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Wage Inequality, Returns to Education and Gender Premia in MENA

By

Fatma El-Hamidi
Department of Economics
University of Pittsburgh
fatma@pitt.edu

Mona Said
Department of Economics
SOAS, London University
ms101@soas.ac.uk

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I. Introduction

Despite their common cultural and historical legacy, the Middle East and North Africa (MENA) countries have diverse characteristics in such key areas as the structures of the economies, level of development, and type of governance and institutions. Yet the past two decades have been periods of considerable socioeconomic change in most countries in the MENA region, characterized by adoption of economic liberalization policies and a declining role of the state which traditionally acted as employer of first and last resort. This chapter examines some key equity issues emanating from this transition in the region's labour markets. In particular, the chapter will focus on changes in the distribution of returns to education, gender wage premia and overall wage inequality in MENA during this period.

A detailed analysis of wage inequality, and returns to education centers on two countries; Egypt and Morocco. The choice to focus our research on a comparison between those two countries emanated from both practical and conceptual grounds. Not only are there relatively rich data sets for those two countries, but also the comparison between them can be quite informative for conceptual reasons. Both countries had some form of guarantee of public sector employment for their graduates,[1] but stand at two extremes in terms of problems in their educational systems. Egypt is praised for now

[1] Although in Morocco the scheme was not as formalized and comprehensive as in Egypt, nor indeed did it have the same devastating impact on educational expansion and labor market outcomes.

approaching universal primary school enrollment[2] and closing the gender gap on that count, but criticized for over-investing in low quality secondary and tertiary education, whereas Morocco is seen to be one of only three countries in the region (the other two being Saudi Arabia and Yemen) where access to primary schools remains problematic; especially for girls (Van Eeghen, 2003; Megahid, 2004). It would be interesting to examine how these differing patterns impacted gender wage differentials and labour market rewards to education.

For both countries, we formally test the hypothesis that a reduction in the role of the public sector as employer of secondary and university school graduates in MENA led to falling returns to education over time and lower returns in the private sector compared to the public sector. This will be accomplished by estimating selectivity corrected returns to different levels of education, from which a crude estimate of the private rate of return is calculated. As only private rates of return to education are calculated in this paper, we will henceforth refer to those as simply 'returns to education'.

However, a reduction in educational premia does not necessarily mean that wage inequality is reduced. Wage inequality along other dimensions, such as gender, skill, region, and occupation, may in fact increase as public sector wage-setting rules become less salient (World Bank, 2004). Thus a second set of questions that will be examined in this paper relates to whether there has been a widening in wage differentials, particularly along gender lines since the early 1990s in both countries.

[2] Although still with high drop out rates and illiteracy rates that reached 45 percent (UNICEF, 2005).

The analysis in this chapter will draw on data from two relatively rich household level labour force surveys recently conducted for each county. For Egypt, we use a 1998 nationally representative household survey, Egyptian Labor Market Survey (ELMS) and a comparable survey carried out a decade earlier, Labour Force Sample Survey (LFSS) of 1988. For Morocco, we use the Morocco Living Standard Measurement Studies (MLSMS) of 1990/1991 and 1998/1999.

The rest of the chapter will be organized as follows: Section II presents an overview of the state of wage inequality in MENA during the last 25 years, focusing on MENA status amongst world regions. Section III discusses the estimation methodology, data and results of examining the impact of public sector retrenchments on returns to education, wage differentials and wage inequality in Egypt and Morocco. Finally Section IV concludes by summarizing the empirical findings and drawing some implications.

II. Wage Inequality in MENA Since the 1970's

In a recent survey of inequality trends in the MENA region over the past three decades Adams and Page (2001) indicated that although the MENA region had one of the highest rates of income inequality in the world in 1970 (Gini = 0.440), it had recorded tremendous improvement since. Together with South Asia, the MENA region is the only developing region to record improvements in income inequality over the past three decades. As a result, MENA, by the end of 1990s, had one of the most equal income distributions in the world with an estimated Gini coefficient of (0.360). Another distinguishing feature of the region is the fact that it has a high share of income accruing to the bottom quantile of its distribution, and this share has increased significantly over time. The mean income of the bottom quantile rose rapidly between 1975-1979 and 1985-

1989. It then declined during the succeeding ten years and recovered at the end of the period. These trends are slightly different in East Asia, for example, where the mean income of the lowest quantile rose continuously until the economic crisis of the 1997/1998 and then fell. That is, the increase in incomes of the poorest is less rapid in East Asia compared to MENA, but it was sustained for longer. However, in Latin America the mean income of the poorest quantile declined continuously from 1980s onwards.

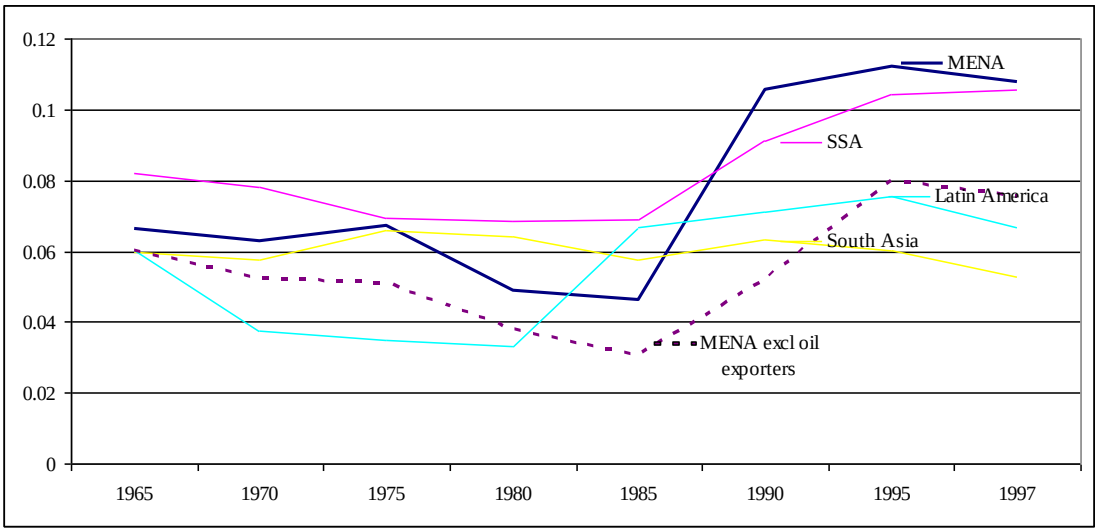
The pattern of income growth accruing to the poorest quantile in MENA reported earlier closely paralleled the region's economic performance and the trend in real wages over the three decades. During the period of rapid growth, the poor benefited from both income growth as well as an increasing share of income accruing to the bottom quantile group. These income and distribution gains for the poor did not appear to have been reversed during the region's economic downturn after 1985 (Adams & Page, 2001; Ali and Elbadawi , 2002).

The more egalitarian income distribution in the MENA region are a result of a number of factors. The post-colonial political ideologies, which dictated the redistribution of assets, including agricultural land and public employment helped promote more equal income distribution. Additionally, the area experienced a rapid growth in aid flows associated with redistribution of oil rents, which helped to finance both public investments as well as commodity based subsidies, in oil rich countries; and workers remittances in labor rich countries.

In order to examine how much of this income inequality is generated due to processes in the labor market itself, Figure 1 compares a Theil measure of wage

inequality for different regions of the World over the past three decades, based on a data base compiled by UNIDO (2002).

Figure (1): The UTIP-UNIDO Wage Inequality Theil Measure: 1965-1997-



Source: UNIDO, 2002.

The UNIDO wage inequality Theil measure exhibits an S shape trend in all regions, but with different break points. Between 1965 and 1985, the MENA, Sub Saharan Africa and South Asia regions experienced a decline in their wage inequality measure. This period was followed by a sharp rise in wage inequality between 1985 and 1990. The trend then stabilized over the 1990s to start declining towards the end of the decade. However, the story in Latin America is slightly different. Wage inequality started to rise in 1980, stabilized between 1985 and 1995 and started to decline thereafter.

Yet, by the 1990s, the MENA region has started to show the highest wage inequality levels compared to other regions. While South Asia, as a region, remains to exhibit the least variable trends in wage inequality. It is important to note, however, that the high level and sharp rise in the Theil wage inequality measure in the MENA region in the 1990s is largely emanating from trends in oil-exporting countries, especially Kuwait,

where the measure shot up in the mid 1980s, compared to a decade earlier (see Table 1 and Figure 2 below). If we exclude the oil-exporting countries from the MENA sample, the measure becomes much lower, and in the 1990s, the MENA average remains well below Sub-Saharan Africa, although still above Latin America and South Asia averages. This is consistent with the picture of low overall income inequality in MENA compared to other regions in the world reported in the Adams and Page (2001) study quoted above.[3]

Observing the wage inequality data for three separate groups[4] of MENA countries reveal a consistent trend. Wage inequality declined steadily between 1965 and 1985, then rose again till 1995 only to decline thereafter. These results conform with the general trend reported around the world. However, although the three groups of countries exhibit similar trends, the measure is much higher in oil exporting economies, compared to the diversified economies group.

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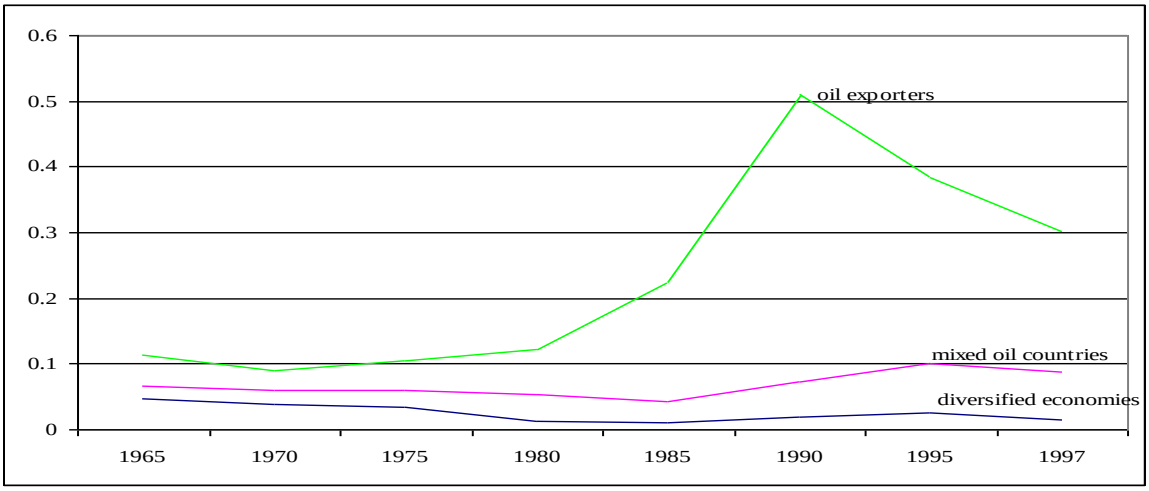
[3] Adams and Page (2001) also exclude the oil-exporting countries from their MENA sample, but they measure overall income inequality using the Gini coefficient. By contrast, as mentioned earlier, the UNIDO data is restricted to manufacturing wages (and not total income) and is based on a Theil t-statistic inequality measure. Moreover, some differences in measured inequality are also expected due to the difference in the measures used. While the Gini coefficient is relatively sensitive to changes in the middle of the distribution—around the mode, Theil index tends to be more sensitive to changes at the lower end of the distribution.

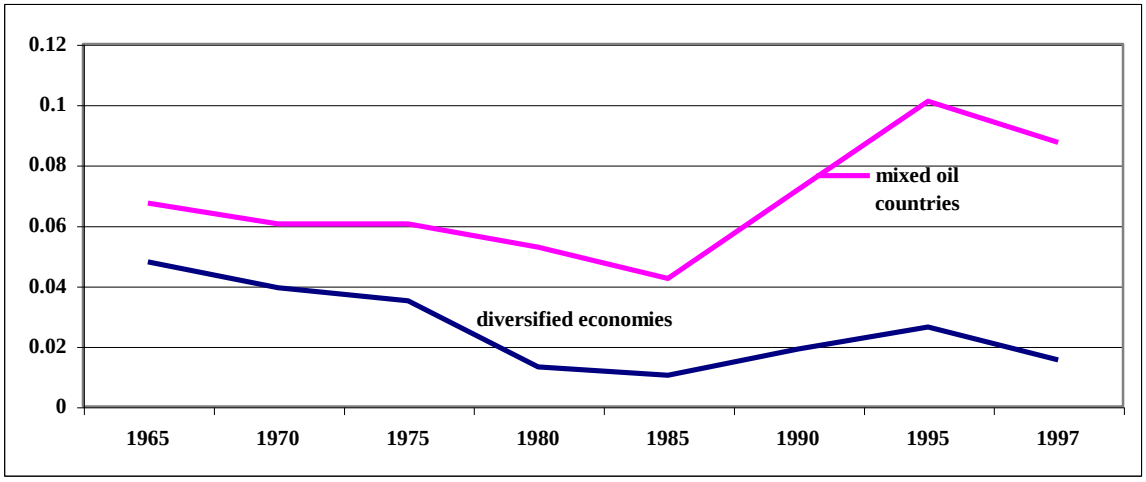
[4] The diversified economies include: Egypt, Syria, Jordan, Morocco and Tunisia; The mixed oil economies include, Algeria, Iran and Iraq; The oil exporting countries are Kuwait, Libya and Qatar. Other MENA countries are not covered because of lack of data.

Figure (2): The UTIP-UNIDO Wage Inequality THEIL Measure for a sample of MENA countries: 1965 - 1997

A. Including Oil Exporters



B. Excluding Oil-exporters



Source: UNIDO, 2002.

It should be noted that the figures above hide a lot of variation that exists between countries. As data in Table 1 reveals, the lowest recorded inequality in 1995 was in Algeria (0.02) compared to (0.05) in Jordan, (0.070) in Egypt and Morocco and a high of (0.34 and 0.43) in Kuwait and Qatar respectively.

Table (1): The UTIP-UNIDO Wage Inequality THEIL Measure for a sample of MENA countries: 1965 - 1995

	1965	1975	1985	1995
Mixed oil Producers average	0.05	0.04	0.01	0.03
Algeria	0.01	0.01	0.01	0.02
Iran, I.R. of	0.08	0.06	0.00	0.03
Iraq	0.05	0.03	0.02	
Diversified economies average	0.07	0.06	0.04	0.10
Egypt	0.03	0.01	0.02	0.07
Syria	0.12	0.05	0.01	0.19
Jordan	0.07	0.09	0.09	0.05
Morocco	0.06	0.10	0.05	0.07
Tunisia	0.06	0.06	0.04	0.13
Oil exporters average	0.11	0.11	0.22	0.38
Kuwait	0.12	0.20	0.17	0.34
Libya	0.11	0.01		
Qatar			0.28	0.43
MENA Average	**0.07**	**0.07**	**0.05**	**0.11**

Source: UNIDO, 2002.

III . The Evolution of Gender Differentials and Returns to Education

A. Gender and Sector Differences in Returns to Education

Between 1970 and early 1990s, MENA countries witnessed its greatest increase in literacy rates and primary and secondary school enrollment, though gender gap still persistent. Though enrollment rates may appear high, drop out ratios are increasing, especially for rural girls. For most MENA countries, low female enrollment in schools is a reflection of the low priority poor families, mostly rural residents, put on girl's education, accompanied by low school quality and lack of transportation and inadequate school facilities. Older females are constraints by customary traditions of early marriage, childbearing, and household chores.

An important element of the labor market is the wage remuneration to different levels of education, i.e. returns to schooling. Theoretically, returns to education rise with the level of education, regardless of gender or region. Nevertheless, wages in MENA follow different directions.

It is relatively well-established in the literature that public sector wage settings generally and in MENA in particular, are based on governmental decrees that rewards seniority and years of experience, and tends to be more equal than wage setting in the private sector. It is also well-known that public sector wage-setting rules place a great deal of emphasis on formal educational credentials as the main bases of wage differences among workers, a phenomenon known as 'credentialism'. With a reduction in the role of the State as employer of first and last resort, we would expect wages to increasingly follow a free market remuneration of wages, i.e. reflecting true productivity differences among workers. If educational discrepancies reflect productivity disparity, and if the public sector has a tendency towards wage reduction, we would expect returns to education to be higher in the private than in the public sector, and generally rising over time as the role of the latter intensifies. If, on the other hand, educational credentials do not necessarily explain productivity differences, but nevertheless highly rewarded in the public sector due to credentialism in wage setting, a reduction in the role of the public sector will lead to lower returns in the private sector and falling returns over time.

Given that the region's educational systems have accommodated for years to the needs of growing civil service, the second situation is much more likely in MENA. However, a reduction in educational premia does not necessarily mean that wage

inequality is reduced, wage inequality along gender, as well as skill, region, occupation may in fact increase as public sector wage setting role becomes less salient.

B. Detailed Analysis of Egyptian and Moroccan data

Microeconometric studies on returns to education and gender wage differentials are few in MENA, due to the scarcity of data, and most highlighted differences between public and private sectors. The availability of rich datasets in the late 1990s facilitated some preliminary analyses for Turkey (see Tansel, 1994, 1999a and 1999b) and Egypt (see Assaad , 1997, Said 2002, 2003 and 2004 and El-Hamidi , 2004).

In this chapter we conduct a more detailed study of educational choice and earning determination in Egypt and Morocco, based on the same estimation techniques that correct for selectivity bias, in order to arrive at strictly comparable estimates of returns to education, wage inequality and gender differentials for the two countries. The estimation model used is described in the following section.

B. 1 Estimation Methodology

In the traditional, (Mincer, 1974) specification, returns to education are estimated as follows:

$$\text{Ln}W = \beta 0 + \beta 1\text{EDU} + \beta 2\text{EXP} + \beta 3\text{EXP}^2 + u$$

Where EDU is the number of years of schooling, EXP is experience in years, EXP^2 is experience squared, and u is a random disturbance term. The specification is shown logarithmically in order for the regressors to be interpreted in terms of marginal effects. In this way index β is interpreted as the rate of returns to schooling.

Griliches (1977), however, pointed out that the coefficient estimates of the OLS estimation of the classical model could suffer from self-selection bias. If educational attainment of an individual is partially determined by his/her abilities and family

backgrounds, estimating the previous classical earnings function without taking into account the possibility that family background and ability might influence educational attainment, could give biased results. One approach to reduce the bias is to include control variables that might capture part of the unobserved components in the error term such as family background characteristics: Father and mother level of education and father's occupation. An interaction term between education and family background can capture the effect of family background on returns to education.

These results, however, are still subject to another type of selection bias. When estimating the wage equation, only those who reported wages at the time of the survey are entered into the analysis. In order to solve the problem of sample selection bias, Heckman (1979) suggests estimating two equations. First the participation equation is estimated, for the purpose of this study a logit model is estimated (using the entire sample: workers and non-workers). From the logit results, a selection variable (the inverse Mills ratio term) is created. This estimate is used in the second step, as an additional regressor in the wage equation, yielding consistent estimates of the coefficients free of censoring bias.

A recent extension to this model is to capture the so-called "certification effect" or "sheep skin effect". The idea is that an employer might value a worker with a certificate more than a worker without one. For this reason, and to allow for estimated rate of return to vary by level of schooling, dummies for different levels of education are used instead of years of schooling.

The modified Mincerian earnings function is:

$$\text{Ln}W = \beta_0 + \sum\beta_k \text{E.Dum}_{ik} + \beta_2 \text{EXP} + \beta_3 \text{EXP}^2 + \sum\beta_j \text{ Reg. Dum}_{ij} + \beta_4 \lambda + u \quad (1)$$

Where E.Dum are dummies for levels of education, experience, experience squared, regional dummy and the selection term.

In this specification, the private rate of return to the k^{th} level of education is estimated by the following formula:

$$r_k = (\beta_k - \beta_{k-1}) / \Delta n_k \quad (2)$$

where β_k is the coefficient of a specific level of education, β_{k-1} is the coefficient of the previous level of education, and Δn is the difference in years of schooling between K and K-1. (Psacharopoulos, *1981).* For the purpose of this study, only results of the private rates of returns will be reported[5].

In order to ascertain whether changes in returns to education translated into altering overall wage inequality in the Egyptian and Moroccan labor markets, we further study wage differentials along two lines: public-private, and male- female. We decompose earnings' gap into components attributable to pure pay discrimination within sectors as opposed to differences in characteristics.

The overall wage differential between public and private (or males and females) workers can be decomposed into different components: (1) a portion due to differences in average characteristics, such as experience, region and education. (2) a portion due to

[5] Contact the authors for comprehensive results including selectivity corrected logit estimates and returns to education.

differences in the parameters of the wage function, caused by labor market discrimination and other omitted factors, and (3) a portion due to differences in selectivity bias.

Adopting the methodology, which was first utilized by Oaxaca (1973) and Blinder (1973) and following the approach employed by Reimers (1983), which uses an unweighted average of each type of worker's coefficients, the wage differential can be decomposed as:

$$\ln\overline{W}_m - \ln\overline{W}_f = 0.5(\overline{X}_m - \overline{X}_f)(\hat{\beta}_m + \hat{\beta}_f)\overline{X}_f + 0.5(\overline{X}_m + \overline{X}_f)(\hat{\beta}_m - \hat{\beta}_f) + (\hat{\beta}_m\overline{\lambda}_m - \hat{\delta}_f\overline{\lambda}_f) \quad (3)$$

The first term on the right-hand side of equation (3) is the differences in the endowments of wage-determining characteristics (*X's*) between the male and female workers, evaluated according to the male pay structure ($\hat{\beta}_m$). This portion can also be interpreted as the wage gain females would experience if they had the same characteristics on the average as males. The second term on the right-hand side is the portion due to differences in pay structure (coefficients, $\hat{\beta}'s$) between males and females. It is the wage gain females would experience, given their mean characteristics, if they were compensated as males. The last term represents the wage differential attributed to sample selection bias.

B. 2 Data

The empirical analysis is based on the 1988 and 1998 Egypt Labor Force Sample Surveys (LFSS), which are both nationally representative household surveys covering 10,000 households in1988 and 5000 households in 1998; as well as The Morocco Living Standard Measurement Studies (MLSMS) of 1990/1991 and 1998/1999, covering 3349 households in 1990/91, and 5129 households in 1998/1999. Both surveys include

extensive data on employment characteristics such as status, economic activity, duration of unemployment, occupation …etc.

Variables that capture endowments that are used in this study include: level of education (illiterate, read and write, primary, preparatory, secondary and university and above), age, experience, experience squared, regional dummies (rural vs. urban), parental education[6], hourly wages (in logs), and number of children in the household (one dummy for those less than 6 years of age; and a dummy for those greater than six years of age). The analysis is restricted to non-agriculture workers,[7] who are sons or daughters of the household heads between the ages of 15 and 64, and not currently enrolled in school. Table (A-1) in the appendix displays means and standard deviations for variables.

B. 3 Estimation Results

Figures (A-1) through (A-4) in the Appendix show earning distribution of real monthly wages by quantile for Egypt 1988 and 1998 and for Morocco 1991 and 1999. The same figures display the share of total wage workers in each quantile. For example, for Egypt, in 1988, about 44% of all employees earned a little over 500 LE per month. In 1998, 45% of workers earned a little over 400 LE. A drop of 25% in real wages. Public sector workers felt the same drop in real wages between 1988 and 1998. Private sector

[6] There were cases with few observations on Mother's level of education, therefore, and for the purpose of this comparative study, we opted to use one dummy that takes the value zero for illiterate mothers and 1 for literate mothers.

[7] High rates of seasonal employment within the agriculture sector are justification for excluding them from the analysis.

workers on the other hand witnessed the largest drop in their real wages (50%). Moroccan workers were in a better shape than the Egyptians. The real wages of about 50% of Moroccan workers dropped by only 20% between 1991 and 1999. Real wages of Public sector workers dropped by 12% whereas private sector workers suffered a mere 3% of a reduction in their real wages.

In calculating rates of return to education, we assume that the illiterates have zero years of education, those who can read and write have 3 years of education, primary education encompasses 6 years of education, preparatory education achieves 9 years of education, secondary certificates requires 12 years of education, and university education graduate achieves 16 years of education.

Table (2) shows that in Egypt, the period 1988 to 1998 was indeed a decade of wage compression.[8] With the exception of private sector females (whose coefficients were insignificant any way), almost all private rates of returns to education for males working in either the public or private sectors have dropped between 1988 and 1998. Thus, a public sector male with a university degree earned 6.9% more than a public sector worker with a secondary certificate in 1988, but only 5.5% more in 1998 (a difference of 1.5%). Private sector workers with comparable degrees noticed a drop of 3.9% in their relative returns to education. Females were not in a better position either. Again, returns to university education compared to secondary certificates dropped for public sector females by 1.4 percentage points.

[8] This finding is consistent with the main conclusion reported in previous research (Said, 1992) using the same data , but not correcting for self-selection bias.

Table (2): % Differences in Rates of Return to Education By Sector of Employment, Egypt, 1988 and 1998

Males

Education Level	Public, 88	Public, 98	Private, 88*	Private, 98
Primary to R&W	5.27	7.03	1.20	0.37
Prep. To Primary	13.83	12.00	6.40	4.00
Sec. to Prep.	4.93	5.77	-1.57	2.70
Univ. to Sec.	6.93	5.50	10.93	7.03

Females

Education Level	Public, 88	Public, 98	Private, 88*	Private, 98*
Primary to R&W	9.53	18.90	5.90	12.80
Prep. To Primary	17.10	11.23	2.73	4.27
Sec. to Prep.	4.97	9.00	-7.53	-10.30
Univ. to Sec.	7.13	5.75	28.68	32.25

* Corresponds to insignificant coefficients.
Shaded areas correspond to insignificant coefficients.
Source: Authors' own calculations from LFSS 1988 and ELMS 1998.

Table 3 also shows that a similar trend has been taking place in Morocco in the 1990s. For Moroccan males with university education (vs. secondary) in public sector, returns dropped sharply in 10 years, from 26% to less than 5% in 1999. Private sector males also witnessed a drop in their returns at all levels of education between 1991 and 1999. Although we notice the same result for females, their coefficients were insignificant to start with. Females in public sector with university degrees had a drop in their returns by only 1 percentage point. But overall, females in the public sector did fair better in 1999.

Table (3): % Differences in Rates of Return to Education By Sector of Employment, Morocco 1991 and 1999

Males

Education Level	Public, 91	Public, 99	Private, 91*	Private, 99
Primary to R&W	14.60	4.87	6.60	0.83
Prep. To Primary	10.97	10.00	8.50	11.80
Sec. to Prep.	9.37	8.97	22.43	19.20
Univ. to Sec.	25.85	4.93	25.08	8.58

Females

Education Level	Public, 91	Public, 99	Private, 91*	Private, 99*
Primary to R&W	12.70	18.13	8.80	10.10
Prep. To Primary	12.17	13.53	23.20	19.90
Sec. to Prep.	1.87	4.77	1.57	13.13
Univ. to Sec.	14.18	13.13	25.75	0.58

* Corresponds to insignificant coefficients.
Shaded areas correspond to insignificant coefficients.
Source: Authors' own calculations from1991 and 1999 MLSMS, Morocco.

Finally, we look at the effect of macro policies on wage inequality. We follow the literature by applying Oaxaca-Blinder wages differentials model and using the same methodology to sort out the differences in wages between public and private (and male-female) sectors that are due to endowments and those that are due to discrimination, i.e. the explained from the unexplained. We grouped differences due to discrimination and differences due to selection bias in one “unexplained” factor.

Table (4):Wage Decomposition for Egypt and Morocco: Public vs. Private; Males vs. Females

	Raw Diff. in logs	%Explained Endowments	%Unexplained Discrimination	Adjusted Gap (%)
Egypt				
Males, Public-Private Wage Differentials (1998)	0.06	52	48	3
Females, Public-Private Wage Differentials (1998)	0.20	20	80	16
Public (Males-Females) Wage Differentials (1998)	0.04	19	81	3
Private (Males-Females) Wage Differentials (1998)	0.17	30	70	12
Males, Public-Private Wage Differentials (1988)	0.15	55	44	7
Females, Public-Private Wage Differentials (1988)	0.52	67	33	17
Public (Males-Females) Wage Differentials (1988)	0.09	14	86	8
Private (Males-Females) Wage Differentials (1988)	0.46	15	85	39
Morocco				
Males, Public-Private Wage Differentials (1999)	1.13	49	51	58
Females, Public-Private Wage Differentials (1999)	1.62	50	50	81
Public (Males-Females) Wage Differentials (1999)	0.08	27	73	6
Private (Males-Females) Wage Differentials (1999)	0.58	28	72	42
Males, Public-Private Wage Differentials (1991)	1.10	70	30	33
Females, Public-Private Wage Differentials (1991)	1.29	89	11	14
Public (Males-Females) Wage Differentials (1991)	0.05	30	70	3
Private (Males-Females) Wage Differentials (1991)	0.24	18	82	20

Source: Authors' own calculations from LFSS 1988 and ELMS 1998, and from1991 and 1999 MLSMS, Morocco.

Table (4) presents decompositions for gender and sector wage gaps for Egypt and Morocco which separate the justifiable or fair (i.e. explained) and unjustifiable or unfair (i.e. unexplained or discrimination) components. For Egypt, male public sector wage premium declined from 7% in 1988 to 3% 1998; whereas female wages remaind almost

the same at 16-17 %. In other words, by the end of the decade, the public sector remained just as attractive for females, but lost a bit of its attraction, at least in terms of wage premiums for men. In term of the adjusted gender wage gaps, they appear to have declined in both the public sector (from 8 to 3%) and private sector (from 39% to 12%). Overall, wage inequality by education and gender appears to have declined substantially in Egypt during that decade of pursuing economic liberalization policies.[9]

By contrast, all changes in public sector premiums and unexplained wage gaps in Morocco appear to be in the opposite direction. Male premiums in the public sector increased from 33% in 1991 to 58%, so did female premiums, which dramatically jumped from 14% in 1991 to 81% in 1999. An obvious explanation for the latter result is that the private sector in Morocco became much more discriminating in wage payments to women. This suspicion is confirmed by the results on gender wage differentials, also presented in the same table that show the unexplained component attributable to gender-based discrimination has doubled between 1991 and 1999, reaching, still, a modest 6 % in the public sector and 42% in the private sector – which is high by international standards. Overall, and in contrast to what happened in Egypt, the nineties appear to be a decade of increasing wage inequality by gender and education in Morocco.

[9] When comparing the gender gap along public and private lines, we reached a different picture than the previous research (World Bank, 2004). That is, the adjusted private sector gender wage differences have also dropped in 1998. One immediate explanation, would be correcting for selectivity which was not preformed in the previous research. Other interpretations/ securitization are in process.

IV Conclusion

Since the early 1990s, most countries in the MENA region started a new development model that aims to rely mostly on a growing export oriented, and privately held economy to achieve higher rates of growth. This chapter explores some of the equity implications of this transition by examining changes in the distribution of returns to education and gender wage premia in the Egyptian and Moroccan labor market in the 1990s. This is accomplished by estimating joint models of educational choice and wage determination for both countries yielding selectivity corrected returns to different levels of education, from which a crude estimate of the private rate of return is calculated.

In line with theoretical expectation, as in MENA centralized wage setting in the public sector resulted in high rewards to educational credentials regardless of their link to productivity[10], a reduction in the role of the public sector leads to lower returns in the private sector and falling returns over time. Only at the university level, are returns higher in the private sector in Egypt indicating that employers place relatively little value on basic and secondary education. In Morocco there is some evidence of higher returns in the private sector by the end of the 1990, which might be indicative of better matching of educational credentials and productivity differences. These results, however, need to be interpreted with care, especially for females, due to insignificant estimates associated with small sample size. Overall, returns to education results indicate clear wage compression for all sectors in Egypt, and for some, but not all groups in Morocco.

[10] Public sector wage setting followed a fixed salary for each certificate and a regular raise according to seniority (not performance, productivity or skill), with lower and upper limits for each occupational grade.

However, as indicted in the introduction, a reduction in educational premia does not necessarily mean that wage inequality is reduced, as wage inequality along other dimensions, such as gender and sector might increase. Oaxaca-Blinder wages-differentials decompositions of sector and gender wage gap for Egypt and Morocco indicate the unexplained component in public wage premia and gender gaps have declined in Egypt, but substantially increased in Morocco over the 1990s. Overall, economic liberalization and public sector retrenchment which were much more comprehensive in Morocco appear to have had a more dislocating effect also on labor market wage outcomes.

Possible policy implications for the results in this paper are in the three areas of educational reform, civil service reform and improving access of women to private sector jobs. First, the evidence on rates of return suggests that, at least in terms of education, public sector wage setting practices leads to wage contraction over time in an effort to protect lower strata wage earners from inflation. Yet by rewarding educational credentials in public employment with higher wages, governments have encouraged investment in types of human capital that are not necessarily valued in the private sector. The problem is most acute in primary and secondary education, which has experienced significant expansion in the region to accommodate growing numbers of enrollees, often at the expense of quality. There is need to re-focus efforts on quality improvements and greater responsiveness to the needs of the private sector. In particular, the reform of vocational secondary and higher institute technical education systems in MENA should remain quite high on the policy agenda.

Second, the notion that a large premium for public sector employees can persist suggests that markets are not performing appropriately or that the public sector remains a model employer that does not discriminate against employees, this is backed up by the results on discrimination reported above. Hence efforts to downsize and reform public sector pay systems in MENA should not necessarily take the private sector wage as the efficient benchmark. There is a need to conduct deeper inequality analysis and study in more detail the internal labor market within the public sector. At the very least, a differentiation between the government and state-owned enterprises should be introduced.

Finally, given the favorable treatment of women in the government in MENA compared to the private sector and the lower levels of discrimination there, it is likely that the burden of privatization and civil service downsizing may fall disproportionately on women and may negatively affect the already low participation rates, unless effort is made to reduce the extent of gender-based discrimination in the private sector.

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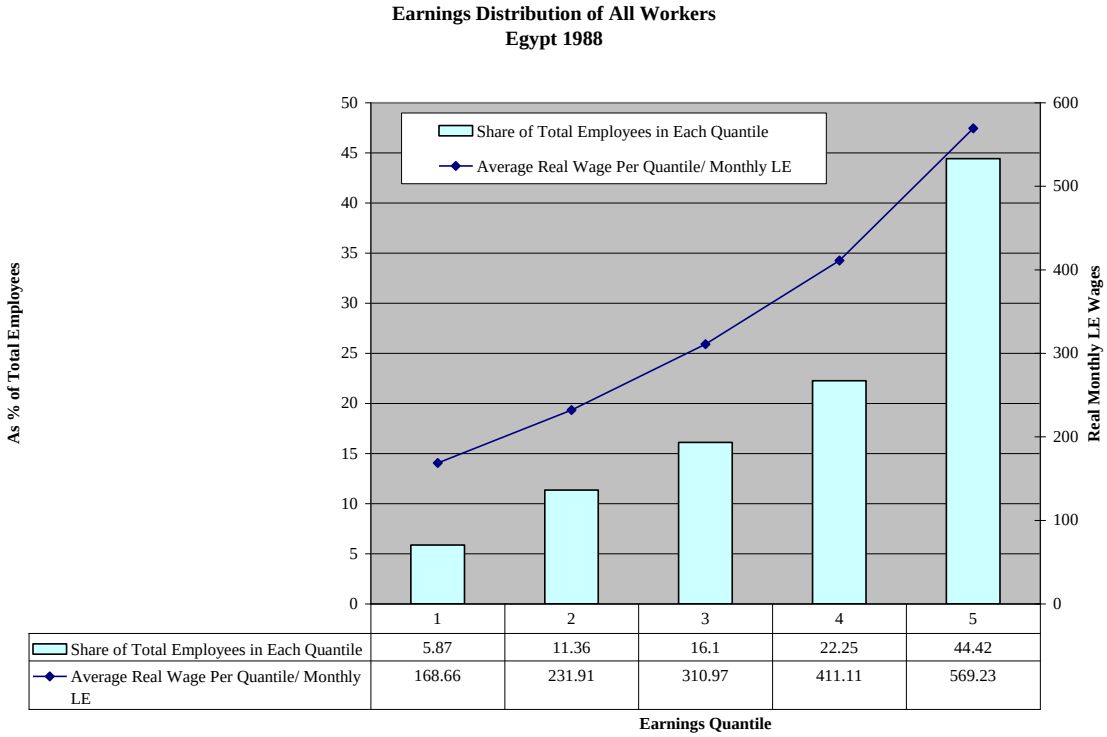
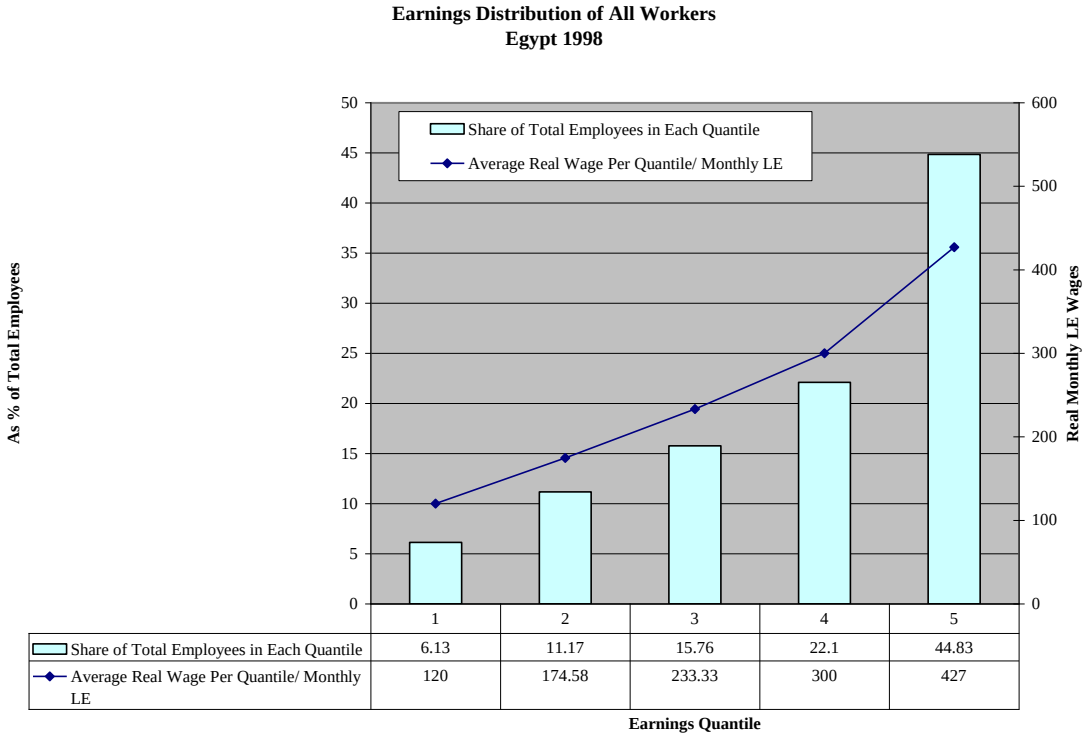
Appendix

Figure (A-1)



	1	2	3	4	5
Share of Total Employees in Each Quantile	5.87	11.36	16.1	22.25	44.42
Average Real Wage Per Quantile/ Monthly LE	168.66	231.91	310.97	411.11	569.23

Figure (A-2)



	1	2	3	4	5
Share of Total Employees in Each Quantile	6.13	11.17	15.76	22.1	44.83
Average Real Wage Per Quantile/ Monthly LE	120	174.58	233.33	300	427

Figure (A-3)

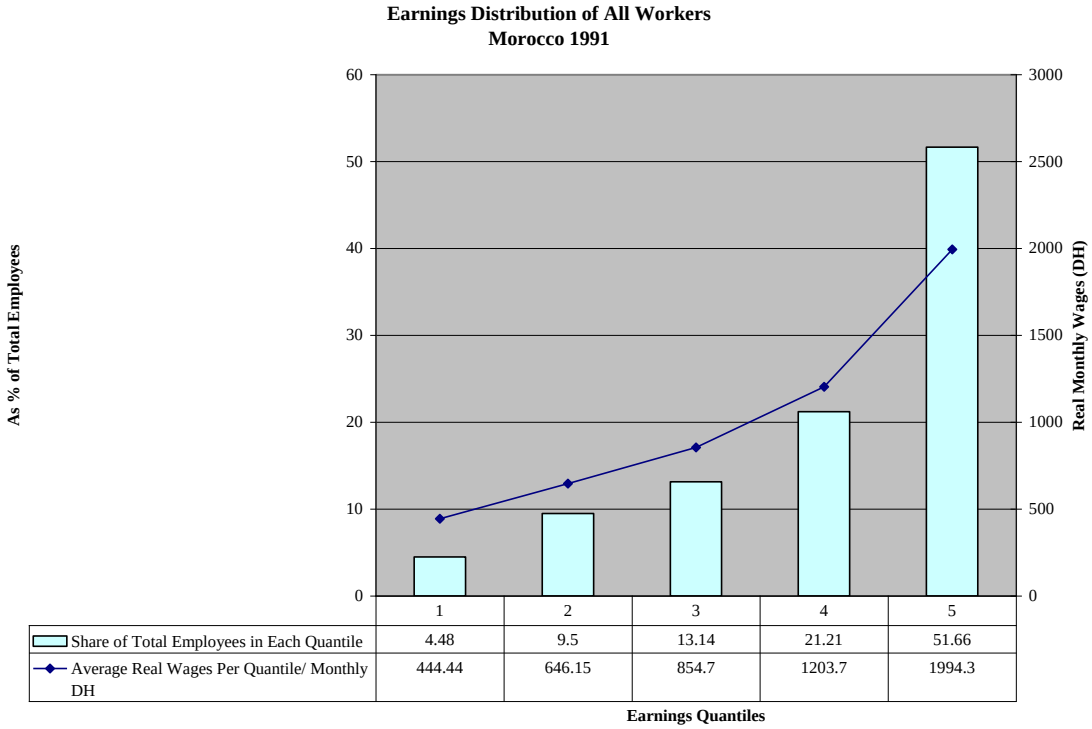

Earnings Distribution of All Workers
Morocco 1991
As % of Total Employees
Real Monthly Wages (DH)
60
50
40
30
20
10
0
3000
2500
2000
1500
1000
500
0
1
2
3
4
5
Share of Total Employees in Each Quantile
4.48
9.5
13.14
21.21
51.66
Average Real Wages Per Quantile/ Monthly DH
444.44
646.15
854.7
1203.7
1994.3
Earnings Quantiles

Figure (A-4)

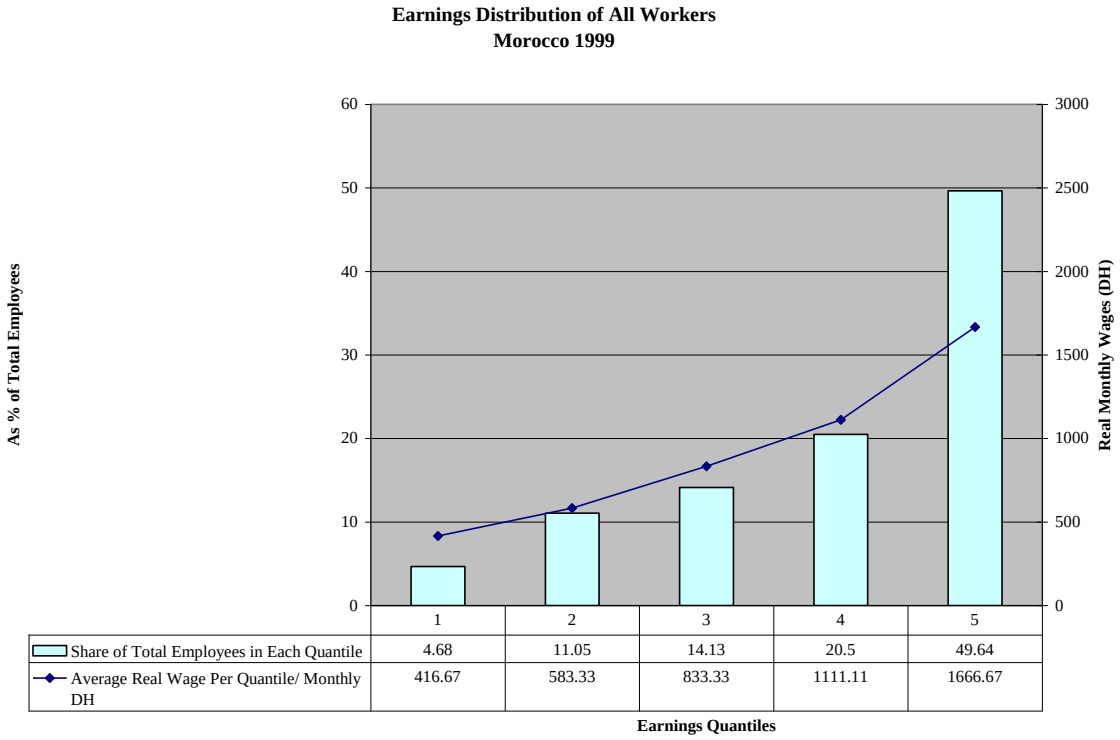

Earnings Distribution of All Workers
Morocco 1999
As % of Total Employees
Real Monthly Wages (DH)
60
50
40
30
20
10
0
3000
2500
2000
1500
1000
500
0
1
2
3
4
5
Share of Total Employees in Each Quantile
4.68
11.05
14.13
20.5
49.64
Average Real Wage Per Quantile/ Monthly DH
416.67
583.33
833.33
1111.11
1666.67
Earnings Quantiles

Table (A-1)Summary Statistics for Variables Used in the Analysis

1- Public Sector Males, 1998, Egypt		
No. of Observations= 1307		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	0.369	0.646
Urban	0.706	0.456
Experience	23.550	11.423
Experience Sq.	6.850	5.649
Illiterate	0.000	0.000
Read&Write	0.090	0.286
Primary	0.151	0.358
Preparatory	0.291	0.454
Secondary	0.105	0.307
University+	0.287	0.452
M. Illiterate	0.208	0.406
F. Read&Write	0.388	0.487
F.Primary	0.037	0.188
F. Secondary	0.020	0.139
F. University	0.045	0.208
Sibling 0-6 Years	0.819	1.033
Sibling >6 Years	3.826	2.313

2- Public Sector Females, 1998, Egypt		
No. of Observations= 636		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	0.356	0.656
Urban	0.848	0.360
Experience	18.349	9.805
Experience Sq.	4.327	4.021
Illiterate	0.000	0.000
Read&Write	0.007	0.086
Primary	0.029	0.169
Preparatory	0.397	0.490
Secondary	0.177	0.382
University+	0.370	0.483
M. Illiterate	0.363	0.481
F. Read&Write	0.407	0.492
F.Primary	0.063	0.244
F. Secondary	0.027	0.163
F. University	0.095	0.293
Sibling 0-6 Years	0.585	0.844
Sibling >6 Years	3.173	1.795

3- Private Sector Males, 1998, Egypt		
No. of Observations= 745		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	0.223	0.646
Urban	0.631	0.483
Experience	16.958	12.146
Experience Sq.	4.350	5.511
Illiterate	0.000	0.000
Read&Write	0.122	0.328
Primary	0.249	0.433
Preparatory	0.240	0.427
Secondary	0.036	0.186
University+	0.086	0.280
M. Illiterate	0.156	0.363
F. Read&Write	0.300	0.458
F.Primary	0.024	0.153
F. Secondary	0.006	0.080
F. University	0.025	0.156
Sibling 0-6 Years	0.821	1.077
Sibling >6 Years	4.349	2.497

4- Private Sector Females, 1998, Egypt		
No. of Observations= 78		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	-0.048	0.902
Urban	0.775	0.419
Experience	12.030	11.326
Experience Sq.	2.724	4.446
Illiterate	0.000	0.000
Read&Write	0.044	0.206
Primary	0.113	0.317
Preparatory	0.289	0.455
Secondary	0.074	0.262
University+	0.235	0.425
M. Illiterate	0.301	0.462
F. Read&Write	0.309	0.464
F.Primary	0.018	0.134
F. Secondary	0.018	0.134
F. University	0.064	0.245
Sibling 0-6 Years	0.642	0.907
Sibling >6 Years	3.995	2.180

5- Public Sector Males, 1988, Egypt		
No. of Observations= 1689		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	0.628	0.658
Urban	0.677	0.468
Experience	23.011	12.008
Experience Sq.	6.736	6.156
Illiterate	0.000	0.000
Read&Write	0.187	0.390
Primary	0.125	0.331
Preparatory	0.244	0.430
Secondary	0.066	0.248
University+	0.232	0.422
M. Illiterate	0.150	0.357
F. Read&Write	0.348	0.477
F.Primary	0.070	0.256
F. Secondary	0.009	0.093
F. University	0.039	0.193
Sibling 0-6 Years	1.121	1.326
Sibling >6 Years	4.028	2.642

6- Public Sector Females, 1988, Egypt		
No. of Observations= 589		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	0.536	0.657
Urban	0.845	0.362
Experience	13.697	8.906
Experience Sq.	2.668	3.381
Illiterate	0.000	0.000
Read&Write	0.013	0.115
Primary	0.039	0.193
Preparatory	0.466	0.499
Secondary	0.148	0.356
University+	0.291	0.455
M. Illiterate	0.367	0.482
F. Read&Write	0.438	0.497
F.Primary	0.094	0.293
F. Secondary	0.025	0.157
F. University	0.084	0.278
Sibling 0-6 Years	0.774	1.034
Sibling >6 Years	3.258	2.098

7- Private Sector Males, 1988, Egypt		
No. of Observations= 1595		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	0.484	0.703
Urban	0.590	0.492
Experience	15.379	12.516
Experience Sq.	3.931	5.675
Illiterate	0.000	0.000
Read&Write	0.167	0.373
Primary	0.207	0.405
Preparatory	0.149	0.357
Secondary	0.021	0.143
University+	0.055	0.228
M. Illiterate	0.117	0.321
F. Read&Write	0.262	0.440
F.Primary	0.052	0.222
F. Secondary	0.006	0.075
F. University	0.020	0.140
Sibling 0-6 Years	1.145	1.420
Sibling >6 Years	4.549	2.791

8- Private Sector Females, 1988, Egypt		
No. of Observations= 254		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	0.044	0.779
Urban	0.627	0.484
Experience	13.220	11.235
Experience Sq.	3.005	4.741
Illiterate	0.000	0.000
Read&Write	0.043	0.203
Primary	0.097	0.296
Preparatory	0.233	0.423
Secondary	0.032	0.177
University+	0.118	0.324
M. Illiterate	0.204	0.404
F. Read&Write	0.216	0.412
F.Primary	0.098	0.298
F. Secondary	0.008	0.088
F. University	0.063	0.243
Sibling 0-6 Years	0.832	1.068
Sibling >6 Years	3.910	2.235

9- Public Sector Males, 1999, Morocco		
No. of Observations= 434		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	2.640	0.695
Experience	28.597	9.188
Experience Sq.	9.020	5.495
Urban	0.894	0.308
Illiterate	0.296	0.457
Read&Write	0.125	0.331
Primary	0.174	0.380
Preparatory	0.223	0.416
Secondary	0.165	0.372
University+	0.142	0.349
M. Illiterate	0.031	0.173
F. Read&Write	0.679	0.467
F.Primary	0.220	0.415
F. Preparatory	0.067	0.251
F. Secondary	0.016	0.125
F. University	0.012	0.109
Sibling 0-6 Years	0.891	1.042
Sibling >6 Years	5.245	2.483

10- Public Sector Females, 1999, Morocco		
No. of Observations= 147		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	2.553	0.703
Experience	26.800	7.754
Experience Sq.	7.781	4.386
Urban	0.990	0.099
Illiterate	0.185	0.390
Read&Write	0.059	0.235
Primary	0.073	0.261
Preparatory	0.322	0.468
Secondary	0.210	0.408
University+	0.210	0.408
M. Illiterate	0.105	0.308
F. Read&Write	0.512	0.501
F.Primary	0.227	0.420
F. Preparatory	0.151	0.359
F. Secondary	0.070	0.255
F. University	0.023	0.151
Sibling 0-6 Years	0.634	0.856
Sibling >6 Years	5.068	2.293

11- Private Sector Males, 1999, Morocco		
No. of Observations= 1055		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	1.354	1.079
Experience	20.364	11.783
Experience Sq.	5.535	5.807
Urban	0.608	0.488
Illiterate	0.713	0.452
Read&Write	0.304	0.460
Primary	0.184	0.388
Preparatory	0.063	0.242
Secondary	0.026	0.159
University+	0.014	0.118
M. Illiterate	0.021	0.144
F. Read&Write	0.778	0.416
F.Primary	0.130	0.337
F. Preparatory	0.057	0.231
F. Secondary	0.014	0.116
F. University	0.010	0.097
Sibling 0-6 Years	0.890	1.033
Sibling >6 Years	6.088	2.602

12- Private Sector Females, 1999, Morocco		
No. of Observations= 379		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	1.050	1.111
Experience	18.022	10.890
Experience Sq.	4.432	5.007
Urban	0.827	0.379
Illiterate	0.699	0.459
Read&Write	0.217	0.412
Primary	0.158	0.365
Preparatory	0.092	0.289
Secondary	0.031	0.172
University+	0.020	0.141
M. Illiterate	0.029	0.169
F. Read&Write	0.754	0.431
F.Primary	0.125	0.331
F. Preparatory	0.077	0.267
F. Secondary	0.008	0.089
F. University	0.012	0.109
Sibling 0-6 Years	0.629	0.927
Sibling >6 Years	5.736	2.546

13- Public Sector Males, 1991, Morocco		
No. of Observations= 376		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	-1.243	1.011
Urban	0.854	0.353
Illiterate	0.000	0.000
Read&Write	0.139	0.346
Primary	0.184	0.388
Preparatory	0.177	0.382
Secondary	0.168	0.374
University+	0.146	0.353
M. Illiterate	0.005	0.070
F. Read&Write	0.821	0.384
F.Primary	0.150	0.358
F. Preparatory	0.018	0.132
F. Secondary	0.002	0.047
F. University	0.004	0.066

14- Public Sector Females, 1991, Morocco		
No. of Observations= 109		
Variable	**Mean**	**Std. Dev.**
Log Real Wage	-1.374	1.017
Urban	0.942	0.235
Illiterate	0.000	0.000
Read&Write	0.051	0.220
Primary	0.145	0.353
Preparatory	0.203	0.404
Secondary	0.312	0.465
University+	0.145	0.353
M. Illiterate	0.031	0.174
F. Read&Write	0.780	0.416
F.Primary	0.119	0.326
F. Preparatory	0.064	0.246
F. Secondary	0.018	0.135
F. University	0.018	0.135

15- Private Sector Males, 1991, Morocco

No. of Observations= 660

Variable	Mean	Std. Dev.
Log Real Wage	-2.412	0.836
Urban	0.486	0.500
Illiterate	0.000	0.000
Read&Write	0.271	0.445
Primary	0.132	0.339
Preparatory	0.046	0.210
Secondary	0.037	0.188
University+	0.011	0.105
M. Illiterate	0.013	0.114
F. Read&Write	0.838	0.369
F.Primary	0.112	0.316
F. Preparatory	0.033	0.180
F. Secondary	0.009	0.095
F. University	0.005	0.067

16- Private Sector Females, 1991, Morocco

No. of Observations= 154

Variable	Mean	Std. Dev.
Log Real Wage	-2.684	0.950
Urban	0.728	0.446
Illiterate	0.000	0.000
Read&Write	0.168	0.374
Primary	0.052	0.223
Preparatory	0.071	0.257
Secondary	0.056	0.230
University+	0.026	0.160
M. Illiterate	0.021	0.143
F. Read&Write	0.799	0.402
F.Primary	0.143	0.351
F. Preparatory	0.032	0.178
F. Secondary	0.026	0.160
F. University	0.000	0.000