



UNITED NATIONS
UNIVERSITY

UNU-MERIT

Working Paper Series

#2017-039

**Occupational choice of return migrants:
Is there a 'Jack-of-all-trades' effect?
Clotilde Mahé**

Maastricht Economic and social Research institute on Innovation and Technology (UNU-MERIT)
email: info@merit.unu.edu | website: <http://www.merit.unu.edu>

Maastricht Graduate School of Governance (MGSoG)
email: info-governance@maastrichtuniversity.nl | website: <http://www.maastrichtuniversity.nl/governance>

Boschstraat 24, 6211 AX Maastricht, The Netherlands
Tel: (31) (43) 388 44 00

UNU-MERIT Working Papers

ISSN 1871-9872

**Maastricht Economic and social Research Institute on Innovation and Technology
UNU-MERIT**

**Maastricht Graduate School of Governance
MGSoG**

UNU-MERIT Working Papers intend to disseminate preliminary results of research carried out at UNU-MERIT and MGSoG to stimulate discussion on the issues raised.



Occupational choice of return migrants: Is there a ‘Jack-of-all-trades’ effect?

Clotilde Mahé*

September 17, 2017

Abstract

Although it has been found that return migrants are more likely to be self-employed than non-migrants, the role of migration episodes *per se* remains unclear. With reference to Lazear’s Jack-of-all-trades hypothesis, this paper examines whether migrants are more likely to choose self-employment upon return because of the diverse work experience they gained abroad. Using the 2012 Egypt Labour Market Panel Survey, seemingly unrelated regression model estimates show that return migrants’ greater propensity to be self-employed, to survive or to generate jobs as self-employed might proceed from participating in significantly more occupations, sectors and jobs over their work history than non-migrants. Results hold for non-agricultural activities, rural areas, and controlling for financial resources. In line with Lazear’s framework, they confirm that entrepreneurship can be learnt, and that exposure to multiple occupations and industries matters for entering into and persisting in self-employment.

JEL classifications: F22, J24, L26, O12, O15

Keywords: International migration, Return migration,
Entrepreneurship, Human capital,
North Africa, Egypt

*UNU-MERIT/MGSoG, Maastricht University, Boschstraat 24, 6211 AX, Maastricht, The Netherlands, (+31) 043 388 4400, clotilde.mahe@maastrichtuniversity.nl.

1 Introduction

Return migrants have been found to have a higher propensity to be self-employed and to survive as entrepreneurs than non-migrants.¹ Apart from the opportunity that migration gives to accumulate wealth, a possible explanation for these findings is that moving, living abroad or returning ‘home’ could impart a variety of skills needed in entrepreneurship. Entering into and persisting in self-employment involve a variety of tasks that demand multiple skills, such as tolerance for risk, persistence, planning, budgeting or communicating across cultures – being successful requires entrepreneurs to be multi-skilled. ‘Entrepreneurial human capital’ or ‘entrepreneurial ability’ has been recognised as an essential, if often elusive, determinant of entrepreneurship.² There is however no consensus on whether one is born with innate entrepreneurial ability or whether entrepreneurial ability can be taught (Silva, 2007).

According to Lazear (2005), entrepreneurial ability can be learnt, not only through education but also experience. Entrepreneurs need a generalist, well-balanced skills-mix profile: they need to be Jacks-of-all-trades, that is 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. A growing literature has examined Lazear’s (2005) Jack-of-all-trades (JAT) hypothesis.³ We contribute to this literature by investigating whether migration is a process that can affect the likelihood of returnees to become entrepreneurs; and if so, whether this is due to a migration-induced Jack-of-all-trades effect on skills-set balance. That migrating plays a role in forming entrepreneurial ability could be informative for entrepreneurship support policies.

We use the 2012 Egypt Labour Market Panel Survey (ELMPS) (ERF and CAPMAS, 2013). Offering quality data, Egypt provides a good example. Micro and small enterprises (MSEs) constitute almost 99 percent of Egypt’s total enterprises, and around 80 percent of total employment, providing work for about 75 percent of new entrants to the job market (Ghanem, 2013). In light of the high incidence of youth unemployment,⁴ MSEs could offer socially and economically excluded youth better living standards.⁵ Simultaneously, a survival strategy to escape poor social and economic development (Zohry, 2009), international emigration from Egypt is mainly function of overseas labour demand, and is strongly affected by the economic and political conditions of labour importing countries (Wahba, 2009). Largely dominated by men, migration from Egypt to Middle Eastern and North African (MENA) countries has been temporary in nature. Empirical research on return migration and entrepreneurship in Egypt has mainly used the ELMPS to look at occupational choice upon return. Overseas savings and the acquisition of skills during a stay abroad have been shown to increase the propensity to become self-employed upon return, by compensating their potential loss of social capital (Wahba and Zenou, 2012). Marchetta (2012) finds that being a return migrant significantly increases the prospect of survival of entrepreneurial activities in Egypt. The role of migration as a learning experience however remains unclear. Being self-employed upon return could occur due to migration-induced wealth effects – remittances and repatriated savings – or to the development of a balanced skills-set, migration-induced Jack-of-all-trades effect.

¹ See for instance McCormick and Wahba (2001) or Wahba (2015) on return migration and entry into self-employment, and Marchetta (2012) on survival in self-employment.

² For a review of the literature, see for instance Hessels et al. (2014).

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

⁴ In 2008, they represented around 95 percent of Egypt’s unemployed; previous governmental strategies to youth job creation in the public sector has proven unsustainable (Ghanem, 2013).

⁵ In 2008, 72 percent of new entrants to the labour market with secondary education found themselves working in the informal MSE sector, often as unpaid family workers (Ghanem, 2013).

Reduced-form estimates of a Seemingly Unrelated Regression (SUR) model show that having migrated significantly increases the propensity to be self-employed upon return to Egypt, the more occupations (14.65 percentage points), sectors (31.83) and jobs (7.49) migrants were exposed over their work history. Results hold for non-agricultural sectors, individuals living in a rural area, and individuals without savings. Return migrants, because of a more varied work experience, are also more likely to persist as self-employed. We provide additional evidence, robust to the endogeneity of migration, human capital strategy investment and occupational choice, to the current debate on the development impacts of (return) migration on communities of origin by showing that not only migration-induced wealth effect, but also the work experience gained abroad as such can affect migrants' occupational choice upon return. We furthermore contribute to the scarce literature on empirically testing [Lazear's \(2005\)](#) Jack-of-all-trades hypothesis in developing economies where international migration is a prevalent labour market alternative. Because there, self-employed evolve in underdeveloped, ill-functioning market-supporting institutions, they should be much more generalist to handle almost all dimensions of business management ([Chen and Hu, 2012](#)). By unpacking migration as a learning process, this paper is eventually in line with [Lazear's \(2005\)](#) framework, as it confirms that entrepreneurship can be learnt, and that learning-by-doing and experiential learning matter for entering into and persisting in self-employment ([Hessels et al., 2014](#)). Entrepreneurship (education) support policies should thus focus on widening the work experience of potential, fledging entrepreneurs; broader labour market policies should allow for flexible transitions between self- and wage-employment.

The rest of this paper is structured as follows. Section 2 provides an overview of the relevant literature. Section 3 introduces the data, followed by our estimation strategy in Section 4. Section 5 presents estimation results. Section 6 concludes.

2 Conceptual background

In the absence or inefficiency of markets, savings accumulated during migration (and remittances) could act as substitutes for formal insurance, facilitating access to capital and widening opportunities for income generation, promoting investments in new or existing ventures, enhancing their productivity.⁶ Simultaneously, by moving abroad, emigrants are likely to weaken social ties with origin countries – a loss of social capital that may threaten any entrepreneurial activity upon return – and/or enhance their employability as wage-employed upon return, which could lower returnees' will to initiate business activities ([Wahba and Zenou, 2012](#)).⁷

The human capital channel is relatively complex. Evidence is mixed with respect to higher education. For example, [Gibson et al. \(2013\)](#) conclude from micro-economic evidence of five islands that, although return migration of the highly skilled is common, their involvement in entrepreneurial activities once back to origin countries is seldom, in contrast with [McCormick and Wahba's \(2001\)](#) findings. By inducing greater job turnover, migrating could

⁶ See for instance [Dustmann and Kirchkamp \(2002\)](#) or [Mesnard \(2004\)](#) who evidenced the endogeneity of time abroad and business start-up upon return.

⁷ If [Wahba and Zenou \(2012\)](#) find that a loss in social capital during migration can be offset by gains in financial and human capitals for returnees to successfully set their businesses in place in homeland Egypt, [Obukhova et al. \(2012\)](#) show that returnee entrepreneurs to China do not outperform non-migrant, 'homegrown' entrepreneurs. Because of a lack of 'local' social networks – in this case, school ties – where high-tech enterprises are set in place, returnees are likely to underperform non-migrant entrepreneurs or returnee entrepreneurs with such ties.

affect returnees' mindsets, for instance, their propensity to take risk, be it for taking a new job and/or setting up a firm, as well as their capabilities, that is their skills and know-how. Occupation, integration process in, and choice of destination country might interact in the decision to set up a business upon return.⁸

On the other hand, entrepreneurs might need a different skills profile than employees do. Instead of being 'specialists', entrepreneurs require a relatively balanced, varied set of skills – knowledge in financing, accounting, production processes, marketing and management. Entrepreneurs may not be expert in all these fields, but they need some notion of each, in particular if they are to hire experts for each role (Lazear and Gibbs, 2010). Lazear's (2005) Jack-of-all-trades theory of entrepreneurship builds a framework in which an individual, who can have two skills such as product design and/or marketing, has the choice between having a wage-employed specialised job or becoming an entrepreneur. If an employee specialises in his best skill, an entrepreneur needs certain knowledge of both skills to carry out each task, or to supervise others – specialists – who perform them. An entrepreneur values his skills based on the level of each skill he possesses; his skills-set is limited by his weakest skill. In other words, the more a potential entrepreneur is specialised (in one skill), the more he will be tied by his weakest skill: maximizing his income is limited by his knowledge level in his weakest skill.

As a consequence, the less balanced someone's skills-set is – the more expert he is – the less likely he will opt for self-employment: balanced skills are key for entrepreneurship. This is particularly the case in developing economies. In a context of highly imperfect markets, (would-be) entrepreneurs have to tackle a number of challenges that may not be as prominent in developed economies, rendering the need for well-balanced skills even more important (Chen and Hu, 2012). This suggests that potential entrepreneurs would give more value to a balanced investment in human capital, privileging investments in their weakest skill, in order to become less specialised. This prediction of the JAT hypothesis can be tested by looking at human capital investment patterns of self-employed and employed. Entrepreneurs should have a more generalist rather than specialised attitude to human capital – they should tend to invest in various skills at once.

Using a 1997 survey of about 5,000 Stanford MBA alumni, Lazear (2005) finds that entrepreneurs' past experience included a broader variety of activities and a greater number of jobs; they attended less specialised courses that deepened their knowledge compared to more specialised classmates who became wage-employed. Subsequent empirical research has supported (to some extent) and refined his findings, accounting for Silva's (2007) concern about endogeneity.⁹ Astebro and Thompson (2011) use Canadian data to show that inventor-entrepreneurs tend to have more diverse experience on the labour market. Yet, they find varied work experience to be correlated with lower household income, contradicting the JAT prediction. Testing this theory with German data, Lechmann and Schnabel (2014) find that self-employed carry out more tasks, and that their work necessitates more skills, than wage-employed. However, self-employed are also found to want more expert skills as such; their results provide weak support for different human capital investment patterns between self- and wage-employed. Using data from Germany and the Netherlands, Hessels et al. (2014) show that those with more varied work experience are more likely to be self-employed, but being a generalist does not seem to be relevant.

⁸ Work experience abroad in a high-income economy, for instance, could explain returnees' propensity for self-employment, as suggested by McCormick and Wahba (2001) for Egypt, Kilic et al. (2009) for Albania, or Gubert and Nordman (2011) for Algeria.

⁹ Silva (2007) shows that individuals' unobservable characteristics such as innate abilities may simultaneously influence individuals' skills and occupational choice.

In this regard, migration could be seen as a process that helps shaping entrepreneurial spirit. Moving, living abroad or returning ‘home’ could induce building persistence, skills in planning time and financing, or communicating across cultures. By changing jobs in a alien environment, temporary migration could affect the propensity to take risk and the accumulation of occupation- and sector-specific skills – experiences that potentially contribute to a more balanced skills-mix, i.e. beneficial for entrepreneurial activities. Acting as a learning process, migration experience could contribute to forging the entrepreneur. Upon return to their home country, migrants would differ from stayers in their propensity and attitudes towards self-employment, entrepreneurial abilities and business characteristics. Studying the behaviour of return migrants could thus be an insightful test of Lazear’s (2005) hypothesis. Chen and Hu (2012), investigating Lazear’s (2005) JAT hypothesis in a migration setting, show in particular that the variety of skills – how ‘balanced’ their skills-mix is, measured by the number of professional fields and accumulated skills¹⁰ – accumulated during migration to urban areas significantly increases returnees’ likelihood to opt for self-employment upon return. Démurger and Xu (2011) confirm this hypothesis. Return migrants are found to be more likely to engage in entrepreneurial activities upon return to origin rural areas than stayers; this probability is increased by savings accumulated and professional experience gained during migration – in this case, migrants’ job turnover.

Resource accumulation abroad may however be influenced by the perception of profitable investment opportunities in origin communities, reflected for instance in pre-existing business ownership in the migrants’ household. Alternatively, family assets may attract returnees’ investments given the prospect of inheritance of these assets (Amuedo-Dorantes and Pozo, 2006). Once an investment target is reached, decision to return can be made. Resources gathered during migration might then lead to business investments, but it could also be that existing businesses at home reveal greater investment opportunities, and, along with future claims for bequest, act as incentives to invest; hence, potential reverse causality. 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 simultaneously be more enclined to opt for self-employment because of their own, innate preferences (Chen and Hu, 2012).

Gaps in the existing literature, in particular regarding how temporary migration affects occupational choice upon return, thus remain to be filled. Despite few works, such as Chen and Hu (2012), Démurger and Xu (2011) or Black and Castaldo (2009), the relative importance of the abilities gained during migration compared to remittances and repatriated savings, that is whether it is ‘wealth’ rather than ‘skills’ that are affected by migration, is not yet clear. Migrating, by inducing greater job turnover could indeed affect returnees’ mindsets, for instance, their propensity to take risk, be it for taking a new job and/or setting up a firm, as well as abilities, that is their skills and know-how – work experience itself – influencing their skills-mix.

¹⁰Chen and Hu (2012) measure the accumulation of skills by ranging skills from no skill, non-managerial skill only, managerial skill only, and managerial and non-managerial skills.

3 Data

3.1 Data source

We use a longitudinal and nationally representative household survey, the ELMPS, administrated since 1998 by the Economic Research Forum in cooperation with the Central Agency for Public Mobilization and Statistics. The ELMPS is made of four cross-sections – 1988, 1998, 2006 and 2012 – the last three constituting a three-round panel. This paper uses its last wave, as a cross-section since some variables only collected in its last wave are used. The 2012 round covers 12,060 households and 49,186 individuals, tracking households and individuals surveyed in 2006, plus a refresher sample of people interviewed in 1998. More details on data collection are available in [Assaad and Kraft \(2013\)](#). The ELMPS contains information on a variety of topics. Modules on labour market outcomes (4-6), residential mobility (3), current (12) and return (international) migration (10)¹¹ are of particular interest.

3.2 Descriptive statistics

Egypt has been labour exporter since the 1970s economic reforms and opening of the country; it is the biggest labour exporter of the MENA region ([Wahba, 2014](#)). Two main trends characterized Egyptian emigration: relatively temporary migration to MENA countries, involving male household heads, for one to five years; and more permanent migration to Western countries, involving the entire nuclear family. Egyptians' first destination was labour-importing MENA countries, in particular oil-producing Gulf States, Libya and Iraq because of labour shortages. 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. Although the majority is still heading to MENA States, around 30 percent of Egyptian migrants were residing in OECD countries in 2000 ([Wahba, 2009](#)). Egypt's international migration comprises both low- and high-skilled migrants ([Wahba, 2014](#)). The early 1980s saw highly educated professionals (physicians, health workers, teachers), and less educated workers, usually working in construction, temporarily leaving to MENA countries. Nowadays, the proportion of less educated Egyptian migrants has decreased relative to the proportion of more educated workers, as demand from labour-importing MENA countries 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; Libya, Jordan and Iraq, the least.

The estimation sample includes individuals born before 1990, as no return migrants are reported for individuals born after 1990. This is to avoid potential bias in the use of our estimation strategy. The sample excludes individuals who changed job after the January 2011 Uprising. It is also limited to those whose first destination country was an MENA country, as listed in [Bertoli and Marchetta \(2015\)](#) – Algeria, Iraq, Jordan, Kuwait, Lebanon, Libya, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates and Yemen. This helps better focus on the effects induced by temporary migration since (i) Egyptians emigrating to Western countries tend to stay permanently; and (ii) the majority of Egyptians emigrates to MENA countries. Table 1 presents estimation sample descriptive statistics.

¹¹ This paper uses this newly added module on return migration that surveys individuals between 15 and 59 years old, who worked abroad for at least six months, to classify individuals as return migrants.

Table 1: Descriptive statistics of estimation sample

	Full sample		By status		By migration		Self-employed	
	Mean	Std. Dev.	Mean	Mean	Mean	Mean	Mean	Mean
Dependent variables								
Self-employment	.2284	.4198	0	1	.2174	.3312	1	1
Independent variables								
Return migrant	.0971	.2961	.0842	.1408	0	1	0	1
Years abroad	.4423	2.0201	.3426	.7789	0	4.55	0	5.5319
Accumulated occupation	1.3035	.5096	1.2809	1.3795	1.2732	1.5844	1.3495	1.5623
Accumulated sectors	1.2041	.4713	1.1994	1.22	1.1562	1.6495	1.1652	1.554
Accumulated jobs	2.0336	.8774	1.9829	2.2048	1.903	3.2477	2.0368	3.2299
Male	.8370	.3694	.8221	.8873	.8213	.9826	.8702	.9917
Age	38.2099	10.7902	37.081	42.021	37.581	44.057	41.532	45.006
Married	.8248	.3802	.8082	.8807	.8102	.9596	.8656	.9723
Illiterate	.1865	.3895	.1348	.3612	.1832	.2174	.3609	.3629
Literate (without diploma)	.0445	.2063	.0382	.0659	.0421	.0670	.0654	.0693
Elementary school	.0948	.2929	.0867	.1221	.0944	.0982	.1235	.1136
Middle school	.0503	.2187	.0504	.0503	.0504	.0495	.0499	.0526
High school	.3564	.4790	.3848	.2605	.3500	.4156	.2533	.3047
Post-secondary, university and higher	.2675	.4427	.3052	.1400	.2799	.1523	.1471	.0970
Literate mother	.2128	.4093	.2352	.1373	.2226	.1220	.1444	.0942
Children dependency ratio	.2958	.2305	.2910	.3119	.2932	.3196	.3099	.3245
2007 unemployment rate (gov.)	.0903	.0300	.0916	.0861	.0905	.0886	.0860	.0870
Vocational high school	.3339	.4716	.3622	.2383	.3269	.3991	.2288	.2964
Father was self-employed	.3568	.4791	.3034	.5374	.3464	.4541	.5361	.5457
Past self-employment	.0385	.1924	.0269	.0776	.0324	.0954	.0617	.1745
First job was self-employed	.0618	.2409	.0129	.2270	.0656	.0266	.2565	.0471
Years of unemployment	.6875	1.9623	.7682	.4150	.7000	.5725	.4181	.3961
Tenure of current job	14.0906	9.9730	13.668	15.52	13.994	14.99	15.614	14.945
Potential years of work experience	22.4186	12.6758	20.521	28.828	21.702	29.076	28.327	31.884
Savings	.0770	.2666	.0746	.0850	.0753	.0927	.0831	.0970
Agriculture	.1516	.3586	.0957	.3401	.1452	.2110	.33	.4017
Mining	.0025	.0499	.0031	.0004	.0025	.0028	.0005	0
Manufacturing	.1270	.3330	.1386	.0881	.1310	.0908	.0899	.0776
Utilities	.0197	.1389	.0255	0	.0200	.0165	0	0
Construction	.1131	.3167	.1282	.0620	.1093	.1477	.0554	.1025
Trade	.1687	.3745	.1146	.3518	.1728	.1312	.3663	.2632
Transport	.0887	.2844	.0912	.0803	.0877	.0982	.0758	.1080
Business services	.0355	.1852	.0366	.0320	.0365	.0266	.0336	.0222
Government	.2579	.4375	.3322	.0070	.2595	.2431	.0077	.0028
Personal services	.0349	.1836	.0340	.0382	.0353	.0312	.0409	.0222
Extraterritorial organisations	.0003	.0163	.0004	.0009	.0002	.09	0	0
Experience in micro-enterprise	.3965	.4892	.3320	.6143	.3566	.7670	.5688	.8920
Oil price at average age of emigration (19 years old)	44.0754	21.9640	44.705	41.949	43.452	49.867	40.779	49.086
N		11,224	8,660	2,565	10,134	1,090	2,203	361

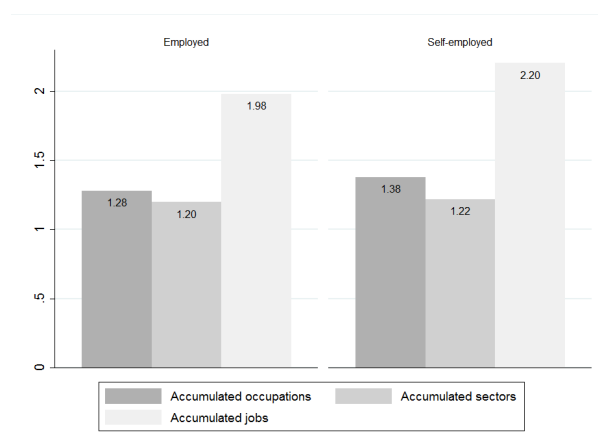
Notes: Summary statistics for variables included in the analysis, after dropping observations with missing information, for the full sample, broken down by occupation, by migration experience, and limited to self-employed individuals by migration. The sample consists of 16-64 individuals (N=11,224). Means between treated (self-employed, returnees and self-employed returnees) and control groups (respectively employees, stayers and self-employed stayers) statistically significantly different at the 10 percent significance level are in bold.

The outcome of interest is a binary variable taking value 1 if a working-age (16-64) individual is self-employed; null, if employed. Out of 11,224 observations, 22.84 percent are self-employed. Three measures of a balanced skills profile are alternatively used: (i) accumulated occupations, a continuous variable capturing the *number of occupational skills* an individual has accumulated over the four last spells of his job history, either as low-skilled blue-collar, high-skilled blue-collar, low-skilled white-collar and high-skilled white-collar;¹² (ii) accumulated industries, a continuous variable representing the *number of industries* (or sectors) an individual has worked in over the four last spells of his job history;¹³ and (iii) accumulated jobs, a continuous variable recording the *number of jobs* an individual has had over his entire job history.

These three measures of skills-mix balance are not aggregated as each one may capture different dynamics. For instance, if accumulating occupational skills is likely to increase the degree of balance and how generalist an individual is, working in various industries may be correlated with a specialised skills profile: only those with specialist occupational skills, either low- or high-skilled, would be able to work in different sectors, keeping the same occupation. Job accumulation – job turnover – in contrast, may affect the degree of risk aversion that plays in changing jobs. Individuals in the full estimation sample seem to have a relatively low degree of skills-mix balance. They have accumulated, on average, 1.30 occupations, and worked in 1.20 sectors over their last four job spells; they have had 2.03 jobs on average over their entire job history.¹⁴

Table 1 reveals notable differences between self-employed and employees. On average, those self-employed are more likely to be men, married, older and less educated than individuals working as employees. They are more likely to come from a poorer family, with a father who was also self-employed at the time of their fifteenth birthday. They tend to have been self-employed in the past (including their first job), to have worked in a micro-enterprise, and to have experienced less years of unemployment than employees. Self-employed also tend to work relatively more in agriculture and in trade; employees, as public servants. Figure 1 shows that those self-employed have accumulated significantly more occupational skills (1.38), sectors (1.22) and jobs (2.20), compared to employees (respectively 1.28, 1.99 and 1.9).

Figure 1: Skills-mix profile by occupation



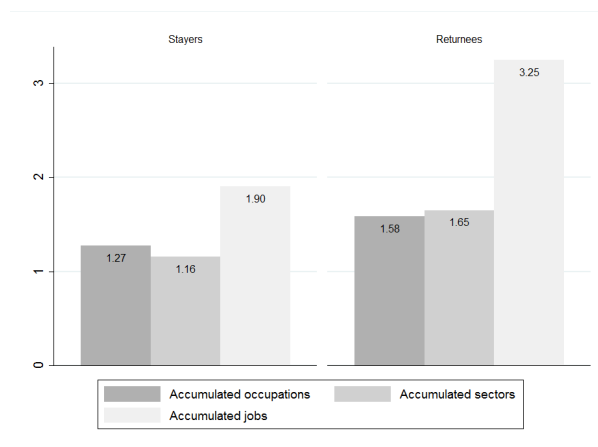
¹² Following the International Standard Classification of Occupations (ISCO-88), occupations are classified in terms of skill level and skill specialisation, forming four skill levels. Low-skilled blue-collar occupations correspond to skill level 1 occupations; high-skilled blue-collar to skill level 2; low-skilled white-collar to skill level 3; and high-skilled white-collar occupations to skill level 4 occupations.

¹³ Following the International Standard Industrial Classification of all economic activities (ISIC4).

¹⁴ This means that if an individual has only had two jobs in his lifetime, only these two jobs will be observed.

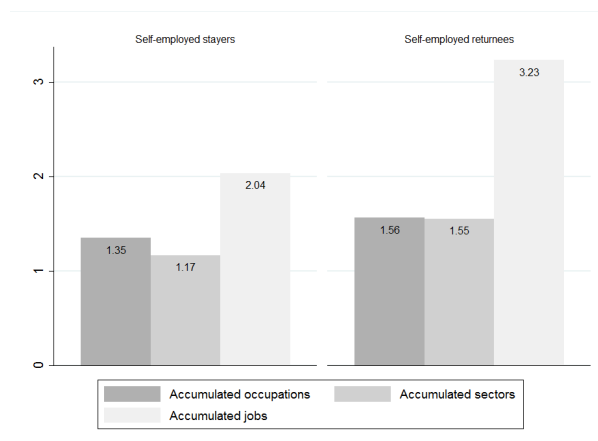
Being a return migrant is defined as a binary variable, taking 1 if an individual has emigrated at 15 or older for work for at least six months, and returned to Egypt at the time of the survey; 0, otherwise. About 10 percent of the estimation sample are return migrants who, on average, spent 4.55 years abroad; those self-employed are more likely to have migrated than employees. Return migrants are significantly more often men, older, and less educated than stayers. They come from poorer households with a greater number of dependents. They are more likely to have had a vocational training, a father self-employed and to have been self-employed in the past. They tend to work relatively more in agriculture and construction. Returnees show a higher rate of self-employment: 33.12 compared to 21.74 percent of stayers, the rest being wage-employed. Return migrants also display a significantly greater number of occupational skills, sectors and jobs, accumulated over their work experience, suggesting that they have a more balanced skills-mix profile, as shown in Figure 2.

Figure 2: Skills-mix profile by migration experience



Moreover, limiting the sample to working-age self-employed, those who migrated appear to be more often men, older, more likely to be married and to come from poorer families than those who did not migrate. The former are also more likely to have had vocational training and to have set up a firm in the past, but less likely to have been self-employed in their first job. Figure 3 reveals that self-employed returnees have substantially obtained more occupational skills (1.56, 1.55 and 3.23), worked in more sectors, and had a greater number of jobs than self-employed who have not migrated (respectively 1.35, 1.17 and 2.04).

Figure 3: Skills-mix profile of self-employed by migration experience



4 Methodology

4.1 Estimation

A major analytical issue is the endogeneity of temporary migration. Migrating is subject to both negative and positive selection biases due to unobservable features, likely to affect occupational choice and business performance upon return (Marchetta, 2012).

Those who emigrate and return may do so because they are more endowed, i.e. have more balanced skills before departure, than non-migrants. In this case, empirical results comparing performance would be biased. On the other hand, dynamics between return migration and entrepreneurship may also be biased if returnees are innately more risk-takers, and so initiate riskier business strategies, or if returnees opt for self-employment by lack of social capital and/or greater wage-employment opportunities upon return. Emigrating itself could also be driven by the desire to set up an enterprise upon return. They could be simultaneous decisions, and temporary migration could be part of would-be entrepreneurs' business strategies (Wahba and Zenou, 2012; Batista et al., 2017). The relation between skills-mix balance and occupational choice might similarly be biased by endogeneity. Not only unobservable characteristics might simultaneously affect human capital investment strategy and occupation (self-selection); how (un)balanced is one's skills-set might be a conscious effort to reach a well-defined position (reverse causality).

To tackle endogeneity, we use an instrumental variable approach. As in Wahba and Zenou (2012), Marchetta (2012) or Bertoli and Marchetta (2015), changes in the real price of oil are used to obtain an exogenous source of variation in the probability of temporary migration. Inflation-adjusted prices of oil are assumed to drive the demand for non-native labour either directly in oil-producer countries, through employer-based immigration policies, responsive to change in local economic conditions; or indirectly in non oil-producer 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 emigration should influence the decision to migrate, but should not be directly related to current – observed – occupational choice upon return. In addition, because migration to MENA countries tends to be temporary, predicting emigration should suffice to instrument return migration. 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, to choose out of 11 alternatives, from 18 to 28 years old. The potential endogeneity between skills-mix balance and occupational choice is tackled by using as exclusion restriction work experience in a micro-firm over his/her last four job spells, which is assumed to influence occupational choice only through the accumulation of entrepreneurial skills or abilities. Small, micro-firms tend to lack complex hierarchical structures, and are less likely to be highly-specialised work places: working conditions give employees the opportunity to perform a variety of tasks (Stuetzer et al., 2013). Performing various tasks might then develop balanced skills via learning-by-doing (Stuetzer et al., 2013).

To assess the effect of migration experience on entrepreneurship through the human capital channel of working-age (16-64) individuals, a Seemingly Unrelated Regression (SUR) linear probability model is used since the three decisions – temporarily migrating, having a balanced skills-set, and being self-employed – form a non-recursive model with direct causal paths and correlated disturbances.¹⁵

¹⁵ Correlated disturbances assume that corresponding endogenous variables share at least one common omitted explanatory variable.

$$Returnee_i = \delta_{10} + \delta_{11}X_{Ri} + \delta_{12}Z_{Ri} + \epsilon_{1i} \quad (1)$$

$$SkillsSet_{ij} = \alpha_{20} + \alpha_{21}X_{SSi} + \alpha_{22}Z_{SSi} + \alpha_{23}Returnee_i + \epsilon_{2i} \quad (2)$$

$$SelfEmployed_i = \gamma_{30} + \gamma_{31}X_{SEi} + \gamma_{32}Z_{SEi} + \gamma_{33}SkillsSet_{ij} + \epsilon_{3i} \quad (3)$$

Where *Returnee* is alternatively a binary variable, taking unity if a working-age individual *i* has worked at least six months abroad, and a continuous variable of years abroad. *SkillsSet* is a continuous variable, with $j = 1, 2, 3$, alternatively measuring the number of different occupations or industries accumulated over the last four job spells, or the number of positions over the entire job history. *SelfEmployed* is a binary variable taking unity if an individual is currently self-employed.

X_R is a vector of individual and household characteristics capturing gender, age, marital status, education, whether an individual's mother is literate,¹⁶ and child dependency ratio. X_{SS} controls for the same variables as X_R , except age. X_{SE} controls for gender, household characteristics and lagged unemployment rates at the governorate level. Z_R , exclusion restriction for equation (1), is the price of crude oil in US Dollars (USD), inflation-adjusted for March 2015, as explained earlier. Z_{SS} , exclusion restriction for equation (2), is a binary variable taking unity if an individual worked in a micro-firm over his/her last four job spells, assumed to influence occupational choice only through the accumulation of entrepreneurial skills or abilities. Z_{SE} is a vector of variables thought to influence occupational choice such as vocational training, whether an individual's father was self-employed, whether his/her first job was self-employed, years of unemployment, tenure and tenure squared in years at current job, potential years of work experience and potential years of work experience squared. Labour force related information are measured over the last four job spells available in the Module 6 of the ELMPS.

As Z_R , Z_{BS} and Z_{SE} are unique to each structural equation, the above model can be solved, and its structural parameters uniquely identified. These three structural model equations can be rewritten as three reduced form equations in the endogenous variables *Returnee*, *SkillsSet* and *SelfEmployed*, so that each of these variables will depend on the exogenous variables in the entire system as well as the structural errors. The reduced form is estimated via a generalized simultaneous equations model (GSEM) estimator; then adding governorate fixed-effects;¹⁷ and excluding individuals living in a household with current or return migrants. Standard errors are clustered at the household level to account for potential correlation within families.

$$Returnee = f(., Z_R, \delta) \quad (4)$$

$$SkillsSet = f(., Z_{SS}, \alpha; Z_R, \beta) \quad (5)$$

¹⁶ Mother's education proxies potential inequalities of opportunities individuals might face based on their family background (Paxson and Schady, 2004; Paxson and Schady, 2007; in Atinc et al., 2005).

¹⁷ First level of Egypt's administrative subdivision.

$$SelfEmployed = f(., Z_{SS}, \gamma) \quad (6)$$

By estimating the relationship between having a balanced skills-set and being a returnee, controlling for the endogeneity of return migration, we obtain the marginal effect of balanced skills over return migration. By estimating the relationship between being self-employed and having a balanced skills-set, controlling for the endogeneity of a balanced skills-mix, we obtain the marginal effect of self-employment over balanced skills:

$$\frac{\partial SkillsSet}{\partial Returnee} = \frac{\beta}{\delta} \quad (7)$$

$$\frac{\partial SelfEmployed}{\partial SkillsSet} = \frac{\gamma}{\alpha} \quad (8)$$

The marginal effect of self-employment over return migration through skill accumulation is computed by multiplying these two marginal effects:

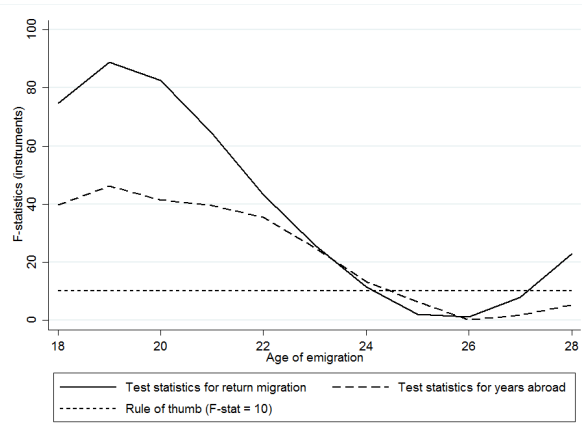
$$\frac{\partial SelfEmployed}{\partial Returnee} = \frac{\partial SelfEmployed}{\partial SkillsSet} \cdot \frac{\partial SkillsSet}{\partial Returnee} = \frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta} \quad (9)$$

4.2 Identification strategy

The selection of the age, i.e. year of potential emigration, at which an individual is matched to the real price of oil draws on [Bertoli and Marchetta \(2015\)](#). To do so, we estimate equation (1), and examine the strength of this instrument at different matching ages, ranging from 18 to 28 years old, by testing for each alternative the null hypothesis that the estimated coefficient on the real price of oil equals zero through a Wald test, implemented by Stata's *test* command. As [Cameron and Trivedi \(2009, p.196\)](#) note that 'a widely used rule of thumb [...] views an F statistic of less than 10 as indicating weak instruments. This rule of thumb is ad hoc and may not be sufficiently conservative [...]', we select the age of potential emigration giving the highest F statistic.

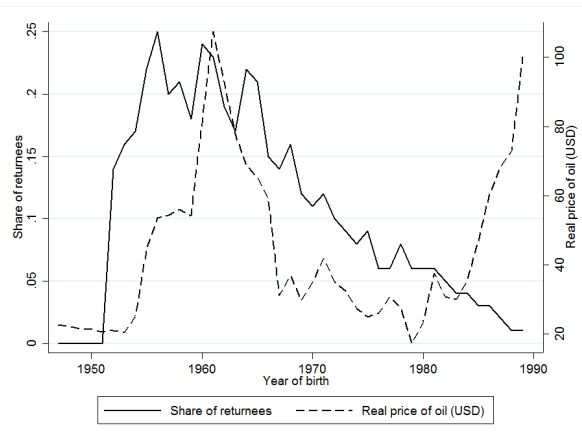
Figure 4 depicts the values of the F-statistics for equation (1), being a return migrant and the number of years abroad as alternative dependent variables, at each age, as well as the 10 F-statistic rule of thumb. The F-statistic is the highest for 19 years old for the two dependent variables – being a return migrant, or the number of year one spent working abroad – close to [Bertoli and Marchetta's \(2015\)](#) choice of 20 years old, but below 10 for 26, age selected by [Wahba and Zenou \(2012\)](#) and [El-Mallakh and Wahba \(2016\)](#). We thus opt for the real price of oil when individuals were 19 as instrument for temporary migration to MENA countries. Table 1 supports the selection of 19 as matching age: real oil prices were, on average, statistically significantly higher for return migrants (USD49.87) at 19 years old than for stayers (USD43.45), confirming the rationale behind this instrument.

Figure 4: First stage test statistics (F-stats) for the real oil price at different ages



Following Bertoli and Marchetta (2015), Figure 5 shows the relation between the share of returnees of the estimation sample, their year of birth and the real price of oil when they were 19 years old, from 1950 to 1990. The proportion of return migrants is the highest, approximately 25% for those born in mid-1950s and early 1960s, who might have emigrated following the sharp increases in oil prices in the 1970s and 1980s. The proportion of returnees then falls, till the end of the series, 1989.¹⁸ The steady decrease in the share of returnees does not match the rise in real oil price starting in the late 1980s. Egyptians, born in the late 1970s and onwards, who emigrated 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 well represent the pool of Egyptians who left in the 2000s, which could induce bias – hence their exclusion of the estimation sample. As Table 1 show, the average real price of oil at 19 years old is significantly greater for return migrants – USD49.87 compared to USD43.45 for stayers. Similarly, they are much more likely to have worked in a micro-enterprise (76.70 percent against 35.66 percent).

Figure 5: Share of returnees by year of birth and real oil price at the age of 19



¹⁸No 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.

5 Results

5.1 Benchmark specifications

Table 2 presents GSEM reduced-form coefficient estimates of a SUR linear probability model of return migration, number of occupational skills, sectors or jobs accumulated, and self-employment. Columns (1)-(3) measure how balanced a skills-mix is by the number of occupations accumulated over the last four job spells; Columns (4)-(6), by the number of sectors; and Columns (7)-(9), by the number of jobs accumulated over the entire job history. Observations are working-age (16-64 year-old) individuals, self-employed or employees, excluding individuals living in a household with members currently abroad,¹⁹ individuals living in a household with members who returned from migration abroad,²⁰ as well as those working in agriculture.²¹ Columns (1), (4) and (7) present GSEM coefficient estimates of self-employment equation; Columns (2), (5) and (8) present GSEM coefficient estimates of skills-mix (accumulated occupations, sectors or jobs) equation; and Columns (3), (6) and (9) present GSEM coefficient estimates of return migration equation. F-statistics and associated p-values testing the strength of the instrumental variable used to identify the model, historical real price of oil at 19 years old, are reported. This instrument is strong and relevant across all but one model specifications.

The sign and significance of the control variables do not appear to significantly differ across specifications. Being male, having a father who was self-employed, reflecting a ‘family’ (cultural) entrepreneurial capital, and having been self-employed as first job, a measure of entrepreneurial motivation, tend to increase the probability of a working-age to be self-employed. Years of potential work experience seem to have a non-linear with self-employment: younger Egyptians often privilege self-employed positions, and older, more averse to risk, have a lower propensity than prime working age individuals to set up their own firm. Vocational training and past self-employment experiences appear to decrease the propensity to self-employment, suggesting that varied, non self-employed occupations are required prior to starting a business. Having to support children tends to increase the likelihood of self-employment, maybe out of necessity. Micro-firm experience is also positively correlated with exposure to different occupations, sectors and having held several jobs. This is consistent with the hypothesis that working in a micro-firm gives employees the opportunity to perform a variety of tasks, helping to develop a balanced skills-mix via learning-by-doing (Stuetzer et al., 2013). Inflation-adjusted price of oil at 19 years old is a strong, statistically significant instrument, despite the relatively small magnitude of its coefficient estimates.

¹⁹ The out-migration of a household member is likely to influence the occupational choice of left-behind relatives (Binzel and Assaad, 2011).

²⁰ If return migrants are found to be relatively more entrepreneurial, they could have spillover effects on non-migrant household members, and affect their occupational choice (Giulietti et al., 2013).

²¹ Occupational choice dynamics in agriculture are likely to differ from other sectors’.

Table 2: Benchmark coefficient estimates

Variables	Self-employed (1)	Accumulated occupations (2)	Returnee (3)	Self-employed (4)	Accumulated sectors (5)	Returnee (6)	Self-employed (7)	Accumulated jobs (8)	Returnee (9)
Micro-enterprise	0.1448*** (0.0095)	0.4654*** (0.0110)		0.1448*** (0.0095)	0.2829*** (0.0109)		0.1448*** (0.0095)	0.9142*** (0.0165)	
Oil price (19)		0.0007*** (0.0002)	0.0014*** (0.0002)		0.0009*** (0.0002)	0.0014*** (0.0002)		0.0007* (0.0004)	0.0014*** (0.0002)
Male	0.0222*** (0.0081)	0.1030*** (0.0086)	0.1029*** (0.0049)	0.0222*** (0.0081)	0.0999*** (0.0075)	0.1029*** (0.0049)	0.0222*** (0.0081)	0.1707*** (0.0194)	0.1029*** (0.0049)
Age			0.0052*** (0.0003)			0.0052*** (0.0003)			0.0052*** (0.0003)
Married	-0.0230** (0.0096)	0.0629*** (0.0114)	0.0344*** (0.0065)	-0.0230** (0.0096)	0.0756*** (0.0107)	0.0344*** (0.0065)	-0.0230** (0.0096)	0.2772*** (0.0206)	0.0344*** (0.0065)
Literate mother	0.0136 (0.0087)	0.0071 (0.0115)	-0.0112 (0.0068)	0.0136 (0.0087)	0.0168 (0.0117)	-0.0112 (0.0068)	0.0136 (0.0087)	0.0335 (0.0213)	-0.0112 (0.0068)
Literate (without diploma)		0.1358*** (0.0278)	0.0323* (0.0174)		0.0936*** (0.0285)	0.0323* (0.0174)		0.2115*** (0.0361)	0.0323* (0.0174)
Elementary school		0.1076*** (0.0191)	0.0093 (0.0119)		0.0582*** (0.0185)	0.0093 (0.0119)		0.1067*** (0.0252)	0.0093 (0.0119)
Middle school		0.0824*** (0.0239)	-0.0013 (0.0147)		0.0499** (0.0229)	-0.0013 (0.0147)		0.1576*** (0.0332)	-0.0013 (0.0147)
High school		0.1759*** (0.0135)	0.0429*** (0.0092)		0.1208*** (0.0131)	0.0429*** (0.0092)		0.3140*** (0.0196)	0.0429*** (0.0092)
Post-secondary, university and higher		0.1167*** (0.0145)	-0.0026 (0.0094)		0.0873*** (0.0142)	-0.0026 (0.0094)		0.3131*** (0.0236)	-0.0026 (0.0094)
Father was self-employed	0.0975*** (0.0081)			0.0975*** (0.0081)			0.0975*** (0.0081)		
Vocational high-school	-0.0217*** (0.0073)			-0.0217*** (0.0073)			-0.0217*** (0.0073)		
Past self-employment	-0.1786*** (0.0293)			-0.1786*** (0.0293)			-0.1786*** (0.0293)		
First job was self-employed	0.6909*** (0.0154)			0.6909*** (0.0154)			0.6909*** (0.0154)		
Years of unemployment	-0.0033* (0.0018)			-0.0033* (0.0018)			-0.0033* (0.0018)		
Tenure	-0.0022 (0.0015)			-0.0022 (0.0015)			-0.0022 (0.0015)		
Tenure squared	-0.0001*** (0.0000)			-0.0001*** (0.0000)			-0.0001*** (0.0000)		
Years of potential work experience	-0.0024* (0.0014)			-0.0024* (0.0014)			-0.0024* (0.0014)		
Years of potential work experience squared	0.0003*** (0.0000)			0.0003*** (0.0000)			0.0003*** (0.0000)		
Under 15 dependency ratio	0.1319*** (0.0180)	0.0049 (0.0221)	0.0580*** (0.0148)	0.1319*** (0.0180)	-0.0061 (0.0224)	0.0580*** (0.0148)	0.1319*** (0.0180)	-0.0817** (0.0375)	0.0580*** (0.0148)
2007 unemployment rate	-0.8277 (0.5431)			-0.8277 (0.5431)			-0.8277 (0.5431)		
Constant	0.1090 (0.0704)	0.8369*** (0.0194)	-0.3048*** (0.0184)	0.1090 (0.0704)	0.8297*** (0.0192)	-0.3048*** (0.0184)	0.1090 (0.0704)	1.0694*** (0.0338)	-0.3048*** (0.0184)
Governorate fixed effects	Yes			Yes			Yes		
$\frac{\gamma}{\alpha} - \frac{\beta}{\delta}$.1465*** (.0479)			.3183** (.0804)			.0749* (.0384)	
Observations		10,592			10,592			10,592	
Variance of errors	0.1243*** (0.0020)	0.2055*** (0.0038)	0.0860*** (0.0021)	0.1243*** (0.0020)	0.2040*** (0.0053)	0.0860*** (0.0021)	0.1243*** (0.0020)	0.5560*** (0.0080)	0.0860*** (0.0021)
F-statistics (instrument)			86.42			86.42			86.42
P-value (instrument)			0.0000			0.0000			0.0000

Notes: The dependent variable is a binary variable taking unity if a working-age individual is self-employed; 0, if employed, wage-employed or unpaid, contributing to family work. Observations are working-age individuals with no migration experience or return migrants from abroad, excluding individuals living in a household with members currently abroad and those living in a household with members who returned from migration abroad, adding governorate fixed effects. Columns (1), (4) and (7) present GSEM coefficient estimates of self-employment equation; Columns (2), (5) and (8) present GSEM coefficient estimates of balanced skills-mix (accumulated occupations, sectors or jobs, respectively) equation; and Columns (3), (6) and (9) present GSEM coefficient estimates of return migration equation. Standard errors clustered at the household level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The marginal effects of return migration on self-employment through the development of a balanced skill profile are displayed at the bottom of the table. Having migrated statistically significantly increases the probability of being self-employed, as accumulating occupational, sectoral and job experience increases the likelihood of being self-employed respectively by 14.65 percentage points, 31.83 and 7.49. Using a continuous variable measuring return migration, years abroad, as in Table 3, yields estimates similar in sign and significance, albeit of a much smaller magnitude. An additional year abroad increases the likelihood of being self-employed in a non-agricultural sectors by 2.49 percentage points via exposure to diverse occupations; by 5.42, when exposed to multiple industries; and by 1.28, the greater the number of job. Readers should however be cautious in interpreting these results as the linear probability model estimated does not account for the censored nature of the number of years abroad.

These results suggest that migration can contribute to the formation of entrepreneurial abilities by building skills through varied occupations and industrial sectors. This findings corroborate those of [Lechmann and Schnabel \(2014\)](#) or [Hessels et al. \(2014\)](#). Migration appears to be a process shaping entrepreneurs. The job accumulation channel is weaker. Changing jobs – job turnover – could affect entrepreneurial mindsets²² by lowering the degree of risk aversion to job change, rather than affecting entrepreneurial abilities,²³ like accumulating occupations and sectors do. This could imply that this is not a relevant measure of, or does not contribute to the formation of, a skills-mix conducive to entrepreneurship as such, but by an alternative channel such as the degree of risk aversion.

5.2 Robustness checks

We check the robustness of our identification strategy, as in [Bertoli and Marchetta \(2015\)](#). First, Figure 2 showed that the steady decrease in the share of returnees from 1979 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 1979 or later, and who emigrated to MENA countries in the early 2000s have not yet returned to Egypt; or, if they have, they may not be representative of the pool of Egyptians who left in the 2000s. Therefore, this trend does not necessarily mirror a change in the relationship between historical real price of oil and temporary migration used to control for the endogeneity of migration. Table 3 presents estimates of a sample limited to working-age individuals born before 1979, for which we used the real price of oil at 20 years old, applying the same selection criterion for instrument selection as above. Coefficient estimates and marginal effects of return migration on self-employment do not differ substantially from benchmark results. Being a return migrant of working age and born before 1979 increases the likelihood of self-employment with the number of occupation (20.67 percentage points), sectors (32.21) and jobs (24.69). Estimates have a higher statistical significance.

Second, if the historical price of oil is assumed to drive the demand for non-native labour both directly, in oil-producer countries, and indirectly, in non-oil producer countries, some could argue that the later effect is weaker, if not insignificant. As in [Bertoli and Marchetta \(2015\)](#), we exclude people who first emigrated to non-oil producer countries – Jordan, Lebanon, Syria and Yemen – from the estimation sample. Table 3 shows that coefficient estimates and marginal effects of return migration on self-employment follow the same pattern as benchmark results.

²² Entrepreneurial mindsets are defined as ‘the socio-emotional skills and overall awareness of entrepreneurship associated with entrepreneurial motivation and future success as an entrepreneur’ such as self-confidence, leadership, creativity, risk propensity, resilience, etc. ([Valerio et al., 2014](#), p. 36).

²³ 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).

Return migration increases the likelihood of self-employment with the number of occupations (12.58 percentage points), and with the number of sectors (32.55); the job accumulation channel, with a positive sign, is however, statistically insignificant.

Lastly, we use an alternative instrumental variable, changes in the yearly average of the official exchange rate of the Egyptian Pound to US dollar, in local currency unit per US dollar,²⁴ at a potential age of emigration to obtain exogenous variations in return migration. The lower Egypt's official exchange rate, that is the weaker the Egyptian Pound, the greater the incentive to emigrate. Historical, matched exchange rates are assumed to act as pull factor, reflecting how profitable, in monetary terms, working abroad is. Exchange rates could influence the contemporaneous profitability of some industries more than others, and affect occupational choice upon return observed in the data. However, by including both wage- and self-employment in all sectors of the economy, and matching exchange rates to some potential age of emigration, (lagged) exchange rates should not be directly related to occupational choice upon return. In addition, because emigration to MENA countries is temporary in nature, predicting emigration should suffice to instrument return migration. We proceed as in [Bertoli and Marchetta \(2015\)](#) to select the age at which individuals have to be matched to the exchange rate, and rely on an optimality criterion to choose out of 11 alternative ages, from 18 to 28 years old. The F-statistic is the highest for 24 years old for return migration (binary variable). We thus opt for the official exchange rate at 24 years old to instrument for temporary migration to MENA countries. Benchmark specifications yield similar estimates, although greater in significance and magnitude. [Table 3](#) suggests that, return migration increases the probability to be self-employed upon return with the number of occupational (by 20.79 percentage points), industries (47.85) and jobs (43.25).

²⁴Data on official exchange rates in local currency unit per US dollar are available on the website of the World Bank.

Table 3: Robustness of identification strategy

Variables	Self-employed (1)	Accumulated occupations (2)	Returnee (3)	Self-employed (4)	Accumulated sectors (5)	Returnee (6)	Self-employed (7)	Accumulated jobs (8)	Returnee (9)
<i>Number of years abroad (intensive margin)</i>									
Micro-enterprise	0.1448*** (0.0095)	0.4654*** (0.0110)		0.1448*** (0.0095)	0.2829*** (0.0109)		0.1448*** (0.0095)	0.9142*** (0.0165)	
Oil price (19)		0.0007*** (0.0002)	0.0083*** (0.0012)		0.0009*** (0.0002)	0.0083*** (0.0012)		0.0007* (0.0004)	0.0083*** (0.0012)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\lambda}{\alpha} \cdot \frac{\beta}{\delta}$.0249*** (.0086)			.0542*** (.0150)			.0128* (.0067)	
Observations		10,592			10,592			10,592	
Variance of errors	0.1243*** (0.0020)	0.2055*** (0.0038)	4.1125*** (0.3308)	0.1243*** (0.0020)	0.2040*** (0.0053)	4.1125*** (0.3308)	0.1243*** (0.0020)	0.5560*** (0.0080)	4.1125*** (0.3308)
F-statistic (instrument)			44.69			44.69			44.69
P-value (instrument)			0.0000			0.0000			0.0000
<i>Born before 1979</i>									
Micro-enterprise	0.1548*** (0.0126)	0.4388*** (0.0141)		0.1548*** (0.0126)	0.2884*** (0.0143)		0.1548*** (0.0126)	0.8153*** (0.0218)	
Oil price (19)		0.0014*** (0.0003)	0.0023*** (0.0002)		0.0014*** (0.0003)	0.0023*** (0.0002)		0.0030*** (0.0005)	0.0023*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\lambda}{\alpha} \cdot \frac{\beta}{\delta}$.2067*** (.0490988)			.3221*** (.0737862)			.2469*** (.0416881)	
Observations		6,434			6,434			6,434	
Variance of errors	0.1457*** (0.0025)	0.2299*** (0.0051)	0.1143*** (0.0029)	0.1457*** (0.0025)	0.2433*** (0.0071)	0.1143*** (0.0029)	0.1457*** (0.0025)	0.5841*** (0.0098)	0.1143*** (0.0029)
F-statistic (instrument)			106.28			106.28			106.28
P-value (instrument)			0.0000			0.0000			0.0000
<i>Migration to oil-producer countries</i>									
Micro-enterprise	0.1424*** (0.0096)	0.4647*** (0.0110)		0.1424*** (0.0096)	0.2753*** (0.0110)		0.1424*** (0.0096)	0.8984*** (0.0165)	
Oil price (19)		0.0006*** (0.0002)	0.0014*** (0.0001)		0.0009*** (0.0002)	0.0014*** (0.0001)		0.0005 (0.0004)	0.0014*** (0.0001)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\lambda}{\alpha} \cdot \frac{\beta}{\delta}$.1258*** (.0475)			.3255*** (.0831)			.0600 (.0397)	
Observations		10,409			10,409			10,409	
Variance of errors	0.1226*** (0.0020)	0.2011*** (0.0038)	0.0743*** (0.0021)	0.1226*** (0.0020)	0.1992*** (0.0053)	0.0743*** (0.0021)	0.1226*** (0.0020)	0.5493*** (0.0081)	0.0743*** (0.0021)
F-statistic (instrument)			88.63			88.63			88.63
P-value (instrument)			0.0000			0.0000			0.0000
<i>Official exchange rate at 24 years old as instrument</i>									
Micro-enterprise	0.1448*** (0.0095)	0.4565*** (0.0110)		0.1448*** (0.0095)	0.2706*** (0.0108)		0.1448*** (0.0095)	0.8799*** (0.0162)	
Exchange rate (24)		-0.0244*** (0.0023)	-0.0372*** (0.0047)		-0.0333*** (0.0024)	-0.0372*** (0.0047)		-0.0979*** (0.0038)	-0.0372*** (0.0047)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\lambda}{\alpha} \cdot \frac{\beta}{\delta}$.2079*** (.0351)			.4785*** (.0749)			.4325*** (.0616)	
Observations		10,592			10,592			10,592	
Variance of errors	0.1243*** (0.0020)	0.2035*** (0.0038)	0.0862*** (0.0021)	0.1243*** (0.0020)	0.2004*** (0.0051)	0.0862*** (0.0021)	0.1243*** (0.0020)	0.5216*** (0.0076)	0.0862*** (0.0021)
F-statistic (instrument)			63.99			63.99			63.99
P-value (instrument)			0.0000			0.0000			0.0000

Notes: The dependent variable is a binary variable taking unity if a working-age individual is self-employed; 0, if employed, wage-employed or unpaid, contributing to family work. Observations are working-age individuals with no migration experience or return migrants from abroad, excluding individuals living in a household with members currently abroad, and those living in a household with members who returned from migration abroad. Columns (1), (4) and (7) present GSEM coefficient estimates of self-employment equation; Columns (2), (5) and (8) present GSEM coefficient estimates of balanced skills-mix (accumulated occupations, sectors or jobs, respectively) equation; and Columns (3), (6) and (9) present GSEM coefficient estimates of return migration equation. In the first panel, return migration is captured in number of years spent abroad. In the second panel, the estimation sample is limited to individuals born before 1979. In the third panel, the estimation sample is limited to migration to oil-producer countries. In the last panel, return migration is instrumented by the official exchange rate at 24 years old. Standard errors clustered at the household level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

5.3 Heterogeneous effects

When limiting the estimation sample to those working in agriculture, Table A1 points to an insignificant relation between return migration and self-employment through the development of a balanced skills-set: none marginal effect is significant; the sign on the number of occupations is negative. This change in sign and significance compared to those working in a non-agricultural sector, suggests that either agricultural entrepreneurship does not require the same set of occupational skills than non-agricultural sectors, but a rather specialist skills-mix; or that return migration affects self-employment in agricultural sectors through channels other than the accumulation of human capital, through migration-induced monetary flows for instance. This might support McCormick and Wahba's (2001) findings: overseas savings might have a stronger effect on self-employment in agriculture than human capital if the self-employed in agriculture are of lower educational attainment, or did not change occupations while away or upon return, that is if migrating did not give them the opportunity to accumulate diverse enough occupational skills. This 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, and in particular being farmer, may not require the experience gathered while working abroad – having migrated may not be 'enough' or relevant, as it may not provide the capital necessary to start agricultural activities or access land.

Table A2 shows that, return migration increases the likelihood of self-employment with the number of distinct occupations (19.34 percentage points), sectors (34.27) and jobs (10.04), only in rural areas. This suggests that return migration in Egypt might affect rural off-farm entrepreneurship, potentially contributing to the structural reallocation of its labour force.

Since return migrants are significantly more likely to have savings (9.27 percent) than non-migrants (7.23) (see Table 1), not accounting for potentially migration-induced savings could bias the estimates. In the absence of an additional instrumental variable, we disentangle the financial and human capital channels by running the above SUR linear probability model on two sub-samples, based on possession of savings. Table A3 reveals that having migrated increases the probability to be self-employed upon return by developing a balanced skills-mix only for those who do not have savings. Given that our instrument is weak for the sub-sample with savings, these estimates support the previous set of results for individuals who do not have savings, indicating the existence of a migration-induced entrepreneurial human capital, beyond any potential wealth effect.

With reference to benchmark specifications (Table 2), we eventually assess whether return migration influences entrepreneurship through the formation of a varied skills-set not only in terms of occupational choice, but also productivity, as a measure of 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 do not innovate much, nor generate jobs; many fail. Whether return migrants survive in their entrepreneurial activities has received relatively less attention in the literature.²⁵ Business survival might indeed be a precondition for a lasting, positive effect of migrants' activities upon return, in particular in a developing country context, where the turnover of MSEs is high (Marchetta, 2012). Similarly to the decision to become self-employed, the accumulation of financial, human

²⁵To the best of our knowledge, only Marchetta (2012) has specifically studied the persistence of returnees' entrepreneurial activities.

or social capitals could, respectively, loosen financial constraints to set up a firm, grow, or thrive by improving entrepreneurs' abilities, and developing their network. Migration experience could thus help establishing more stable activities. However, while abroad, migrants may lose some social capital at home, a disadvantage upon return as contacts can be useful in managing a rather small entity. Returnees might also enjoy more or better wage-employed opportunities upon return, which could reduce their incentives to opt for self-employment, or the interest in persisting as self-employed (Marchetta, 2012).

Tables B1 to B4 consider the productivity of self-employed activities. Descriptive statistics suggest that return migrants experience upward occupational mobility (see Table B1), as well as a transition to tertiary activities (see Table B2). Table B3 looks at the 'survival' of return migrants as self-employed; Table B4, the effect of return migration on firms' job creation potentials. Using the number of years (tenure) of the current self-employed position, Table B3 suggests that having migrated significantly increases the number of years of current self-employment with occupations (2.88 years), sectors (6.26) and jobs (1.47), supporting the dynamics between return migration and occupational choice found above. Using the average number of years of self-employment over the four last spells of job as outcome variable, it suggests that the average tenure of self-employment²⁶ is significantly affected by return migration through the number of jobs an individual has accumulated (increase by 0.73 years), and the number of industries (1.59 years) and occupations (.37) an individual was exposed to. In comparison, gaining experience in diverse occupation and industries abroad similarly affects the propensity to be employer or own-account worker upon return. These estimates confirm the influence of migration in developing human capital critical for entrepreneurship to set up a business and persist as self-employed; creating jobs as self-employed might require more.

6 Concluding remarks

There is no consensus on whether one is born with innate entrepreneurial ability or whether entrepreneurial ability can be learnt. This paper contributes to filling gaps in the empirical literature on entrepreneurship by unpacking migration as a learning experience for self-employment. Using Lazear's (2005) Jack-of-all-trades framework, we posited that migration leads to a more balanced skills-set, resulting in a greater propensity to self-employment among return migrants than among those who never migrated, so-called stayers. Our results, robust to the endogeneity of temporary migration, indicate that in non-agricultural sectors, return migration increases the propensity to be self-employed by affecting entrepreneurial mindsets and abilities. Migration increases the likelihood of self-employment and survival of entrepreneurial activities through the development of entrepreneurial abilities – in this paper, the exposure to varied occupations or industries. By inducing job changes, migration leads to greater job turnover, likely to enhance the propensity to take risk, to either change job or opt for self-employment. Results hold for non-agricultural activities, rural areas, and controlling for the possession of savings.

We provide additional evidence to the current debate on the development impacts of (return) migration on communities of origin by showing that not only migration-induced wealth effect, but also the work experience gained abroad as such can affect migrants' occupational choice upon return. Migration could contribute to the formation of a balanced human capital conducive to entrepreneurship by facilitating the accumulation of skills; it can be seen as a process shaping entrepreneurial abilities.

²⁶ Measured as the number of years as self-employed divided by number of jobs over a maximum of four job spells.

We also contribute to the scarce literature on empirically testing Lazear's (2005) Jack-of-all-trades hypothesis in a developing economy with prevalent international migration, where understanding the development potentials of migration might be relevant. Because there, self-employed evolve in underdeveloped, ill-functioning market-supporting institutions, they should be much more generalist to handle almost all dimensions of business management (Chen and Hu, 2012). As migrating tends to occur out of necessity in Egypt, by understanding how migration might offer learning opportunities, this paper confirms that entrepreneurship can be learnt, and that learning-by-doing and experiential learning matter for entering into and persisting in self-employment (Hessels et al., 2014), moreover since the MSE sector has often been thought as a potential solution to Egypt's high youth unemployment.

Entrepreneurship (education) support policies should thus focus on widening the work experience of potential, fledging entrepreneurs, accounting for differences in sectors of occupation (farm versus off-farm) and location (rural versus rural). Agricultural entrepreneurship in particular might be facing institutional and geography-specific challenges, and might require easier access to land as well as skill specialisation rather than diversification of the human capital critical for successful entrepreneurship. Easier access to land, land consolidation, or modernisation of the farming sector could enable farmers to move away from subsistence farming towards higher efficiency and economies of scale, and to reallocate labour towards sectors of higher productivity – potentially seizing more of what migration can bring (Morsy et al., 2014).

Acknowledgements

The author would like to acknowledge the support of the European Union under the Marie Curie Initial Training Network (ITN) Transnational Migration, Citizenship and the Circulation of Rights and Responsibilities (TRANSMIC) (Grant Agreement No. 608417), as well as the Economic Research Forum for providing the database used in this paper; Ragui Assaad and Caroline Krafft for kindly answering questions about the database. The author is furthermore grateful to her supervisors, Wim Naudé and Melissa Siegel, and various colleagues who provided comments, suggestions and encouragements, in particular Mueid Al Raee, Fernanda Bácia de Mattos, Micheline Goedhuys, Francesca Marchetta, Pierre Mohnen, Sergio Parra-Cely and Tamer Taha. The usual disclaimer applies.

References

- Amuedo-Dorantes, C. and Pozo, S. (2006). Remittance receipt and business ownership in the Dominican Republic. *The World Economy*, 29(7):939–956.
- Assaad, R. and Kraft, C. (2013). The Egypt Labor Market Panel Survey: Introducing the 2012 round. *ERF Working Paper No. 758*. Giza: Economic Research Forum.
- Astebro, T. and Thompson, P. (2011). Entrepreneurs: Jacks of all trades or hobos? *Research Policy*, 40(5):637–649.
- Atinc, T., Banerjee, A., Ferreira, F., Lanjouw, P., Menendez, M., Ozler, B., Prennushi, G., Rao, V., Robinson, J., Walton, M., and Woolcock, M. (2005). *World development report 2006: Equity and development*. World Bank Group.
- Batista, C., McIndoe-Calder, T., and Vicente, P. (2017). Return migration, self-selection and entrepreneurship. *Oxford Bulletin of Economics and Statistics*.
- Bertoli, S. and Marchetta, F. (2015). Bringing it all back home – Return migration and fertility choices. *World Development*, 65:27–40.
- Binzel, C. and Assaad, R. (2011). Egyptian men working abroad: Labor supply responses by the women left behind. *Labour Economics*, 18(S1):S98–S114.
- Black, R. and Castaldo, A. (2009). Return migration and entrepreneurship in Ghana and Cote d’Ivoire: The Role of capital transfers. *Tijdschrift voor Economische en Sociale Geografie*, 100(1):44–58.
- Cameron, A. and Trivedi, P. (2009). *Microeconometrics using Stata*. Stata press edition.
- Chen, Y. and Hu, F. (2012). Are Entrepreneurs Jacks-of-all-trades? Evidence from a return migration survey in rural China. Working paper, mimeo.
- Démurger, S. and Xu, H. (2011). Return migrants: The Rise of new entrepreneurs in rural China. *World Development*, 39(10):1847–1861.
- Dustmann, C. and Kirchkamp, O. (2002). The Optimal migration duration and activity choice after re-migration. *Journal of Development Economics*, 67(2):351–372.
- El-Mallakh, N. and Wahba, J. (2016). Upward or downward: Occupational mobility and return migration. *ERF Working Paper No. 1010*. Giza: Economic Research Forum.
- ERF and CAPMAS (2013). Egypt Labor Market Panel Survey, ELMPS (2012), Version 2.1 of the licensed data files. Provided by the Economic Research Forum, available at <http://www.erfdataportal.com/index.php/catalog> [accessed in May 2015].
- Ghanem, H. (2013). The Role of micro and small enterprises in Egypt’s economic transition. *Global Economy & Development Working Paper No. 55*.
- Gibson, J., McKenzie, D., and Stillman, S. (2013). Accounting for selectivity and duration-dependent heterogeneity when estimating the impact of emigration on incomes and poverty in sending areas. *Economic Development and Cultural Change*, 61(2):247–280.
- Giulietti, C., Wahba, J., and Zimmermann, K. (2013). Entrepreneurship of the left behind. *IZA Discussion Paper No. 7270*. Bonn: Institute for the Study of Labor.

- Gubert, F. and Nordman, C. (2011). Return migration and small enterprise development in the Maghreb. In Plaza, S. and Ratha, D., editors, *Diaspora for Development in Africa*, pages 103–126. Washington, D.C.: World Bank.
- Hessels, J., Brixy, U., Naudé, W., and Gries, T. (2014). Skill variety, innovation and new business formation. *IZA Working Paper No. 7889*. Bonn: Institute for the Study of Labor.
- Kilic, T., Calogero, C., Davis, B., and Zezza, A. (2009). Investing back home: Return migration and business ownership in Albania. *Economics of Transition*, 17(3):587–623.
- Lazear, E. P. (2005). Entrepreneurship. *Journal of Labor Economics*, 24(4).
- Lazear, E. P. and Gibbs, M. (2010). *Personnel Economics in Practice, 2nd Edition*.
- Lechmann, D. and Schnabel, C. (2014). Are the self-employed really jacks-of-all-trades? Testing the assumptions and implications of Lazear’s theory of entrepreneurship with German data. *Small Business Economics*, 42(1):59–76.
- Marchetta, F. (2012). Return migration and the survival of entrepreneurial activities in Egypt. *World Development*, 40(10):1999–2013.
- McCormick, B. and Wahba, J. (2001). Overseas work experience, savings and entrepreneurship among return migrants to LDCs. *Scottish Journal of Political Economy*, 48(2).
- Mesnard, A. (2004). Temporary migration and capital market imperfections. *Oxford Economic Papers*, 56(2):242–262.
- Morsy, H., Levy, A., and Sanchez, C. (2014). Growing without changing: A Tale of Egypt’s weak productivity growth. *EBRD Working Paper No. 172*. London: European Bank for Reconstruction and Development.
- Obukhova, E., Wang, Y., and Li, J. (2012). The Power of local networks: Returnee entrepreneurs, school ties, and firm performance. Working Paper, mimeo.
- Paxson, C. and Schady, N. (2004). Child health and economic crisis in Peru. *World Bank Policy Research Working Paper Series No. 3260*. Washington, D.C.: World Bank.
- Paxson, C. and Schady, N. (2007). Cognitive development among young children in Ecuador: The Roles of wealth, health and parenting. *The Journal of Human Resources*, 42(1):49–84.
- Silva, O. (2007). The Jack-of-all-trades entrepreneur: Innate talent or acquired skill? *Economics letters*, 97(2):118–123.
- Stuetzer, M., Obschonka, M., E., and Schmitt-Rodermund (2013). Balanced skills among nascent entrepreneurs. *Small Business Economics*, 41(1):93–114.
- Valerio, A., Parton, B., and Robb, A. (2014). Entrepreneurship education and training program around the world: Dimensions for success. Washington, D.C.: World Bank.
- Wahba, J. (2009). An Overview of internal and international migration in Egypt. In Assaad, R., editor, *Egypt’s labor market revisited*, chapter 5. The American University in Cairo Press.
- Wahba, J. (2014). Through the keyhole: International migration in Egypt. *ERF Working Paper No. 830*. Giza: Economic Research Forum.
- Wahba, J. (2015). Selection, selection, selection: The Impact of return migration. *Journal of Population Economics*, 28:535–563.

- Wahba, J. and Zenou, Y. (2012). Out of sight, out of mind: Migration, entrepreneurship and social capital. *Regional Science and Urban Economics*, 42:890–903.
- Zohry, A. (2009). The Development impact of internal migration: findings from Egypt. In *The 26th International Conference on Population, IUSSP, Marrakech, 27 Sep.-2 Oct.*

Appendices

A Robustness of benchmark estimates

Table A1: Agricultural versus non agricultural sectors

Variables	Self-employed (1)	Accumulated occupations (2)	Returnee (3)	Self-employed (4)	Accumulated sectors (5)	Returnee (6)	Self-employed (7)	Accumulated jobs (8)	Returnee (9)
<i>Agricultural sector</i>									
Micro-enterprise	0.2737*** (0.0297)	0.1137*** (0.0154)		0.2737*** (0.0297)	0.2173*** (0.0184)		0.2737*** (0.0297)	1.2419*** (0.0314)	
Oil price (19)		-0.0003 (0.0004)	0.0020*** (0.0004)		0.0001 (0.0005)	0.0020*** (0.0004)		0.0003 (0.0007)	0.0020*** (0.0004)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$		-.3067 (.4601)			.0707 (.2877)			.0354 (.0779)	
Observations		1,587			1,587			1,587	
Variance of errors	0.1277*** (0.0046)	0.0847*** (0.0074)	0.1170*** (0.0058)	0.1277*** (0.0046)	0.1287*** (0.0082)	0.1170*** (0.0058)	0.1277*** (0.0046)	0.3590*** (0.0171)	0.1170*** (0.0058)
F-statistic (instrument)			20.27			20.27			20.27
P-value (instrument)			0.0000			0.0000			0.0000
<i>Non-agricultural sector</i>									
Micro-enterprise	0.1125*** (0.0097)	0.5346*** (0.0123)		0.1125*** (0.0097)	0.2956*** (0.0125)		0.1125*** (0.0097)	0.8443*** (0.0185)	
Oil price (19)		0.0007*** (0.0002)	0.0013*** (0.0002)		0.0010*** (0.0002)	0.0013*** (0.0002)		0.0007* (0.0004)	0.0013*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.1126*** (.0380)			.2871*** (.0752)			.0701* (.0389)	
Observations		9,005			9,005			9,005	
Variance of errors	0.1132*** (0.0023)	0.2046*** (0.0042)	0.0802*** (0.0023)	0.1132*** (0.0023)	0.2154*** (0.0059)	0.0802*** (0.0023)	0.1132*** (0.0023)	0.5781*** (0.0087)	0.0802*** (0.0023)
F-statistic (instrument)			66.29			66.29			66.29
P-value (instrument)			0.0000			0.0000			0.0000

Notes: The dependent variable is a binary variable taking unity if a working-age individual is self-employed; 0, if employed, wage-employed or unpaid, contributing to family work. Observations are working-age individuals with no migration experience or return migrants from abroad, excluding individuals living in a household with members currently abroad and those living in a household with members who returned from migration abroad, adding governorate fixed effects. Columns (1), (4) and (7) present GSEM coefficient estimates of self-employment equation; Columns (2), (5) and (8) present GSEM coefficient estimates of balanced skills-mix (accumulated occupations, sectors or jobs, respectively) equation; and Columns (3), (6) and (9) present GSEM coefficient estimates of return migration equation. Standard errors clustered at the household level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A2: Rural versus urban areas

Variables	Self-employed (1)	Accumulated occupations (2)	Returnee (3)	Self-employed (4)	Accumulated sectors (5)	Returnee (6)	Self-employed (7)	Accumulated jobs (8)	Returnee (9)
<i>Rural</i>									
Micro-enterprise	0.1643*** (0.0129)	0.4379*** (0.0143)		0.1643*** (0.0129)	0.2957*** (0.0144)		0.1643*** (0.0129)	0.9866*** (0.0218)	
Oil price (19)		0.0010*** (0.0003)	0.0019*** (0.0002)		0.0012*** (0.0003)	0.0019*** (0.0002)		0.0012** (0.0005)	0.0019*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.1934*** (.0647)			.3427*** (.0952)			.1004** (.0397)	
Observations		5,454			5,454			5,454	
Variance of errors	0.1355*** (0.0028)	0.2213*** (0.0053)	0.1030*** (0.0030)	0.1355*** (0.0028)	0.2207*** (0.0074)	0.1030*** (0.0030)	0.1355*** (0.0028)	0.5282*** (0.0111)	0.1030*** (0.0030)
F-statistic (instrument)			67.41			67.41			67.41
P-value (instrument)			0.0000			0.0000			0.0000
<i>Urban</i>									
Micro-enterprise	0.1259*** (0.0139)	0.4980*** (0.0169)		0.1259*** (0.0139)	0.2639*** (0.0166)		0.1259*** (0.0139)	0.8287*** (0.0252)	
Oil price (19)		0.0004 (0.0003)	0.0009*** (0.0002)		0.0006** (0.0003)	0.0009*** (0.0002)		0.0003 (0.0005)	0.0009*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.1067 (.0785)			.3047* (.1553)			.0446 (.0852)	
Observations		5,138			5,138			5,138	
Variance of errors	0.1106*** (0.0029)	0.1865*** (0.0055)	0.0658*** (0.0029)	0.1106*** (0.0029)	0.1856*** (0.0074)	0.0658*** (0.0029)	0.1106*** (0.0029)	0.5807*** (0.0116)	0.0658*** (0.0029)
F-statistic (instrument)			23.71			23.71			23.71
P-value (instrument)			0.0000			0.0000			0.0000

Notes: The dependent variable is a binary variable taking unity if a working-age individual is self-employed; 0, if employed, wage-employed or unpaid, contributing to family work. Observations are working-age individuals with no migration experience or return migrants from abroad, excluding individuals living in a household with members currently abroad, and those living in a household with members who returned from migration abroad. Columns (1), (4) and (7) present GSEM coefficient estimates of self-employment equation; Columns (2), (5) and (8) present GSEM coefficient estimates of balanced skills-mix (accumulated occupations, sectors or jobs, respectively) equation; and Columns (3), (6) and (9) present GSEM coefficient estimates of return migration equation. Standard errors clustered at the household level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Possession of savings

Variables	Self-employed (1)	Accumulated occupations (2)	Returnee (3)	Self-employed (4)	Accumulated sectors (5)	Returnee (6)	Self-employed (7)	Accumulated jobs (8)	Returnee (9)
<i>Without savings</i>									
Micro-enterprise	0.1345*** (0.0097)	0.4619*** (0.0112)		0.1345*** (0.0097)	0.2844*** (0.0112)		0.1345*** (0.0097)	0.9282*** (0.0168)	
Oil price (19)		0.0007*** (0.0002)	0.0014*** (0.0002)		0.0009*** (0.0002)	0.0014*** (0.0002)		0.0006* (0.0004)	0.0014*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.1531*** (.0483)			.3099*** (.0790)			.0652* (.0365)	
Observations		9,790			9,790			9,790	
Variance of errors	0.1233*** (0.0021)	0.2057*** (0.0040)	0.0848*** (0.0022)	0.1233*** (0.0021)	0.2021*** (0.0054)	0.0848*** (0.0022)	0.1233*** (0.0021)	0.5421*** (0.0083)	0.0848*** (0.0022)
F-statistic (instrument)			77.70			77.70			77.70
P-value (instrument)			0.0000			0.0000			0.0000
<i>With savings</i>									
Micro-enterprise	0.3310*** (0.0397)	0.4867*** (0.0493)		0.3310*** (0.0397)	0.2433*** (0.0504)		0.3310*** (0.0397)	0.6611*** (0.0758)	
Oil price (19)		0.0001 (0.0007)	0.0017*** (0.0006)		0.0006 (0.0008)	0.0017*** (0.0006)		0.0013 (0.0015)	0.0017*** (0.0006)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.0475 (.2789)			.4903 (.6404)			.3885 (.4087)	
Observations		802			802			802	
Variance of errors	0.1196*** (0.0067)	0.1930*** (0.0142)	0.0982*** (0.0074)	0.1196*** (0.0067)	0.2205*** (0.0204)	0.0982*** (0.0074)	0.1196*** (0.0067)	0.6482*** (0.0290)	0.0982*** (0.0074)
F-statistic (instrument)			8.81			8.81			8.81
P-value (instrument)			0.0031			0.0031			0.0031

Notes: The dependent variable is a binary variable taking unity if a working-age individual is self-employed; 0, if employed, wage-employed or unpaid, contributing to family work. Observations are working-age individuals with no migration experience or return migrants from abroad, excluding individuals living in a household with members currently abroad, and those living in a household with members who returned from migration abroad. Columns (1), (4) and (7) present GSEM coefficient estimates of self-employment equation; Columns (2), (5) and (8) present GSEM coefficient estimates of balanced skills-mix (accumulated occupations, sectors or jobs, respectively) equation; and Columns (3), (6) and (9) present GSEM coefficient estimates of return migration equation. Standard errors clustered at the household level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

B Investigating the productivity of self-employed activities

Table B1: Occupational transition of returnees, before and after migration (%)

		After									%
		Manag.	Prof.	Tech.	Clerical support	Service workers	Skilled agri.	Craft workers	Plant and machinery	Element. occup.	
Before	Manag.	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
	Tech.	14.29	4.08	73.47	2.04	0.00	0.00	4.08	2.04	0.00	100.00
	Clerical support	0.00	12.50	12.50	62.50	0.00	0.00	0.00	12.50	0.00	100.00
	Service workers	14.89	6.38	12.77	2.13	29.79	4.26	10.64	10.64	8.51	100.00
	Skilled agri.	3.90	2.27	4.87	0.32	4.55	59.09	8.12	7.14	9.74	100.00
	Craft workers	10.20	1.18	9.41	3.14	4.71	5.10	52.55	9.02	4.71	100.00
	Plant and machinery	10.00	0.00	10.00	4.00	0.00	6.00	4.00	62.00	4.00	100.00
	Element. occup.	6.25	18.75	0.00	0.00	6.25	0.00	18.75	31.25	18.75	100.00
	Obs.	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 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.

Table B2: Sectoral transition of returnees, before and after migration (%)

		After										%	
		A	Mi	Ma	U	C	Trade	Trans	B	G	P		E
Before	A	59.35	0.32	2.58	0.97	7.42	7.10	5.81	0.32	11.94	3.87	0.32	100.00
	Mi	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
	Ma	3.45	0.00	60.92	0.00	1.15	10.34	9.20	1.15	13.79	0.00	0.00	100.00
	U	0.00	0.00	0.00	66.67	16.67	0.00	0.00	0.00	16.67	0.00	0.00	100.00
	C	6.70	0.56	3.91	2.23	52.51	11.17	8.94	1.12	10.61	2.23	0.00	100.00
	Trade	2.53	1.27	3.80	1.27	8.86	58.23	11.39	2.53	8.86	1.27	0.00	100.00
	Trans	5.13	0.00	5.13	0.00	10.26	5.13	61.54	5.13	7.69	0.00	0.00	100.00
	B	0.00	0.00	0.00	0.00	0.00	7.14	14.29	50.00	28.57	0.00	0.00	100.00
	Gov.	0.00	0.00	2.27	0.00	3.41	2.27	1.14	1.14	88.64	1.14	0.00	100.00
	P	0.00	0.00	0.00	0.00	0.00	10.00	20.00	0.00	10.00	60.00	0.00	100.00
	E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00
Obs.	203	3	76	12	133	103	80	16	162	24	1	813	
%	24.97	0.37	9.35	1.48	16.36	12.67	9.84	1.97	19.93	2.95	0.12	100.00	

Notes: Entries computed with information available for returnees before and after migration. A stands for agriculture; Mi, mining; Ma, manufacturing; U, utilities; C, construction; Tran, transportation; B, business services; G, government; P, personal services; E, extraterritorial organisations.

Table B3: Survival of entrepreneurial activities

Variables	Self-employed (1)	Accumulated occupations (2)	Returnee (3)	Self-employed (4)	Accumulated sectors (5)	Returnee (6)	Self-employed (7)	Accumulated jobs (8)	Returnee (9)
<i>Length of current self-employment</i>									
Micro-enterprise	2.8482*** (0.1637)	0.4654*** (0.0110)		2.8482*** (0.1637)	0.2829*** (0.0109)		2.8482*** (0.1637)	0.9142*** (0.0165)	
Oil price (19)		0.0007*** (0.0002)	0.0014*** (0.0002)		0.0009*** (0.0002)	0.0014*** (0.0002)		0.0007* (0.0004)	0.0014*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$		2.8827*** (.9374)			6.2632*** (1.5597)			1.4745* (.7527)	
Observations		10,592			10,592			10,592	
Variance of errors	41.8247*** (0.9004)	0.2055*** (0.0038)	0.0860*** (0.0021)	41.8247*** (0.9004)	0.2040*** (0.0053)	0.0860*** (0.0021)	41.8247*** (0.9004)	0.5560*** (0.0080)	0.0860*** (0.0021)
F-statistic (instrument)			86.42			86.42			86.42
P-value (instrument)			0.0000			0.0000			0.0000
<i>Average tenure of self-employment</i>									
Micro-enterprise	0.7242*** (0.0927)	0.4654*** (0.0110)		0.7242*** (0.0927)	0.2829*** (0.0109)		0.7242*** (0.0927)	0.9142*** (0.0165)	
Oil price (19)		0.0007*** (0.0002)	0.0014*** (0.0002)		0.0009*** (0.0002)	0.0014*** (0.0002)		0.0007* (0.0004)	0.0014*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.7329*** (.2542)			1.5924*** (.4364)			.3749* (.1964)	
Observations		10,592			10,592			10,592	
Variance of errors	19.4381*** (0.6846)	0.2055*** (0.0038)	0.0860*** (0.0021)	19.4381*** (0.6846)	0.2040*** (0.0053)	0.0860*** (0.0021)	19.4381*** (0.6846)	0.5560*** (0.0080)	0.0860*** (0.0021)
F-statistic (instrument)			86.42			86.42			86.42
P-value (instrument)			0.0000			0.0000			0.0000

Notes: The dependent variable is a continuous variable measuring the number of years of current self-employed activities, in the upper panel; the number of years as self-employed divided by number of jobs over a maximum of four job spells, in the lower panel. Observations are working-age individuals with no migration experience or return migrants from abroad, excluding individuals living in a household with members currently abroad, and those living in a household with members who returned from migration abroad. Columns (1), (4) and (7) present GSEM coefficient estimates of self-employment equation; Columns (2), (5) and (8) present GSEM coefficient estimates of balanced skills-mix (accumulated occupations, sectors or jobs, respectively) equation; and Columns (3), (6) and (9) present GSEM coefficient estimates of return migration equation. Standard errors clustered at the household level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table B4: Job creation of entrepreneurial activities

Variables	Self-employed (1)	Accumulated occupations (2)	Returnee (3)	Self-employed (4)	Accumulated sectors (5)	Returnee (6)	Self-employed (7)	Accumulated jobs (8)	Returnee (9)
<i>Employer</i>									
Micro-enterprise	0.1099*** (0.0084)	0.4715*** (0.0116)		0.1099*** (0.0084)	0.2924*** (0.0117)		0.1099*** (0.0084)	0.9061*** (0.0175)	
Oil price (19)		0.0006*** (0.0002)	0.0013*** (0.0002)		0.0008*** (0.0002)	0.0013*** (0.0002)		0.0005 (0.0004)	0.0013*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.0999** (.0394)			.2280*** (.0662)			.0495 (.0335)	
Observations		9,452			9,452			9,452	
Variance of errors	0.0877*** (0.0020)	0.1967*** (0.0039)	0.0844*** (0.0022)	0.0877*** (0.0020)	0.2017*** (0.0056)	0.0844*** (0.0022)	0.0877*** (0.0020)	0.5596*** (0.0086)	0.0844*** (0.0022)
F-statistic (instrument)			69.09			69.09			69.09
P-value (instrument)			0.0000			0.0000			0.0000
<i>Own-account worker</i>									
Micro-enterprise	0.0622*** (0.0082)	0.4938*** (0.0119)		0.0622*** (0.0082)	0.3166*** (0.0122)		0.0622*** (0.0082)	0.9128*** (0.0177)	
Oil price (19)		0.0008*** (0.0002)	0.0012*** (0.0002)		0.0010*** (0.0002)	0.0012*** (0.0002)		0.0006 (0.0004)	0.0012*** (0.0002)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.0808*** (.0264)			.1721*** (.0454)			.0345 (.0214)	
Observations		9,299			9,299			9,299	
Variance of errors	0.0810*** (0.0022)	0.1957*** (0.0041)	0.0786*** (0.0022)	0.0810*** (0.0022)	0.2031*** (0.0056)	0.0786*** (0.0022)	0.0810*** (0.0022)	0.5633*** (0.0087)	0.0786*** (0.0022)
F-statistic (instrument)			58.49			58.49			58.49
P-value (instrument)			0.0000			0.0000			0.0000
<i>Employer, conditional on self-employment</i>									
Micro-enterprise	0.0707** (0.0281)	0.3564*** (0.0225)		0.0707** (0.0281)	0.1561*** (0.0194)		0.0707** (0.0281)	0.9462*** (0.0347)	
Oil price (19)		0.0006 (0.0005)	0.0026*** (0.0004)		0.0004 (0.0005)	0.0026*** (0.0004)		0.0013* (0.0007)	0.0026*** (0.0004)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
$\frac{\gamma}{\alpha} \cdot \frac{\beta}{\delta}$.0475 (.0425)			.0678 (.0815)			.0380 (.0240)	
Observations		2,433			2,433			2,433	
Variance of errors	0.2237*** (0.0029)	0.2686*** (0.0090)	0.1178*** (0.0046)	0.2237*** (0.0029)	0.2083*** (0.0096)	0.1178*** (0.0046)	0.2237*** (0.0029)	0.5085*** (0.0147)	0.1178*** (0.0046)
F-statistic (instrument)			52.12			52.12			52.12
P-value (instrument)			0.0000			0.0000			0.0000

Notes: The dependent variable is a binary variable taking unity if a working-age individual is an employer (upper and lower panel) or an own-account worker (middle panel); 0, if employed, wage-employed or unpaid, contributing to family work. Observations are working-age individuals with no migration experience or return migrants from abroad, excluding individuals living in a household with members currently abroad, and those living in a household with members who returned from migration abroad. Columns (1), (4) and (7) present GSEM coefficient estimates of self-employment equation; Columns (2), (5) and (8) present GSEM coefficient estimates of balanced skills-mix (accumulated occupations, sectors or jobs, respectively) equation; and Columns (3), (6) and (9) present GSEM coefficient estimates of return migration equation. Upper panel excludes own-account workers. Middle panel excludes employers. Lower panel excludes non self-employed. Standard errors clustered at the household level are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The UNU-MERIT WORKING Paper Series

- 2017-01 *The economic impact of East-West migration on the European Union* by Martin Kahanec and Mariola Pytliková
- 2017-02 *Fostering social mobility: The case of the 'Bono de Desarrollo Humano' in Ecuador* by Andrés Mideros and Franziska Gassmann
- 2017-03 *Impact of the Great Recession on industry unemployment: a 1976-2011 comparison* by Yelena Takhtamanova and Eva Sierminska
- 2017-04 *Labour mobility through business visits as a way to foster productivity* by Mariacristina Piva, Massimiliano Tani and Marco Vivarelli
- 2017-05 *Country risk, FDI flows and convergence trends in the context of the Investment Development Path* by Jonas Hub Frenken and Dorcas Mbuvi
- 2017-06 *How development aid explains (or not) the rise and fall of insurgent attacks in Iraq* by Pui-Hang Wong
- 2017-07 *Productivity and household welfare impact of technology adoption: Micro-level evidence from rural Ethiopia* by Tigist Mekonnen
- 2017-08 *Impact of agricultural technology adoption on market participation in the rural social network system* by Tigist Mekonnen
- 2017-09 *Financing rural households and its impact: Evidence from randomized field experiment data* by Tigist Mekonnen
- 2017-10 *U.S. and Soviet foreign aid during the Cold War: A case study of Ethiopia* by Tobias Broich
- 2017-11 *Do authoritarian regimes receive more Chinese development finance than democratic ones? Empirical evidence for Africa* by Tobias Broich
- 2017-12 *Pathways for capacity building in heterogeneous value chains: Evidence from the case of IT-enabled services in South Africa* by Charlotte Keijser and Michiko Iizuka
- 2017-13 *Is innovation destroying jobs? Firm-level evidence from the EU* by Mariacristina Piva and Marco Vivarelli
- 2017-14 *Transition from civil war to peace: The role of the United Nations and international community in Mozambique* by Ayokunu Adedokun
- 2017-15 *Emerging challenges to long-term peace and security in Mozambique* by Ayokunu Adedokun
- 2017-16 *Post-conflict peacebuilding: A critical survey of the literature and avenues for future research* by Ayokunu Adedokun
- 2017-17 *Effects of health insurance on labour supply: A systematic review* by Nga Le, Wim Groot, Sonila M. Tomini and Florian Tomini
- 2017-18 *Challenged by migration: Europe's options* by Amelie F. Constant and Klaus F. Zimmermann
- 2017-19 *Innovation policy & labour productivity growth: Education, research & development, government effectiveness and business policy* by Mueid Al Raei, Jo Ritzen and Denis de Crombrughe
- 2017-20 *Role of WASH and Agency in Health: A study of isolated rural communities in Nilgiris and Jalpaiguri* by Shyama V. Ramani
- 2017-21 *The productivity effect of public R&D in the Netherlands* by Luc Soete, Bart Verspagen and Thomas Ziesemer
- 2017-22 *The role of migration-specific and migration-relevant policies in migrant decision-making in transit* by Katie Kuschminder and Khalid Koser

- 2017-23 *Regional analysis of sanitation performance in India* by Debasree Bose and Arijita Dutta
- 2017-24 *Estimating the impact of sericulture adoption on farmer income in Rwanda: an application of propensity score matching* by Alexis Habiyaremye
- 2017-25 *Indigenous knowledge for sustainable livelihoods: Lessons from ecological pest control and post-harvest techniques of Baduy (West Java) and Nguni (Southern Africa)* by Leeja C Korina and Alexis Habiyaremye
- 2017-26 *Sanitation challenges of the poor in urban and rural settings: Case studies of Bengaluru City and rural North Karnataka* by Manasi Sessaiah, Latha Nagesh and Hemalatha Ramesh
- 2017-27 *Heterogeneous effects of bilateral investment treaties* by Rod Falvey and Neil Foster-McGregor
- 2017-28 *Willingness to pay for agricultural risk insurance as a strategy to adapt climate change* by Tigist Mekonnen
- 2017-29 *Social protection investments, human capital, and income growth: Simulating the returns to social cash transfers in Uganda* by Stephan Dietrich, Daniele Malerba, Armando Barrientos, Franziska Gassmann, Pierre Mohnen, Nyasha Tirivayi, Susan Kavuma and Fred Matovu
- 2017-30 *Opening and linking up: Firms, global value chains and productivity in Latin America* by Pierluigi Montalbano, Silvia Nenci and Carlo Pietrobelli
- 2017-31 *Husbands' return migration and wives' occupational choices* by Clotilde Mahé
- 2017-32 *The need to customise innovation indicators in developing countries* by Michiko Iizuka and Hugo Hollanders
- 2017-33 *Economic diversification: Explaining the pattern of diversification in the global economy and its implications for fostering diversification in poorer countries* by Clovis Freire
- 2017-34 *How inequality hurts growth: Revisiting the Galor-Zeira model through a Korean case* by Bogang Jun, Mary Kaltenberg and Won-Sik Hwang
- 2017-35 *Is the demand-pull driver equally crucial for product vs process innovation?* by Herbert Dawid, Gabriele Pellegrino and Marco Vivarelli
- 2017-36 *Testing linear growth rate formulas of non-scale endogenous growth models* by Thomas HW Ziesemer
- 2017-37 *Promoting structural transformation: Strategic diversification vs laissez-faire approach* by Clovis Freire
- 2017-38 *On the relationship between the breadth of PTAs and trade flows* by Rod Falvey and Neil Foster-McGregor
- 2017-39 *Occupational choice of return migrants: Is there a 'Jack-of-all-trades' effect?* by Clotilde Mahé