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2009

working paper series

EDUCATION AND EARNINGS
IN THE MIDDLE EAST: A COMPARATIVE STUDY
OF RETURNS TO SCHOOLING
IN EGYPT, IRAN, AND TURKEY

Djavad Salehi-Isfahani

Working Paper No. 504

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September 2009

Financial support from ERF (grant # ERF00-US-1001 is gratefully acknowledged. I wish to thank Ragui Assaad and Insan Tunali for sharing their thoughts and their survey data with me, and Ali Hashemi for valuable research assistance.

Send correspondence to:
Djavad Salehi-Isfahani
Department of Economics, Virginia Tech
salehi@vt.edu

* This research has benefited from the financial contribution of ERF as part of the ERF-GDN Regional Research Competition. The content of this publication is the sole responsibility of the authors and can in no way be taken to reflect the views of ERF or GDN.

Abstract

This paper presents a comparative study of private returns to schooling in Egypt, Iran, and Turkey using similar survey data and a uniform methodology. We employ three surveys for each country that span nearly two decades, ranging from 1987 to 2006. Our aim is to learn from survey data about the signals of rewards that individuals use in their decisions to invest in education. So we pay special attention to differences across countries and over time in the institutions of education and labor markets, and how these differences might be related to the observed patterns of rewards to education. We find a fair amount of consistency in the patterns of returns between the countries, as well as important differences that suggest the influence of institutions. We find that returns to education increase in years of schooling in all three countries, as one would expect in countries with relatively rigid labor markets, where heavy emphasis on higher terminal degrees reduce the value of basic education. Private returns to tertiary relative to upper secondary and vocational education are high, confirming that university education is highly attractive in these countries. Low returns to vocational training relative to general upper secondary, which have been observed in many developing countries, are true in Egypt and Iran, but not Turkey. We attempt to reconcile these facts with the institutional features of the countries and changes over time.

ملخص

تعرض هذه الورقة دراسة مقارنة للعائدات الخاصة من التعليم في كل من مصر وإيران وتركيا في ضوء بيانات مسحية متشابهة ومنهجية متناغمة في الثلاث حالات. وقد قمنا بتوظيف ثلاث مسوحات لكل قطر من هذه الأقطار بحيث تغطي هذه المسوح قرابة عقدين من الزمن من العام 1987 حتى العام 2006. وفي ضوء البيانات المسحية فإن هدفنا هو معرفة الإشارات التي تحفز الأفراد للإستثمار في مجال التعليم؛ ولذا فإننا نعتبر أهمية خاصة للإختلافات عبر الدول وعبر الزمن في المؤسسات التعليمية وأسواق العمل وإلى أي مدى ترتبط هذه التباينات بالأنماط الملاحظة لجوائز التعليم. ونحن نلاحظ قدراً معقولاً من التناغم والاتساق في نماذج العائدات بين الدول المذكورة، كما نلاحظ تباينات مهمة توحى بوجود بما للمؤسسات من تأثير. كما نرصد زيادة في عائدات التعليم خلال سنوات الدراسة في الثلاث بلدان محل الدراسة بالشكل الذي يتوقعه المرء في مثل هذه البلدان ذات أسواق العمل التي تتسم بالجمود النسبي والتي فيها يؤدي التركيز على أهمية الدرجات العلمية النهائية إلى التقليل من قيمة التعليم الأساسي. أما العائدات الخاصة لتعليم المستوى الثالث المرتبط بالتعليم المهني وفوق الثانوي فإنها عالية ما يؤكد أن التعليم الجامعي يتميز بجاذبية كبيرة في هذه الدول. وتسجل العديد من البلدان النامية كمصر وإيران عائدات منخفضة فيما يتعلق بالتدريب المهني المرتبط بالتعليم العام فوق الثانوي إلا أن تركيا تشذ عن هذه القاعدة ونحن من جانبنا نحاول التوفيق بين هذه الحقائق والخصائص المؤسسية للدول والتغيرات على مدار الزمن.

1. Introduction

Employment issues, especially for youth, are central to the economic development Middle East and North Africa (MENA) countries (Yousef 2004). In the past decades, education has expanded in MENA faster than in any region of the world, yet its benefits in terms of growth in output and jobs have been very disappointing (World Bank 2007). Low productivity of education in MENA is confirmed in studies of the social rate of return for education (defined as the increase in total output due to increase in years of schooling) which produce estimates close to zero (Pritchett 1999; Makdisi, Fattah, and Limam 2006). Further evidence of the low productivity of education in MENA is high rates of unemployment of educated youth, often exceeding 20 percent. Yet, despite the low productivity of education, families and youth still believe in education as the main path to social and economic success and continue to invest heavily in schooling.

These facts do not represent so much of a puzzle as evidence of distortion in the signals that guide investment in human capital. Clearly, private and social returns to schooling diverge in MENA countries. The benefits of education for the individual, which are largely based on the perceived effects of education on pay and the probability of finding a job, are greater than the benefits for the national output. Several studies of private returns to education confirm the high returns to schooling, especially university education, in several MENA countries (Assaad 1997; Huitfeldt and Kabbani 2007; Tansel 1994; Tansel 2002; Tansel 2005).

This study seeks to, first, examine how private rewards to education compare in Egypt, Iran, and Turkey, and, second, understand the relationship between these returns and the institutional structure of education and labor markets in these countries. The choice of these particular countries, besides the fact that they represent the three largest labor markets in the MENA region, is based on the availability of similar survey data across time, and that the institutions of education and labor market in these countries differ in interesting ways. Returns to schooling are frequently discussed in a comparative perspective (Psacharopoulos 1994; Psacharopoulos and Patrinos 2004; Pritchett 2006), but often comparability is lost because of differences in methodology, the type of data used, and the list of variables used as controls in the regressions. We try to maximize comparability by applying a uniform methodology, tightly controlling the definition of the variables used, and using similar survey data.

We are particularly interested in two types of questions: First, we want to know about the signals of rewards to education that labor markets send to youth, their families, and educators. This is important for policy because the level of investment in education and the type of skills individuals invest in depend on these signals. Are the extraordinary efforts on the part of youth to enter university and the high public and private investments in tertiary education justified by the observed private returns to tertiary education? How do they compare with returns to practical skills that are taught in vocation schools? Second, we ask if the observed patterns of returns across countries and changes over time are related to variation in the institution of the markets for education and labor. To answer this question ideally we want to link the structure of returns to specific institutional facts about a country or a change over time, and perform causal analysis to isolate the effect of institutions from other factors. We lack the data to do so, so we aim much more modestly, to provide conjectures based on the observed patterns institutional variation setting that will help policy makers (and future causal researchers) know the likely effects of education and labor market policy on labor market outcomes. We believe that this is a useful way to learn from multiple surveys for MENA countries. As Heckman and Pages (2004) have noted, “using large cross sections of data for multiple time periods can greatly sharpen estimates of the effects of institutions on the labor market.”

There are a number of comparative studies of returns to education that have a similar objective—they attempt to relate returns to the economic environment but do not perform causal analysis [Asplund and Pereira (1999), Harmon, Walker, and Westergaard-Nielson (2001), Denny, Harmon, and Lydon (2002), Lauer (2005)]. Our work is in the spirit of the collection of papers in Harmon, Walker, and Westergaard-Nielson (2001) done for European countries and stress uniformity of methodology, sometimes at the expense of technical sophistication, in order to reduce the variation in the estimated returns arising from the estimation technique. They use descriptive accounts of labor market conditions with Mincer equation estimates, stressing the connections between the observed returns and the economic environment. The objective of a similar cross-country comparative project of return to education (PURE) is to link “the observed patterns and trends [in returns] to national educational systems and policies.”¹ Among the several papers on returns to education in MENA countries Said and El-Hamidi (2005) is in this vein in that they try to obtain comparable results for Egypt and Morocco and across two periods to show the effect of labor market liberalization in these countries in the 1990s.

To increase comparability, we focus on male wage and salary earners only, because the quality of the earnings data for the self employed do not inspire confidence for cross country comparisons. Wage and salary data are generally of higher quality relative to self employment income in countries where taxation of income from self-employment either does not exist or is not well enforced, especially for the less educated. Also, our main results are for men, whose participation rates in the labor market are high enough for use to ignore difficult selection issues. We report the comparative results for female wage earners separately.

Our main findings can be summarized as follows:

- In all three countries and all periods we find the results from the standard Mincer equation reasonable but inadequate. The assumption of linearity in returns to schooling is rejected by data from all three countries. We find that the returns are increasing in years of schooling. This is consistent with how students are selected into higher levels of schooling (the greater the selectivity, the higher the convexity) and labor market rigidity. With the emphasis on terminal degrees, basic and upper secondary education is more focused on passing exams to enter university that enhancing productivity.
- An interesting contrast emerges on the returns to education at the university level. In Iran and Turkey, where selection into university is highly competitive and relatively small proportions are admitted, return to tertiary education is high. We believe that a strong ability bias explains the high returns. In Egypt, where selection takes place three years earlier at grade 9, marginal returns for university education are lower. In Iran, where the expansion of private universities between 1987 and 2006 has increased the supply of graduates and reduced selectivity into university, we notice a small decline in marginal returns to university.
- All three countries have liberalized their labor markets, with Egypt making the most progress, followed by Turkey, and Iran coming in as a distant third. This is consistent with the changes in our estimates of the returns to education: There is a significant increase in returns to tertiary relative to upper secondary in Egypt and Turkey, but not in Iran.
- There is significant variation between countries and over time in the returns to Technical and Vocation Training (TVE) compared to general high school. We find that in Turkey where selection into the vocational track is not compulsory and extensive, vocational

¹ See <http://www.etla.fi/PURE/>.

returns compared favorably with general high school education. In Egypt, where tracking into vocational education is extensive, returns to vocational education are lower than general. In Iran, while tracking was not fully implemented, before 2001, vocational returns exceeded general upper secondary, but the situation reversed in 2006 when tracking had taken effect.

This report is organized as follows. Section 2 introduces the surveys used in this study. Section 3 briefly reviews previous research on returns to education in the Middle Eastern countries and introduces the Mincer methodology used in this study. Section 4 and 5 describe the institutions of the education and labor markets in the three countries. Section 6 introduces the key characteristics of the labor force and earnings before going to the estimation results in Section 7. In this section we first focus on returns to the most homogenous group of workers, urban men 20-54 years old, before presenting estimates for women, where selection issues reduce comparability across countries and over time. Section 8 concludes.

2. Data

We derive our working sample for urban, male wage earners, 20-54 years old, from nine surveys from Egypt, Iran, and Turkey. Egyptian data is from the Labor Force Sample Survey of 1988 (LFSS 1988), the Egyptian Labor Market Survey of 1998 (ELMS 1998), and the recent Egyptian Labor Market Panel Survey of 2006 (ELMPS 2006). These surveys yield sample sizes for urban wage earners aged 20-54 of 1,629 individuals in 1988, 2,041 in 1998 and 2,949 in 2006. All Egyptian surveys are self-weighted.

Iranian data is obtained from the Socio-Economic Characteristics of Household (SECH) for 1987 and 2001, and the Household Expenditure and Income Survey (HEIS) 2006. SECH data is the first round of panel data sets, and HEIS is an annual survey, which for the first time in 2006 included information on hours worked, so it was possible to include it as a comparable survey with the SECH data. SECH surveys are self-weighted but HEIS are not, so we use weights in all our calculations. After accounting for missing values and restricting the sample to urban wage earners in the 20-54 age group, the sample size for 1987, 2001, and 2006 are, respectively, 1,556, 2,124, and 7,457 wage earners. The Turkish data are taken from the labor force surveys of 1988, 1994, and 2002. These surveys yield, respectively, 7,755, 10,782, and 4,687 observations of wage earners.

We use the information provided in these surveys to construct comparable measures of hourly earnings in units of 2000 Purchasing Power Parity (PPP) international dollars (PPP data from World Development indicators). All the surveys provide information on the years of education and categories of educational attainment of the respondents. As much as possible, we define education levels to mean the same thing across the three countries. Table 1 provides the summary statistics, which we discuss in more detail later in Section 6.

3. Review of Literature and Methodology

The literature on returns to education is one of the most extensive in labor economics. Psacharopoulos (1994) and Psacharopoulos and Patrinos (2004) report on dozens of such studies globally. Card (1999) reviews the literature from the point of view of causation—the extent to which education rather than its correlates, such as ability and family background, affect earnings. Nearly all empirical studies of returns to education begin with the Mincer equation (Mincer 1974):

$$\ln W_i = \alpha + \beta S_i + \gamma E_i + \delta E_i^2 + \varepsilon_i \quad (1)$$

where S is years of schooling and E is experience. The Mincer equation is an effective way to summarize earnings data.

There are relatively few published studies and a handful of unpublished papers on returns to education for MENA countries. Of the published papers, Assaad (1997) uses the 1988 Egyptian survey, and Tansel (1994), (2001), (2002), and (2005) use various Turkish labor force and expenditure surveys. There are also several unpublished studies (El-Hamidi and Said ; Dah and Hammami 2002; Huitfeldt and Kabbani 2007; Said and El-Hamidi 2005; Said 2008) using available surveys in the region. Additional returns for Jordan and Yemen are reported in World Bank (2004).

Although these papers all use variants of the Mincer equation, with the exception of Said and El-Hamidi (2005), they have limited comparative value because of differences in the estimation equation, which is included in the sample, and how they treat selection issues. Said and El-Hamidi (2005) take advantage of surveys taken before and after reforms in Egypt and Morocco during the 1990s that decreased the role of the state in employment. Their estimates show that returns to higher levels of schooling fell in both countries during this period. Although it is difficult to attribute the change in returns to the reduced role of the public sector, it is consistent with the role of the public sector in rewarding education in excess of productivity.

Most of these studies tackle the public-private differences in returns, which indirectly deals with the effect of one of the most important aspects of the environment that affects the distribution of earnings, namely the dominant role of the public sector in the Middle Eastern labor markets. Assaad (1997), Tansel (2005), and Said and El-Hamidi (2005) take account of the role of the public sector in wage setting in Egypt, Morocco, and Turkey. They discuss how differences in public and private sector compensation policies are reflected in the observed returns to education. Assaad (1997) models the incentive structure that leads to the observed labor market outcomes of differential wages and queuing time for public and private sector workers given education.

4. Educational Systems

Figures 3, 4 and 5 summarize the education systems in the three countries. Below for each country we describe the structure of this chart and the rules for selection into higher levels in the school system.

4.1. Iran

Schooling in Iran consists of primary (grades 1-5), lower secondary (grades 6-8), and upper secondary (grades 9-11), pre-university (grade 12), and tertiary levels. As part of a major schooling reform initiated in 1991, upper secondary was reduced from 4 to 3 years. Two branches of vocational education were also introduced as part of these reforms. High school students who wish to continue to university are required to attend a year of preparatory high school, which is in place of the 12th year of the old upper secondary system. Education is compulsory up to grade 8.

All education decisions are made by the central government, including administration of national exams. Public education predominates at all levels and is free. Less than 10% of students attend private schools. Tertiary education was mostly public until the 1980s but private universities have expanded since. In 2006 about 50% of university students were enrolled in private universities, mostly in the Islamic Azad University, which is closely connected to and controlled by Iran's leading clergy and politicians.

At the end of the 9th grade (first year of high school) students take either an academic or technical/vocational track, contingent upon the aptitude shown during the lower secondary years. The academic track is called the "theoretical track" and consists of two stages lasting a

total of three years. The first two years of this track cover a general curriculum, and the final year allows students to specialize in one of four areas: literature and arts, natural sciences, physics and mathematics, or social sciences and economics. At the end of this cycle, students take the national upper secondary examinations conducted by the Ministry of Education. Successful candidates are awarded a high school diploma, which is a terminal degree and provides access to the pre-university year or employment.

Students who successfully complete the additional preparatory year are eligible to take the national university entrance examinations (*concour*). Students who are placed in the technical/vocational track enter either a work-study program (*kardanesh*), or a three-year technical program at a technical and vocational school *fanni-herfei*. The *kardanesh* track is less desirable and is reserved for the worst performers in lower secondary school. They receive one year of general training before being assigned to an employer for apprenticeship for two years. Students in *fanni-herfei* schools, which are considered more desirable, can continue to tertiary-level technical education in their fields (*kardani*) upon passing a competitive national exam. Recently, *kardanesh* students have been also granted the possibility to take the same test and continue to tertiary education, which boosted its enrollments despite the fact that their chance of securing a place in *kardani* schools is extremely low (Salehi-Isfahani and Egel 2007).

4.2. Egypt

Basic education in Egypt consists of five years of primary and three years of preparatory (lower secondary) school. These are compulsory for all children aged 6. Upper secondary education is three years and is divided into general and vocational branches. The latter is divided further into a three-year track leading to qualification as Technician, and a five-year advanced vocational/technical training for the First Technician certificate.

In grade 9, based on national exams, students are separated into the general upper secondary and vocational tracks. Unlike Iran and Turkey, in Egypt selection for university education begins early, in grade 9, and about two-third of students are sent to the technical track. As a result, almost all those who continue in the general secondary track enter university. Most students who stay on in the general track continue to tertiary.

4.3. Turkey

The Turkish education system mandates 8 years of primary education between the ages of 6 and 14. Primary education institutions consist of eight-year schools (5 years of primary school and 3 years of middle school) at the end of which the basic education diploma is awarded. Basic education is followed by secondary education which lasts for 3 years in case of general education and 4 years for technical education.

Technical and vocational high schools offer four-and three-year programs, respectively, and prepare students for employment or for higher education. Vocational track students are allowed to take part in the university entrance examinations.

Admission to university is centralized and based on the highly competitive two-part university entrance examination. Those with the highest grades are qualified for the four-year undergraduate programs. Students applying to higher vocational college must take the first part of the university entrance examination. This, along with the applicant's grade average during secondary school, determines admission into higher vocational colleges.

Implications of the education systems for returns to education are as follows. First, there is very little selection on ability up to grade 9 in any of the countries. Beyond grade 9 there is strong selection in all three countries, especially Egypt, because lower ability students are not allowed to continue in the academic track. So, differences in returns between general and

vocational education may be in part be due to differences in general ability. The same logic applies to returns to university education where selection is strong. But selection at this level is very different between Egypt on the one hand and Iran and Turkey on the other. In Egypt, where selection is most important between lower and upper secondary, we do not expect a strong ability bias for estimates of university education. In contrast, in Iran and Turkey, where effective selection takes place at the gate of the university, we would expect returns to be biased upward. We return to this issue in section 7.3.

5. Labor Market Institutions

Describing labor market institutions is less clear cut than for education. MENA labor markets are known as rigid by developed country standards, and even by some developing country standards. All three countries under consideration have been historically dominated by the state both in terms of public sector employment and in regulation of private employment. The institutions of the labor market in MENA countries have been shaped by the region's particular history; in particular by the emergence of the interventionist-redistributive state after WW II and independence (Yousef 2004). Egypt embraced socialism in the 1950s and built state-based heavy machinery in employment. Turkey was well known for its *etatist* system, and Iran, first under the Shahs thanks to oil revenues that enriched the state in the 1970s and later under a revolutionary regime, had an active state in employment and regulation. Their impact on returns to education has been amplified by the fact that historically they have been the main employers of graduates of higher education. Table 3 shows that the public sector employs a far greater proportion of the more educated workers in all three countries, so its reward structure has a greater influence on the incentives for investment in education.

Ranking countries on labor market institutions is not an easy task because different indices consider different aspects of labor market flexibility and therefore do not always yield the same rankings. The World Bank series on Doing Business summarize legal codes, whereas the Heritage Foundation and the Economist Intelligence Unit (EIU) also use expert opinions surveys. In the 1990s the Heritage index for wage and price controls, which is a rough measure of labor market rigidity, ranked Egypt and Turkey 3 out of 5 (most rigid) and Iran as 4. A different index by Heritage available only since 2005 puts Egypt above Turkey and Iran in 2007 (at 69.1 compared to 48.0 for Turkey, and 43.8 for Iran).

The size of the wage bill of public sector employees as percent of GDP is an indicator of the influence of public sector employment policies in setting the rewards to education. Comparable data from World Bank World Development Indicators database (2005) is only available for the 1990s. This ratio is constant and about 6 percent in Egypt, rising from about 8.0 percent in 1990 to 11.5 percent in 2000 in Iran, and from 6.5 percent to 8.2 percent in Turkey during the same period. Thus, this indicator of labor market institutions places Egypt and Turkey at about the same level of flexibility and above Iran.

Other evidence indicates that Turkey may be more flexible than Egypt, certainly in the earlier years. Turkey embarked on its liberalization in the early 1980s and has been praised for achieving good results (Onaran and Aydinler-Avsar 2006). Lawson and Bierhanzl (2004) places Turkey well above the median in overall labor market flexibility, which is also true of those aspects that are more relevant to earnings, such as hiring and firing practices and wage setting.

Egypt has been engaged in opening its economy since the 1970s, but serious labor market reform only came in 2003. Egypt's labor markets were still under the domination of the state in 1988, the time of our first Egyptian survey. Egypt underwent substantial reforms in the

1990s, moving it away from a planned economy toward a competitive economy. Serious labor market reforms did not come until 2003, when regulations for private sector employment were relaxed, specifically to allow private employers to lay off workers. The effects of this reform should be in part reflected in the 2006 estimates for Egypt.

Summarizing this evidence, we believe that all three countries have increased their flexibility, but the speed of change has been greater in Egypt and Turkey than Iran. In the 1980s, labor markets in Egypt and Iran were both more rigid than labor markets in Turkey, but in the 1990s Egypt improved faster than Iran but it did not become more flexible than Turkey. In recent years, thanks to the 2003 reforms, Egypt has caught up with Turkey while Iran is still a distant third.

It is important to bear in mind that when laws change to allow for more flexibility, that it may take several years before its effect is observed across the age spectrum because older workers may not be subject to new laws.

6. The Characteristics of the Labor Force and Earnings

The samples for all three countries and all periods are remarkably similar in terms of average age (about 34-35 years), but there are differences in average schooling, which affect the average years of experience since experience is defined as age minus years of schooling minus six (see Table 1). The share of public sector in wage and salary employment has declined in Egypt and Iran but increased in Turkey, where it started at one fourth the level of Egypt and Iran. The latter countries have successfully reduced the share of public sector in wage employment from nearly two-third to 44 and 35 percents, respectively. Turkey is still the country with the largest share of private wage and salary employment.

Over the period of study, average years of schooling for the urban workforce 20-54 years old has increased by about two years.² Average years of schooling are the highest in Egypt (10.8 years in 2006), which is the poorest country of the three, exceeding Iran's by about 1.8 years and Turkey's (which is the most advanced of the three) by more than 2 years.

Egypt and Iran added about two years of schooling during two decades and Turkey about 1.4 years in 14 years. Egypt, which is the poorest country in the group has the most educated labor force, with average years of schooling of 10.8 years in 2006, followed by Iran (9.08 years) and Turkey (8.30 years in 2002), which is the reverse order based on per capita GDP (see Figure 1).

But the averages for years of schooling hide large differences in the distributions of the workforce by education level, which are also in Table 1. Egypt has the highest proportions of illiterate and university graduates (9.1% and 27.4% in 2006), while Turkey, the most developed country in the group, has the lowest in both categories (1.3% and 14.2% in 2002). In Turkey by far the largest group are those with primary education (44.45% in 2002), with a relatively small lower secondary group (13.35%). This is most likely a consequence of the low compulsory years of schooling, which until 1997 was only 5 years. In contrast, Iran and Egypt have required 8 years for the last decade. Iran has a relatively even distribution of graduates from primary to tertiary (ranging from 22.16% in primary to 12.76% in tertiary).

Egypt also boasts the largest share of vocational upper secondary graduates (34.84% in 2006), but has relatively few workers with general upper secondary degrees. This is because those presumed not suited for university education are sent to vocational education, while most of those who remain in general upper secondary end up in university. The share of TVE

² Average years of schooling are calculated based on the levels, multiplying the number of graduates by the total number of years for that level and the number without a diploma with the average years for the level below and above.

graduates rose from 20.4% in 1988 to 34.8% in 2006. Turkey has the lowest ratio of vocational graduates, but their share doubled during 1994-2002. In Iran, too, the share of vocational graduates rose dramatically during 1987-2001. This rise was as a result of the introduction of a new program introduced in the 1990s that selected students away from the general academic track into two vocational tracks, technical and vocational high schools and a work-study *kardanesh* program. But their share had dropped off by 2006 to 8.5%. There has been serious attrition from this program (Salehi-Isfahani and Egel 2007), but the fluctuations need a closer look.³

6.1 Earnings and Education

Average wages in Table 1 reflect the general level of economic development in these countries. The mean and median hourly wage (in 2000 PPP \$) are similar in Iran and Turkey, and nearly twice that in Egypt. In all three countries, median earnings were lower than mean earnings, indicating that the wage distributions are skewed to the right. The shifts in the wage distributions can be seen in more detail in Figure 2, which show log wage distributions for all nine surveys.

Table 4 provides a detailed comparison of wages across the three countries by education (standard deviations are presented in a separate Table 5). Real hourly wages are reported in units of 2000 Purchasing Power Parity (PPP) US dollars to allow comparison across countries and time. Although these wages do not refer to the same years for all three countries, it is possible to discern a general picture from these numbers. Average real wages (last rows of each panel) are highest in Turkey, followed by Iran and Egypt, roughly corresponding to the level of economic development in these countries, though Iran's GDP per capita now exceed Turkey's because of the high oil prices.

Average real wages have been increasing over time in Iran, but not in Egypt and Turkey. In Egypt, wages declined from \$1.89 per hour in 1988 to \$1.29 in 1998 before rising back up to \$1.93 in 2006. This was true for all levels of education, implying that returns to schooling were not affected as much. In Turkey, average wage rose 1988-1994 and then declined to 2002. Low educated workers suffered a continuous decline. In Iran, during 1987-2001, decline is noted at the two extremes of education, for those with less than upper secondary education and for the university educated.

In terms of earnings, vocational high school graduates have not fared well in any of the countries, despite the shortage of such skills. In Egypt their wages are low and stagnant; in Iran and Turkey they have declined in the later periods even as their economies have expanded (see Figure 1). Clearly, their skills are not what the new dynamic sectors of these economies demand.

The college premium appears to have decreased in Iran and Turkey over the years but increased in Egypt. The mean wages of illiterate workers or workers with less than primary education has decreased in all countries. High school graduates and workers with tertiary level education have been benefited from increasing wages in all three countries.

University graduates have gained the most in Iran and Egypt, but declined in Turkey. In Iran, despite the expansion of universities and the rising number of graduates in Iran, average wages of graduates have increased during the 2001-06 period. Turkey and Iran offer about the same level of average premium for university education (about PPP \$3 per hour in the last period); in Egypt the premium is much less (just over \$1 in 2006).

³ The figures for 2001 for Iran should be treated with caution because vocational students were identified from their fields of study.

We will revisit these premiums when we discuss the estimates of returns to schooling which control for experience, providing a more accurate view of the changing rewards to schooling.

6.1.1 Wage dispersion and labor market institutions

Are these rankings and trends in labor market flexibility reflected in wage dispersions? In the extreme case when wages are set by governments according to formal schooling credentials, we would expect little wage dispersion around the mean. In fact, in this case, the Mincer equation would simply return the government-set wage scale. However, variation in the quality of degrees and of other skills would generate additional variation. So, where employers are freer to set wages, we would expect that returns to greater wage dispersion.

We measure wage dispersion by the coefficient of variation (the ratio of standard deviation to the mean) and present the results by education level for public and private sectors in Table 6. Wage dispersions have behaved in different ways in these countries. In Egypt the overall coefficient of variation fell and then increased, in Iran it fell and then stayed constant, and in Turkey it fell continuously.

The dispersion of wages in the public and private sector may differ, especially for the more educated because public sector wages in these countries are administratively set and are tied to education, so we would expect public sector wages to be more compressed relative to private sector. This conjecture is for the most part borne out by the data. Except in Egypt in 2006 and Iran in 1987, public sector wages are less dispersed than private wages. This is especially true in Turkey, where private employment is in the strongest position. Looking at this difference by education, again Turkey's experience fits our conjecture, as does Iran's for the upper secondary and tertiary educated in the last period (2006), when private employment expanded to two-third of the wage and salary labor force.

One would also expect dispersion to have increased over time in the private sector as private employers gain freedom to pay according to productivity and not credentials, more so than in the public sector. In Egypt, dispersion increased during 1998-2006, when major labor market reform took place, but it increased more for public than private sector, and it increased for each level except the bottom two. In Iran, there is a significant increase in the dispersion for the tertiary educated in the private sector, but not for other groups. In Turkey, dispersions generally decreased.

7. Estimation Results

7.1 Returns to Education for Men

As noted earlier, our basic tool for comparing changes in returns to schooling across countries and over time is the Mincer equation (1). We employ three variants of the Mincer equation: the standard version linear in years of schooling, non-linear with quadratic years of schooling, and semi-parametric with education levels.

In order to avoid selection issues, we limit our sample to urban men aged 20-54 who earn a wage or salary, who have the highest rates of participation in the labor force, about 90 percent (see also panel (b) in Table 2). This simple approach requires fewer assumptions for identification and therefore yields more credible comparative results. We report the results for female earnings separately.

The results for the standard Mincer equation are presented in Table 7. All coefficients are significant and the goodness of fit is about the same across countries (it has increased over time in Iran and Turkey but declined in Egypt).

The estimated private returns are generally lower in Egypt compared to Iran and Turkey. In the early period the returns are low in all three countries: about 5% in Egypt and 7% in Iran and Turkey. Whereas in Egypt they remain about the same in the 1990s and through to 2006, they rise over time in Turkey, and in Iran they rise from 1987 to 2001 but fall back in 2006. In 2006, Egypt's rate of return is estimated at 5.3% per year of schooling, Iran's is 8.1%, and Turkey's (in 2002) is much higher, at 11.6%.⁴

Estimates for returns to experience do not change in different versions of the Mincer equation, so we discuss them in the context of the standard Mincer equation and will not repeat it for other versions of the model. Figure 6 shows the effect of experience on log wages using the estimated coefficients in Table 7. We evaluate log wages at zero schooling level because we want to focus on the effect of experience on wages only.

Returns to experience follow a common pattern for most samples, except for Iran in 1987, when they rise sharply until 30 years of experience and then fall. The marginal returns to each year of experience begin very high, at 20%, and decline to zero by about experience of 28 years, after which they turn negative. This unusual pattern may reflect the revolutionary and war economy of Iran in the 1980s, when private sector was in full retreat and public sector pay scales dominated the wage distribution. Public sector wages rise with experience without regard to productivity, so the decrease in the effect of experience that we observe over time in Iran may be attributed to the rise of private sector.

In a similar vein, the decline in returns to experience in the later period in Iran can be attributed to the rise of private employment relative to public during the period under consideration (see Table 1). In fact, a similar story can be also told for Egypt, where returns to experience have also declined since the 1980s while public sector has lost its prominence. By contrast, returns have increased in Turkey since 1988. It is difficult to ascertain from the data we have what accounts for this pattern of change. However, it is worth noting that in Turkey the proportion of public sector workers in the sample has been rising, contrary to the trend in Egypt and Iran (Table 1).

Differences in the experience profiles between the public and private sectors are depicted in Figures 7 and 8. The drawback of this exercise is that we do not correct for selection into public and private sectors, because of a lack of credible instruments, so these graphs should be viewed as summaries of wage-experience profiles holding education constant in the two sectors.

In general, decline in the value of experience can be a good thing if skills rather bureaucratic promotion based on age determine compensation, but it could also be a bad sign if experience is a good proxy for skills it is trumped by diplomas. Again, the data does not allow us to distinguish between these possibilities, but the decline in returns to experience in Egypt and Iran since the 1980s may well be the result of more competitive labor markets.

7.2 Non-linearity

The standard Mincer equation assumes that each year of schooling has the same value as another. While in most studies of returns to education this assumption appears to have empirical support, non-linear returns are also frequently observed, even for advanced economies (Trostel, 2005).

Below we relax the linearity assumption in two ways, first by including the quadratic terms for schooling, which deals with the first type of non-linearity, and later by using schooling

⁴ The coefficient of schooling is the same as the rate of return if the only cost of investing in education is the opportunity cost of the individual's time. This is generally true for all countries up to high school, as free public education is available to all, but at the university level a large percentage of Iranian and Turkish students pays high private tuition.

levels instead of years of schooling, which deals with the second type. To test for non-linearity in our samples, we modify equation 1 by adding a quadratic terms for years of schooling:

$$\ln W_i = \alpha + \beta_1 S_i + \beta_2 S_i^2 + \gamma_1 E_i + \gamma_2 E_i^2 + \varepsilon_i \quad (2)$$

The results in Table 8 show considerable non-linearity. The coefficient of S^2 is positive for all countries and all periods, indicating that the returns to education increase with schooling. This is not unusual, though a simple application of diminishing returns would suggest that returns should decrease.

Figure 9 depicts the effect of years of schooling on log wages using the estimated coefficients in Table 8. First, note that all profiles are convex, showing increasing returns to years of schooling. Increasing returns to human capital at the individual level is not surprising, as returns to later years of schooling may include the accumulated benefits of earlier years. On the other hand, as noted earlier, the observed non-linearity may be capturing administrative wage setting which emphasizes university education.

7.3 Education Levels

Our next formulation of the equation for returns to schooling is to use levels of education instead of years of schooling. This is motivated by the conjecture of strong sheepskin effect one would expect from public sector wage schemes, as well as previous empirical work (Assaad 1997; El-Hamidi 2006).

We divide schooling levels into four: less than upper secondary, upper secondary, tertiary. The reason for combining lower levels into one category is twofold: First, from previous regressions on years of schooling (Figure 9) and level regressions with extended levels we learn that returns at lower levels are relatively linear. Second, our focus of interest is on returns to upper secondary and tertiary education, where major shifts in supply have taken place and which have been most affected by reform of how skills are rewarded. Our estimated equation for levels is:

$$\ln W_i = \alpha + \sum_j \beta_j L_{ij} + \gamma_1 E_i + \gamma_2 E_i^2 + \varepsilon_i \quad (3)$$

where L_{ij} is the dummy variable for the level of education of individual i and $j = 0, \dots, 4$. The lowest education level, less than primary or (illiterate and read and write) is the reference category. Table 9 shows the estimation results for our six samples as well as the marginal returns for tertiary relative to general and vocational upper secondary levels. Education levels are basic education (less than upper secondary), general upper secondary, vocational upper secondary, and tertiary. We combine two-year post-secondary programs with tertiary because we could not get obtain comparable data for the separate categories for all three countries. Returns to basic education (primary plus lower secondary, first row of Table 9) are highest in Turkey (45% relative to less than primary in 2002) followed by Iran (14.% in 2006) and Egypt (8.6% in 2006). Returns have generally increased in all three countries since the 1980s: In Turkey they have increased during each sub-period, whereas in Egypt and Iran they rose during the first to the second period and then fell.

Upper secondary education, where enrollments have risen the fastest during this period, has about a 34% premium over basic education in Egypt, 42% in Iran and 52% in Turkey (see the marginal effects in Table 9). The pattern of change over time in this marginal effect has been divergent in these countries. In Egypt the premium has stayed the same over time, in Iran it has declined, and in Turkey it has increased.

The levels regressions allow a separate category for vocational training at the upper secondary level. In several cases –Iran 2006, Egypt all periods, and Turkey 1988–returns to vocational training were lower (though not significantly in Turkey) than general secondary. These results are consistent with what others have reported for Egypt (Assaad 1997; El-Hamidi 2006), and for other developing countries (Psacharopoulos 1994; Psacharopoulos and Patrinos 2004). Our estimates of returns to general and vocational upper secondary in Turkey for 1994 and 2002 are almost exactly the same. But, Tansel (2002), using a different (expenditure) survey for 1994 and a different estimation strategy finds that returns to vocational training were actually higher. She uses multinomial logit with selection, though she does not have any identifying restrictions and relies on functional form. Thus the divergence between her results and ours are not surprising given the differences in data and selection.

In interpreting the result for Egypt it should be remembered that there are not many students with terminal general upper secondary degrees because most students who are not sent to the vocational track make it to university. As a result, the more appropriate comparison should be with tertiary and post-secondary technical education rather than general upper secondary.⁵ Lower returns in Egypt in the 1990s are blamed on over-supply of vocationally trained workers by a factor of 5-7 Heyneman and Gill (1997). Another problem is the perception that the vocational system “is reserved for those who consider themselves as having ‘failed already’ Heyneman and Gill (1997).

The change in vocational returns relative to upper secondary in Iran, for which the estimates are reported here for the first time, is of interest because of the implementation of the tracking system during the 1990s. The question is whether forcing about one-half of students at grade 9 to switch to vocational branches may have affected returns for this group. One would expect when enrollment in vocational is not voluntary that the mix of students in vocational schools changes, perhaps shift away from those with a genuine interest in such skills and in the direction of dropouts. In fact, about one half of those who enroll in these tracks do not graduate (Salehi-Isfahani and Egel 2007). This may have also affected negatively the reputation of the vocational graduates as a whole as they are now known as those who failed to qualify for the academic track. The reversal of fortunes for vocational graduates from a position of advantage in the first two periods, to disadvantage in 2006, may well be saying something about this change in Iran’s educational system.

The other major change in education is the growth of tertiary education in all three countries. Overall returns to tertiary are highest in Turkey, where in 2002 the college premium was 75%, followed by Iran and Egypt at 51% and 30%, respectively, in 2006. But the relevant marginal returns for Egypt are those relative to vocational because most general upper secondary graduates end up in university. Still, the tertiary premium relative to vocational training is lowest in Egypt: 44% (2006) compared to 62% in Iran (2006) and 75% in Turkey (2002).

How has the expansion of tertiary education affected returns to tertiary relative to upper secondary? In Egypt, the marginal returns for tertiary dropped during 1988-1998, but increased in 2006. In Iran, where the expansion of tertiary education has been the fastest, marginal returns dropped continuously, though not by much, from 56% college premium to 51%. In Turkey, tertiary returns relative to high school have increased, implying that the expansion was met with increase in demand. Along with other results we have seen earlier, the Turkish experience appears to reflect the more globalized nature of its economy.

⁵ We combine the technical institute graduates with tertiary because we lack similar data for the other two countries.

7.4 Public and Private Returns

An important question for the Middle Eastern labor market, one that we have stressed here and also received attention in the literature, is the role of public sector employment in setting the rewards for education. Previous studies have used the Mincer equation to capture the differential reward structure in the two sectors by modeling the choice of sector (Assaad 1997; Tansel 2005). These studies attempt to model selection into each sector, which is in general preferable to running separate regression for public and private sector workers. But, as noted earlier, the problem with such selection models is their identification. Since the estimation results from selection models are usually very sensitive to the validity of the exclusion restrictions assumed in the selection equation (Vella 1999), and we do not have the right instruments for identification of sector choice, we prefer to report the results of separate regressions for the public and private sectors. We believe that the simplicity of this approach provides a better basis for comparing returns across countries than one based on selection. Naturally, the results should be interpreted as a summary of how education and experience are rewarded in private and public sectors. We cannot tell if the observed reward structure is reflecting the productivity of education and experience in the two sectors or if it reflects how these sectors select based on unobserved productive characteristics. To the extent that that individuals and families ignore the selection mechanisms of these sectors in their investment decisions, this is the relevant data to consider.

When we just put a dummy variable in equation 3 we find that, holding education and experience constant, average returns have generally increased for public sector employees, which is not what we expected based on the trend for liberalization. In Egypt, the dummy variable is negative and significant for 1988 and 1998, indicating on average lower pay for public sector employees of about 30.6% and 23.1%, and near zero in 2006. In Iran, the private sector premium is 34.3% in 1987, but it changes to public sector premiums of 15.0% and 8.8% in 2001 and 2006. In Turkey, private sector premiums of 34.8% and 23.9% in 1988 and 1994 turned to a public sector advantage of 55.1%. This is a large shift in favor of public sector workers, which is also evident from average wages in Table 4, but raises more questions than it answers. One question is if the difference between the two sectors may not be more in the returns to specific levels rather than just for the average.

To check for differences in returns we run separate regressions, and present the marginal returns in Table 11. These results reveal some big changes in the compensation schemes of private and public sector in the three countries. In Egypt, the value of general upper secondary is lower in private sector than public sector and falling.

In Iran, the most interesting point that emerges is the reversal of the roles of public and private sectors as the sector with the highest reward for tertiary graduates. In 1987 and 2001, the premium for tertiary diplomas relative to upper secondary in the public sector was 57.8% and from 52.3%, falling to 41.0% in 2006, while in the private sector the tertiary premium rose from 38.1% to 59.6% during 2001-06. In 2006, the average university graduate earned 18.6% more in private than public sector. This is consistent with the increasing influence and sophistication of the private sector in recent years in Iran. This is especially interesting because during this period Iran experiences a large increase in the supply of college graduates, as evidenced by the doubling of their share in the 20-54 years-old male wage earners, from 6.10% in 2001 to 12.8% in 2006 (see Table 1). During the same period upper secondary share remained constant at about 19%. There is further evidence of divergence in payment schemes of public and private sectors for vocational graduates. While they enjoy a premium in the private sector in all periods, in the public sector their premium goes from negative 14.4% to a positive 37.7%. Relative to basic education, upper secondary graduates enjoy a higher premium in the public than private sector, though the former has sharply

declined, from about 70.5% in 1987 to 40.0% in 2006 (still higher than the private sector private premium of 29.2%).

In Turkey, the pattern of change in the premium for upper secondary relative to basic education is the same as Iran, showing a decline in the public sector, but, unlike in Iran, the premium is higher in the private relative to the public sector. The marginal returns to tertiary education have increased in the private sector, but not the public sector. The premium for tertiary graduates relative to upper secondary is not only much larger in the private sector, they have also increased (from 62.2% in 1994 to 85.8% in 2002), while they have declined in the public sector (from 52.3% to 42.2%). These observations are consistent with the fact that labor markets have become more competitive in Turkey over time.

7.5 Unemployment

Families and individuals presumably base their investment decisions not just on the average rewards but also on the probability of finding a job. Most studies of returns to education do not concern themselves with this aspect of returns to education, because implicitly they assume that everyone gets a job. But in developing countries, education not only increases pay it also affects the probability of getting a job. Assaad (1997) carefully models queuing time for public and private jobs in the choice of sector. We take a simpler approach to accounting for employment probability in the Mincer returns.

As Table 12 shows, unemployment rates by education differ over time and across countries. Unemployment rates for tertiary educated workers have increased over time in all three countries. In Egypt, unemployment rates for other less educated groups have actually declined, indicating a lower expected premium for university graduates than might appear in the simple Mincer returns. In Iran, tertiary and vocational unemployment rates have increased over time, and in Turkey all categories have higher rates. Given this diversity of unemployment experience, it is important to take them into account in interpreting how rewards to education vary across countries and over time.

To further simplify the calculation of the expected returns, we assume that the unemployment rates in Table 12, which pertain to ages 20-54, represent closely how individuals discount average rewards. Of course, unemployment rates vary across the life cycle and individuals may heavily discount unemployment rates associated with a particular education level that occurs later in their careers or not consider them as good predictions of what unemployment would be in future when they reach older ages. We believe that as estimates of the average length of time a person with given education might expect to be without a job, these rates serve well the purpose of discounting estimated average rewards in Table 9.

To incorporate the variation in probability of being unemployed at each level of education, we multiply each wage by its relevant unemployment rate to obtain the expected wage, which we then use in the Mincer regressions. The estimates of the marginal expected returns obtained in this way are presented in Table 13. The results are not substantively different from the base case (Table 9).

For Egypt, the main question is: Does the rising unemployment among tertiary graduates (Table 12) relative to other groups erase the rising trend in the college premium? The answer is: it has for the most part. The premium for tertiary relative to vocational (the more relevant comparison) now appears as relatively constant over time: 38% in 1988 and 1998, up to 39% in 2006. For upper secondary, the premium still shows a sharp increase, but doubling instead of trebling.

For Turkey, where unemployment rates have increased for all groups, the relative margins have remained fairly similar to the simple Mincer case.

7.6 *Schooling Quality*

Schooling quality is an obvious determinant of earnings (Card and Krueger 1992; Bedi A.S. 2002). Omitting school quality can result in overestimation of the effect of schooling on wages if years of schooling and quality of schooling are positively correlated. This can happen if neighborhood preference for schooling means that schools are of higher quality. In this case individuals with more schooling would also have enjoyed higher quality schooling. Since we have already narrowed our comparative samples to urban workers, we have implicitly controlled for the largest variation in school quality that arises between rural and urban areas. However, as a sensitivity check, it is useful to get an idea if further control of quality might change the estimated results.

Data on schooling quality are not available but we can indirectly control school quality by differencing out any variation within a province or sampling cluster. When school quality matters, we should be estimating this equation:

$$\ln W_i = \alpha + \beta S_i + \gamma_1 E_i + \gamma_2 E_i^2 + \delta Q_j \quad (4)$$

where Q_j is the quality of school for cluster j . If S_i and Q_j are positively correlated, omitting Q_j will result in an overestimate of β . Fixed effects estimation (replace observations by differences from the province or cluster mean), removes Q_j from the right hand side.

We do two types of fixed effect, one that corrects for province level differences in school quality and another for cluster level, which is much smaller. We can do the former for Egypt and Iran for which we have province information, and the latter for Iran for 1987 and 2001, when we have cluster information. It should be noted that this techniques does not just remove the differences in school quality but all differences across province and cluster. The results are presented in Tables 14 for province level correction for Egypt and Iran and 15, for cluster level correction for Iran. While some education coefficients change by more than two standard deviations (experience coefficients remain the same), the patterns are the same as in Table 9. These results suggest that differences across provinces, among them school quality do not explain the variation in the estimated returns to schooling.

But the variation in school quality may come from within provinces. To check for this, we compare cluster fixed effect results for Iran in Table 15. There are indications here that school quality—or other cluster characteristics not captured by schooling and experience—do matter. In particular, the most important signal for Iranian youth, the college premium, appears to have fallen much more sharply during 1987-2001 than we thought previously based on estimates in Table 9. According to the fixed-effects results, the marginal return for tertiary relative to upper secondary declined from 70% to 46% during this period, compared to 56% to 52% estimated earlier. Also, the gap between the returns to upper secondary relative to vocations, which we earlier estimated at -12% and -22.% in 1987 and 2001, now appear to be -17% and -18%, respectively, which does not show as large a drop for upper secondary as before.

7.7 *Returns to Education for Women*

One of the most important changes in Middle Eastern countries is the great rush to university education of women. In several countries, notably Iran, women outnumber men in universities. Yet labor force participation of women, even among the university educated is low relative to men. So, the question arises if the attraction of university education is high enough to explain the rise in university education by women, or if the returns to their education are perhaps realized elsewhere, say, in the marriage market. So, as in the case of men, we are interested in a comparative perspective on women's return to education because

the variation across countries and over time may reveal the connection between labor markets and the rewards to education.

Comparison of the structure of rewards for education in the three countries is more complicated for women than men. Men in these countries have similar rates of participation in the labor force that have also stayed relatively constant over time, which is not true for women. But, as in other countries with rising education and declining fertility, the participation of women in market work in general and wage work in particular has changed over time. Participation rates have increased in all three countries since the 1980s, but at different rates. Iran's female participation rate has nearly doubled during 1987-2006 (see panel (b) in Table 2, from 11.4% to 21.2%, whereas in Egypt it increased from 45.8% to 50.0% (1988-2006). Differences in participation rates suggest the possibility that female wage workers in different samples may differ in ability and other characteristics that matter in the labor market.

As a result, in estimating returns to schooling of women correcting for selection is important. Unfortunately, the difficulty of credible instruments that help identify the selection equation persists. The instrument that is readily available in all our samples is the number of small children, which can be reasonably said to affect participation but not the wage. The choice of this instrument is not without drawback, however, because the decisions to have small children and to engage in market work are not independent of each other.

We report the results for all three countries without selection in Table 16 and then with selection for Egypt and Iran (Table 16), as the Turkish samples available to us were restricted to wage and salary workers, which do not allow the estimation of the selection equation. The results with and without selection for Egypt and Iran only differ significantly for the last year, 2006. The estimated marginal return for tertiary relative to upper secondary, which is the key indicator of the incentives for university education, rise for Egyptian women from 19.6% in 1988 to 23.0% in 2006 (in 1994 there is a 14.7% negative college premium). With selection, these premiums drop to 18.9% and 19.8% (the 1998 premium is still negative and large, -17%). In Iran, the estimates of the college premium based on the simple Mincer estimates shows a sharp increase from 27.0% in 1987 to 47.4% in 2001 and 63.9% in 2006. The selectivity corrected premiums are lower: 25.9%, 42.7% and 58.4%. In Turkey, where we only have the non-selectivity corrected estimates, the premiums are the highest but have not risen as fast as in Iran: 67.1% in 1988, 71.5% in 1994, and 84.3% in 2002. Most likely, if we had been able to make the adjustment for selection, these returns would have been adjusted downward, but we do not believe that the pattern of change over time in returns to female education would have stayed the same. Specifically, the higher return to tertiary education for women in Turkey relative to Egypt and Iran would remain.

The main findings from this comparative estimation is that: (a) rewards to women's education are high, as has been noted previously (reference), (b) rewards have increased over time, and (c) the selection correction reduces the estimates, implying that more able women participate in the market.

8. Conclusion

This study has provided a comparative perspective on returns to schooling across three countries and over time using a uniform methodology. The consistency of methodology and data allows us to appreciate the differences in returns and better understand them. Along with our estimation of returns to schooling we provide a detailed account of the differences in the environment in which these returns are realized. We characterize these environments with the

description of the institutions of education and the labor markets in these countries and how they changed over time.

In education we showed that all countries have very similar structures for levels of education and rely heavily on examinations to sort students into track and levels of education. But they differ in where the selection is strongest. We show that these differences are in part reflected in the Mincer results. All three countries differ in how they select students into general and upper secondary school and vocational training. Egypt applies the strongest filter at grade 9 (age 15), diverting about two-third of the students into the vocational track, while the remainder are college bound. Indeed, most matriculate into the tertiary level. In Iran, such a filter was imposed in the 1990s and in Turkey there has never been a serious effort to prevent students from continuing in the general upper secondary track. In Egypt, the effect of early tracking is that the less able students are sent to the vocational track and, not surprisingly, we found that the estimated returns to schooling for vocational graduates are lower than high school. In Iran, vocational returns were higher before the implementation of tracking and fell in 2006 when the program had had its full effect. In Turkey, there are no differences between general and vocational upper secondary education.

Selection into university education is strong in Iran and Turkey but not in Egypt. In Iran and Turkey, dreaded central university entrance examinations prevent more than half of the hopefuls from continuing onto tertiary education. For those who fail, one would assume that their high school training, tailored to prepare them for higher education, turns out to be of little value in the labor market. In Egypt, the central exams filter out fewer students so there are fewer disappointments. So it is that the estimated college premium is lowest in Egypt, followed by Iran and Turkey. Arguably, these differences are related to how the education systems select students into higher levels. Obviously, education quality and supply and demand for graduates that surely differ between these countries, also influence returns to education and may account for the observed differences.

The interplay of education and labor market institutions is important in accounting for the attraction of diplomas and hence the effectiveness of selection screens. Labor market rigidity raises rewards for diplomas and the signaling value of education. Differences in the labor market institutions are more difficult to ease out from the patterns of observed Mincer returns, but they show up in a few places. One strong result is the non-linearity of returns in years of schooling. We found for all three countries that returns increased with years of schooling. The degree of convexity of returns can be the result of both education and labor market institutions. Strong selection into upper levels of schooling means that more able students end up there and instead of the usual linearity we get a convex structure for returns. Labor market rigidity can also result in the convexity of returns. In rigid labor markets, where diplomas matter more than skills, much of the value of the early years of schooling are realized when higher diplomas are acquired, so for those who do not make it to the higher levels, returns tend to be low.

The most important dimensions of rigidity are the share of the public sector in total employment and the degree of regulation of private employment. Public sector hires mainly based on university diplomas and its pay schemes heavily influence the overall reward structure. We classified the three countries according to this measure into Iran as the least flexible, followed by Egypt and Turkey. All three countries have liberalized their labor markets over the last two decades, with Egypt moving faster and further than Iran in the last few years. Our results show that the degree of convexity is higher in Iran than the other two, as we expect based on the role of the rigidity of its labor markets. However, contrary to expectation, we do not observe a decrease in convexity in any on these countries over time.

We search for further clues in the pattern of compensation for public and private wage earners. Ignoring selection issues, we divide our samples into public and private and estimate separate returns functions for each sector. We begin with the expectation that, where free to choose rewards, private employers pick the more able graduates and pay them higher, so the average premium for, say, tertiary graduates relative to upper secondary would be higher in private relative to public sector. But, in rigid markets, we expect that private-public differential in premiums would be lower or even go the other way. We find some evidence to this effect. In Turkey, in all three years, private tertiary-upper secondary margins are in favor of the private sector. In Egypt, this is only the case in the last period, 2006, after its major labor market reforms in 2003. In Iran, we see the same pattern as in Egypt, presumably showing the effect of liberalization, albeit a more gradual one.

We have stated as the goal of this study to learn from Mincer equation estimates about the role of institutions in determining the rewards structure to education. Admittedly, this is a very ambitious goal and one that is only attainable with good data that allows one to isolate various policy influences on rewards and perform causal analysis. What this study has achieved, if anything, is to provide suggestive evidence that such links exist, thereby justifying the search for better data. One direction for this search is in the quasi experimental direction, looking for changes in policy that can be more closely associated with specific returns to education.

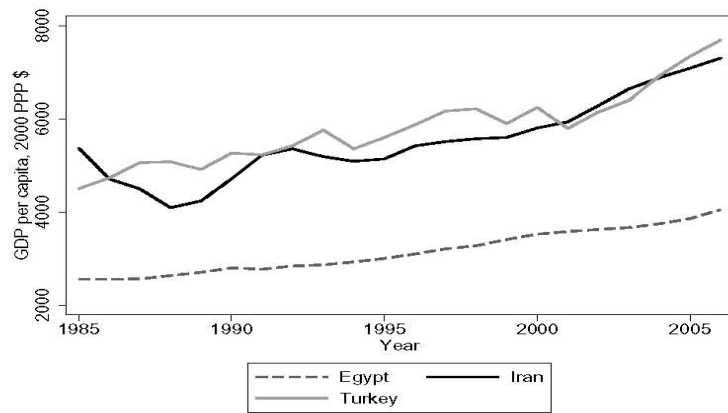
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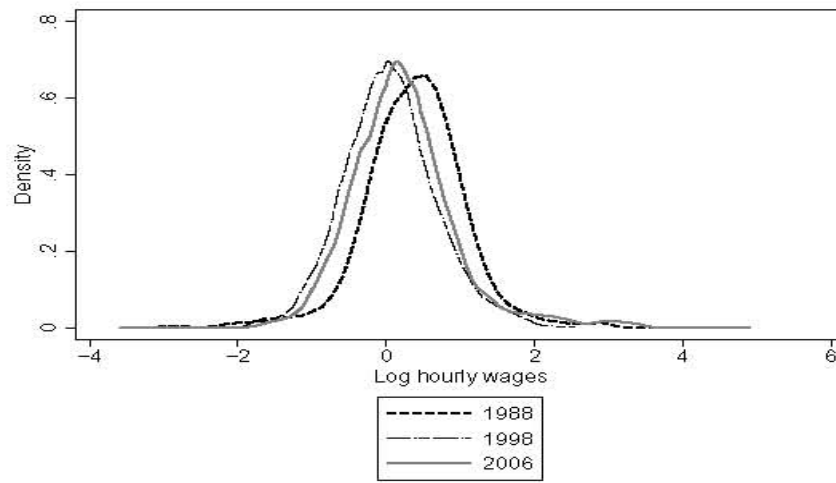
Figure 1: GDP Per Capita in Egypt, Iran and Turkey, 1985-2006



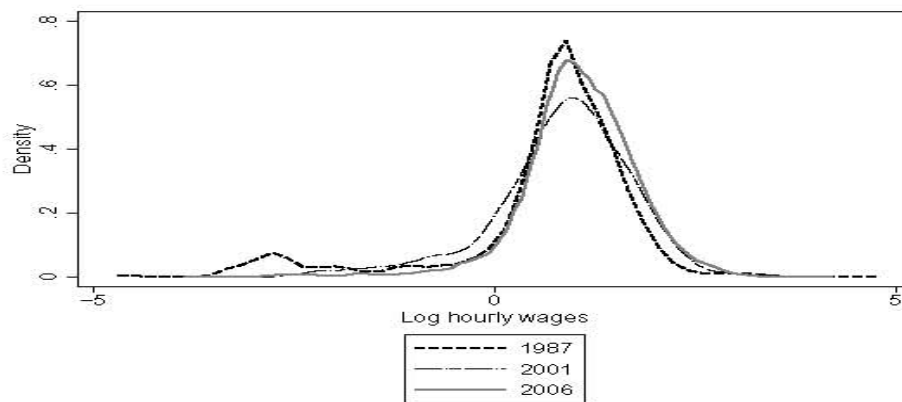
Source: World Bank WDI (2005).

Figure 2: Distributions of Log Hourly Wages

(a) Egypt



(b) Iran



(c) Turkey

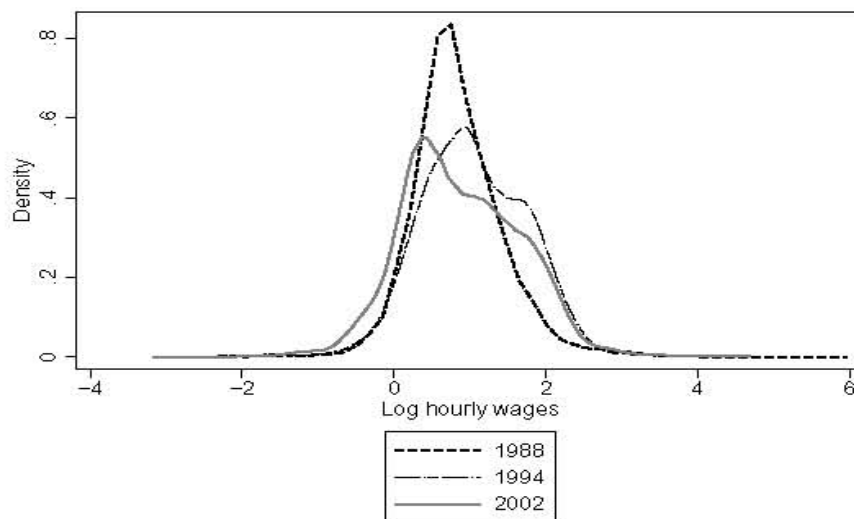


Figure 3: Education System in Egypt

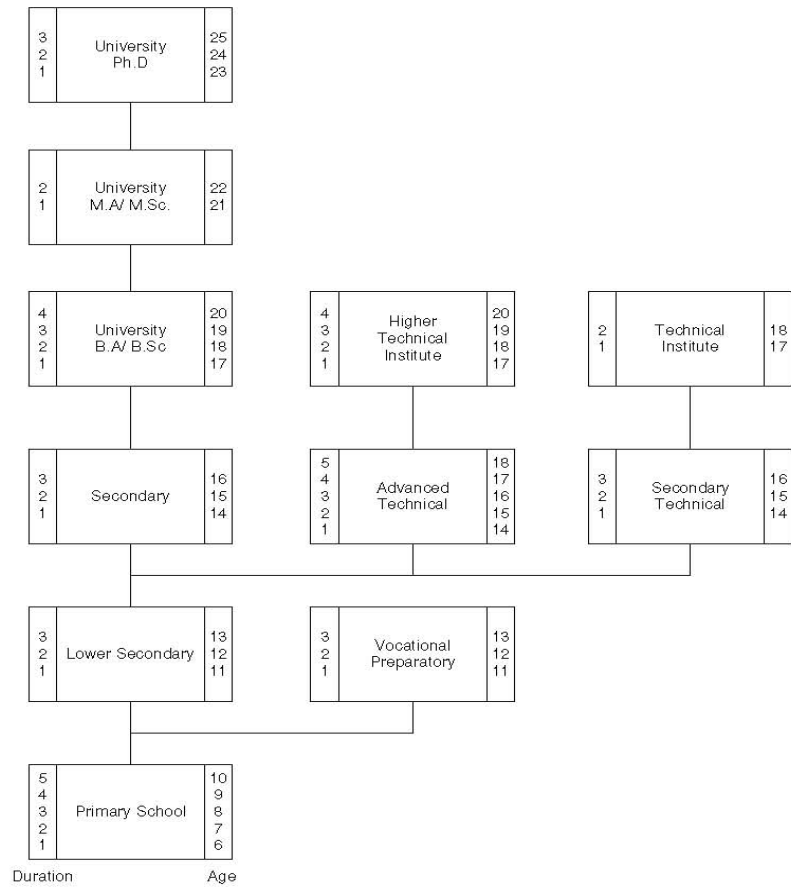


Figure 4: Education System in Iran

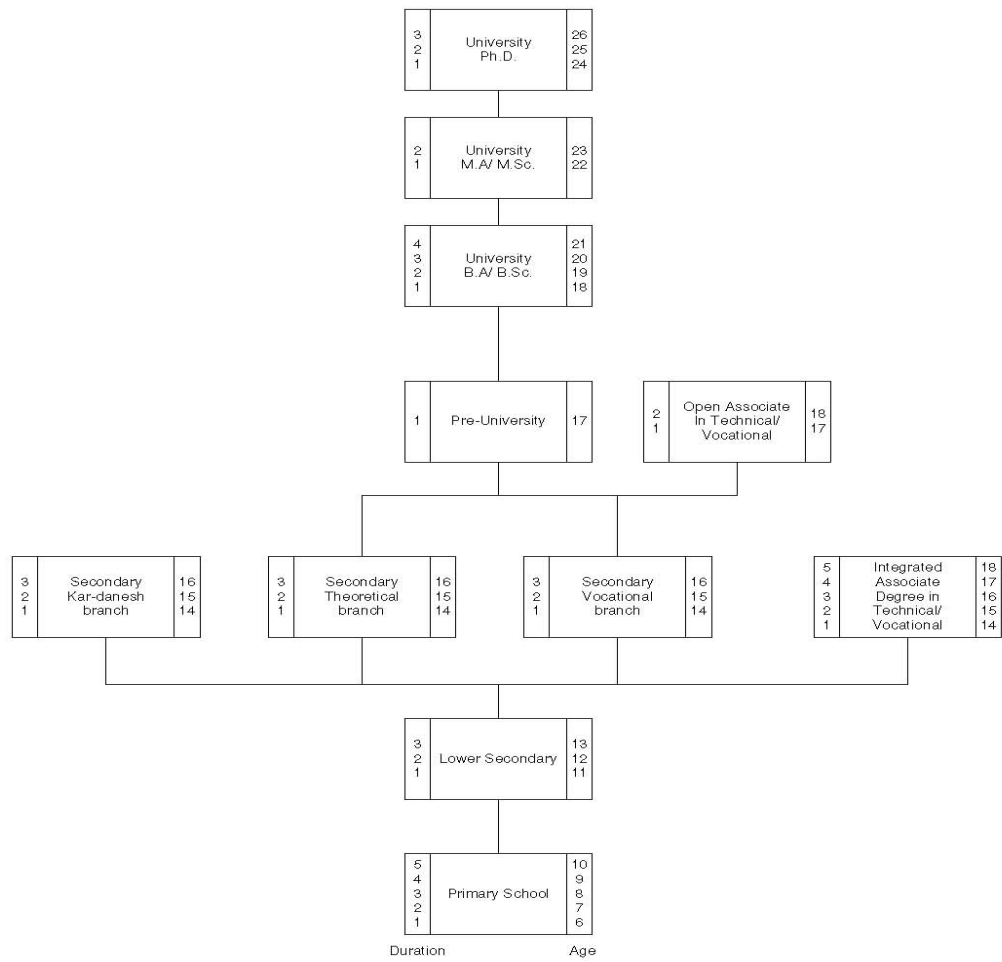


Figure 5: Education System in Turkey

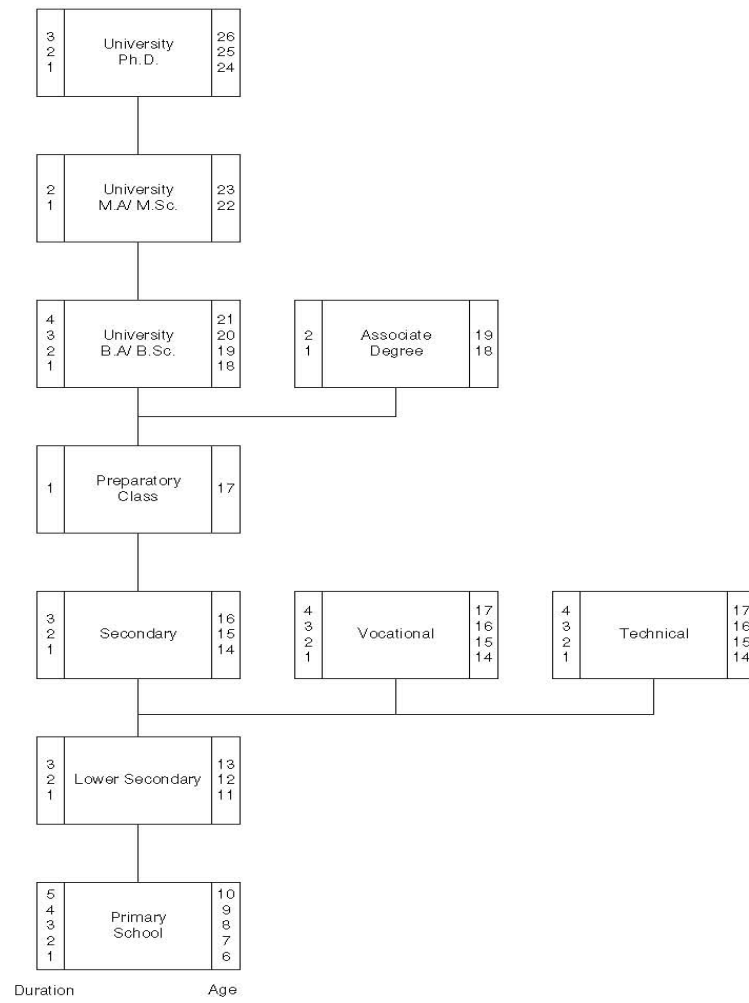
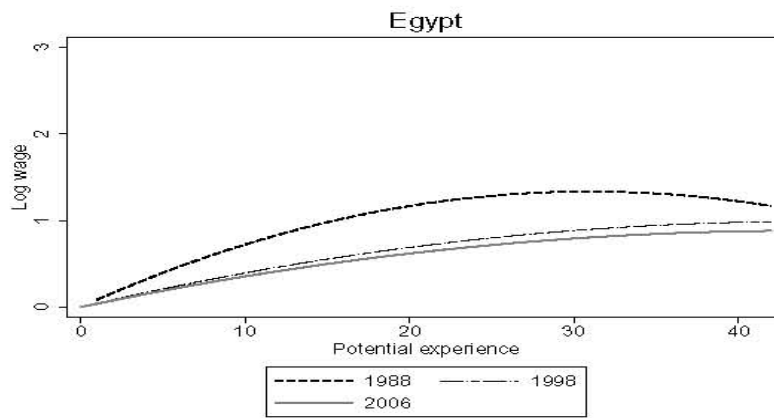
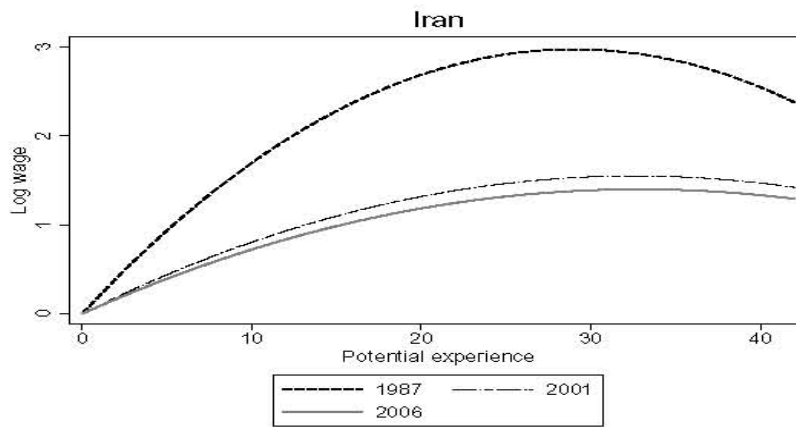


Figure 6: Earning-Experience Profile—Standard Mincer Equation

(a) Egypt



(b) Iran



(c) Turkey

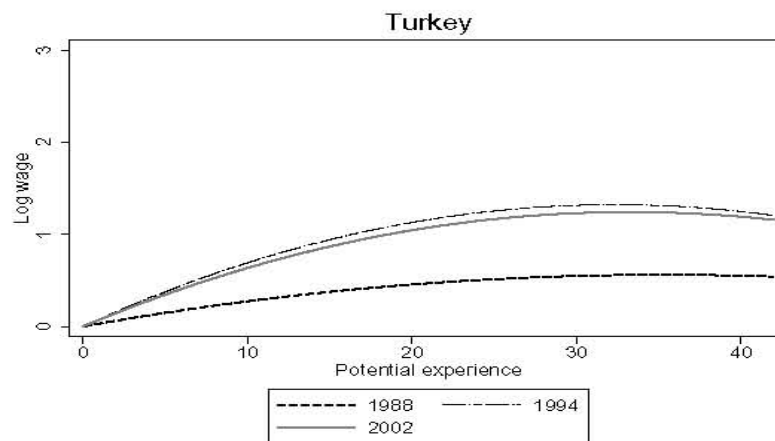
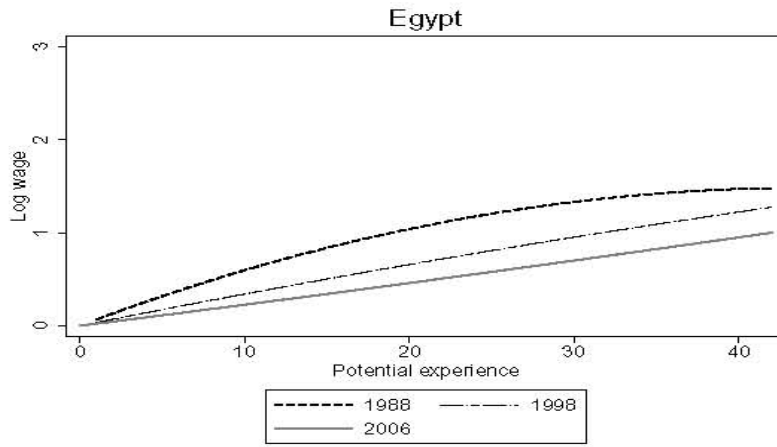
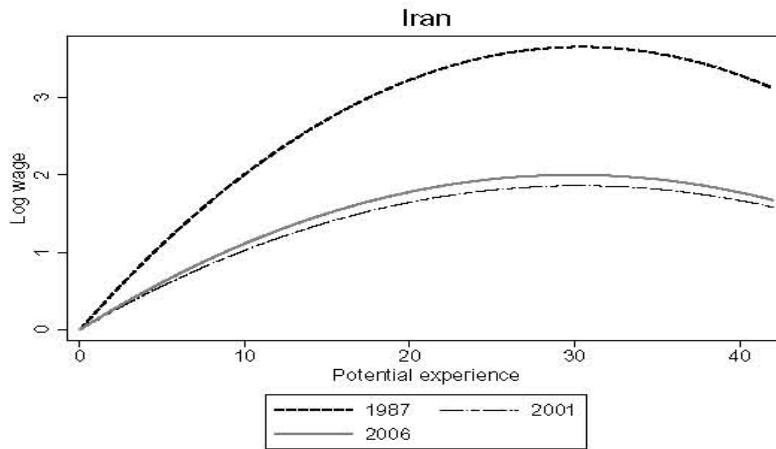


Figure 7: Earning-Experience Profile—Public Sector

(a) Egypt



(b) Iran



(c) Turkey

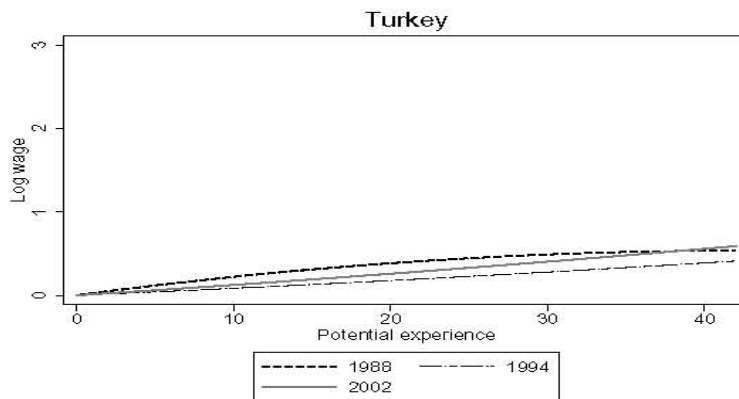
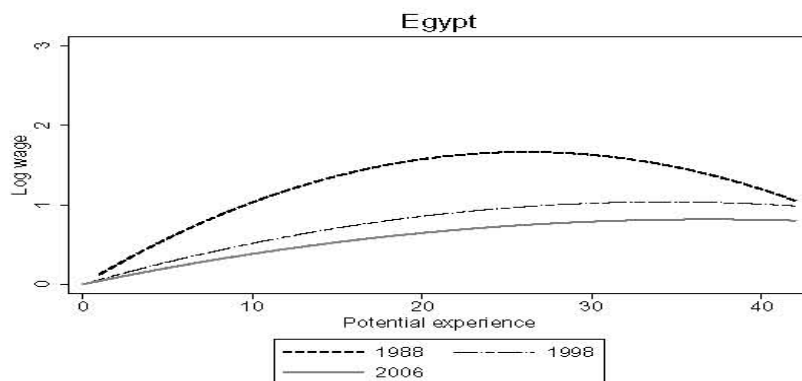
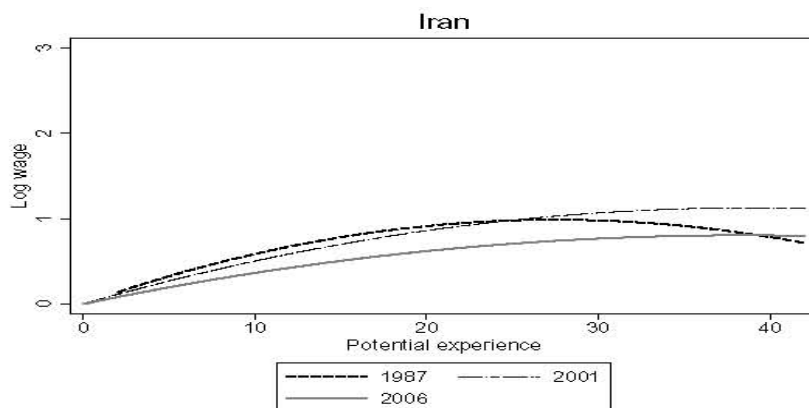


Figure 8: Earning-Experience Profile—Private Sector

(a) Egypt



(b) Iran



(c) Turkey

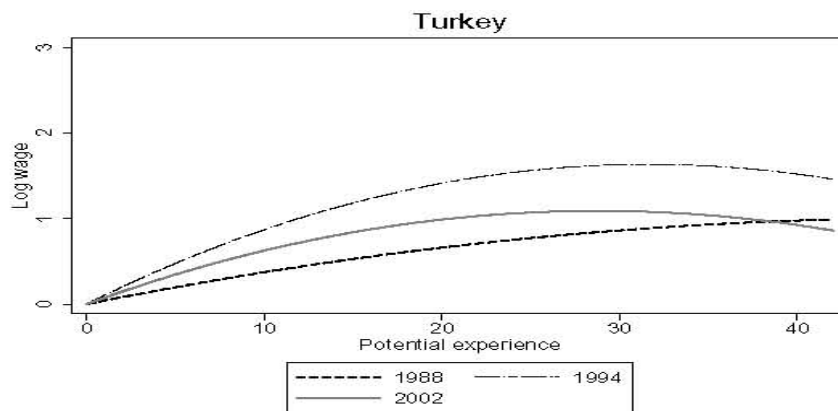
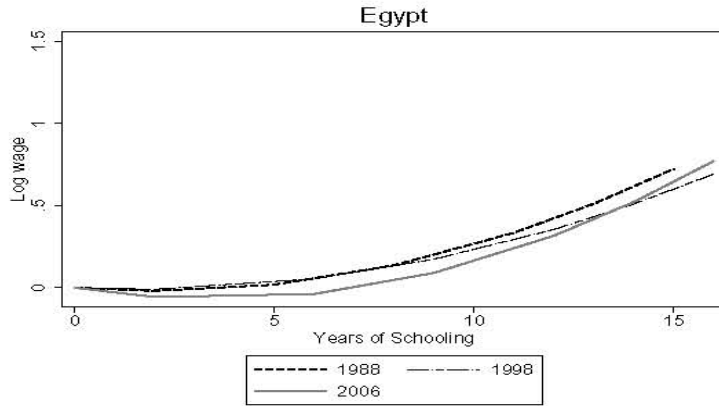


Figure 9: Earning-Schooling Profile—Mincer Equation with Quadratic Schooling

(a) Egypt



(b) Iran



(c) Turkey

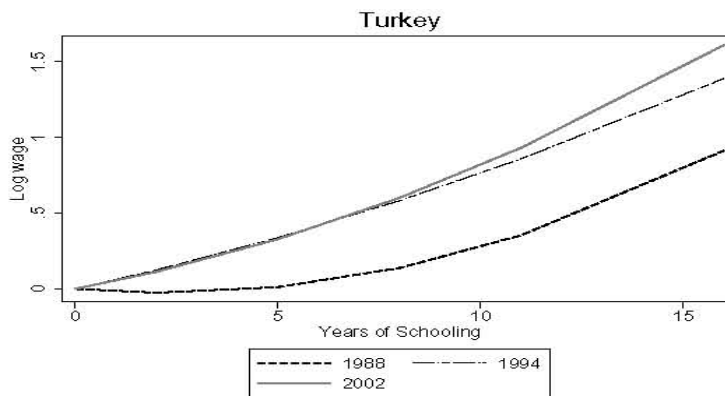


Table 1: Summary Statistics, Urban Male Workers, Aged 20-54

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Age	35.66	36.31	34.93	32.45	34.99	34.47	33.72	34.79	35.30
Average years of schooling	7.96	10.15	10.90	6.49	8.89	9.08	7.00	7.73	8.30
Average years of experience	19.91	19.17	17.30	18.21	19.36	18.65	19.70	20.35	20.41
Mean hourly wage	1.91	1.30	1.92	2.98	3.27	3.65	3.01	3.84	3.56
Median hourly wage	1.49	1.04	1.21	2.42	2.57	2.86	2.19	2.73	2.37
Sd log hourly wage	0.70	0.63	0.75	1.16	0.88	0.80	0.62	0.71	0.82
Public sector	63.23	55.19	43.89	66.71	49.00	35.07	22.37	19.43	27.93
No of observations	1,629	2,041	2,949	1,556	2,132	7,408	7,755	10,782	4,687
Education levels (percent)									
Illiterate	17.56	10.93	9.05	17.29	4.69	5.88	4.82	1.97	1.35
Read & Write	16.51	8.33	4.92	11.44	6.47	4.28	5.36	2.30	2.15
Primary	7.73	11.46	9.87	25.64	20.40	22.16	53.22	50.72	44.45
Lower secondary	6.32	6.81	5.56	15.17	19.47	19.66	10.25	12.61	13.35
Upper secondary	2.52	1.18	0.92	19.41	18.95	19.06	9.65	16.87	16.47
Vocational high school	20.38	26.90	34.99	7.65	20.12	9.90	6.46	4.02	8.07
Post secondary	6.45	9.41	7.39	1.35	3.80	6.30	0.00	0.00	0.00
Tertiary	22.53	24.99	27.30	2.06	6.10	12.76	10.24	11.52	14.15
Average hourly wage									
Illiterate	1.46	0.99	1.31	2.61	2.35	2.40	2.46	2.12	2.12
Read & Write	1.60	1.07	1.44	2.75	2.23	2.93	2.48	2.76	1.68
Primary	1.61	1.11	1.29	2.69	2.39	2.93	2.68	3.07	2.48
Lower secondary	1.38	1.13	1.31	2.53	2.47	2.73	2.75	3.56	3.26
Upper secondary	2.27	1.60	1.83	3.33	3.45	3.83	2.98	4.08	3.73
Vocational high school	1.72	1.11	1.55	3.96	4.40	2.84	3.08	4.49	3.75
Post secondary	1.92	1.28	2.06	4.55	4.65	4.75	-	-	-
Tertiary	2.86	1.85	3.02	6.23	5.51	6.96	5.53	7.44	7.38

Source: Egypt Labor Market Surveys 1988, 1998, 2006; Iran Social Economic Characteristics of Households 1987, 2001, and Household Expenditure and Income Survey 2006; Turkey Labor Force Surveys 1988, 1994 and 2002.

Table 2: Participation Rates (percent)

(a). Labor force participation, ages 15-64									
	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Female	29.00	20.30	21.60	21.60	34.50	41.90	36.10	33.10	29.40
Male	77.90	74.00	77.20	82.90	75.50	75.70	85.50	82.40	75.20
Total	53.50	47.20	49.40	53.10	55.20	59.00	61.10	58.10	52.60

Source: World Bank WDI database

(b). Labor force participation, ages 20-54									
	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Male	83.77	84.93	89.05	94.39	92.3	90.84	-	-	-
Female	45.75	49.25	50.01	11.4	24.97	21.15	-	-	-
Total	64.34	66.97	69.53	52.6	58.36	55.8	-	-	-

Source: Author's calculation

(c). Wage-labor participation, ages 20-54									
	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Male	49.66	60.37	59.05	48.33	46.15	45.92	82.88	85.05	-
Female	14.07	17.76	16.17	5.40	7.98	7.88	12.83	17.66	-
Total	31.47	38.92	37.61	26.71	26.91	26.80	48.04	49.96	-

Source: Author's calculation

Table 3: The Distribution of Public and Private Employees by Education (percent)

Egypt									
	1988			1998			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	31.04	9.85	17.64	18.44	4.90	10.97	13.01	4.11	9.12
Read & Write	19.30	14.83	16.47	10.87	6.33	8.36	6.23	3.42	5.00
Primary	9.06	7.02	7.77	15.81	8.02	11.51	13.32	5.51	9.90
Lower secondary	6.54	6.15	6.29	8.45	5.53	6.84	6.48	4.43	5.58
Upper secondary	2.01	2.83	2.53	1.21	1.16	1.18	1.09	0.70	0.92
Vocational high school	15.94	22.73	20.23	25.69	27.63	26.76	35.65	33.93	34.90
Post secondary	4.19	7.80	6.48	5.16	12.92	9.44	5.45	9.78	7.35
Tertiary	11.91	28.78	22.58	14.38	33.51	24.94	18.77	38.12	27.24
Total	100	100	100	100	100	100	100	100	100

Iran									
	1987			2001			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	33.59	9.15	17.29	7.18	1.94	4.61	8.36	1.30	5.88
Read & Write	14.29	10.02	11.44	9.79	3.01	6.47	6.02	1.07	4.28
Primary	25.29	25.82	25.64	28.64	11.46	20.22	27.74	11.82	22.16
Lower secondary	9.85	17.82	15.17	22.85	16.41	19.70	24.01	11.60	19.66
Upper secondary	11.78	23.22	19.41	14.74	22.91	18.74	16.56	23.69	19.06
Vocational high school	4.83	9.06	7.65	13.15	27.57	20.22	9.82	10.06	9.90
Post secondary		2.02	1.35	1.12	6.70	3.85	2.22	13.85	6.30
Tertiary	0.39	2.89	2.06	2.52	10.00	6.18	5.27	26.61	12.76
Total	100	100	100	100	100	100	100	100	100

Turkey									
	1988			1994			2002		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	5.97	0.84	4.82	2.37	0.28	1.97	1.80	0.20	1.35
Read & Write	6.52	1.31	5.36	2.82	0.11	2.30	2.91	0.20	2.15
Primary	60.83	26.84	53.22	60.32	10.87	50.72	52.80	22.91	44.45
Lower secondary	9.41	13.16	10.25	12.11	14.70	12.61	12.83	14.72	13.35
Upper secondary	7.92	15.66	9.65	13.32	31.58	16.87	14.67	21.11	16.47
Vocational high school	4.86	11.99	6.46	3.69	5.40	4.02	7.89	8.52	8.07
Tertiary	4.48	30.20	10.24	5.36	37.06	11.52	7.11	32.34	14.15
Total	100	100	100	100	100	100	100	100	100

Table 4: Average Wage by Sector and Education Level, PPP 2000

Egypt									
	1988			1998			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	1.54	1.31	1.46	1.06	0.79	0.99	1.17	2.29	1.39
Read & Write	1.77	1.48	1.60	1.12	1.00	1.07	1.43	1.44	1.43
Primary	1.82	1.45	1.61	1.20	0.97	1.11	1.24	1.49	1.30
Lower secondary	1.43	1.36	1.38	1.28	0.95	1.13	1.18	1.54	1.31
Upper secondary	2.48	2.18	2.27	1.62	1.58	1.60	1.48	2.52	1.83
Vocational high school	1.90	1.65	1.72	0.98	1.21	1.11	1.40	1.76	1.55
Post secondary	2.37	1.78	1.92	1.20	1.31	1.28	1.32	2.61	2.07
Tertiary	3.44	2.72	2.86	1.97	1.82	1.86	2.88	3.11	3.02
Total	1.94	1.89	1.91	1.23	1.36	1.30	1.61	2.35	1.93

Iran									
	1987			2001			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	2.57	2.69	2.61	2.05	3.75	2.40	2.33	3.26	2.40
Read & Write	2.54	2.66	2.60	2.10	2.79	2.26	2.65	3.79	2.77
Primary	2.89	2.68	2.75	2.11	2.91	2.33	2.57	4.59	2.98
Lower secondary	2.74	2.47	2.53	2.09	2.95	2.44	2.48	3.64	2.71
Upper secondary	2.78	3.47	3.33	2.95	3.89	3.51	3.10	4.77	3.83
Vocational high school	3.15	4.17	3.96	4.19	4.52	4.41	2.59	3.30	2.84
Post secondary	-	4.55	4.55	1.84	5.14	4.65	3.11	5.23	4.75
Tertiary	4.00	6.37	6.23	4.56	5.76	5.51	6.96	6.96	6.96
Total	2.72	3.11	2.98	2.56	4.03	3.28	2.87	5.09	3.65

Turkey									
	1988			1994			2002		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	2.46	2.48	2.46	2.09	3.33	2.12	2.07	3.38	2.12
Read & Write	2.49	2.24	2.48	2.76	2.77	2.76	1.64	3.09	1.68
Primary	2.76	2.04	2.68	3.04	3.93	3.07	2.15	4.42	2.48
Lower secondary	2.83	2.56	2.75	3.66	3.22	3.56	2.56	4.85	3.26
Upper secondary	3.08	2.82	2.98	4.21	3.86	4.08	3.10	4.85	3.73
Vocational high school	2.98	3.22	3.08	4.6	4.18	4.49	3.20	5.06	3.75
Post secondary	-	-	-	-	-	-	-	-	-
Tertiary	6.25	5.15	5.53	9.26	6.35	7.44	7.47	7.34	7.38
Total	2.92	3.32	3.01	3.63	4.71	3.84	2.79	5.57	3.56

Table 5: Standard Deviations for Real Hourly Wages by Education Level

Egypt									
	1988			1998			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	0.92	1.72	1.26	0.69	0.40	0.64	1.60	5.29	2.77
Read & Write	0.93	1.46	1.26	0.52	0.63	0.57	2.01	1.26	1.81
Primary	0.80	0.63	0.73	0.54	0.62	0.58	1.10	1.84	1.32
Lower secondary	0.73	0.61	0.66	1.29	0.53	1.03	0.65	2.45	1.54
Upper secondary	3.02	1.16	1.86	0.90	1.17	1.03	1.20	2.62	1.82
Vocational high school	3.84	1.13	2.27	0.64	0.82	0.75	2.46	2.07	2.31
Post secondary	3.93	1.28	2.21	0.92	0.93	0.93	0.75	6.63	5.12
Tertiary	4.28	2.24	2.76	1.90	1.28	1.47	5.75	7.32	6.75
Total	2.48	1.69	2.02	1.04	1.03	1.04	3.09	5.31	4.22

Iran									
	1987			2001			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	2.13	2.45	2.24	1.61	5.60	2.95	1.12	1.00	1.14
Read & Write	1.47	1.86	1.68	2.42	1.31	2.23	2.34	2.82	2.42
Primary	2.94	3.17	3.10	1.92	1.49	1.85	1.88	2.93	2.28
Lower secondary	2.35	2.15	2.19	1.68	2.05	1.89	1.47	2.05	1.66
Upper secondary	1.93	6.83	6.16	3.12	2.88	3.01	1.96	2.60	2.41
Vocational high school	1.65	7.31	6.55	3.85	2.73	3.15	1.61	3.85	2.66
Post secondary	-	2.50	2.50	0.86	2.61	2.70	1.67	3.01	2.90
Tertiary	0.73	4.07	3.98	1.92	4.09	3.77	7.03	3.82	4.89
Total	2.27	4.61	3.99	2.56	2.91	2.83	2.56	3.39	3.07

Turkey									
	1988			1994			2002		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	2.33	1.63	2.31	1.37	1.11	1.38	3.35	1.29	3.30
Read & Write	1.86	0.81	1.82	2.77	2.63	2.77	1.69	1.28	1.70
Primary	8.21	1.14	7.74	3.01	5.63	3.16	1.97	6.29	3.10
Lower secondary	3.54	2.66	3.31	4.05	2.18	3.71	2.99	4.46	3.66
Upper secondary	3.30	1.60	2.81	3.75	2.16	3.27	4.30	2.74	3.90
Vocational high school	2.42	1.58	2.11	3.11	1.79	2.83	3.15	2.17	3.01
Post secondary	-	-	-	-	-	-	-	-	-
Tertiary	5.03	4.29	4.58	9.37	3.08	6.39	12.25	5.64	8.63
Total	2.33	1.63	2.31	1.37	1.11	1.38	4.41	5.07	4.77

Table 6: The Coefficient of Variation of Log Hourly Wages by Education Level, Urban Men

Egypt									
	1988			1998			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	0.59	1.32	0.86	0.65	0.50	0.65	1.36	2.31	1.99
Read & Write	0.53	0.98	0.78	0.46	0.64	0.53	1.41	0.87	1.27
Primary	0.44	0.44	0.45	0.45	0.65	0.53	0.89	1.23	1.01
Lower secondary	0.51	0.45	0.47	1.00	0.56	0.91	0.55	1.60	1.18
Upper secondary	1.21	0.53	0.82	0.55	0.74	0.64	0.81	1.04	1.00
Vocational high school	2.01	0.69	1.32	0.65	0.68	0.68	1.76	1.17	1.49
Post secondary	1.66	0.71	1.14	0.77	0.72	0.73	0.57	2.54	2.47
Tertiary	1.24	0.82	0.97	0.97	0.70	0.79	2.00	2.36	2.23
Total	1.29	0.90	1.06	0.84	0.76	0.80	1.92	2.26	2.19

Iran									
	1987			2001			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	0.83	0.91	0.86	0.78	1.49	1.23	0.48	0.31	0.47
Read & Write	0.58	0.70	0.65	1.15	0.47	0.99	0.88	0.74	0.87
Primary	1.02	1.18	1.13	0.91	0.51	0.79	0.73	0.64	0.77
Lower secondary	0.86	0.87	0.87	0.80	0.70	0.77	0.59	0.56	0.61
Upper secondary	0.69	1.97	1.85	1.06	0.74	0.86	0.63	0.55	0.63
Vocational high school	0.52	1.75	1.65	0.92	0.61	0.71	0.62	1.17	0.93
Post secondary	-	0.55	0.55	0.47	0.51	0.58	0.54	0.58	0.61
Tertiary	0.18	0.64	0.64	0.42	0.71	0.68	1.01	0.55	0.70
Total	0.83	1.48	1.34	1.00	0.72	0.86	0.89	0.67	0.84

Turkey									
	1988			1994			2002		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	0.95	0.66	0.94	0.66	0.33	0.65	1.62	0.38	1.55
Read & Write	0.75	0.36	0.73	1.00	0.95	1.00	1.03	0.42	1.02
Primary	2.97	0.56	2.89	0.99	1.43	1.03	0.91	1.42	1.25
Lower secondary	1.25	1.04	1.20	1.10	0.68	1.04	1.17	0.92	1.12
Upper secondary	1.07	0.57	0.94	0.89	0.56	0.80	1.39	0.56	1.05
Vocational high school	0.81	0.49	0.69	0.68	0.43	0.63	0.98	0.43	0.80
Post secondary	-	-	-	-	-	-	-	-	-
Tertiary	0.81	0.83	0.83	1.01	0.49	0.86	1.64	0.77	1.17
Total	2.31	0.91	2.03	1.13	0.70	1.03	1.58	0.91	1.34

Table 7: Returns to Schooling: Standard Mincer Equation, Urban Male Wage-Earners

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Years of schooling	0.048 (0.003)**	0.046 (0.003)**	0.053 (0.003)**	0.070 (0.006)**	0.091 (0.004)**	0.081 (0.002)**	0.065 (0.002)**	0.093 (0.003)**	0.116 (0.003)**
Experience	0.086 (0.008)**	0.044 (0.005)**	0.040 (0.005)**	0.205 (0.013)**	0.095 (0.009)**	0.101 (0.006)**	0.032 (0.004)**	0.074 (0.005)**	0.077 (0.006)**
Experience sq.	-0.139 (0.017)**	-0.050 (0.012)**	-0.045 (0.012)**	-0.353 (0.027)**	-0.146 (0.020)**	-0.162 (0.014)**	-0.045 (0.008)**	-0.115 (0.012)**	-0.120 (0.014)**
Constant	-1.019 (0.095)**	-1.029 (0.055)**	-0.854 (0.054)**	-2.026 (0.154)**	-1.114 (0.095)**	-0.875 (0.069)**	-0.026 (0.043)	-0.598 (0.058)**	-1.025 (0.076)**
Observations	1629	2041	2949	1556	2132	7408	7754	10782	4687
R-squared	0.21	0.20	0.14	0.27	0.25	0.30	0.15	0.27	0.30

Note: Urban male wage earners (aged 20-54), Robust standard errors in parentheses, * significant at 5%; ** significant at 1%

Table 8: Returns to Schooling: Mincer Equation with Quadratic Years of Schooling

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Years of schooling	-0.019 (0.011)	-0.011 (0.009)	-0.039 (0.009)**	-0.022 (0.017)	0.014 (0.015)	-0.029 (0.007)**	-0.024 (0.006)**	0.046 (0.010)**	0.054 (0.017)**
Years of schooling sq.	0.004 (0.001)**	0.003 (0.001)**	0.005 (0.001)**	0.007 (0.001)**	0.005 (0.001)**	0.006 (0.000)**	0.003 (0.000)**	0.003 (0.001)**	0.003 (0.001)**
Experience	0.085 (0.008)**	0.045 (0.005)**	0.045 (0.005)**	0.207 (0.013)**	0.098 (0.009)**	0.104 (0.006)**	0.037 (0.004)**	0.075 (0.005)**	0.078 (0.006)**
Experience sq.	-0.136 (0.017)**	-0.053 (0.011)**	-0.057 (0.012)**	-0.363 (0.026)**	-0.157 (0.020)**	-0.174 (0.014)**	-0.060 (0.008)**	-0.118 (0.012)**	-0.124 (0.014)**
Constant	-0.905 (0.096)**	-0.900 (0.058)**	-0.671 (0.057)**	-1.835 (0.155)**	-0.895 (0.101)**	-0.519 (0.068)**	0.227 (0.045)**	-0.421 (0.068)**	-0.789 (0.101)**
Observations	1629	2041	2949	1556	2132	7408	7754	10782	4687
R-squared	0.22	0.22	0.17	0.28	0.26	0.33	0.17	0.27	0.30

Note: Urban male wage earners (aged 20-54), Robust standard errors in parentheses, * significant at 5%; ** significant at 1%

Table 9: Returns to Schooling: Mincer Equation with Levels of Education

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Basic education	0.097 (0.045)*	0.182 (0.041)**	0.090 (0.041)*	0.086 (0.060)	0.263 (0.060)**	0.149 (0.028)**	0.048 (0.023)*	0.287 (0.045)**	0.450 (0.080)**
Upper secondary	0.409 (0.113)**	0.675 (0.109)**	0.440 (0.131)**	0.651 (0.076)**	0.720 (0.066)**	0.568 (0.032)**	0.320 (0.031)**	0.739 (0.049)**	0.971 (0.085)**
Vocational	0.311 (0.046)**	0.305 (0.040)**	0.301 (0.037)**	0.771 (0.102)**	0.943 (0.067)**	0.456 (0.055)**	0.365 (0.033)**	0.883 (0.062)**	0.975 (0.092)**
Tertiary	0.684 (0.044)**	0.662 (0.039)**	0.745 (0.040)**	1.208 (0.133)**	1.238 (0.076)**	1.078 (0.036)**	0.933 (0.031)**	1.327 (0.053)**	1.722 (0.085)**
Potential experience	0.085 (0.008)**	0.045 (0.005)**	0.043 (0.005)**	0.205 (0.013)**	0.099 (0.009)**	0.105 (0.006)**	0.035 (0.004)**	0.075 (0.005)**	0.077 (0.006)**
Potential experience sq.	-0.138 (0.018)**	-0.055 (0.011)**	-0.055 (0.012)**	-0.363 (0.027)**	-0.160 (0.019)**	-0.179 (0.014)**	-0.058 (0.008)**	-0.120 (0.012)**	-0.125 (0.014)**
Constant	-0.909 (0.095)**	-0.903 (0.056)**	-0.665 (0.055)**	-1.799 (0.152)**	-0.863 (0.100)**	-0.560 (0.068)**	0.235 (0.043)**	-0.367 (0.069)**	-0.780 (0.102)**
Observations	1629	2041	2949	1556	2132	7408	7754	10782	4687
R-squared	0.22	0.21	0.16	0.28	0.26	0.31	0.17	0.27	0.29
Marginal effects									
Upper sec to Basic	0.312	0.493	0.350	0.565	0.457	0.419	0.272	0.452	0.521
Vocational to Basic	0.214	0.123	0.211	0.685	0.680	0.307	0.317	0.596	0.525
Upper sec to Vocational	0.098	0.370	0.139	-0.120	-0.223	0.112	-0.045	-0.144	-0.004
Tertiary to Upper sec.	0.275	-0.013	0.305	0.557	0.518	0.510	0.613	0.588	0.751
Tertiary to Vocational	0.373	0.357	0.444	0.437	0.295	0.622	0.568	0.444	0.747

Note: Urban male wage earners (aged 20-54), Robust standard errors in parentheses, * significant at 5%; ** significant at 1%

Table 10: Returns to Schooling: Mincer Estimates with Levels of Education and Public Dummy Variable

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Basic education	0.150 (0.044)**	0.220 (0.039)**	0.088 (0.041)*	0.195 (0.062)**	0.200 (0.058)**	0.132 (0.028)**	0.056 (0.023)*	0.292 (0.045)**	0.352 (0.078)**
Upper secondary	0.501 (0.110)**	0.775 (0.105)**	0.438 (0.131)**	0.797 (0.084)**	0.625 (0.067)**	0.527 (0.036)**	0.350 (0.032)**	0.765 (0.051)**	0.716 (0.085)**
Vocational	0.450 (0.050)**	0.412 (0.041)**	0.301 (0.040)**	0.912 (0.106)**	0.826 (0.069)**	0.414 (0.055)**	0.398 (0.035)**	0.902 (0.063)**	0.757 (0.092)**
Tertiary	0.849 (0.049)**	0.811 (0.043)**	0.744 (0.045)**	1.406 (0.141)**	1.089 (0.080)**	1.008 (0.047)**	0.985 (0.034)**	1.368 (0.060)**	1.304 (0.089)**
Potential experience	0.095 (0.008)**	0.052 (0.005)**	0.043 (0.005)**	0.206 (0.013)**	0.098 (0.009)**	0.104 (0.007)**	0.037 (0.004)**	0.077 (0.006)**	0.058 (0.006)**
Potential experience sq.	-0.145 (0.018)**	-0.062 (0.012)**	-0.055 (0.012)**	-0.359 (0.026)**	-0.162 (0.020)**	-0.178 (0.014)**	-0.061 (0.008)**	-0.123 (0.013)**	-0.098 (0.013)**
Public sector dummy	-0.306 (0.040)**	-0.231 (0.029)**	0.001 (0.032)	-0.343 (0.053)**	0.150 (0.039)**	0.088 (0.035)*	-0.072 (0.015)**	-0.059 (0.027)*	0.551 (0.032)**
Constant	-0.958 (0.095)**	-0.972 (0.056)**	-0.664 (0.056)**	-1.685 (0.141)**	-0.811 (0.103)**	-0.535 (0.074)**	0.212 (0.044)**	-0.390 (0.071)**	-0.502 (0.101)**
Observations	1621	2033	2932	1556	2102	7408	7754	10782	4687
R-squared	0.25	0.24	0.16	0.30	0.28	0.31	0.17	0.27	0.36
Marginal effects									
Upper sec to Basic	0.351	0.555	0.350	0.602	0.425	0.395	0.294	0.473	0.364
Vocational to Basic	0.300	0.192	0.213	0.717	0.626	0.282	0.342	0.610	0.405
Upper sec to Vocational	0.051	0.363	0.137	-0.115	-0.201	0.113	-0.048	-0.137	-0.041
Tertiary to Upper sec.	0.348	0.036	0.306	0.609	0.464	0.481	0.635	0.603	0.588
Tertiary to Vocational	0.399	0.399	0.443	0.494	0.263	0.594	0.587	0.466	0.547

Note: Urban male wage earners (aged 20-54), Robust standard errors in parentheses, * significant at 5%; ** significant at 1%

Table 11: Returns to Schooling: Mincer Estimates for Public and Private Sectors

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Public sector									
Upper sec to Basic	0.480	0.581	0.567	0.705	0.465	0.400	0.338	0.247	0.229
Vocational to Basic	0.460	0.405	0.387	0.758	0.609	0.023	0.462	0.359	0.277
Upper sec to Vocational	0.020	0.176	0.180	-0.053	-0.144	0.377	-0.124	-0.112	-0.048
Tertiary to Upper sec.	0.326	0.186	0.230	0.578	0.523	0.410	0.561	0.523	0.422
Tertiary to Vocational	0.346	0.362	0.410	0.525	0.379	0.787	0.437	0.411	0.374
Private sector									
Upper sec to Basic	0.338	0.479	0.253	0.180	0.348	0.292	0.275	0.543	0.425
Vocational to Basic	0.157	0.012	0.138	0.373	0.692	0.318	0.266	0.681	0.468
Upper sec to Vocational	0.181	0.467	0.115	-0.193	-0.344	-0.026	0.009	-0.138	-0.043
Tertiary to Upper sec.	0.247	-0.065	0.367	0.422	0.381	0.596	0.725	0.687	0.858
Tertiary to Vocational	0.428	0.402	0.482	0.229	0.037	0.570	0.734	0.549	0.815

Note: Urban male wage earners, aged 20-54

Table 12: Unemployment Rates by Levels of Education

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Illiterate	3.51	3.81	1.73	7.34	6.60	5.60	15.61	11.20	7.92
Basic education	4.59	4.98	3.04	8.26	10.68	10.70	11.68	7.80	10.05
Upper secondary	4.76	6.52	3.77	12.21	12.23	10.34	13.27	10.05	13.52
Vocational	8.64	8.83	5.88	15.76	10.82	20.04	13.34	6.64	12.79
Tertiary	6.13	6.87	10.67	3.34	5.32	11.33	9.60	6.11	11.27

Table 13: Mincer with Expected Wages

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Basic education	0.085 (0.045)	0.170 (0.041)**	0.077 (0.041)	0.076 (0.060)	0.219 (0.060)**	0.095 (0.028)**	0.093 (0.023)**	0.322 (0.045)**	0.427 (0.080)**
Upper secondary	0.396 (0.113)**	0.646 (0.109)**	0.420 (0.131)**	0.599 (0.076)**	0.660 (0.066)**	0.518 (0.032)**	0.348 (0.031)**	0.750 (0.049)**	0.910 (0.085)**
Vocational	0.257 (0.046)**	0.252 (0.040)**	0.259 (0.037)**	0.678 (0.102)**	0.899 (0.067)**	0.293 (0.055)**	0.392 (0.033)**	0.930 (0.062)**	0.922 (0.092)**
Tertiary	0.658 (0.044)**	0.630 (0.039)**	0.651 (0.040)**	1.252 (0.134)**	1.255 (0.075)**	1.019 (0.036)**	1.002 (0.031)**	1.380 (0.054)**	1.686 (0.085)**
Potential experience	0.085 (0.008)**	0.045 (0.005)**	0.043 (0.005)**	0.206 (0.013)**	0.099 (0.009)**	0.105 (0.006)**	0.036 (0.004)**	0.075 (0.005)**	0.077 (0.006)**
Potential experience sq.	-0.138 (0.018)**	-0.055 (0.012)**	-0.055 (0.012)**	-0.363 (0.027)**	-0.160 (0.019)**	-0.179 (0.014)**	-0.058 (0.008)**	-0.120 (0.012)**	-0.125 (0.014)**
Constant	-0.946 (0.095)**	-0.943 (0.056)**	-0.686 (0.054)**	-1.879 (0.152)**	-0.936 (0.100)**	-0.623 (0.068)**	0.063 (0.043)	-0.483 (0.070)**	-0.864 (0.102)**
Observations	1629	2041	2949	1556	2132	7408	7754	10782	4687
R-squared	0.22	0.21	0.14	0.28	0.27	0.32	0.18	0.27	0.29
Marginal effects									
Upper sec to Basic	0.311	0.476	0.343	0.523	0.441	0.423	0.255	0.428	0.483
Vocational to Basic	0.172	0.082	0.182	0.602	0.680	0.198	0.299	0.608	0.495
Upper sec to Vocational	0.139	0.394	0.161	-0.079	-0.239	0.225	-0.044	-0.180	-0.012
Tertiary to Upper sec.	0.262	-0.016	0.231	0.653	0.595	0.501	0.654	0.630	0.776
Tertiary to Vocational	0.401	0.378	0.392	0.574	0.356	0.726	0.610	0.450	0.764

Note: Urban male wage earners (aged 20-54), Robust standard errors in parentheses, * significant at 5%; ** significant at 1%

Table 14: Fixed-Effects Estimates of the Mincer Equation: Province-Level, Egypt and Iran

	Egypt			Iran		
	1988	1998	2006	1987	2001	2006
Basic education	0.027 (0.047)	0.153 (0.040)**	0.070 (0.041)	0.107 (0.061)	0.253 (0.058)**	0.157 (0.028)**
Upper secondary	0.430 (0.101)**	0.501 (0.098)**	0.380 (0.127)**	0.682 (0.082)**	0.710 (0.065)**	0.573 (0.032)**
Vocational	0.309 (0.045)**	0.302 (0.039)**	0.293 (0.037)**	0.784 (0.104)**	0.925 (0.065)**	0.464 (0.055)**
Tertiary	0.634 (0.042)**	0.640 (0.039)**	0.723 (0.039)**	1.274 (0.132)**	1.213 (0.074)**	1.088 (0.036)**
Potential experience	0.084 (0.008)**	0.047 (0.005)**	0.044 (0.005)**	0.201 (0.013)**	0.099 (0.008)**	0.106 (0.006)**
Potential experience sq./100	-0.136 (0.017)**	-0.058 (0.011)**	-0.057 (0.012)**	-0.356 (0.026)**	-0.160 (0.019)**	-0.180 (0.014)**
Constant	-0.865 (0.089)**	-0.903 (0.054)**	-0.658 (0.054)**	-1.775 (0.152)**	-0.861 (0.097)**	-0.569 (0.068)**
Observations	1695	2094	2965	1556	2132	7408
R-squared	0.24	0.23	0.19	0.31	0.31	0.32
Marginal effects						
Upper sec to Basic	0.403	0.348	0.310	0.575	0.457	0.416
Vocational to Basic	0.282	0.149	0.223	0.677	0.672	0.307
Upper sec to Vocational	0.121	0.199	0.087	-0.102	-0.215	0.109
Tertiary to Upper sec.	0.204	0.139	0.343	0.592	0.503	0.515
Tertiary to Vocational	0.325	0.338	0.430	0.490	0.288	0.624

Note: Urban male wage earners (aged 20-54), Robust standard errors in parentheses * significant at 5%; ** significant at 1%

Table 15: Fixed-Effects Estimates of the Mincer Equation: Cluster-Level, Iran

	Iran	
	1987	2001
Basic education	0.145 (0.065)*	0.184 (0.060)**
Upper secondary	0.779 (0.091)**	0.561 (0.069)**
Vocational	0.948 (0.122)**	0.746 (0.073)**
Tertiary	1.48 (0.148)**	1.023 (0.082)**
Potential experience	0.209 (0.013)**	0.099 (0.008)**
Potential experience sq./100	-0.368 (0.027)**	-0.167 (0.019)**
Constant	-1.912 (0.160)**	-0.708 (0.102)**
Observations	1556	2132
R-squared	0.36	0.37
Marginal effects		
Upper sec to Basic	0.634	0.377
Vocational to Basic	0.803	0.562
Upper sec to Vocational	-0.169	-0.185
Tertiary to Upper sec.	0.701	0.462
Tertiary to Vocational	0.532	0.277

Note: Urban male wage earners, aged 20-54, Robust standard errors in parentheses, * significant at 5%; ** significant at 1%

Table 16: Returns to Education of Women without Correction for Selection

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2002
Basic education	0.410 (0.142)**	0.347 (0.172)*	0.543 (0.229)*	0.358 (0.227)	0.773 (0.240)**	0.727 (0.145)**	0.057 (0.066)	0.254 (0.082)**	0.312 (0.130)*
Upper secondary	0.986 (0.179)**	1.191 (0.446)**	1.067 (0.231)**	0.975 (0.205)**	1.513 (0.196)**	1.248 (0.133)**	0.436 (0.071)**	0.806 (0.085)**	1.112 (0.135)**
Vocational	0.849 (0.105)**	0.553 (0.132)**	0.897 (0.158)**	0.914 (0.239)**	1.643 (0.200)**	1.213 (0.151)**	0.486 (0.070)**	1.046 (0.149)**	1.207 (0.145)**
Tertiary	1.250 (0.105)**	1.037 (0.132)**	1.302 (0.156)**	1.239 (0.228)**	1.994 (0.205)**	1.902 (0.134)**	1.100 (0.071)**	1.522 (0.084)**	1.954 (0.132)**
Potential experience	0.107 (0.014)**	0.046 (0.009)**	0.064 (0.009)**	0.083 (0.022)**	0.051 (0.016)**	0.094 (0.009)**	0.036 (0.007)**	0.062 (0.009)**	0.082 (0.009)**
Potential experience sq.	-0.178 (0.037)**	-0.024 (0.023)	-0.064 (0.027)*	-0.163 (0.065)*	-0.035 (0.042)	-0.163 (0.024)**	-0.058 (0.018)**	-0.132 (0.024)**	-0.161 (0.026)**
Constant	-1.806 (0.154)**	-1.483 (0.146)**	-1.715 (0.160)**	-0.603 (0.231)**	-1.307 (0.226)**	-1.158 (0.149)**	0.045 (0.082)	-0.389 (0.101)**	-0.973 (0.145)**
Observations	609	770	1056	206	442	1298	1557	2385	1070
R-squared	0.37	0.33	0.25	0.27	0.33	0.40	0.28	0.38	0.50
Marginal effects									
Upper sec to Basic	0.576	0.844	0.524	0.617	0.740	0.521	0.379	0.552	0.800
Vocational to Basic	0.439	0.206	0.354	0.556	0.870	0.486	0.429	0.792	0.895
Upper sec to Vocational	0.137	0.638	0.170	0.061	-0.130	0.035	-0.050	-0.240	-0.095
Tertiary to Upper sec.	0.264	-0.154	0.235	0.264	0.481	0.654	0.664	0.716	0.842
Tertiary to Vocational	0.401	0.484	0.405	0.325	0.351	0.689	0.614	0.476	0.747

Note: Urban female wage earners (aged 20-54), Robust standard errors in parentheses, * significant at 5%; ** significant at 1%

Table 17: Returns to Education of Women with Correction for Selection into Wage Work

	Egypt			Iran		
	1988	1998	2006	1987	2001	2006
Basic education	0.391 (0.134)**	0.339 (0.138)*	0.560 (0.179)**	0.313 (0.211)	0.832 (0.189)**	0.811 (0.096)**
Upper secondary	1.012 (0.173)**	1.192 (0.228)**	1.070 (0.300)**	0.930 (0.188)**	1.542 (0.166)**	1.333 (0.093)**
Vocational	0.793 (0.095)**	0.532 (0.095)**	0.891 (0.129)**	0.846 (0.215)**	1.667 (0.168)**	1.230 (0.113)**
Tertiary	1.204 (0.095)**	1.021 (0.095)**	1.273 (0.130)**	1.186 (0.207)**	1.968 (0.167)**	1.929 (0.092)**
Potential experience	0.106 (0.012)**	0.039 (0.009)**	0.059 (0.009)**	0.073 (0.019)**	0.040 (0.015)**	0.077 (0.008)**
Potential experience sq./100	-0.175 (0.031)**	-0.009 (0.023)	-0.049 (0.025)	-0.144 (0.050)**	-0.018 (0.042)	-0.123 (0.020)**
Constant	-2.053 (0.222)**	-2.704 (0.889)**	-2.514 (0.300)**	-1.132 (0.389)**	-2.380 (0.448)**	-2.928 (0.493)**
Selection						
Married	-0.385 (0.059)**	-0.084 (0.055)	-0.126 (0.047)**	-0.457 (0.092)**	-0.403 (0.062)**	-0.219 (0.033)**
No. of children aged less than 4	-0.077 (0.040)	-0.045 (0.042)	-0.231 (0.035)**	-0.106 (0.049)*	-0.065 (0.057)	-0.009 (0.033)
Constant	-0.563 (0.046)**	-0.686 (0.044)**	-0.605 (0.037)**	-1.005 (0.070)**	-0.925 (0.051)**	-1.216 (0.026)**
Mill's ratio	0.211 (0.183)	0.967 (0.682)	0.632 (0.207)**	0.363 (0.216)	0.695 (0.258)**	1.023 (0.277)**
Observations	3218	3469	4854	2681	4159	15324
Marginal effects						
Upper sec to Basic	0.621	0.853	0.51	0.617	0.71	0.522
Vocational to Basic	0.402	0.193	0.331	0.533	0.835	0.419
Upper sec to Vocational	0.219	0.66	0.179	0.084	-0.125	0.103
Tertiary to Upper sec.	0.192	-0.171	0.203	0.256	0.426	0.596
Tertiary to Vocational	0.411	0.489	0.382	0.34	0.301	0.699

Note: Urban female wage earners (aged 20-54), Robust standard errors in parentheses * significant at 5%; ** significant at 1%