theta q(\theta) - m\, \delta \\ &= \left[n - F(\widetilde{t}_{re}) - F(\widetilde{t}_{nm}) \right] \theta q(\theta) - m\, \delta \end{aligned}$$

In steady-state, $\dot{m} = 0$, and (22) and (23) are given by:

$$\int_{\widetilde{t}_{re}}^{\overline{t}} \left[t\, H_{re} + S_{re} \right]\, f(t)dt + \int_{\widetilde{t}_{nm}}^{\overline{t}} \left[t\, H_{nm} + S_{nm} \right]\, f(t)dt = \left(\frac{\delta + q(\theta)}{q(\theta)} \right) m$$

$$m = \frac{n\theta q(\theta)}{\delta + \theta q(\theta)}$$

By combining these two equations, we obtain:

$$\int_{\widetilde{t}_{re}}^{\overline{t}} \left[t\, H_{re} + S_{re} \right]\, f(t)dt + \int_{\widetilde{t}_{nm}}^{\overline{t}} \left[t\, H_{nm} + S_{nm} \right]\, f(t)dt = \frac{\left[\delta + q(\theta) \right] n\, \theta}{\delta + \theta q(\theta)} \qquad (23)$$

The equilibrium is now easy to calculate. There are three equations: (16) for $\widetilde{t}_{re}$, (16) for $\widetilde{t}_{nm}$, and (23), and three unknowns: $\widetilde{t}_{re}$, $\widetilde{t}_{nm}$, and θ. It can be shown that a unique equilibrium exists.

We would like to test Propositions 1, 2 and 3, i.e. what influences the choice of becoming an entrepreneur for a returnee and a non-migrant and the choice of migration. In particular, we would like to answer the following questions: Who is more likely to become an entrepreneur? A returnee or a non-migrant? Which variables affect this choice?

The general idea of the model is that overseas temporary migration provides an opportunity for human and physical capital accumulation but, at the same time, may lead to loss of social capital back home. We have shown in our theoretical analysis that there may be a trade off between those two factors.

3 The data

To test this idea, we will use data from a rich survey: Egypt Labor Market Survey 1998 (ELMS1998) carried out by the Central Agency of Public Mobilization and Statistics (CAPMAS) in Egypt. The ELMS 1998 is nationally-representative household survey that gathered data on a wide range of labor market variables at the household and individual level covering 5,000 households. Each data set is comprised of three questionnaires: 1) the household questionnaire; 2) the individual questionnaire; 3) the family enterprise questionnaire. Each household has at least one household questionnaire and one individual questionnaire. If any of the members of the household was self-employed or an employer, a family enterprise questionnaire for this household was administrated. Data for the household questionnaire was collected from the head of the household and included the roster of members of the household, each individual's relationship to the head of the household and demographic characteristics of the household. The individual questionnaire applies to individuals six years old and above. A battery of individual modules was designed to collect data on individual characteristics, employment characteristics, unemployment, mobility and career history, and earnings. Data for the individual questionnaire were collected from the individual him/herself except for individuals less than 15 years old. We make use of the economic unit questionnaire which being part of a household survey gathered information on all economic units and establishments regardless of firm size as is common in establishment surveys and thus captured all employment in the economy not just that occurs within fixed establishments of a certain size. The economic unit module is extremely valuable in providing detailed picture of entrepreneurship.

We define an entrepreneur as an employer or self employed *owner* of non-agricultural economic unit. We adopt this definition to enable us to study entrepreneurship and business set up. The analysis in this paper is restricted to males heads of households over 25 years of age at the time of survey. We observe only returnees i.e. migrants who are currently overseas are not observed in our survey. This should not be a problem in our context since the majority, over 90 percent, of Egyptian migration is temporary in nature. Egypt has been a major labor exporter since the early 70s, exporting both educated and uneducated labor - with around 10% of the labor force working overseas at any point in time. The majority of Egyptian migrants go to the Gulf States and to other Arab countries. After the oil boom of 1973, the Gulf oil exporting countries found their development plans constrained by labor shortages, and embarked on importing large numbers of workers from neighboring countries. At the peak, the Gulf States were importing 90% of their labor force. Between 1975 and 1995, 5 million foreign workers have migrated to the Gulf States. (See Girgis (2002)) During the 70s and 80s, Arab neighboring countries were the main labor exporters to the GCC. Even in the 80s and 90s, when Asians replaced Arab workers, Egyptians outflow of workers continued though at a lower scale. In the mid 1990s, Egyptian workers were the second highest concentration of migrants after Indian nationals in Saudi Arabia. The Gulf States have been a locus of huge inflows of migrants given their high demand for overseas labor and the temporary nature of their contracts. As a consequence, Egypt has a substantial proportion of return migrants who has worked overseas at one point in time. As noted by Lucas (2008) that migration to the Gulf States is all temporary in nature with the mean migration duration of around four to five years and acquisition of citizenship being effectively impossible for anyone. Thus, we assume that there is no sample selection issue related to return migration since almost all emigration from Egypt to Arab Countries has been temporary in nature.[10]

Table 1 provides descriptive statistics on returnees and non-migrants for the total sample. Table 1 shows that 35% of returnees are entrepreneurs compared to 30% among non-migrants. Overall, returnees seem to be younger in age, and more educated relative to non-migrants. Yet, as Table 1 shows return migrants tend to come from the whole educational spectrum: 14 percent of returnees had no education and 24 % were University graduates. Two thirds

[10]Around 10 percent of emigration from Egypt was destined to North America and Europe in the 80s and 90s. However, emigrants to those destinations tend to emigrate permanently and move with their families so are not observed in survey data collected in Egypt.

of returnees resided originally in urban areas. Almost 22 % of returnees were waged workers prior to migration compared to 39 percent among non-migrants.

[*Insert Table* 1 *here*]

4 Econometric Framework

To test the model's predictions, we estimate the determinants of entrepreneurship to examine whether returnees are more or less likely than stayers to become entrepreneurs and the extent to which there is a trade off between the loss of social capital and the gain in human and physical capital as a result of temporary migration if any. To capture the interdependence between temporary (return) migration and entrepreneurship, we use a bivariate probit model where the two decisions are interdependent, although we test for this interdependence later. In addition, one potentially confounding factor is that temporary/return migration and entrepreneurship may be endogenously determined decisions. Individuals migrate temporarily because they plan to become entrepreneurs on their return, whilst on the other hand temporary migration might influence the occupational choice of returnees and therefore their prospects of becoming entrepreneurs. To address this endogeneity issue, we use a recursive bivariate probit model to take care of the endogeneity between the entrepreneurship decision and the temporary/return migration decision.[11] The recursive structure builds on a reduced form equation for the potentially endogenous dummy return migration (RM_i^*) and a structural form equation determining the outcome of interest namely entrepreneurship E_i^*. We adopt a recursive model in which return migration is assumed to influence the probability of entrepreneurship: a dummy variable for temporary/return migration appears as a regressor in the entrepreneurship decision equation. This is estimated using full information maximum likelihood estimation (FIML).

$$E_i^* = \beta' X_i + \beta S_i + \gamma' H_i + \gamma RM + \varepsilon_i \tag{24}$$

with

$$\begin{aligned} E_i &= 1 \; if \; E_i^* \geq 0 \\ &= 0 \; otherwise \end{aligned}$$

[11] See Greene (1998, 2003) for a further description of recursive bivarite probit models

$$RM_i^* = \alpha' Z_i + \mu_i \tag{25}$$

with

$$\begin{aligned} RM_i &= 1 \; if \; RM_i^* \geq 0 \\ &= 0 \; otherwise \end{aligned}$$

where $\mathbb{E}[\varepsilon_i] = \mathbb{E}[\mu_i] = 0$, $Var[\varepsilon_i] = Var[\mu_i] = 1$, and $Cov[\varepsilon_i, \mu_i] = \rho$.

Following the theoretical model, equation (24) shows that the probability of an individual being an entrepreneur (business owner) E_i is a function of X_i, a vector of individual and regional characteristics of individual i, his/her social network S_i and his/her human capital and savings H_i. It is also a function of whether the individual is a returnee ($RM = 1$) or not ($RM = 0$ otherwise), i.e., the endogenous variable. The second equation estimates the temporary/return migration decision, which is a function of Z_i, a vector of explanatory variables. These two decisions are treated as two interdependent decisions and ρ is the coefficient of correlation between the two error terms. A significant ρ would support this assumption of interdependence.

Although it is sufficient to have variation in the exogenous variables in both equations to avoid identification problems,[12] this would rely heavily on the assumption of bivariate normality. Thus, to avoid identification by functional form, we impose exclusion restrictions to improve identification. We use the share of adult male migrants in the total adult male population in the sub-district of origin of the individual in 2006 based on Census data. [13] As argued by Massey (1990) migration dynamics is a "cumulative causation" process, i.e. past migrants in a community provides a resource to new migrants that lowers the costs and risks associated with moving. Hence, current migration is a function of past migration patterns. Thus using the rates for 2006 should reflect past migration patterns. In addition, using migration prevalence rates for 2006 should ensure the plausibility of the exogeneity restriction needed for the validity of this instrument. There is no threat that sub-district level migration prevalence rates in 2006 are likely to be a factor determining the probability

[12] Wilde (2000) shows that exclusion restrictions are not needed provided there is one varying exogenous regressor in each equation.

[13] We have had to rely on figures from 2006 Census for this variable. This question was not incluced in previous censuses. This shouldn't be a problem since differences in migration rates by district of origin have been stable over time.

of entrepreneurship in 1998. Individuals' occupational choice and whether they set up a business or not should not be affected by the migration rates in the community, but by their own migration experience and regional labor market conditions which we control for using the share of self employed among total employed adult males by "district" [14] and the share of employers among total employed adult males by "district" in 1996 using Census data. We also include regional fixed effects to capture local labor market conditions.

The vector X_i includes individual characteristics. The individual characteristics are age, marital status and education. Six educational dummies are used: no education (reference group), read and write, less than intermediate, intermediate, higher than intermediate and university education. Experience in the Egyptian labor marker measured in years and its square to capture non-linearity are also used. Experience is calculated as the difference between the year of the survey and year the individual entered the labor market for the first time, where for returnees also any time spent overseas is deducted. We also control for whether an individual's father was self-employed or employer when the individual was 15 of age which we envisage to have an effect on the occupational choice of the individual and thus might affect his probability of becoming entrepreneur.

To capture the effect of *social capital/network*, we use household size (which is a measure of the size of the network S_i in the theoretical model). In other words, the larger is the household size, the bigger is the network size. We interact this variable with the returnee dummy. We also control for potential loss of social capital by including the total number of household members who migrated.[15] We also capture the network S_i by including whether the individual lives in a village or a small town (with less than 20,000 inhabitants) relative to living in cities, since people who live in smaller communities tend to know each other and form closed-knit societies.[16] In addition, we control for whether the returnee has been back from overseas in the last year since we believe that if individuals lose their social capital

[14]The smallest administrative unit is shiakha (in urban areas) and village (in rural areas). We refer to those as sub-district. "Qisms" (districts) are comprised of several shiakhas/villages.

[15]We also tried the proportion of the household members who migrated and a dummy for having had migrated with other household members. Similar estimates were obtained.

[16]People in large cities, in comparison with people in small towns or rural areas, experience general deficits in the quality of interpersonal relations. This is the perspective of the so-called *social disorganization* theory and the *social capital* literature (see e.g. Wirth, 1938, Coleman, 1988, and Putman, 1993, 2001). Furthermore, urbanites are less likely than rural dwellers to base their personal networks on traditional sources (such as family). This is the so-called *subculture* theory (see e.g. Fisher 1976, 1982).

they would be unlikely to start a business in their first year upon return, but we later also check the robustness of our results by extending the period of return to the previous 2 years. To capture the potential gain in human capital from overseas work, we include migration duration in years (this corresponds to H_i in the theoretical model). We also control for whether the entrepreneur who migrated have used personal savings to start up his business (savings correspond to K in the theoretical model). Unfortunately we do not have data on personal savings for entrepreneurs and non-entrepreneurs, only whether entrepreneurs have used their savings to set up their businesses.

The vector Z_i includes the individual characteristics such as age and educational level. To control further for the migration decision, previous job characteristics, occupation and residence are used. For migrants, those refer to the job characteristics (public sector), occupation and urban/rural region of residence prior to migration and for non-migrants these refer to previous job/ residence if they have changed jobs/ residence before or current ones if they have not. For a detailed description of the variables, see Table A1.

Table 2 provides descriptive statistics on entrepreneurs relative to non-entrepreneurs distinguishing between returnees and non-migrants. First, in terms of social network measures, Table 2 shows that non-migrant entrepreneurs have on average bigger household size compared to returnee entrepreneurs, but relative also to non-migrant non-entrepreneurs suggesting a positive role for social network in entrepreneurship among non-migrants. Also around 8 percent of returnee non-entrepreneurs had migrated with other family members compared to 7 percent among returnee entrepreneurs. Moreover, a bigger proportion of entrepreneurs live in villages/small towns relative to non-entrepreneurs, but this proportion is even bigger among returnee entrepreneurs relative to non-migrant entrepreneurs. The social network measures provide preliminary support for the importance of social capital in entrepreneurship and show that returnee entrepreneurs having lower social capital relative to non-migrant entrepreneurs. In addition, overseas migration might enhance human capital captured by migration duration. Thus, on average, returnee entrepreneurs were overseas for 5.4 years compared to 5.0 years among returnee non-entrepreneurs. Around 87 percent of returnee entrepreneurs have used their savings to start-up their businesses. In terms of individual characteristics, 15 percent of returnee entrepreneurs were self-employed before migration compared to only 3 percent of returnee non-entrepreneurs. Almost 59 percent of entrepreneurs among both returnees and non-migrants had a father who was self-employed or

employer. Thus, the descriptive statistics indicate a potential trade off between social capital on one hand and human and physical capital on the other hand as important determinants of entrepreneurship.

[*Insert Table* 2 *here*]

5 Empirical findings

This section presents the results of the estimation of our empirical models, starting with the simple binary probit estimation, followed by recursive bivariate probit results. First, as a baseline comparison, we estimate a simple univariate probit of the probability of being an entrepreneur (i.e., business owner) at the time of the survey and include a dummy for being returnee but we do not control for the migration decision. The marginal effects are reported in Table 3. We find that returnees are more likely than non-migrants (11%) to become entrepreneurs.

[*Insert Table* 3 *here*]

Secondly we estimate a *recursive bivariate probit model* where the first equation estimates the probability of being an entrepreneur and the second equation estimates the probability of being a returnee, where being a returnee is an endogenous regressor in the first equation. Table 3 displays the results. First, it is worth noting that the correlation coefficient between the probability of becoming an entrepreneur and being a returnee is significant, indicating that the error terms are interdependent, which is consistent with the theoretical model. However, the correlation coefficient is negative suggesting that unobservable characteristics affect those two decisions in opposite ways. For example, being a risk taker will not increase both probabilities since it might increase the probability of entrepreneurship but not of return migration, or it might be that entrepreneurs are less likely to become migrants because they prefer non-waged work and migration to the Gulf States is mostly waged work. It is also important to note that the exclusion restriction, migration prevalence rates in sub-district, is significant.

Table 4, Column 1 shows that controlling for the endogeneity of the migration decision, we find that a returnee is more likely to become an entrepreneur as compared to a stayer. Our findings suggest that household size has a positive impact on the probability of being entrepreneur, but not for returnees where this effect is not significant. This suggests that

international migration may in fact dampens or weakens social capital at the country of origin. This is confirmed when looking at the impact of the number of household members who migrated at the same time with the migrant, which has a negative impact on the probability of becoming an entrepreneur, although it is not statistically significant. Furthermore, although living in a village or a small town has a positive significant effect on becoming an entrepreneur, this effect is not significant for returnees, suggesting again that migration leads to a loss of social networks. Finally, having returned in the last year from overseas has a negative effect on the probability of being an entrepreneur, which might suggest that returnees need time to rebuild their social networks upon return. On the other hand, the effect of migration duration is positive and significant, suggesting that migration might enhance human capital. Finally, we disentangle another effect by finding that savings or credit matter for becoming an entrepreneur for returnees.

[*Insert Table* 4 *here*]

To check the robustness of our results, we conduct several checks in Table 5. First, in column "5", to capture labor market conditions, we use the information on the date of the start of the business[17] (as in Proposition 3 in the theoretical model). We find that our previous results are robust. In column "6", we exclude those entrepreneurs who were self-employed before migration and find that our previous results hold and are not driven by including those who were entrepreneurs before migration. In column "7", we vary the length since return by using 2 years instead of one and find that returning in the last two years has a negative, albeit not significant, effect on the probability of becoming an entrepreneur. We then control for living in Greater Cairo and find that this has negative significant effect for non-migrants but an insignificant impact for returnees (column "8"), supporting our earlier findings that social network has no significant effect for returnees. Finally, in column "9", to ensure that our results are not biased by few successful long term surviving firms, we restrict our sample to businesses set up in the last 10-15 years and find that the results are unchanged.

[*Insert Table* 5 *here*]

Overall, our results suggest that *social networks have no significant impact on becoming entrepreneurs for returnees but matter for non-migrants.* We also find that human capital

[17]Exact date of start up of businesses is available for those started between 1990-98.

and savings matter for becoming entrepreneur for returnees. The joint probability of being a returnee and entrepreneur is around 19 percent and only 14 percent for being a non-migrant and an entrepreneur. Interestingly, conditional on being a returnee, the probability of becoming an entrepreneur is almost 50 percent. This suggests that one needs to control for the endogeneity of temporary migration when studying the entrepreneurship decision.

[*Insert Table* 6 *here*]

6 Conclusion

This paper examines an important question for developing countries, namely what factors affect entrepreneurship. We focus on the case of return migrants and develop a theoretical search model that puts forward the trade off faced by returnees since overseas migration provides an opportunity for human and physical capital accumulation but, at the same time, may lead to a loss of social capital back home. We test the predictions of the model using Egyptian data and find that, controlling for the endogeneity of temporary migration, an overseas returnee is more likely to become an entrepreneur than a non-migrant. Our results also suggest that social networks increase the probability of entrepreneurship for non-migrants but have no significant impact for returnees. We also find that human capital and savings affect the likelihood for returnees of becoming entrepreneurs. Interestingly, the findings also indicate that although return migration and entrepreneurship are correlated, there might be a trade off between those two decisions.

This paper sheds light on a very important policy issue for developing countries. The paper shows how entrepreneurship depends on social networks, human capital and access to credit. Although migrants may potentially lose their social capital, their accumulated savings and experience overseas over-compensate for their loss. This, in a way, emphasizes the importance of access to credit as a major obstacle facing entrepreneurs in developing countries. Thus, policies focusing on access to credit is paramount for investment and thus for economic growth and development.

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Appendix

Proof of Proposition 1. First, observe that to determine which individual has the highest probability to become entrepreneur, we have to check the following condition:

$$\widetilde{t}_{re} \gtreqless \widetilde{t}_{nm} \tag{26}$$

which is equivalent to:

$$\frac{S_{nm}H_{re} - S_{re}H_{nm}}{H_{re} - H_{nm}} \gtreqless \frac{I_U + K}{I_V} \tag{27}$$

We know that $S_{nm}H_{re} - S_{re}H_{nm} > 0$ and $H_{re} - H_{nm} > 0$ so this inequality can go in both directions.

(i) The inequality (27) can be written as:

$$\frac{S_{nm}\Delta H - S_{re}}{\Delta H - 1} \gtreqless \frac{I_U + K}{I_V}$$

where $\Delta H = \frac{H_{re}}{H_{nm}}$. We have

$$\begin{aligned} \frac{\partial \left[\frac{S_{nm}\Delta H - S_{re}}{\Delta H - 1}\right]}{\partial \Delta H} &= S_{nm}\left(\Delta H - 1\right) - \left(S_{nm}\Delta H - S_{re}\right) \\ &= S_{re} - S_{nm} < 0 \end{aligned}$$

As a result, for a given $\frac{I_U+K}{I_V}$, S_{nm} and S_{re}, the left-hand side of (27) is decreasing in ΔH. Thus the higher is ΔH, the higher is the difference in human capital between returnees and non-migrants, the more likely a returnee is an entrepreneur, i.e. $\widetilde{t}_{re} < \widetilde{t}_{nm}$.

(ii) We can do a similar exercise for S_{mn} and S_{re}. We have:

$$\frac{\partial \left[\frac{S_{nm}H_{re} - S_{re}H_{nm}}{H_{re} - H_{nm}}\right]}{\partial S_{nm}} > 0 \text{ and } \frac{\partial \left[\frac{S_{nm}H_{re} - S_{re}H_{nm}}{H_{re} - H_{nm}}\right]}{\partial S_{re}} < 0$$

which means the lower S_{nm} and/or the higher S_{re}, the more likely a returnee is an entrepreneur, i.e. $\widetilde{t}_{re} < \widetilde{t}_{nm}$.

(iii) Let us now focus on the right hand side of (27). Denote by x any parameter. We have

$$\frac{\partial \left[\frac{I_U+K}{I_V}\right]}{\partial x} = \frac{\frac{\partial I_U}{\partial x} I_V - \left[I_U + K\right]\frac{\partial I_V}{\partial x}}{\left(I_V\right)^2}$$

Now, using Lemma 1, we obtain:

$$\frac{\partial \left[\frac{I_U+K}{I_V}\right]}{\partial \theta} > 0$$

$$\frac{\partial \left[\frac{I_U+K}{I_V}\right]}{\partial w_U} > 0$$

$$\frac{\partial \left[\frac{I_U+K}{I_V}\right]}{\partial \gamma} > 0$$

(iv) For y and δ, the sign is not determined. However, we have:

$$\frac{\partial \left[\frac{I_U+K}{I_V}\right]}{\partial y} \gtreqless 0 \Longleftrightarrow \frac{\partial I_U}{\partial y}\frac{y}{I_U} \gtreqless \left[1+\frac{K}{I_U}\right]\frac{\partial I_V}{\partial y}\frac{y}{I_V}$$

$$\Longleftrightarrow \frac{\eta^y_{I_U}}{\eta^y_{I_V}} \gtreqless 1+\frac{K}{I_U}$$

where

$$\eta^y_{I_U} \equiv \frac{\partial I_U}{\partial y}\frac{y}{I_U} > 0 \text{ and } \eta^y_{I_V} \equiv \frac{\partial I_V}{\partial y}\frac{y}{I_V} > 0$$

If $\eta^y_{I_U} < \eta^y_{I_V}$, then $\frac{\partial\left[\frac{I_U+K}{I_V}\right]}{\partial y} < 0$.

$$\frac{\partial \left[\frac{I_U+K}{I_V}\right]}{\partial \delta} \gtreqless 0 \Longleftrightarrow -\left[I_U+K\right]\frac{\partial I_V}{\partial \delta} \gtreqless -\frac{\partial I_U}{\partial \delta}I_V$$

$$\Longleftrightarrow \frac{\eta^\delta_{I_U}}{\eta^\delta_{I_V}} \lesseqgtr 1+\frac{K}{I_U}$$

where

$$\eta^\delta_{I_U} \equiv -\frac{\partial I_U}{\partial \delta}\frac{\delta}{I_U} > 0 \text{ and } \eta^\delta_{I_V} \equiv -\frac{\partial I_V}{\partial \delta}\frac{\delta}{I_V} > 0$$

If $\eta^\delta_{I_U} < \eta^\delta_{I_V}$, then $\frac{\partial\left[\frac{I_U+K}{I_V}\right]}{\partial \delta} < 0$. ∎

Table 1: Sample Descriptive Statistics

Variable	Returnees		Non-Migrants	
	Mean	**Std Dev**	**Mean**	**Std Dev**
Individual Characteristics				
Entrepreneur (%)	35.43	47.90	30.44	46.02
Age (years)	42.99	7.86	45.65	10.39
Married (%)	96.57	18.22	95.66	20.37
Educational level (%)				
None	14.00	34.75	25.28	43.47
Read & write	9.14	28.86	14.78	35.50
Less than intermediate	15.71	36.45	18.71	39.01
Intermediate	31.14	46.37	18.46	38.80
Higher than intermediate	6.29	24.31	6.18	24.09
University	23.71	42.59	16.59	37.20
Previous Work/Residence Characteristics (%)				
Urban resident: Previous	65.71	47.53	67.75	46.75
Waged worker : Previous	21.71	41.29	38.39	48.64
Public sector worker: Previous	7.14	25.79	5.63	23.06
Previous Occupation dummies (%)				
Technical & scientific: Previous	18.86	39.17	17.41	37.92
Management : Previous	0.57	7.55	2.22	14.72
Clerical: Previous	6.29	24.31	9.91	29.88
Sales: Previous	6.00	23.78	9.81	29.75
Services: Previous	4.86	21.53	6.99	25.51
Agriculture: Previous	10.86	31.15	20.57	40.43
Production: Previous	25.43	43.61	30.19	45.92
Regions of Residence in 1998 (%)				
Greater Cairo	19.71	39.84	20.60	40.45
Alex & Canal Cities	13.71	34.45	13.32	33.99
Lower Urban	17.43	37.99	16.46	37.08
Upper Urban	14.57	35.33	17.15	37.70
Lower Rural	22.29	41.68	19.40	39.55
Upper Rural	12.29	32.87	13.07	33.71
Sample Size	350		3160	

Table 2: Data Statistics of Entrepreneurs and Non-Entrepreneurs

Variable	Entrepreneurs				Non-Entrepreneurs			
	Returnee		Non-Migrants		Returnee		Non-Migrants	
	Mean	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Individual Characteristics								
Age (%)	43.03	7.89	46.15	9.78	42.97	7.87	45.43	10.64
Married (%)	97.58	15.43	96.15	19.24	96.02	19.60	95.45	20.84
LM experience in Egypt (years)	20.12	10.90	30.94	12.23	19.54	10.56	27.96	12.64
Self-employed bef. migration (%)	14.52	35.37			3.10	17.36		
Father: self-empl/ employer (%)	58.87	49.41	59.04	49.20	31.86	46.70	34.17	47.44
Educational level: (%)								
None	16.94	37.66	32.26	46.77	12.39	33.02	22.22	41.58
Read & write	10.48	30.76	17.69	38.18	8.41	27.81	13.50	34.18
< than intermediate	15.32	36.17	19.46	39.61	15.93	36.68	18.39	38.75
Intermediate	30.65	46.29	13.74	34.44	31.42	46.52	20.53	40.40
> than intermediate	6.45	24.67	4.16	19.98	6.19	24.16	7.07	25.64
University	20.16	40.28	12.70	33.31	25.66	43.77	18.29	38.67
Social Network								
Household size	5.37	1.97	5.94	2.60	5.31	1.96	5.19	2.16
Family migrated (%)	7.26	26.05			7.96	28.73		
Live in village/small town	47.58	50.14	44.49	49.72	39.38	48.97	34.85	47.66
Returned in last year	3.23	17.74			4.87	21.57		
Returned in last 2 years	5.65	23.17			8.41	27.81		
Migration Characteristics								
Migration duration (years)	5.35	5.03			5.02	4.85		
Savings								
Migrant used savings (%)	87.10	33.66						
District Characteristics								
Share of Migrants	1.62	1.28	1.33	1.24	1.29	1.00	1.17	1.17
Share of Self employed	18.52	10.91	19.39	10.83	18.08	10.51	18.03	9.88
Share of employer	7.65	6.21	7.69	8.95	8.34	7.75	7.06	7.25
Regions (%)								
Greater Cairo	16.13	36.93	14.66	35.39	21.68	41.30	23.20	42.22
Sample Size	124		962		226		2198	

Table 3: Probability of being Entrepreneur

	Marginal Effects
Returnee	0.111
	(3.86)**
Individual Characteristics	
LM experience in Egypt	0.008
	(2.75)**
LM exp. in Egypt Sq.	-0.000
	(0.69)
Age	-0.005
	(2.78)**
Married	-0.005
	(0.13)
Educational level (ref. group: none)	
Read & write	-0.006
	(0.23)
Less than intermediate	-0.018
	(0.74)
Intermediate	-0.072
	(2.59)**
Higher than intermediate	-0.075
	(1.92)
University	-0.035
	(1.07)
Pred Prob (at X bar)	0.303
Sample Size	3503
Pseudo R2	0.0332
Log Pseudo likelihood	-2095.9211

Notes: Robust t statistics in parentheses. Regional dummies included.
* significant at 5%; ** significant at 1%

Table 4: Bivariate Probit Estimates: Probability of being an Entrepreneur and Probability of being a Returnee

	1	2	3	4
Probability of being Entrepreneur				
Returnee	1.459	1.390	1.396	0.476
	(9.17)**	(4.43)**	(4.33)**	(1.03)
Social Network				
Household size		0.055	0.054	0.053
		(4.87)**	(4.63)**	(4.61)**
Household size*returnee		-0.071	-0.077	-0.051
		(1.98)*	(2.11)*	(0.91)
Family migrated		-0.054	-0.004	-0.196
		(0.30)	(0.02)	(0.84)
Lives in village/small town		0.181	0.153	0.146
		(3.38)**	(2.82)**	(2.69)**
Lives in vil/small town * returnee		0.005	-0.000	-0.056
		(0.03)	(0.00)	(0.23)
Returned in last year		-0.248	-0.271	-6.716
		(0.65)	(0.70)	(14.12)**
Human Capital				
Migration duration		0.033	0.036	0.034
		(2.19)*	(2.36)*	(1.44)
Physical Capital				
Migrant used savings				0.032
				(24.57)**
District Characteristics				
Share of Self employed		0.444	0.338	0.406
		(1.69)	(1.27)	(1.47)
Share of employer		0.265	0.130	0.281
		(0.83)	(0.40)	(0.85)
Individual Characteristics				
Father: self-empl/ employer			0.592	0.584
			(12.00)**	(11.57)**
Self-empl. before migration		1.346	1.286	1.265
		(11.84)**	(11.02)**	(10.54)**
LM experience in Egypt	0.026	0.026	0.026	0.026
	(3.27)**	(2.98)**	(2.82)**	(2.81)**
LM exp in Egypt Sq.	-0.000	-0.000	-0.000	-0.000
	(1.27)	(0.57)	(0.68)	(0.68)
Age	-0.015	-0.022	-0.023	-0.023
	(2.92)**	(3.88)**	(3.89)**	(3.93)**
Educational level (ref. group: none)				
Read & write	-0.058	0.056	0.025	0.024
	(0.80)	(0.71)	(0.32)	(0.30)
Less than intermediate	-0.164	0.022	-0.005	0.015
	(2.31)*	(0.29)	(0.06)	(0.18)
Intermediate	-0.409	-0.156	-0.235	-0.255
	(5.00)**	(1.70)	(2.51)*	(2.65)**
Higher than intermediate	-0.344	-0.068	-0.141	-0.199
	(3.05)**	(0.56)	(1.13)	(1.50)
University	-0.306	0.009	-0.046	-0.003
	(3.34)**	(0.09)	(0.44)	(0.03)
Married	0.025	-0.056	-0.093	-0.086
	(0.23)	(0.48)	(0.76)	(0.69)
Constant	-0.362	-0.770	-0.845	-0.861
	(2.01)*	(3.72)**	(3.99)**	(4.04)**

	1	2	3	4
Probability of being Returnee				
Share of Migrants	0.094	0.085	0.085	0.081
	(3.93)**	(3.44)**	(3.44)**	(3.32)**
Individual Characteristics				
Age	0.005	0.004	0.004	0.004
	(1.78)	(1.33)	(1.28)	(1.24)
Educational level (ref. group: none)				
Read & write	0.193	0.146	0.132	0.125
	(1.66)	(1.23)	(1.11)	(1.05)
Less than intermediate	0.365	0.284	0.275	0.282
	(3.49)**	(2.60)**	(2.53)*	(2.58)**
Intermediate	0.800	0.718	0.702	0.679
	(6.87)**	(5.87)**	(5.80)**	(5.71)**
Higher than intermediate	0.558	0.433	0.417	0.367
	(3.22)**	(2.41)*	(2.33)*	(2.12)*
University	0.720	0.572	0.558	0.550
	(5.17)**	(3.92)**	(3.86)**	(3.85)**
Previous Employment Characteristics				
Public sector worker: Previous	-0.905	-0.900	-0.893	-0.887
	(11.17)**	(10.45)**	(10.36)**	(10.24)**
Urban resident: previous	-0.136	-0.110	-0.110	-0.109
	(1.96)	(1.49)	(1.48)	(1.46)
Previous Occupation dummies (ref: technical, & scientific)				
Management: Previous	-0.982	-1.008	-1.018	-1.067
	(3.18)**	(3.19)**	(3.25)**	(3.42)**
Clerical: Previous	-0.565	-0.593	-0.599	-0.618
	(4.48)**	(4.46)**	(4.50)**	(4.63)**
Sales: Previous	-0.533	-0.686	-0.721	-0.739
	(3.35)**	(4.01)**	(4.33)**	(4.67)**
Services: Previous	-0.466	-0.545	-0.542	-0.582
	(2.96)**	(3.37)**	(3.31)**	(3.69)**
Agriculture: Previous	-0.608	-0.759	-0.776	-0.804
	(4.23)**	(4.94)**	(5.09)**	(5.67)**
Production: Previous	-0.512	-0.581	-0.578	-0.604
	(4.82)**	(5.21)**	(5.13)**	(5.58)**
Constant	-1.304	-1.123	-1.103	-1.064
	(6.39)**	(5.24)**	(5.15)**	(5.19)**
Rho	-0.64	-0.49	-0.48	-0.55
Wald test of rho=0: chi2(1) =	33.80	12.76	11.37	17.04
Sample size	3387	3185	3185	3185
Log Pseudo likelihood	-3001.62	-2713.08	-2637.29	-2500.20

Notes: Robust t statistics in parentheses. * significant at 5%; ** significant at 1%.
Regional dummies included.

Table 5: Further Sensitivity Analysis: Bivariate Probit Estimates: Probability of being an Entrepreneur

	5	6	7	8	9
Returnee	1.312	1.452	1.393	1.366	0.976
	(3.81)**	(4.54)**	(4.29)**	(4.22)**	(1.84)+
Social networks					
Household size	0.058	0.055	0.054	0.050	0.089
	(4.85)**	(4.87)**	(4.65)**	(4.31)**	(4.88)**
Household size*returnee	-0.077	-0.089	-0.076	-0.076	-0.097
	(2.03)*	(2.41)*	(2.07)*	(2.10)*	(1.61)
Family migrated	-0.040	-0.016	-0.003	0.019	0.128
	(0.21)	(0.09)	(0.02)	(0.10)	(0.56)
Live in rural areas	0.159	0.140	0.153	0.138	0.105
	(2.84)**	(2.63)**	(2.81)**	(2.52)*	(1.40)
Live in village/small town* returnee	-0.029	0.027	-0.006	0.012	0.024
	(0.19)	(0.18)	(0.04)	(0.08)	
Live in Greater Cairo				-0.180	
				(2.51)*	
Live in Greater Cairo* returnee				0.081	
				(0.40)	
Returned in last year	-0.226	-0.120		-0.266	
	(0.58)	(0.33)		(0.69)	
Returned in last 2 years			-0.257		
			(0.87)		
Human Capital					
Migration duration	0.033	0.037	0.037	0.038	0.027
	(2.07)*	(2.33)*	(2.38)*	(2.35)*	(1.08)
Physical Capital					
Migrant used savings					0.031
					(21.69)**
Date Started Business	included				

Notes: Robust t statistics in parentheses. . + significant at 10%; * significant at 5%; ** significant at 1%.
Those are the estimates from the first equation in the bivariate probit model. Only selected variables are shown. Model 5 includes dummies for date of start of business. Model 6 excludes those who were self-employed before migration. Model 7 uses 2 years since return dummy. Model 8 includes Greater Cairo. Model 9 includes businesses started after 1985 (sample size is 1738).

Table A1: Data Appendix

Variable	Definition
Individual Characteristics	
Age	Age in years at the time of survey
Married	Martial Status at the time of survey
LM experience in Egypt	Years of experience in the Egyptian labor market.
LM experience in Egypt Sq	Years of experience in the Egyptian labor market squared
Father: self-empl/ employer	=1 if the individual's father was self employed or employer when the individual was aged 15 years of age.
Educational level	
None	=1 if the individual has no education
Read & write	=1 if the individual can read and write
Less than intermediate	=1 if the individual has less than intermediate education (6 years).
Intermediate	=1 if the individual has intermediate education (9 years)
Higher than intermediate	=1 if the individual has higher than intermediate educ. (12 years)
University	=1 if the individual has university education (16 yrs of education).
Social Network	
Household size	Household size at the time of survey
Household size*returnee	Household size interacted with returnee
Family migrated	Household members migrated with the migrant head
Live in village/small town	=1 if individual lives in a village or town with less than 20,000 inhabitants
Live in vil/small town* returnee	=1 if returnee lives in a village or town with < than 20,000 inhabitants
Returned in last year	=1 if the individual returned from overseas in the last year
Returned in last 2 years	=1 if the individual returned from overseas in the last 2 years
Migration Characteristics	
Migration duration	Migration duration in years
Migrant used savings	Migrants used savings to start-up business
District Characteristics	
Share of Migrants	Share of adult male migrants among adult males in sub-district (skiakha/village)
Share of Self employed	Share of self employed among total employed adult males in district (qism)
Share of Employer	Share of employer among total employed adult males in district (qism)
Previous Work/Residence Characteristics	
Urban resident: Previous	Previous residence: urban dummy
Public sector worker: Previous	Previous sector of employment: public sector dummy
Self-empl. before migration	Self-employed before migration & returnee dummy
Previous Occupation dummies	
Technical & scientific: Previous	Previous occupation: Technical & Scientific dummy
Management: Previous	Previous occupation: Management dummy
Clerical: Previous	Previous occupation: clerical dummy
Sales: Previous	Previous occupation: sales dummy
Services: Previous	Previous occupation: services dummy
Agriculture: Previous	Previous occupation: agriculture dummy
Production: Previous	Previous occupation: production dummy

Dependent variables	
Entrepreneur	=1 if the individual is an employer or self employed *owner* of non-agricultural economic unit
Returnee	=1 if the individual is a return international migrant