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Send correspondence to:
Mona Said
American University in Cairo
mona_said@aucegypt.edu

Abstract

This paper investigates the pattern of wages and wage inequality in Egypt over the period 1988-2012, a time of substantial economic and political changes, including the recent global financial crises and the January 25th 2011 revolution. This analysis is based on four nationally representative labor market surveys: the special round of the Egyptian Labor Force Sample Survey (LFSS) carried out in October 1988, the 1998 Egypt Labor Market Survey (ELMS), and the 2006 and 2012 rounds of the Egypt Labor Market Panel Survey (ELMPS). The analysis in the paper proceeds as follows. Section 2 introduces the main stylized facts and structural features of real wage and inequality in the Egyptian labor market during the recent liberalization episodes. Section 3 describes the wage determination model used in calculating wage differentials and returns to education. Section 4 discusses the wage estimation results, while focusing on public-private and gender wage gaps and changes in returns to education over the past decade. Finally, section 5 concludes and draws implications for the reform of the labor market in the wake of the financial crisis.

ملخص

تبحث هذه الورقة نمط الأجور وعدم المساواة في الأجور في مصر خلال الفترة 1988-2012، وهو الوقت الذى حدثت فيه تغيرات اقتصادية وسياسية كبيرة، بما في ذلك الأزمات المالية العالمية الأخيرة وثورة 25 يناير 2011. ويستند هذا التحليل على أربعة مسوح ممثلة لسوق العمل فى مصر : سلسلة خاصة من عينة مسح القوى العاملة فى مصر (LFSS) التي أجريت في أكتوبر 1988، ومسح سوق العمل مصر 1998 (ELMS)، والمسح التتبعى لسوق العمل فى مصر(ELMPS) لعام 2006 و 2012. يجرى التحليل في هذه الورقة على النحو التالي. القسم الثانى يقدم الحقائق المجردة الرئيسية والسمات الهيكلية من الأجور الحقيقية وعدم المساواة في سوق العمل المصري خلال مراحل التحرير الأخيرة. يصف القسم الثالث نموذج تحديد الأجور المستخدمة في حساب الفوارق في الأجور والعوائد من التعليم. القسم الرابع يناقش نتائج تقدير الأجور، مع التركيز على الفوارق في الأجور بين القطاعين العام والخاص والنوع الاجتماعي والتغيرات في عائدات التعليم على مدى العقد الماضي. وأخيرا، يختتم القسم الخامس بتوضيح توجه وآثار الإصلاح لسوق العمل في أعقاب الأزمة المالية.

1. Introduction

This paper investigates the pattern of wages and wage inequality in Egypt over the period 1988-2012, a time of substantial economic and political changes, including the recent global financial crises and the January 25th 2011 revolution. This analysis is based on four nationally representative labor market surveys: the special round of the Egyptian Labor Force Sample Survey (LFSS) carried out in October 1988, the 1998 Egypt Labor Market Survey (ELMS), and the 2006 and 2012 rounds of the Egypt Labor Market Panel Survey (ELMPS); for details see Assaad and Krafft (2013). See Said (2002) and (2009) for discussions of the results of the earlier surveys.

After an early period (1988-98) of falling real wages and wage compression, both real wages and wage inequality started rising again in Egypt between 1998 and 2006. The paper investigates the recent changes in wages that took place after 2006 and the onset of the global financial crisis and the Egyptian revolution, and which groups were most affected. To explore how the distribution of wages has changed for different groups, the paper presents an analysis of returns to education, sector and gender wage differentials, and several measurements and decompositions of overall wage inequality across demographic groups and institutional sectors. The paper also focuses on low wage earners in the labor market, a group that was identified by defining low earnings lines, in line with regional poverty lines based on the most recent household income, expenditure, and consumption survey (HIECS 2010/11). This allows an exploration of changes in the profile of the low-waged by major individual (demographic) and job characteristics.

Although the recent global crisis had a substantial impact on labor markets around the world, very few studies have been undertaken to examine its impact on wages and inequality outcomes in emerging and transition economies, due to data limitations. The results in Egypt point to distinct phases: an initial period of wage erosion and narrowing pay differentials, and a subsequent period of recovery in real wages and rising inequality (1998-2006) and then slightly decreasing inequality (2006-2012). Estimates based on data in 2012 point to a combination of real pay increases but increasing shares of low-wage earners, coupled with stable gender and sector pay differentials.

The analysis in the paper proceeds as follows. Section 2 introduces the main stylized facts and structural features of real wage and inequality in the Egyptian labor market during the recent liberalization episodes. Section 3 describes the wage determination model used in calculating wage differentials and returns to education. Section 4 discusses the wage estimation results, while focusing on public-private and gender wage gaps and changes in returns to education over the past decade. Finally, section 5 concludes and draws implications for the reform of the labor market in the wake of the financial crisis.

2. Evolution of Wages and the Wage Structure Since 1988

2.1 Trends in real wages since 1988

Our data allow us to explore longer term trends in the Egyptian labor market prior to the onset of both the financial crisis and revolution, and dating back to the outset of economic reform and structural adjustment policies in the late 1980s and early 1990s. As the pace of liberalization increased and the economy shifted towards a market-led model during the period from 1988 to 1998, several important changes were witnessed in the labor market in Egypt. The public sector employment guarantee scheme, providing all graduates of vocational secondary and university degrees with public employment, in operation since 1964, came to an almost complete halt (Assaad 1997). Moreover, after more than 20 years of debate, privatization became a reality post-1996, when schemes for early retirement and compensation of retrenched workers were introduced in several public enterprises selected to be privatized. As a result, there was an absolute decline in the number of employed workers

in public enterprises for the first time in the 1990s. In 2003, a new labor law substantially decreased the job security guarantees of public enterprise and private sector workers in return for granting them a limited right to strike. See Assaad and Krafft (2013) for more details on the evolution of employment.

Table 1 examines the changes in median monthly wages across socio-economic groups and over time. To facilitate comparability, all 1988, 1998 and 2006 wages are in real 2012 Egyptian Pounds (LE), that is, they have been adjusted to take into account inflation and are presented in terms of 2012 prices using the official consumer price index. The numbers in the table reveal that after substantially declining in real terms from 1988 to 1998, by 2006 wages had made only a partial recovery compared to their 1988 levels, and continued to moderately recover up to 2012. After 2006, the traditionally under-paid benefited from higher wage increases (youth aged 15-24, agricultural workers and those from rural Upper Egypt), while the traditionally higher-paid saw stagnation or falling real wages (especially university graduates and those living in Greater Cairo).

Figure 1 presents a summary of the main findings on real monthly wages, inequality (measured by the decile ratio) and the share of workers below the low-earnings line from 1988 to 2012 (see appendix on calculation of low earnings line). The 'decile ratio' is the ratio of the 90th percentile of the wage distribution to the 10th percentile. Looking at this whole period, starting 1988, it is clear that real wages fell and then recovered, but 2012 median monthly wages are generally similar to 1988. Wage inequality, as measured by the declie ratio, increased then dropped, to more or less the same level in 2012 as in 1988. The main change that took place is that there is now a larger share of earners that can be classified as below the low-earnings line (derived from the poverty line). While this share remains below the 1998 level, it is higher than in either 1988 or 2006. This may be in part due to the shift of large numbers of workers from non-wage into wage work (Assaad and Krafft 2013), and it is not possible to assess whether the share of low-earners would have risen or fallen if this shift were accounted for.

The Egyptian labor market can be described as going through distinct phases in the aftermath of economic liberalization and structural adjustment. From 1988 to 1998, we observe a period of real wage erosion. This was followed by a period of real wage recovery from 1998 to 2012. While inequality rose from 1988 to 2006, as of 2012 there was a drop in wage inequality as measured by the declie ratio. Inequality remained above 1988 and 1998 levels, but below 2006 levels. Thus as of 2012, after two decades of privatization and structural adjustment programs, the Egyptian labor market seems to have recovered to pre-adjustment levels of real wages, but with a high portion of wage workers that can be classified as low earners and higher inequality.

2.2 Trend in the share of Low Earners

Table 2 shows the percentage of low earners across groups. Overall, over the period 2006-2012, there has been a rise in the share of low wage earners from 39% of all wage-earners in 2006 to 46% percent in 2012. The increase in the share of low earners was much more pronounced for males, prime age workers 35-49; Greater Cairo and Lower Egypt (highest at 54% in urban Upper Egypt); university and post-secondary institute graduates, and public enterprise and government workers. The share of the low-waged was already high and remained highest at 50% in private sector. It is also quite interesting that the share of low wage earners in agriculture declined substantially. However, many agriculture workers shifted to other sectors over time and many workers shifted from non-wage to wage work (see Assaad and Krafft 2013).

To answer the question of who the low-waged are in Egypt, the gender, age, regional and educational structure of the group of low-wage workers in 2012 remained similar to 2006,

with 44% of males low earners but 56% of working females, a 59% rate in younger age groups (15-34 years), 49% among those residing in rural (upper and lower) Egypt, 58% among illiterates and 46% among those with vocational high school degree. Furthermore, between 2006 to 2012 important structural changes took place by sector of economic activity, including a large drop in the share below the low earnings line working in agriculture and increases in other sectors.

2.3 Trends in wage inequality

Finally, we turn to an analysis of the implication of the above changes in wage differentials in terms of the overall observed inequality (or dispersion) of monthly wages. Table 3 shows Gini coefficients[1] for different socio-economic groups in Egypt over time. Wage inequality has overall remained essentially flat over time. Looking at differences across institutional sectors, it is also interesting to note that whereas in 1988, monthly wages were most compressed (equalized) in the government sector and most dispersed the private sector, by 2012 inequality became quite similar across sectors. Inequality, as measured by the Gini coefficient, continues to be highest in the Greater Cairo region and among the most educated.

Inequality has declined in all sectors when comparing 2006 and 2012 and looking at the decile ratio (see Figure 2). In line with the Gini coefficient, decile ratios show that the government and public enterprise sectors experienced rising inequality from 1988-2006 and all sectors had a decline from 2006 to 2012. The slight U turn or relative stability in decile ratios in aggregate hides two clearly opposing effects: increase in dispersion in the public sector, especially in public enterprises, and continued compression in the wage structure of the private sector. This can be taken as further evidence of the declining impact of the public sector employment guarantee and centralized wage bargaining in the government sector in Egypt in comparison to the late 1980s.

Besides the Gini coefficient, the measures of inequality estimated include the Theil Index (Table 4). As a member of the general entropy (GE) Indices, the Theil Index has the desirable property of being additively decomposable into components within and between groups. However, both measures are problematic in that they take into account all observations, making them sensitive to errors or real changes at the tails of the distribution.

Table 4 presents further decomposition of inequality by sector, using the Gini, decile ratio, and Theil index, which show that most of the observed inequality for Egypt is 'within' groups. The groups considered are level of education (8 groups), occupation (9 groups) and industry (3 groups). All measures of inequality indicate an overall increase in inequality between 1998 and 2006 followed by a decline between 2006 and 2012, but differences are slight. Within group, inequality dominates in all sectors and by gender.

3. Modeling Wages

3.1 Estimation model

The empirical analysis in this section aims to provide measures of sector and gender wage differentials that correct for individual differences in characteristics as well as in returns to these characteristics. Ordinary least squares (weighted by sampling weights, described below) are used to estimate separate wage equations for workers in the public (p), and private (r) sectors as follows:

$$\text{Ln} (w_{is}) = X_{is}\beta_s + u_s \quad (s = p, r) \tag{1}$$

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[1] The Gini coefficient is a measure used to depict the degree of income or wealth inequality. A value of 0 represents perfect equality, whereas a value of 1 represents perfect inequality. Due to outliers in the wage distribution and difficulties in surveying the highest earners in Egypt, we restrict our analysis to those below the 99.5th percentile of monthly wages.

Where Ln (w_{is}) is log hourly wages of individual i in sector s and X is the vector of individual and job related characteristics known to be of relevance in determining wages. This is estimated twice, once for males (m) and once for females (f), yielding four equations.

Given the parameter estimates from (1), public-private wage differentials can be evaluated at the mean of the sample, using the following decomposition formula:

$$D_s = \overline{\ln(w_s)} - \overline{\ln(w_r)} = \frac{(\beta_s + \beta_r)(\overline{X}_s - \overline{X}_i)}{2} + \frac{(\beta_s - \beta_r)(\overline{X}_s + \overline{X}_i)}{2} \qquad (s = p) \qquad (2)$$

D_s refers to the wage differential between the public and the private sector. $\overline{\ln(w)}$ refers to the mean of Ln wages.

The formula decomposes the wage differential into two main components. The first term, which is 'explained,' is the part of the differential attributable to differences in observed characteristics of workers (X's). The second term, which is "unexplained," is the part of the differential resulting from differences in the pay structure, or in returns to the characteristics. Note that the unexplained component also includes the differential in base wage (the constant term) that can be interpreted as a premium or pure rent from attachment to a particular sector. Similarly the same formula can be used to decompose the male-female wage gap as follows:

$$D_f = \overline{\ln(w_m)} - \overline{\ln(w_f)} = \frac{(\beta_m + \beta_f)(\overline{X}_m - \overline{X}_f)}{2} + \frac{(\beta_m - \beta_f)(\overline{X}_m + \overline{X}_f)}{2} \qquad (3)$$

Here, the unexplained component (second term on the right hand side) is broadly taken to refer to a rough estimate of gender-based discrimination.

3.2 Data and variable specification

The sample is limited to wage workers who are between the age of 16 and 64, amounting to 7,491 in 2006 and 10,228 in 2012. Only monetary earnings are included in the wage equation. Log real hourly wage is used as a dependent variable, which is computed by dividing the monetary net earnings by the number of hours worked per year, and all wages are expressed in 2012 prices. Log hourly wage is used (instead of hourly wage) to reduce the effects of wages outliers. The regressions correct for eight levels of educational attainment (the omitted category is that of the illiterates) and six regional or locational dummy variables (the omitted category is Greater Cairo.) The regressions are presented in full in appendix tables A2 and A3.

4. Corrected Sector and Gender Wage Differentials

Gender and sector wage differentials are estimated based on separate estimates—four equations, one for each combination of gender and sector—to calculate wage decompositions that also allow for different coefficients for education, experience and region. Table 5 below reports corrected gender and sector wage differentials for Egypt based on the method outlined above, allowing for different returns to characteristics. Thus, corrected sector wage differentials are calculated as the difference between predicted log hourly wages for public sector employees using the public sector wage equation and their predicted log hourly wages using the private sector equation (expressed as a proportion of the former). These calculations are done separately for both males and females. Similarly, corrected gender wage differentials are the difference between predicted female wages using the female equation and their predicted wages using the male equation. These calculations are done separately for the public and private sectors. The corrected female-male differentials are compressed in the public sector and are near gender equality as of 2012. The gender gap remained very high at over 40% in the private sector as of 2012. See Arabsheibani (2000) and Said (2009) for additional discussion of gender wage differentials. Corrected public-private differentials

confirm that the public sector advantage does not exist for males (there is a slight 6% disadvantage in 2012) and is around 35% for females as of 2012. See El-Gamrawy and Amer (2013) for a discussion of public-private differentials, and Assaad (1997) for further discussion of historical gender and sector wage differentials.

4.1 Returns to Education

Finally, it is possible to use the wage parameter estimates to calculate cumulative and marginal returns to education and compare them to earlier estimates over the past decade in Egypt. These estimates are presented in Table 6 below. Two main important observations can be made as a result of this comparison. First, cumulative returns to schooling (in comparison to illiterates) have dropped quite substantially in Egypt over 2006-2012 at all levels. This continues the trend of decreasing returns to education (Salehi-Isfahani, Tunali, and Assaad 2009). For women at the university level, they increased especially in the private sector, but this is probably due to women selecting out of low-wage jobs in the private sector, an option men do not have. In 2012, returns to schooling for both men and women declined at the university level, but increased at the vocational secondary level. This is probably a story of demand and supply, with the increase of university degree holders in relation to low demand for their skills in an era of economic slowdown in Egypt. The increase in returns to vocational degrees might again reflect a selection story, with only the higher quality graduates remaining in the labor force, whereas the rest (especially women) are discouraged and leave the labor force.[2] This is in line with private sector returns falling for males, who do not select out of the workforce.

5. Conclusion

This paper contributes to the limited literature (Cho & Newhouse 2013; and Roushdy & Gadallah 2011) on the effects of the recent global economic crisis in emerging and transition economies by utilizing recently available household survey data in Egypt. An examination of public-private, gender and education dynamics of wage inequality during a period of economic liberalization and crises points to a number of important developments. There was initially wage erosion and then a subsequent phase of recovery of real wages. Overall, inequality has been relatively constant, with a slight rise over time and then a slight drop in 2012. Simultaneously, there was an increase in the share of workers below the low earnings line to a startling 46% of all working Egyptians. Returns to education declined over this period. To the extent that some increases were witnessed for vocational education graduates and women, this may well reflect selection out of low wage jobs, such that those remaining in the labor force appear as being paid higher. Moderate increases in real wages were not sufficient to reverse the trend of an increasing share of the impoverished or low earners in the Egyptian labor market. Corrected wage differentials reveal that most of the wage adjustment took place prior to the financial crisis and revolution period in Egypt, and the wage structure remained relatively stable since 2006. Women in Egypt remain better paid in the public sector. There is no gender gap in the government, but the gap is substantial in the private sector.

To conclude, wage and inequality trends in the Egyptian labor market confirm deteriorating conditions, especially for women in the private sector and university graduates in the era of financial crisis and revolution. This calls attention to the importance of demand stimulus measures, active labor market policies and institutional interventions to help generate higher paying and decent jobs and reverse the trend of declining participation reported in other papers.

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[2] See El-Hamidi (2006) for more on the returns to general and vocational secondary education.

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Figure 1: Median Real Monthly Wages, Earnings Inequality (Declie Ratio), and Share of Low-Wage Earners, Wage Workers Using the Market Definition of Employment, 15-65 Years Old, 1988-2012
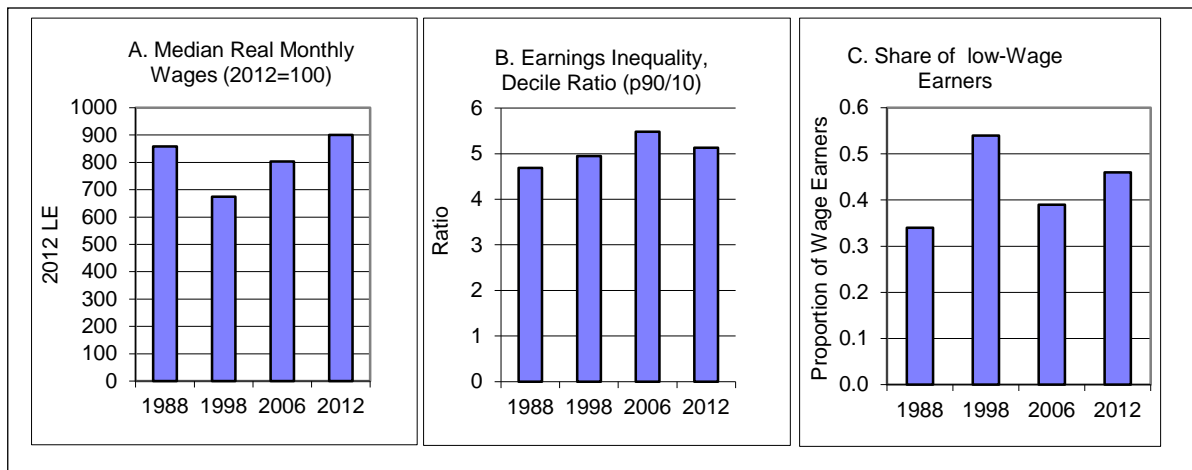
Figure 2: Decile Ratios (p90/p10) of Monthly Wages for All Wage Workers Across Institutional Sectors (Wage Workers Using the Market Definition, 15-65 Years Old) (1988-2012)
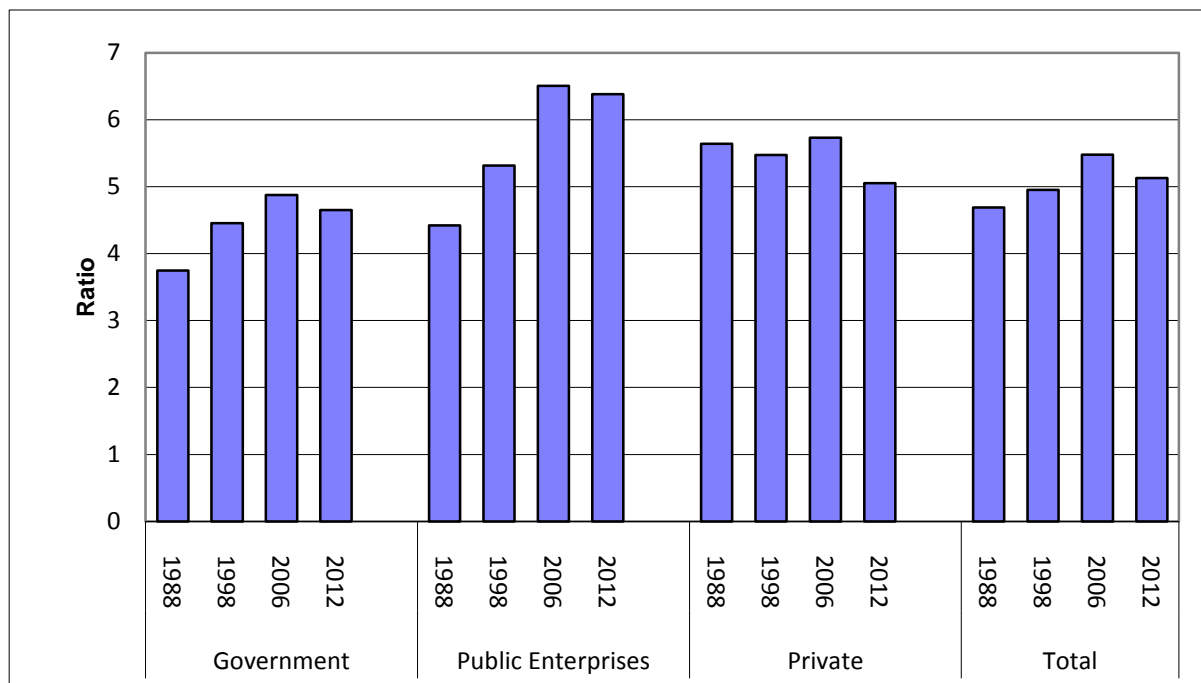
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Table 1: Trends in Real Monthly Wages in Egypt, Wage Workers Using the Market Definition of Work, 15-65 Years Old, 1988-2012

	Median real monthly wages by group						
	\multicolumn{4}{c}{Level}	\multicolumn{3}{c}{Change}			
	1988	1998	2006	2012	1988-98	1998-2006	2006-2012
		(in 2012 L.E.)				(in percent)	
Total	859	675	803	900	-21	19	12
Gender							
Male	934	703	826	900	-25	18	9
Female	678	572	747	800	-16	31	7
Age Group							
15-24	627	487	560	700	-22	15	25
25-34	768	597	767	845	-22	28	10
35-49	1062	731	895	993	-31	22	11
50-64	1137	942	1180	1176	-17	25	0
Region							
Greater Cairo	1137	885	1075	1000	-22	21	-7
Alexandria and Suez Canal Cities	1024	843	983	1000	-18	17	2
Urban Lower Egypt	904	703	852	900	-22	21	6
Rural Lower Egypt	783	654	826	891	-17	26	8
Urban Upper Egypt	705	585	734	800	-17	26	9
Rural Upper Egypt	705	509	672	850	-28	32	27
Educational Attainment							
Illiterate	705	526	639	751	-25	21	18
Literate without Diploma	904	590	734	776	-35	24	6
Elementary school	940	691	708	800	-27	2	13
Middle School	979	703	843	850	-28	20	1
General High school	1431	984	934	900	-31	-5	-4
Vocational high school	776	596	767	900	-23	29	17
Post-secondary institute	949	678	897	1000	-29	32	11
University & above	1311	928	1119	1083	-29	21	-3
Sector of Activity							
Agriculture	627	487	553	712	-22	13	29
Industry	1055	731	826	950	-31	13	15
Services	866	646	852	900	-25	32	6
Institutional sector							
Government	814	614	858	950	-25	40	11
Public Enterprise	1175	913	1147	1227	-22	26	7
Private	783	688	747	845	-12	9	13

Source: Author's calculations based on LFSS 1988, ELMS 1998, ELMPS 2006, ELMPS 2012

Table 2: Distribution of Real monthly Wages and Share below Low Earnings Line in Egypt, 1988-2012

| | Share Below low earnings line earnings by group | | | | | | |
| | Level | | | | Relative change in % | | |
	1988	1998	2006	2012	1988-98	1998-2006	2006 - 2012
Total	0.34	0.54	0.39	0.46	57	-27	18
Gender							
Male	0.30	0.51	0.37	0.44	70	-27	19
Female	0.51	0.65	0.48	0.56	28	-27	16
Age Group							
15-24	0.49	0.72	0.63	0.66	48	-13	5
25-34	0.40	0.60	0.43	0.51	49	-28	17
35-49	0.22	0.48	0.30	0.40	117	-37	33
50-64	0.24	0.34	0.21	0.31	43	-38	48
region							
Greater Cairo	0.24	0.34	0.26	0.36	44	-25	39
Alexandria and Canal Cities	0.27	0.40	0.30	0.35	52	-25	16
Urban Lower Egypt	0.33	0.52	0.38	0.47	60	-28	25
Rural Lower Egypt	0.39	0.57	0.40	0.47	44	-30	18
Urban Upper Egypt	0.44	0.62	0.46	0.54	42	-26	17
Rural Upper Egypt	0.44	0.71	0.51	0.51	60	-28	-1
Educational Attainment							
illiterate	0.44	0.66	0.50	0.58	50	-24	16
Literate without Diploma	0.30	0.60	0.44	0.59	101	-27	34
Elementary school	0.36	0.52	0.47	0.56	45	-8	18
Middle School	0.25	0.51	0.38	0.50	101	-26	32
General High school	0.08	0.30	0.39	0.45	265	30	14
Vocational high school	0.45	0.61	0.44	0.46	35	-28	5
Post-secondary institute	0.33	0.57	0.29	0.41	74	-50	42
University & above	0.17	0.32	0.24	0.35	86	-25	46
Sector of Activity							
Agriculture	0.54	0.69	0.66	0.52	28	-5	-21
Industry	0.23	0.43	0.37	0.44	87	-15	21
Services	0.36	0.57	0.37	0.45	59	-35	21
Institutional sector							
Government	0.39	0.60	0.35	0.43	56	-41	22
Public enterprise	0.20	0.34	0.21	0.28	74	-38	32
Private	0.36	0.52	0.45	0.50	44	-14	11

Source: Author's calculations based on LFSS 1988, ELMS 1998, ELMPS 2006, ELMPS 2012

Table 3: Gini Coefficients for Real Monthly Wages by Group, Wage Workers Using the Market Definition, 15-65 Years Old) 1988-2012*

	Gini coefficient for earnings by group						
	Level				Change in %		
						1998-	2006 -
	1988	1998	2006	2012	1988-98	2006	2012
Total	0.36	0.36	0.38	0.36	-2	7	-5
Gender							
Male	0.36	0.36	0.38	0.36	-1	6	-4
Female	0.37	0.36	0.41	0.38	-1	13	-8
Age Group							
15-24	0.36	0.33	0.35	0.34	-8	5	-3
25-34	0.33	0.33	0.38	0.35	-1	14	-7
35-49	0.33	0.34	0.36	0.36	2	5	2
50-64	0.36	0.35	0.36	0.35	-2	2	-1
region							
Greater Cairo	0.38	0.36	0.39	0.39	-6	7	0
Alexandria and Canal Cities	0.34	0.36	0.39	0.35	7	8	-12
Urban Lower Egypt	0.34	0.31	0.36	0.33	-9	16	-7
Rural Lower Egypt	0.33	0.34	0.38	0.38	4	9	2
Urban Upper Egypt	0.31	0.32	0.33	0.34	2	5	0
Rural Upper Egypt	0.30	0.32	0.37	0.35	7	17	-7
Educational Attainment							
illiterate	0.30	0.33	0.37	0.34	7	12	-8
Literate without Diploma	0.31	0.34	0.37	0.35	11	10	-6
Elementary school	0.33	0.33	0.35	0.34	1	6	-3
Middle School	0.31	0.33	0.37	0.33	5	15	-12
General High school	0.33	0.36	0.35	0.37	8	-1	6
Vocational high school	0.35	0.32	0.36	0.34	-8	11	-6
Post-secondary institute	0.34	0.33	0.33	0.39	-3	0	18
University & above	0.38	0.36	0.39	0.38	-5	8	-3
Sector of Activity							
Agriculture	0.28	0.35	0.35	0.31	23	3	-13
Industry	0.35	0.34	0.39	0.37	-2	15	-6
Services	0.37	0.36	0.37	0.36	-2	3	-2
Institutional sector							
Government	0.33	0.34	0.36	0.35	3	7	-2
Public enterprise	0.34	0.36	0.39	0.38	5	8	-1
Private	0.38	0.36	0.39	0.36	-5	6	-7

Source: Author's calculations based on LFSS 1988, ELMS 1998, ELMPS 2006, ELMPS 2012

Table 4: Measures of Inequality of Monthly Wages, (Wage Workers With Wages Less than 10,000 LE Per Month, 15-65 Years Old) Egypt 1998-2012

	Gini			Decile Ratio			TheilG(1)			Decomposition of Theil Index 2012 (% due to within group inequality)		
---	---	---	---	---	---	---	---	---	---	Education	Occupation	Industry
	1998	2006	2012	1998	2006	2012	1998	2006	2012			
Government	0.34	0.36	0.35	4.46	4.58	4.69	0.20	0.25	0.23	**0.96**	0.92	0.98
Public Enterprise	0.36	0.39	0.38	5.32	5.45	6.38	0.22	0.26	0.25	**0.82**	0.77	1.00
Private Sector	0.36	0.39	0.36	5.50	5.77	4.93	0.23	0.28	0.24	**0.95**	0.91	0.98
Total	0.36	0.38	0.36	5.00	5.41	5.15	0.23	0.28	0.24	**0.94**	0.90	0.98
Male	0.36	0.38	0.36	4.80	5.00	5.00	0.22	0.27	0.24	**0.92**	0.87	0.97
Female	0.36	0.41	0.38	5.18	7.08	5.70	0.23	0.31	0.26	**0.94**	0.90	0.99
Total	0.36	0.38	0.36	5.00	5.41	5.15	0.23	0.28	0.24	**0.94**	0.90	0.98

Source: Author's calculations based on ELMS 1998, ELMPS 2006, ELMPS 2012

Table 5: Gender and Sector Wage Differentials in Egypt, (Wage Workers Using the Market Definition, 15-65 Years Old) 1988-2012 (in Log Hourly Wages)

	Egypt							
	1988		1998		2006		2012	
	crude	corrected	crude	corrected	crude	corrected	crude	corrected
Sector Wage Differentials								
Male Public-private	0.20	-0.19	0.11	-0.19	0.32	**-0.04**	0.24	**-0.06**
Female Public-private	-0.56	0.59	0.50	0.08	0.72	**0.33**	0.54	**0.35**
Gender Wage Differentials (Female-Male)								
Public sector	-0.07	0.02	0.02	0.08	-0.09	**-0.08**	-0.02	**-0.01**
Private Sector	-0.66	-0.43	-0.34	-0.31	-0.49	**-0.41**	-0.32	**-0.41**

Source: Author's calculation from log hourly wage regressions based on the 1988 LFSS, 1998 ELSS and 2006-2012 ELMPS.

Table 6: Percentage Cumulative and Marginal Annualized Returns to Education in Egypt (Wage Workers Using the Market Definition, 15-65 Years Old), 2006-2012

	2006					2012				
Cumulative returns	Total	Male		Female		Total	Male		Female	
(in comparison to illiterate)		Private	Public	Private	Public		Private	Public	Private	Public
Basic (preparatory)	2.2	1.7	4.3	1.7	4.9	1.1	0.1	4.6	0.4	5.9
Vocational Secondary	2.8	1.7	5.3	-0.6	5.7	2.2	1.0	5.7	1.1	6.3
University and above	4.8	4.8	6.5	3.5	6.0	4.0	2.8	7.0	4.4	6.8
Marginal returns										
(in comparison to previous level)										
Vocational Secondary	4.7	1.8	8.1	-7.3	8.1	5.6	3.7	9.0	2.9	7.8
University and above	10.9	14.1	10.3	15.8	7.0	9.4	8.2	10.8	14.5	8.4

Source: Author's calculations based on ELMPS 2006, ELMPS 2012

Table A1: Trends in Real Hourly Wages in Egypt, Wage Workers [3] 1988-2012

	Mean real hourly wages by group							Median real hourly wages by group						
	Level				Change			Level				Change		
	1988	1998	2006	2012	1988 -98	1998 - 2006	2006 - 2012	1988	1998	2006	2012	1988 -98	1998 - 2006	2006 - 2012
		(in 2012 L.E.)				(in percent)			(in 2012 L.E.)				(in percent)	
Total	5.7	4.3	5.0	5.7	-25	18	14	4.5	3.4	4.1	4.6	-24	20	12
Gender														
Male	5.8	4.3	5.0	5.7	-26	18	12	4.6	3.5	4.1	4.5	-25	18	10
Female	5.2	4.2	5.0	6.0	-19	20	18	3.9	3.3	4.1	4.9	-16	26	19
Age Group														
15-24	4.1	2.8	3.3	4.2	-30	17	26	3.6	2.4	2.8	3.6	-32	16	27
25-34	5.4	3.8	4.6	5.1	-29	21	11	4.5	3.2	3.8	4.2	-29	17	11
35-49	6.8	4.8	5.7	6.2	-30	18	10	5.9	3.9	4.9	5.0	-33	23	4
50-64	7.2	6.0	7.1	7.6	-16	18	8	5.9	5.0	6.3	6.3	-15	26	-1
Region														
Greater Cairo	6.9	5.7	6.3	6.9	-18	11	10	5.7	4.2	5.0	5.2	-25	20	2
Alexandria and Canal Cities	6.3	5.1	5.8	6.4	-19	13	11	5.4	4.1	4.7	5.2	-25	17	10
Urban Lower Egypt	5.7	4.3	5.1	5.6	-25	19	9	4.5	3.5	4.3	4.7	-22	22	8
Rural Lower Egypt	5.5	4.3	5.4	5.9	-21	23	11	4.5	3.5	4.4	4.8	-23	25	9
Urban Upper Egypt	4.7	3.6	4.2	4.9	-22	16	17	4.0	3.1	3.7	4.1	-22	18	10
Rural Upper Egypt	4.6	3.2	4.3	5.4	-30	33	25	4.4	2.8	3.6	4.4	-37	27	23
Educational Attainment														
Illiterate	4.4	3.3	3.9	4.5	-25	17	15	4.0	2.8	3.3	3.8	-29	17	14
Literate without Diploma	5.1	3.6	4.1	4.9	-29	14	19	4.4	3.0	3.3	3.8	-31	9	14
Elementary school	5.2	3.7	4.0	4.6	-30	9	15	4.2	3.1	3.3	3.9	-25	6	15
Middle School	5.1	3.8	4.6	4.7	-25	20	3	4.4	3.5	3.8	4.0	-19	9	5
General High school	8.2	6.4	5.2	5.5	-21	-20	5	6.5	4.2	4.1	4.3	-35	-3	6
Vocational high school	5.5	3.8	4.7	5.4	-32	24	15	4.5	3.1	3.9	4.5	-31	26	14
Post-secondary institute	6.2	4.5	5.7	6.7	-27	26	18	5.7	3.8	4.8	5.0	-34	26	5
University & above	8.9	6.6	7.1	7.6	-26	8	7	7.5	5.2	6.0	6.3	-30	15	4
Sector of Activity														
Agriculture	4.5	3.4	3.7	4.4	-26	10	17	4.5	3.2	3.5	4.0	-30	11	15
Industry	6.0	4.3	5.1	5.8	-28	16	14	5.4	3.5	3.9	4.4	-34	12	13
Services	5.8	4.4	5.2	5.9	-25	19	13	4.7	3.5	4.5	5.0	-26	29	9
Institutional sector														
Government	5.8	4.4	5.7	6.6	-24	31	16	4.8	3.5	4.8	5.5	-27	36	14
Public enterprise	7.1	5.8	7.2	8.2	-19	24	14	5.9	4.6	5.6	6.1	-22	23	9
Private	5.1	3.9	4.3	5.0	-24	10	16	4.5	3.2	3.6	4.1	-29	13	13

Source: Author's calculations based on LFSS 1988, ELMS 1998, ELMPS 2006, ELMPS 2012

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[3] Excluding those above the 99.5th percentile

Table A2: Ordinary Least Squares Wage Equation Estimates (Wage Workers Using the Market Definition, 15-65 Years Old), Egypt 2006

	Total	Male		Female	
		Private	Public	Private	Public
Experience	0.054***	0.046***	0.040***	0.061***	0.055***
	(0.002)	(0.003)	(0.005)	(0.012)	(0.006)
Experience Squared	-0.001***	-0.001***	-0.000***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Literate without Diploma	0.032	0.057	0.148*	-0.321*	-0.320
	(0.038)	(0.044)	(0.082)	(0.174)	(0.239)
Elementary school	0.105***	0.083**	0.233***	-0.092	0.143
	(0.033)	(0.037)	(0.077)	(0.153)	(0.278)
Middle School	0.199***	0.155***	0.387***	0.150	0.441*
	(0.043)	(0.050)	(0.089)	(0.200)	(0.239)
General High school	0.445***	0.232*	0.855***	0.271	0.803***
	(0.091)	(0.121)	(0.178)	(0.281)	(0.299)
Vocational high school	0.339***	0.209***	0.631***	-0.070	0.684***
	(0.028)	(0.033)	(0.068)	(0.108)	(0.134)
Post-secondary institute	0.513***	0.308***	0.858***	0.081	0.756***
	(0.040)	(0.062)	(0.081)	(0.179)	(0.141)
University	0.773***	0.772***	1.041***	0.561***	0.963***
	(0.031)	(0.043)	(0.069)	(0.119)	(0.135)
Alexandria and Canal Cities	-0.035	0.025	0.004	-0.124	-0.190***
	(0.028)	(0.039)	(0.056)	(0.103)	(0.062)
Urban Lower Egypt	-0.169***	-0.083**	-0.213***	-0.616***	-0.204***
	(0.028)	(0.040)	(0.054)	(0.110)	(0.059)
Rural Lower Egypt	-0.146***	-0.124***	-0.183***	-0.182	-0.173***
	(0.027)	(0.039)	(0.049)	(0.140)	(0.055)
Urban Upper Egypt	-0.215***	-0.082**	-0.337***	-0.485***	-0.195***
	(0.025)	(0.034)	(0.046)	(0.100)	(0.061)
Rural Upper Egypt	-0.196***	-0.094***	-0.301***	-0.254*	-0.282***
	(0.027)	(0.035)	(0.052)	(0.145)	(0.090)
Female	-0.221***				
	(0.020)				
Public Sector	0.020				
	(0.019)				
Constant	0.679***	0.782***	0.541***	0.625***	0.234
	(0.036)	(0.046)	(0.085)	(0.133)	(0.148)
Observations	7,525	3,478	2,488	438	1,119
R-squared	0.239	0.159	0.200	0.335	0.325

Notes: Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A3: Ordinary Least Squares Wage Equation Estimates (Wage Workers Using The Market Definition, 15-65 Years Old), Egypt 2012

	Total	Male		Female	
		Private	Public	Private	Public
Experience	0.035***	0.024***	0.033***	0.039***	0.037***
	(0.002)	(0.002)	(0.004)	(0.012)	(0.006)
Experience Squared	-0.000***	-0.000***	-0.000***	-0.000	-0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Literate without Diploma	0.023	0.019	0.206**	0.107	0.323
	(0.039)	(0.044)	(0.085)	(0.242)	(0.256)
Elementary school	0.066**	0.006	0.210***	0.378**	1.995***
	(0.028)	(0.031)	(0.073)	(0.158)	(0.394)
Middle School	0.096***	0.009	0.413***	0.040	0.527***
	(0.034)	(0.038)	(0.081)	(0.209)	(0.201)
General High school	0.283***	0.169***	0.662***	0.359	0.694***
	(0.046)	(0.058)	(0.098)	(0.237)	(0.185)
Vocational high school	0.264***	0.120***	0.683***	0.128	0.760***
	(0.023)	(0.027)	(0.060)	(0.119)	(0.145)
Post-secondary institute	0.378***	0.241***	0.828***	0.143	0.853***
	(0.038)	(0.057)	(0.076)	(0.201)	(0.157)
University	0.638***	0.447***	1.116***	0.706***	1.095***
	(0.027)	(0.035)	(0.062)	(0.121)	(0.144)
Alexandria and Canal Cities	-0.018	-0.081**	0.099*	-0.198*	0.005
	(0.028)	(0.038)	(0.055)	(0.116)	(0.066)
Urban Lower Egypt	-0.175***	-0.176***	-0.146***	-0.258**	-0.256***
	(0.027)	(0.036)	(0.054)	(0.129)	(0.061)
Rural Lower Egypt	-0.157***	-0.120***	-0.196***	-0.281*	-0.226***
	(0.025)	(0.035)	(0.050)	(0.143)	(0.058)
Urban Upper Egypt	-0.225***	-0.192***	-0.265***	-0.403***	-0.217***
	(0.023)	(0.030)	(0.046)	(0.106)	(0.058)
Rural Upper Egypt	-0.087***	-0.025	-0.242***	-0.194	-0.184**
	(0.024)	(0.031)	(0.049)	(0.165)	(0.074)
Female	-0.127***				
	(0.019)				
Public Sector	0.048***				
	(0.017)				
Constant	0.968***	1.178***	0.576***	0.743***	0.399**
	(0.034)	(0.043)	(0.082)	(0.140)	(0.156)
Observations	10,088	5,571	2,739	410	1,368
R-squared	0.153	0.067	0.218	0.211	0.234

Notes: Standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix: Calculation of Low Earnings Line

To identify low earners, a low earnings line was computed using the official national poverty lines listed in Appendix Table A4 below. Taking 2012 as the base year, the individual region-specific poverty lines were converted to real terms using the consumer price index. To account for the fact that each worker's earnings are used to support not only him or herself but also other non-working members of their household, per-capita region-specific poverty lines were then scaled up by the regional median ratio of household members to working-age employed household members. Lastly, the 2012 low earning line was used to identify low earners in all four survey rounds, which was done for the sake of comparability and to abstract from changes in dependency ratios that may have occurred during the 1988-2012 period. Table 4 shows the low earning lines that emanated for each region as a result of this exercise. These are used to examine the portion of earners that can be classified as low-earners. The gender, age, regional and educational structure of the group of low-wage workers in 2012 remained similar to 2006.

Table A4: Real Monthly Per-capita Region-Specific Poverty Lines and Low Earning Line (in 2012 L.E.)

Region	Real monthly per-capita region-specific poverty lines 2011	Real monthly region-specific low earning lines 2012	Dependency Ratio 2012
Metropolitan	304	926	3.06
Lower Egypt Urban	282	845	3.09
Lower Egypt Rural	279	837	3.23
Upper Egypt Urban	293	878	3.31
Upper Egypt Rural	281	983	3.74
Total Egypt	286	899	3.34

Source: Author's Calculation based on ELMPS 2006-2012 and regional poverty lines from Household Income Expenditure and Consumption Survey (HIECS) 2010- 2011.