

# A comparative study of returns to education of urban men in Egypt, Iran, and Turkey\*

Djavad Salehi-Isfahani  
Virginia Tech

Insan Tunali  
Koc University

Ragui Assaad  
University of Minnesota

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## Abstract

This paper presents a comparative study of private returns to schooling of urban men 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, from the 1980s to 2006, and, to increase the comparability of the estimates across surveys, we focus on urban men 20-54 years old and in full time wage and salary employment. Our aim is to learn how the monetary signals of rewards that guide individual decisions to invest in education are shaped by the institutions of education and labor markets in these countries. Our estimates generally support the stylized facts of the institutions of education and labor markets in Middle Eastern countries. Their labor markets have been described as dominated by the public sector and therefore relatively inflexible, and their education systems as more focused on secondary and tertiary degrees than teaching practical and productive skills. Returns in all countries are increasing in years of schooling, which is contrary to the Mincer assumption of linear returns but consistent with overemphasis on secondary and tertiary degrees. Low returns to vocational training relative to general upper secondary, which have been observed in many developing countries, are observed in Egypt and Iran, but not Turkey. This pattern of returns across countries seems to correspond to how students are selected into vocational and general upper secondary tracks, which is an important part of the education institutions of these countries, and the fact that Turkey's economy is more open than the other two. Greater competitiveness in all three countries over time seems to have increased returns to university education and in few cases to vocational education, but not to general high school.

*JEL classification:* J24, J31, O15, O53, P52

*Keywords:* Egypt, Iran, Turkey, returns to education, Mincer equation, labor market institutions, education institutions, labor market flexibility

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# 1 Introduction

Employment issues, especially for youth, are central to economic development of the countries of the Middle East and North Africa (MENA) (Yousef 2004 and Dhillon and Yousef 2009). In the past decades, education has expanded in MENA faster than in any other region of the world, yet its benefits in terms of growth in output and employment have been very disappointing (World Bank 2007). Low productivity of education in MENA has been 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 the 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 in the Middle East. These distortions are generally introduced by policies that reward education degrees rather than productivity, often caused by the large role of the public sector in these economies (World Bank 2004a). Governments often hire solely on the basis of education credentials and set wages based on seniority, disconnected from individual productivity. Sometimes labor laws extend these rules to the formal private sector as well. As a result, private and social returns to schooling diverge in the Middle East. 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 report high levels of private returns to schooling, especially university education, in several MENA countries (Assaad 1997; Huitfeldt and Kabbani 2007; Tansel 1994; Tansel 2002b; Tansel 2002a; Tansel 2005; Tansel 2008). Not all the benefits of education are reflected in economic growth and not all its influence on output is contemporaneous. Other positive effects occur with long delays, such as the positive effect of education on fertility and health. Increased education also improves the quality of life for the individual, which is not usually measured by regular measures of economic growth. Having said that, given the enormous amount of public and private resources that are devoted to education in MENA countries, distortions in incentives to invest in education can be very costly and understanding the sources of these distortions is important for design of effective human capital policy.

In this paper we compare returns to education in the three largest countries of the region, Egypt, Iran, and Turkey, and over time. We are primarily interested in two types of questions: First, we want to know how the monetary signals of rewards to education that labor markets send to youth, their families, and educators vary across these countries and over time. Second, we ask if the patterns of returns that we observe in these data are related to differences in the institutions of the markets for education and labor between these countries and institutional reforms of the last two decades.

The motivation for the first question is to understand how the signals that guide the high levels of private investment in education in these countries, especially the extraordinary effort on the part of youth to enter university, vary between countries and over time. How do returns to tertiary education compare to returns for practical skills taught by vocational and technical schools? How do returns in Turkey that has a more open economy compare to those in Egypt and Iran with more closed systems? How does this comparison change with the level of education? We are only able to measure the monetary signals, that is wages and salaries. In reality a wider set of signals guide investment in education, such as job security and benefits, but monetary rewards play

an important role. The largest difference in job security is between public and private sectors, and we try to address this aspect of employment in these countries by reporting separate estimates of returns to education for these sectors.

We use the standard Mincer framework with minor modifications. Mincer regressions have been criticized for yielding biased estimates of the causal effect of education on earnings because they ignore the role of unobserved ability (Heckman, Lochner, and Todd 2006 and 2008). However, Mincer results are still considered informative because the ability bias is likely to be small (Card 1999). We therefore sidestep the thorny issues of selection in this paper because our main interest is in describing the pattern of monetary rewards that guide investment in education in these countries rather than the causal impact of schooling on wages. The difficulty of getting uniformly strong identification for the effect of selection in different contexts introduces a dimension of variation in the estimated results that may reduce their comparability. We are well aware that in the countries that we study students are selected into higher levels in large part based on their ability, so we are careful to avoid attaching any causal effect to education *per se*, and use the information about selection in interpreting our estimates.

As regards the second question, we offer a stylized account of variation across countries and over time in education and labor market institutions and show that for the most part they correspond to the observed pattern of rewards. Turkey has a more competitive economy than Egypt or Iran, and all three countries have liberalized their economies to various extents over time. We ask if these changes are reflected in the estimated Mincer coefficients, but our attempt to link the structure of returns to specific institutional features of the countries or specific changes over time are descriptive in nature and stop well short of causal analysis. Our choice of surveys and simple methodology helps eliminate the variation in the estimates that might result from differences in data and method of estimation, but there are other factors that could explain differences in returns besides differences in institutions. Despite these limitations, we believe that our approach is a useful way to quantify the impact of institutions on human capital formation in these 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 comparative studies in Harmon, Walker, and Westergaard-Nielson (2001), done for European countries, that stress uniformity of methodology in order to reduce the variation in the estimated returns due to technique of estimation. These studies combine descriptive accounts of labor market conditions with Mincer equation estimates to draw conclusions about how observed returns are influenced by the economic environment. A similar cross-country comparative project of return to education (PURE) also attempts to link “the observed patterns and trends [in returns] to national educational systems and policies.”<sup>1</sup>

There are very 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 to estimate returns in the public and private sectors, and El-Hamidi (2006) uses the 1988 and 1998 surveys to look for the sheepskin effects in the returns to education. Tansel (1994), (2001), (2002b), (2002a), (2005), and (2008) use various Turkish labor force and expenditure surveys. There are also unpublished studies

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<sup>1</sup>See <http://www.etla.fi/PURE>.

using available surveys in the region (Dah and Hammami 2002; Huitfeldt and Kabbani 2007; Said and El-Hamidi 2005; Said 2008). World Bank (2004b) also reports results on returns to education for Jordan and Yemen. With the exception of Said and El-Hamidi (2005), these studies have limited comparative value because of differences in the estimation technique, sample coverage, and treatment of selection. Said and El-Hamidi (2005) compare returns to education in Egypt and Morocco before and after the labor market liberalizations of the 1990s.

To increase comparability, we focus on urban male wage and salary earners in full time employment only. We focus on men because their high rates of labor force participation (see Table 2) lead to more accurate results and reduce selection bias. Also, the wider range of education levels of men makes their pattern of earnings a better guide to the structure of incentives for education and skill acquisition. We further increase comparability across our surveys by focusing on urban workers only. The share of urban men in total employed men, wage and non-wage, ranges from about 40 percent in Egypt to 60 percent in Turkey and 70 percent in Iran (in 2006). Because we focus on wage work, excluding rural workers does not reduce samples sizes by much. The definition of urban varies from country to country. Iran and Turkey classify an area as urban according to population size. The threshold for urban in Iran is 5000 and in Turkey 20,000, which explains in part why the share of urban workers in employment 9n Table 2 is higher in Iran than in Turkey. In Egypt, urban is defined administratively according to the characteristics of the location rather than population size.

We include in the sample only men 20-54 years old, the group with the most stable participation rate, and therefore the least problem with selection into the wage labor force. Those excluded, young workers of school age and older workers about to retire, have more variable participation rates as over time more students have stayed in school longer and some workers have retired earlier. Table 2 shows that in our samples the share of the 20-54 age group in the urban male employed population ranges from about 80 to 90 percent.

We focus on wage and salary workers and exclude the self employed because the accuracy of the earnings data for the latter is lower and may thus confound our cross country comparison. Furthermore, self employment wages have greater errors because both hours and incomes are subject to misreporting. Wage and salary data are generally of higher quality relative to self employment incomes in countries where taxation of income from self-employment either does not exist or is not well enforced, especially for the less educated. The non-wage aspects of wage and salary work tend to be more uniform across countries compared to self employment, which can refer to vastly differing settings—for example, professionals vs. street vendors—and may therefore mean different types of employment depending on the country. Excluding the self employed still leaves a substantial part of the workforce in our working sample. As seen in Table 2, wage workers are a significant proportion of the employed population under consideration: the share of wage and salary workers among urban men aged 20-54 ranges from 58 to 73 percent.

Finally, we limit our sample to full time workers because we are concerned with measurement error in hourly wages. Hourly wages are obtained by dividing monthly or weekly earnings by monthly or weekly hours. There is evidence that misperceptions concerning actual hours result in very high hourly wages for some professions (such as teachers when they only report hours in class). Since trimming the wage data might result in selection problems (Bollinger and Chandra 2005) we decided to focus on full-time workers (defined as those who work at least 30 hours). The share of full time workers in our restricted samples (urban male wage and salary workers aged 20-54) is above 90 percent (Table 2).

Given the limitations we place on the sample, our results pertain to urban men aged 20-54 only and should not be generalized to other age groups or to women. However, this is not a limitation of this study because we selected this particular group because it offers the most reliable results from which we can learn about the structure of incentives and the underlying institutions that guide investment in education.

Our main findings can be summarized as follows:

- There is a fair amount of variation in education levels of the urban male labor force. Though Egypt has the least developed economy of the three, it has the highest level of education (Table 1). In 2006, according to our surveys the average number of years of schooling in Egypt was 11.0 in 2006, compared to 9.0 in Iran and 8.4 in Turkey (in 2003). The share of workers with tertiary degrees in Egypt was twice that of Iran and Turkey (28 percent compared to 11.4 percent in Iran and 11.1 percent in Turkey).
- Wage levels conform to differences in per capita income in these countries, with Turkish and Iranian wages about twice as high as those in Egypt (Table 1).
- The results from the standard Mincer equation are reasonable but inadequate. In all three countries and in all periods the assumption of linearity in returns to schooling is rejected. Returns are increasing in years of schooling, which is consistent with how students are selected into higher levels of schooling (the greater the selectivity, the higher the convexity). The results are also consistent with the level of labor market rigidity, because rigid markets reward terminal degrees rather than productivity. Accordingly, returns to basic education are low relative to high school and university education.
- Returns to education below tertiary have declined in Egypt and Iran, but increased in Turkey. This is consistent with the more even progress of tertiary education in Turkey compared to Egypt and Iran.
- Returns to education at the university level differ between countries and over time. In Egypt, where selectivity into the tertiary level is low, returns to tertiary education are also low compared to Iran and Turkey, where selection is based on highly competitive national exams. A strong ability bias rather than greater productivity of tertiary education, at least in the case of Iran, is probably responsible for this outcome. The biggest change over time in the college premium is in Iran, where the expansion of university education, especially of lower quality private universities, between 1987 and 2006 has increased the supply of graduates and reduced the returns to university education by about 20 percent. In Egypt they have stayed relatively constant and in Turkey they have increased.
- There is significant variation between countries and over time in the returns to technical and vocational education (TVE) compared to general high school. We find that in Turkey, where selection into the vocational track is not compulsory and extensive, vocational returns compare favorably with general high school education. In Egypt, where tracking into vocational education is extensive, returns to vocational education are lower than returns to general upper secondary. In Iran, when tracking was not fully implemented, before 2001, vocational returns exceeded those of general upper secondary, but by 2006 when tracking had taken effect the reverse was true.

This paper is organized as follows. Section 2 introduces the surveys used in this study and offers a brief description of the economic setting under which the surveys were collected. Section 3 and 4 describe the institutions of the education and labor markets in the three countries. Section 5 introduces the key characteristics of the labor

force and earnings before going to the estimation results in Section 6. Section 7 is the conclusion.

## 2 Data

We use a total of nine surveys, three from each country. Egyptian data are 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), which have been used extensively by other researchers. These surveys yield sample sizes of 1,530 individuals in 1988, 1,947 in 1998, and 2,889 in 2006.

Iranian data are from the Socio-Economic Characteristics of Household (SECH) for 1987 and 2001, and the Household Expenditure and Income Survey (HEIS) 2006. These surveys have not been used previously for research on education. SECH data are the first rounds of panel data sets, and HEIS is an annual survey, which in 2006 included data on hours worked. All three are conducted by the Statistical Center of Iran, so definitions of variables are consistent across surveys. 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 full time urban male wage earners in the 20-54 age group, the sample size for 1987, 2001, and 2006 are, respectively, 1,476, 2000, and 6,855.

Turkish data are taken from the October round of the 1988 Household Labor Force Survey (HLFS), the 1994 Household Income and Consumption Expenditures Survey (HICES), and the 2003 Household Budget Survey (HBS). These surveys are based on stratified nationwide samples and yield respective sample sizes of 7,614, 10,566 and 9,483 full-time prime age (20-54) male wage and salary workers. All data sets were issued by the Turkish Statistical Institute (TURKSTAT) and afford standardized variable definitions. Regional price indices are used to arrive at comparable real wages.

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 available from the World Bank World Development Indicators (see Table 4 for the PPP exchange rates used to convert local currencies to international dollars). All surveys provide information on levels of educational attainment of the respondents. As much as possible, we define education levels to mean the same thing across the three countries. Where years of schooling are not explicitly reported, we use levels to calculate years of schooling.

Table 1 provides the summary statistics, which we discuss in more detail later in section 5. In the regressions we combine the lowest two categories, illiterate and read and write, into one and we combine primary and lower secondary into another called basic education. Returns for these education levels are similar, so it is more efficient to group them into one. We measure experience as potential experience, equal to age minus 6 minus years of schooling.

These surveys cover a long and sometimes tumultuous period in the recent economic history of the three countries. As Figure 1 shows, Egypt is the poorest of the three countries but its growth has been more smooth than those of Iran and Turkey. Egypt's 1988 survey was taken at a time when the economy was experiencing slow growth and struggling with accumulated foreign debt. In 1991 Egypt introduced serious economic reforms to liberalize its state-dominated economy, and has subsequently expanded their scope. The 1998 survey was taken in an average year in the post-reform period, whereas the 2006 survey was during a more robust year of economic growth benefitting from the oil boom and deepening of reforms.

In contrast, Iran's economy has fluctuated widely in the period under study, mainly

because of shocks that followed the Islamic revolution of 1979. The year of the first survey (1987) is when the war with Iraq was raging and the economy was in its deepest recession, and large sections of industry and the entire banking system were under government control. The 2001 survey is taken at a time when economic reforms had freed up various markets for goods and services as well as for credit and foreign exchange. The economic conditions in 2006 are best described as an oil boom.

Turkey's economy has also experienced severe shocks during the period of study, but mainly of macroeconomic nature. The first survey in 1988 reflects the post-oil boom stagnation in Turkey, which had earlier benefitted from the oil boom of the early 1980s and the Iran-Iraq war. The second survey is taken in 1994, when the economy was struggling with record high inflation, a balance of payments crisis, and economic slump. The last survey was taken in 2003, early on during the impressive but short lived growth spurt that ended in 2008.

### 3 Educational Systems

Figures 3, 4, and 5 summarize the education systems for all three countries. We describe below the structure of these charts and the rules for selection into higher levels in their respective school systems.

#### 3.1 Egypt

Currently, basic education consists of nine years, six years of primary and three years of preparatory (lower secondary) education. Compulsory education was extended from six years of primary school to nine years of basic education in 1981. For a period of eleven years from 1988 to 1999, primary education was reduced to 5 years. The sixth grade was re-introduced for children who entered first grade in 1999. Thus all those who completed primary education in the sample of 20 to 54 year olds in the 1988 got six years of primary education, but some of the adults in our 1998 and 2006 samples only got five years of primary education. Upper secondary education is three years and is divided into general and technical/vocational branches. A small number of technical secondary schools have a five-year curriculum. In grade 9 (formerly 8), based on their grades in national exams, students are separated into the general upper secondary and technical/vocational tracks. Unlike Iran and Turkey, in Egypt selection for university education begins early, in grade 9, and about two-thirds of students are sent to the technical/vocational track. As a result, almost all of those who enter the general secondary track end up eventually passing the general secondary exams and entering some form of higher education institution.

#### 3.2 Iran

Schooling in Iran consists of primary (grades 1-5), lower secondary (grades 6-8), 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 and pre-university added as an option for those who wish to continue to the tertiary level. 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 grade schools. Tertiary education was nearly all public until the 1980s but private universities have expanded since. In 2006 about half of all 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 in the technical/vocational track enter either a work-study program (*kardanesh*) or a three-year 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 also been 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).

### 3.3 Turkey

The Turkish education system mandated 5 years of primary education until 1997. The compulsory education reform implemented at that time increased basic education to 8 years, the level formerly associated with lower secondary schooling. Upper secondary education includes both General High School and Vocational High School components. Both types offer three and four year programs that have quality implications (see Tunali et al. 2004), but these cannot be distinguished in our data. Private schools have a trivial share in the primary and secondary tiers. Access to the better private and public (Anatolian) high schools is selective, and is based on a nationwide entrance examination taken at the end of 8 years.

Before 1997, some selection based on ability took place at grade 5. Middle school (lower secondary) enrollments were low, because typically those who could envision completing a high school education continued on. After 1997, middle school was integrated into basic education, and as a result high school enrollments increased (Tunali and Yuret 2009).

The tertiary tier includes both two- and four-year schools. Admission is based on a highly competitive nationwide entrance examination, which has varied in format over time. Factors such as student’s high school performance, high school type, and the average performance of applicants from that school in the nationwide exam are combined with the raw exam score to arrive at a weighted score. The weighting schemes have also been subjected to changes. Thanks to sustained increases in high school enrollments, competition for four-year university slots has increased over time. Two developments

since the mid 90s are worthy of mention. The first is the emergence of new private universities in the major Turkish cities. The second is the increased share of two-year degree granting programs which emphasize vocational skills.

### 3.4 Implications

The implications of these education systems for returns to education are as follows. First, except in Turkey before 1997, there is very little selection on ability up to grade 9 in any of the countries. Beyond grade 9 there is selection in all three countries, especially in Egypt, where lower ability students are not allowed to continue in the academic track. So, differences in returns between general and vocational education are potentially the result of differences in the value of skills learned in these tracks and differences in ability. The same logic applies to returns to university education where selection plays an important role, especially in Iran and Turkey. In Egypt, where selection is most important between lower and upper secondary, we do not expect a strong ability bias for estimates of returns to university education relative to general secondary education. However, few workers end up with general secondary education in Egypt (see Table 1) because most continue on to university. 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 relative to upper secondary.

## 4 Labor Market Institutions

Providing a description of labor market institutions is less straightforward than those for education. MENA labor markets are rigid by developed-country standards and even by some developing-country standards (World Bank 2004a). By rigid we mean low flexibility on the part of employers in deciding on pay and the duration of employment of specific workers. The main source of this rigidity in the three countries under study is state domination of their economies, both in terms of direct employment and in regulation of private employment. Their labor market institutions have been shaped by the emergence of the interventionist-redistributive state following anti-colonial struggles after World War II (Yousef 2004). Egypt embraced socialism in the 1950s and built a heavy state machinery in employment. Turkey was well known for its *etatist* system. Iran had an active state in employment and regulation, first under the Shahs, in part thanks to the abundance of oil revenues that enriched the state in the 1970s, and later under the Islamic revolutionary regime, which nationalized large sections of the economy in the 1980s.

The impact of the state on returns to education has been amplified by the fact that historically it has been the main employer of graduates of higher education. Table 3 shows that the public sector employs a far greater proportion of the more educated workers in these countries, so the structure of its compensation has a greater influence on the incentives for investment in education. In Egypt, in 2006, about 38 percent of public sector employees had a tertiary degree and 80 percent had a high school degree or above. In Iran the same figures were 24 percent and 73 percent; in Turkey, 25 percent and 70 percent.

There are several rankings of countries according to the flexibility of their labor market institutions. Different indices consider different aspects of labor market flexibility and therefore do not always yield the same rankings. The World Bank data on Doing Business summarize legal codes, whereas the Heritage Foundation and the Economist Intelligence Unit (EIU) rely more on actual practice using expert opinion surveys. In

the 1990s the Heritage index for wage and price controls, which is a rough measure of labor market rigidity, scored Egypt and Turkey 3 out of 5, below Iran in rigidity with an index of 4. A new index by the Heritage Foundation available only since 2005, in 2007 places Egypt above Turkey and Iran in terms of rigidity (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 another useful indicator of the importance of government in total employment and by implication the influence of public sector employment policies in setting the rewards for education. Comparable data from World Bank World Development Indicators database is only available for the 1990s. This ratio is constant and about 6 percent in Egypt, in Iran rising from about 8.0 percent in 1990 to 11.5 percent in 2000, and in Turkey increasing from 6.5 percent to 8.2 percent during the same period. This indicator thus places Egypt and Turkey at about the same level of flexibility and above Iran.

Other evidence indicates that the Turkish economy and labor markets may be more flexible than Egypt's, certainly in the earlier years. Turkey embarked on its liberalization in the early 1980s and has been praised for achieving good results (Onaran and Aydiner-Avsar 2006). Although drastic labor market reforms have been on the agenda for some time, they have been difficult to implement (Tunali et al. 2004, World Bank 2004b). Lawson and Bierhanzl (2004) place Turkey well above the median in overall labor market flexibility, which is also true of those aspects that are more relevant to signals of 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.

In Iran, in 2003 the Labor Law of 1990 was amended to exclude firms with fewer than five workers from its layoff rules and wage scales (Salehi-Isfahani 2005). In 2005, firms under 10 were allowed to engage in three-party agreements involving the government and workers' representatives to relax the layoff rules. In addition, in recent years firms have been increasingly able to evade the Law by employing workers on fixed, short-term contracts, thus increasing employment flexibility.

It is important to bear in mind that when laws change to allow for more flexibility it may take several years before their effect is observed across the age spectrum because older workers may not be subject to new laws, so the results of the most recent changes may not be reflected in the latest surveys at hand (Turkey 2003, and Egypt and Iran 2006).

Summarizing this evidence, we believe that all three countries have increased their labor market flexibility, but the speed of change has been greater in Egypt and Turkey than in 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 rapidly. In recent years, especially thanks to the 2003 reforms, Egypt may have caught up with Turkey in labor market flexibility, while Iran remains in third place.

## 5 Labor Force Characteristics and Earnings

The samples for the three countries and all three 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 the public sector in wage and salaried employment of prime age men has declined in Egypt and Iran but increased in Turkey, though it started at one fourth the level of Egypt and Iran in the 1980s. The latter two have successfully reduced their share of the public sector in wage employment, from nearly two-thirds to 44 and 35 percent, respectively. Although private sector job growth suffered following the 2001 crisis, 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.<sup>2</sup>

Average years of schooling for the urban male workforce and its rate of increase are in reverse order based on per capita GDP (see Figure 1). Egypt, which happens to be the poorest country of the three, has the most educated workforce (average 11.0 years of schooling in 2006), exceeding Iran's by about 2 years and Turkey's (the most advanced of the three) by about 2.5 years. Interestingly, Turkey also lags behind Egypt and Iran in expansion of education. The latter added about two years of schooling during two decades (35 and 38 percent increase) while Turkey increased its schooling by about 1.4 years in 14 years (23 percent).

The averages for years of schooling hide large differences in the distributions of the workforce by education level, which are also presented in Table 1. Egypt has the highest proportions of illiterates as well as university graduates (8.4% and 29.0% in 2006), while Turkey has the lowest in both categories (0.8% and 11.1% in 2003). In Turkey, by far the largest group are those with primary education (39.8% in 2003), with a relatively small lower secondary group (15.0%). This is most likely the consequence of the low level of compulsory education, which until 1997 was only 5 years, compared to 8 years in Iran and Egypt for the last decade. Iran has a relatively even distribution of graduates from primary to tertiary (ranging from 22.6% in primary to 11.4% in tertiary).

Egypt also boasts the largest share of vocational upper secondary graduates (33.8% in 2006, up from 19.90% in 1988), but has relatively few workers with the general upper secondary degree (about 1% in the later periods). This is because those not deemed suitable for university education are sent to vocational education, while most of those who remain in general upper secondary end up in university. Turkey has the lowest share of vocational graduates, about 6.4% in 2003. In Iran, the share of TVE graduates rose dramatically during 1987-2001, from 7.7% to 20.2%. This rise was 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 program known as *kardanesh*. But by 2006 attrition had reduced the share of these tracks to only 10.3% (Salehi-Isfahani 2009; Salehi-Isfahani and Egel 2009).<sup>3</sup>

## 5.1 Earnings and education

Average wages in Tables 1 and 4 reflect the general level of economic development in these countries. The mean and median hourly wages in 2000 Purchasing Power Parity PPP US dollars are similar in Iran and Turkey, and nearly twice that in Egypt.<sup>4</sup> The

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<sup>2</sup>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.

<sup>3</sup>The figures for 2001 for Iran should be treated with caution because TVE graduates were coded the same as upper secondary and we had to identify them using their fields of study.

<sup>4</sup>Hourly wages in local currency are divided by the PPP rates in Table 4 to obtain wages in 2000 international dollars.

shifts in the log wage distributions over time are shown more clearly in Figures 2a-c, which compare real wages in 2000 PPP dollars across countries and over time. In Egypt wage distributions did not change much over time. Wages decreased significantly across deciles during 1988-1998, and only partially recovered in 2006. In Iran, wages for upper deciles increased continuously but not for the second and third deciles, which fell from 1987 to 2001. In Turkey real wages increased across deciles during 1988-1994, with greater gains for the upper deciles. The process reversed after 1994, with wages in 2003 lower for all deciles, arguably because of the 2001 recession.

Wages increases during this period were higher in the public compared to the private sector (Table 4). In Egypt, during 1988-2006 public sector wages had risen by 23 percent while private sector wages had fallen by 18 percent. In Iran, average wages in the public sector rose by 63% during 1987-2006, while private wages rose by only 4.5%. In Turkey, public sector wages rose by 47% during 1988-2003, while private wages were *down* by 11%.

Vocational high school graduates have not fared well in any of the countries during the period under study. They did worst in Iran with a drop in the real wage of one-third during 2001-06, and best in Turkey with a drop of only 19% during 1994-2003. Since these economies have generally expanded during the period of study (see Figure 1), it is likely that the skills that TVE graduates learn are not what new jobs in these economies require. Alternatively, the tracking mechanism that selects students into TVE has selected increasingly lower ability students. Either way, given the shortage of practical skills in these economies, something needs to be done to change this trend.

University graduates have fared better. In Egypt during 1988-98 their average hourly wage (public and private combined) declined sharply, from \$2.98 to \$1.90, but recovered to \$3.04 in 2006. In Iran their wages fell from \$5.67 in 1987 to \$5.43 in 2001 and increased to \$6.18 in 2006, despite the expansion of universities and the rising number of graduates during the 2001-06 period. The wage increase of tertiary graduates during this period took place both in the public and private sectors and suggests the positive effect of the oil boom on this category. The average college premium (tertiary minus upper secondary wage) increased, from \$2.03 per hour to \$2.46. In contrast, in Egypt and Turkey the average college premium fell. In Turkey, tertiary graduates enjoy the highest pay but their real wages fell lightly, from \$7.27 in 1994 to \$7.07 in 2003. We will revisit these premiums when we discuss the estimates of returns to schooling that control for experience, providing a more accurate view of the changing rewards to schooling.

## 5.2 Wage dispersions and labor market institutions

Are the rankings and trends in labor market flexibility discussed earlier 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, given education. In this extreme case, the Mincer equation would simply return the government-set wage scale. In a more flexible market, variation in the quality of degrees and of other skills would generate variation in wages for a given level of education.

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 was higher in 2006 compared to earlier years, suggesting less rigid wage setting. Interestingly, the coefficient of variation increased more in the public than private sector. In Iran dispersion has fallen continuously. In Turkey it fell during 1988-94 but rose slightly in 2003. These patterns hold for nearly all education levels.

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 wages in the private sector. This conjecture is borne out by the data except for Egypt in 2006 and Iran in 1987, where public sector wages are less tightly distributed than private wages.

Given the trend toward more labor market liberalization, we expected dispersion of wages to have increased over time in the private sector, more so than in the public sector, as liberalization gives more freedom to private employers to pay according to productivity rather than credentials. This conjecture is supported by the evidence in Table 6 as dispersion is higher for private sector in Egypt and Turkey but not Iran. In Egypt, the substantial increase in dispersion in private wages during 1998-2006 may be due to the labor market reforms since 2003 which has freed wage setting in the private sector. In Iran, there is a significant increase in the dispersion of wages for the tertiary educated in the private sector, but not for other groups.

## 6 Estimation Results

### 6.1 Standard Mincer returns

We use the Mincer equation (Mincer 1974) to compare the returns to education across countries and over time:

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

where  $W$  is the hourly wage,  $S$  is years of schooling,  $E$  is years of experience, and  $i$  is the index for the individual. The Mincer equation is an effective way to summarize earnings data, though it does not reveal the causal impact of education where there is selection in education and labor markets are not competitive (Card 1999; Heckman, Lochner, and Todd 2003; Heckman, Lochner, and Todd 2008) We employ three variants of this equation: the standard version linear in years of schooling, non-linear with quadratic years of schooling, and semi-parametric with education levels.

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 coefficients of schooling (which we interpret as the private rates of returns)<sup>5</sup> are lower in Egypt relative to Iran and Turkey. In the early years the returns are low in all three countries: about 5% in Egypt and 7% in Iran and Turkey. They remain about the same in Egypt and Iran in later years, but in the case of Turkey there is a clear upward trend. In 2006, the rate of return is estimated at 5.3% per year of schooling in Egypt, 7.6% in Iran, and 12.4% in Turkey (2003).

Estimates for returns to (potential) 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.<sup>6</sup>

<sup>5</sup>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, but at the university level a large percentage of Iranian and Turkish students pay private tuition.

<sup>6</sup>This choice affects the position of the curves but not their shape. For Egypt and Iran, where wages have

Returns to experience follow a common pattern, increasing continuously, even beyond 30 years of experience. The results for the 1987 sample for Iran are different from the rest. The marginal returns to each year of experience begin very high, at 20%, and decline to zero by about 28 years of experience, after which they turn negative. This unusual pattern may reflect the revolutionary and war economy of Iran in the 1980s, when the private sector was in full retreat and the public sector pay scales dominated the wage distribution. For all three countries we observe a downward shift in the wage-experience profile, indicating lower returns to experience. We attribute this to the shift away from public employment, in which wages rise with experience without regard to productivity, and toward private employment and greater emphasis on productivity (see Table 1).

Interestingly, after 1988 returns to experience increase in Turkey. Although it is not possible to explain this change definitively, this may be related to the fact that, unlike in the other two countries, in Turkey the proportion of public sector workers in the sample has been *rising* (Table 1).

Public and private sector workers have different experience profiles, as seen from Figures 7 and 8. These profiles are derived from separate regressions for the two sectors (not reported here). 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. Nevertheless, we do observe differences in the experience profile for public and private sector workers. For public sector workers, in all countries the returns to experience have declined since the 1980s, whereas for private sector workers the results are mixed. The profile has shifted upward for Turkey, where the private sector has been more active, but not for Egypt and Iran.

In general, decline in the value of experience can be a good thing if it means that the role of bureaucratic promotion based on age or tenure has become less important in determining compensation. The decline in returns to experience in Egypt and Iran since the 1980s is consistent with increasing competitiveness of their labor markets.

## 6.2 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 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 term for years of schooling:

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

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 in contrast with the notion of diminishing returns in schooling, which implies that the returns should be decreasing.

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increased faster at the higher education levels, these experience profile are underestimate the wage levels in later years.

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 are 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 higher degrees, especially university education. The negative coefficients for years of schooling (mostly not significant) is because the wages of those with very low levels of schooling are even lower than those with no schooling.

The graphs also show that over time returns in Turkey have been rising, stagnant in Egypt and declining in Iran. The larger coefficients of years of schooling squared in the last period compared to the period before suggest that the degree of convexity in the wage-schooling profile has increased, implying more, rather than less, emphasis on higher degrees. We will return to the issue of convexity of returns below where we use levels instead of years of education.

### 6.3 Education levels

We can get a more precise idea of the convexity by using levels instead of years of schooling. This is also motivated by the evidence that degrees matter over and above years of schooling (the sheepskin effect), which has been observed in previous empirical work on Egypt (Assaad 1997; El-Hamidi 2006). In our regressions we divide schooling levels into five categories: less than primary (illiterate plus read and write), less than upper secondary, upper secondary, vocational high school, and tertiary. We combine two-year post-secondary programs with tertiary because we could not obtain comparable data separately for all three countries. We also combine the illiterate and the read-and-write categories into one because previous regressions on years of schooling (Figure 9) and level regressions with extended levels show that returns at lower levels are close to linear. Doing so also prevents our reference category from getting too small (the proportion of the illiterate workers in the 20-54 age groups had decreased in later years).

Our estimated equation for levels is:

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

where  $L_{ij}$  is the dummy variable for the level of education of individual  $i$  and  $j = 0, \dots, 4$ . Table 9 shows the results of the estimation for our nine samples. These coefficients measure the premium relative to the reference category, which is less than primary. Marginal returns for tertiary relative to general and vocational upper secondary levels are provided at the bottom of the table. Returns to basic education (primary plus lower secondary) in the first row show wide variation across countries and over time. They increase from the first period to the second in all three countries, and sharply so in Iran and Turkey. This trend is reversed in Egypt and Iran but not Turkey.

Beyond the basic level, returns to schooling have increased only in Turkey, where the economy has been more dynamic and the labor markets the least distorted of the three. This has occurred in Turkey despite an increase in supply of more educated workers, suggesting that increased demand is responsible for the higher premiums. One possible explanation is that Turkey benefited more for the expansion of the global economy, which increased the share of the type of goods and services (such as tourism) that employ more educated workers. The marginal returns to upper secondary (i.e., the upper secondary premium, computed as the difference between the coefficients of upper secondary and basic levels) nearly doubled in Turkey in 15 years, increasing from 26.8

percent in 1988 to 51.1 percent in 2003.<sup>7</sup> In Iran, the same marginal returns were not only lower but declined by one-fourth during a similar period, from 56.9 percent in 1987 to 41.4 percent in 2006. This is consistent with the rapid expansion of upper secondary education in the 1990s, less for its own sake than to take a shot at university education. The decline in returns at higher levels suggests that demand for skilled labor did not keep pace with the increase in supply. Economic growth in Iran in the 2001-06 period was robust, thanks to the high price of oil, but the oil-based nature of growth may not have favored the more educated labor force sufficiently to counter the effect of their increasing numbers.

The levels regressions allow a separate category for vocational and technical training at the upper secondary level, which many regard as the solution to labor market mismatch and youth unemployment. The distinction between general and vocational upper secondary is not very useful in the case of Egypt, where general upper secondary students are a very small category and the results for them are not reliable. But for Iran and Turkey the distinction is very important from a policy point of view. In these countries, Iran in particular, about two-thirds of secondary students continue on the general track in the hope of entering university. The question is whether those who fail to enter university acquire skills along the way that the market needs and rewards. If not, should Iran and Turkey follow the Egyptian model and limit the general track so that all who stay in it are actually able to enter university. More recently, since 2006, Iran has found its own solution to the latter problem by expanding university education (mainly its distance component) so fast as to make it possible for all upper secondary graduates to continue their education to the tertiary level.

Keeping in mind the different selection mechanisms in the three countries, we note these observations based on the results in Table 9. The first observation is that, predictably, vocational returns are much lower in Egypt than in the other two countries. The marginal returns to vocational education, as noted earlier, were 21.9 percent in 2006, which is lower than in Iran (32.6 percent in 2006) and Turkey (60.8 percent in 2003). These results for Egypt 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), which show that TVE education has lower returns than general upper secondary. The much lower estimated TVE coefficient in Egypt in 1998 (16.4 percent compared to 50.4 percent for general upper secondary) is consistent with observations made by Heyneman and Gill (1997), which blames it on over-supply of vocationally trained workers by a factor of 5 to 7. An added problem is the strong negative signal from tracking. As Heyneman and Gill (1997) note, the general perception is that the vocational system “is reserved for those who consider themselves as having ‘failed already’.”

The second observation is that rewards for vocational and technical skills training have changed in Iran and Turkey, the two countries with large general upper secondary groups. In Iran, the change in vocational returns relative to upper secondary is of particular interest because of the implementation of the tracking system during the 1990s, which should be reflected in the 2006 data. 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 adverse selection when enrollment in TVE is not voluntary, and that the mix of students in vocational schools would shift away

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<sup>7</sup>This result is in contrast to the results in Tansel (2008), who finds returns to have decreased over time. The two sets of results are not fully comparable because of differences in methodology (Tansel corrects for selection into various sectors of the economy). Given substantial economic growth in Turkey, we find the decline in returns to education somewhat implausible.

from those with a genuine interest in such skills in the direction of would-be high school dropouts. After the implementation of tracking, about half of those who enroll in vocational 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 Iran results are consistent with these expectations: marginal returns to TVE decreased from 70.9 percent in 1987 to 64.9 percent in 2001 and to 32.6 percent in 2006. They started at about 25 percent *higher* than general upper secondary and fell to 21 percent *lower*. The sharp decline since 2001 is likely the effect of the introduction of tracking in the 1990s which selected students with low academic ability into TVE. The Turkish results are interesting because they show that, contrary to general perception, returns to TVE are higher than upper secondary, by about 20 percent in all years. The returns increased during 1988-1994 but stayed constant up to 2003. Tansel (1994, Tansel (2002b), using a different estimation strategy, also finds that returns to vocational training were higher than those to upper secondary.

The marginal returns to university education (the college premium) show a divergent experience for the three countries. In all three countries, tertiary education expanded rapidly, but the returns show the impact has been quite different.<sup>8</sup> In Turkey, the premium increased from 52.9 percent in 1994 to 72.0 percent in 2003. This is consistent with the greater sophistication of its economy and the lower level of distortion in its labor market. Lower distortion means that the expansion may well have been driven by demand, making it possible for the rewards to increase.

The opposite has occurred in Iran, where the expansion of university education has been rapid but guided more by degree seeking behavior than by employer demands for specific skills taught in university. The share of tertiary graduates in the 20-54 years-old male wage earners increased from 5.45% in 2001 to 11.40% in 2006 (see Table 1). During the same period the share of upper secondary workers remained constant at about 19%. As a result, the marginal returns to tertiary education relative to upper secondary fell from 54 percent in 1987 to 45 percent in 2001 and 2006.

In Egypt, the relevant premium, relative to vocational upper secondary, is lower than in the other two countries and followed an intermediate pattern over time. The premium fell from 37.5 percent in 1988 to 35.2 percent in 1998, but increased to 44.2 percent in 2006. The latter may reflect the general increased competitiveness of the economy over time and the specific labor market reforms since 2003.

## 6.4 Returns in the public and private sectors

The public sector plays a large role in the structure of wages in Middle Eastern labor markets. In this section we consider how these signals of rewards to investment in education differ across countries and over time.

Most studies of returns to education in MENA attempt to capture the differential reward structures in the public and private sectors. 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. Assaad (1997) and Tansel (2005) also model how individuals are sorted into these sectors. Accounting for selection is important because workers in the two sectors may differ in unobservable characteristics that affect their wages. The difficulty with the selection approach is finding suitable instruments for identification. The estimation results from selection models are very sensitive to the va-

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<sup>8</sup>We combine the technical institute graduates in Egypt with tertiary because we lack similar data for the other two countries.

lidity of the exclusion restrictions assumed in the selection equation (Vella 1999). Since we lack good instruments that would preserve comparability of the estimates across countries and over time, we limit our analysis to two simple extensions, namely adding a sector dummy variable in equation 3 and estimating separate regressions for the public and private sectors. Naturally, the results should be interpreted as a summary of how education and experience are rewarded in the private and public sectors. We cannot tell whether the observed reward structures reflect the productivity of education and experience in the two sectors or differences in selection. To the extent that individuals and families ignore the selection mechanisms of these sectors in their investment decisions, these results are the relevant labor market signals to consider.

The coefficient of the dummy variable (see Tale 10), which is one for public sector workers, is negative in early years and turns positive in the last year for all three countries. Thus, holding education and experience constant, average public wages, which used to be lower than private sector wages, are higher in the latest year. This seems inconsistent with greater labor market liberalization that we have postulated in this paper. In Turkey, a private sector premium of about 7 percent in 1988 and 1994 turned to a public sector advantage of 41.6 percent in 2003. In Egypt, private sector advantages of 30.2% and 21.5% disappeared by 2006. In Iran, the private sector premium of 34.8% in 1987 changed to public sector premiums of 15.9% in 2001 and 6.9% in 2006. 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 whether the difference between the two sectors is more in the returns to specific levels rather than just the average.

The differences in rewards to education in public and private employment can be seen from the results of separate regressions in Table 11 (to save space we present only the marginal returns). The results reveal large differences in the compensation schemes in the private and public sectors in the three countries.

In Egypt, except at the tertiary level, the public sector offers larger wage premiums than the private sector. In 2006, the college premium offered by private employers, which had been lower by 25 and 13 percent in previous years, was 20 percent greater than that offered by public employers (differences are significant at the 5 percent level of confidence).

A similar situation is observed in Iran, where at lower levels of education the public sector offers greater premiums, but there is an interesting shift in 2006 for the tertiary premium. During 2001-06, the premium for tertiary diplomas relative to upper secondary in the public sector fell from 43.7% to 36.2%, while the private sector premium rose from 39.6% to 54.1%. This switch in the position of the public and private sectors is consistent with the increasing influence and sophistication of the private sector in recent years in Iran. This change also bodes well for private employers who can thus enhance their role in setting the incentives for what students learn in secondary schools and universities.

There is further evidence of divergence in payment schemes of public and private sectors in the premium for vocational relative to basic education. One would expect that the technical skills training of vocational graduates would make them more desirable for private than public employers. However, this is not the case in Egypt, where during all periods TVE graduates working in the public sector enjoyed a greater premium relative to those with basic education. In Iran vocational graduates used to enjoy a greater premium in the public sector but in 2006 the situation was reversed. This is mainly because of the faster decline in TVE compensation in the public sector than any improvement in the private sector. In Turkey, in 1994 and 2003, the premium offered by private employers to TVE graduates was 97 and 54 percent higher compared to public

employers. The opposite was the case in 1988.

The premium for upper secondary relative to basic education was higher in the public than private sector in Iran, though the public sector premium has fallen significantly over time. The opposite is the case in Turkey since 1994, where private employers offer a higher premium.

## 7 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 relate observed differences in the estimated returns to differences in the environment in which these returns are realized. We characterize these environments with descriptions 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-thirds 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 returns to 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 then 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 signalling 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 is realized when higher diplomas are acquired, so for those who do not make it to the higher levels, returns tend to be low, as we have noted in the Mincer regressions in this paper.

The most important dimensions of rigidity are the share of the public sector in total employment and the degree of regulation of private employment. The 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 these measures 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 of 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 the private relative to the public sector. But, in rigid markets, we expect that the 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.

The links we highlight between our estimates of returns to education and the institutions that determine rewards to education are mainly suggestive and fall well short of establishing a causal role for institutions. Nevertheless, we believe that providing comparable estimates of returns in three countries with differing institutions and highlighting their differences in connection with differences in these institutions is the right direction to proceed. Clearly we need more studies of returns to education, but we also need them to address the contexts in which they arise. Human capital policy in MENA can benefit greatly from showing how the signals that lead families and individuals to invest in education might be shaped by institutions that policy can influence, such as the system of selection in education and labor market flexibility.

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## 8 Figures

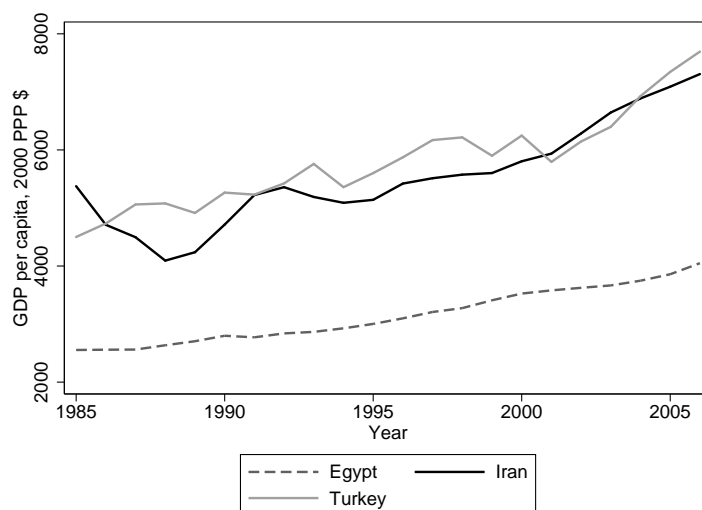
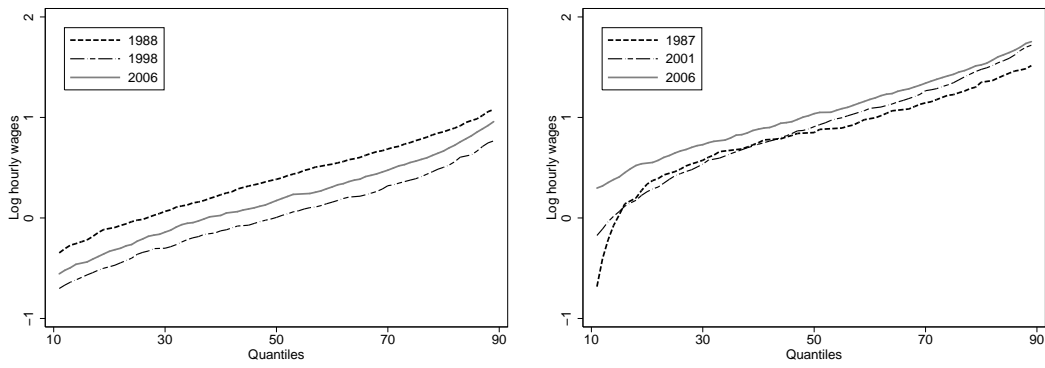
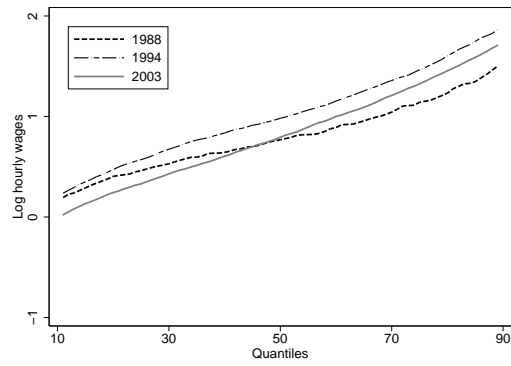


Figure 1: GDP per capita in Egypt, Iran, and Turkey, 1985-2006  
Source: World Bank WDI (2007)



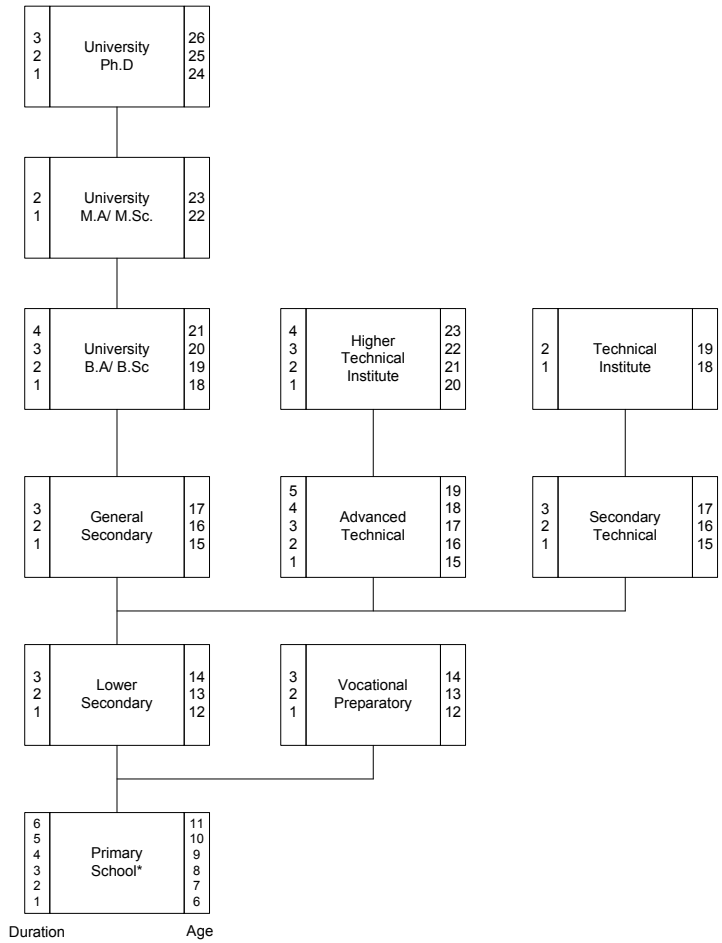
(a) Egypt

(b) Iran



(c) Turkey

Figure 2: Distributions of log hourly wages



\* There were only 5 years of primary school from 1988 to 1999

Figure 3: Education system in Egypt

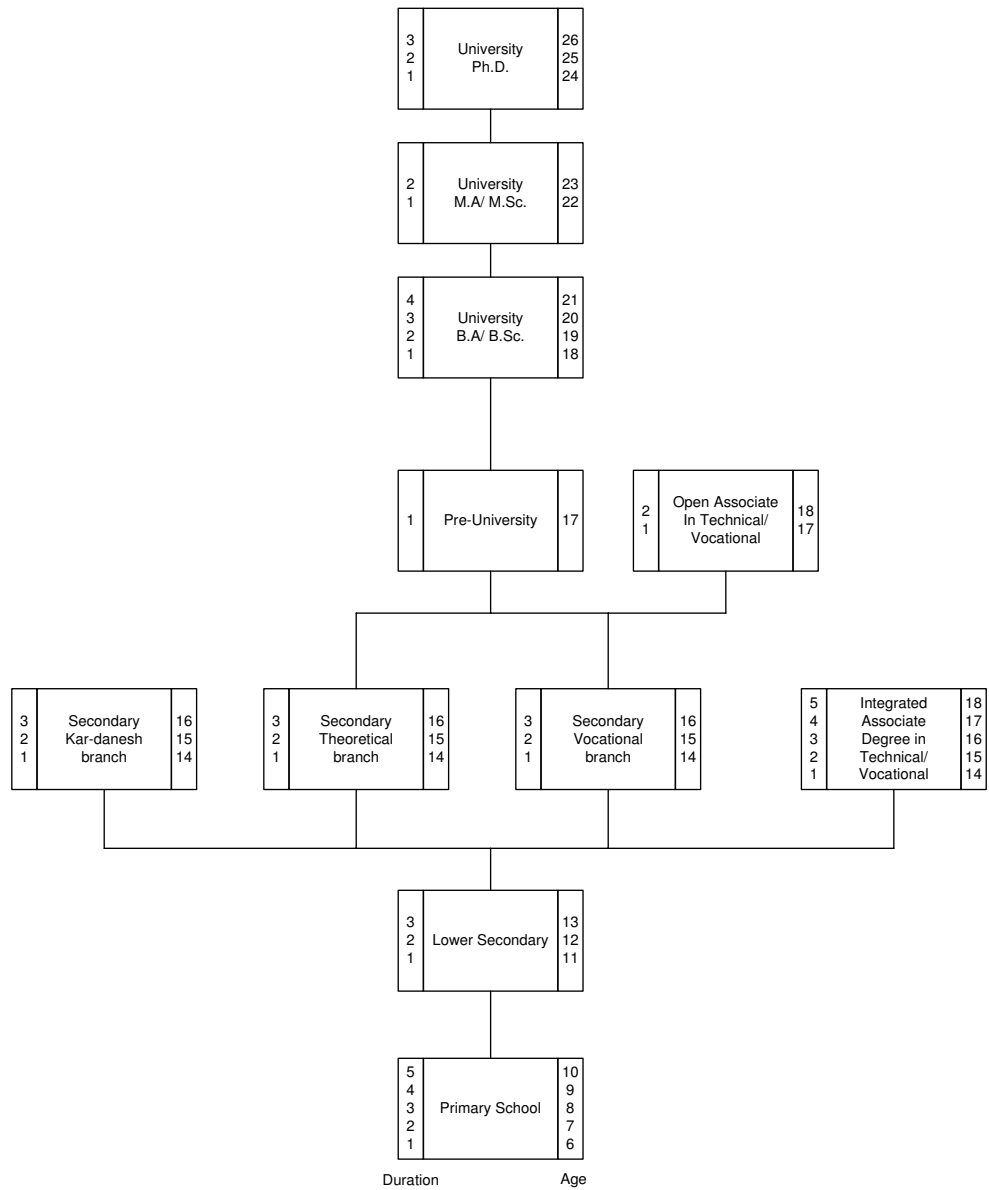


Figure 4: Education system in Iran

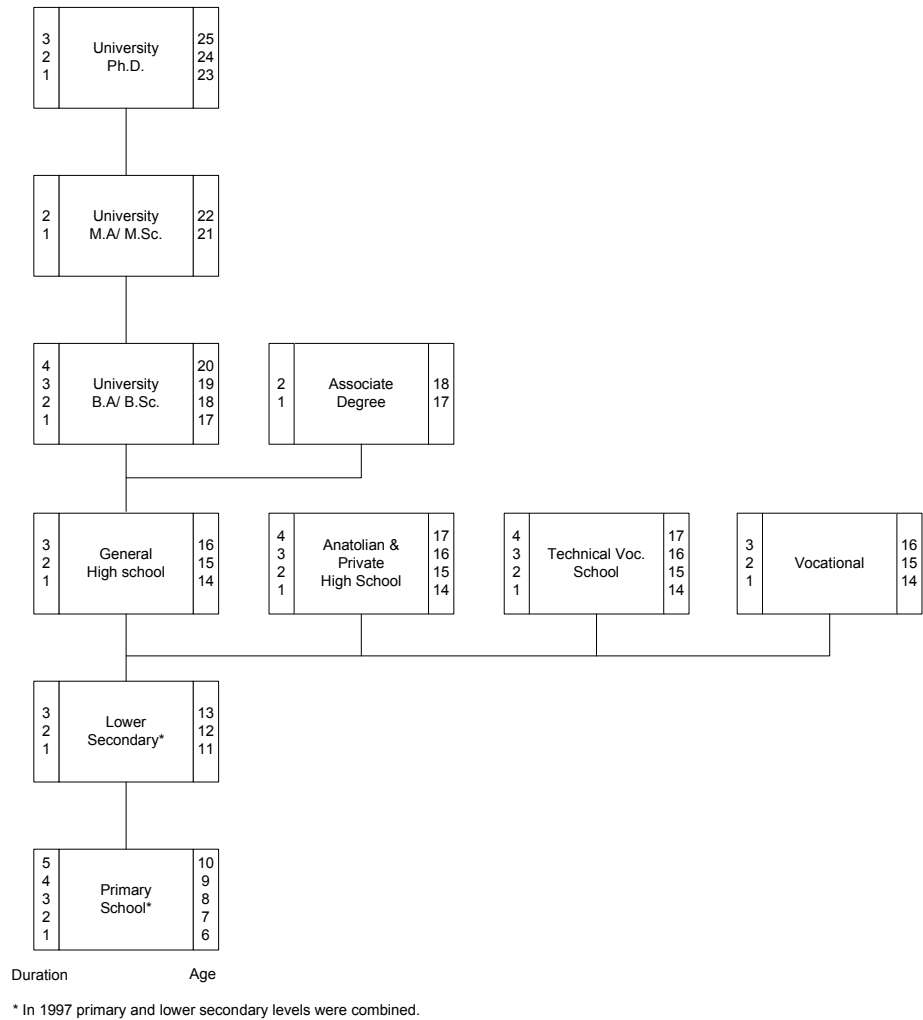


Figure 5: Education system in Turkey

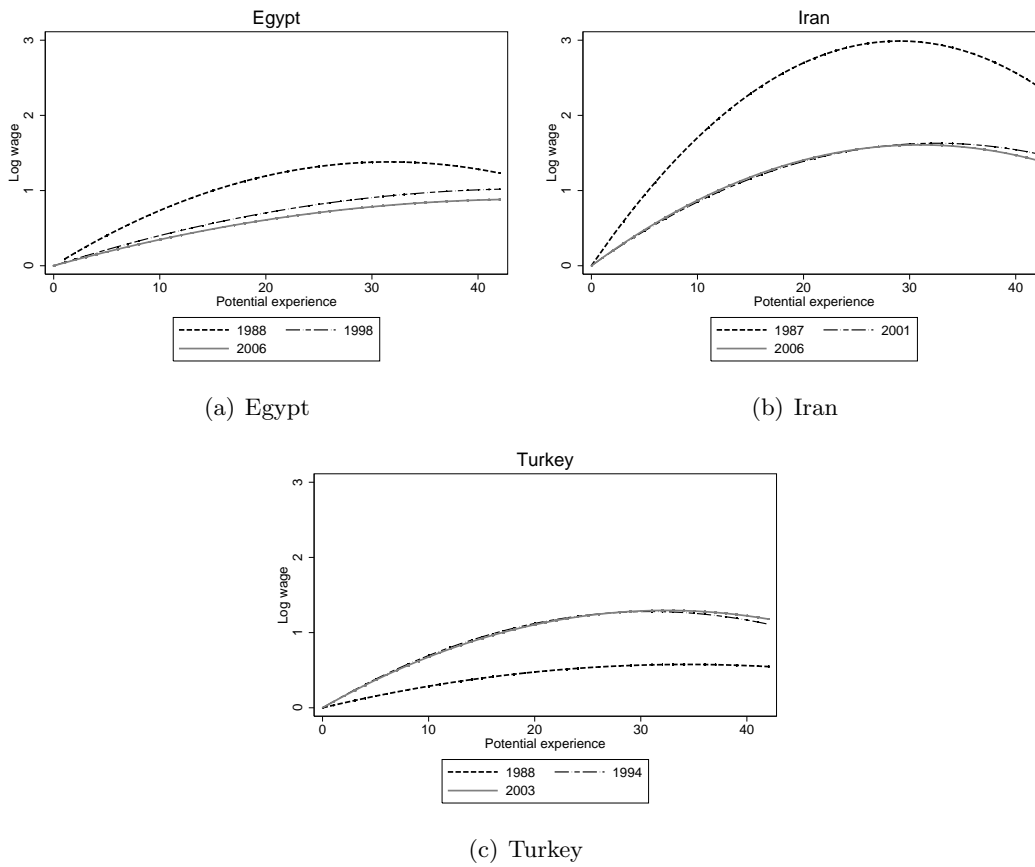
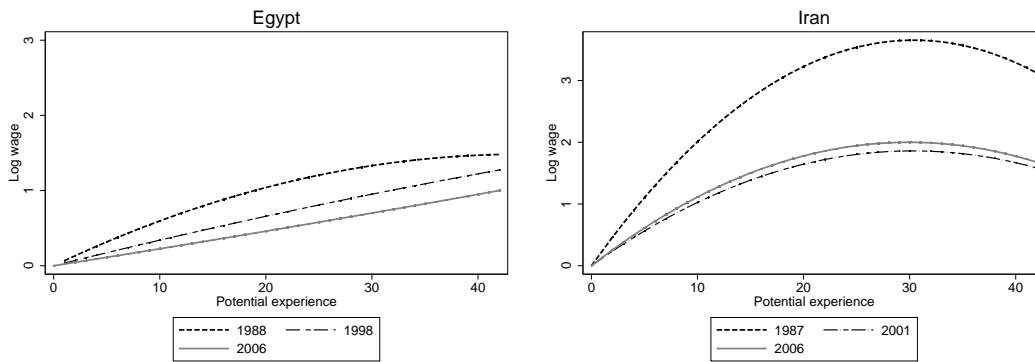
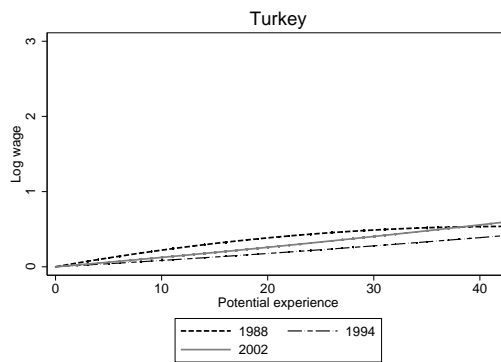


Figure 6: Wage-experience profiles based on the standard Mincer regressions



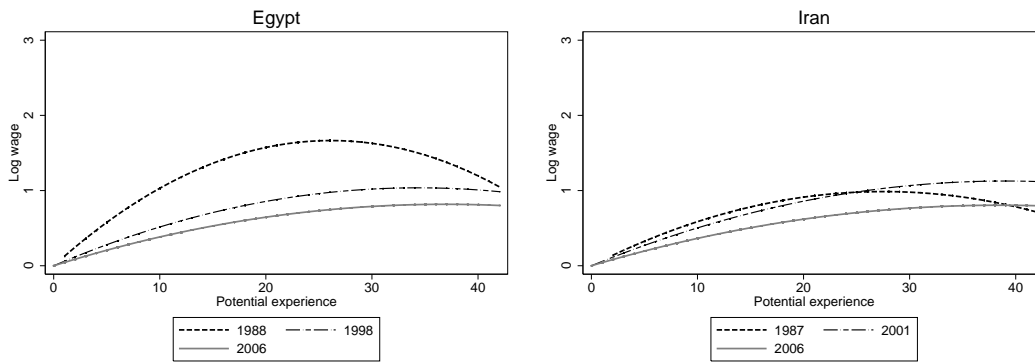
(a) Egypt

(b) Iran



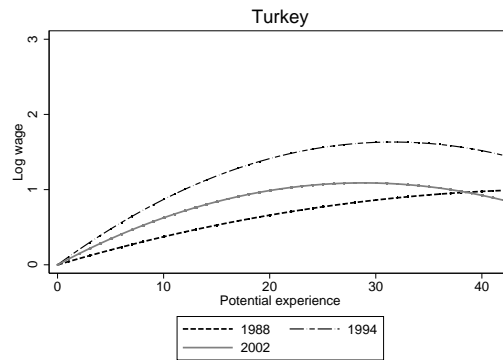
(c) Turkey

Figure 7: Earning-experience profile–public sector



(a) Egypt

(b) Iran



(c) Turkey

Figure 8: Earning-experience profile—private sector

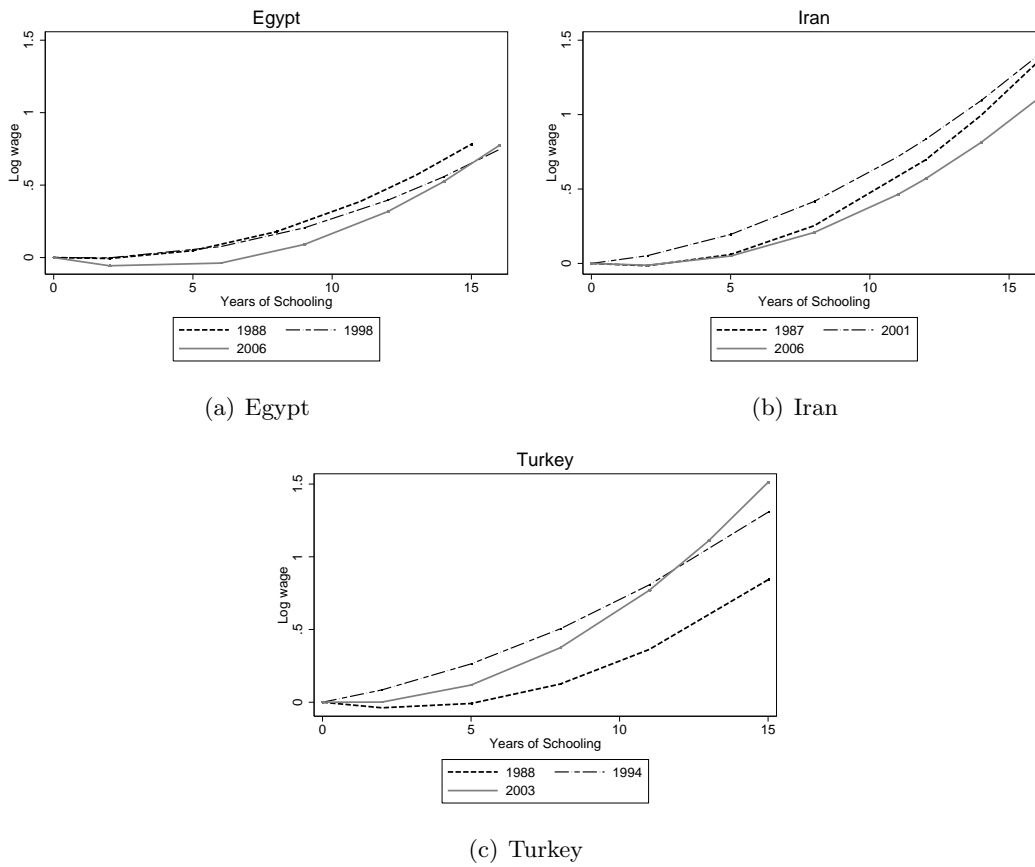


Figure 9: Earning-schooling profile–Mincer equation with quadratic schooling

## 9 Tables

Table 1: Summary statistics, urban male wage and salary workers, aged 20-54

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2003
Age	35.87	36.23	34.99	32.32	34.95	34.38	33.68	34.75	35.47
Average years of schooling	8.24	10.34	11.10	6.47	8.81	8.96	6.84	7.58	8.44
Average years of experience	19.94	18.98	17.21	18.12	19.39	18.67	19.81	20.46	20.52
Mean hourly wage	1.96	1.31	1.96	2.78	3.09	3.40	2.89	3.66	3.08
Median hourly wage	1.55	1.04	1.24	2.33	2.51	2.85	2.16	2.70	2.24
Sd log hourly wage	0.71	0.63	0.76	1.16	0.87	0.77	0.60	0.69	0.71
Public sector	63.13	53.75	42.64	67.01	48.66	34.26	21.82	19.02	26.59
No of observations	1,530	1,947	2,889	1,476	2,000	6,855	7,614	10,566	9,483
<b>Education levels (percent)</b>									
Illiterate	16.08	9.78	8.36	16.73	4.70	5.84	4.80	1.95	0.82
Read&Write	15.80	8.04	4.65	11.72	6.55	4.26	5.37	2.23	1.60
Primary	8.22	11.46	9.27	25.95	20.35	22.59	53.72	51.10	39.82
Lower secondary	6.38	7.74	6.11	15.58	20.25	20.42	10.41	12.61	15.02
Upper secondary	2.58	1.15	1.23	19.72	19.55	19.28	9.69	17.16	21.80
Vocational high school	19.90	26.12	33.80	7.66	20.20	10.31	6.46	3.99	6.45
Post secondary	6.14	9.50	7.60	0.88	2.95	5.91	-	-	3.37
Tertiary	24.91	26.20	28.98	1.76	5.45	11.40	9.55	10.96	11.11
<b>Average hourly wage</b>									
Illiterate	1.34	0.91	1.45	2.52	2.32	2.34	2.35	2.06	1.57
Read&Write	1.54	1.06	1.47	2.73	2.22	2.74	2.42	2.39	1.68
Primary	1.58	1.09	1.30	2.51	2.26	2.82	2.58	2.92	2.07
Lower secondary	1.40	1.07	1.29	2.43	2.38	2.68	2.66	3.28	2.46
Upper secondary	2.48	1.58	1.65	2.93	3.35	3.72	2.88	4.01	3.13
Vocational high school	1.82	1.10	1.57	3.86	4.15	2.79	3.04	4.37	3.56
Post secondary	1.89	1.28	1.91	3.75	3.67	4.20	-	-	4.29
Tertiary	2.98	1.90	3.04	5.67	5.43	6.18	5.33	7.27	7.07

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 2003.

Table 2: Participation rates and sample characteristics (percent)

<b>Labor force participation, ages 15-64</b>									
	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2003
Male	77.9	74.0	77.2	82.9	75.5	75.7	85.5	82.4	75.2
Female	29.0	20.3	21.6	21.6	34.5	41.9	36.1	33.1	29.4
Total	53.5	47.2	49.4	53.1	55.2	59.0	61.1	58.1	52.6
<b>Labor force participation, ages 20-54</b>									
	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2003
Male	83.8	84.9	89.1	94.4	92.3	90.8	93.6	92.0	85.1
Female	45.8	49.3	50.0	11.4	25.0	21.2	36.6	34.2	31.4
Total	64.3	67.0	69.5	52.6	58.4	55.8	64.4	62.8	58.1
<b>The structure of working sample</b>									
	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2003
Proportion urban	43.7	43.3	41.4	57.7	57.5	70.8	-	-	63.5
Proportion aged 20-54	69.9	77.7	79.8	73.8	77.3	80.7	84.0	87.0	91.2
Proportion in wage and salary	64.8	74.0	73.5	63.7	57.9	58.0	67.6	68.7	72.0
Proportion full-time	94.1	95.3	97.9	94.6	94.0	93.1	98.1	97.5	94.6

Note: In the bottom panel, the first row is the share of urban workers in total male employment, and subsequent percentages are shares in the category immediately above.

Source: Top panel, World Bank WDI database, 2007; bottom two panels, authors' calculations from survey data.

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	27.70	9.42	16.16	15.89	4.56	9.80	11.66	3.99	8.39
Read&Write	17.63	14.65	15.75	9.75	6.60	8.06	5.37	3.74	4.68
Primary	9.73	7.40	8.26	14.99	8.46	11.48	12.17	5.36	9.27
Lower secondary	6.57	6.26	6.37	9.86	5.95	7.76	7.11	4.86	6.15
Upper secondary	2.30	2.76	2.59	1.15	1.16	1.15	1.42	1.00	1.24
Vocational high school	16.58	21.52	19.70	25.40	26.58	26.03	34.39	32.93	33.77
Post secondary	3.92	7.49	6.17	5.69	12.82	9.52	5.98	9.77	7.59
Tertiary	15.57	30.50	25.00	17.27	33.85	26.18	21.90	38.35	28.91
Total	100	100	100	100	100	100	100	100	100

	Iran								
	1987			2001			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	31.83	9.30	16.73	7.00	2.08	4.61	8.14	1.43	5.84
Read&Write	14.37	10.41	11.72	9.76	3.12	6.53	5.89	1.12	4.26
Primary	25.87	25.99	25.95	28.01	12.07	20.25	27.95	12.31	22.59
Lower secondary	10.27	18.20	15.58	23.57	17.17	20.46	24.50	12.58	20.42
Upper secondary	12.11	23.46	19.72	15.09	23.83	19.34	16.57	24.48	19.28
Vocational high school	5.13	8.90	7.66	13.12	27.89	20.30	10.03	10.86	10.31
Post secondary	-	1.31	0.88	1.08	4.99	2.99	2.20	13.01	5.91
Tertiary	0.41	2.43	1.76	2.37	8.84	5.52	4.72	24.21	11.40
Total	100	100	100	100	100	100	100	100	100

	Turkey								
	1988			1994			2003		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	5.89	0.88	4.80	2.34	0.29	1.95	1.07	0.14	0.82
Read&Write	6.48	1.37	5.37	2.72	0.12	2.23	2.02	0.45	1.60
Primary	60.89	28.03	53.72	60.50	11.10	51.10	48.09	16.99	39.82
Lower secondary	9.48	13.75	10.41	11.97	15.35	12.61	15.75	13.02	15.02
Upper secondary	7.88	16.18	9.69	13.49	32.78	17.16	19.14	29.17	21.80
Vocational high school	4.89	12.11	6.46	3.68	5.31	3.99	5.60	8.80	6.45
Post secondary	-	-	-	-	-	-	2.23	6.51	3.37
Tertiary	4.48	27.69	9.55	5.30	35.05	10.96	6.11	24.93	11.11
Total	100	100	100	100	100	100	100	100	100

Table 4: Average hourly wage by sector and education level, 2000 international (PPP) dollars

	Egypt								
	1988			1998			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	1.44	1.16	1.34	0.95	0.78	0.91	1.07	2.95	1.45
Read&Write	1.77	1.39	1.55	1.10	1.01	1.06	1.45	1.49	1.47
Primary	1.74	1.46	1.58	1.18	0.96	1.09	1.21	1.58	1.30
Lower secondary	1.43	1.39	1.40	1.12	1.00	1.07	1.16	1.53	1.29
Upper secondary	3.21	2.13	2.48	1.61	1.55	1.58	1.37	2.19	1.65
Vocational high school	2.05	1.71	1.82	0.98	1.20	1.10	1.40	1.81	1.57
Post secondary	1.76	1.92	1.89	1.22	1.30	1.28	1.30	2.43	1.92
Tertiary	3.76	2.75	2.98	2.02	1.85	1.90	3.04	3.04	3.04
Total	2.04	1.92	1.96	1.23	1.37	1.31	1.68	2.36	1.97
	Iran								
	1987			2001			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	2.44	2.65	2.52	1.99	3.75	2.38	2.25	3.26	2.34
Read&Write	2.59	2.83	2.73	2.08	2.81	2.25	2.63	3.91	2.74
Primary	2.60	2.46	2.51	2.02	2.94	2.29	2.47	4.36	2.82
Lower secondary	2.74	2.34	2.43	1.95	2.92	2.35	2.44	3.61	2.68
Upper secondary	2.73	2.98	2.93	2.75	3.84	3.40	3.07	4.56	3.72
Vocational high school	3.15	4.06	3.86	3.90	4.28	4.15	2.51	3.28	2.79
Post secondary	-	3.75	3.75	1.79	4.10	3.67	3.13	4.55	4.20
Tertiary	4.00	5.80	5.67	4.61	5.66	5.43	5.86	6.29	6.18
Total	2.61	2.86	2.78	2.42	3.84	3.11	2.73	4.67	3.40
	Turkey								
	1988			1994			2003		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	2.34	2.48	2.35	2.02	3.33	2.06	1.48	3.59	1.57
Read&Write	2.43	2.24	2.42	2.38	2.77	2.39	1.46	4.43	1.68
Primary	2.64	2.04	2.58	2.91	3.06	2.92	1.86	3.74	2.07
Lower secondary	2.70	2.56	2.66	3.31	3.15	3.28	2.04	3.84	2.46
Upper secondary	2.96	2.74	2.88	4.15	3.76	4.01	2.58	4.13	3.13
Vocational high school	2.97	3.15	3.04	4.50	3.99	4.37	2.99	4.55	3.56
Post secondary	-	-	-	-	-	-	3.63	4.92	4.29
Tertiary	6.21	4.81	5.33	9.24	6.01	7.27	8.39	6.17	7.07
Total	2.82	3.14	2.89	3.48	4.39	3.66	2.52	4.62	3.08

Notes: All wages are converted from local currency to 2000 international dollars using the PPP exchange rates from World Bank, World Development Indicators database.

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	0.73	0.59	0.69	0.54	0.42	0.51	0.56	6.26
Read&Write	1.01	0.65	0.84	0.50	0.63	0.56	2.02	1.30	1.80
Primary	0.78	0.59	0.69	0.54	0.65	0.59	1.09	1.99	1.37
Lower secondary	0.77	0.59	0.66	0.62	0.55	0.59	0.60	2.45	1.50
Upper secondary	3.63	1.14	2.26	0.98	1.25	1.11	1.02	2.41	1.64
Vocational high school	4.44	1.20	2.66	0.61	0.77	0.71	2.39	2.14	2.30
Post secondary	1.20	1.53	1.45	0.92	0.96	0.95	0.71	5.65	4.24
Tertiary	4.53	2.07	2.86	1.90	1.26	1.48	5.82	6.32	6.11
Total	2.79	1.52	2.08	1.03	1.02	1.03	3.22	4.74	3.95
	Iran								
	1987			2001			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
	Illiterate	2.01	2.47	2.19	1.63	5.60	3.04	0.96	1.00
Read&Write	1.49	2.53	2.17	2.43	1.32	2.24	2.50	2.37	2.52
Primary	2.19	2.45	2.37	1.86	1.49	1.81	1.39	2.64	1.85
Lower secondary	2.37	1.97	2.07	1.29	2.03	1.70	1.24	1.90	1.48
Upper secondary	1.90	2.47	2.37	2.78	2.87	2.88	1.88	2.36	2.23
Vocational high school	1.65	7.52	6.68	3.49	2.51	2.87	1.35	3.87	2.58
Post secondary		2.70	2.70	0.88	1.65	1.78	1.54	2.34	2.26
Tertiary	0.73	4.24	4.10	1.96	4.29	3.91	5.54	3.60	4.22
Total	2.00	3.29	2.93	2.34	2.78	2.66	2.04	3.04	2.60
	Turkey								
	1988			1994			2003		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
	Illiterate	2.07	1.63	2.06	1.30	1.11	1.31	1.15	1.74
Read&Write	1.61	0.81	1.58	1.55	2.63	1.56	0.83	1.72	1.2
Primary	7.55	1.14	7.12	2.52	1.40	2.49	1.06	1.79	1.31
Lower secondary	2.78	2.66	2.75	2.30	1.37	2.12	1.31	1.77	1.61
Upper secondary	2.95	1.27	2.48	3.58	1.75	3.05	2.31	1.9	2.29
Vocational high school	2.43	1.52	2.10	2.86	1.40	2.57	2.81	2.03	2.66
Post secondary							2.85	1.78	2.45
Tertiary	5.03	3.64	4.26	9.50	2.73	6.51	9.18	2.78	6.3
Total	6.21	2.60	5.62	3.68	2.39	3.49	3.17	2.32	3.11

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	0.51	0.51	0.51	0.57	0.54	0.56	0.52	2.12	2.03
Read&Write	0.57	0.47	0.54	0.45	0.62	0.53	1.39	0.87	1.22
Primary	0.45	0.40	0.44	0.46	0.68	0.54	0.90	1.26	1.05
Lower secondary	0.54	0.42	0.47	0.55	0.55	0.55	0.52	1.60	1.16
Upper secondary	1.13	0.54	0.91	0.61	0.81	0.70	0.74	1.10	0.99
Vocational high school	2.17	0.70	1.46	0.62	0.64	0.65	1.71	1.18	1.46
Post secondary	0.68	0.80	0.77	0.75	0.74	0.74	0.55	2.33	2.21
Tertiary	1.20	0.75	0.96	0.94	0.68	0.78	1.91	2.08	2.01
Total	1.37	0.79	1.06	0.84	0.74	0.79	1.92	2.01	2.01
	Iran								
	1987			2001			2006		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	0.82	0.93	0.87	0.82	1.49	1.28	0.43	0.31	0.43
Read&Write	0.58	0.89	0.79	1.17	0.47	1.00	0.95	0.61	0.92
Primary	0.84	1.00	0.94	0.92	0.51	0.79	0.56	0.61	0.66
Lower secondary	0.86	0.84	0.85	0.66	0.70	0.72	0.51	0.53	0.55
Upper secondary	0.70	0.83	0.81	1.01	0.75	0.85	0.61	0.52	0.60
Vocational high school	0.52	1.85	1.73	0.89	0.59	0.69	0.54	1.18	0.92
Post secondary		0.72	0.72	0.49	0.40	0.49	0.49	0.51	0.54
Tertiary	0.18	0.73	0.72	0.43	0.76	0.72	0.95	0.57	0.68
Total	0.77	1.15	1.05	0.97	0.72	0.86	0.75	0.65	0.76
	Turkey								
	1988			1994			2003		
	Private	Public	Total	Private	Public	Total	Private	Public	Total
Illiterate	0.88	0.66	0.88	0.64	0.33	0.64	0.78	0.48	0.80
Read&Write	0.66	0.36	0.65	0.65	0.95	0.65	0.57	0.39	0.71
Primary	2.86	0.56	2.76	0.87	0.46	0.85	0.57	0.48	0.63
Lower secondary	1.03	1.04	1.03	0.69	0.43	0.65	0.64	0.46	0.65
Upper secondary	1.00	0.46	0.86	0.86	0.47	0.76	0.90	0.46	0.73
Vocational high school	0.82	0.48	0.69	0.64	0.35	0.59	0.94	0.45	0.75
Post secondary	-	-	-	-	-	-	0.79	0.36	0.57
Tertiary	0.81	0.76	0.80	1.03	0.45	0.90	1.09	0.45	0.89
Total	2.20	0.83	1.94	1.06	0.54	0.95	1.26	0.50	1.01

Table 7: Returns to schooling: Standard Mincer equation, urban male wage-earners

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2003
Years of schooling	0.052 (0.003)**	0.049 (0.003)**	0.054 (0.003)**	0.069 (0.006)**	0.088 (0.004)**	0.076 (0.002)**	0.065 (0.002)**	0.096 (0.003)**	0.124 (0.002)**
Experience	0.087 (0.008)**	0.045 (0.005)**	0.039 (0.005)**	0.206 (0.013)**	0.100 (0.009)**	0.104 (0.007)**	0.034 (0.004)**	0.083 (0.005)**	0.080 (0.003)**
Experience sq.	-0.138 (0.018)**	-0.050 (0.012)**	-0.043 (0.012)**	-0.354 (0.027)**	-0.154 (0.020)**	-0.168 (0.014)**	-0.049 (0.008)**	-0.135 (0.011)**	-0.124 (0.008)**
Constant	-1.110 (0.099)**	-1.101 (0.055)**	-0.859 (0.055)**	-2.065 (0.159)**	-1.184 (0.095)**	-0.894 (0.071)**	-0.053 (0.043)	-0.720 (0.055)**	-1.218 (0.042)**
Observations	1530	1947	2889	1476	2000	6855	7614	10566	9483
R-squared	0.24	0.22	0.14	0.27	0.26	0.29	0.14	0.29	0.38

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

Table 8: Returns to schooling with quadratic years of schooling

	Egypt		Iran		Turkey	
	1988	1998	1987	2001	1988	2003
Years of schooling	-0.012 (0.011)	-0.008 (0.009)**	-0.021 (0.018)	0.017 (0.015)	-0.031 (0.007)**	-0.015 (0.011)
Years of schooling sq.	0.004 (0.001)**	0.005 (0.001)**	0.007 (0.001)**	0.004 (0.001)**	0.006 (0.000)**	0.008 (0.001)**
Experience	0.086 (0.008)**	0.046 (0.005)**	0.208 (0.013)**	0.103 (0.009)**	0.039 (0.004)**	0.082 (0.003)**
Experience sq.	-0.135 (0.018)**	-0.052 (0.011)**	-0.366 (0.027)**	-0.162 (0.020)**	-0.064 (0.008)**	-0.130 (0.008)**
Constant	-1.000 (0.100)**	-0.970 (0.059)**	-1.890 (0.159)**	-0.978 (0.102)**	0.205 (0.045)**	-0.703 (0.056)**
Observations	1530	1947	1476	2000	7614	9483
R-squared	0.25	0.24	0.28	0.27	0.17	0.40

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

Table 9: Returns to schooling: Education levels

	Egypt		Iran		Turkey	
	1988	1998	2006	2001	1988	2003
Basic education	0.133 (0.045)**	0.188 (0.041)**	0.084 (0.042)*	0.265 (0.061)**	0.054 (0.023)*	0.302 (0.039)**
Upper secondary	0.432 (0.116)**	0.692 (0.113)**	0.447 (0.131)**	0.731 (0.067)**	0.322 (0.030)**	0.861 (0.052)**
Vocational	0.364 (0.047)**	0.352 (0.040)**	0.303 (0.038)**	0.914 (0.067)**	0.374 (0.033)**	0.958 (0.056)**
Tertiary	0.739 (0.044)**	0.704 (0.040)**	0.745 (0.040)**	1.180 (0.081)**	0.902 (0.031)**	1.581 (0.054)**
Potential experience	0.086 (0.008)**	0.046 (0.005)**	0.042 (0.005)**	0.104 (0.009)**	0.036 (0.004)**	0.081 (0.003)**
Potential experience sq.	-0.136 (0.018)**	-0.055 (0.011)**	-0.053 (0.012)**	-0.167 (0.019)**	-0.060 (0.008)**	-0.131 (0.008)**
Constant	-0.997 (0.099)**	-0.972 (0.056)**	-0.666 (0.056)**	-0.947 (0.101)**	0.211 (0.042)**	-0.487 (0.061)**
Observations	1530	1947	2889	2000	7614	9483
R-squared	0.25	0.23	0.16	0.27	0.17	0.38
<b>Marginal effects</b>						
Upper sec to Basic	0.299	0.504	0.363	0.466	0.268	0.511
Vocational to Basic	0.231	0.164	0.219	0.649	0.320	0.608
Upper sec to Vocational	0.068	0.340	0.144	-0.183	-0.052	-0.097
Tertiary to Upper sec.	0.307	0.012	0.298	0.449	0.580	0.720
Tertiary to Vocational	0.375	0.352	0.442	0.266	0.528	0.623

Note: Marginal returns are the difference between the regression coefficients for the levels. Urban male wage earners (aged 20-54). Robust standard errors in parentheses, \* significant at 5%; \*\* significant at 1%

Table 10: Returns to schooling: public sector dummy variable

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2003
Basic education	0.181 (0.044)**	0.222 (0.040)**	0.083 (0.042)*	0.185 (0.063)**	0.200 (0.058)**	0.149 (0.028)**	0.063 (0.023)**	0.308 (0.039)**	0.306 (0.047)**
Upper secondary	0.519 (0.113)**	0.790 (0.110)**	0.444 (0.131)**	0.791 (0.085)**	0.629 (0.068)**	0.545 (0.036)**	0.352 (0.031)**	0.805 (0.047)**	0.689 (0.050)**
Vocational	0.493 (0.050)**	0.450 (0.042)**	0.302 (0.041)**	0.922 (0.110)**	0.791 (0.069)**	0.455 (0.055)**	0.407 (0.034)**	0.939 (0.059)**	0.786 (0.055)**
Tertiary	0.892 (0.048)**	0.838 (0.044)**	0.743 (0.045)**	1.385 (0.176)**	1.027 (0.085)**	0.969 (0.048)**	0.951 (0.034)**	1.350 (0.056)**	1.314 (0.055)**
Potential experience	0.096 (0.009)**	0.053 (0.005)**	0.042 (0.005)**	0.208 (0.013)**	0.103 (0.009)**	0.108 (0.007)**	0.038 (0.004)**	0.086 (0.005)**	0.066 (0.003)**
Potential experience sq.	-0.144 (0.018)**	-0.060 (0.012)**	-0.053 (0.012)**	-0.363 (0.027)**	-0.171 (0.020)**	-0.186 (0.015)**	-0.062 (0.008)**	-0.143 (0.011)**	-0.111 (0.008)**
Public sector dummy	-0.302 (0.041)**	-0.215 (0.030)**	0.002 (0.032)	-0.348 (0.053)**	0.159 (0.040)**	0.069 (0.035)	-0.072 (0.015)**	-0.077 (0.024)**	0.416 (0.018)**
Constant	-1.032 (0.099)**	-1.031 (0.056)**	-0.665 (0.057)**	-1.723 (0.144)**	-0.892 (0.104)**	-0.610 (0.076)**	0.188 (0.043)**	-0.517 (0.063)**	-0.625 (0.058)**
Observations	1522	1941	2872	1476	1975	6855	7614	10566	9483
R-squared	0.28	0.25	0.16	0.30	0.28	0.30	0.17	0.29	0.43
<b>Marginal effects</b>									
Upper sec to Basic	0.338	0.568	0.361	0.606	0.429	0.396	0.289	0.497	0.383
Vocational to Basic	0.312	0.228	0.219	0.737	0.591	0.306	0.344	0.631	0.480
Upper sec to Vocational	0.026	0.340	0.142	-0.131	-0.162	0.090	-0.055	-0.134	-0.097
Tertiary to Upper sec.	0.373	0.048	0.299	0.594	0.398	0.424	0.599	0.545	0.625
Tertiary to Vocational	0.399	0.388	0.441	0.463	0.236	0.514	0.544	0.411	0.528

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

Table 11: Returns to schooling: public and private sectors

	Egypt			Iran			Turkey		
	1988	1998	2006	1987	2001	2006	1988	1994	2003
<b>Public sector</b>									
Upper sec to Basic	0.376	0.725	0.570	0.704	0.482	0.399	0.324	0.259	0.244
Vocational to Basic	0.424	0.446	0.388	0.777	0.578	0.056	0.445	0.355	0.345
Upper sec to Vocational	-0.048	0.279	0.182	-0.073	-0.096	0.343	-0.121	-0.096	-0.101
Tertiary to Upper sec.	0.415	0.077	0.226	0.594	0.437	0.362	0.503	0.480	0.419
Tertiary to Vocational	0.367	0.356	0.408	0.521	0.341	0.705	0.382	0.384	0.318
<b>Private sector</b>									
Upper sec to Basic	0.299	0.476	0.269	0.196	0.346	0.298	0.271	0.562	0.434
Vocational to Basic	0.193	0.057	0.147	0.400	0.667	0.335	0.278	0.698	0.530
Upper sec to Vocational	0.106	0.419	0.122	-0.204	-0.321	-0.037	-0.007	-0.136	-0.096
Tertiary to Upper sec.	0.353	-0.014	0.367	0.435	0.396	0.541	0.720	0.632	0.884
Tertiary to Vocational	0.459	0.405	0.489	0.231	0.075	0.504	0.713	0.496	0.788

Note: Urban male wage earners, aged 20-54