The micro-structure of wages and wage determination in the UAE

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Abstract

The supply of labor in the UAE – as in other GCC economies – is characterized by an overrepresentation of foreign workers (the expatriates) relative to the Emirati (the locals). The consequence is a labor market duality along nationality lines because particular policy treatments apply differently between local Emirati and expatriate workers. To what extend do such differentials in policy treatments determine skill formation and labor market outcomes in the UAE? This paper aims at unveiling the potential effects from such policies using empirical evidence drawn from the 2009 UAE Labor Force Survey. The findings suggest that the Emiratization process – a set of rules that protects Emirati from open market competition – has possible adverse effects for the human capital formation of UAE nationals. Likewise, the Emiratization process can severely reduce the returns to investment on education for native Emirati relative to the returns obtained by comparable sub-groups in the population. The empirical evidence also suggest possible adverse effects as result of the mechanisms underlying the sponsorship system that regulates immigration flows; these mechanisms have the potential to elicit low effort and productivity levels from expatriates irrespective of their skill class. Overall, the evidence suggest that moving towards a knowledge based economy – as mandated in the 2020 UAE Strategic Plan – would require re-thinking and re-shaping existing labor policies for a more efficient allocation of existing and future human capital stocks in the UAE.

Keywords: Labor supply, UAE, returns to labor, wage determination, Emiratization, the Kafala

JEL – Classification: J3, J4, J7 J16, J24

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1. Introduction

Labor earnings are the key signal through which individuals make labor market choices, for example, the choice to participate in paid active employment, invest on-the-job-training, immigrate or even retire earlier than at the official age of retirement. Thus, studying the micro-structure of earnings unveils crucial information on the behavior of those who supply labor (the participants) and those who do not (the non-participants) in relation to their human capital stock. At the same time, understanding the behavior of the workforce – participants or not – provides key information on the potential effect that social interventions – e.g., education policies, labor market policies – have on the supply side of the market. The aim of this paper is to use the recently collected 2009 United Arab Emirates Labor Force Survey to study the micro-structure of wages in the United Arab Emirates (UAE) and unveil information on the characteristics of the work force, estimate wage profiles and wage gaps between sub-groups of workers, and understand the wage determination process in the UAE. The study is innovative for the economy – certainly at Federal level – and provides insight on what motivates the supply side of the labor market with a view to evaluate potential effect of existing labor policies on the future development of the UAE.

The human capital characteristics of the workforce – and the development of such – reflect the economy's long run potential for productivity, innovation and ultimately, potential for economic growth. This is why studying the characteristics and dynamics behind human capital formation is crucial for relatively young nations that are still developing towards their steady state level of growth, as is the case of the United Arab Emirates. Human capital stocks at the individual level depend both on intensive education (formal schooling) and extensive education (on the job training, learning by doing or experience). Whereas intensive education is mostly an institutional outcome, extensive education is significantly motivated by the returns that individuals get from active participation in paid employment, i.e., earnings. Thus, studying the structure of earnings in the economy helps us understand the motivation behind the supply of labor for a given level of educational attainment. The study of earnings is often based on the standard competitive model of the labor market; as examples, see the empirical work by Katz and Murphy, (1992), or more recent review of the model by Lemieux et al., (2009). The model suggests that workers are paid their marginal revenue product so that at any point in time the distribution of earnings reflects the equilibrium condition from market forces. The main implication behind the competitive model is that earnings differentials between workers reflect productivity differentials. Such a simplistic view ignores that labor markets are imperfect and create frictions that, alongside institutional interventions – legal, regulatory and contractual –, results in earnings being set in a direction uncorrelated with workers' skills or potential productivity. Although

the distortions are at the micro-economic level, the implication can be significant at the macro level. This is the case for economies of the Gulf Cooperating Council (GCC) where the idiosyncratic characteristics of the economy – i.e., abundance of natural resources together with relatively small autochthonous populations – induce immigration policies leading to a dual labor market. The duality implies that returns from human capital are often set by factors – e.g., nationality – not necessarily related to the individual's labor market performance or his productivity potential relative to units in a similar skill class. Any study of the micro-economic structure of wages in the UAE (or any other GCC economy) requires accounting for such idiosyncratic characteristics to better understand the potential effect that social and/or labor market related interventions have on labor market outcomes, i.e., on participation, skill formation, wage distribution, wage inequality or the wage gap between socio-economically related sub-groups in the population.

The duality in the UAE's labor market – also fund in other GCC economies – is often justified by the large number of foreign workers that arrive attracted by sponsorship based salaries that are relatively high when compared to salaries obtained back in their countries of origin. The result is that foreign workers supply labor into a market where the local participants are in a minority. In establishing rules that induced two distinct labor markets, the authorities accommodate the uneven representation between locals and expatriates by effectively limiting the movement of the expatriates and heavily protecting the employment of the locals in the population. In practice the duality is possible because of the combined effect between the sponsorship system – known as the *Kafala* system in the Gulf region – and the set of pro-local employment rules in the UAE known as the *Emiratization process*; the latter set of rules aim at motivating the local population towards a more active participation in paid employment. But such a combined effect induces noise on wage determination process so that the final distribution of wages is not necessarily a reflection of labor productivity at the micro-economic level. In fact, the empirical estimates in this paper suggest that the join effect of the Kafala system and the Emiratization process lead to adverse effects on human capital formation for both the locals and expatriate participants. Locals that participate in gainful employment enter the market with an average schooling of 10 years, an average that is similar to that of national expatriates from developing economies and lags behind expatriates from western economies by approximately 6 years. Emiratization could be the reason for such low educational outcome, i.e. Emiratization interferes with those market incentives that would motivate investment on education and might explain why returns to educational investment for Emirati are estimated to be 120% below its potential outcome. At the same time the Kafala system – applied to expatriates – implies that employers can subtract significant rents from about 70% of the labor force – in fact, from all expatriates at all skill classes except for nationals from western types of economies. Overall,

expatriates from Arab non-GCC economies and nationals of developing economies are paid between 170% and 400% less than UAE/GCC nationals (or westerners). The gap varies substantially if we are comparing public versus private sector or according to gender sub-groups. However the gap remains substantial and can only be explained because there is no mobility of the workforce. There is also a significant 'Emirate' effect in the UAE: relative to the poorer Northern Emirates, working in Abu Dhabi implies a significant wage premium for anyone of the sub-populations considered in the empirical analysis; for example, and relative to other Emirates, there is at least a 49% Abu Dhabi premium for western males or 33% premium for females from developing economies. Also relative to the Northern poorer Emirates, there is a significant Dubai premium for all sub-groups except for UAE/GCC nationals. Such regional differences imply a growing development gap between the wealthier Emirates – Dubai and Abu Dhabi – and the remaining 5 Emirates in the UAE. The gap between wealthier and poorer Emirates has significant implications for the nationals because there is critical mass of Emirati (33%) that still live and work in Emirates other than Abu Dhabi or Dubai. Overall, the empirical evidence suggest that existing educational, labor and social/development policies require modification if the UAE aims towards a sophisticated knowledge based economy in tune with its per capital GDP ranking in the world (15th place with a per capita GDP of USA $36500, IMF 2009 estimates).

The paper is organized as follows. Section 2 provides an objective overview of the main rules and regulation governing the UAE's labor market with specific reference to the Emiratization process and the Kafala system. Section 3 presents the 2009 UAE labor force survey and provides estimates to summarize the social and demographic characteristic of the population represented in the data. Section 4 focuses attention on the prime age population in the UAE to explain key labor market outcomes and analyze the distribution of labor income by comparing wage profiles between labor market sub-groups in the UAE. Section 5 provides a detail analysis of wage determination with a particular focus on measuring and comparing returns to human capital investment between sub-groups in the population. Section 6 concludes reflecting on the empirical evidence from preceding sections and how these help us understand the potential implication of existing labor market policies on the further economic development of the United Arab Emirates.

2. Labor Market Regulations in the UAE

Common with other GCC economies, the most striking feature of the UAE's labor market is the large volume of imported workers – the expatriates – the majority of which arrive to occupy low and semi-skill vacancies in the manufacturing and service sector. The trend of importing large

numbers of workers to the UAE – especially from South East Asia and the Indian sub-continent – started in the late 1960s, i.e., during the early stage of economic development triggered by the discovery of natural resources – oil and gas – mostly in the Emirates of Dubai and Abu Dhabi.[1] At present the UAE still imports a significant number of workers either to occupy newly created vacancies or to replace exiting workers who have ended their finite contractual period.[2] In all, the latest figures show that in 2008 the stock of expatriates in the UAE – workers and their families – approximated 3.3 million, i.e., 79.9% of a population of approximately 4.1 million in 2008.[3] The fact that immigrant workers and their families represent a large percentage in the population has social, demographic and economic implications for all the Emirates in the UAE and in particular for the two more economically dynamic Emirates – Dubai and the capital, Abu Dhabi. Clearly, the market that ought to be more directly affected by existing UAE immigration policies is the labor market. The demand and supply of immigrants determine the characteristics of the stock of expatriate workers in the UAE but, at the same time, the same demand and supply of expatriates has direct and indirect implications for the demand and supply of the local natives, i.e., the Emirati workers.

In order to accommodate such massive inflow of workers, the laws that dominate the supply and demand of labor in the UAE are geared towards three main goals; (a) to protect and motivate the participation of the minority local Emirati population in active paid work; (b) to distribute natural resource wealth while enhancing human capital formation and (c) to keep an effective control over the new arrivals and the stock of existing expatriate workers. The laws that support (a) and (b) are gathered under a mandate known as '*the Emiratization process'*; the mandate aims at the gradual incorporation and increase participation of the local Emirati into paid employment. On the other hand, the laws that help implement the target in (c) are summarized under the Sponsorship – or *Kafala* – system. We now explain these in turn starting with an *objective* description of *the Emiratization process*.

According to TANMIA – the federal agency in charge monitoring and smoothing the labor market entry of local Emirati in all Emirates – the key mandate under *the Emiratization process* is to create and find sustainable and meaningful employment for UAE nationals by minimizing matching

[1] Before these initial waves, during the 1950s and 1960s the Gulf region received large numbers of immigrants from poorer neighboring Arab states. These immigrants arrived looking for economic opportunities but also escaping from political turmoil in the region, especially from the Arab-Israeli War of 1948. Thus, before the 1970s nationals from poorer Arab nations had the largest representation in the Gulf. For example, in the early 1970s, Arab worker represented 90% and 30% of all workers in the Kingdom of Saudi Arabia and the UAE, respectively. In the early 2000s the percentage of Arabs in the region had fallen dramatically in favor of new waves from South East Asia and the Indian sub-continent; for example, in 2004 the representation of Arabs in the Kingdom of Saudi Arabia was 33% and in the UAE the representation had fallen to 13% (Doper, 2006).

[2] Most expatriate workers in the UAE arrive for a limited period that by law cannot last for less than 1 year and for no longer than 3 years. The opportunity to renew the contract increases with skill class.

[3] See the UAE National Bureau of Statistics, in www.uaestatistics.gov.ae/ReportDetailsEnglish.

frictions between Emirati job-seekers and employers in both the public and the private sector – although the emphasis of Emiratization is to allocate Emirati workers in private sector employment.[4] The actions that make the Emiratization process operational are defined under points (a) and (b) In specific reference to (a), the laws defines a minimum quota of local employees in the private sector – 4% in the Banking sector, 5% in the Insurance sector and 2% in the trade sector –, provides training programs for Emirati nationals aimed at adjusting their skills to existing vacancies, makes firing local Emirati workers very costly – both in the private and public sector – and determines occupational sectors that can only be filled by local Emirati – e.g., effective from 2006, Resolution 443 of the Ministry of Social Affairs mandates that all secretarial and human resource jobs are to be nationalized both in the private and the public sector. In terms of (b), neither the Ministry of Labor nor the Ministry of Social Affairs stipulates particular laws with reference to setting a wage premium in favor of the Emirati. However, empirical evidence shows the clear existence of a premium mainly through the overrepresentation of locals in the public sector where the wage rate is above the equilibrium wage in the private sector – see Sections 3, 4 and 5.

Traditionally, given the low representation of the Emirati population the number of unemployed Emirati has been low relative to the volume of vacancies in the open market. For example, the latest figures from TAMMIA in 2008 showed a total of 26,000 unemployed Emirati while the local labor market showed 100,000 vacancies.[5] There is, however, a tendency for the private sector to hire non-nationals even in the presence of quotas. Such private sector behavior justifies the re-enforcement of the Emiratization process as described above so that Emirati seeking work slowly increase their chances in the private sector while reducing their overrepresentation in public sector employment.[6] One avenue that has aimed at reinforcing the quotas while providing the private sector with real positive monetary incentives has been through the establishment of the Cultural Diversification Classification system: the Federal Cabinet decision No. 19 of the 19th of July 2005 established a

[4] TANMIA stands for 'National Human Resource Development and Employment Authority', in Arabic. The role of the authority was initiated in the early 1990s although it became an authority by presidential decree in 1999. The main objective of the authority is to assist in the employment needs of the Emirati in all the Emirates and at federal level. TANMIAs main task in regulating and implementation the Emiratization program implies integrating three main centers: the *Employment and Skills Development Center* – these supply and administer training for the local unemployed –, the *Center for Labor Market Research and Information* – this center supplies research needs on labor market trends – and the *Center for Career Guidance and Planning* – this center guides the unemployed towards particular carrier paths for the unemployed. The implementation of the Emiratization program depends on the interaction between these three centers (TANMIA Report, 2004, 2005, 2008).

[5] See www.emiratization.org for updated information on entry-exit flows of local Emirati job-seekers in the UAE.

[6] In practice the quota system seeks to target 100% nationalization of vacancies in government positions, while slowly introducing the quota system not just for the banking, insurance and sales sectors but also aiming towards a quota to be applied to companies employing more than 50 people starting from 2009.

classification system for companies according to the nationality distribution of employees known as 'Cultural Diversification Classification' that determines three types of companies: Type A are those with 30% or less of their workers from the same nationality; Type B are those with 31% to 74% of workers from the same nationality and Type C are firms with 75% or more workers from an identical nationality. Since the classification system was established the Ministry of Labor has been able to keep a record on the number of Emirati actively working in the private sector. The positive aspect for firms is that of significantly lower transaction fees that apply to their operations, including the cost of hiring labor. Thus, firms classified as Type A will pay the least and will further see their fees reduced in the event of showing a gradual increase of national Emirati workers employed in their firms. Type B can move to become Type A if they increase the percentage of Emirati workers and in doing so reduce the percentage of foreigners from one single nationality to be less than 30%. Although the classification system of private firms is not strictly speaking part of Emiratization – i.e., the Emiratization process are measures defined as having a direct effect on the human capital formation of Emirati job seekers – there are interlinks between Emiratization and the laws that govern Cultural Diversification Classification. For example, firms in the private sector can easily enhance their classification from a lower type – e.g., C or B – to a higher type – e.g., B or A – by applying the new regulations that stipulate the nationalization of particular sectors. For example, on the 6th of September 2005, the Ministry of Labor issued a Ministerial Decree with regards to the employment of Public Relation Officers. Thus, starting from January 2006, companies with 100 or more employees are mandated to employ Emirati when the company demands new Public Relations Officers or replaces existing ones. As a way to make sure that such mandate is observed, the Ministry of Labor will not accept any labor transaction unless submitted by a UAE national Public Relations Officer. Furthermore, the same decree restricts the validity of expatriate Public Relation Officers cards to one year as opposed to having the usual three year extension. It is expected that existing non-national Public Relation Officers should remain in the economy to train incoming Emirati Public Relation Officers that should eventually take over the position. It is with such type of initiatives that the UAE hopes to integrate the Emiratization Process alongside decrees such as those of Cultural Diversification that should in fact help slowly promote the participation of Emirati nationals into private sector employment.

The Emiratization process has clear positive short run consequences for the local population in the UAE, i.e., it creates legal mandates that enhance the chances for Emirati nationals to fill in vacancies in the private sector while protecting their opportunities in the public sector. However, the Emirati account for about 19% of the population in the UAE, i.e., the general equilibrium effects from Emiratization on overall labor market outcomes might be significant but potentially limited in scope.

On the other hand, the goal defined in (c) reflects the sponsorship system – or the *Kafala* system as in known in the Gulf area – and this is the cornerstone to immigration policies in the UAE. Because 80% of the labor force is made up of foreigners – and therefore subject to the Kafala – immigration policies will have far greater consequences at an aggregate level than the Emiratization process. We now turn our attention to *objectively* describe these set or rules and regulations that govern the immigration dynamics in the UAE.

All non-UAE nationals arriving to work in the UAE do so through a sponsor that has previously filed a petition with the Ministry of Social Affairs. Once the petition is accepted the foreign worker can enter the UAE as an expatriate employee with all the rights and obligations fully regulated by the legal framework established at the level of the Federation (Law 12, 1986, UEA).[7] To such an extent and definition, the system in the UAE is identical to that of any other economy in the world: immigrants arrive to the UAE with a contract that allows them to participate in paid employment because at national level – be it in a non-skilled or highly skilled position – the vacancy cannot be filled by a native in the population. Except for government related sponsors – i.e., the public sector and mixed sectors enterprises – and employers in the Free Zones – i.e., areas where enterprise ownership is allowed to be 100% foreign – all other employers are subject to the Federal laws and regulations. The first step to be followed by a sponsor – who might be a UAE national or a foreign entrepreneur – not exempt from formal labor regulations is to pay a set of fees to bring workers into the UAE. Likewise, for each worker that the – non-government related – sponsor brings in, he or she has to deposit a security bank-check with the naturalization officers so that it secures the future end of service payment and repatriation costs (see Appendix A for a full description of Law 12, 1986).[8] The difference between immigrants arriving in the UAE and other immigrants in other economies – e.g., in the EU-Zone, USA or Canada with a tradition of bringing labor to fill in unoccupied vacancies – is that while in the UAE, the expatriate worker operates under a single contract for the original sponsor, i.e., without approval from the original sponsor, the incoming immigrant is not free to move and compete for other existing vacancies and remains with the original sponsor for the period mandated

[7] Most of the information in this section draws from Al Tamami (2004, 2008), a set of reports that describe the labor regulations governing the UAE as result of the latest Federal laws. These laws are enforced for everyone except those in Free zones.

[8] A valid visa with residency status is issued after entering the UAE but only if the prospective worker obtains a clean bill of health that consists on testing negative for HIV/AIDS, Tuberculosis and the group of Hepatitis. Once this is accepted, the worker has the same rights and obligations as Emirati workers except in three aspects: expatriates do not have the obligation to contribute towards the National Pension Fund or the right to benefit from it; expatriates cannot benefit from social or labor related transfers – e.g., they cannot benefit from government training, income support, social welfare schemes, etc. – and finally, expatriate workers do not have the same freedom as Emirati workers to be mobile within the UAE labor market.

by the contract.[9] When the contract is not transferrable between sponsors the expatriate is obliged to fulfill a current contract before opting for a new one within the federation. This means that expatriates are effectively tied to the employer/sponsor who can be thought as a monopsonist with an infinite supply of labor while the vast majority of expatriates face infinite mobility costs. [10] Once the contract terminates, the law mandates that the expatriate worker leaves the country. Expatriates can then re-enter at a later stage either under a new contract with the old sponsor or with a new sponsor. In both cases there is a minimum amount of waiting time – of at least six month depending on the skill class – before the expatriate is allowed in to re-start under a new working contract.[11]

So far we have objectively described the two pillars that define laws and regulations in the UAE labor market, i.e., the Emiratization process – directed towards the protection and enhancement of Emirati in the labor market, especially in private sector employment – and the sponsorship system targeted towards the protection and regulation of expatriate workers that arrive to share the UAE labor market with the local natives in the population. Both sets of rules operate in the UAE – i.e., throughout the seven Emirates in the Federation – but do not apply to Free Zones and apply only partly to public sector employment. Thus, in Free Zones federal labor laws have no effect so that both local natives and expatriate labor workers are free from the sponsorship system, the Cultural diversification system and the regulations that determine the period of stay of workers that are employed in such commercial zones.[12] Likewise, both the public sector and mixed firms are free from

[9] A Ministerial decree from the Ministry of Labor dated 11th of September 2005 states that workers of any kind are free to change sponsors if and only if the original sponsor agrees to it and the worker has all the legal documents – i.e., he or she is legally in the country, has a legal labor card and sufficient time left in the visa to justify the move to an alternative sponsor. Exceptions to this rule apply if the sponsor has violated the conditions of the contract – e.g., if the sponsor does not pay the worker's salary, violates his rights, etc. – in which case the worker can file a petition to change sponsors without the consent of the original sponsor.

[10] The rule is not applied equally to all expatriate workers in the UAE. The degree of mobility between vacancies depends on the skill class of the worker. Thus, individuals with Masters and PhD are free to move between jobs at a relatively low cost, whereas mobility for unskilled, semi-skilled or even workers with a first university degree are more are less mobile or mobility comes at a very high cost. In general, according to the Ministerial Order Decision Number 826 from 11.9.2005, Ministry of Labor and Social Affairs, the worker will not be issued a new work contract after 6 months after the cancellation of the old contract. The waiting time is different according to the human capital skill of the individual.

[11] In contrast to other economies, the UAE does not demand an exit visa to be issued from the sponsor to the worker each time he or she leaves the country. This is a requirement in other economies – e.g., in the KSA – which implies even a stronger tie between expatriate employee and sponsor.

[12] All workers that arrive to work in the Free Zone do so through the Free Zone authority and are employed directly by such authority rather than being employed by the firm for which they work. When worker and employer do not agree – e.g. if the employer bridges the contract in terms of salary or conditions – the employee can claim back to the Free Zone authority and find new employment within the free zone and with a different employer without having to leave the country, for example. To this extent, there is a degree of mobility within Free Zones sub-labor markets that are not fund in non-free zone industrial sectors of the Emirates.

most of the laws and regulations that apply to workers hired through the sponsorship system in private sector employment in the UAE.[13]

Generally speaking, the UAE Federation has recognized that the inflexible labor market conditions upon which expatriate enter the UAE do translate into inflexible labor markets that may lead to frictions and inefficient use of existing human capital. It is for this reason that the federation is currently considering the introduction of alternatives to existing sponsorship practices. For example, for the past three years the UAE Ministry of Labor and Social Affairs has been studying the potential introduction of a labor insurance system in accordance with international practices such that regular monthly deductions from workers salaries could be used to secure some form of maintenance for workers that find themselves out of work for some finite period as result of sponsorship problems: the insurance scheme could follow closely that of the Singaporean experience that would further allow incoming workers to extend their stay with a formal pension system.[14] However, while such rules and regulations remain applicable in the UAE it is fundamental that we question the effect these have on the current economic development of the Federation. We do this in two ways; first we review the potential analytical consequences of such laws and regulations by means of reviewing the possible effects these could have in theory. Secondly we review existing representative data in a detail empirical study to understand the actual situation of the labor market – in terms of supply side – and review the possible effect that existing labor laws might have had on contemporaneous labour market outcomes.

[13] Public sector employers are both the Federation and the local governments that govern each of the seven Emirates in the UAE. Expatriate employees in such government entities are not required to apply for labor cards, are not necessarily subject to the band on mobility and are able to extend their contrast often for an infinite time period. Likewise, expatriates working in mixed, i.e., firms that are partly government owned – e.g., Emirate Airlines, Ethihad Airlines, Jumeirah Group, etc. – are also equally exempt from the legal restrictions that apply to workers in the private sector. However, expatriate workers in the public and the mixed sector account for 21% of the total expatriate labor force if we discount domestic workers and workers in labor camps. The two last categories mention deserve a bypass mention: domestic workers have never being considered as part of the labor market since they are considered as part of the household and as such are not and have not been registered with the Ministry of Labor upon entry in the UAE. Likewise, Labor Camp workers, the majority of which are dedicated to non-skilled works in the construction sector, are often excented from the labor force survey as result of the non-household type of status that automatically implies not being surveyed by the surveyer. However, for all purpose, labor camp workers are fully subject to the conditions implied to private sector firms unless these are in the Free Zone or they are classified as mixed or public sector enterprises.

[14] At present the scheme is in the process of being studied. The mandate follows the advice from Dr. Ali Bin Abdullah Al Ka'abi, Minister of Labor and Social Affairs who assigned the task of reviewing the Singapoure example to Dr. Khalid Al Khazraji, the under-secretary to the minister, for further evaluation.

Theoretical effects, considerations

We start this section by analysing the possible consequence of the contemporaneous legal setting that governs the labor market in the UAE, namely, we analyse both the Emiratization process and the sponsorship system in the UAE with reference to positive and negative aspects of these for both the local Emirati population and the population in general.

One of the main consequences from the Emiratization process is a significant wage premium that should be view as a transfer of natural resource wealth from the authorities to the local population. The transfer mechanism is designed to motivate the local population to supply labor and, at the same time, invest on extensive human capital formation. There are, of course, other mechanisms that distribute natural resource wealth in the UAE – i.e., income support and a generous social benefit system – but allowing for a wage above the market wage given to expatriates minimizes distortions to labor incentives and creates the potential to increase human capital through on the job learning.

The Emiratization side that relates to training, advisory and monitoring of unemployed Emirati is similar to the set of Active Labor Market Polices (ALMP) that are often implemented in western type of economies; In countries such as the UK, USA, Switzerland or Scandinavia, ALMP have been used since the 1980s to motivate the unemployed towards gainful employment by means of targeting the training needs of the unemployed to smooth the matching process between them and ongoing vacancies (see Heckman et al., 1999, for a seminal review of the ALMP implemented in western type of economies). However, whereas ALMP are often guided towards increasing the effect from free markets on the employment outcomes of difficult to place unemployed, the Emiratization process creates barriers that prevent the labor market from setting equilibrium prices (wages) and quantities (employment level and/or the natural unemployment rate).

From an economic point of view – i.e., in terms of the externality that such process induces in the labor market – the Emiratization process could be compared to the existence of a union with the only difference that Emiratization arrives as a UAE designed government mandate and the employer – either in the private or the public sector – has no bargaining power to negotiate the employment/wage split in relation to expected profits: by eliminating the bargaining power of the employer, the Emiratization process leads to excess labor supply while those that are 'unionized' are paid wages higher than the competitive market wage, i.e., Emiratization leads to the design of inefficient contracts while the monetary cost of Emiratization is at the expense of the employer. [15] The cost of

[15] The situation in the UAE with Emiratization can be thought as being similar to that of facing a 'vertical contract curve'; the employer accommodates the requirements and agrees to a level of employment and wages as demanded by the union/Emiratization process while keeping output constant at the level that

Emiratization is often justified through an argument of protectionism, i.e., at present the human capital stock of natives in the UAE needs to increase to levels comparable with economies that have a similar per capita wealth: while the economy remains in the adjustment period the natives require protection from a competitive labor market in similar ways as infant industries in the developing world require protection (from outside competition) while they mature. Figure 1 show how the educational attainment of the local Emirati has evolved over time relative to that of similar aged cohorts with different nationalities.[16] Clearly, the trends in Figure 1 show that the adjustment process is still ongoing despite the fact that relative to older cohorts, younger cohorts of Emirati workers are significantly better equipped to compete for work in an open labor market. Figure 2 shows the same information as in Figure 1 but allowing for Emirati only and separating between males and females. It is clear that the gradient for females is significantly higher than for males thus showing similar trends in the adjustment of human capital as that found in emerging economies, i.e., as the natives become better equipped in terms of start-up human capital, the schooling attainment of females – which usually lags behind that of males in emerging markets – increases at a rate faster than that experienced by the males in the population. Such empirical evidence suggest that educational policies since the foundation of the UAE Federation have been very successful at targeting the needs for formal schooling in the population with a view to catch up with the schooling outcomes of advanced western type of economies.

maximizes profits. The situation is often sustainable in non-competitive markets – e.g., public sector or firms producing in monopolistic product markets.

[16] The graph indicates tendencies but it is clearly subject to selection (for expatriates) and survival bias (for UAE nationals). With respect to the each of the expatriate nationality groups, these are the stock of workers in the UAE at the time of the survey (2009) and represent a selection very much dictated by the immigration rules in the Federation, thus, westerners are often selected to work in the UAE because of their higher skills, i.e., the line showing the average schooling by cohorts for westerners probably represents an upper bound to the actual distribution of education in their country of origin. A similar argument implies that the line representing the educational attainment for individuals in less developed economies is likely to represent a lower bound to the actual attainments in their original economies. On the other hand, the average education by cohorts for the UAE does represent the actual evolution of education over time except that it is likely to be subject to selection bias; older cohorts that passed away were probably less educated and would have flatten down the actual estimate in Figure 1 whereas younger cohorts are more likely to have PhD students not accounted for in the sample (i.e., sample points that are still surviving as students in higher levels of education implies that the representation for younger cohorts is likely to be a lower bound of the true outcome in the population).

Figure 1

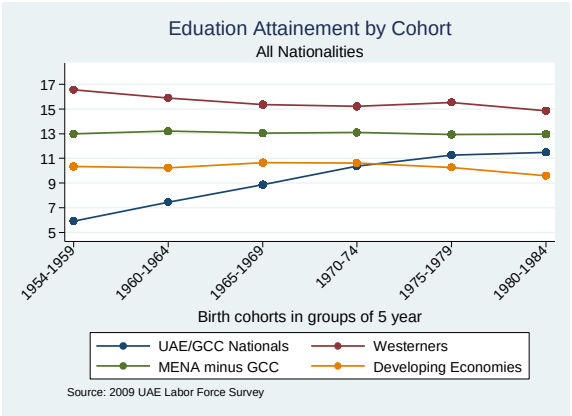
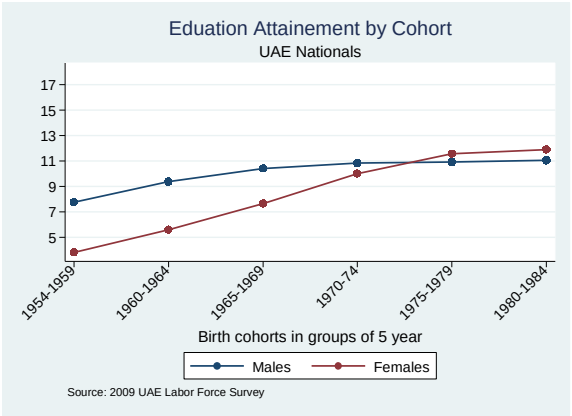


Figure 2



Having analyzed the first pillar of the legal settings that affects the dynamics of the labor market in the UAE – i.e., the Emiratization process – we are not able to turn to a review of potentially positive and negative aspects of the sponsorship system. The most striking features from such system is that expatriate workers have limited or no mobility within a contractual period. This is the curtail difference between the UAE – the GCC in general – and other economies – for example, in westernized economies – with immediate positive consequence to the sponsor. When the worker is unable to move between jobs as in a free labor market, the benefits of the sponsorship system to the employer come in the form of two rents: the first rent arises because the employer is in a position to offer wages well below the expatriate's marginal product. The second rent arises because in the absence of perfect competition, all earning's differentials from human capital differentials, age, gender, innate ability and potential wage compensation mechanisms are subtracted by the employer. Although the Kafala system – i.e., the sponsorship system in GCC type of economies – applies to any skill class, employers are only able to subtract rents – especially of the first type – from low and semi-skill workers; for higher skill classes the extent to which UAE employer can subtract rents is often conditional on the worker's nationality.

Besides the clear direct rent related benefits for UAE employers, other agents in the economic can also benefit as result of the Kafala simply because the system promotes large waves of incoming immigrants at a very low cost. First, paying wages below the marginal product of workers implies lower production costs that could be passed on to the consumer through lower consumer prices when the final product is domestically sold, i.e., lower consumer prices could be a form for expatriate workers of gaining back lost rents due to selling their human capital in a non-mobile labor market. Second, low production costs increases the competitive advantage of exporting domestically produced goods. Thirdly, when production is labor intensive – as is the case of the UAE at present – the

marginal returns from labor per unit invested on physical capital is higher than in the event of having to pay the market cost of labor. Thus, relative to other economies, investment on physical capital per unit of labor in economies with the Kafala system – as is the case in the UAE – is cheaper: this should provide investment incentives attracting both internal and foreign investment into the economy with the consequent feedback effect on both labor and non-labor intensive enterprises; more investment induces entrepreneurial competition and a drive towards optimal allocation of investment capacity. Forth, in the event that skilled and unskilled labor are gross complements in the production process, the Kafala system leads to a large demand for unskilled workers will increase the demand for higher skills – e.g., increase in the demand for monitoring supervisors if the demand for unskilled construction workers increases. In turn, employment creation at higher levels of human capital feeds back into the economy because more internal employment increases overall household's disposable income – i.e. sharing production rent as result of newly created employment – driving further increases on consumer's demand. A further argument that puts emphasis on the positive aspects of the Kafala system is that tightening the mobility of expatriate workers in the UAE reduces the chance of an expanding informal economy. However, in the absence of income tax this becomes a human or social argument rather than an economic one.

So far we have described the potential positive effects from the Kafala system, at least for agents in the economy other than the low and medium skill expatriate workers – i.e., the Kafala is positive for the sponsoring employers, the high skill employees (natives or not) that enjoy higher consumer's surplus, and the local population who are not subject to the labor rules established by the Kafala but enjoy the benefits from cheap labor and consequent economic spill over effects. But it is also clear that the Kafala creates constrains that precludes the free working of a competitive labor market with adverse consequences for overall productivity and the further development of domestic human capital. Under conditions of perfect competition, allowing for labor mobility is central to policies that enhance productivity, i.e., when free mobility between jobs is part of the dynamics in the labor market, employees are more likely to engage on learning that leads to higher knowledge and allows them to opt for higher paid positions: exercising higher levels of effort and increasing on the job knowledge increases overall extensive human capital with the consequent positive effect on overall productivity. But such dynamics of human capital in a mobile labor market would require that employers pay efficiency wages if they want to keep their higher ability employees after they have entered the country – or if their employees become more knowledgeable in their jobs; since added value per worker will also be higher, efficiency wages are the optimal policy that further leads to wage growth and higher disposable income on consumer's hands. Free mobility within jobs also creates a larger pool of workers leading to a more efficient matching process between the unemployed and existing

vacancies. Better matching reduces frictions and increases the productivity of the workforce since, on average, there will be lower turnover rates. At the same time, employers that aim at reducing the cost of loosing productive employees to better paid jobs could start to offer training as ways to promote lower quitting rates and attract high ability workers within each skill class.

The above arguments put an emphasis on the positive effects resulting from free mobility; the arguments emphasis the negative impact of the Kafala on the development of human capital and overall productivity since the Kafala precludes the mobility of workers between vacancies. Thus, the Kafala system implies constrains to the nation's productivity potential because it has adverse effect on the efficient use of its human capital, while human capital is the key instrument that allows countries to move towards the complexity of knowledge economies. According to the 2020 UAE Strategic Planning, the aim of the federation is to move gradually towards a knowledge economy where research, development and innovation become instrumental for sustainable growth.

Clearly, the Kafala system – as it stands at present in the UAE – and the Emiratization process are sets of regulations often associated with economies at a takeoff or emerging stage of development, i.e., both the Kafala and Emiratization act as barriers to protect domestic interest at the cost of market interference with the possible consequent inefficiencies that we should be able to detect with empirical estimates. Generally speaking, the movement towards a knowledge economy would require free movement for expatriates – i.e., dropping the existing constrains from the sponsorship system thus creating more competition and efficiency among expatriates – as well as promoting more incentives for local Emirati to enter the private sector without the forceful need from Emiratization, i.e., creating a new set of Emiratization polices that compared to existing ones are not so straightforwardly destructive with regards to labor market incentives, provide greater incentives towards human capital formation and create and distribute private sector employment among the Emirati in the population. The new set of rules would effectively lower the protection of the local Emirati workforce from outside competition as long as these have reached the accumulation of human capital so that they can compete with equally productive expatriate workers.

Generally, the movement towards a knowledge economy would require immigration policies that attract workers with high levels of human capital and policies that help promote the development of the existing human capital stocks – of both, expatriates and native Emirati – especially through increasing competition for an optimal vacancy matching in the labor market. Ultimately these policies would enhance the productivity dynamics of the local Emirati, induce higher levels of extensive human capital and, in the process, the new policies would reduce the dependence of the UAE from external workers for semi- and higher skill positions. But to what extent is the UAE ready to shift existing labor policies that allow for the economy to move towards a knowledge economy? We aim at

analysing the information in the 2009 UAE labor force survey to answer the question and study the contemporaneous state of human capital stocks – Emirati versus non-Emirati in the population – and the relation between returns to human capital and labor market characteristics of the workforce. In the sections that follow we provide an exhaustive study of the micro-structure of wages in the UAE in three stages: the first stage is descriptive and simply reviews the 2009 UAE labor force survey to make the correct selection of prime age individuals and explore how the population can be broken into sub-groups that are homogenous with regards to labor market outcomes. The next two stages allow for comparative inferences between subgroups; stage two is non-causal and simply compares stocks of human capital and wage profiles conditional on key labor market indicators; stage three describes a Mincer based model for causal inference that allow to estimate and compare the return to human capital between sub-groups in the labor market. Estimates from the three stages provide the basis to evaluate existing labor market policies in the UAE.

3. Population and Workforce Characteristics

The 2009 UAE labor force survey provides labor market information on household members aged 15 and over from a representative sample of households in the UAE. The original survey targets 11,021 dwellings to cover three types of households represented in the populations of all 7 Emirates, namely, local Emirati households, non-local Emirati households and collective households.[17] Once the original sample is clean from non-respondents, outliers and inconsistencies, the household size in the dataset drops to 10,215; most of those eliminated are as result of unit non-response.[18] The 10,215 households contain 34,619 individuals aged 15 or older.[19] Table 1 shows summary statistics with

[17] The seven Emirates in the UAE are Abu Dhabi, Dubai, Sharjah, Ajman, Um Al Quwain, Ras Al Khaimah and Fujairah. All three types of households are represented in all the Emirates. The forth type of housing unit existent in the UAE is the accommodation in 'labor camps'. These represent about 20% of the workforce in the UAE but are not included in the survey because the housing unit 'labor camps' is not considered as a household – and the survey follows a household design.

[18] A total of 706 households did not respond at all to any of the questions in the survey except for the coversheet information. Then, 4 households show inconsistency between type of household – local, non-local and collective – and nationality of household members, we drop 3 households with heads declared to be in prison, 17 households that being foreigners are part of diplomatic bodies – i.e., outside the local labor market –, we drop 51 households that have 21 or more prime age adults living under the same dwelling and are either locals or non-locals – i.e., not collective, and we drop 13 households whose head earns hourly wage rates higher than 700 AED, i.e., we trim the sample from wage outliers with reference to the 99th upper percentile.

[19] This count excludes domestic workers that live in the household as maids, cooks, gardeners, etc. These individuals are neither part of the main stream labor market nor are they integral part of the household size. Nevertheless, information from domestic servants – number per household and ratio of domestics to household size – becomes part of the analysis as variables that might explain the labor supply behavior of representative households.

regards to key socio-demographic indicators for the 34,619 individuals alongside sample statistics summarizing the characteristics of the 10,215 households in the sample.

Table 1 show that the local Emirati – aged 15 and older – represent slightly less than a quarter of the UAE population (21%) although they account for 19% in terms of households; this reflects that the average size in local households (about 7 members) is higher than in non-local households (about 4 members). The population of expatriates living in non-local households (59%) is significantly larger than expatriates in collective households (22%); the difference between non-local and collective households is that the latter are groupings of workers that share similar socio-demographic characteristics – e.g., gender, nationality, economic activity, etc. – and usually work for the same enterprise that provides them with the choice of sharing collective accommodation. The statistics also shows that there is a strong tendency for all three types of dwellings to be located in Abu Dhabi or Dubai, these two Emirates being the most developed and industrialized ones in the UAE. The proportion of households located in the Emirate of Sharjah is also significantly large relative to the other poorer and less densely populated Emirates; this is probably a neighboring effect since the living costs are lower in Sharjah while being geographically attached to the Emirate of Dubai. We notice that living in a given Emirate does not necessarily imply working in it: 23% of the locals work in an Emirate other than the one of residence; as expected, the percentage is lower for the non locals whose mobility might be limited by geographical knowledge, culture or contractual conditions. Nevertheless, 18% of expatriates in non-local household work in an Emirate different to that of their residence; the same figure is significantly lower for collective households (only 8%).

Table 1 also shows the distribution of individuals in the sample by region of origin; almost all members associated with local households are UAE nationals (96%) while the number of UAE nationals inhabiting non-local and collective households is negligent, as expected. The largest represented region among non-local households are nationals of the BIPP economies – Bangladesh, India, Philippines and Pakistan – that represent 35% of expatriates at individual level. This is followed closely by nationals of MENA economies – Middle East and North Africa excluding GCC – that represent 33% of individuals in non-local households. There is also a non-negligent representation from Eastern European economies with 14% of individuals in the group of non-locals holding a nationality from such region. On the other hand, the origins that stand out among individuals living in collective housing is that of BIPP economies (40%) followed by a 27% representation from Asian economies – excluding the Asian Tigers and Eastern Europe – and finally followed by a 12% representation from the MENA region – excluding GCC individuals.

According to Table 1, the sample – all of which are potential labor participants being aged 15 and older – constitute a relatively young population with an average age of 31 for the locals, 34 for the

non-locals in nuclear households and 32 for expatriates in collective households. The gender share among the locals shows a mixture comparable to any other society, i.e., a 50-50 share between males and females. The relatively larger percent of males among expatriates – in non-local households but more significantly in collective households – can be explained by the types of demand for labor in the UAE, i.e., demand for males that occupy low skill and semi-skilled positions while females are more likely to fulfill domestic positions and to live as domestic workers.[20] Relative to collective expatriates, there is a larger representation of females among the so called non-local households. This is because expatriates from non-locals households occupy higher skill positions with salaries that are higher than those of collective households; the higher monthly salaries of non-local workers allow them to bring their families to join them in the UAE, whereas the much lower monthly salary of workers in collective households implies they cannot bypass the law that puts monetary restrictions to family re-unification. This explains why despite observing that a large percent of worker in collective households are married (63%) the percentage representation of females – e.g., as their wives – is almost negligent for the group.[21]

Table 1 provides three blocks of indicators to describe the characteristics of the workforce in the UAE; *(i)* fixed cost of labor participation – e.g., household demographics, rural location, etc – *(ii)* human capital stocks and *(iii)* labor market status, including average returns from active participation. With regards to block *(i)* the statistics shows that the fixed cost of labor market participation differ by type of households: the average number of dependent children in local households (3.4) is significantly larger than that in non-local households (1.4). On the other hand, the ratio of domestic workers to number of adults in the household is 0.38 for local households and 0.02 for non-local household, i.e., local households rely on the use of domestic workers significantly more than non-local households: we can think that domestic workers effectively lower time constrains and therefore increase the potential to participate in actively paid employment. Despite this, and holding other things constant, the cost of accessing labor market position is higher for the locals since 33% of these live in rural areas as compared to the non-locals (7%) or collective workers (23%). In the latter case,

[20] In anticipation to Section 4, we indicate that the empirical sections in the paper are estimated once we drop all domestic workers living in the surveyed households. Thus, all summary statistics reflect deflation by family size discounting domestic workers. The survey is a labor force survey in the sense that most questions reflect labor market information but its structure is that of a household (budget) survey where domestic workers would be surveyed as any other family member. The problem is that we lack 'household information' for domestic workers and, at the same time, we cannot count them as family members of the household where they work because the domestic worker's characteristics – e.g., education, marital status, etc. – are not associated to the serving household.

[21] At present – since August 2010 – the requirement for a worker to be able to bring his or her spouse – and children under the age of 18 – to live with them in the UAE is AED 10,000 more (about $2,725 USA or more). The new figure represents an increase from the required AED 6,000 before August 2010.

since the location of the house is often strategically provided for them in relation to their workplace, access to and from work for the 23% located in rural areas is probably not an issue.

Family structure, access to labor market vacancies and time constrains are some of the fixed costs that might explain why *only* 45% of surveyed Emirati (local) adults are actively participating in paid labor market activities.[22] Instead, non-local households show that 64% of adults are active – and most of those who are not have a housewife status – while all individuals (99%) living in collective households are active participants; by definition, the latter group are single males that would not be able to remain in the UAE without been actively engaged in some form of paid labor market activity.

The human capital indicators in Table 1 show that individuals in non-local households have attained, on average, 4 more years of formal education than individuals in local households; in terms of education, individuals in local households are closer to those living in collective accommodation. Thus, whereas on average, a local individual will have finished secondary schooling with some vocational training, an individual in a non-local household is, on average, more likely to hold a bachelors degree from university. The same picture emerges when looking at the distribution of the sample by ascending categories of education: the density of the locals centers in the lower tail of the educational scale with densities in the categories of illiterate (17%), primary (42%) and secondary (40%) that are similar to the sample of individuals in collective households – 28%, 35% and 27%, respectively. Instead, individuals in non-local households are mostly located between having completed primary (26%) or secondary school (31%), or a first university degree (43%). In terms of years of experience, the distance between locals and non-local households is probably due to age difference: the locals are, on average, younger. On the other hand, those in collective households have about 3.4 years more of experience than those in non-locals households despite the fact that the latter are, on average, 2 years older: the difference could be explained because expatriates in non-locals households have spent more time investing in education than expatriates in collective households. It is importance to notice that the imputed value of experience might not necessarily reflect the amount of work experience in the UAE; in fact, the average number of years residing in the UAE is about 15 for those who work and live in non-local households whereas for those in collective households the average number of years living in the UAE in is about 11. It is usually the case that more skilled workers – i.e., those in non-local rather than collective households – will be given better chances to renew their contracts or find follow up employment in the UAE; this could explain why the average

[22] For all three household types, participating adults in the household are those aged 18 and over, they will not be full time students but will have completed their formal education and they will be classified as employers, employees or unemployed seeking work.

duration – conditional of having survived as in the UAE – of a non-local household is greater than that of a collective household.

Indicators for employment status show that compared to non-locals households, individuals in local households are 5% less likely to take up entrepreneurial activities, 16% less likely to be working as employees, 4% more likely to be unemployed seeking work and 4% more likely to claim unwillingness to work. The category 'out of the labor force' is not necessarily comparable between sub-groups of local, non-locals and collectives because the locals includes the retired, the permanently disabled and a significant percentage of young individuals who are still in full time education; for non-locals the category is mostly made up of housewives and non-local children aged 15 and older who are in full time education in the UAE. Clearly, the percentage of 'out of the labor force' among the collective households is close to zero because the family structure for these type of expatriates is missing while they remain as workers in the UAE.

One striking measure in Table 1 is the share of the workforce between the public and the private sector – disregarding the third residual category known as public-private partnerships (or mixed sector). Locals are almost unanimously employed by the public sector with a representation in the private sector that falls below 10% among the actively employed. The percentage contrasts with the representation of non-locals in the public sector (22%) which approximates that of what might be expected in western economies. These figures are a clear reflection that labor policies such as the Emiratization process are still in their infancy in terms of motivating the private sector at creating employment opportunities for the locals in the population. There is also an element of self-selection on behalf of Emirati participants towards public sector employment where the salary is higher relative to analogous positions in the private sector. As result of such public-private breakdown, local Emirati employees work mostly in the service – tertiary – industry whereas non-locals and collective workers are represented in both the manufacturing (secondary) sector and the service (tertiary) sector. For all three types of individuals, the service sector is the one that employs most individuals this being consistent with service sector driven economy in the UAE. It is noticeable, however, that 41% of workers living in collective households are employed in the manufacturing sector – light or heavy – thus indicating once more that these are the low and semi-skill workers in the economy.[23]

Finally, Table 1 shows basic summary statistics describing the returns from supplying labor in the market. First we notice that relative to the two types of expatriates, the average number of hours worked per week by local Emirati workers is significantly lower: once more this reflects the

[23] As suggested in the introduction, the survey excludes labor camp workers since these are not living under a dwelling type of structure that would justify surveying them. Labor camp workers are often employed in the construction sector so that the percent of non-locals working in secondary industry is significantly higher than that reflected in the 2009 Labor Force Survey.

overrepresentation of local workers in the public sector. Given that public sector employment adds a premium for local workers, there is a substantial difference in hourly wage rate between locals (AED 115 per hour) and non-locals in relatively comparable white collar positions (AED 59 per hour). Expatriates in collective housing earn, on average, AED 12 per hour: this reflects both low skill occupations as well as wages that are often design according to the worker's country of origin; clearly, since 87% of workers come from relatively poor economies – e.g., BIPP, Asia and Euro-Asia – the hourly wage rate they are offered in the UAE is explained by nationality rather than performance or productivity.

Having described the sample representative of the working age population in the UAE, the sample statistics in Table 1 provide information with regards to the selection of the sample and sub-grouping to further study the micro-structure of wage in the UAE.

Table 1: *Summary statistics, individuals (IND=34,619) in households (HH=10,215)*

	Local Households	Non-Local Households	Collective households
Sample Size & Emirate or residence			
Households (Share in population)	2,595 (0.19)	6,242 (0.59)	1,378 (0.22)
Individuals (share in population)	12,305 (0.21)	16,532 (0.47)	5,782 (0.31)
Abu Dhabi	0.40	0.28	0.33
Dubai	0.20	0.36	0.30
Sharjah	0.17	0.27	0.21
Ajman	0.05	0.05	0.05
Um Al Quwain	0.02	0.08	0.01
Ras Al Khaimah	0.11	0.03	0.07
Fujairah	0.06	0.01	0.04
Share (individuals) working and living in different Emirates (0)	0.23	0.18	0.08
Basic descriptive, households in the sample (HH)			
Share live in Rural area	0.33	0.06	0.23
Average household size, excluding domestic servants	7.23	3.82	4.40
Average number of kids (0,17) in the household	3.24	1.43	Negligent
Share of labor active participant adults in household	0.53	0.67	0.97
Share of labor active participant wives in household	0.19	0.23	Negligent
Average ratio of household size to number of domestics	3.4	0.16	Negligent
Basic demographics, individuals age 15 and over (IND)			
Average Age	31.2	34.4	32.4
Proportion of males	0.50	0.57	0.96
Average number years residing in the UAE	Not applicable	15.1	10.6
Proportion contemporaneously married	0.51	0.75	0.63
Region of Origen (1):			
UAE	0.96	0.003	Negligent
GCC without UAE	0.01	0.013	Negligent
MENA without GCC	0.014	0.33	0.12
Western Economies	Negligent	0.052	0.001
Central and South America	Negligent	0.0013	Negligent
Asian Tigers	Negligent	0.0017	0.001
Euro-Asia	0.006	0.14	0.20
Asia (without Asian Tigers & Euro Asia)	0.004	0.085	0.27
Africa	0.004	0.013	0.008
BIPP Economies	0.004	0.35	0.40
Others	0.001	0.02	Negligent
Human Capital Indicators:			
Years of schooling, if completed education (imputed) (2)	9.4	12.9	8.0
Years of labor market experience, if participant (imputed) (3)	11.4	15.0	18.4
Duration in present/last working place (4)	8.0	6.6	4.7
Schooling Attainment (if completed)			
Illiterate	0.17	0.05	0.28
Primary	0.42	0.26	0.35
Secondary	0.40	0.31	0.27
Bachelor	0.19	0.44	0.13
Diploma	0.01	0.021	0.01
Masters	0.01	0.064	Negligent
PhD	0.002	0.010	Negligent
Direct individual's labor market indicators (IND)			
Employment Status: Employer/Self-employed	0.01	0.06	0.01
Employee	0.37	0.53	0.98
Unemployed	0.07	0.04	0.007
Not willing to work	0.05	0.01	Negligent
Housewives	0.20	0.23	0.02
Out of the labor force (5)	0.30	0.14	0.01
Sector of employment (6): Public Sector	0.87	0.22	0.15
(*of which, police &/or military*)	(0.23)	(0.02)	(Negligent)
Private Sector	0.07	0.71	0.81
Mixed sector	0.06	0.07	0.03
Domestic worker	None	0.003	0.01
Industrial sector (6): Primary industry	0.03	0.05	0.09
Secondary industry	0.10	0.32	0.41
Tertiary industry	0.87	0.63	0.50
Labor supply (6): Average Number of hours worked per week	40.7	47.7	53.7
Average hourly wage rate	115.4	58.9	12.9

Note: All estimates reflect population proportions based on weights at either the household level (HH) or at the individual level (IND); when household estimates apply (HH) the deflator for means and proportions is the number of weighted households, otherwise the deflator is the number of weighted individuals in the sample. (0) The estimates are based on individuals that work as employers or employees (n=22,682). (1) In general, the Gulf Cooperating Council includes The Kingdom of Saudi Arabia, Kuwait, Bahrain, Qatar, United Arab Emirates and Oman; the MENA region includes all Arab economies in the Middle East and North Africa; the Western economies groups North American economies, Oceania, Japan and all countries of the European Economy; The Asian Tiger economies includes Hong Kong, South Korea, Singapore and Malaysia; Euro-Asian economies includes all economies from Easter Europe and the Russian Federation; BIPP economies includes Bangladesh, India, Pakistan and Philippines. (2) Imputed years of schooling allows for a continuous variable reflecting formal years of intensive education using the variable 'category of education'; the lowest amount is 1 year (illiterate) and the highest is 22 years of formal education (PhD); average years in education are estimated excluding full time students.(3) Experience is based on estimating the number of years in the labor market using contemporaneous age minus yeas of education and allowing for 6 to be the lower bound of entry into formal intensive education; the variable cannot be estimated for 'housewives' or those declaring 'unwilling to work' so that these categories are left out of the deflator. (4) Duration in the past or present workplace is asked only to employers, self-employed, employees and the unemployed; all other labor market status are left out of the deflator (5) The category 'out of the labor force' includes early retired – if these declare explicitly to be so –, retired due to having reached age 65, permanently disabled and full time students. (6) Estimates conditional on the sub-group 'employees'. Source: 2009 UAE Labor Force Survey.

4. Sample selection & Wage distribution

The sample estimates in Table 1 confirm that there exists a clear divide along nationality lines – local Emirati versus non-local expatriates – with regards to key labor market determinants – e.g., fixed cost of participation, stocks of human capital, etc. – and the outcome from participation – i.e., sector of employment, participation behavior and the returns from such participation. In studies of wage determination – and therefore the application of human capital models from Becker (1964) or Mincer (1974) to more recent studies such as Diamond (1982), Nickell and Layard (1999) or Mortensen and Pissarides (2003) – it is classic to account for the presence of unions as well as gender or regional differences in order to define homogenous sub-groups with respect to the potential outcome (wages) and with regards to the effect of labor related policies on labor market outcomes. In the UAE, although gender and regional – by Emirates – are fundamental determinants, the labor market duality that results from the Emiratization process and the Kafala system implies sub-grouping according to the potential homogeneity of worker's country of origin. Thus, throughout the paper wages and labor market outcomes will be analyzed comparing four nationality-driven sub-groups: UAE nationals (Emirati), western type of economies (Westerners), the MENA region excluding GCC economies (Arabs) and nationals of less developed economies and/or economies considered as suppliers of low skill workers to the Gulf (Developing).[24]

Before we proceed we have to identify a sample that is potentially homogenous on outcomes of interest – e.g., wages, participation, etc. – as well as homogenous on possible effects induced by social and labor related policies. To do so we take the original sample described in Table 1 and apply

[24] The sample includes as few as 89 households from GCC economies and they account for 474 individuals among the 34,619 represented in the sample. Since GCC individuals living in the UAE are treated in identical ways as local Emirati – e.g., regarding labor markets but also with respect to social welfare – for all that follows we integrate the few GCC households into the sample of local UAE Emirati households. Thus, when we talk about UAE nationals we refer to households with UAE nationality holders or holders of nationalities with identical rights under UAE/GCC laws.

four selection criteria: the first sample selection criterion eliminates the extremes with regards to age so that only those in the range 25 to 55 – inclusive – are considered in the analysis. The second sample selection criterion eliminates *non-UAE* nationals that are relatives to UAE nationals and live with UAE nationals in 'local households'; they may hold nationalities differ to that of the UAE but they might be consider equal to the locals for issues related to social and labor policies; eliminating them increases homogeneity among the four nationality groups. Third, we drop 207 observations whose nationality are unknown and cannot be classified in anyone of the four nationality groups described above. Finally, the sample is trimmed from wage outliers by eliminating the 2.5% upper and lower tails of the (natural log) hourly wage rate distribution; the trimming applied separately to each of the four nationality sub-groups since within sample wage ranking is highly correlated to nationality. The result of applying these four selection criteria is to reduce the sample to 21,180 individuals distributed in 9,580 unique households.

Table 2 shows summary statistics for key indicators based on the selected sample; each column is associated with one of the four nationality group. The distribution of the sample shows that westerners are in a minority relative to other groups of expatriates. Developing economies provides the largest representation of expatriates (58%) as well as being the expatriate group with the lowest level of schooling attainment; on average, expatriates in the UAE from developing economies have 5 years less of schooling than westerners and 3 years less than nationals from Arab economies. In fact, by years of schooling we see that UAE nationals are equivalent to expatriates from developing countries; individuals in both sub-groups attain, on average, 10 years of schooling which is equivalent to finishing secondary education, at most. Such low average in educational attainment is observed because the two sub-groups hold a significant fraction of individuals who are 'illiterate' or 'can read & write only', two sub-categories missing among westerners and almost negligent among Arab nationals. Expatriates live mostly in urban areas and only UAE nationals are considerably represented in rural ones (32%); it follows from this that the workplace for most expatriate workers is located in Abu Dhabi and Dubai while prime age UAE nationals have a non-negligent representation in the Central and Northern Emirates – 16% and 14% respectively.[25]

[25] The Central Emirates include Sharjah and Ajman; The Northern Emirates includes Um Al Quwain, Ras Al Khaimah and Fujairah.

Table 2: *Summary statistics: Selected individuals (IND=21,180) in households (HH=9,568)*

	Emirati	Westerners	Arabs	Developing
Sample				
Households (Share in population)	1,828 (0.17)	311 (0.04)	1,882 (0.23)	3,886 (0.56)
Individuals (share in population)	6,017 (0.20)	603 (0.03)	4,191 (0.19)	10,369 (0.58)
Local Households	1,769 (0.97)	--	--	--
Non-local households	59 (GCC,0.03)	306 (0.97)	1,767 (0.88)	2,961 (0.67)
Collective households	--	5 (0.03)	115 (0.12)	925 (0.33)
Share living in Urban Area	0.68	0.99	0.88	0.90
Abu Dhabi	0.45	0.39	0.47	0.25
Dubai	0.25	0.53	0.31	0.54
Central Emirates	0.16	0.05	0.17	0.16
Northern Emirates	0.14	0.03	0.06	0.06
Human Capital				
Average Age	35.7	40.1	36.8	35.4
Proportion of males	0.48	0.59	0.68	0.79
Average number years residing in the UAE	--	7.8	13.2	11.9
Years of labor market experience, if participant (imputed) (3)	16.0	18.0	17.6	19.5
Duration in present/last working place, if participant (4)	9.4	4.5	6.1	5.8
Years of schooling, if completed education (imputed) (2)	10.0	15.6	13.0	10.2
Illiterate	0.08	--	0.01	0.04
Can read and write	0.06	--	0.02	0.14
Primary	0.23	0.01	0.10	0.22
Secondary	0.38	0.18	0.36	0.27
Bachelor	0.24	0.62	0.47	0.28
Masters	0.01	0.15	0.03	0.04
PhD	0.002	0.04	0.01	0.001
Labor Market Characteristics				
Employment Status: Employer/Self-employed	0.02	0.05	0.06	0.04
Employee	0.52	0.67	0.68	0.80
Unemployed	0.06	0.03	0.05	0.01
Not willing to work	0.07	0.02	0.01	0.002
Housewives	0.30	0.23	0.19	0.14
Out of the labor force (5)	0.03	0.004	0.01	0.002
Sector of employment (6): Public Sector	0.85	0.17	0.24	0.16
(*of which, police &/or military*)	(0.23)	(0.03)	(0.02)	(0.001)
Private Sector	0.09	0.78	0.72	0.79
Mixed sector	0.06	0.06	0.04	0.04
Domestic worker	--	--	0.001	0.01
Industrial sector (6): Primary industry	0.04	0.07	0.04	0.07
Secondary indust	0.10	0.29	0.35	0.39
Tertiary industry	0.87	0.64	0.61	0.54
Labor supply (6)				
Average, hours worked per week	40.3	43.6	47.9	51.5
Average, hourly wage rate (AED)	120.6	152.3	46.5	23.2

Note: See footnote in Table 1. Source: 2009 UAE Labor Force Survey

Table 2 shows that relative to the three groups of expatriates in the population, UAE nationals have the lowest participation rate – either in the form of employer/self-employed or employee.[26] The

[26] Since UAE nationals live with their full family structure, it is more likely that the participation rate of UAE nationals is affected by a larger percent of females claiming a housewife status. However, even if we condition on males, the participation rate of UAE nationals aged between 25 and 55 and with completed formal education – i.e., of the selected sample – is only 81% compared to 96% for Westerners, 97% for Arab nationals and 99% for expatriates from the developing world. Most non-participating males from the UAE claim 'unwillingness to work' (11%) rather than a status of unemployment status (5%) or being out of the labor force (3%).

selected sample in Table 2 maintains the same feature as Table 1 regarding the overrepresentation of UAE nations in the public sector as well as the proportion of UAE nationals working in the police and/or military. This means that private sector vacancies are filled mostly by expatriates probably suggesting a self-selection of native Emirati into public sector employment. To some extent this is evidence that the Emiratization process – in place since the 1990s to encourage Emirati into the private sector – has not been successful at allocating Emirati in private employment beyond the mandatory quotas established by the Emiratization mandate. Comparing the average hourly wage rate of UAE nationals (AED 120) to expatriates with similar schooling – i.e., those in developing economies (AED 23) or from Arab economies (AED 46.5) – shows that Emirati participating in the public sector are paid well above the value that their human capital stock is worth in the expatriate labor market. As previously suggested, the observed wage premium could be justified as a way to distribute the national wealth the economy obtains from its natural resources (oil and gas).

The summary statistics in Table 2 provide single sample points useful to show homogeneity within each of the four groups with respect to key labor market outcomes. But single sample points do not inform on the distributional differences between sub-groups for the key variables – education and wages. We now turn our attention to this by comparing nationality sub-groups with respect to the distributional features of schooling attainment conditional on gender, employment status, sector of employment, and region (working Emirate). Following this we look at the distributional features of wages by educational attainment also comparing nationalities, gender, sector of employment and region (working Emirate). Finally, we estimate and plot wage profiles over cohorts to emulate the evolution of wages over the life-cycle and, in doing so, compare nationality sub-groups to understand how labor policies – rather than productivity or competitive practices – are determinant at assigning wages to labor market participants.

Distributional features of Educational outcomes

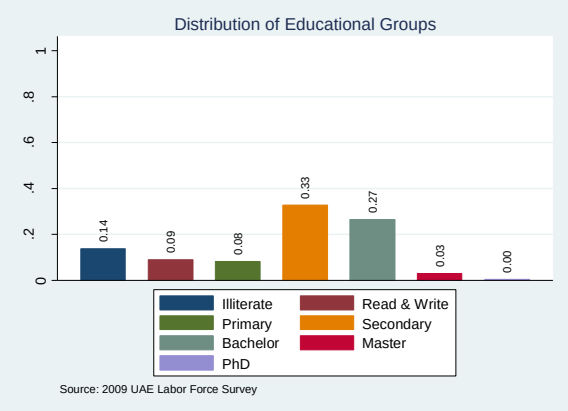
Figures 3 to 8 shows the selected sample – described in Table 2 – distributed over the different educational categories conditional on nationality (Figure 4), gender (Figure 5), employment status (Figure 6), sector of employment (Figure 7) and Emirate where the workplace is located (Figure 8).

Figure 3 shows that the modal education category is ‘secondary education’ while the category with the lowest representation is that of highly specialized workers holding Masters or PhD degrees. Figure 3 shows that 23% of prime age individuals in the population are illiterate (if we take into account also those claiming no formal education but able to read and write). The UNDP 2009 Report ranks the UAE as the 90th country among 180 countries in terms of literacy with 10% of the

population counted as illiterate.[27] The value 10% is close to the percentage reported in Table 2 for UAE nationals since 14% are classified as illiterate. Comparing UNDP estimates with the distributional features in Figure 3 show that immigration policies in the UAE inflate the level of illiteracy in the economy. Thus, allowing for 23% from Figure 3 as representing the levels of illiteracy, the UAE would drop 38 places in the literacy ranking and would share a position with countries such as Tunisia, Nicaragua, Solomon Islands or Algeria. Figure 4 shows that expatriates from developing economies – mostly from BIPP economies – dominate in the two lowest categories of education with UAE/GCC nationals as the second nationality group to show significant levels of illiteracy. The same figure shows that UAE/GCC nationals are represented throughout the educational spectrum while expatriates from the developing world are overrepresented in all the educational categories. The difference between UAE/GCC nationals & nationals from developing economies on the one hand and Westerners & Arabs on the other is on the pattern that Figure 4 shows for the latter two groups: as we move up the scale of educational attainment, the probability of finding an Arab national or a westerner increases significantly. Overall, Figures 3 and 4 provides a very clear picture of how immigration policies shape the skill distribution in the UAE: there is a clear selection of higher skills from the developed world – or Arab nationalities with high skills and a comparative language advantage – but there is also an overloading of the workforce with low-cost low-skills immigrants from developing economies. Figure 5 shows the distribution of gender by category of schooling. However, the figure shows the confounding effect of gender since males are overrepresented in the population, i.e., according to the selected sample of 21,180 individuals, 72% of prime age individuals are male and 28% are females. Since Figure 5 shows gender proportions maintained for all educational categories as in the population, the evidence suggest a weak relation between gender and schooling attainments. Likewise, Figures 6 to 8 shows, respectively, that there is a weak link between formal schooling and employment status (Figure 6), sector of employment (Figure 7) and Emirates of work (Figure 8). That is, employees seem to be equally represented in all schooling categories relative to other employment status – e.g., there is no clear link between unemployment and schooling –, there is no difference between private and public sector demand for specific schooling category and it seems that each Emirate maintains a similar representation of all schooling categories; perhaps the exception to this is Dubai with the highest density in the categories that go from 'secondary education' to 'Masters' degree because it is the Emirate with the largest percentage of Westerners and Arab nationals from non-GCC economies.

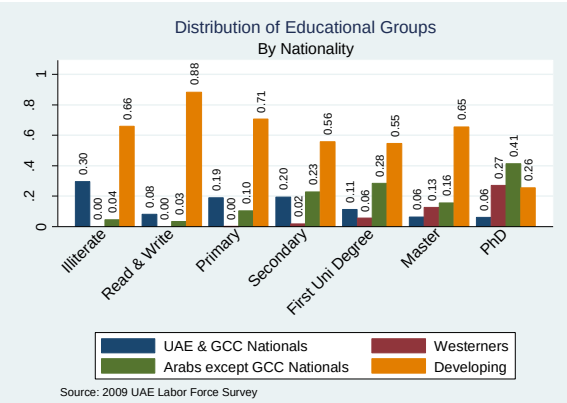
[27] The first country in the UNDP 2009 Ranking in Georgia with 0.0% of illiteracy and the last country in the ranking is Ethiopia with 77.8% its population counted as illiterate.

Figure 3



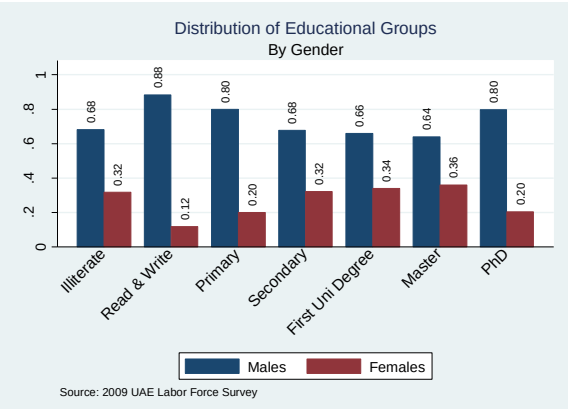
Source: 2009 UAE Labor Force Survey

Figure 4



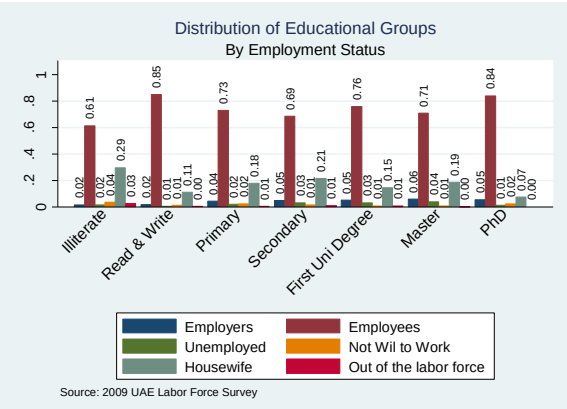
Source: 2009 UAE Labor Force Survey

Figure 5



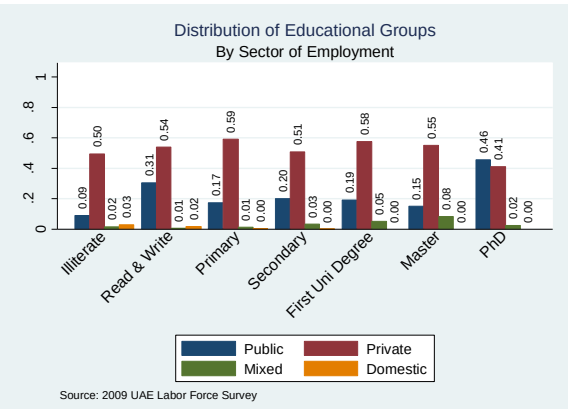
Source: 2009 UAE Labor Force Survey

Figure 6



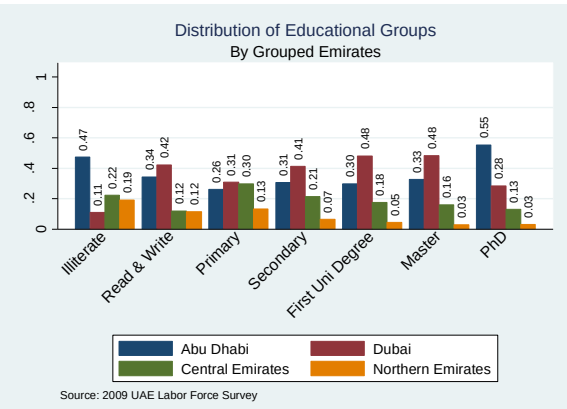
Source: 2009 UAE Labor Force Survey

Figure 7



Source: 2009 UAE Labor Force Survey

Figure 8



Source: 2009 UAE Labor Force Survey

Distributional features of Wages by Educational outcomes

The next set of graphs plots wages over subsequent educational categories and compares the population according to nationality groups (Figure 10), gender (Figures 11 and 12), sectors of employment (Figures 13 to 16) and regional location of the workplace (Figures 17 to 20).

Figure 9

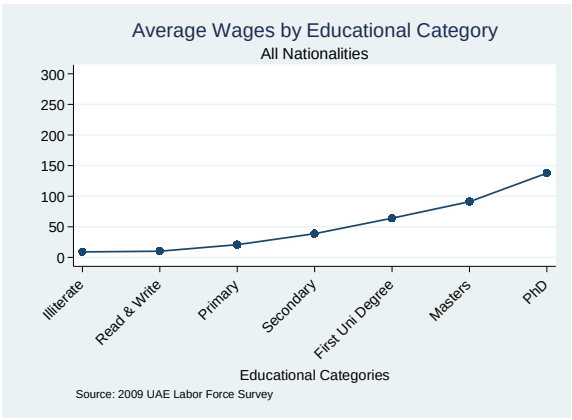


Figure 10

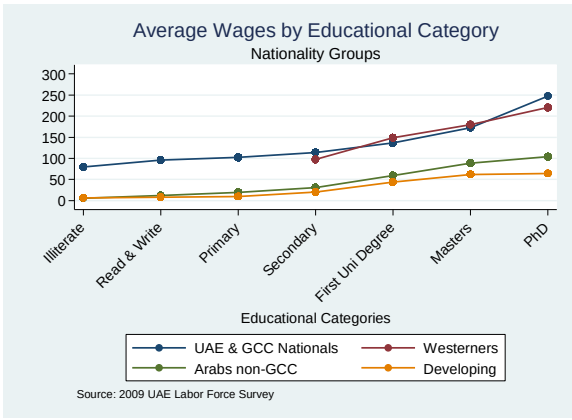


Figure 11

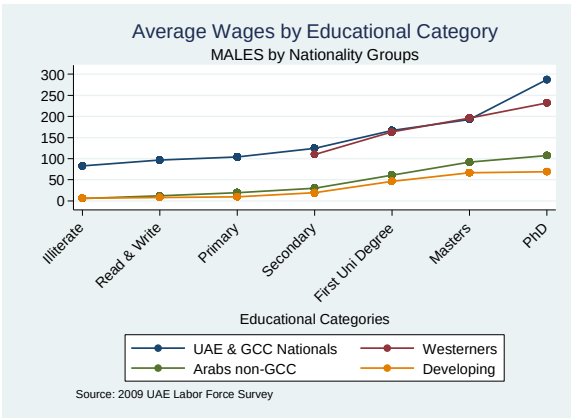


Figure 12

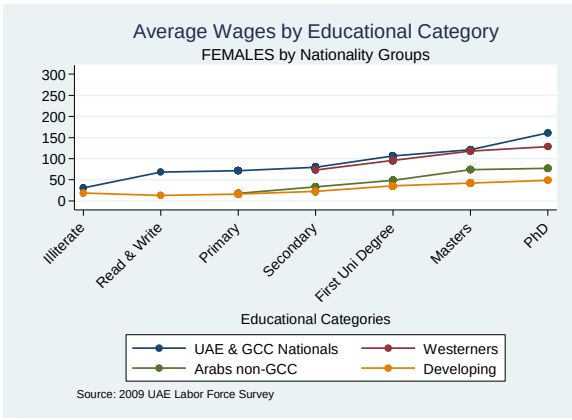


Figure 9 shows that, as expected, wages increase over the educational spectrum. On average, an individual without formal education earns less than AED 10 per hour while PhD holders earn on average AED 150 per hour. The steepest gradient occurs between holding a Masters and a PhD with earnings increasing, on average, by 35% between the two schooling categories. Figure 10 shows clearly that relative to Arab nationals from non-GCC and nationals from developing economies, there is wage premium for Emirati workers irrespective of educational attainment. At levels, the premium increases constantly over ascending categories of education; the largest jump occurs at PhD level where hourly wage rate for Emirati holding a PhD is, on average, AED 150 more than for PhD

holders from Arab non-GCC countries or PhD holders from developing economies. There is no wage gap between Emirati and Westerners with both groups receiving almost identical hourly wage at each comparable education category, i.e., the wage rate for Westerners is only identified for categories above secondary education. Figures 11 and 12 are analogous to Figure 10 but separating the sample by gender. Figure 11 is almost identical to Figure 10 as result of the overrepresentation of males in the population. If at all, there is a slight upward shift of wages (at levels) for male Emirati relative to all other nationalities; the implication is that the wage premium is higher for male Emirati than for female Emirati. Moreover, the gradient between secondary education and PhD for male Emirati becomes steeper once males and females are separated; for example, at PhD level Emirati males earn about AED 300 per hour, a jump of AED 50 relative to Figure 10. In the case of Females, Figure 11 shows that Emirati females also obtain a wage premium relative to other females although it is clear that the wage gap between Emirati females and other nationalities is considerably smaller than observed between Emirati males in their other nationalities counterparts. Thus, Figures 10 and 11 point towards a gender gap among Emirati employees in the UAE labor market: the gap increases significantly for ascending levels of education. For example, at secondary education the average earnings of an Emirati female are AED 75 whereas males earn AED 125 on average at the same level of education. In fact, for an Emirati female to earn – on average – AED 125 she has to be at Master level or beyond. At the highest level of educational attainment an Emirati female earns on average AED 175 which is 75% less than the earnings of an Emirati male with a PhD. In fact, at educational levels above secondary education the wage gap for Emirati females exists not only when compared to Emirati males but also to males from western economies. The gender gap might pause of significant constrain to the optimal use of Emirati human capital. We saw in Figure 2 that females have already overtaken male Emirati in terms of educational attainments. Despite this, the current wage policies that create an artificial wage premium between genders among Emirati might discourage the participation of females in the household in favor of males. Since the latter are less equipped in terms of starting up education, the current wage premium policy has the potential to discourage the efficient use of overall human capital among prime age Emirati in the population.

Figures 13 to 16 plot wages over educational categories separating sectors of employment. Comparing averages in Figures 13 to 14 shows that the public sector pays above the private sector for all levels of education and for any given nationality. Emirati employees in the public sector maintain the wage premium above all nationalities expect for both secondary education and graduates with a first university degree who are paid below westerners with a similar level of education. In the private

and mixed sector, however, the average wage for westerners dominates the average wage of Emirati – and therefore any other nationality – at all identified levels of education.[28]

Figure 13

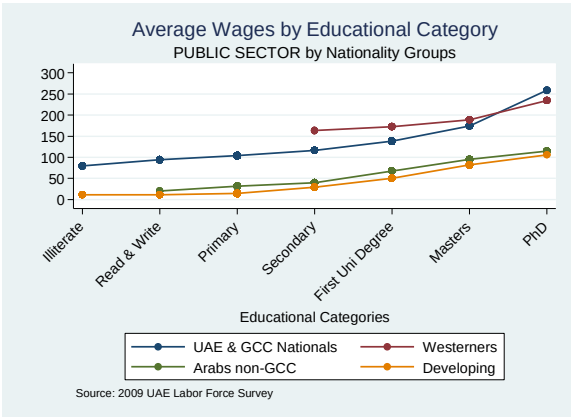


Figure 14

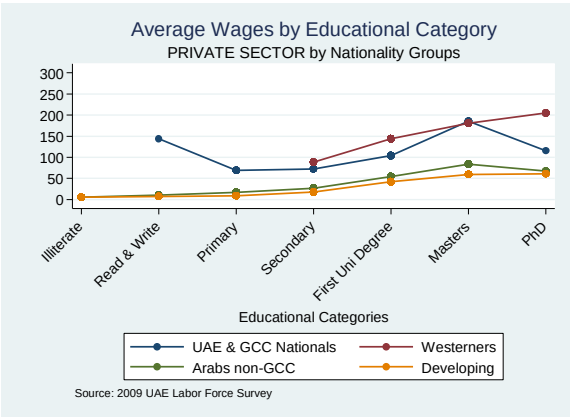


Figure 15

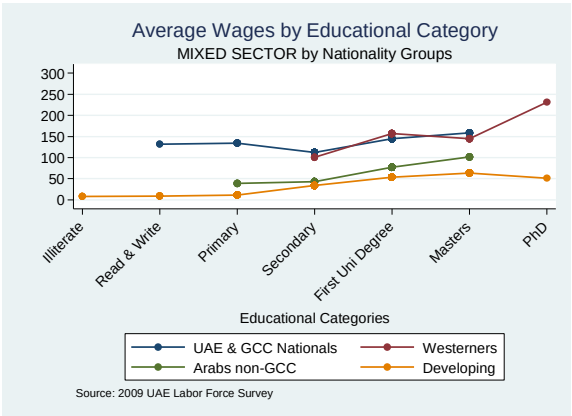


Figure 16

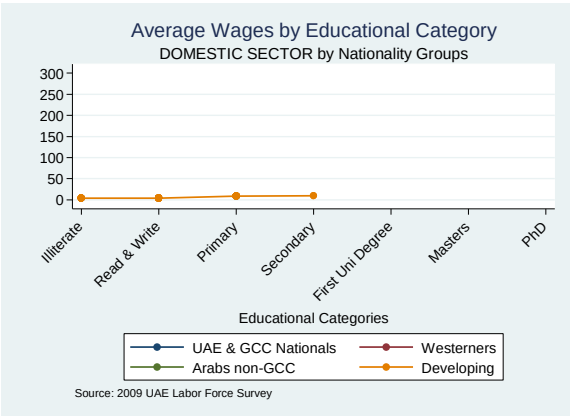


Table 3 complements Figures 13 to 16 by testing for difference between sectors, for all in the population and separating the sample by gender. The table shows that relative to westerners – males or females – Emirati workers obtain average wages that are statistically lower both in the public and the private sector. The difference in the mixed sector – private/public partnerships – is not detected in part because the low number of westerners in such sector implies high variance in estimating average wages, thus, the statistical inference is imprecise. On the other hand, Table 3 shows that the other two

[28] There are very low numbers of private sector Emirati employees in the categories of 'read & write' and 'PhD' implies that the estimates are very noisy. This explains the gap in hourly wage for Emirati in the lowest categories relative to Emirati at higher levels of education. It is likely that other confounding effects drive the results – e.g., experience, age or industrial sector.

nationalities – Arabs from non-GCC and nationals from the developing world – are paid average wages that are statistically below earning paid to local Emirati or westerners.

Table 3: *Hourly Wage Rate (in AED)by Nationality, Sector of Employment and Gender (Employees only)*

		Emirati N=2,988	Westerners N=374	Arabs N=2,519	Developing N=7,588
Hourly Wage Rate; ALL Sectors					
	All individuals	120.6 (1.11)	***152.3*****(+)** (4.64)	***46.5*****(-)** (0.74)	***23.2*****(-)** (0.28)
	Males	130.1 (1.39)	***168.7*****(+)** (5.49)	***46.8*****(-)** (0.85)	***22.4*****(-)** (0.29)
	Females	96.6 (1.40)	96.8 (6.07)	***44.8*****(-)** (1.22)	***32.3*****(-)** (0.74)
Hourly Wage Rate: PUBLIC Sector					
	All individuals	121.6 (1.13)	***185.1*****(+)** (11.9)	***59.5*****(-)** (1.30)	***24.7*****(-)** (0.75)
	Males	129.6 (1.41)	***201.5*****(+)** (14.3)	***60.7*****(-)** (1.53)	***23.7*****(-)** (0.80)
	Females	99.3 (1.46)	***125.9*****(+)** (13.4)	***53.6*****(-)** (1.90)	***37.4*****(-)** (1.84)
Hourly Wage Rate: PRIVATE Sector					
	All individuals	91.8 (5.41)	***144.8*****(+)** (5.21)	***40.6*****(-)** (0.89)	***21.9*****(-)** (0.30)
	Males	105.1 (8.84)	***161.8*****(+)** (6.19)	***40.7*****(-)** (1.01)	***21.2*****(-)** (0.32)
	Females	77.2 (5.53)	***90.7*****(+)** (6.82)	***39.7*****(-)** (1.57)	***30.5*****(-)** (0.81)
Hourly Wage Rate: MIXED Sector:					
	All individuals	130.9 (5.65)	150.4 (14.3)	***62.7*****(-)** (3.86)	***43.3*****(-)** (1.61)
	Males	156.7 (7.42)	157.0 (15.3)	***64.3*****(-)** (4.41)	***43.1*****(-)** (1.76)
	Females	90.0 (5.57)	96.1 (30.5)	***51.5*****(-)** (5.21)	***45.5*****(-)** (3.61)

Note: See footnote in Table 1. Source: 2009 UAE Labor Force Survey. All estimates are based on employees only. There are 13,469 employees in the selected sample defined in Table 2. The distribution by nationality is as follows: 2,988 UAE/GCC nationals, 374 Westerners, 2,519 Arab nationals from non-GCC economies and 7,588 from developing economies. Bracketed numbers show standard errors of the means. Wage estimates from each nationality – by row group – are contrasted against Emirati wages (first column) using a one-sided test. Two stars (**) indicates the difference is significant at the 5% level and one star (*) indicates the difference is significant at the 10%. A (+) sign next to the stars indicates that the value is statistically greater than Emirati wages and a (-) sign indicates the value to be statistically smaller than Emirati wages.

Figures 17 to 20 plot wages over educational categories separating by Emirate where the workplace is locate; on average it is also the Emirate of residence – see Table 2. Comparing Figures 17 and 18 show that both Emirati and westerners in Abu Dhabi obtain a wage premium above the average wages of workers in Dubai. For example, Emirati with completed secondary education earn AED 130 per hour in Abu Dhabi, a 30% increase to that of Emirati with completed secondary education in Dubai. Likewise, westerners with secondary education working in Abu Dhabi earn 62% more than similar westerners in Dubai. The gap between Abu Dhabi and Dubai increases over the educational scale for the Emirati and for westerners, but there is no such gap between Abu Dhabi and Dubai for Arab non-GCC nationals of nationals from developing economies. For all other Emirates – central Emirates and Northern Emirates – and for any of the educational categories, the average wage rate is significantly below that obtained in Abu Dhabi and only comparable to wages in Dubai for Emirati, Arab non-GCC nationals and nationals of developing economies: the low number of westerners leads to highly noisy estimates of average wages in Emirates other than Abu Dhabi and Dubai.

Figure 17

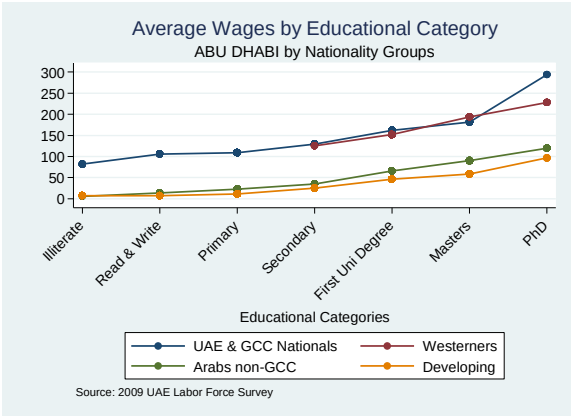


Figure 18

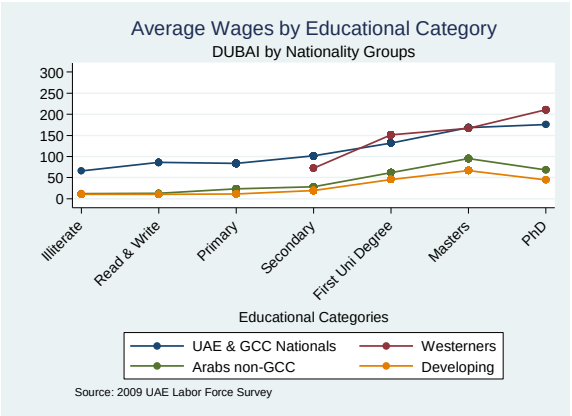


Figure 19

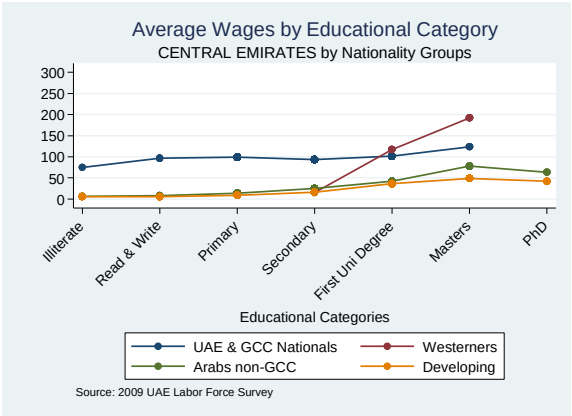
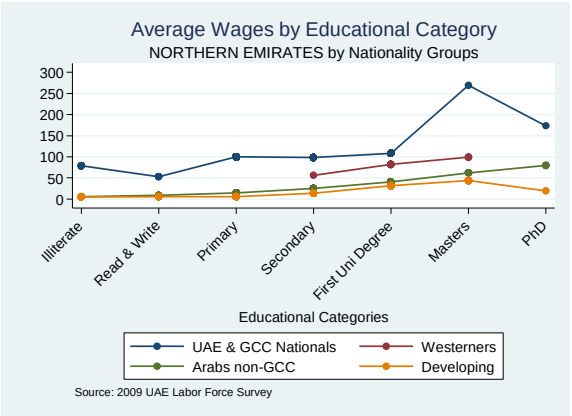


Figure 20



The most striking feature observed in Figures 10 to 20 is that of a clear gap between Emirati & Westerners on the one hand, and Arab non-GCC nationals & nationals for developing economies. The gap is maintained when comparing genders, sector of employment and Emirate where the workplace is located. These gaps are clear evidence that wages in the UAE are determined by the nationality of the immigrant and not as result of his performance or productivity potential in the workplace. In fact, the gap reflects the rents that employers are able to subtract from employees in the absence of a competitive labor market and in the presence of barriers to mobility between vacancies. If we think of westerners (males) as providing the closest estimate of how wages would be set on a competitive market, then Figure 11 shows that rents subtracted from Arab nationals from non-GCC and nationals of the developing world decrease in percentage terms as the educational level increases. For example, at secondary education the wage rate for Arabs or nationals from the developing world is, on average, AED 25; a westerner will earn 300% more, i.e., AED 100 on average, with the same level of education. The same comparison at Master level shows that Arabs and those from developing

economies earn, on average, AED 100 whereas westerners with similar education earn, on average, AED 200, i.e., 100% more. That is, employers are able to subtract higher rents from workers at the low end of the educational scale but only conditional on nationality and at a decreasing rate relative to increasing levels of education.

Wage profiles over cohorts

So far all estimates and comparisons between sub-groups have ignored the potential effect of labor market experience on wages: the variable can be introduced by inspecting wage profiles over subsequent cohorts with increasing age of cohorts emulating years of experience. The problem is that we are using a cross-section so that all estimates reflect information from cohorts at a single point in time and not the same individuals moving at different periods in time. This is why wage profiles estimated using the 2009 UAE labor force survey remains a weak indicator of how human capital affects returns from labor over the life-cycle.[29]

Figure 21 shows that hourly wages increase with age but with increases that are small between subsequent cohorts; however, the changes are statistically significant implying that labor market experience has significant positive effects on increasing hourly wage rate. Increasing experience is valued the highest between the cohorts aged 30 to 34 and 40 to 44 with wages increasing by 46% between the two, from AED 37.4 to AED 50.4 per hour. The smallest growth occurs between the cohorts 40-44 and 45-49 when wages increase by less than 1%, from AED 50.4 per hour to AED 50.7 per hour, on average.

Figure 22 separates the sample by educational groups. The wage profile for individual with education up to and below secondary education is flat, i.e., for those below a first university degree increasing labor market experience has no significant effect on earnings. This is a clear signal that the on the job learning is of limited importance for low skill workers in the UAE; this is possibly the consequence of large turn over as result of finite contracts and barriers to mobility. Another way of reading the information the same information is that productivity as result of learning through experience is not valued in the market, and, therefore, there is potentially low productivity from workers that are not motivated to enhance their human capital. For individual holding a university degree the wage profile is still relatively flat but wages move gradually upward over subsequent cohorts to increase by 50% from AED 50 at the youngest cohorts to about AED 75 among workers in

[29] In our case wage profiling provides an imperfect indicator to life-cycle effects on returns to human capital because we are comparing four sub-groups that have accumulated capital potentially in very distinct environments and under very different labor market policies. In the case of Emirati, wage profiling over cohorts is more valid but we would have to assume that policies and institutional effects on wages have remained constant over time, an assumption that is very unlike for the UAE.

the oldest cohort. The wage profile of specialized workers – Masters and PhD holders – increases at a decreasing rate, thus following the usual trend as in wealthier economies, i.e., experience has a significant and increasing effect on earnings for individuals at the top end of the educational scale.

Figures 23 and 24 are similar to Figure 21 but separating males and females, respectively. As was the case with previous graphs, males are overrepresented in the sample so that their wage profile follows identical trends to the one observed for the full population in Figure 21. Thus, the amount of experience is not significant at setting wages for males with education below a Masters degree; the consequence is a set of flat wage profiles for most males in the workforce. In the case of females (Figure 24) the wage profiles are still flat for those with education levels below Masters, and in the case of Masters and PhD graduates wage profiles are less concave than in the case of males: the fact that experience has a non-monotonic effect on wages for females – especially for those with higher levels of education – is likely to be the consequence of confounding life-cycle effects (e.g., family commitments). However, sample size effects are also responsible for the observed trends in Figure 24: for example, we observe that females in the cohort 35-39 without formal education but able to read and write earn, on average, AED 120 per hour. This is above the earnings of a female in the same cohort but with a PhD (AED 100) or a Masters degree (AED 45). Clearly, there are outliers in the data that determine the outcome, probably as consequence of wage premium for the Emirati population, in this case, female Emirati.

Figures 25 and 26 explore the effect that experience has on the wage profile for private versus public sector employment. Figure 25 shows that the expected concavity in the wage profiles for employees in the public sector is not detected for anyone of the educational levels; at younger cohorts the starting up wage is higher at higher levels of education but wage setting for sub-sequent older cohorts does not take into account experience. On the other hand, wage profile estimates for the private sector allow for an experience premium for workers with a first university degree, Masters or a PhD. For all other levels of education the effect of experience is negligent.

So far the wage profiles explored in Figures 21 to 26 do not distinguish between the four main nationality groups as described in Table 2. This is done in Figures 27 to 32 where we compare the wage profiles of different nationalities – UAE/GCC nationals, Westerners, Arabs non-GCC nationals and nationals from developing economies – separating each of the 6 educational levels identified in the data. Figure 27 and 28 show flat wage profiles for employees without either formal or with just primary education, respectively. The only aspect that is outstanding from the two figures is the significant wage premium exclusive for Emirati employees and constant over subsequent cohorts while a premium for experience is missing for all the nationalities. In terms of estimates, Figure 28 shows that the average earning for individuals in the youngest cohort of Emirati – aged 25 to 29 – is

AED 98 per hour while Emirati (also with primary education) in the oldest cohort – aged 50 to 55 – earn AED 109 per hour; i.e., accumulating human capital over 25 years of (potential) experience is worth a return equal to 1.1% of earnings received at the beginning of the working life of an Emirati. They nevertheless earn 6.3 times more than observationally equivalent Arabs from non-GCC economies at the youngest cohorts (AED 15.6) or 3.6 times more than equivalent Arabs in the oldest cohort (AED 30.7).

The wage profile for westerns is identified only for those with education at or above secondary education. From secondary education and up to PhD level the wage premium is attained by both Emirati and westerners relative to Arabs from non-GCC economies or nationals of developing economies. Moreover, starting from university education onwards – i.e., with 1st degrees, a Masters or a PhD – the data detects a clear wage premium for Emirati and westerners but also an increasing premium resulting from experience for all four nationalities: taking Figure 31 as example, this shows the wage profile for the four nationality groups for individuals with a Masters degree. Emirati aged 25-29 earn, on average, AED 150 while Emirati with Masters in the oldest cohort earn on average AED 185: the gradual increase of 22.5% over subsequent cohorts is noisy but significant. In the case of westerners, the starting up salary of younger cohorts with a Masters is AED 92 and increased by 160% to reach AED 240 for the older cohorts aged 50 to 55. In the case of Arabs from non-GCC economies the change implies that younger cohorts earn on average AED 48 and oldest cohorts with a Masters or equivalent earn AED 95, i.e., accumulating potential experience over 25 years increases earnings by 100% for Arabs from non GCC-economies. The lowest increase at levels among Master graduates occurs among nationals from developing economies; they start with an average salary of AED 57.8 per hour at the youngest cohorts and – as a homogenous group – their earnings increase by 30% to reach AED 75.3 for the oldest cohort in the sub-group. In the case of university graduates with a first degree the change is also significant but less acute while PhD holds also experience concave wage profiles – for all nationalities – although smaller sample size implies noisier estimates – see Figure 32.

Overall, Figure 27 to Figure 32 shows that in the UAE labor market, the nationality of the worker is a more important factor than experience when setting wages within specific levels of education. The implication is that immigration policies – rather than idiosyncratic aspects of the workforce such as innate ability, efforts level, etc. – would be determinant to overall productivity. But nationality is clearly exogenous to individual's innate ability to be productive or exercise effort. It follows that the evidence above might be evidence that overall productivity in the economy does not necessarily reach the optimal level according to the capacity of the existing workforce.

Figure 21

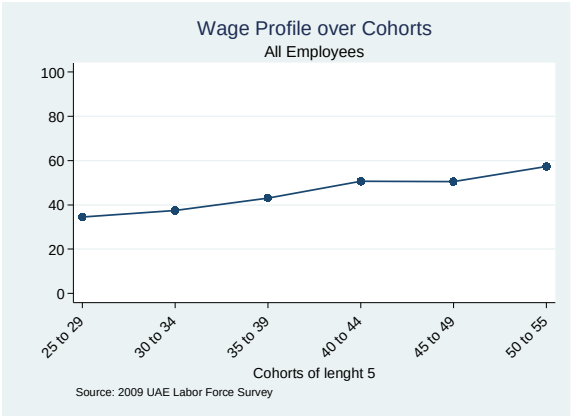


Figure 22

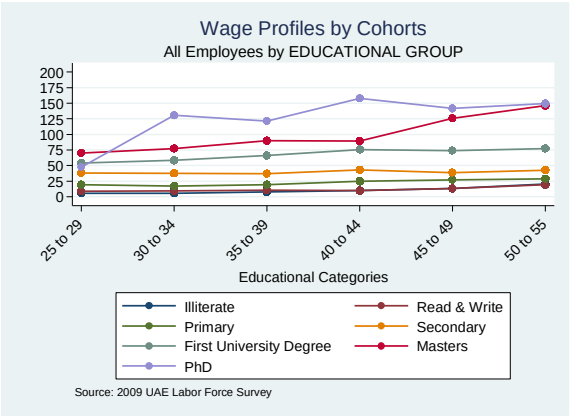


Figure 23

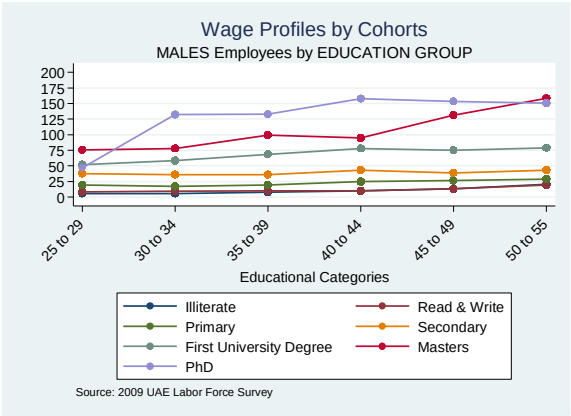


Figure 24

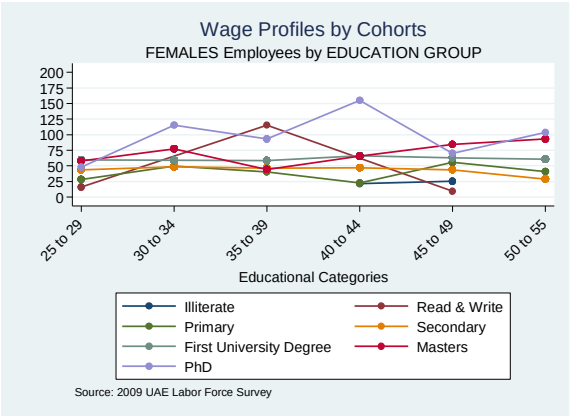


Figure 25

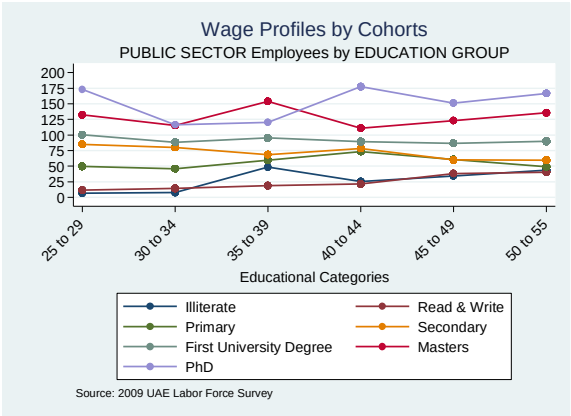


Figure 26

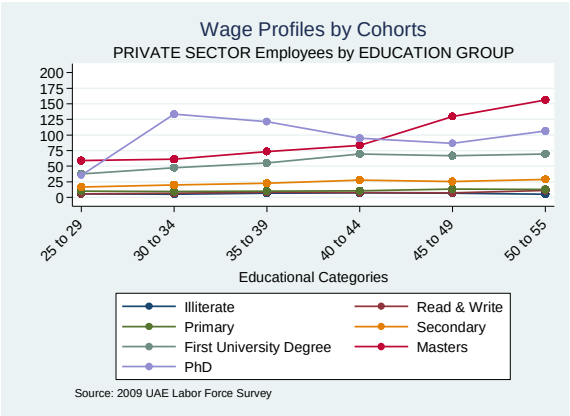


Figure 27

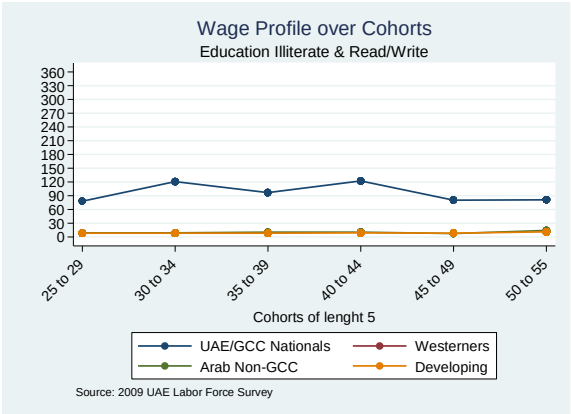


Figure 28

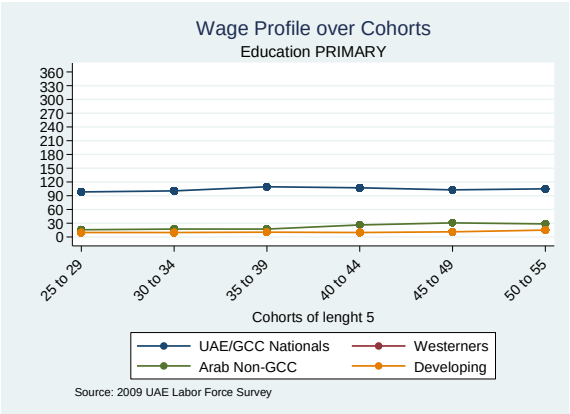


Figure 29

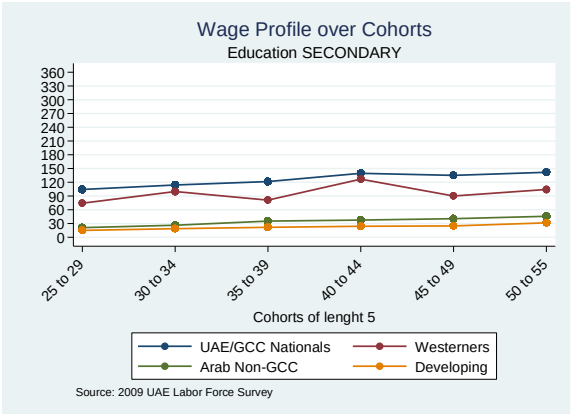


Figure 30

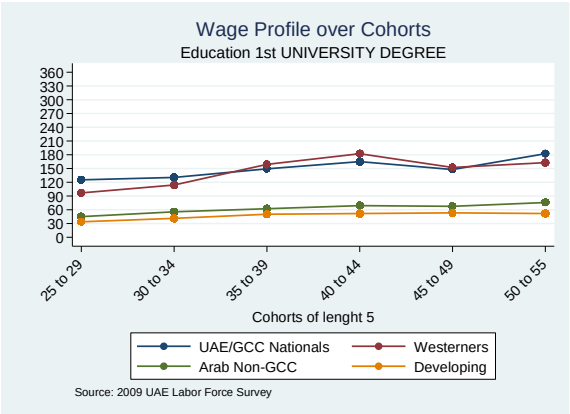


Figure 31

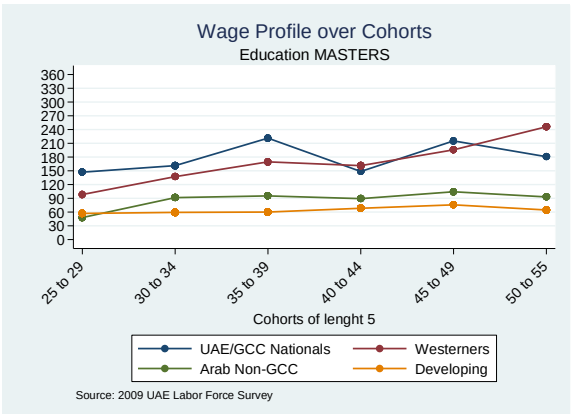
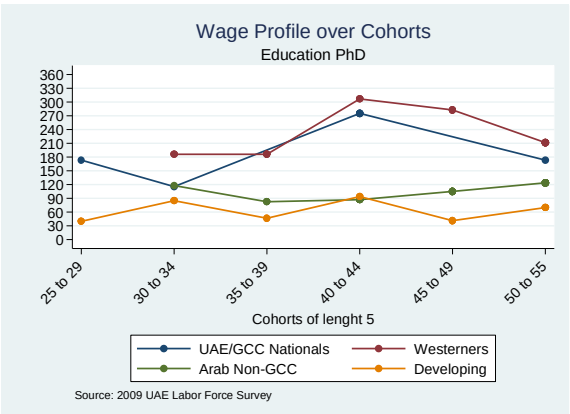


Figure 32



5. Wage determination

Sample selection and modelling strategies

Since the seminal work by Mincer (1964) and Becker (1974) the development of human capital models have evolved around the concept that stocks of human capital – i.e., schooling and learning from labor market experience – are the key determinants of an individual's returns for participating in paid employment, e.g., hourly wage rate. The theoretical development and empirical application of such human capital models is justified on a policy framework because schooling choices – *i.e., education* – and labor market participation – *i.e., acquiring experience* – are unquestionably subject to policy interventions. Thus, understanding wage determination can help define optimal educational and labor market policies that induce, for example, higher worker's productivity and a more efficient matching process between demand and supply in the labor market. Wage determination can also help explain the underlying reasons for income inequality; since earnings are, for most families, the key component for wealth accumulation – including the potential to accumulate health stocks – understanding wage determination provides valuable information to policy makers on how labor markets affect income inequality in the population. In what follows, Mincer based human capital models are justified, specified and estimated in order to understand wage determination in the UAE. The underlying assumption that takes wages as our preferred labor market outcomes is that wages are viewed as the key indicator that motives the participation of individuals in active paid employment. Understanding wage determination complements the previous set of estimates (section 4) with a causal framework that quantifies the value of education in the UAE relative to the cost of labor (wage bill).

The basic Mincer specification explains returns from participation (wages, y_i) as a function of start up education (or formal schooling attainment, edu_i) and working education (i.e., learning by experience and seniority, exp_i). Other variables $x \in X \subseteq \mathbb{R}^P, P \geq 1$ are added in the model to control for social, demographic and labor market characteristics; these variables define a common support on observed heterogeneity that exogenously affects the determination of wages for individuals in the population. Expression (1) provides the basic modelling specification:

$$\ln y_i = c + \beta_1 edu_i + \beta_2 exp_i + \beta_3 exp^2{}_i + \sum_{j=1}^{P} x_i^j \beta_j + u_i \qquad (1)$$

It is conventional to model wages as an exponential relation between the outcome and the covariates thus allowing for the log normal distribution of a positive outcome, as is the case for wages. Allowing for the square value of the variable 'labor market experience' (exp^2) is another conventionality in Mincer regression that helps pick up the concave nature of wages over an individual's lifetime. Applying the 2009 UAE labor force survey to the semi-log earnings function in (1) provides estimates of the average private rate of returns for each additional year of education (β_1) and the average private returns for each additional year of experience ($\beta_2 + 2 \cdot exp \times \beta_3$) among workers in the UAE; in the latter case the returns depend on the stock of experience (β_2) and the rate at which wages change as result of the stock of experience (i.e., on a function of β_3). All other coefficients – i.e., $\beta_{j=1},...,\beta_{j=p}$ – are included to clean away potential confounding effects from the three key policy parameters ($\beta_1, \beta_2, \beta_3$). Expression (1) is often referred to the *basic earnings function*; it differs from the *extended earnings function* in that the latter substitutes the continuous variable *edu* for dummies that capture the returns to education at different levels of the formal schooling cycle (i.e., primary, secondary, etc.). Our empirical application of expression (1) will provide estimates for both *the basic* and *the extended* versions of the earnings function.

The choice of estimation method depends on the relation between the dependent variable and both observed and unobserved heterogeneity. Assuming that expression (1) is *(a)* the correct specification, *(b)* that observed heterogeneity ($x \in X^P$) is exogenous and *(c)* no omitted variable problems, the causal relation between the right and left hand side in (1) can be consistently estimated by fitting a semi-log ordinary least squares regression. If so, estimates $\hat{\beta}_1, \hat{\beta}_2$, and $\hat{\beta}_3$ will be unbiased, consistent and asymptotically normal.[30] Although assumptions *(a)* to *(c)* might be correctly for the dataset at hand – i.e., the 2009 UEA Labor Force Survey – the problem arises with unobserved heterogeneity (u). The survey is such that all prime age individuals in all the selected households enter as individual units in the data. It implies that the selected sample – see Table 2 – does not conform with the assumption of *independence* required for (u) to be *iid*, i.e., units from the same household are not independent from each other and are likely to affect each other's outcome in the labor market.[31] The violation of 'non-independence' between observations does not affect the

[30] Likewise, the property of consistency, unbiased and asymptotically normal estimates applies to all other β_p coefficient in the specification, while it is also assumed that the indicators for education and experience are strictly exogenous.

[31] Labor force surveys very often reflect independent observations by sample design. For example, most European labor force surveys identify a sample of households representative of the underlying population; from these there is a selection of one prime age individual from each household to form the final sample

conditions of consistency and unbiased OLS estimation of the set $\hat{\beta} = \hat{\beta}_1, \hat{\beta}_2, \hat{\beta}_3, \hat{\beta}_{p=1}, ..., \hat{\beta}_P$. The problem is that the asymptotic variance under OLS is no longer valid because the off-diagonals are no longer zero as result of the interdependence between members in the same household. This precluding correct inference from the sample to the population using the OLS based estimated variance covariance matrix. The solution to this problem is to think of each household as a single *cluster* where observations within cluster are assumed to be correlated potentially as result of unobserved cluster effects – e.g., unobserved family ability could be determinant on the labor market participation choices. Thus (1) can be re-written as $\ln y_{ci} = \beta_1 edu_{ci} + \beta_2 exp_{ci} + \beta_3 exp^2{}_{ci} + \sum_{j=1}^{P} x_{ci}^j \beta_j + f_c + u_{ci}$ where the suffix c stands for cluster $c = 1..., C$ to which the *ith* individual belongs and f_c is the unobserved cluster – or household – effect common among all members in a cluster. In matrix form, the following specification applies:

$$\begin{aligned} &\ln y_c = \left[edu_c \; exp_c \; exp_c^2 \; X_{c1} ... X_{cp} \right]' \beta + (f_c + u_c) \\ &where \quad \beta' = (\beta_1, \beta_2, \beta_3, \beta_{p=1}, ..., \beta_P) \end{aligned} \tag{2}$$

Thus, each household contributes to the problem with a matrix of dimension $c \times (4 + p)$ where c indicates the number of observations within cluster (households). Assuming strict exogeneity conditional on cluster – i.e., $u_c \perp [edu_c ... X_c]$ conditional on f_c – running OLS by pooling across clusters provides consistent estimates of the parameter set $\hat{\beta} = \hat{\beta}_1, \hat{\beta}_2, \hat{\beta}_3, \hat{\beta}_{p=1}, ..., \hat{\beta}_P$. The problem is similar to that of random effects analysis with the error correlated between clusters and the solution is to estimate a variance adjusted similarly to GLS estimation so that the asymptotic OLS variance allows for correct inference from the sample to the population. The adjustment applies *cluster estimation* with observations independent between clusters – between households – and identically distributed within clusters. Moreover, cluster estimation produces a variance covariance matrix that is robust not just to within cluster correlation, but it is also robust to any potential form of heteroskedasticity between clusters (see, for example, Ashenfelter and Rose, 1998, for an application of cluster to the analysis of returns to schooling for twins).[32]

representing the labor force. Strictly speaking, the 2009 Labor Force Survey is in between the definition of a household budget survey – with emphasis on labor market indicators – and a labor force survey that has as unit of response, the household. The 2009 UAE Labor Force Survey provides both households and individual level weights so that the sample is representative both at the household and at the level of the individuals.

[32] There are two reasons to think of potential heteroskedasticity in cluster analysis: on the one hand, clusters might be draws from alternative distributions in unobservable ways, and second, clusters differ in size which leads to the potential of cluster being non-identically distributed. Cluster analysis takes care of all potential

Identification – in our case, identifying returns to human capital accumulation – requires that sampled units are homogenous with respect to the outcome and potential policies that affect the outcome: in Mincer regression this often implies sub-dividing the sample according to gender. In sections 3 and 4 we saw that nationality is also an important factor that defines homogeneity of outcomes in the UAE labor market. Thus, Mincer regression following expression (2) should be applied to sub-groups section 4 but further allowing for gender within nationality.

Table 4 shows the size of the 8 subgroups together with a selection of labor market indicators pointing towards homogeneity between groups by nationality and gender with respect to labor market outcomes. UAE (GCC) male nationals are clearly distinct to other sub-groups given the differential labor market policies; this can be seen by comparing their average hourly wage rate – AED 130 – to that of other nationalities that have significantly higher human capital – e.g., the group Arabs – but with hourly wage rate of AED 46.8. The fact that UAE (GCC) male nationals work significantly less number of hours per week – 41 hours – than other male groups shows the tendency for locals to self-select themselves in public sector employment. Male westerners, Arab nationals and nationals of developing economies can be separately considered as homogeneous groups because their labor market outcomes in the UAE are very much determined by their country of origin; Table 4 points to this difference by comparing the average hourly wage of male westerners (AED 168) to that of male Arabs (AED 44) and males in developing economies (AED 22). However, on average, male westerners are also different in terms of having accomplished a significantly higher level of schooling and experience. The difference between Arab males and males in developing economies is less acute but Arab males have on average 4 extra years of education and earn almost twice as much per hour than males that originate from developing economies. With regards to females, there is less difference between sub-groups than those detected for males. UAE (GCC) females show labor market characteristics similar to females that originate from western economies, although the latter still show, on average, 5 extra years of formal education relative to native females. However, separating these two sub-groups is justified simply because, as is the case for males, there are labor policies that apply exclusively to Emirati (and GCC members) and these are deterministic with regards to labor market outcomes. The differences in labor market outcomes between female Arabs and females originating from developing economies are less marked than those between males in analogous sub-groups. However, female Arabs still earn significantly more and work less hours per week than their

forms of heteroskedasticity and non-independence within observations by pooling observations within an OLS framework. The framework weights the observations with a variance covariance matrix that has identical shape as White's robust VCV estimator – i.e., $(\Sigma x_i x_i)^{-1}(\Sigma x_i' \hat{u}_i' \hat{u}_i x_i)(\Sigma x_i x_i)^{-1}$ – but substituting $\hat{u}_i$ for $\hat{u}_c$, the pool OLS residual for the $c-$cluster.

counterparts from developing economies. The fact that Arabs – either males or females – might have a cultural advantage in the UAE labor market would already be sufficient to separate the two in the estimation process to attain within gender sub-groups that are more homogenous with regards to potential labor market outcomes.

Table 4: *Distribution among homogenous groups for labor market outcomes, individuals (IND=21,180)*

	Emirati N= 6,017	Westerners N= 603	Arabs N= 4,191	Developing N= 10,369
MALES (N= 12,894)	**N=2,802**	**N=309**	**N=2,415**	**N=7,368**
Average Years of education	10.4 (0.08)	16.2 (0.13)	13.2 (0.08)	9.6 (0.06)
Average Years of experience	17.6 (0.19)	18.8 (0.43)	17.9 (0.18)	19.9 (0.1)
Mean (s.e.) hourly wage rate (1)	130.1 (1.4)	168.7 (5.5)	46.8 (0.85)	22.4 (0.29)
Mean (s.e) hours worked per week (1)	40.7 (0.17)	43.9 (0.41)	48.8 (0.22)	52.0 (0.13)
Employer or **Self-Employed**	90 (0.04)	25 (0.08)	221 (0.08)	484 (0.05)
Employee	2,151 (0.77)	270 (0.88)	2,076 (0.87)	6,816 (0.94)
Non-Participants (including unemployed)	561 (0.19)	14 (0.04)	118 (0.05)	68 (0.01)
NON PARTICIPANTS (2)				
Out of the Labor force: **Permanently Disabled**	44 (0.09)	zero	6 (0.03)	2 (0.03)
Out of the Labor force: **Full time Student**	26 (0.05)	zero	18 (0.18)	1 (0.01)
Out of the labor force: **Housewives**	zero	zero	zero	zero
Out of the Labor force: **Has an income**	43 (0.08)	4 (0.35)	4 (0.02)	6 (0.07)
Out of the Labor force: **Not willing to work**	28 (0.06)	3 (0.22)	5 (0.03)	5 (0.06)
Out of the Labor force: **Early Retirement**	271 (0.44)	zero	6 (0.05)	1 (0.01)
Out of the Labor force: **Temporarily Disabled**	17 (0.03)	zero	3 (0.02)	6 (0.06)
Out of the Labor Force: **Unemployed**	132 (0.25)	7 (0.43)	76 (0.68)	47 (0.77)
FEMALES (N=8,286)	**N=3,215**	**N=294**	**N=1,776**	**N=3,001**
Average Years of education	9.7 (0.09)	14.6 (0.17)	12.7 (0.09)	12.6 (0.08)
Average Years of experience	12.1 (0.21)	15.5 (0.75)	14.4 (0.31)	13.1 (0.25)
Mean (s.e.) hourly wage rate (1)	96.6 (1.4)	96.8 (6.07)	44.8 (1.2)	32.3 (0.74)
Mean (s.e) hours worked per week (1)	39.2 (0.17)	42.4 (0.83)	41.1 (0.34)	45.3 (0.27)
Employer or **Self-Employed**	8 (0.00)	4 (0.01)	25 (0.01)	25 (0.00)
Employee	837 (0.29)	104 (0.37)	443 (0.27)	772 (0.30)
Non-Participants (including unemployed)	2,370 (0.71)	186 (0.62)	1,308 (0.72)	2,204 (0.69)
NON PARTICIPANTS (2)				
Out of the Labor force: **Permanently Disabled**	21 (0.01)	zero	2 (0.00)	3 (0.00)
Out of the Labor force: **Full time Student**	46 (0.02)	1 (0.01)	7 (0.01)	16 (0.01)
Out of the labor force: **Housewives**	1,955 (0.81)	171 (0.90)	1,125 (0.85)	2,100 (0.95)
Out of the Labor force: **Has an income**	23 (0.01)	zero	6 (0.01)	5 (0.01)
Out of the Labor force: **Not willing to work**	43 (0.03)	2 (0.01)	10 (0.01)	13 (0.01)
Out of the Labor force: **Early Retirement**	20 (0.01)	zero	2 (0.00)	1 (0.00)
Out of the Labor force: **Temporarily Disabled**	3 (0.00)	1 (0.01)	2 (0.00)	2 (0.00)
Out of the Labor Force: **Unemployed**	259 (0.10)	11 (0.07)	154 (0.12)	64 (0.03)

Note: Source: 2009 UAE Labor Force Survey. The sub-groups are a selected based on age and the correct identification of nationality. All values show size; bracketed numbers show the proportional representation of the size relative to the full population by nationality groups. See footnote in Table 1 for the definitions of nationalities and other details. (1) Based on employees only. (2) Proportions based on OLF only.

It is clear form Table 4 that non-participation is significant for males with UAE (GCC) nationality as well as being significant for all female groups irrespective of nationality. The problem we face is that wages are not observed for the non-participants who might be a self-selected sample with participation behaviour driven by the right hand side covariates in (2) – including human capital

indicators such as education and experience. When non-participation rates are small, the selection effect can be negligent; this is the case for males originating from Western societies, Arab economies and the developing world. In the case of nationals from the UAE (GCC) non-participation amounts to 46% of the prime age population mostly due to female non-participation (71%) while remaining substantially high for males (19%). The same case applies to females from western economies, the Arab world and developing economies whose non-participation rates in the UAE are, 62%, 72% and 69%, respectively. When non-participation is associated with the policy parameters – e.g., human capital indicators – ignoring non-participants might lead to bias estimates of returns to human capital. The solution is to allow for the non-participants information to enter the estimation process using a 2 part model; part 1 estimates the effects of selection and part 2 estimates returns to human capital introducing the selection term from part 1 – thus controlling for potential selection due to non-participation. Let $\delta_{ci}=1$ if individual $i \in n_g$ in cluster c from the selected sample n in sub-group g is an active paid participant (employee), and $\delta_{ci}=0$ if the individuals is a non-participant at the time of the survey. Let $m \in M \subseteq \mathbb{R}^k, k \geq 1$ be a vector of covariates that are assumed to determine the participation behaviour – or the fixed cost of participating – but, at the same time, the set m has no effect on hourly wage rate; variables in m are the identification exclusions in the selection process. The following model specification substitutes the modelling strategy in (2) in the event of significant non-participation rates in a given n_g sub-sample:

$$
\begin{aligned}
&\textit{Selection Equation}: \\
&\quad \delta_c^* = \delta_c[edu_c,\ exp_c,\ X_c,\ M_c,\ f_c;\ \varsigma_c] \\
&\quad \Rightarrow \\
&\quad \delta_c = I\left\{\left(\left[edu_c\ exp_c\ exp\ X_{c1}...X_{cp}\ M_1...M_2\ f_c\right]'\eta + \varsigma_c\right) \geq \underline{0}\right\} \\
&\textit{where}\ \ \eta' = (\eta_1, \eta_2, \eta_3, \eta_{p=1}, ..., \eta_P, \eta_{k=1}, ..., \eta_K, d_c)\ \ \textit{and}\ \ \delta_c \in \{0,1\}
\end{aligned}
\tag{3}
$$

$$
\begin{aligned}
&\textit{Outcome Equation}: \\
&\quad \textit{For}\ \ \delta_c : n \times n\ \ \textit{matrix s.t.}\ \ \delta_{ci}=1\ \ \textit{if participant, and}\ \ \delta_{ci}=0\ \ \textit{otherwise.} \\
&\quad \Rightarrow \\
&\quad \delta_c \ln y_c = \delta_c\left\{\left[edu_c\ exp_c\ exp\ X_{c1}...X_{cp}\ f_c\right]'\beta + u_c\right\} \\
&\textit{where}\ \ \beta' = (\beta_1, \beta_2, \beta_3, \beta_{p=1}, ..., \beta_P, d_c)
\end{aligned}
$$

Expression (3) implies a latent process (δ^*) by which individuals evaluate the utility from participating in active employment relative to the fixed cost of participation that we assume to be fully captured by the right hand side variables in δ^*. We observe only the final selection outcome (δ) and model this allowing for a non-linear probabilistic relation between the observed indicator $\delta \in \{0,1\}$ and the set of covariates $\{edu, exp, x, m, f_c\}$. Having controlled for $\{edu, exp, x, f_c\}$, the set m captures the selection process and we add the projected probability of selection ($\hat{\delta}_c$) that absorbs the potential selection bias as result of non-participation. Assuming that (3) is the correct specification, the two part estimation process leads to estimates of returns to human capital that are free from bias that could be potentially caused by unobserved wages for non-participants. The matrix format in expression (3) emphasis the cluster analysis format required to control for non-spherical disturbances and the potential effect from heteroskedasticity. Otherwise, expression (3) is identical to the modelling strategy followed in the seminal work by Heckman (1974, 1979), the follow up work by Mroz (1987) or more recent studies of female labor markets (e.g., Sanchez-Mangas and Sanchez-Marcos, 2008).

In order to estimate the reduced form specification in (3), it is important to distinguish which of the participant and non-participants should enter the estimation process. Firstly, Table 3 refereed to the active participants as those who are employers (or self-employed) and employees: the two sets are very different because employers receive returns from investing physical capital and not just human capital, while employees are compensated with wages in a completely different market where human capital is their only asset. It is therefore necessary to exclude 882 units declared to be employers, thus increasing homogeneity of the sample with regards to labor market outcomes. Secondly, we observe that the non-participants include full time students, temporary disabled and permanently disabled; we eliminate the three type form all 8 groups – a total of 227 observations – because their fixed cost of participation is not related to that of non-participants who can freely access the market and supply labor – even if at a higher cost than the participants. Thus, non-participants are composed of declared housewives, those who are unwilling to work (or have an income to justify so), the early retirees who are still below the age of 56 in our selected sample, and the unemployed.[33] Table 4 shows the

[33] In the UAE, the concept of 'unemployment' differs to that in economies where workers have options to unemployment insurance with unemployment offices keeping official records of the rate of unemployment. Thus, being unemployed in the UAE is a subjective definition that varies from other forms of non-employment in terms of how costly it is to enter the market. For example, housewives are equally unemployed as the unemployed but might declare themselves as housewives thus signalling significantly higher reservation wage. Likewise, it is not rate to see UAE nationals retiring from a position with a set pension and re-entering the market as result of the system that allows the possibility to earn in open employment while receiving a vital pension. It is for this reason that we can consider those who claim to be early retired as individuals who, as is the case with housewives, have a significantly higher reservation wage

distribution of participants and non-participants for each nationality/gender sub-group as well as pointing out which of the specifications – (2) or (3) – is used in estimating returns to human capital.

Table 5: *Distribution among homogenous groups for labor market outcomes, individuals (IND=20,071)*

	Emirati N= 5,762	Westerners N= 572	Arabs N= 3,907	Developing N= 9,830
MALES (N= 11,767)	**N= 2,625**	**N= 284**	**N= 2,167**	**N= 6,875**
Participants (employees)	2,151 (0.83)	270 (0.96)	2,076 (0.96)	6,816 (0.99)
Non-Participants	474 (0.17)	14 (0.05)	91 (0.04)	59 (0.01)
Need to control for SELECTION?	YES	NO	NO	NO
FEMALES (N= 8,120)	**N= 3,137**	**N= 288**	**N= 1,740**	**N= 2,955**
Participants (employees)	837 (0.29)	104 (0.38)	443 (0.28)	772 (0.31)
Non-Participants	2,300 (0.71)	184 (0.62)	1,297 (0.72)	2,183 (0.69)
Need to control for SELECTION?	YES	YES	YES	YES

Note: Source: 2009 UAE Labor Force Survey. The sub-groups are a selected based on age, the correct identification of nationality and by labor market status: participants (wage employees) and non-participants (early retired, unemployed, housewives and unwilling to work). All values show size; bracketed numbers show the proportional representation of the size relative to the full population by nationality groups. See footnote in Table 1 for the definitions of nationalities and other details. Controlling for selection implies applying specification (3) to the data while not controlling for selection implies throwing away the non-participants thus estimating (1) on the participants only.

Estimation

We estimate either a one part or two part model using sub-groups with respect to gender and nationality described in Table 5; the table shows the final sample sizes after applying a selection process leading to homogenous sub-samples with respect to labor market outcomes. When selection through non-participation is negligent – males in groups other than UAE/GCC nationals – we estimate expression (2) by fitting a semi-log specification that allows for cluster variance. When selection due to non-participation might be present – UAE/GCC males and all four sub-groups of females – we estimate the framework in (3) using Heckman's two step procedure to combine a Probit model for the selection equation (based on the full sample for a given sub-group) with the semi-log specification for the earnings outcome (based on the restricted sample of employees).

Identifying the selection into participation requires finding variables that affect participation but have no effect on the outcome 'hourly wage rate'. A review of the 2009 Labor Force Survey suggests the construction of four possible variables that may act as exclusion restrictions. First, the position of the individual relative to the head of the household – i.e., if individuals are heads, wives, children of the head, sibling of the head, or other second degree relatives – might determine their participation status without necessarily being determinant on to hourly wage rate. The average

than those who are unemployed, but nevertheless, would still enter the market if offered the correct incentives. This is specially the case for our selected sample that takes individual aged up to 55. We cannot, however, distinguish the possibility of individuals that are retired as result of permanent disability.

number of adults in the household can also be determinant of individual's participation status and, at the same time, have no effect on received wages. The third variable we use as exclusion is the self-excluding percentage of adults that are active participants in the labor force. Finally, although the existence of children (or number of children) can affect both the participation and wages received, the average age of children in the household is second order information that could determine participation without necessarily having a direct impact on hourly wage rate. Altogether, the transformation of these four variables into a variety of dummies conform our set of exclusion restrictions. Besides controlling for selection, both outcome and selection equation contain a set of covariates that clean away potential confounding effects from the key human capital variables, i.e., education and experience. Table B1 (Appendix B) describes the set of covariates and exclusions employed in estimation and reports on the variables used as reference variables for identification.

Table 6a summarizes the key results from estimating the effect of human capital on received hourly wage rate for males and for each of the four nationality sub-groupings. The table displays estimates of returns to education and returns to experience as well as estimates for key labor market coefficients – the effect of regional variation, public versus private sector of employment and industrial sector. The table presents two models for each of the nationality groups: Model 1 estimates the basic Mincer function: the estimated coefficient for the variable education should be interpreted as the percentage change in earnings for each additional year of education. Model 2 estimates the extended earnings function where the returns to education are estimated at different incremental levels of education: each coefficient associated with an educational category has to be read in relation to the previous level and relative to the assumed number of years passed between levels.[34] Table 6b is analogous to Table 6a but for females.

[34] See Psacharopoulos (1994) for an interpretation and application of the methodology. It is assumed that returns increase as a constant monotonic function between consecutive levels of education. The difference between subsequent coefficients ($\beta(i)-\beta(i-1)$) is the increased in returns between levels in education. The average return for a given year is $(\beta(i)-\beta(i-1))/Y$, where Y is the number of years passed between levels 'i' and level 'i-1'.

Table 6a: *Effects of Human Capital on Hourly Wage Rates (Returns to education & experience: MALES by nationality sub-groups).*

	UAE/GCC Nationals		WESTERNERS nationals (1)		ARAB (MENA except GCC) nationals (1)		DEVELOPING nationals (1)	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Selection Equation (δ)								
Censored Observations			--	--	--	--	--	--
NO. of Exclusions	474	474	--	--	--	--	--	--
NO. Non-Exclusions	15	12	--	--	--	--	--	--
Log Likelihood	17	24	--	--	--	--	--	--
LR for the exclusions (df)	-782.1	-790	--	--	--	--	--	--
Pseudo-R2	814.7 (32)	798.9 (36)	--	--	--	--	--	--
Number of iterations	0.34	0.34	--	--	--	--	--	--
	6	6						
Outcome Equation ($LnWages$)								
Uncensored Observations	2,151	2,151	270	270	2,076	2,076	6,816	6,816
Number of other variables (2)	11	11	12	12	11	11	11	11
Constant	***4.03****	***4.43****	***2.80***	***3.62****	***1.41****	***2.11****	***1.07****	***1.82****
Human Capital								
Schooling	***0.055****	--	***0.064****	--	***0.122****	--	***0.122****	--
Experience (3)	0.005	0.0039	**0.076***	**0.060***	0.013	0.010	-0.003	***-0.018****
Experience Square (3)	-0.0002	***-0.0005****	***-0.002****	***-0.002****	0.0002	-0.0002	***0.0003****	-0.001
Education Dummies								
Read & Write		0.061	--	--	--	0.029	--	***0.046****
Primary		0.058	--	--	--	**0.290***	--	***0.123****
Secondary		**0.217***	--	--	--	***0.599****	--	***0.488****
BA/First Degree		***0.489****	--	**0.309***	--	***1.226****	--	***1.18****
Masters & Above		***0.587****	--	**0.409***	--	***1.61****	--	***1.50****
Labor Market indicators								
Years in present Job	***0.0116****	***0.0125****	-0.009	-0.008	***0.016****	***0.018****	0.003	***0.005****
Private Sector	***-0.239****	***-0.238****	0.084	0.066	***-0.242****	***-0.271****	***-0.260****	***-0.233****
Public Sector	**-0.089***	**-0.095***	**0.188***	**0.199***	0.014	-0.002	***0.165****	***0.178****
Industry: Manufacturing	--	--	-0.080	-0.074	-0.155	-0.151	**0.092***	***0.154****
Industry: Construction	--	--	-0.050	-0.059	-0.102	-0.108	***0.112****	***0.160****
Industry: Transport/Communications.	--	--	0.09	0.049	***-0.228****	***-0.222****	***0.138****	***0.199****
Industry: Finance	--	--	-0.002	0.010	0.039	0.036	***0.137****	***0.181****
Industry: Services	--	--	***-0.290****	***-0.287****	***-0.22****	***-0.202****	-0.05	0.027
Industry: Non-service	***-0.174****	***-0.164****	--	---	--	--	--	--
Regional Indicators								
Works in ABU DHABI	***0.126****	***0.124****	***0.490****	***0.513****	***0.381****	***0.403****	***0.320****	***0.328****
Works in DUBAI	-0.043	-0.047	***0.378****	***0.388****	***0.387****	***0.391****	***0.345****	***0.356****
Works in SHARJAH	***-0.145****	***-0.136****	0.219	0.214	***0.186****	***0.193****	***0.100****	***0.169****
Works in AJMAN	-0.091	-0.100	--	--	0.072	0.064	0.006	0.067
Works in RAS AL KHAIMA	***-0.138****	***-0.139****	0.081	0.062	0.079	0.090	-0.074	-0.058
Works & lives in different EMIR	**-0.045***	**-0.046***	-0.015	0.010	0.063	0.081	***0.135****	***0.122****
Urban Area	0.004	0.005	0.381	0.352	***0.304****	***0.337****	***0.151****	***0.197****
Diagnostics								
Number of Observations	2,625	2,625	270	270	2,056	2,056	6,816	6,816
Number of Clusters	2,025	2,025	267	267	1,736	1,736	3,760	3,760
Log Pseudo-Likelihood	-2,037	-2,038	--	--	--	--	--	--
Lambda	0.034	0.027	--	--	--	--	--	--
Rho	0.079	0.063	--	--	--	--	--	--
R-Square or Wald CHI2 (df)	***539.5*** (25)	***548.6*** (29)	0.36	0.35	0.55	0.56	0.66	0.68
Number of iterations	4	4	--	--	--	--	--	

Note: Source: 2009 UAE Labor Force Survey.(1)See Footnote in Table 1 for grouping of economies; OLS with robust cluster variance applies to the three groups but not to UAE/GCC nationals where we apply a 2 part model estimation with selection and outcome equation. Model 1: Schooling in continuous number of years; Model 2: extensive earnings function with discrete categories of education.(2) See Appendix B, Table 1B, for a detail account of all other variables included in regression; the list is exhaustive but not all variables are identified for all sub-groups.(3) 'Potential experience' is imputed using age and years of schooling plus 6. See Table B1 in Appendix B for the reference categories.

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Table 6b: *Effects of Human Capital on Hourly Wage Rates (Returns to education & experience: FEMALES by nationality sub-groups).*

	UAE/GCC Nationals		WESTERN ECONOMIES nationals		ARAB (MENA except GCC) nationals		DEVELOPING ECONOMIES nationals	
	Model 1	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**	**Model 1**	**Model 2**
Selection Equation (δ)								
Censored Observations	2,300	2,300	184	184	1,297	1,297	2,183	2,183
NO. of Exclusions	13	13	7	7	9	9	9	9
NO. Non-Exclusions	17	17	15	15	17	17	17	17
Log Likelihood	-582.2	-607.03	-34.9	-37.5	-372.7	-381.3	-304.5	-317.6
LR for the exclusions (df)	2,638 (33)	2,587 (37)	312 (22)	306.8 (23)	1,302 (29)	511.3 (27)	3,037 (29)	3,011 (33)
Pseudo-R2	0.69	0.68	0.82	0.80	0.64	0.63	0.83	0.83
Number of iterations	9	9	8	8	8	8	8	8
Outcome Equation ***(Ln Wages)***								
Uncensored Observations	867	837	104	104	443	443	772	772
Number of other variables	11	11	10	10	11	11	11	11
Constant	***4.01*** **	***3.55*** **	1.23	***3.11*** **	***2.37*** **	***2.87*** **	***1.49*** **	***2.43*** **
Human Capital								
Schooling	**0.026***	--	***0.154*** **	--	***0.073*** **	--	***0.109*** **	--
Experience	-0.032	***-0.049*** **	0.068	0.034	0.006	0.013	***0.044*** **	***0.039*** **
Experience Square	-0.000	0.0004	0.0004	0.0007	-0.0003	-0.0003	-0.0001	-0.0003
Education Dummies								
Read & Write	--	***1.03*** **	--	--	--	--	--	-0.236
Primary	--	***0.756*** **	--	--	--	--	--	-0.029
Secondary	--	***0.856*** **	--	--	--	0.173	--	0.338
BA/First Degree	--	***0.945*** **	--	***0.634*** **	--	***0.567*** **	--	***0.868*** **
Masters & Above	--	***0.978*** **	--	***0.884*** **	--	***1.070*** **	--	***0.996*** **
Labor Market indicators								
Years in present Job	***0.014*** **	***0.02*** **	-0.013	-0.113	0.006	0.007	***0.015*** **	***0.015*** **
Private Sector	***-0.201*** **	***-0.185*** **	-0.062	-0.066	***-0.233*** **	***-0.216*** **	***-0.274*** **	***-0.277*** **
Public Sector	0.082	0.090	0.192	0.218	0.063	0.087	-0.070	-0.075
Industry: Manufacturing	--	--	--	--	--	--	--	--
Industry: Construction	--	--	--	--	--	--	--	--
Industry: Transport/Communications	--	--	--	--	--	--	--	--
Industry: Finance	--	--	--	--	--	--	--	--
Industry: Services	0.006	0.009	-0.004	0.024	-0.048	-0.041	-0.036	-0.029
Regional Indicators								
Works in ABU DHABI	***0.356*** **	***0.357*** **	***0.729*** **	***0.771*** **	***0.300*** **	***0.308*** **	***0.496*** **	***0.509*** **
Works in DUBAI	***0.160*** **	***0.163*** **	***0.708*** **	***0.775*** **	***0.320*** **	***0.343*** **	***0.530*** **	***0.516*** **
Works in SHARJAH	0.008	0.006	**0.664***	0.613	-0.049	-0.050	**0.253***	**0.259***
Works in AJMAN	0.058	0.054	--	--	0.084	0.031	0.226	0.190
Works in RAS AL KHAIMA	0.053	0.059	--	--	-0.026	0.023	-0.087	-0.060
Works in UM AL QUWAIN	--	--	--	--	--	--	--	--
Works & lives in different EMIR	0.027	0.025	***-0.468*** **	**-0.439***	-0.026	-0.049	***0.180*** **	***0.197*** **
Urban Area	-0.011	-0.011	--	--	-0.025	-0.008	-0.317	***-0.325*** **
Diagnostics								
Number of Observations	3,137	3,137	288	288	1,740	1,740	2,955	2,955
Number of Clusters	2,259	2,259	282	282	1,632	1,632	2,721	2,721
Log Pseudo-Likelihood	-983.2	-1008.2	-121.8	-126.4	-689.2	-687.6	-972.6	-935.7
Wald Chi2 (df)	***222*** ** (25)	***253*** ** (29)	***361*** ** (28)	***338*** ** (22)	***232*** ** (25)	***511*** ** (27)	***386*** ** (25)	***411*** ** (29)
Lambda (s.e)	-0.13 (0.1)	-0.12 (0.1)	-0.001(0.3)	0.16 (0.21)	0.001(0.1)	0.04(0.08)	0.17(0.08)	0.18(0.08)
Rho	-0.34 (0.2)	-0.3 (0.2)	-0.002(0.5)	0.28 (0.37)	0.001(0.2)	0.08(0.18)	***0.3*** **(0.16)	***0.4*** **(0.15)
Number of iterations (1)	3	3	2	3	2	2	3	3

Note: Source: 2009 UAE Labor Force Survey. See notes in Table 6a.

Returns to Education

Generally speaking it is assumed that the rates of return to education should be inversely related to the level of economic development, i.e., the law of diminishing returns applies to the formation of human capital at the margin. This is because as economies become richer their citizens accumulate human capital; over time, investing on additional years in education brings lower returns to the accumulation of such human capital especially at the upper ends of the educational scale. Table 6a shows that in the case of UAE/GCC *males* there is a 5.5% return for each additional year invested in education; in the case UAE/GCC of *females* the rate of return is lower at 2.6%. Both estimates provide a drastic contrast to estimates from other male and female sub-groups that operate in the UAE labor market. Thus, relative to males from the UAE/GCC, working in the UAE implies that each extra year invested in education bring 0.9% higher returns for male westerners and 6.7% higher return for either non-GCC Arab males or males for the developing world. The presence of the Emiratization process could explain why returns to investing in education are so low for UAE/GCC nationals: Emiratization protects their members – i.e., the Emirati and GCC nationals – from competing in the market by setting wages artificially higher and in relation to the public sector. The effect is similar to that of belonging to a union: for example, Wahba (2000) estimate returns to education in the Egyptian labor market and she finds that union membership increases earnings by 19% so that controlling for membership with a union dummy effectively reduces the returns to education from 8.5% to 7.3%. The estimated returns to education for western male (6.4%) is very close to the estimate for the OECD average of 6.8%; moreover, the educational compression among westerners operating in the UAE labor market – i.e., most are university graduates – implies that the estimate of 6.4% reflects steady state levels of human capital where the diminishing returns to an extra year of education are already relatively flat. On the other hand, UAE expatriates for Arabs from non-GCC economies and nationals from developing economies are observed throughout the educational spectrum: since there is a steeper effect of education when increasing investment at the earlier stages, as expected, the marginal effect – in the UAE labor market – of investing in one extra year of education is greater for Arabs and those from the developing world – both estimated at 12.2% for each extra year of education – relative to westerners working in the UAE.

The fact that Emirati/GCC females experience a significantly lower return from investing in education (2.6%) is also an oddity; generally, and relative to males in any given population, females lack behind in educational attainment. Following the same principle of diminishing returns it implies that returns to education for female should be above that estimated for males: this is in fact what happens when we compare the returns from education for male westerners (6.4%, Table 6a) against

female westerners (15.4%, Table 6b). It is likely that the low returns of 2.6% for UAE/GCC national females is due institutional effects – e.g., overrepresentation in the public sector –, short periods in current workplace – i.e., females do not stay long enough in a work placement to get back returns from their education investment – and low variability between types of work exercised by females – e.g., self-selection of females into employment positions that have been nationalized such as secretarial work, human resource, and similar type of work irrespective of years in education. The other two sets of females – Arab non-GCC economies and from developing economies – experience returns to extra years of education (7.3% and 10.9%, respectively) below that experienced by their male counterparts (12.2% in both cases). It is likely that in both cases the results for females are explained because they operate where there is no reward for extra years of education at the low levels of the educational scale – e.g., domestic service or low skill service sector independent from skills.

An interesting exercise is to evaluate the returns to investment in education for workers in the UAE comparing these to estimates in other economies or economic blocks; this is done in Table 7 draws from estimates in Psacharopoulos (1994). Table 7 suggest that returns to investment in education for UAE/GCC nationals (males or females) are close to that experienced by employees in India. However, the reason why returns to investment in education are low in the Indian sub-continent is because the demand for skill labor remains low; employment and skills mismatch keep the returns to educational investment artificially low when most employees are overqualified in relation to their work. Inspecting the other economies displayed in Table 7 – Argentina, Chile, Philippines and Portugal – shows that in the case of emerging & middle income countries – i.e., comparable to the UAE – returns to one year invested in education should be about 9 to 12% for males and 1 to 2% higher in the case of females. Our estimates on returns to education for workers in the UAE are comparable to similar economies only for westerners (males or females), for non-GCC Arabs and for nationals from developing economies. The 6.4% estimate for western males suggest that immigration policies in the UAE are westerners (male employees) with high skills who are able to sell their human capital at the long run opportunity cost (relative to investment in physical capital). In this respect the UAE immigration policies are optimal at attracting profitable high skill human capital at the long run equilibrium price. Relative to western males, estimates for western females are much higher (15.4%) as would be the case in their country of origins; this is reflected in gender difference for the selected set of economies in Table 7. Nevertheless, a 15.4% return to education for western females is likely to reflect that the return for investing in education is significantly higher in the UAE than back in their country or origin – e.g., in the UAE westerns are able to exploit human capital such as language skills that would not count as comparative advantage back in their countries of origin.

In the case of Arab males from non-GCC economies and males from developing economies, the estimate of 12.2% return for each year invested in education is a close reflection of what these expatriates would receive in their countries of origin: it is likely that the estimates reflect the UAE wage setting behaviour of employees that assign earnings according to country of origin. At the same time, the fact that Arab and nationals from the developing world are represented in the UAE throughout the educational spectrum implies that estimates for the returns to education are a close reflection of the return they would obtain back in their countries of origin. Thus, the 12.2% for Arabs from non-GCC/developing economy nationals based on the 2009 UAE sample is close to the estimates by Psacharopoulos (1994) for males in the Phillippines (12.4%), Sub-Saharan Africa (13.4%), the Asian sub-continent (9.6%) or MENA economies (8.2%). Comparing expatriate females and females in their country of origin shows that – except for westerners – females in the UAE obtain returns from investing in education below that obtained in their country of origin. For example, many females in the UAE classified as coming from developing economies are from the Philippines. Back in their countries of origin they would obtain 1.5% higher return for each extra year in education. The difference is small but probably points that, except for westerns, females in the UAE are a selected sample from their country of origin willing to take up work below their educational skills.

Table 7: *Returns to education: Comparing UAE labor markets to other economies, from Psacharopoulos (1994)*

	FULL POPULATION	MALES	FEMALES
UAE Labor Market			
UAE/GCC Nationals	5.1%	5.5%	2.6%
Westerners	9.3%	6.4%	15.4%
Arabs from non-GCC economies	13.0%	12.2%	7.3%
Nationals from Developing economies	12.7%	12.2%	10.9%
Rest of the World			
India	Not available	5.3%	3.6%
Argentina	Not available	9.1%	10.3%
Chile	Not available	12.1%	13.2%
Philippines	Not available	12.4%	12.4%
Portugal	Not available	9.4%	10.4%
Blocks of Economies			
Sub-Saharan Africa	13.4%	Not available	Not available
Asia (non OECD)	9.6%	Not available	Not available
MENA economies (non OECD)	8.2%	Not available	Not available
Latin America & Caribbean	12.4%	Not available	Not available
OECD	6.8%	Not available	Not available

Note: Source for UAE labor market: 2009 UAE Labor Force Survey; Table 6a for males & Table 6b for females. Estimates for the UAE labor market full population are reported but not tabulated. Source for Rest of the World & Blocks of Economies: Psacharopoulos (1994).

So far we have reviewed the average return per year invested in education; these estimates are based on Model 1 – Tables 6a and 6b – by taking the average on the continuous variable 'years in education'. Model 2 estimates returns to education as individuals move sequentially over the educational scale: these estimates help understand the relative effect of moving into further degrees of formal education allowing for possible non-linear effects that are lacking in estimates from Model 1. Table 8 takes the estimates coefficients to convert these into the return to education for each year spent in a given educational category.[35] The same table displays estimates from a selection of countries – also based on Psacharopoulos (1984) – as a comparative guide to our own estimates. Furthermore, Figures 33 to 36 plots the information in Table 8 to allow for a graphical display of the gradual increase in returns to investing for sequential increases in education.

[35] The methodology is simple and has been described in Psacharopoulos (1994). The estimates have a reference category the last category observed for any given group. For example, for the UAE/GCC male population all estimates start by assuming zero returns from illiteracy. Taking the next category – read & write – and assuming two years of semi-formal education to attain such level, the estimate of returns to education for read and write is the coefficient divided by 2. The follow up category is 'primary' education. Taking the difference between the two coefficients in Table 6a – primary minus read & write – and assuming it takes 4 years of formal education to attain a certificate of primary schooling, the difference divided by 4 gives a rate of return for each year in primary education equal to 0.7%. Likewise for all other estimates in Table 8.

Table 8: *Returns to education: Percentage added by increasing level of education (Full Method: Model 2, Tables 6a & 6b)*

	UAE NATIONALS (1)	WESTERN NATIONALS (2)	ARAB NATIONALS NON-GCC (3)	DEVELOPING ECONOMIES NATIONALS (1)
MALES				
Read & Write	3.1%	--	1.5	2.3%
Primary Education	0.7%	--	6.5	1.9%
Secondary Education	5.3%	--	10.3	12.2%
University Degree	6.8%	7.7%	15.7	17.3%
Post Graduate education (Masters, PhD)	3.3%	3.3%	12.8	10.7%
FEMALES				
Read & Write	51.5%	--	--	-11.8%
Primary Education	12.6%	--	--	5.2%
Secondary Education	3.3%	--	5.8%	12.2%
University Degree	2.2%	15.9%	9.9%	13.3%
Post Graduate education (Masters, PhD)	1.1%	8.3%	16.8%	4.3%

The WORLD, examples (Psacharopoulos, 1994)	**Ethiopia**	**Hong Kong**	**Chile**	**Austria**	**Belgium**	**Japan**
Read & Write	--	--	--	--	--	--
Primary Education	35%	--	9.7%	--	--	13.4%
Secondary Education	22.8%	18.5%	12.9%	11.3%	21.2%	10.4%
University Degree or higher (4)	27.4%	25.2%	20.7%	4.2%	8.7%	8.8%

Note: Source: 2009 UAE Labor Force Survey. We assume the following average to apply to all in the population: ability to read and write requires at least 2 years of formal or informal preparation; Primary education requires six years of elementary education; secondary – including preschool – requires 3 years of schooling beyond primary education; a university degree requires four years of further education above secondary level and Postgraduate education requires at most 3 years of post-first degree education. (1) Relative to base zero returns for illiteracy; (2) Relative base zero returns for secondary education; (3) Relative to base zero returns for illiteracy for males and base zero returns for primary education for females (4) Includes any degree from 1st University to postgraduate education.

Figure 33 plots the estimates for males to show that all nationality groups experience a concave monotonic increase in returns when moving to higher levels of education; nevertheless, investing to move from a first degree to postgraduate university leads to a relative decline in returns to education for all groups: the steepest decline is experienced by UAE/GCC nationals and westerners. The concavity in returns to education for both UAE/GCC nationals and westerners is flatter than for the other two sub-groups. In the case of westerners this can be explained because the immigration laws bring expatriates with high skills that have already reached their long run equilibrium in terms of investing in formal human capital. In the case of UAE/GCC nationals this cannot be the case; on average they have attained educational levels similar to those from less developed economies – i.e., an average of 10.4 years in formal schooling – implying that institutional effects (e.g., Emiratization) is what determines such low returns to investment in education. Figure 34 shows similar information as Figure 33 but for the sub-group of females: comparing the two figures shows that on average, the return to education for females in the UAE display concavity that is slightly above that of males, but negligent; it implies that the expected female premium for returns to education often found in other

economies is missing in the UAE. There are two outliers standing out in Figure 34: for UAE/GCC females, moving from illiterate to read and write brings a return of 51.5%; this could be better explained by an outlier effect in the data.[36] The second outlier is the negative effect that reading and writing brings to females from developing economies; this is explained because for such sub-group of females being above illiteracy does not necessarily imply a significant change in terms of position or earnings in the UAE labor market for females: they will still occupy domestic work or unskilled positions in the service sector for which there is no requirement of formal education. As a final comparative exercise, Figure 35 compares males and females UAE/GCC nationals to suggest that relative to males, females experience declined returns to human capital investment as they move up the educational scale. In general, comparing Figures 33 and 34 to Figure 36 – selected economies from various regions in the world – shows that returns to investing in subsequent levels of education in the UAE follow similar trends as in other economies: returns increase monotonically with the largest increase experienced when moving from primary to secondary education.

[36] From Table 6a we see there are 837 female participants from UAE/GCC origin. Less than 5% of these are below education 'illiterate' and 'read & write' while the majority concentrate in the category 'primary' education. The small size at the low end of the educational scale leads to outlier effects from females that having a very low level of education are nevertheless engaged in gainful employment probably as result of unobserved effects not captured by education.

igure 33

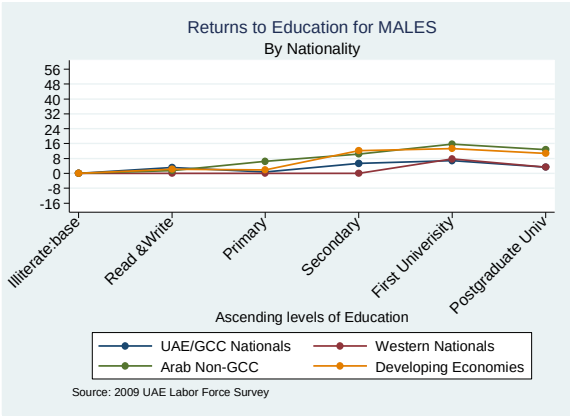


Figure 34

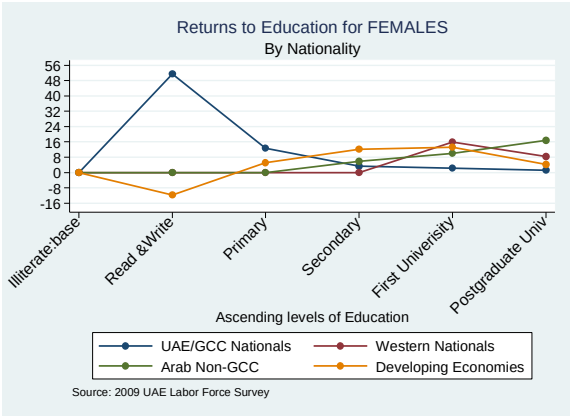


Figure 35

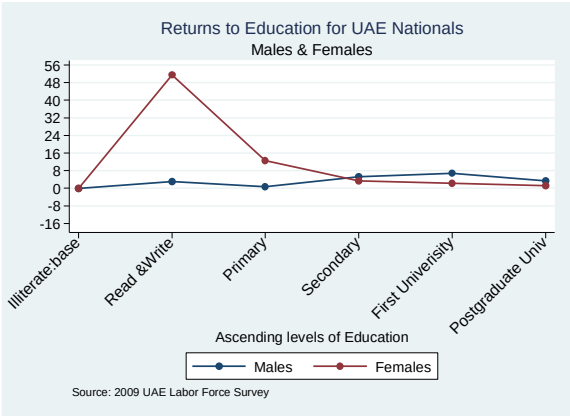
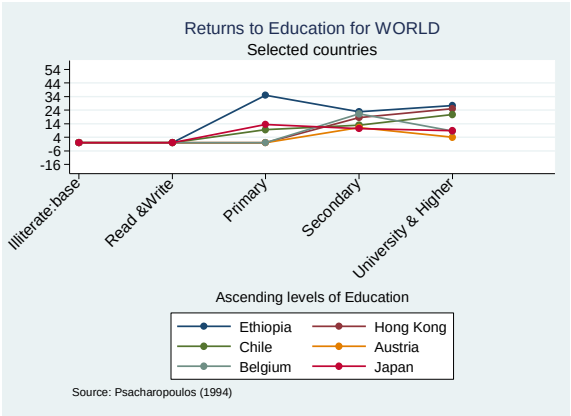


Figure 36



Experience, sector and regional effects

Table 6a and 6b considers effects to earnings other than those implied by education, most notably the effect from experience, i.e. returns from on-the-job-learning. Years of experience are often considered to be the reason why life-cycle wage profiles are concave in shape; it is assumed that individuals enter the market and earn higher returns because of the learning process that allows them to accumulate human capital within skill class. The learning process is greater at the starting point – entering the market – and decreases over time as individuals reach their retirement period. This would explain the concave nature of a wage profile; in estimating returns to human capital, we let experience enter at levels and in square so that the latter captures the concavity effect from the learning process over the life-cycle. Since Mincer (1974) the amount of empirical work following such setting has been huge; recent examples of these are Gibbons et al. (2005), Hirsch et al. (2004), Munasinghe et al. (2008), but to mention a few. In most of these examples, the authors estimate the effect of experience

to find that concavity is present and significant. For example, Gibbons et al. (2005) find that experience – i.e., learning – implies a premium of 2% in sectors where technological advances are important relative to service and manufacturing sectors. Hirch et al. (2004) find that racial differences in the USA determine a significant wage gap although returns from experience are not affected by racial differences. On the other hand, Munasinghe et al. (2008) finds that the gender gap between males and females is not determined by difference in experience.

Tables 6a and 6b show that the effect of experience on earnings varies between genders and by nationality sub-groups. In the case of males, the variable experience is significant only for the population of westerners; furthermore it is only for this sub-group that the variable displays concavity with respect to earnings. For all other groups of males experience is not significant. Again, this seems to be the consequence of the combined effect between the Emiratization process and the Kafala system: Emiratization implies that wages for Emirati are set at public sector level with a premium that does not take experience into consideration. In the case of low and semi-skilled foreigners, the short term contractual conditions implies that they arrive to the UAE to occupy positions where their skills and nationality are determinant of wages, but not necessarily the experience they bring with them. Table 6b shows similar result for females: overall, experience is not significant at determining wages except for the sub-group of females from developing economies; in their case experience has a significant positive linear – non-decreasing – effect on earnings. Overall, the fact that experience brings low returns to supply of labor in the UAE reflects the short-run decision making that employers make with regards to the workforce. In economies where markets are competitive, wage differentials and efficiency wages are determinant to motivate workers to exercise higher efforts, higher productivity and lower turnover rates. Learning by doing or on-the-job-training is assumed as part of the worker's return so that experience is fundamental at wage determination. The lack of labor market competition in the UAE implies that wages are paid for start up education; workers do not necessarily have expectations in terms of gaining efficiency wages with potential adverse consequences for effort levels and productivity outcomes.

Tables 6a and 6b also explore the effect of years in the present workplace and sector of employment on wage determination. Duration in the same workplace has positive effects on earnings for local UAE/GCC employees – males and females – and employees from Arab non-GCC nationalities – males only: these are in fact the two nationality groups of prime age individuals who are more likely to settle in the UAE – see Table 1 and 2 – and spend longer periods in the UAE labor market – e.g., due to cultural similarities, greater chances to extent their contracts compared to nationals from developing economies, etc. In terms of sector of employment, and relative to the mixed sector – i.e., public private partnerships – working in the private sector has negative effects for all

groups except for westerners; for this latter group, public employment in the UAE bring a 20% premium in earnings relative to working in the mixed sector. In the case of females, private sector employment has also a negative effect for UAE/GCC nationals, Arab from non-GCC economies and nationals from the developing world; the negative effect on earnings for western females working in the private sector – relative to working in the mixed private/public sector – is not statistically significant.

Finally we look at Table 6a and 6b to comment on the effect of regional variation on wage determination. The two tables show that for all nationalities and irrespective of gender, Abu Dhabi pays a premium relative to all other Emirates – and with reference to the Emirate of Fujairah. In the case of males, the Abu Dhabi premium is highest for westerners (49%) and lowest for UAE/GCC nations (12.6%); the same applies for western females (73%) although in this case the lowest Abu Dhabi premium goes to females from Arab non-GCC economies (30%). The data also detects a significant Dubai premium for all sub-groups except for males from UAE/GCC economies: in all cases, the Dubai premium is below the premium obtained by workers in Abu Dhabi for westerners (males and females) but higher for Arab non-GCC females and for both genders for nationals of developing economies. In general, the coefficients for Emirates are consistent with ranking of Emirates by wealth. As we saw in Section 2, Abu Dhabi pays consistency higher salaries for any given level of education – within nationality group – and this is picked up in the causal framework.

6. Conclusions & Policy discussion

This paper aims at evaluating UAE policies relevant to labor market outcomes by means of studying the characteristics of the workforce, the supply behaviour of the workforce and the micro-structure of earnings in the UAE. All estimates in the paper are based on the 2009 United Arab Emirates Labor force survey, a recently collected household based micro-data representative of all seven Emirates in the UAE.

As is the case in other GCC economies, the UAE labor market is characterized by large imports of expatriate labor that participate in gainful employment alongside the Emirati. The size imbalance between the autochthonous population and expatriates living in the UAE is determinant for the implementation of two key labor market policies: the Emiratization process and the Sponsorship (Kafala) system. The Emiratization process describes a set of rules and regulations that aim at increasing the participation of Emirati citizens in gainful employment – especially in the private sector – while enhancing their skills relative to the vacancy needs in the local labor market. The Kafala system keeps an effective control over expatriates by tightening the foreign worker to a

particular sponsor for the duration of the contract while working in the UAE; the control of the Kafala system precludes free mobility of 80% of the workforce thus effectively destroying the potential for the market to determine an equilibrium price for labor that would reflect the efficient allocation of resources. We study the potential consequences that such policies have on the supply side of the labor market by distinguishing between 4 groups of workers that are potentially homogenous with regards to labor market outcomes and the effect of labor market policies: the local Emirati, nationals of western type of economies, Arab nationals from non-GCC economies and nationals from developing economies. The local Emirati include GCC nationals since these have identical treatment in the UAE labor market as the local population; westerners include EU, North & South America, Japan, Oceania and Asians from the Tiger economies; Arabs from non-GCC economies includes all other MENA economies; the group from the developing world are overrepresented by Bangladeshi, Indians, Pakistani and Filipino, although it also includes other less developed parts of the world, e.g., Eastern Europeans, Iran or Sub-Saharan Africa. In comparing these four groups of workers in the UAE we aim at eliciting information of two kinds: first, understand the relative standing of the Emirati prime age population in the UAE and secondly, understand the effect that existing policies would have for an economy that aims at reaching a stage of knowledge driven economic growth.

One of the most outstanding findings when comparing the local Emirati to the other three populations is that the average educational attainment of the prime age Emirati population is closer to that of nationals from developing economies. On average, a local Emirati that has completed schooling will have 10 years of formal education. This is about 6 years below the average obtained by westerners or 3 years below the average obtained by Arabs from the MENA region (excluding GCC economies). Section 2 – Figure 1 – showed the educational attainment of the Emirati increasing gradually over the past 50 years so that the youngest cohort that has currently finished schooling have, on average, 11 years of formal education. It is worrying, however, to see that the gradient becomes flat at 11 years rather than potentially increasing towards higher and more specialized levels of formal education: an average of 11 years of formal education implies that fewer than required among the younger cohorts opt for an education beyond completing high school.

The low levels of start-up education for the Emirati population couples with institutional aspects in the labor market that do not necessarily encourage human capital growth of the extensive kind – i.e., job-learning or productivity driven increases in human capital. The data shows that only 54% of the Emirati prime age population are gainfully employed; in the OEDC the average is 71%.[37] Of those who are non-participants the largest percentage are Emirati females declaring a housewife

[37] See http://stats.oecd.org/Index.aspx.

status – 30% – followed closely by those who claim 'not willing to work' – 7% of the prime age population. It is worrying to see that the participation of females lacks behind that of males among the Emirati population; Figure 2 shows that the educational policies since the foundation of the Federation have successfully encourage the educational attainment of females; among the youngest cohorts, females have an average of 1 more year of education than Emirati males, i.e., Emirati females are more likely to have completed some form of university education relative to their male counterparts. Since much of the education in the UAE is subsidized the private costs to education fall on society while the social return to education is partly lost due to the non-participation decision of females (Johnson and Wilkins, 2002). Thus, it seems that the data points towards the need to revise the set of social policies that would effectively increase the participation of Emirati females.

The data shows that Emirati who are gainfully employed select themselves into public sector employment with 85% of the 54% who are employed working as public sector employees and of these, 23% do so for the police or the military. One of the aims of the Emiratization program since it was established in the mid 1990s was to gradually increase the participation of Emirati into private sector employment. Taking into account that the mandatory quotas imposed for certain sectors – banking, insurance and trade – imply a minimum of Emirati employment of about 5%, it seems that the Emiratization process has not been very successful at motivating the mechanisms in the market to increase the placement of Emirati in the private sector beyond the required quota: only 9% of those who are employed work fully outside the public domain. A clear reason why Emirati nationals might prefer to work for the public sector is the wage premium that such sector offers to nationals; Section 3 shows that on average, Emirati in the private sector earn AED 30 less per hour worked than Emirati in the public sector; to such monetary premium we should also an non-pecuniary gain for public sector employees that work, on average, 8 hours less per week than those in the private sector. Public sector employment and the implementation of a wage premium for Emirati could be justified as protecting the locals from unfair competition while building the correct type of human capital stocks so to compete with expatriates in the population. However, since productivity and innovation in public sector employment is, on average, below that in the private sector, it is likely that the productivity potential of current Emirati employees – and their potential to accumulate productive experience – suffers in the long run. This would perpetuate low quotas of Emirati as participants in private sector employment thus jeopardizing the potential for the UAE to move towards a knowledge economy by means of the locals in the population. Alternative policies to a wage premium in the public sector would be to provide Emirati with the choice to compete for wage subsidized employment in the

private sector as is often done in European economies[38] In fact, what the Emiratization process seems to achieve is to diminish the (private) returns to investment in education: our Mincer based estimates on the returns to education for Emirati male suggest that each extra year of education for an Emirati male provides a monetary return of 5.5%. This compares poorly to the rate of return obtained from populations with similar educational background and operation in the same UAE labor market; for example, those from less developed economies show a rate of return from productive activities that equals 12.2% per year of schooling. A low rate of return of (5.5%) implies that the Emiratization process has the same effect as a union. In economies with a strong presence of unionized workers, the effect of the union is to set wages for their workers at a level greater than similar skilled non-unionized workers as well as effectively compressing the distribution of wage between workers with similar skills. Wabha (2000) finds that controlling for unionization of workers the returns to education in a Mincer estimate drop by 19%. If we assume that – conditional on the Emirati schooling average – 12.2% is the rate of return that would correspond to the local Emirati in the absence of Emiratization, then what the Emiratization process is doing is reducing the rate of return for each year invested in education by 120%. This, in turn, discourages the schooling investment decisions of new generations of Emirati and further jeopardizes the potential to depend on the local workforce for the promotion of knowledge based economic growth. In the case of Emirati females the return per year invested in education is only 2.6%; such low return can only be explained by the fact that female participants occupy positions that are fairly homogenous with regards to skill requirement and independent from starting up skills – e.g., secretarial work, human resource positions, etc. Such homogeneity of job placement is also part of the Emiratization process that in 2006 nationalized particular sectors in the labor market that are often oriented toward female employment.

Having analyzed the reasons behind the low return to education of male and female Emirati participants, it is also important to mention that the nonparticipation rate of Emirati is large and might significantly affect the results. For example, the Kafala system of sponsorship in the UAE encourages the creation of dormant entrepreneurs since foreign investment have to find local partners that act as sponsors in the creation of investment opportunities – the 51-49 share. It is likely that those with a higher degree of education take more advantage of this phenomenon and act as dormant partners thus opting out of the labor market as employees. This would imply that non-participants induce a negative bias thus underestimating the effect of education on earnings. We test for this by allowing for the

[38] See, for example, Gerfin et al. (2002) which examines the case of wage subsidies offered to long term unemployed in Switzerland. The subsidy offers temporary work in a competitive market for the unemployed who takes up employment at a lower cost to the employer. Over time the newly employed gains learning experience that enhances their chances to become long term employed. Compared to classic active labor market policies – e.g., training, public sector placement, etc. - wage subsidized schemes seem to increase the chances of permanent employment by 7% over the employment rate of the long term unemployed.

Mincer estimates on local Emirati to control for possible selection effects in a two part model – both for males and females, separately. In the case of males, the selection term is in fact positive – i.e., excluding non-participants from the outcome equation would underestimate the returns to education – but the variable is not statistically significant: two much variability on the support of the non-participants implies that we cannot conclude if they have any effect on the 5.5% estimate of returns to education. Likewise, in the case of Emirate females, the selection term is not statistically significant.[39] Altogether the evidence suggest potential adverse effect of the Emiratization process on the promotion of intensive (schooling) and extensive (training, experience) human capital formation among UAE local citizens. At the same time, the numbers of non-participants is significant; this is likely to be the consequence of very generous social protection – e.g., welfare benefits, subsidies and hand outs such as free housing. It implies that labor policies – e.g., Emiratization – are not the only policies that require revision for a more efficient working of the labor market but also educational policies and social policies that have adverse effects on the participation rate of the locals.

With regards to the expatriates in the population – westerners, Arabs from non-GCC economies and nationals from developing economies – the evidence in the paper are also clear indications on the effects of existing labor policies. Wage determination is clearly marked by the origin of the expatriates. The fact that workers from the developing world are overrepresented in the UAE – they account for 58% of expatriates mostly from BIPP economies – shows that immigration policies have yet a long way to adjust before the UAE starts moving towards a knowledge driven economy as described in the 2020 UAE Strategic Plan. Westerners with high skills are in a minority (less than 5%) and stay for shorter periods of time than other expatriates in the population. The population of expatriates that are likely to spend longer periods in the UAE – i.e., renew contracts or find new opportunities for further periods – are the expatriates from Arab non-GCC economies and from the developing world; they are the populations with less opportunities back in their country of origin and, at the same time, the return they get in the UAE from having invested in education is higher or as high as in their country of origin to fully justify their stay in the UAE; for example, we estimate that expatriates from developing economies obtain a 12.2% return for each year invested in education. The group is heavily represented by Filipino nationals; Psacharopoulos (1994) reports that the return per year of education in the Philippines is 12.4%, but this is conditional to being employed which is difficult when the rate of unemployment in the Philippines approximates 15%. However, it is

[39] In fact, we see from the data that the percentage of Emirati declaring entrepreneurial activities – either as employers or self-employed – is significantly low compared to that of the other three nationality groups. However, it is also important to mention that we do not have information on non-labor income in the data, and this would have been a very good exclusion to understand the potential effect of dormant partners on returns to education.

also the case that the two populations of expatriates – Arabs and from developing economies – are paid wages well below their marginal revenue product: productivity rents are subtracted from them at all levels of the educational spectrum. For example, males from Arab non-GCC economies with secondary education are paid, on average, AED 25 per hour; their western counterfactuals are paid AED 110 per hour. The gap increases as educational attainment increase, but at a decreasing rate. Thus, at Master level an Arab non-GCC national earns about AED 110 per hour whereas his western counterpart earns AED 235. Such wage gap exists because wages are set according to the country of origin and once the expatriate starts working in the UAE, the Kafala system precludes searching and moving to a higher paid position.

There are clear benefits of the Kafala system while the local population in the UAE remain in a minority that cannot compete in the open market because of their relatively low levels of human capital. However, expatriates from non-western economies amount to more than 70% of the population of workers in the UAE: effectively, the Kafala system promotes low efforts levels and relatively low motivation to enhance learning related human capital that is essential for increasing levels of productivity, innovation and economic growth. In the absence of the Kafala, expatriate workers would be free to compete for and obtain higher earnings through efficiency wages. This would reduce the wages obtained by population of workers such as expatriates from western economies. But competition would enhance productivity and efforts among those supplying labor, including the local Emirati. Overall, the empirical evidence in the paper point towards an inefficient market that protects the locals at the expense of lost human capital accumulation and, at the same time, existing wage setting policies promote lower effort and low productivity among the vast majority of those who are subject to the Kafala system. In the short run the protectionism implied by the Emiratization process might be justified if, at the same time, social and educational policies are effective at promoting start-up education. On the other hand, the revising the Kafala system to promote a more efficient and productive workforce might bring more efficient outcomes in terms of productivity from the workforce – without necessarily having immediate implications for the Emiratization process. Countries such as Saudi and Bahrain – see Fakkar, 2009 – are already studying the possibility of alternatives to the Kafala system by means of experimental designs that promote a greater degree of mobility of expatriate workers. This often consists on setting up agencies that act as intermediary between the employer and the potential expatriate employee who is then able to opt to vacancies in the market as opposed to be tight to a single sponsor. Employers willing to keep workers would have to start offering wages that are not necessarily tight to the origin of the expatriate but are more in tune with the expatriates potential productivity. Learning would then be a meaningful investment strategy – as would be offering learning by the employer – thus leading toward increased

human capital for given level of skills. Overall productivity would increase with potential spill over effects to the locals in the population – e.g., greater chances for entrepreneurial activity. This would already imply a movement towards a knowledge driven economy as described in the 2020 UAE Strategic Plan.

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Appendices

Appendix A: Labor Laws & Regulations in the UAE

Labor matters in the UAE are regulated by Federal Law No. 12, 1986. The regulations of the law apply to all employers and employees except for agents in the Free Zones, government workers – federal or local –, domestic workers and agricultural workers. Other than these, the laws are written to clarify the legal relation that applies to both employers and employees.[40]

With regards to *expatriates*, the basic pillar for their employment is that of a sponsorship system: non-nationals that become workers in the UAE do so through an initial process of sponsorship. The employer – who might be a national or in a partnership with a national entity – files an application with the Ministry for social affairs. Once approved, the worker is allowed to enter the country conditional on successfully obtaining a clean bill of health. In addition the prospective employer has to deposit a security with the Ministry that guarantees the worker's end of service benefits and repatriation costs. Generally all contracts are for a limited period; if so the law mandates these cannot be for a period exceeding 4 years. It is rare for a non-national to be given an unlimited contract, i.e.., the law allows for unlimited-period contract but these often apply to nationals only and are oral rather than written. By law a contract has to state wages, benefits, date of commencement, limited or unlimited, nature of work, duration of contract, termination conditions and location of employment.

[40] Foreign partners are not considered 'employees', therefore, they are exempt from obtaining a labor card and do not have to go through the labor office. They are simply required to declare their sponsors as partners and provide the minimum investment requirements to justify and form the partnership in the UAE (subject to the regulations in a given Emirate).

The specified wage rate in the contract defines the terms of payment – per period or per completed unit – and includes both basic wage and total allowances. The basic wage is employed in estimating the end-of-service bonus. The law does not define a minimum wage. However, employees with a monthly salary of AED 4000 or less – excluding accommodation allowances – cannot sponsor their families to live with them in the UAE. The official number of working hours – except overtime – is at most 54 hours over at most 6 days a week. Employees in administration/executive positions should get overtime pay after 40 hours work. Overtime should be paid at 25% increase over the standard wage rate.

The amount of annual leaves are also stated by law – and vary between 2 and 2.5 days per month of employment – and paid in full as part of the productive year. On top of this, Muslim employees obtain 30 days – at most – for the Haj but it is counted as unpaid leave. Leave given for the Haj does not rest from the employee's right to annual leave. Before the probation period the worker is not entitle to sick leave; after the probation period sick leave is granted with full pay for the first 15 days, with half pay for up to the 30th day and for no pay after 30 days of sick leave. In all cases the sick leave period requires medical certificates. Females are given full pay for 45 days of maternity leave if they have worked for the firm for one year or more, and half pay if worked for less than one year. The law grants a further 10 days of (this time unpaid) maternity leave.

The minimum age of employment is 16 and up to the age of 18 the employee is considered a juvenile employee by the Ministry. A juvenile employee can only be hired with his or her guardian's consent, cannot work on hazardous jobs, at night, exceed more than 6 hours per day, cannot work overtime and cannot work during official holidays. Women of any age are prohibited to work between the hours of 22:00 – 07:00 – except in administration, the health industry or by force majeure –, are prohibited to work and are also prohibited to work on hazardous positions where hazardous maybe to the women's physical or moral health.

Each employer must keep a record on each employee that defines his or her history of employment – e.g., sick leaves, payroll, etc. If the worker commits some form of non-acceptable action in the workplace, the law identifies particular regulations for the worker to be disciplined, e.g., wage reduction. The law also specifies the compensation that a worker can expect in the event of getting injured at the workplace – including the compensation grated to the spouse in case of widowhood. All contracts are subject to termination when at least one of the two parties desires: all conditions and contingencies for termination should be stated in the contract – e.g., time of notice, conditions to grant end of service payments, etc. Once a contract is terminated, the employee has no legal residency status and, at the same time, has no right to re-employment with a new employer in the UAE for a period of 6 months: some professions are exempted from this rule and are allowed to

start employment with a new employer immediately after the end of their contracts and if they have not violated any of the rules defined by the labor regulations in Law 12.[41] Employees that commit an offence or violate any of the laws regulating employment in the UAE are not allowed to enter employment into the UAE for a least one year, e.g., employees that leave employment without notice or do not fulfil the complete notice period.

With regards to national Emirati, a contract can be written or oral and it can be entered with the Ministry at any time if wished for. However, in the case of nationals, there exists no mandate that obligates these parties to file a contract. In general, a contract is far more flexible for nationals who do not have to comply with the notification restriction and can leave employment at anytime without legal penalty – i.e. unless this is stated by the contract as some private arrangement between employer and national employee. The following applies to all employees, expatriates and nationals: sponsoring a domestic worker requires the employee or national to earn a minimum of AED 6,000.

Appendix B: List of Covariates & Exclusion restrictions (Earnings functions)

Table B1 provides a list of variables included in estimating the earnings functions in Section 5. Not all variables are identified for all sub-groups. The table lists all the variables that are initially tried for each of the nationality sub-groups and for each of the basic earnings function in Model 1 and the extended earnings method in Model 2.

[41] These are engineers, doctors, pharmacists and hospital health care workers, agricultural instructors, teachers, qualified accountants and auditors, qualified administration officials, technical in scientific electronics and laboratories, heavy transport drivers, and employees in the government run oil industry.

Table B1: *List of covariates and exclusion restrictions; Models 1 and 2 for Tables 6a and 6b.*

	Covariates	Exclusion Restrictions
SELECTION EQUATION	■ Experience and 'Experience Square' ■ Education (Continuous years or dummy variables for educational levels) ■ Emirate of residence ■ Dummy for Urban/Rural area ■ Continuous variable for 'number of years the household has existed in the UAE'; in the case of collective workers, number of years living in the UAE. The variable is not included for the sub-group UAE/GCC. ■ Family size excluding domestic workers ■ Continuous variables for number of kids aged 0 to 5, 6 to 10, 11 to 14 and 15 to 17 ■ Dummy for marital status (irrespective of whether the spouse resides or not in the UAE) ■ Cohort variable (dummy for 25 to 29, 30 to 34, 35 to 39, 40 to 44, 45 to 49 and 50 to 55)	■ Percentage of working adults in the household self-exclusive of individual's working status ■ For UAE/GCC nationals: Dummy variable if the head in the household has more than one wife ■ Dummy variables identifying the relation between the individual and the household head: head, wife of head, child of head, in-law of head, sibling of head, other relation to head, no relation to head ■ Mean number of adults in the household ■ Continuous variables describing the average age of children in the household: average age of kids if there are kids aged 0 to 5, if there are kids aged 6 to 10, if there are kids aged 11 to 14 and if there are kids aged 15 to 17 (zero otherwise)
OUTCOME EQUATION	All the variables included in the Selection Equation, except for the exclusion restrictions, and the following additions or changes: ■ Emirate where work is located ■ Dummy variable if Emirate of workplace is different to Emirate of residence ■ Years working in present workplace ■ Sector of Employment (Private, public or mixed) ■ Industry; manufacturing, construction, transportation, financial and Real Estate, Service sector	No exclusion restrictions apply
Reference Categories	■ Emirate of Residence: Fujairah ■ Emirate of workplace: Fujairah ■ Cohorts: Youngest, aged 25 to 29 ■ Sector of employment: Mixed ■ Industry: Mining & Agro-fishery ■ Education level: Illiterate	■ Relation to household head: dummy for wife of household head.