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RETURNS TO EDUCATION:
AN UPDATED COMPARISON FROM ARAB COUNTRIES

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Abstract

The paper provides a comparative study of private rate of return to education in Tunisia, Palestine, Sudan and Egypt using similar specifications, methodology and surveys. The paper employ 2010/2011 round of the Harmonized Household Income Expenditure Surveys of three Arab countries, namely, Egypt, Tunisia and Palestine. In addition, the 2009 round of Sudan is used. The paper attempts to estimate the rate of return to schooling in four Arab countries to learn more about the pattern of rewards to different levels of schooling and how individuals use these benefits to invest in education. Moreover, the paper attempts to link the structure of returns to education to labor market institutions. The findings of the paper confirm less consistency in the structure of returns in Arab countries and this is due to difference in education quality and supply and demand of graduates which has a significant influence on returns to schooling. The findings support that returns to education increases with years of schooling in Egypt due to rigid labor market, as more attention is given to credentials on behalf of skills. The rate of return on tertiary education is higher compared to basic education in all countries in standard Mincerian model. Returns to education are higher for females than males for all countries except for Sudan and Tunisia on tertiary level after accounting for jobs and regional disparity.

JEL Classification: I2,

Keywords: Education Economics, Rate of return, Arab Countries, Cross-section

ملخص

تقدم هذه الورقة دراسة مقارنة لمعدل العائد الخاص في التعليم في تونس وفلسطين والسودان ومصر باستخدام مواصفات ومنهجية ودراسات الاستقصائية مماثلة. تستخدم الورقة جولة من البيانات المنسقة لمسح دخل وانفاق الأسر لأعوام 2010/2011 من ثلاث دول عربية، وهي مصر وتونس وفلسطين. وبالإضافة إلى ذلك، يتم استخدام نفس المسح لعام 2009 الخاص بالسودان. وتحاول هذه الورقة تقدير معدل العائد على التعليم المدرسي في أربع دول عربية لمعرفة المزيد عن نمط المكافآت لمستويات مختلفة من التعليم وكيف يمكن للأفراد استخدام هذه المزايا للاستثمار في التعليم. وعلاوة على ذلك، تسعى الورقة إلى ربط هيكل عوائد التعليم في مؤسسات سوق العمل. تؤكد نتائج ورقة ضعف الاتساق في هيكل العائدات في الدول العربية وهذا يرجع إلى اختلاف نوعية التعليم والعرض والطلب على الخريجين والذى له تأثير كبير على العودة إلى التعليم. تدعم الورقة أيضا النتائج التي تشير أن زيادة عوائد التعليم ترتبط بعدد سنوات التعليم في مصر بسبب جمود سوق العمل، كما يتم إعطاء المزيد من الاهتمام للأوراق نيابة عن المهارات. معدل العائد على التعليم العالي هو أعلى مقارنة بالتعليم الأساسي في جميع البلدان في نموذج Mincerian القياسية. عائدات التعليم هي أعلى بالنسبة للإناث من الذكور في جميع البلدان باستثناء السودان وتونس على مستوى التعليم العالي بعد حساب الوظائف والتفاوت الإقليمي.

1. Introduction

A large literature is devoted to investigate the implications of human capital theory in the late 1950's and by (Mincer 1974) ,(George Psacharopoulos 1981) and others. Public investment in human capital is attributed to the positive social externalities that it creates such as enabling students to learn skills that increase labor productivity, improve child health and his well-being, efficiency of consumer choices and social capital. In practice, the economic value of investment in education has been measured by variety of methodological approaches in the empirical analysis. To explore thoroughly the case of MENA region, the rate of return on higher education is higher compared to basic education. Although, the rate of return is found to be lower in MENA region compared to Asia and Latin America(World Bank 2008). Estimates of private rate of return for different educational level have been carried out for a large number of developing and developed countries. The pattern reported on estimated rate of return to schooling across developing economies is varying. Some studies find that rewards to basic schooling is higher compared to secondary and lower for university level (George Psacharopoulos 1981), while others find that the returns to basic schooling is the lowest when comparing to secondary and tertiary level (Montenegro and Patrinos, 2014; Colclough et al., 2010)**.** Majority of studies used the internal rate of return approach when estimating rate of return to schooling. This approach is first introduced in early 1960s and defined as the interest rate that equates the discounted present value of benefits and the discounted present value of costs (Hansen, 1963; Hanoch, 1967). Followed by (Mincer 1974) used earning function and it is carried by taking the log of earnings as a dependent variable and schooling , experience and experience square as independent variables. This approach is also exposed to critical analysis by (Heckman et al. 2008). The first contribution of the paper is to update the empirical literature with recent estimates of the rate of return to different schooling levels in four Arab countries and apply the same estimation procedures across all countries. The countries are selected in the study due to availability of data are Egypt (2010), Palestine (2010), Tunisia (2010), and Sudan (2009). Altogether, these countries constitute about 50% of the Arab population and show a good geographical diversity.

The objective of the paper is two-fold: ***First:*** it estimates the rate of return to education in Arab countries using the standard and extended Mincer earnings functions. ***Second:*** it adjusts the estimates of the return to education for the labor market outcomes and regional disparities, knowing the higher rate of unemployment exited in Arab countries and in rural areas. The paper is making use of recent harmonized household surveys conducted for the Arab countries.

The paper is interested to answer one main question: Are there any signals of rewards to education send by the labor market to educators and their families at different level of education in Arab countries. Given these signals, decisions about investment in education and the skills acquired are determined, thus, signals are very important to policy makers. To answer this question, the paper attempts to investigate the influence of various labor market occupations on the structure of returns to education in Arab countries.

Our main findings can be summarized as follows:

- In all Arab countries, results come from basic Mincerian wage equation reasonable but not sufficient to construct the linkage between returns to education and labor market outcomes. The linearity assumption for returns to years of schooling is accepted for all countries except Egypt. This explained the labor market rigidity and the degree of selectivity to tertiary education. Both basic and secondary schooling required passing exam to enter tertiary education. Besides, the rate of return to female years of schooling is higher compared to males and the gap gets larger after adjusting for different occupations and regional disparities. This explained by rise in women's drop-out and lower labor force participation rate in all Arab countries selected in the paper.

- An interesting contrast exists on returns to education at tertiary level. Standard Mincerian function, estimates reveals that rate of return to education at tertiary level is higher compared to other levels of education except for Sudan. After adjusting for occupations and regions, the rate of return to tertiary education in Palestine declines and the same results confirmed for Sudan. In Palestine, since 2000 , where the Israeli government stops employing Palestinian workers and that result in declining drop-out rates of school and increasing students enrolment in tertiary education. As result, initially, the rate of return to tertiary education raises substantially, then, due to increase of supply of graduates associated with high unemployment rate, the rate to tertiary declines.
- The rate of return on secondary education exhibits variation compared to higher education for Both Palestine and Sudan. The paper finds that in Palestine, upper secondary education facing serious supply imbalances among its three streams. This is due to increasing drop-out rates from literary stage with no skills and declining student enrolment rate. While, in Sudan, the government expansion on higher education was on the expenses of both primary and secondary education which lead to lower enrolment rates.
- There is a significant variation between countries in the returns to education from gender perspectives. The rate of return to education for females is higher compared to males after accounting for Jobs and regions for both Egypt and Palestine. We find in Sudan, rate of return to female education is lower for tertiary education due to lower labor force participation rate and dominating of patriarchal society. While in Tunisia, the paper finds that returns are lower to females due to oversupply of female workers at both secondary and tertiary level compared to males.
- The remainder of the paper is organized as follows. Section 2 presents the literature review on rate of return to education in Arab countries. Section 3 presents education system in four countries. Section 4 outlines the methodological approaches used in estimating rate of return to education. Section 5 describes the data and some stylized facts for data and section 6 the empirical results. Section 7 concludes.

2. Literature Review

The empirical evidence from the 1960s and 1990s found that the relationship between earnings and education was concave (Psacharopoulos, 1994,1985 ;Psacharopoulos and Patrinos , 2004). Despite, most recent studies suggested that private rate of returns were higher at tertiary level than at primary level (Colclough et al., 2010; Appleton, 2000). Table 1 review the findings of group of studies on returns to education, by region and educational level.

A number of contradicting results emerge for the region. First, studies showed contradicting results regarding the average rate of return to higher and primary education. In MENA, some studies suggest that rate of private return on tertiary is higher compared to primary education (Psacharopoulos, 1981; 1994; Psacharopoulos and Patrinos, 2004; Colclough et al., 2010).Despite, Montenegro and Patrinos (2014) and Psacharopoulos (1985) showed that return on primary education is higher compared to tertiary education. Second, for Sub-Saharan African countries, the same striking conclusion has been found. In most cases, the secondary education is found is less than primary and tertiary. This could be due to diverting a large group of low profile students who fail to join the university into vocational secondary school which explains the lower return.

In sum, the studies covered a range of different countries using different methodologies which resulted in contradicting conclusions. In fact, in some countries, the rate of return on tertiary is higher, while others show higher return on basic education. It is clear that no conclusion can be drawn from these studies. Moreover, the results on educational rate of return are even varying within specific countries. To have more insights on this point, Table (2) in the appendix

show the recent ROE we found for some countries of the region including the countries used in the paper. Moreover, the variation in rate of return on education by country was found apparently in the literature. Some studies supported the idea that rate of return on education on basic education is the highest , this result is supported by Salehi-Isfahani, Tunali, & Assaad, 2009 for Egypt ;Barouni and Broecke, 2014 for Sudan and Montenegro and Patrinos, 2014 for West Bank and Gaza. However, we obeserve significant variations in rate of return on education for some countries over time like Egypt and Sudan (see for example, Herrera and Badr(2011); Ali (2006) & Salehi-Isfahani, Tunali, & Assaad (2009).

Summing up, a large body of literature is devoted to calculate the private rate of return to education in developing countries. However, examining the ROR on education in Arab countries is very limited. Unfortunately, as displayed above, authors do not consistently reach to the same findings relative to the return on education at different schooling level. The variation exists across countries due to many reasons that could be related to labor market institutions, quality of education and the supply and demand among university degree graduates. The variation for the rate of return could be also with in the country depending on the estimation techniques used as well as the year of the survey. Based on, there is an urgent need for applying a consistent methodology across all Arab countries. In this paper, we attempt to apply Standard and extended Mincerian model to estimate the rate of return on education and to show to what extent the results are sensitive on the approach implemented.

3. Educational System

3.1 Egypt

Basic education in Egypt consists of two stages: a six-year primary level and a three year preparatory level (lower secondary). Basic schooling is compulsory levels for all children aged 6. Beyond the basic schooling, the secondary level is divided into two tracks: general and vocational. The former requires high scores in the preparatory level as it is the considered more "prestigious" and the only route to enter university. While, vocational education is divided into two tracks: three years to be a technician and five-years of advanced vocational education to receive first technician certificate (Salehi-isfahani 2009). Education is mainly funded and controlled in terms of curricula by the Ministry of education (MEO) (Elbadawy 2009).

3.2 Palestine

The education system consists of basic education (grades 1-10), secondary (grades 11-12), and post secondary-higher education and non formal and continuing education. The starting age of the compulsory education is 6 years. Beyond basic education, there are three branches of secondary education. First: academic secondary has duration of two years and followed by general secondary exam "Tawijihi" and it is required to join university. Second, vocational education and has duration of two years and it is divided into four streams: agriculture, industrial, commercial and nursing. This phase requires general vocational exam to join college community. Finally, vocational training and has two streams, long term training for two years to prepare skilled workers and short-term training of 5-8 years to prepare semi-skilled workers. The students pass the Tawjihi exam and join the university to receive a bachelor of four years or five years if the bachelor is in engineering. Non-formal education is funded by ministries rather than ministry of education as ministry of labor, social affairs and others. Besides, local and international charitable organizations (UNRWA), organization of employees and employers, religious organizations and private entities funded education in Palestine. Based on, funding educations comes from the government and the donors.

3.3 Tunisia

Basic schooling has duration of nine years. It is free and compulsory with starting age 6. It is divided into two complementary levels: primary schooling is of six years and preparatory is of

three years. The main objective of basic schooling is to make students acquire the tools of knowledge and develop their intellectual and practical skills. Access to secondary education depends on passing successfully the performance examination of the primary grades. The Ministry of Education (MOE) has undertaken many initiatives since 1990 with the aim of improving the quality of education and under the influence of internationalization of educational policies and the modest performance of Tunisia in international comparisons. The government desires to create a linkage between the educations those students receive in the diverse cycles of secondary education and the education those students will have at tertiary education. The secondary education has duration of four years and it consists of two cycles of two years each. The first cycle aims to give the students a balanced training in languages, humanities, science and technology and allow the students to deepen the knowledge earned in the primary grades. The second cycle intended to prepare the students for specialization and reinforce the students' interest in knowledge. This in turn not only, contributes to improvement in the results at the secondary level but also at the university level itself. Finally, higher education has duration of three years and attempt to deepen the specialization or for doctoral studies and research. Tunisian government is responsible for public educational establishments' .Besides, the predominance of public education and the weak existence of the private sector gives no choice between public and private school since private schools accept very small number and its tuitions are very high (Akkari 2005).

3.4 Sudan

Education in Sudan is free and compulsory for children aged 6 to 13 years (pre-school to secondary school). In 1991, the revolutionary government of Bashir has introduced reforms in the Sudanese educational system. The new policy was proclaimed by the Bashir's government aims to provide a framework of reference for the reforms. Education is to be based on the permanence of human native, religious values and physical nature. After words, Arabic becomes the official language for teaching and scientific curriculum. Besides, educational ladder in Sudan has changed in 1991 from 6-3-3 to 2-8-3 to include two years of pre-school, 8 years of primary school and 3 years of secondary school. Technical secondary schools enrolled the students who fail to join the universities. These types of schools aim to fulfil the government needs from specialists, technicians and experts (Hamdy 2007). Moreover, the new government ends student's free education and accommodation at the university level, which makes it very difficult for the poor families to send their children to school. Besides, joining the military service becomes a prerequisite to join college; this in turn hampered many males from completing their education (Gasim 2010). Education is financed by government, families, councils and some NGOs.

4. Methodology

For the purpose of the paper, estimating the ROR on education will be through using the earnings function method (George Psacharopoulos 1981).Mincer method relies on basic assumption that the age-earnings profiles are flat or equidistant between adjacent educational levels .

Our analysis used annual earnings for only wage earners. For the age of individuals, we include those who aged 15 years and above who are engaged in salaried employment. Educational levels are measured at three levels: Basic education which combines both primary and lower secondary, secondary and tertiary. Most of the surveys used in the study are combining both primary and lower secondary levels together. Table (3): Shows the length of each educational level as well as the typical school starting age by country. In case of tertiary level, it ranges from 4 to 6 years; we always choose the lower figure (Barouni and Broecke 2014).

Free education is applied for secondary and tertiary as well as basic education in some Arab countries. Thus, the only cost incurred by individuals is the private rate of return is the opportunity cost foregone earnings. Finally, an alarm has to be raised for the foregone earnings of basic school-aged children. In the empirical literature, we have a mixture of views, where (George Psacharopoulos 1994) argue not to assign the full-length (6 years) of primary schooling as foregone earnings and suggests one, two or three years to be assigned as foregone earnings. While assigning three years as an opportunity cost of foregone earnings are followed by many economists as for example, (Montenegro and Patrinos, 2014; Colclough et al., 2010;(George Psacharopoulos 1995). Others studies calculate the opportunity cost assigned to the primary level from the data itself , it would be more accurate to calculate those individuals who failed to complete basic education for each country separately following (Barouni and Broecke 2014) and subtract them from the full length of basic education. This approach also will be adopted in the paper. Moreover, the sample excludes self-employed workers because the data does not offer differentiation between returns to labor and capital. Family contribution, unemployed and voluntary workers are also eliminated because their wage does not reflect market productivity(Montenegro and Patrinos 2014). To have more insights about the aforementioned estimation model applied in the paper.

4.1 Earnings Function method

At first step, the paper makes use of Mincer Method in its two forms. As, (Mincer 1974) provided a great method for estimating rate of return on education using semi-log earnings function. The basic model follows the equation below:

$$\ln(E) = \beta_0 + \beta_1 S + \beta_2 A + \beta_3 A^2 + \varepsilon \tag{1}$$

The Extended Mincerian Model as follows:

$$\ln(E) = \beta_0 + \beta_1 prim + \beta_2 sec + \beta_3 ter + \beta_4 A + \beta_5 A^2 + \varepsilon \tag{2}$$

Where E represents earnings, educational level is represented by two proxies : S is years of schooling (continuous variable) and series of dummy variables ($prim, sec, ter$) say $primary$, $secondary$ and $tertiary$ having the value of 1 if the person belongs to the particular educational level and 0 otherwise. Knowing that, traditional Mincerian model used potential experience (A) instead of age and it is calculated as {age- years of schooling- School starting age (6)} following (Barouni and Broecke 2014); A^2 is the potential experience-squared; and ε is random disturbance term reflecting unobserved characteristics . The intuition behind using experience is to avoid biases of the results. Moreover , using age and its square give estimates for the rate of return that are more likely to be biased downward (Chiswick 1997). Therefore, β_1 in equation (1) can be viewed as average rate of return to years of schooling of salaried worker. While in equation (2) $\beta_1, \beta_2,$ and β_3 are used to estimate returns at different schooling level, knowing that illiterates are the omitted variable.

Furthermore, we relax the linearity assumption by introducing the quadratic term of schooling to equation (1).

$$\ln(E) = \beta_0 + \beta_1 S + \beta_3 A^2 \beta_2 A + \beta_3 A^2 + \varepsilon \tag{1.1}$$

After fitting the extended earnings function in equation (2). The private return to different levels of schooling can be derived from the following formulas:

$$r_{(primary \, vs \, illetarte \,)} = \frac{\beta_1}{S_p} \tag{3}$$

$$r_{(secondary \, vs \, primary)} = \frac{\beta_2 - \beta_1}{S_S - S_p} \tag{4}$$

$$r_{(tertary \; vs \; secondary)} = \frac{\beta_3 - \beta_2}{S_t - S_s} \tag{5}$$

Where S stands for the number of years of schooling at each successive level of education (p = primary, S= secondary and T=tertiary). In fact, the drawbacks of the Mincerian method that it assumed flat earnings profile and makes no difference for the discounted rate of return that existed over time.

Secondly, since wages could vary across countries according to occupations. We estimate the Mincer Model after controlling for occupation categories. We identified four categories: high professions, middle profession, low profession and blue collar. We select high profession as a base category. Moreover, we control for location by inserting regional dummies (south, north and centre). Based on, we estimate the basic and extended Mincer model after controlling for occupations and regions across countries. To assess equity issues, we run the model for the full-sample and separately for male and female workers.

5. Data

This study relies on OAMDI (2014) Harmonized Household Income and Expenditure Surveys (HHIES). The data sets used from this database are the 2010/2011 round of the HHIES of three Arab countries, namely, Egypt, Tunisia and Palestine. In addition, the 2009 round of Sudan is used. It should be noted that, for Egypt a sample of 50 percent is drawn from the Household Income, Expenditure and Consumption (HIECS) and in the case of Jordan 25 percent are only made available on OAMDI. In the meantime a 100 percent set of Harmonized data is available on OAMDI for the remaining countries.

The aforementioned surveys provide large amount of information measuring the living standards of households and individuals. It includes data that facilitate measuring poverty and relative incomes, income distribution, as well as households' ownership of assets. Besides, data can be found on the characteristics of household education, health and demography in addition to household expenditure on food, health and education. Education expenditure has not been covered in depth using the survey data in the MENA region. However, there is sufficient information to undertake the analysis.

Some basic information on the number of observations for each sample and educational attainment is provided in table (4) in the appendix. By applying the basic and extended Mincerian earning functions to three different groups: i) total sample, ii) males and iii) females.

As shown in figure (1), the average rate of return to another year of schooling is 11.2 % and 11.1% for both Palestine and Tunisia respectively. While, average rate of return to another year of schooling is 8.8% and 7.6% for Egypt and Sudan respectively.

When considering for males and females samples, it is observed that rate of returns to another year of schooling is much higher for females compared to males for Tunisia, Palestine, Egypt and Sudan in Figure (2). It is observed to be the highest for Palestine (13.2%), followed by Egypt (11.2%) and Tunisia (11.1%) and finally, Sudan (10.9%).

In figure (3), stresses on the rate of return to schooling at three different educational levels, it is observed that rate of return to females at tertiary and secondary level of schooling are always higher than males for all Arab countries except for secondary level in Tunisia. In, Tunisia, the rate of return for males at secondary schooling is slightly higher than females at the same level. On the contrary, higher returns for males at basic schooling compared to women were observed high for all countries.

When analyzing the returns to schooling by gender and by schooling level, it is observed that rate of return to schooling are well-behaved and have a normal distribution as shown in figure (4-7) for all countries.

Besides, some facts have to be mentioned about experience-earnings profiles for Arab countries as shown in figure (8-11). With respect to total sample, the profile is convex for Sudan ,Palestine and Tunisia, where the rate of return to experience increases substantially at first years after labor market entry and then decline in the later earnings (40 years and above). While, for Egypt, the non-linearity existed as rate of return to experience continues to increase over time. The intuition behind this finding in Egypt is to account for accumulated benefits at earlier stages of working as result of increasing years of schooling and capture wage setting which emphasizes the merits of higher education.

For men profile, the rate of return follows the full-sample pattern increases at first years after labor market entry and then slightly decline at the middle years followed by a gentile increase in later earnings for both Egypt. In case of Sudan and Palestine, the profile of men is convex.

For women, the profile shows less of an increase in earnings compared to men and has a convex profile with a bump portion at around 10-19 years of experience for Egypt, Tunisia and Palestine, while for Sudan the bump at 20-29 years as well.

6. Empirical Results

The education system in the Arab region is quite different from their counterparts. Free education is applied to all schooling level including higher education as a part of social contract (Assaad, Krafft, and Salehi-isfahani 2014). One of the consequences of the free education policy is the mismatch between education system outcomes and the labor market needs(Assaad and Krafft 2013a). The only exception is Sudan, where Al-Bashir's government has suspended free education for higher school and that results in huge financial burden on students and their families and low enrolment rates (Gasim 2010).

Tables (3-6) present the returns to education in **four** Arab countries using the basic and extended Mincerian method before and after adjusting for types of occupations and regional disparities. Starting with the overall pattern across all countries, we find that return to tertiary is the highest across countries while return to basic education is the lowest except for Sudan (both tertiary and secondary are nearly the same) (Table 5). With respect to years of schooling, the returns to another year of schooling ranged from 3.4% to 7% (Table 3) and decreased substantially after accounting for jobs and regions in table (4) ranged from 2.2 to 6%. Moreover, females' returns to schooling are higher than males for all countries after accounting for types of occupation and region where they live(Table 4).

As noted earlier, the paper makes use of two forms of Mincerian model: The standard version with years of schooling and the extended model with educational levels. For both models we re-run the two Mincerian model after adjusting for different types of jobs and place of residence. The results of the standard Mincer equation are presented in Table 7. All the coefficients are positive and significant across four countries. Table 8 shows the results of the standard Mincerian model after adding dummies for occupations and region. The coefficient of years of schooling is positive and significant and the goodness of fit increases across countries. With respect to gender, we run the standard model for males and females who are 15-60 years old and are waged workers. Table 9 and 10 show the results of the standard Mincerian equation before and after accounting for jobs and regional disparities for male and female samples separately. It is observed that a return to additional years of schooling is higher for females than males. Estimates for returns to experience follow the same pattern across all Arab countries and does not change with different versions of the Mincer Model. Returns to experience decreases at the beginning and then rises sharply at later years of working earnings due to human capital accumulation that individual's acquire at earlier years. The results of the extended Mincerian model are presented in tables (11-12). It is observed that all the coefficients of educational level is positive and significant across countries and the goodness of fit increases

across countries after accounting for occupations and place of residence. Tables (13-14) showed extended Mincerian equations for males and females separately. It is observed that rate of return to education is for females for all educational levels compared to males.

We introduce the quadratic term of schooling to the standard Mincer model to relax linearity assumption as in equation (1.1), the results of the coefficients S^2 is insignificant for all countries except Egypt. That means for only Egypt, the rate of return to schooling increases with schooling to be 21.4% and the rate decreases to 16.6% after accounting for Jobs .This results highlighted the accumulated benefits that individuals acquire at early wages are reflected in wage setting (Salehi-isfahani 2009).

Countries with well-functioning education system and labor market, educational attainment and potential experience should be reflected in individual's rewards in labor market. In the case of Arab countries, the education system and labor market allocate human capital and rewards based on individual's circumstances such as parental education, social class, gender and the region where they live and this will lead to pre-market inequality of opportunities (Roemer, 1998). Besides, returns to schooling could be affected by other circumstances which is beyond individual's control such as family connections, personal ties and social networks which influence access to different jobs and this lead to in-labor market inequality of opportunity (Caroline Krafft and Assaad 2015). This could explain clearly the reasons behind diminishing rate of return on schooling in Arab countries.

It is observed that returns to education in ***Egypt*** is lowest compared to other countries at all schooling level. Egypt provides a systematic pattern of inequality of opportunities throughout the basic schooling (C Krafft, Elbadawy, and Assaad 2013). It is found that Egypt suffered from inequality of opportunity related to father's education, geographic location and finally mother's education level has a significant impact (Hassine, 2011).This is also supported by the work of (World Bank 2012), Wages are highly influenced by parental education and household location. After accounting for geographic location and various occupations in table (6), the rate of return to all levels of schooling become much lower. This attributed to high inequality of opportunities with respect to job occupations in Egypt; youth from low socio-economic backgrounds have less access to cadres and high professions (Binzel 2011). These unequal opportunities that hinder youth from accumulating human capital pre-labor market entrance could lead to further inequalities in the labor market (Caroline Krafft and Assaad 2015). For Egypt, the rate of return to basic education is 1.5 percent while it is 4%, 2.3%, 1.3% in Palestine, Sudan and Tunisia respectively. This is attributed to low public funding allocated to basic education in Egypt (El-Baradei, 2013) and low quality of basic education. Egypt is classified as one of the lowest countries with respect to quality of basic education(Schwab 2014) .Altogether , lead families who can afford often use private tutoring as a way to help their children to succeed in school (Assaad and Krafft 2015). Based on these facts, the rate of return to basic schooling in Egypt is very low compared to other Arab countries. This is supported by the work of (Said 2015) who estimated the annual rate of return on basic schooling to be 1% for every year of schooling. Besides, with respect to (Psacharopoulos and Patrinos , 2004), the rate of return to basic schooling in Egypt is estimated to be less than one-twenty- fifth the international average of 26.6 percent annually of primary education.

It is argued that unemployment rate rises among tertiary graduates in Egypt (Assaad, Krafft, and Salehi-isfahani 2014). This is one of the negative implications of free education policy and result in declining the rate of return on secondary and tertiary education compared to other countries in the region.(Caroline Krafft 2013) argue formal vocational education is not the best route to acquire skills to get a job. Moreover, the rate of return to vocational secondary education is zero even compared to those with no formal schooling but with apprenticeship.

Based on these aforementioned facts, the signals sent by students and their families to education institutions are significantly attenuated as they pay no tuition fees. Besides, enrolment in secondary and tertiary education is rationed; the education institutions are no longer encouraged to tailor their programmes with respect to students' preferences and needs. This is also occurred due to the past history of government that acts as main employer for their graduates which results on focusing more on the credentials rather than mixed skills for the public sector(Assaad, Krafft, and Salehi-isfahani 2014) .Besides, the inability of the private sector to send signals for the skills they reward and the preferences of the students and their families for public sector jobs (Assaad and Krafft 2013b). All combined lead to diminishing the rate of return to basic and secondary level of education in Egypt and further decline within tertiary education.

__With respect to gender equality__, the private rate of return for women in Egypt is higher at all schooling level compared to men after accounting for job occupation and regional differences (Table 6). This primarily happens due to two main reasons. First, there are large number of higher graduates and higher school diplomas since Abd Nasser period, as they are promised to have state jobs irrespective of their gender. This period followed by suspension of guaranteed public employment from 1988-1998 and result in moving many women to discouraged workers and then out of the labor force. Besides, private sector cannot make up the declining in the public sector employment and cannot accommodate married women which encourages further decline in labor force participation for women (Assaad & El Hamidi, 2009). Second, it is related to gendered norms, where men specialize in work and are breadwinners, while most (if not all) family responsibilities remain woman's task (Elbadawy, 2014).

__Coming to Tunisia__, the rate of return for additional year of schooling is the highest compared to other countries even after controlling for different jobs and region (Table 4). This reinforces the idea of wage increase for university education. The private rate of return on tertiary education is higher compared to Egypt and Palestine and lower than Sudan (Table 5); this is because of the introduction of higher education act in 2008 aims to revise higher education curricula to match with the international standards (Abdessalem 2010). This lead to double the number of students enrolled in Tunisian universities. Based on, Unemployment has increased rapidly among tertiary graduates in Tunisia, dropping the private rate of return on tertiary education by 9.1 % after accounting for jobs and location (Table 6). Furthermore, it is observed that rate of return on basic education gets lower in Tunisia after accounting for jobs compared to other countries.; this is due to rise of unemployment among primary graduates who are looking for jobs in public administration job to earn higher wages. With respect to gender equality, the proportion of female students in schooling has increased rapidly since 2008. Female students show success and progressing in different schooling levels, whereas men show failure and abandoning till the "baccalaureate" leading to large number of females than males. This is clear in results of table (5) where the private rate of return for females is lower than for males' tertiary level. The results are confirmed after accounting for occupational and regional disparities, the private rate of return for males are higher than for females at both secondary and tertiary level; this is attributed to higher gender parity index 1.4 and accompanied by higher female unemployment than males (Abdessalem 2010).

__Coming to Palestine__, the private rate of return on tertiary education is 3.1% higher than basic schooling (Table 5). The gap decreases substantially when accounting for different jobs and regional disparities between Gaza Strip and West Bank (Table 6). In the last two decades, the Palestinian labor market has experienced several shocks starting with Israel occupation to Gaza Strip and West Bank in 1967; many Palestinians dropped out of school to work in Israel. Israel pays higher wages and the jobs are elementary require little to no education. In late seventieth, Palestinian labor market suffered from increasing the supply of tertiary students and coupled

with low returns. Followed by the first uprising (Intifada), which broke out in the late 1987 accompanied by declining the number of workers move to Israel labor market. The Oslo Peace Treaty in 1993 resulted in establishment of Palestine National Authority (PNA) which reinforce the importance of investment in education for most Palestinians (Daoud 2005). Finally, the second Intifada broke out in 2000 and the Israel government closes its door to Palestinian workers and substitute them with foreign guest workers (Angrist 1995). This associated with drop in income and higher rate of unemployment for several reasons; migration of well-educated Palestinian returnees, drop in construction industries and finally drop in capital flows from Palestinian abroad due to political unrest (Daoud 2005). Prior to the second Intifada, Palestinian workers can easily access the Israel labor market where workers with low educational attainment earn higher than those with many years of schooling. This in turn increases the drop-out of children to have a job in Israel market. At the same analogy, the closure of Israel labor market for Palestinians workers causes a fundamental change in the Palestinian labor market. This change lead to decrease children drop-out rates and sharp decline in the wages of workers with low to no years of schooling and increase unemployment rates among them. Based on, the rate of return on tertiary schooling returns to be higher after the second Intifada compared to secondary and basic schooling (Kafri 2004). This is supported by the work of (Tansel and Daoud 2011) who claimed that return to education declined at all levels of education except higher education in Palestine. Moreover, on adding a set of dummies to reflect occupation and regional disparities, the rate of return to education remains higher compared to other schooling levels (Daoud 2005). Besides, from 2000 onwards, the rate of return to schooling has been increased substantially and reducing the employment in Israel settlements rehabilitates the gap between educated and none educated workers in West Bank and Gaza Strip in a way that declines the rate of return to tertiary education compared to secondary level. ***With respect to gender gap,*** it was found that returns to education for females are better than for males with respect to both years of schooling and educational attainment. This is attributed to low labor market participation for females coupled with many opportunities for women in NGOs and international organizations (Tansel and Daoud 2011). One of the main obstacles facing women employment is that Palestinian workers have to reside in the locality of the work place and this is considered hard option for women compared to men. Besides, family restrictions that limits women opportunities in the labor market to those that seem acceptable to families and societies (Alkafri 2011).

Finally to Sudan, it is observed that on average the rate of return to additional year of schooling is low comparing to Palestine and Tunisia due to the existence of inequality in the distribution of human capital over time (Abdel-Gadir 2006). Also, it is found that education rate of return is 13.3 % for secondary, 13% for tertiary and 3.1% for primary schooling (Table 5). This is because Sudan educational system is facing several challenges including the drop-out of large number of youth of school which results in lower labor force participation rates even among males and the incapability of the classrooms to absorb the large number of the returning refugees. Besides, the rate of return to secondary education is high and this is because of the existence of few secondary and post-primary technical institutions in Sudan as the expansion of higher universities comes on the expenses of secondary education. Moreover, the rate of return to tertiary and secondary schooling becomes higher after accounting for occupation and regional disparities. This is due to great disparities in education provision between different regions in Sudan(Brown 2006).

With respect to gender gap, there is a significant gender gap in rate in rate of return to education in Sudan in favour of women at primary and secondary level after adjusting for jobs and region. It is very high for the secondary education and this due to low supply of women at secondary education. This is supported by work of (Samia 2014). In Sudanese traditional

schools, books are designed to spread gendered attitudes that are dictated by patriarchal institution and aims to limit women's authority and aspiration(Baden 1992). Based on, women's opportunities in both educational attainment and labor market are limited to what is acceptable to the society and meet traditional norms. With respect to education, women are discouraged from pursuing engineering and law as they are seen male-dominated and unacceptable to women and for jobs, nurses, teachers and wind wives are more suitable to women than others (Elnour 2012). All these factors combined drives the rate of return to tertiary schooling for women downward compared to men. Besides, discourages women from entering labor market.

6. Conclusion

This paper provides a comparative framework on returns to education across four Arab countries. In estimations, we used consistent methodology, recent household and income surveys and similar definitions for four countries that enable us to track the variations in return and better capture them. We carried out our comparisons between countries at two main routes: first estimating the average return to years of schooling, second, estimating the return to schooling at different levels. Then, the estimations are carried again to include the effect of different occupations and regional disparities. The intuition behind this to account to what extent return to education is affected place of residence and types of occupation which are considered important factors that impact returns to education.

Moreover, the paper provides a detailed overview for the differences in the education system in which returns are calculated. Then, we try to form a linkage between the structure of the returns to education and labor market institution for each country.

The education system in Arab countries is much similar with respect to educational level and its reliance on examinations to sort students into higher educational level depending on their scores. However, they varied on the patterns where the student's selection into upper secondary and tertiary levels are selected and the duration cycle of its educational level.

For Egypt, Palestine and Sudan, the selection starts at the upper secondary level while in Tunisia, the selection takes place by an examination at the end of the primary level. In Egypt, the selection diverts low profile students from entering tertiary level and entering the upper secondary. This could explain the lower returns to secondary compared to tertiary schooling. In Tunisia, the selection is strong and applied at the primary level. The intuition behind the earlier selection aims to create a strong link between the type of education in secondary and tertiary level and thus result in preventing more low profile students from entering the university.

Obviously, the supply and demand of students at secondary and tertiary education surely varied between these countries has an influence on returns and may account for the differences observed when adjusting for employment outcomes and regional disparities.

It is observed that education –experience profiles are convex in all four countries implying non-linearity only for Egypt. The non-linearity for Egypt could be due to labor market rigidity where more attention is given to credentials rather than skills. That could lead to higher benefits acquired to those with university degree and low returns to those with secondary schooling.

Returns to education are higher for females than males for all countries except for Sudan and Tunisia on tertiary level after accounting for jobs and regional disparity. This could be explained with higher gender inequality and biases against women in Sudan that limit their opportunities in labor market .In Tunisia, the return on education are lower due to oversupply for women in labor market compared to men with university degree.

The paper attempts to search for more clues in the patters of return to education on Arab countries and add more dummies to capture different occupations and regional disparities. It is observed that returns to tertiary education are higher for all countries except for Palestine and this is due to wages disparity between Gaza strip and West bank.

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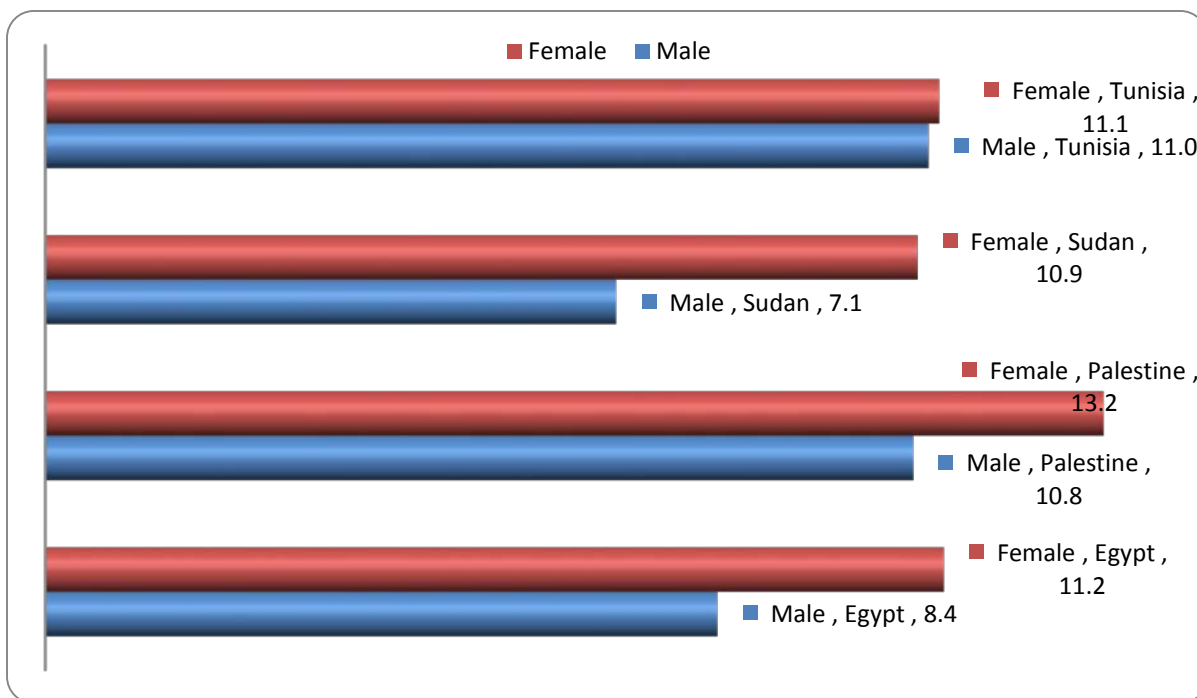
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Figure 1: Average Returns to Years of Schooling (Total sample)
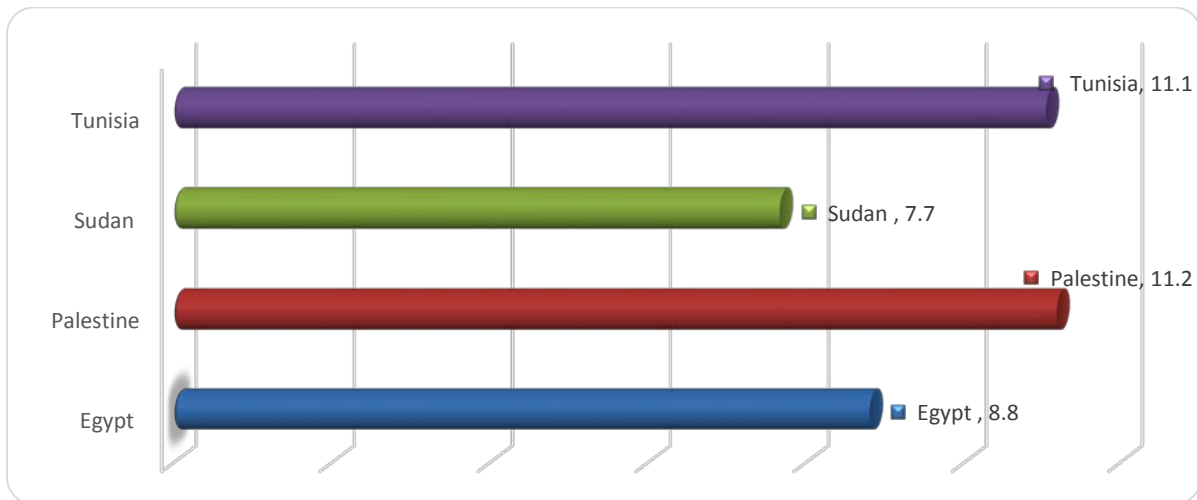
Figure 2: Average Returns to Schooling by Gender

Figure 3: Average Returns to Levels of Schooling by Gender and Country

Female , Tunisia Tertiary , 0.22
Male , Tunisia Tertiary , 0.19
Female , Tunisia Secondary, 0.50
Male , Tunisia Secondary, 0.52
Female , Tunisia Primary , 0.04
Male , Tunisia Primary , 0.09
Female , Sudan Tertiary , 0.3
Male , Sudan Tertiary , 0.1
Female , Sudan Secondary, 0.3
Male , Sudan Secondary, 0.2
Female , Sudan Primary , 0.2
Male , Sudan Primary , 0.3
Female , Palestine Tertiary , 0.3
Male , Palestine Tertiary , 0.1
Female , Palestine Secondary, 0.3
Male , Palestine Secondary, 0.3
Female , Palestine Primary , 0.2
Male , Palestine Primary , 0.5
Female , Egypt Tertiary , 0.36
Male , Egypt Tertiary , 0.15
Female , Egypt Secondary, 0.41
Male , Egypt Secondary, 0.40
Female , Egypt Primary , 0.05
Male , Egypt Primary , 0.14

Female   Male

Figure 4: Returns to Schooling in Tunisia by Schooling Level and Gender
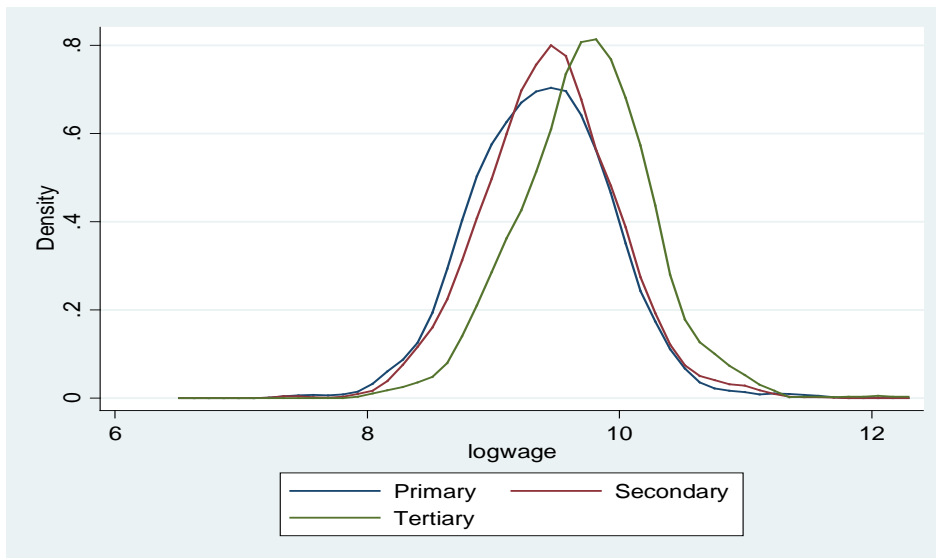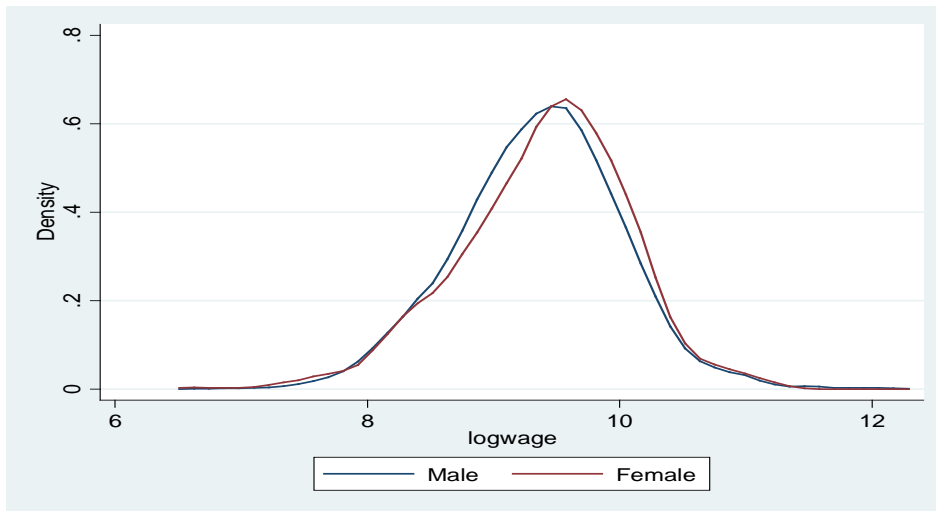
Figure 5: Returns to Schooling in Egypt by Schooling Level and Gender
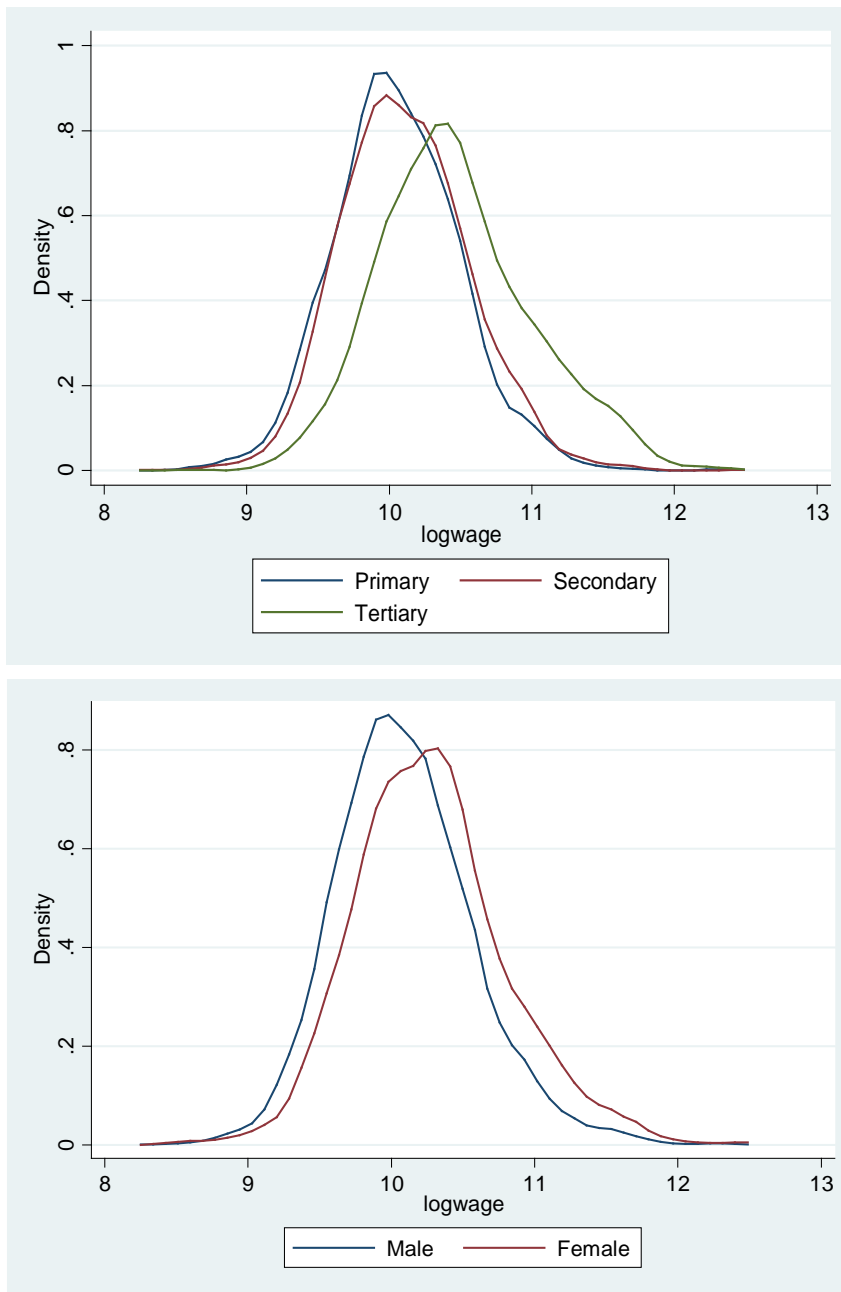
Figure 6: Returns to Schooling in Palestine by Schooling Level and Gender
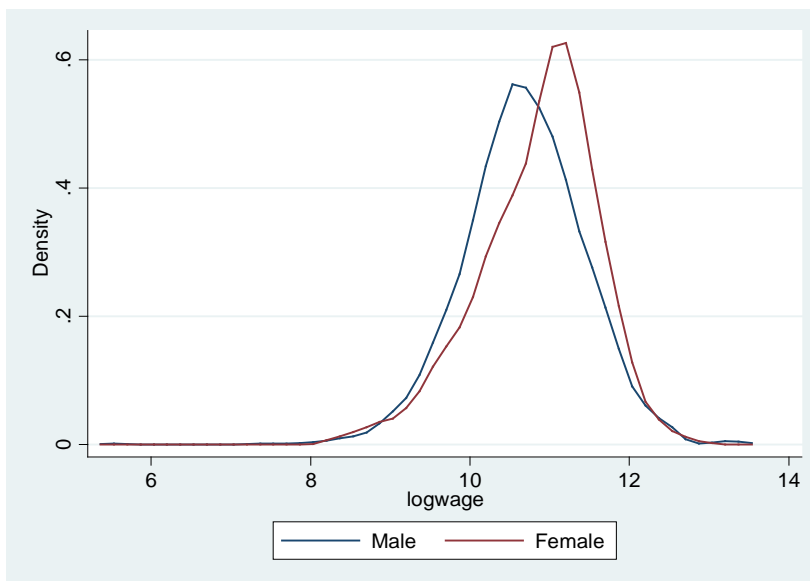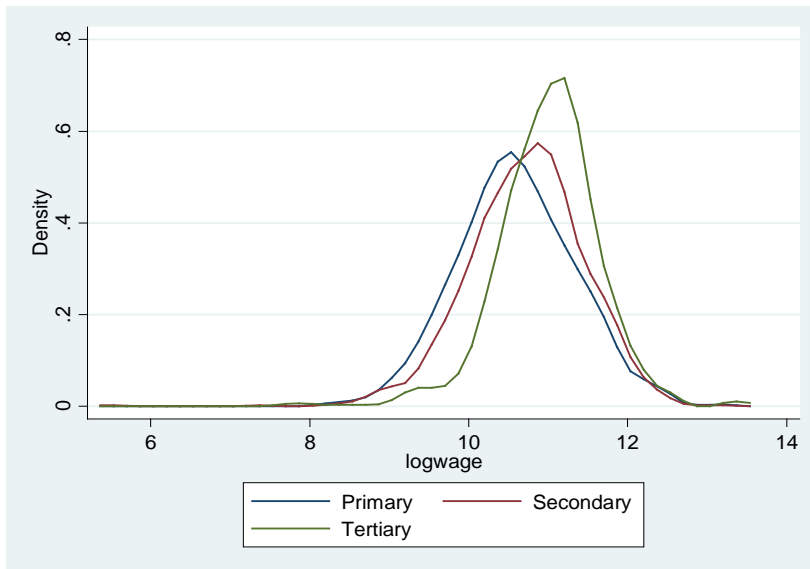
Figure 7: Returns to Schooling in Sudan by Schooling Level and Gender
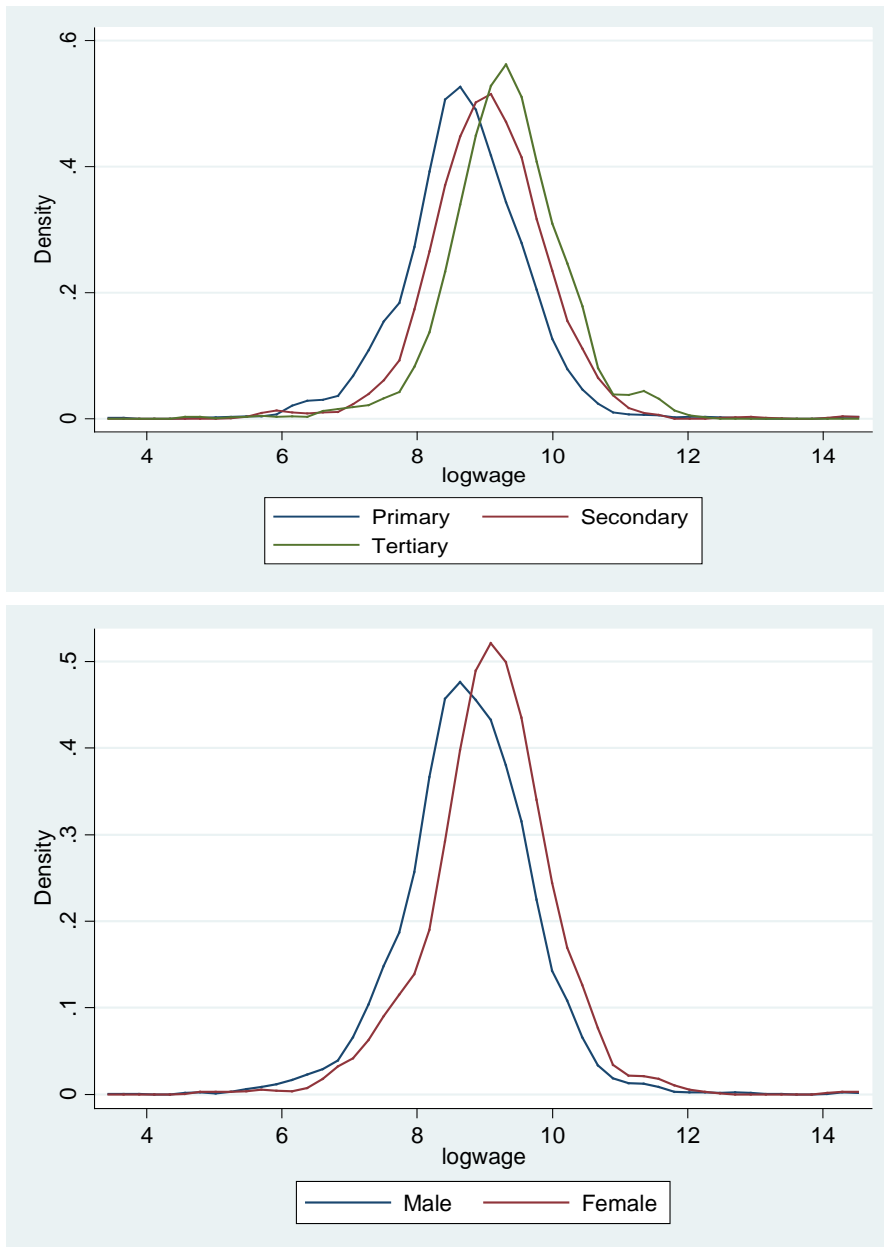
Figure 8a: Experience –Earning Profile for Egypt
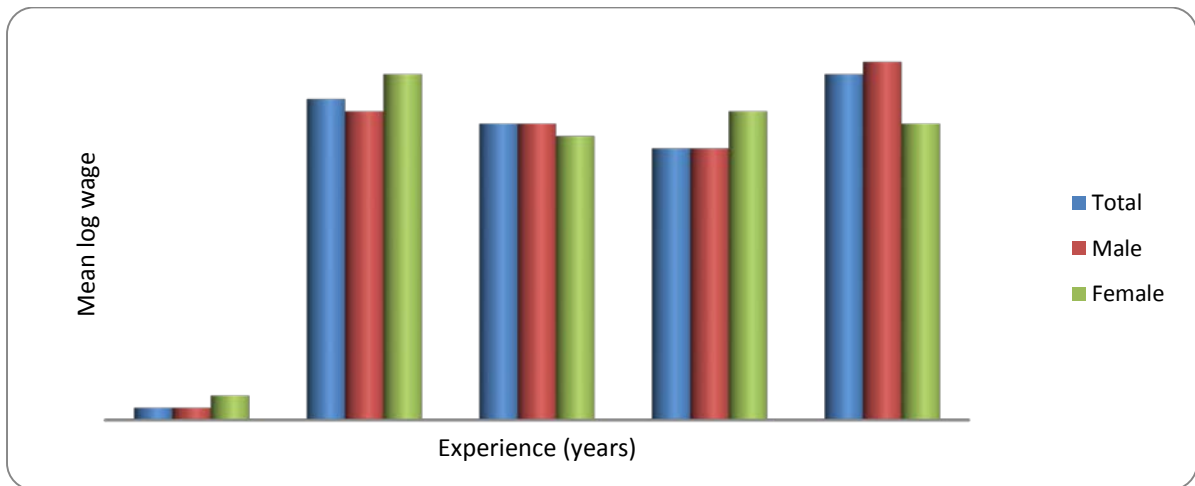
Figure 8b: Experience –Earning Profile for Tunisia
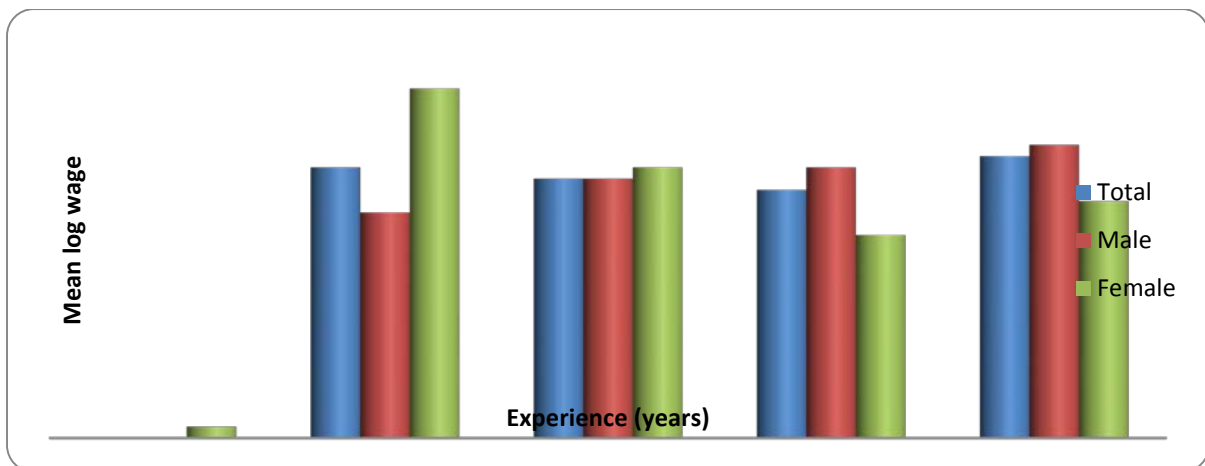
Figure 9: Experience –Earning Profile for Palestine
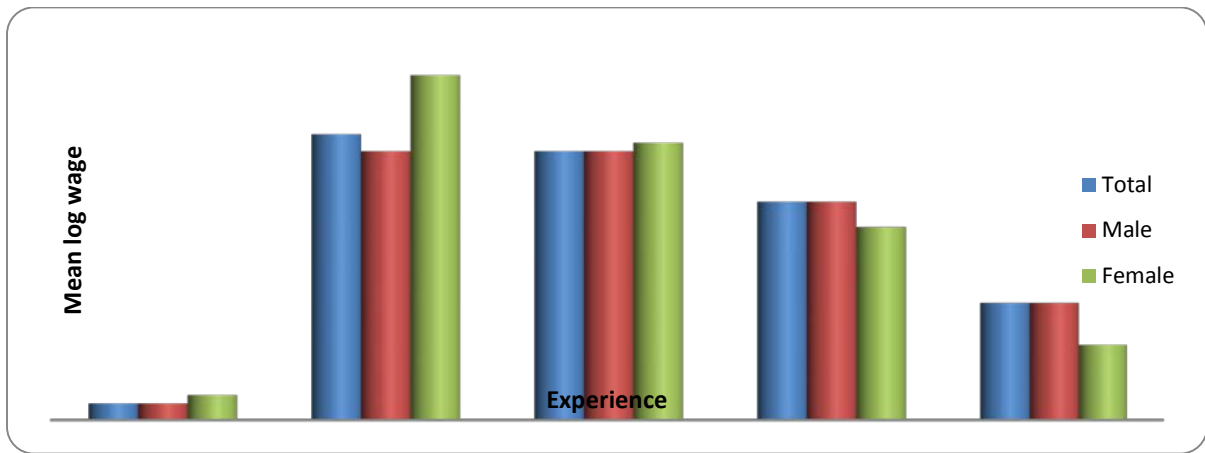
Figure 10: Experience –Earning Profile for Sudan
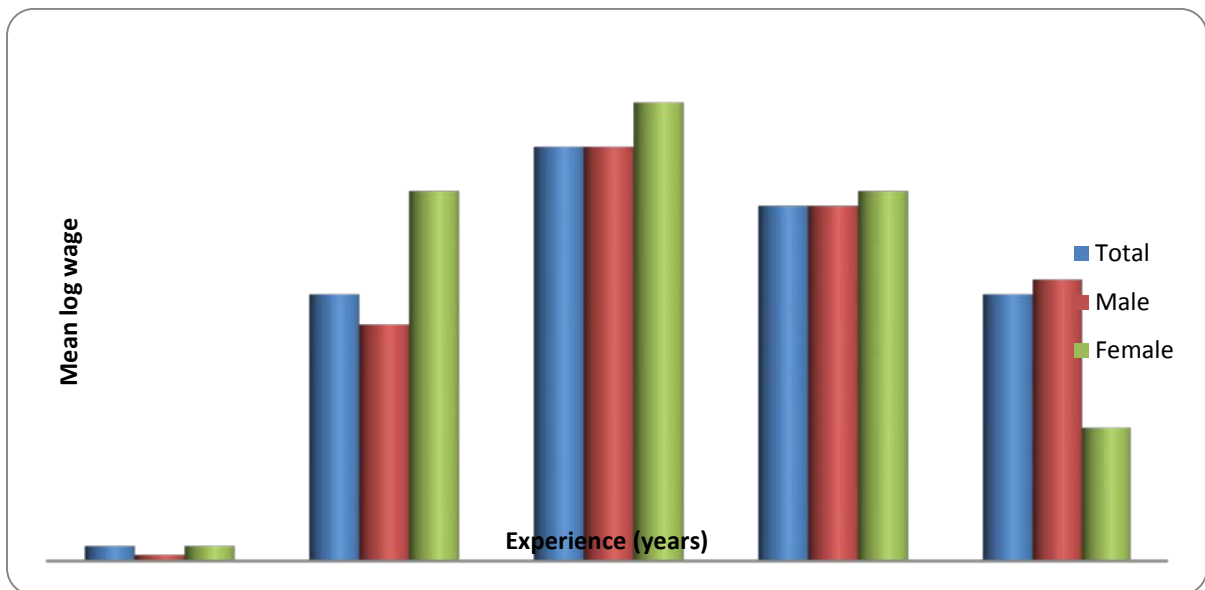
Table 1: Findings of Group of Studies on Returns to Education, by Region and Educational Level

	Region	Primary	Secondary Lower	Upper	Tertiary
Psacharopoulos (1981)[a]	Africa	29	22		32
Psacharopoulos (1985)[a]	Africa	45	26		32
Montenegro and Patrinos (2014)[a]	Middle East/N. Africa	16	4.5		10.5
	Sub-Saharan Africa	14.4	10.6		21
Psacharopoulos (1994)[a]	Sub-Saharan Africa	41.3	26.6		27.8
	Middle East/N. Africa	17.4	15.9		21.7
Psacharopoulos and Patrinos (2004)[a]	Middle East/N. Africa	13.8	13.6		18.8
	Sub-Saharan Africa	37.6	24.6		27.8
Colclough et al.(2010)[b]	Africa	8.9	9.7	14	22.7

Notes: [a] Wage worker; [b] Male wage worker aged 25-34

Table 2: Returns by Level of Education in Some African Countries, Review of Country Studies

| Paper	country	Survey year	Primary	Secondary Lower	Upper	Tertiary
Montenegro and Patrinos, (2014)[a]	West Bank and Gaza	2008	28.7	0.2		5.5
	Tunisia	2001	12.3	8.1		17.4
	Morocco	1998	11.6	6.2		16.1
	Ghana	2012	2.7	8.8		28.7
	Nigeria	2003	16.6	6.8		13
	Mozambique	2008	20.2	13.3		17.7
	Niger	2011	38.7	6.3		29.7
	Senegal	2011	9.8	6.5		21.8
	Sierra Leone	2011	5.5	4.4		3.5
	South Africa	2011	8.9	12.3		39.5
	Seri Lanka	2009	5.8	5.6		14.1
	Turkey	2010	14.2	7.3		14.7
	Uganda	2010	24.8	16.7		----
	Ethiopia	2005	32.7	16.2		17
Barouni and Broecke (2014)[b]	Egypt	2006	1	3		8
	Sudan	2009	10	7		21
	Tunisia	2010	3	12		24
	Burundi	2006	7	14		24
	Ghana	2005	8	15		20
	Mali	2007	12	20		15
	Nigeria	2010	7	14		24
	Rwanda	2005	8	42		39
	South Africa	2010	8	29		29
	Tanzania	2008	5	100		51
	Togo	2011	5	17		22
	Uganda	2006	7	40		29
	Nigeria	2010	7	14		24
(Wahba 2000)[c]	Egypt	1988	3.17	5.83		12.9
	Egypt	1988	3.33	6.07		8.7
Ali (2006)	Sudan	1996	4.7	0.7		15
(Said 2007)[d]	Egypt	1988	3.1		12.6	8.6
(Said 2007)[d]	Egypt	1998	2.8		11.5	7.7
(Said 2015)[d]	Egypt	2006	2.2		2.8	4.8
	Egypt	2012	1.1		2.2	4
(Herrera and Badr 2011)[e]	Egypt	1998	2.7	2.2	19.4	3.0
	Egypt	2006	1.8	3.2	4.5	8.4
Salehi-Isfahani, Tunali, & Assaad[f] (2009)	Egypt	1988	1.5		10	7.7
	Egypt	1998	2.1		16.8	0.3
	Egypt	2006	0.9		12.1	7.5

Notes: [a] Wage worker . [b] Wage worker as well as self-employed. [c] Urban and rural wage workers respectively. [d] All wage worker. [e] Four-years university degree. [f] Urban male wage workers.

Table 3: Basic Schooling Age and Length of Studies by Country and Educational Level

Country	Starting age	Length of education cycle (years)			
		Basic			
		Primary	Lower secondary	Upper secondary	University (Bachelor)
Egypt	6	6	3	3	4-6
Jordon	6	6	4	2	4
Palestine	6	6	4	2	4
Sudan	6		8	3	2-3

Notes : Basic education indicates primary and lower secondary

Source: UNESCO ISCED 1997 Mappings for education. http://www.uis.unesco.org/Education/ISCEDMappings/Pages/default.aspx

Table 4: Summary Statistics of the Returns to Schooling

	Egypt		Palestine		Sudan		Tunisia	
	1	2	1	2	1	2	1	2
		Mean		Mean		Mean		Mean
	N	(SD)	N	(SD)	N	(SD)	N	(SD)
Years of schooling total	7896	8.82	3524	11.19	3640	7.68	4179	11.05
		5.91		3.61		5.59		6.02
Years of schooling male	6654	8.38	2970	10.82	3089	7.11	2715	11.01
		5.85		3.44		5.49		5.85
Years of schooling female	1242	11.20	554	13.19	551	10.87	1464	11.14
		5.66		3.84		5.10		6.32
No education total	7896	0.29	3524	0.05	3640	0.29	4179	0.19
		0.45		0.23		0.45		0.39
No education male	6654	0.31	2970	0.05	3089	0.31	2715	0.18
		0.46		0.23		0.46		0.38
No education female	1242	0.18	554	0.05	551	0.13	1464	0.21
		0.38		0.23		0.34		0.41
Primary schooling total	7896	0.12	3524	0.47	3640	0.31	4179	0.07
		0.33		0.50		0.46		0.26
Primary schooling male	6654	0.14	2970	0.53	3089	0.34	2715	0.09
		0.34		0.50		0.47		0.28
primary schooling female	1242	0.05	554	0.20	551	0.18	1464	0.04
		0.22		0.40		0.39		0.20
Secondary schooling total	7896	0.41	3524	0.28	3640	0.24	4179	0.51
		0.49		0.45		0.43		0.50
Secondary schooling male	6654	0.40	2970	0.27	3089	0.23	2715	0.52
		0.49		0.45		0.42		0.50
Secondary schooling female	1242	0.41	554	0.31	551	0.35	1464	0.50
		0.49		0.46		0.48		0.50
Tertiary schooling total	7896	0.18	3524	0.19	3640	0.16	4179	0.20
		0.39		0.40		0.36		0.40
Tertiary schooling male	6654	0.15	2970	0.15	3089	0.12	2715	0.19
		0.36		0.36		0.33		0.39
Tertiary schooling female	1242	0.36	554	0.31	551	0.34	1464	0.22
		0.48		0.46		0.47		0.41

Table 3: Returns to Schooling: Standard Mincer Equation

Country	Year	Total Yrs. of schooling	Male Yrs. of schooling	Female Yrs. of schooling
Egypt	2011	3.4	2.9	4.8
Palestine	2011	5.1	4.4	7.3
Sudan	2009	4.9	4.5	6.6
Tunisia	2011	7	7	7.3

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 4: Returns to Schooling: Mincer Equation Adjusted for Occupation and Region

Country	Year	Total Yrs. of schooling	Male Yrs. of schooling	Female Yrs. of schooling
Egypt	2011	2.2	1.7	4.9
Palestine	2011	4.6	4.3	5.9
Sudan	2009	4.4	4.1	5.5
Tunisia	2011	6	6.1	6.2

Notes: All wage earners (aged 15-60), Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 5: Returns to Schooling: Mincer Equation with Levels of Education

Country	Year	Total			Male			Female		
		Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Egypt	2011	2.1	3	9.2	1.9	2.1	9.1	4.1	5	8
Palestine	2011	4.1	6.5	7	3.5	5.2	6.4	4.7	15.4	6.6
Sudan	2009	3.1	13.3	13	3.1	13.3	12.7	2.3	12.4	12
Tunisia	2011	4.7	1.2	9.7	4.8	0.4	10.8	4.6	3.1	7.7

Table 6: Returns to Schooling: Mincer Equation With Levels of Education Adjusted for Occupation and Region

Country	Year	Total			Male			Female		
		Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Egypt	2011	1.5	2	6.8	1	1.1	6.5	3.2	7.1	8
Palestine	2011	4	8	5.2	3.3	8.1	5	4.3	9.5	5.6
Sudan	2009	2.3	12.4	12	2.1	10.7	14.5	3.1	16.8	6.7
Tunisia	2011	1.3	1.5	9.1	4	1.4	5.4	4.1	0.1	2.7

Table 7: Returns to Schooling: Standard Mincer Equation

Variables	Egypt	Palestine	Tunisia	Sudan
years of schooling	0.034***	0.051***	0.069***	0.049***
	-0.001	-0.004	-0.002	-0.003
Experience	-0.005***	-0.032***	0.009***	-0.015***
	-0.001	-0.004	-0.002	-0.005
Experience squared	0.000***	0.001***	0	0.000***
	0	0	0	0
Constant	9.778***	10.331***	8.445***	8.568***
	-0.02	-0.057	-0.037	-0.061
Number of observations	7896	3524	4179	3640
R-squared	0.119	0.075	0.321	0.087

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 8: Returns to Schooling: Standard Mincer Equation, After Adjusting for Jobs

	Egypt	Palestine	Tunisia	Sudan
years of schooling	0.022***	0.046***	0.060***	0.044***
	-0.001	-0.004	-0.002	-0.003
Experience	-0.010***	-0.029***	0.007***	-0.016***
	-0.001	-0.003	-0.002	-0.004
Experience squared	0.000***	0.001***	0	0.000***
	0	0	0	0
Occupation				
Omitted variable :		*High professions*		*service sector*
Middle profession	-0.183***	-0.196***	0.109***	*Agriculture*
	-0.024	-0.065	-0.031	-0.412***
Low profession	-0.335***	-0.324***	-0.054**	-0.057
	-0.025	-0.064	-0.022	*Manufacturing*
Blue collar	-0.341***	-0.315***	0.031	0.101
	-0.024	-0.065	-0.024	-0.062
				Construction
				-0.206***
Region				
Omitted variable	*Metropolitan areas*	*Gaza Strip*	*Center Tunisia*	*Center Sudan*
Lower Egypt	-0.123***		*Grand Tunis*	*Western Sudan*
	-0.012	*West Bank*	0.034	-0.284***
Upper Egypt	-0.200***	0.536***	-0.022	-0.051
	-0.014	-0.026	*North*	*Eastern Sudan*
			-0.189***	-0.052
			-0.023	-0.041
			South	*Northern Sudan*
			-0.060**	-0.109***
			-0.023	-0.039
	-0.036	-0.093	-0.047	-0.063
Number of observations	7896	3524	4179	3640
R-squared	0.177	0.185	0.343	0.116

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 9: Returns to Schooling: Standard Mincer Equation, Total Sample, by Gender

Variables	Egypt Male	Egypt Female	Palestine Male	Palestine Female	Tunisia Male	Tunisia Female	Sudan Male	Sudan Female
years of schooling	0.029***	0.048***	0.044***	0.073***	0.069***	0.073***	0.045***	0.066***
	-0.001	-0.003	-0.004	-0.011	-0.003	-0.003	-0.003	-0.01
Experience	-0.009***	0.009**	-0.038***	-0.005	0.002	0.024***	-0.021***	0.004
	-0.001	-0.003	-0.004	-0.009	-0.003	-0.004	-0.005	-0.013
Experience squared	0.000***	0	0.001***	0	0	-0.000***	0.000***	0
	0	0	0	0	0	0	0	0
Constant	9.848***	9.545***	10.443***	9.887***	8.484***	8.311***	8.646***	8.203***
	-0.022	-0.051	-0.062	-0.176	-0.046	-0.063	-0.067	-0.199
Number of observations	6654	1242	2970	554	2715	1464	3089	551
R-squared	0.096	0.204	0.067	0.114	0.296	**0.377**	0.076	0.098

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** sign

Table 10: Returns to Schooling: Standard Mincer Equation, After Adjusting for Jobs and Occupations

	Egypt Male	Egypt Female	Palestine Male	Palestine Female	Tunisia Male	Tunisia Female	Sudan Male	Sudan Female
years of schooling	0.017***	0.049***	0.043***	0.059***	0.062***	0.062***	0.041***	0.055***
	-0.001	-0.004	-0.005	-0.016	-0.003	-0.004	-0.003	-0.01
Experience	-0.014***	0.008**	-0.035***	-0.004	0.001	0.021***	-0.022***	0.002
	-0.001	-0.003	-0.004	-0.009	-0.003	-0.004	-0.005	-0.012
Experience squared	0.000***	0	0.001***	0	0.000*	-0.000***	0.000***	0
	0	0	0	0	0	0	0	0
Occupation Omitted variable :			*High professions*				*service sector*	
Middle profession	-0.195***	-0.198***	-0.210***	-0.141	0.060*	0.161**	*Agriculture*	
	-0.027	-0.049	-0.071	-0.206	-0.036	-0.063	-0.364***	-0.867***
Low profession	-0.345***	-0.246***	-0.321***	-0.332	-0.083***	-0.007	-0.059	-0.207
							Manufacturing	
	-0.027	-0.058	-0.068	-0.233	-0.028	-0.041		
Blue collar	-0.359***	-0.098	-0.314***	-0.354	0.02	0.046	0.140**	-0.114
	-0.027	-0.068	-0.069	-0.243	-0.029	-0.048	-0.064	-0.225
							Construction	
							-0.181***	-0.288
Region Omitted variable :	Metropolitan areas		Gaza Strip		Center Tunisia		Center Sudan	
							-0.05	-1.004
							Western Sudan	
Lower Egypt	-0.120***	-0.140***	*West Bank*		*Grand Tunis*		-0.289***	-0.250**
	-0.013	-0.029	0.556***	0.413***	-0.01	0.094***		
Upper Egypt	-0.194***	-0.230***	-0.028	-0.065	-0.028	-0.036	-0.057	-0.11
							Eastern Sudan	
	-0.015	-0.037			*North*		-0.029	-0.149
					-0.218***	-0.138***	-0.044	-0.122
					-0.029	-0.036	*Northern Sudan*	
					South			
					-0.066**	-0.047	-0.107**	-0.141
					-0.028	-0.042	-0.042	-0.093
Constant	10.434***	9.820***	10.332***	9.953***	8.651***	8.407***	8.803***	8.500***
	-0.039	-0.09	-0.099	-0.35	-0.06	-0.077	-0.067	-0.192
Number of observations	6654	1242	2970	554	2715	1464	3089	551
R-squared	0.159	0.241	0.186	0.166	0.318	0.396	0.104	0.129

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 11: Returns to Schooling: Extended Mincer Equation with Levels of Education

Educational level	Egypt	Palestine	Tunisia	Sudan
Omitted group: Illiterate				
Primary	0.171***	0.243***	0.417***	0.152***
	-0.018	-0.066	-0.047	-0.04
Secondary	0.263***	0.369***	0.466***	0.528***
	-0.015	-0.069	-0.04	-0.042
Tertiary	0.615***	0.640***	0.745***	0.767***
	-0.019	-0.07	-0.043	-0.048
Experience	-0.004***	-0.032***	0.008***	-0.017***
	-0.001	-0.004	-0.003	-0.005
Experience squared	0.000***	0.001***	-0.000***	0.000***
	0	0	0	0
Constant	9.833***	10.575***	8.933***	8.672***
	-0.02	-0.072	-0.045	-0.06
Number of observations	7896	3524	4179	3640
R-squared	0.144	0.069	0.193	0.093

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 12: Returns to Schooling: Mincer Equation with Levels of Education, After Adjusting for Jobs and Occupations

Educational level	Egypt	Palestine	Tunisia	Sudan
Omitted group: Illiterate				
Primary	0.121***	0.231***	0.423***	0.113***
	-0.017	-0.064	-0.044	-0.039
Secondary	0.181***	0.386***	0.384***	0.465***
	-0.016	-0.067	-0.037	-0.042
Tertiary	0.443***	0.588***	0.512***	0.689***
	-0.023	-0.073	-0.043	-0.049
Experience	-0.008***	-0.029***	0.003	-0.017***
	-0.001	-0.004	-0.002	-0.004
Experience squared	0.000***	0.001***	-0.000**	0.000***
	0	0	0	0
Occupation				
Omitted variable : High professions				*Service sector*
Middle profession	-0.202***	-0.191***	0.286***	*Agriculture*
	-0.024	-0.065	-0.033	-0.412***
Low profession	-0.307***	-0.322***	-0.101***	-0.056
	-0.025	-0.066	-0.024	*Manufacturing*
Blue collar	-0.318***	-0.314***	0.01	0.120**
	-0.024	-0.068	-0.027	-0.06
				Construction
				-0.185***
Region				-0.051
Omitted variable :	Metropolitan areas	Gaza Strip	Center Tunisia	Center Sudan
Lower Egypt	-0.113***		*Grand Tunis*	*Western Sudan*
	-0.012	West Bank	0.081***	-0.279***
Upper Egypt	-0.190***	0.545***	-0.024	-0.051
	-0.014	-0.025	*North*	*Eastern Sudan*
			-0.213***	-0.057
			-0.024	-0.041
			South	*Northern Sudan*
			-0.073***	-0.119***
			-0.025	-0.039
Constant	10.332***	10.455***	9.022***	8.845***
	-0.035	-0.102	-0.05	-0.063
Number of observations	7896	3524	4179	3640
R-squared	0.191	0.182	0.268	0.122

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 13: Returns to Schooling: Extended Mincer Equation with Levels of Education

Educational level	Egypt		Palestine		Tunisia		Sudan	
Omitted group: Illiterate	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Primary	0.155***	0.317***	0.212***	0.279	0.422***	0.410***	0.138***	0.264*
	-0.018	-0.072	-0.069	-0.233	-0.06	-0.08	-0.041	-0.162
Secondary	0.215***	0.465***	0.314***	0.565**	0.436***	0.535***	0.462***	0.774***
	-0.016	-0.042	-0.072	-0.241	-0.053	-0.062	-0.045	-0.151
Tertiary	0.564***	0.792***	0.564***	0.822***	0.746***	0.759***	0.751***	0.919***
	-0.022	-0.047	-0.075	-0.239	-0.058	-0.068	-0.055	-0.161
Experience	-0.008***	0.012***	-0.039***	0	0.006*	0.016***	-0.023***	0.001
	-0.001	-0.003	-0.004	-0.01	-0.003	-0.004	-0.005	-0.013
Experience squared	0.000***	0	0.001***	0	-0.000**	-0.000***	0.000***	0
	0	0	0	0	0	0	0	0
Constant	9.905***	9.561***	10.656***	10.255***	8.948***	8.873***	8.750***	8.338***
	-0.022	-0.053	-0.077	-0.232	-0.059	-0.072	-0.063	-0.197
Number of observations	6654	1242	2970	554	2715	1464	3089	551
R-squared	0.122	0.217	0.061	0.102	0.173	0.236	0.082	0.102

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%

Table 14: Returns to Schooling: Extended Mincer Equation with Levels of Education, After Adjusting for Jobs and Occupations

Educational level	Egypt		Palestine		Tunisia		Sudan	
Omitted group: Illiterate	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Primary	0.105***	0.263***	0.198***	0.257	0.440***	0.368***	0.105**	0.151
	-0.018	-0.071	-0.065	-0.233	-0.055	-0.072	-0.041	-0.163
Secondary	0.138***	0.471***	0.354***	0.439*	0.499***	0.373***	0.412***	0.618***
	-0.017	-0.054	-0.069	-0.253	-0.048	-0.059	-0.046	-0.149
Tertiary	0.391***	0.773***	0.549***	0.662**	0.542***	0.455***	0.689***	0.748***
	-0.026	-0.062	-0.077	-0.258	-0.057	-0.068	-0.056	-0.158
Experience	-0.013***	0.011***	-0.035***	-0.001	0	0.010***	-0.023***	0
	-0.001	-0.003	-0.004	-0.009	-0.003	-0.004	-0.005	-0.013
Experience squared	0.000***	0	0.001***	0	0	-0.000***	0.000***	0
	0	0	0	0	0	0	0	0
Occupation								
Omitted variable :			***High professions***				***Service sector***	
Middle profession	-0.220***	-0.184***	-0.207***	-0.142	0.216***	0.439***	***Agriculture***	
	-0.027	-0.05	-0.069	-0.205	-0.039	-0.07	-0.364***	-0.867***
Low profession	-0.318***	-0.230***	-0.315***	-0.367	-0.147***	0.003	-0.058	-0.215
	-0.027	-0.058	-0.069	-0.231	-0.029	-0.047	***Manufacturing***	
Blue collar	-0.335***	-0.124*	-0.309***	-0.398	-0.026	0.096*	0.157**	-0.188
	-0.026	-0.067	-0.071	-0.247	-0.031	-0.056	-0.062	-0.223
							Construction	
							-0.163***	-0.181
Region							-0.05	-1.048
Omitted variable :								
Metropolitan areas	**Metropolitan areas**		**Gaza Strip**		**Center Tunisia**		**Center Sudan**	
Lower Egypt	-0.110***	-0.131***	***West Bank***		***Grand Tunis***		***Western Sudan***	
	-0.013	-0.029	0.566***	0.422***	0.036	0.149***	-0.285***	-0.257**
Upper Egypt	-0.183***	-0.222***	-0.027	-0.065	-0.031	-0.039	-0.057	-0.11
	-0.015	-0.037			***North***		***Eastern Sudan***	
					-0.246***	-0.157***	-0.035	-0.145
					-0.03	-0.038	-0.044	-0.121
					South		***Northern Sudan***	
					-0.086***	-0.054	-0.114***	-0.162*
					-0.03	-0.044	-0.042	-0.091
Constant	10.422***	9.855***	10.517***		9.108***	8.838***	8.905***	8.630***
	-0.038	-0.088	-0.108		-0.065	-0.084	-0.066	-0.191
Number of observations	6654	1242	2970	554	2715	1464	3089	551
R-squared	0.173	0.248	0.183	0.16	0.243	0.319	0.111	0.133

Notes: All wage earners (aged 15-60),Robust standard errors in parentheses, * significant at 10%; **significant at 5%, *** significant at 1%