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Abstract

This paper explores trends in wage and income levels and inequality and mobility in Egypt, especially since 2012. Data are from the 1998, 2006, 2012, and 2018 waves of the Egypt Labor Market Panel Survey (ELMPS). The findings point to declining real wages and incomes and a rise in inequality between 2012 and 2018. As a result, the share of wage workers below the low waged line (the working poor) has increased, especially for older workers, workers with higher education, and government workers. Circumstances, such as parental background and area of birth, have continued to play an important role in determining individuals' wages. Focusing on the panel of individuals present in multiple waves of the survey, mobility since 2006 has remained mostly unchanged. The wage workers who tended to fare better from 2012 to 2018 were males, those in the public sector, and those with higher skills and education, however the differences across subgroups were not large. The deteriorating relative wage position of women in the private sector and increase in the working poor as a result of real wage declines require policy action to reverse those trends.

1. Introduction

This paper explores trends in income inequality and economic mobility in Egypt over the period from 1988 to 2018. It asks three main questions. First, what are the main features of the Egyptian wage and income structure? Second, how have the circumstances that people are born into shaped their wage outcomes? Third, how have gender- and sector-based wage differentials and returns to education contributed to these changes?

To answer these questions, the chapter makes use of a comprehensive series of datasets collected in Egypt over the period from 1988 to 2018. The Egypt Labor Market Panel Survey (ELMPS) spans four waves in 1998, 2006, 2012, and 2018 and is comparable to the 1988 special round of the Labor Force Survey (LFS).[1] These data enable us to provide a descriptive analysis of the levels of wages and income and distribution over time for a number of key population subgroups. Building on this, and keeping with the equality of opportunity paradigm, the paper explores the extent to which characteristics at birth influence wage distributions. To further examine mobility within the income distribution, the panel aspect of the data allows us to examine the characteristics of those individuals who saw the biggest gains or losses in their distributional ranks over time. Finally, to provide a sense of why these changes have taken place, we also estimate gender- and sector-based wage differentials and estimate returns to education.

In recent years, the Egyptian economy has gone through a number of substantial policy-changes, which have impacted the labor market. In the context of an IMF package, the government narrowed the fiscal deficit, cut subsidies, and floated the Egyptian pound in November 2016. This resulted in a devaluation of more than 50%, leading to inflation in 2016/17 of 23.3% and in 2017/18 of 21.6% (El-Haddad and Gadallah, 2018). These policies have left their mark on wages. The formerly upward trend in real wages between 1998 and 2012 has turned to stagnation or declining real wages across most population subgroups. Average real wages have been declining overall, and inequality has been rising, especially among those with lower levels of education and those in the private sector. The share of income accruing to the top 10% has expanded at the expense of the low share held by the bottom 50%. The share of individuals below the low-earnings line has also risen. Contributing to wage inequality, individuals' background characteristics continue to play a role in their wages, though this appears quite stable over time.

This paper is structured as follows. Section 2 looks at wage and income levels, and distributions over time. Section 3 considers mobility within the wage distribution in two ways. It explores the role of circumstances in determining wage outcomes and the characteristics of those individuals who moved up and down in quintile rank across survey waves. Section 4 looks at the role of gender- and sector-based wage differentials and returns to education in influencing wage outcomes. Section 5 concludes.

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[1] The data aree publicly available from the Economic Research Forum Open Access Microdata Initiative: www.erfdataportal.com. See Krafft, Assaad, and Rahman (2019) for more information on the ELMPS.

2. Wage distributions over time

We review the evolution of the distribution of wages, paying attention to sex, sector of employment, occupational skill-level, industry, geographic location, level of education, and job formality. In all calculations, we excluded the top percentile of observations due to the presence of outliers that greatly skewed the results. The variable used for wages is real monthly wages in 2018 prices. We restricted our sample to wage-workers aged 15-64 with positive wages.

2.1 Trends in real wages 1988-2018

Figure 1 displays box and whisker plots for wage distributions for the full sample, and males and females, with a breakdown by sector and formality. The rectangle in the plot displays observations between the 25th and 75th percentiles (the interquartile range or IQR) with an inner line denoting the median value. The closer this value is to one end of the rectangle, the greater the skew in the distribution. The whiskers lead to the upper and lower adjacent values of the distribution.[2]

There has been a decline in median real wages in 2018 for the full sample, as well as for the subcategories of those in the public sector, formal private sector, and informal private sector. The distinction of formality in Egypt is important to draw as those working informally, meaning without contracts or social insurance, face relatively adverse working environments relative to formal workers. The median wages for the full sample of workers are now close to 1998 levels, the lowest point across all waves of the ELMPS. Formal private sector and public sector workers enjoy higher median real wages than informal workers, but all have experienced declines since 2012. Breaking down wages by sex displays a similar story for men. For women, median real wages in the private sector have increased slightly, however, this may be driven by women who face low wages selecting out of employment.

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[2] Upper Adjacent Value (UAV) = Q3+1.5*IQR; Lower Adjacent Value (LAV) = Q1-1.5*IQR

Figure 1. Real monthly wage distributions by sector and sex, 2018 Egyptian pounds, ages 15-64, 1988-2018
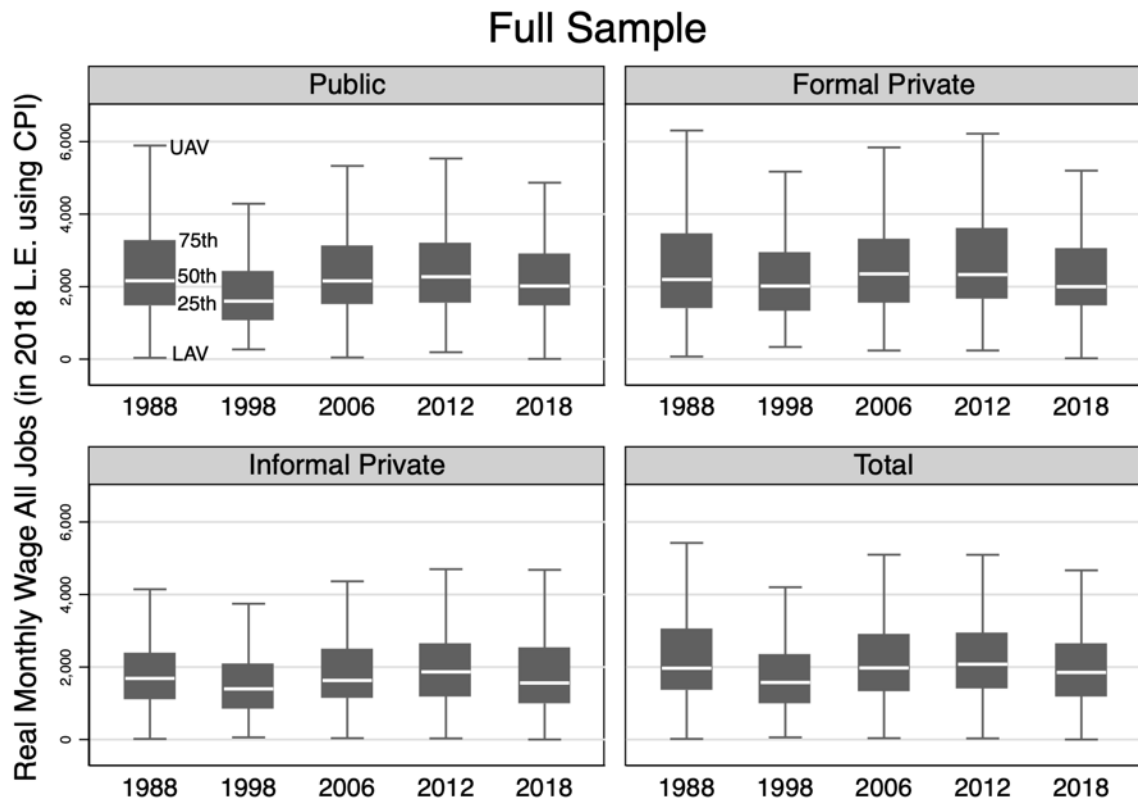
Note: Upper Adjacent Value (UAV) = Q3+1.5*IQR; Lower Adjacent Value (LAV) = Q1-1.5*IQR

Female
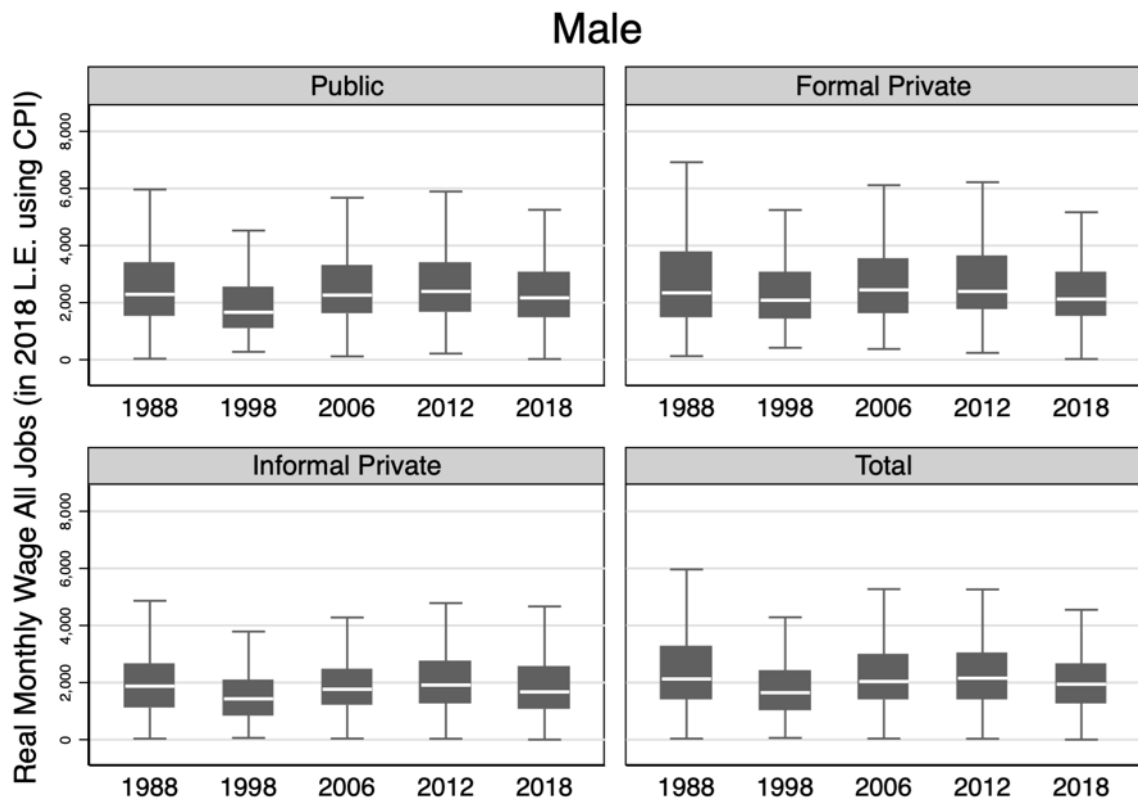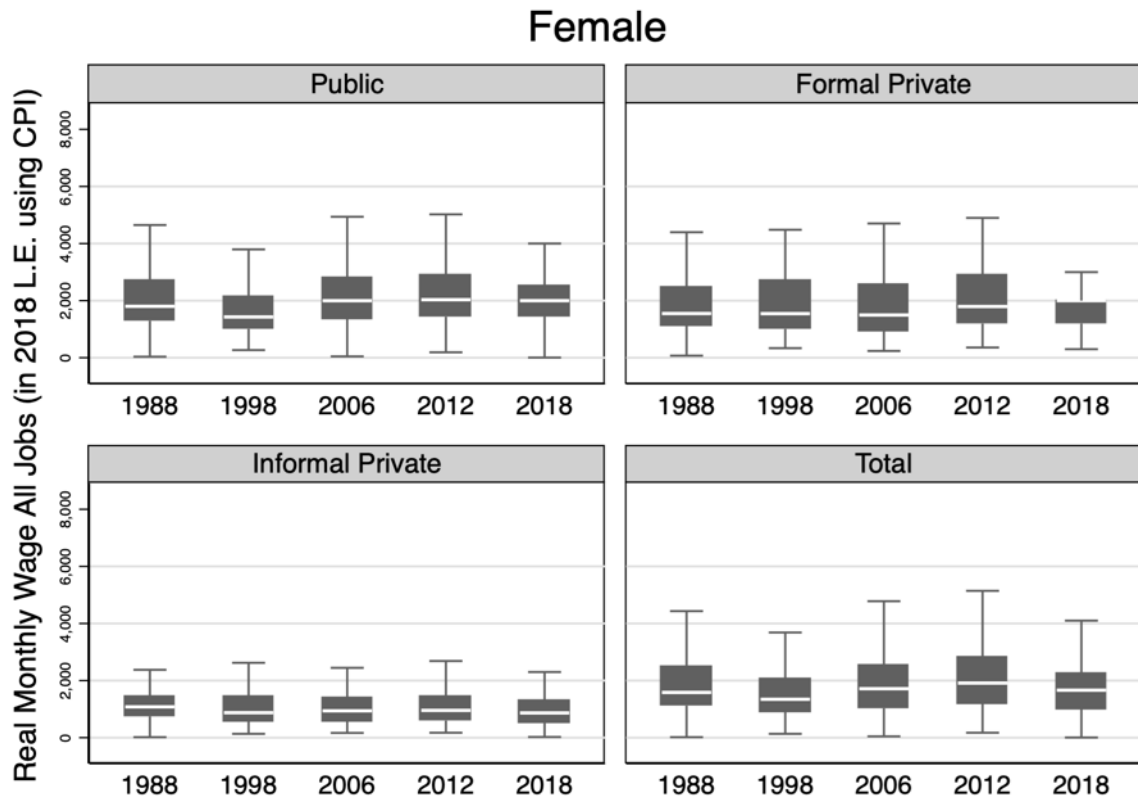
Source: Authors' calculations ELMPS 1988 – 2018

As can be seen from Figure 2 (median) and Tables A1 (mean) and A2 (median) in the Appendix, median real monthly wages rose at a much lower rate (percentage per annum) from 2006 to 2012 in Egypt, after a rapid increase in the preceding period, 1998 to 2006. Between 2012 and 2018, median wages declined for all groups and particularly in urban areas, those with higher education (post-secondary and above) or high and medium skill levels, and in the private sector. Overall, mean real monthly wages in 2018 Egyptian pounds fell by 17% compared to 2012, wheras median wages fell by 11%.

Figure 2. Median real monthly wage growth rates (percentage per annum) by location, education, gender, sector, skill-level, and formality, 2018 Egyptian pounds, full sample, ages 15-64, 1988-2018
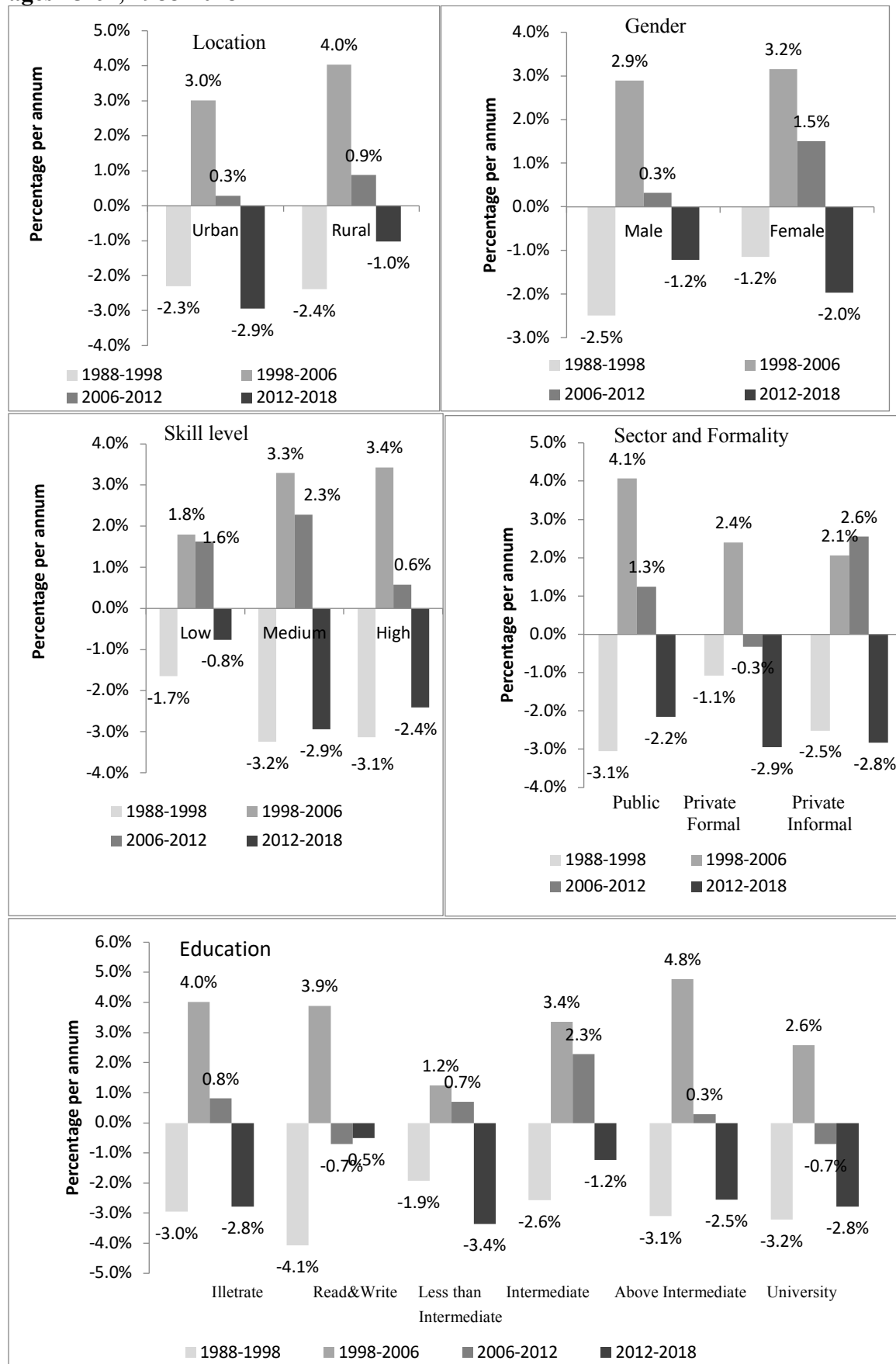
Note: Occupational skill levels have been arranged as follows: High – managers, technicians, and associate professionals; Medium – clerical support, service and sales, and craft and trade workers; Low – agricultural, plant and machinery, and other elementary occupations.

2.2. Beyond Wages: Trends in Transfers, Nonwage Income and Total Income

Regarding individuals' main income sources, in addition to wages, individuals in Egypt derive income from a host of other sources. In the following calculations, we incorporated transfers and non-wage income. Pre-transfer income is the sum of four categories; the wages, the enterprise earnings, the agricultural earnings (i.e. harvest, sale of equipment, etc.) and finally rent and other expenses. Transfers are the sum of pensions, social assistance and remittances. The sample used in all calculations are all those individuals with positive total income (hence, medians for some groups are zero).

The full tables are available in Table A6 and summarized in Figures 3-6 below. In Figure 3, we note that the share of transfers in total income increased for every single group. Therefore, the share of pre-transfer income has substantially decreased. Figure 4 shows that the transfers as share of income have increased especially rapidly for those with higher education and those who work in the private formal sector, who had larger reductions in overall total income (Figure 5). Transfers have increased across the board, however, the increases were not sufficient to cover the loss in pre-transfer income, which resulted in there being an overall decrease in total income.

Figures 5 and 6 show that median income has declined for almost all the groups except for the agriculture sector, medium skill level, the private informal sector and those who have intermediate education level. These declines have especially affected the private formal sector as well as those with higher education (university level). The workers in the private formal sector have experienced a decline in their income of 6.5% per annum and those with higher education experienced a decline of 6.3% per annum over the period 2012-2018 (Figure 6).

Figure 3. Percentage of transfers in total income, 2018 Egyptian pounds, ages 15-64, 2012-2018
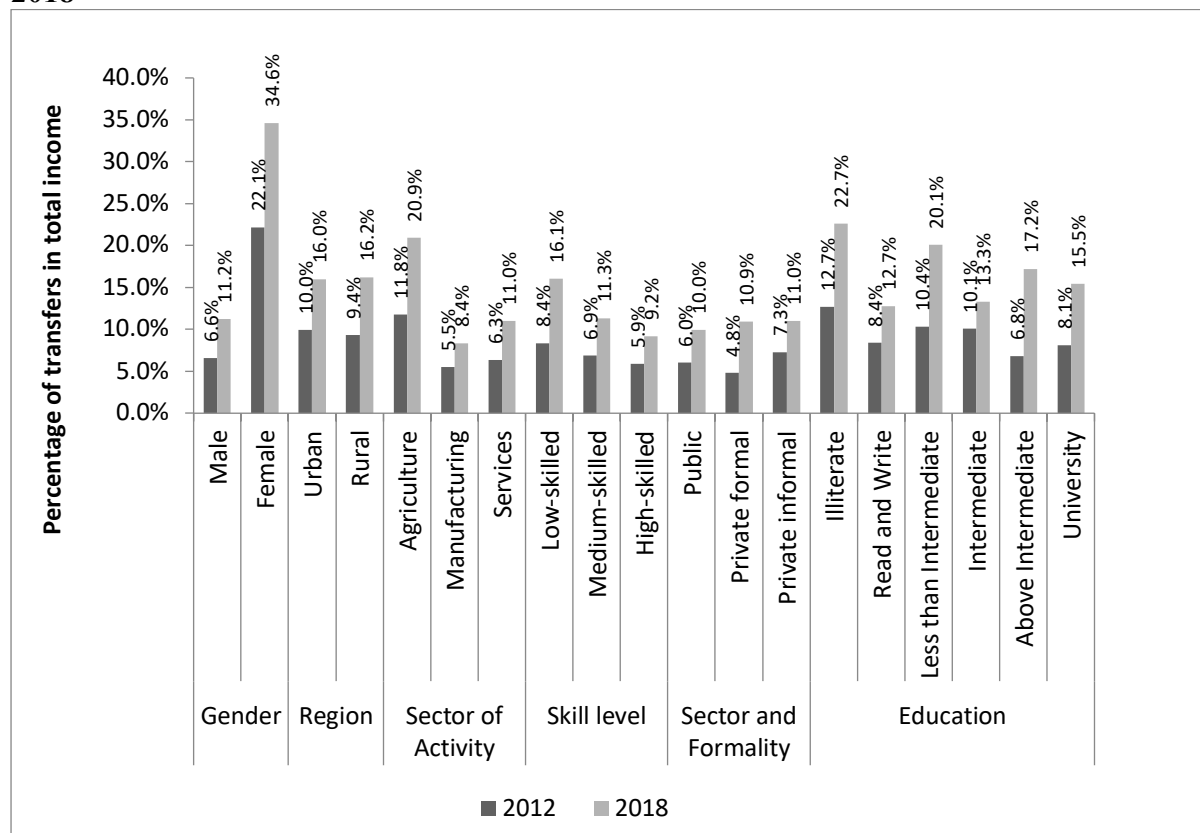
Source: Authors' calculations ELMPS 2012 – 2018

Figure 4. Median monthly total income, 2018 Egyptian pounds, ages 15-64, 2012-2018
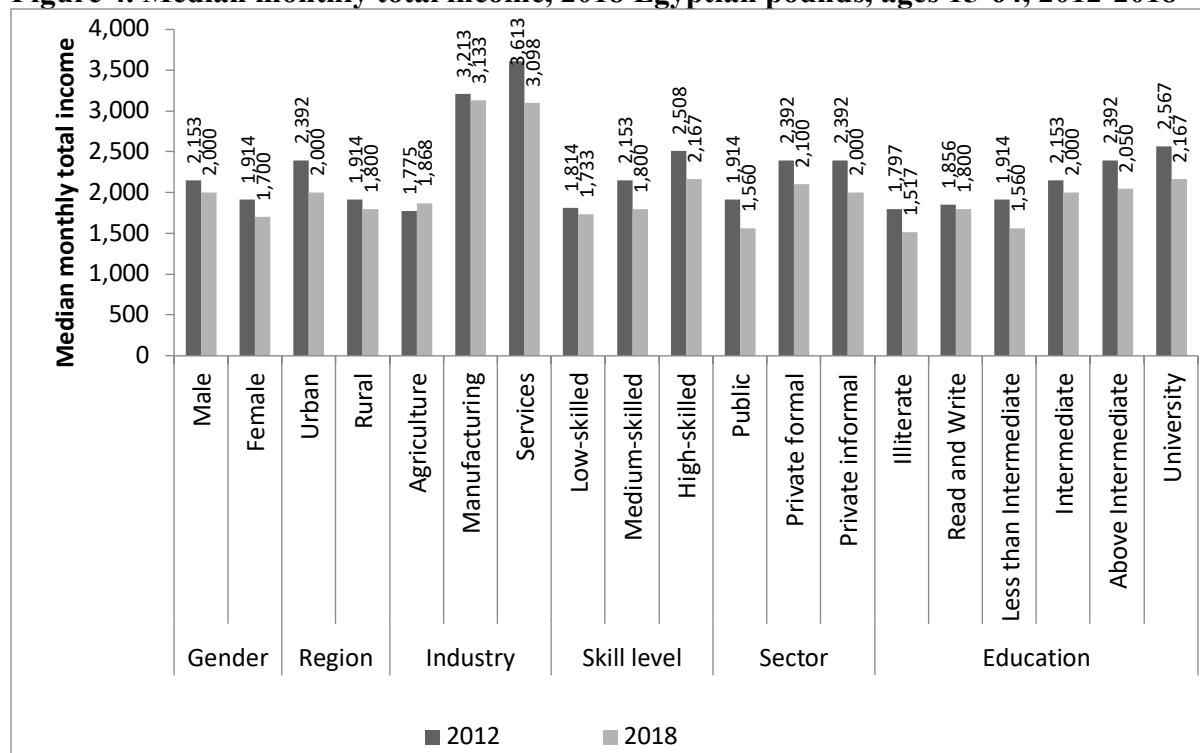
Source: Authors' calculations ELMPS 2012 – 2018

Figure 5. Annual growth rate in share of transfers in total income, ages 15-64, 2012-2018
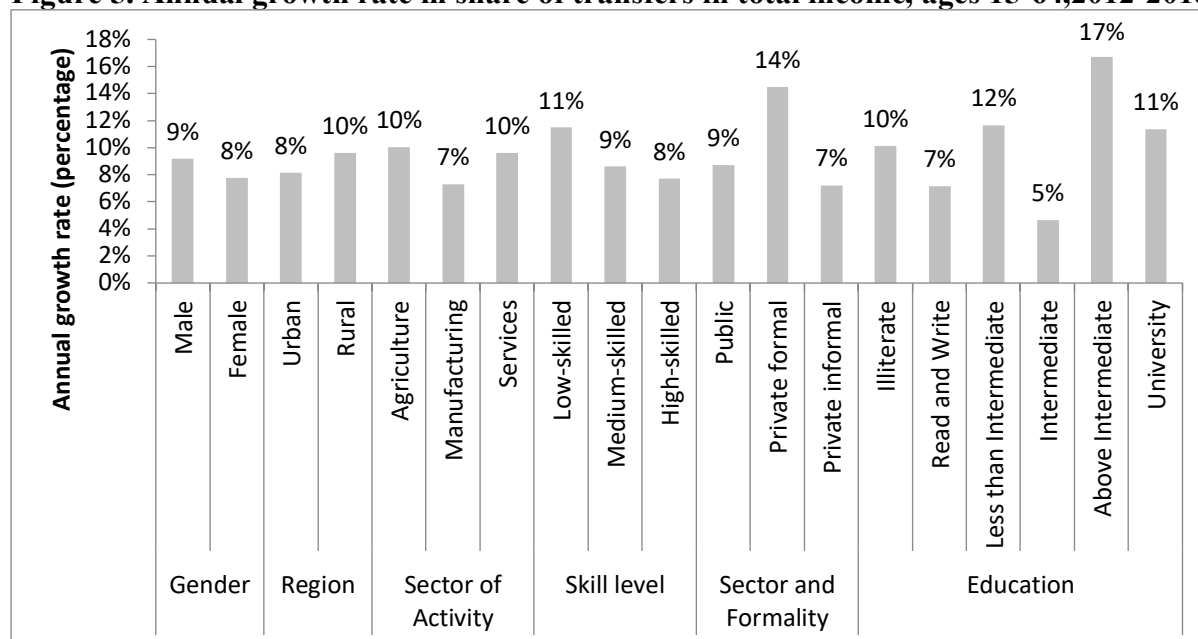
Source: Authors' calculations ELMPS 2012 – 2018

Figure 6. Median real monthly income growth rates (percentage per annum), ages 15-64, 2012-2018
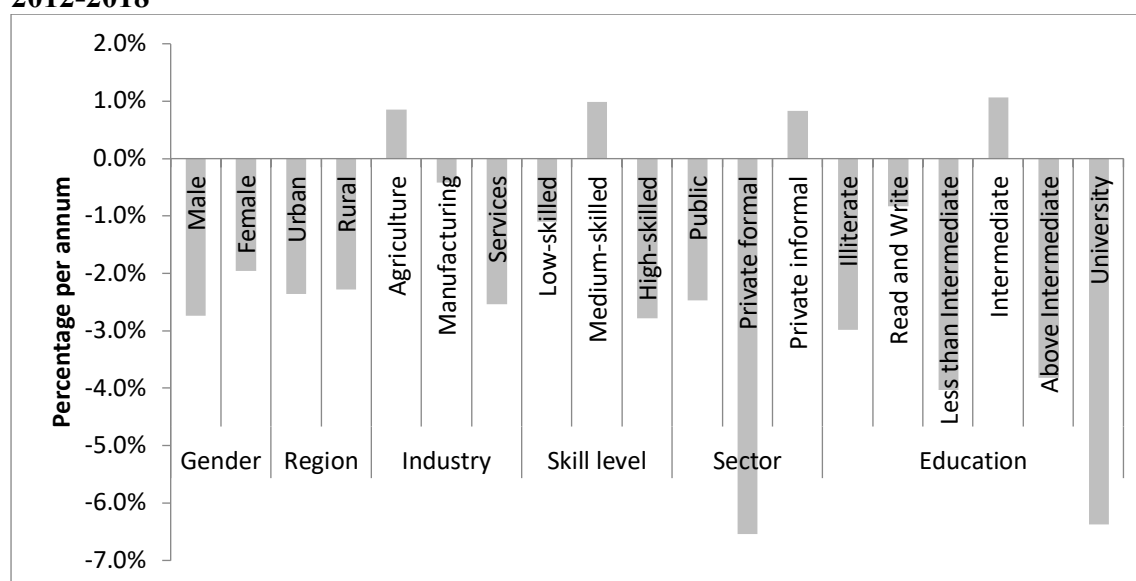
Source: Authors' calculations ELMPS 2012 – 2018

2.3. Trends in Inequality

Turning to measures of inequality, Figure 7 shows that the share of wages accruing to the top 10% has been fairly stable, around 26-27%, from 1988 to 2012. There was then a very slight increase from 26% in 2012 to 28% in 2018 at the expense of the middle 40% and the bottom 50%, which was further squeezed out in 2018.

Figure 7. Share (percentage) of total monthly wages by subgroups, ages 15-64, 1988-2018
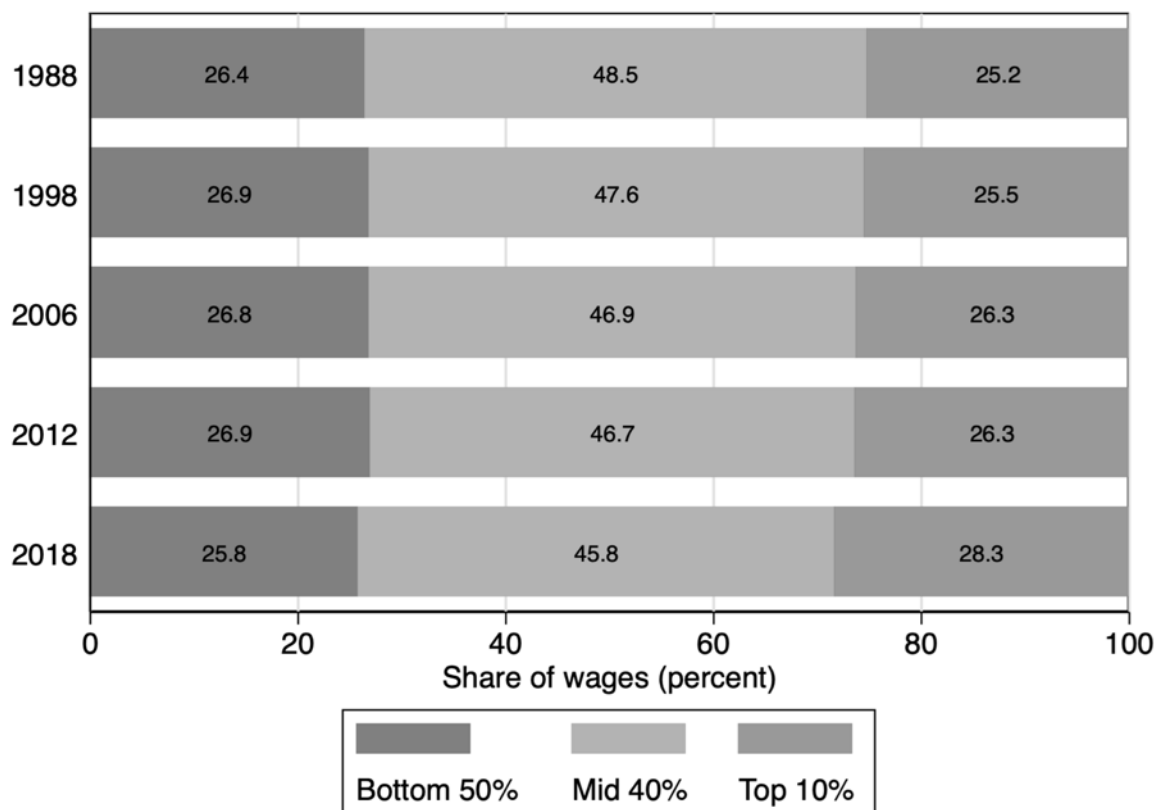
Source: Authors' calculations ELMPS 1988 - 2018

Gini coefficients for real monthly wages, presented in Table A3 and Figure 8 below, show that inequality (as measured by those coefficients), which was consistently 0.34 in previous waves rose to 0.37 in 2018. Gini coefficients recorded rises for all subgroups, with the sharpest rises among workers in the private sector and those with no education.

Figure 8. Gini coefficients for real monthly wages across full sample and subgroups, , ages 15-64, 1988-2018
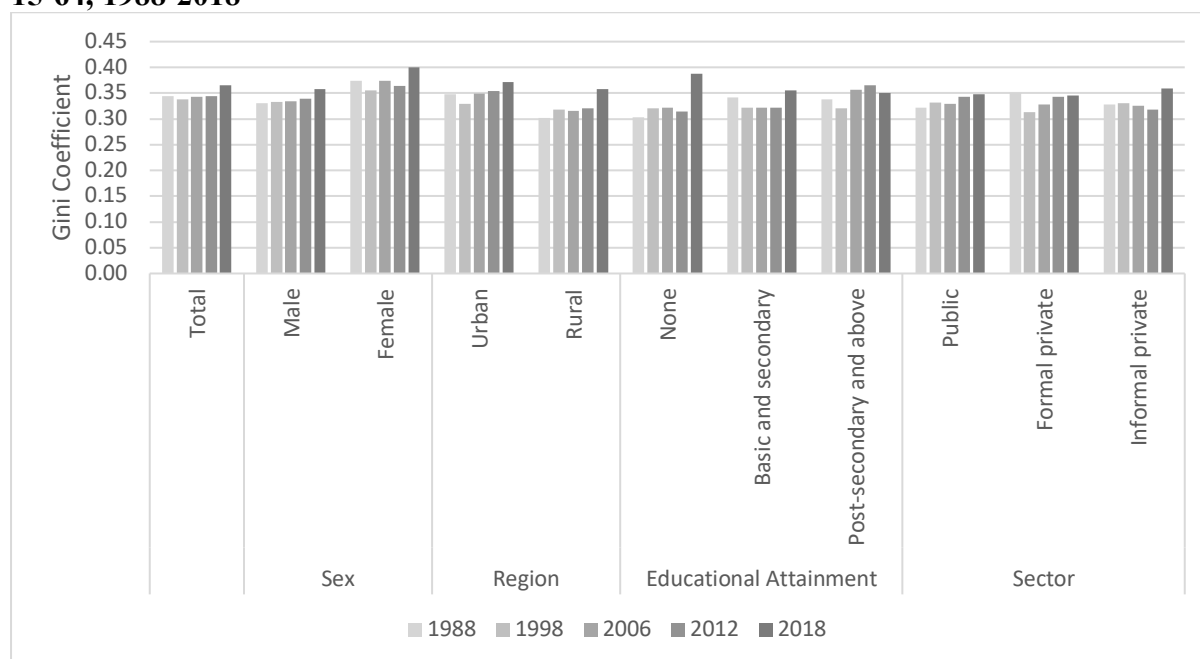
Source: Authors' calculations ELMPS 1988 - 2018

For comparison, Tables A3 and A4 also present Generalized Entropy inequality indices, GE(a) for a = -1, 0, 1, 2, for real monthly wages and total income, respectively. The GE indices differ in their sensitivities to income differences in different parts of the distribution. Unlike the Gini coefficient which treats inequality throughout the distribution equally, the more positive a is, the more sensitive GE(a) is to income differences at the top of the distribution. GE(0) is the mean logarithmic deviation, GE(1) is the Theil index, and GE(2) is half the square of the coefficient of variation.[3]

Figure 9 presents Gini coefficients for total income by subgroups. Together the tables and figure confirm that the increase in wage inequality between 2012-2018 as measured by the Gini cofficient was observed using all inequality indices, and for both wages and total income, with the largest inequality increases observed among women, the less educated and those in urban areas. Measured inequality is more pronounced using the GE(-1) index which is more sensitive to income differences at the bottom of the distribution, hence the increases there in rural areas, for illiterates and informal sector were particularly pronounced. This result calls attention to the importance of studying in more detail the changes that occurred for those classified as low earners in the labor market over the period.

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[3] For a review of inequality measurement and charactersitics of the Generalized Entropy indices, see Jenkins (1991), Cowell (1995), and Cowell (2000).

Figure 9. Gini coefficients for total income, full sample and subgroups, ages 15-64, 1988-2018
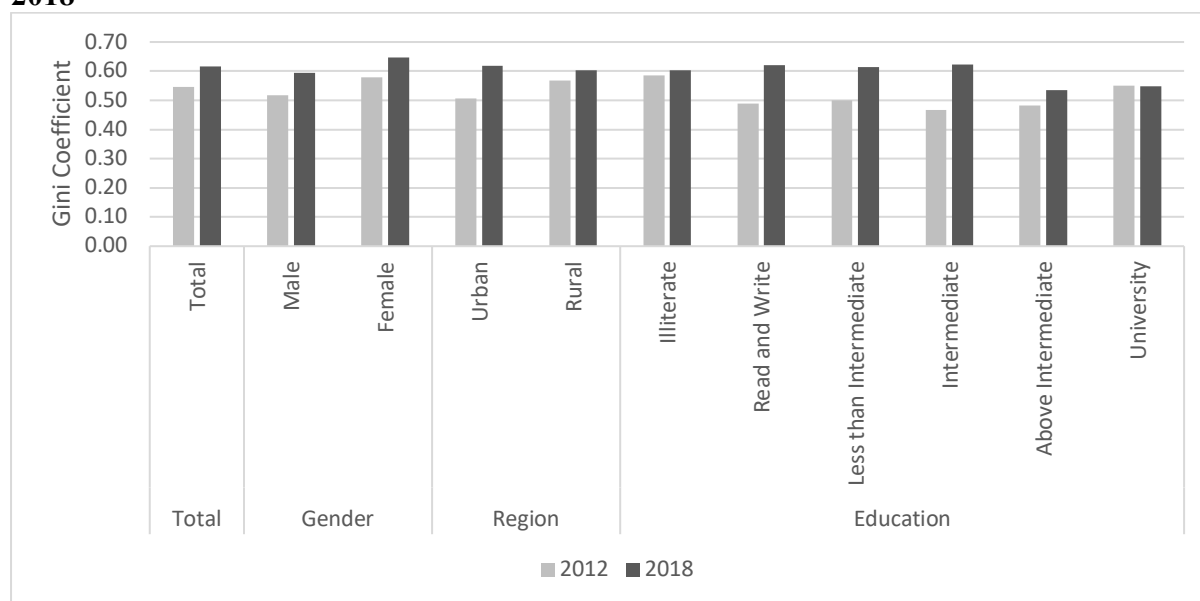
2.4. Trends in the share of low earners

In order to analyze the evolution of wages for those who can be classifed as the working poor, a low earnings line was computed by using the official national poverty lines for 2012 listed in Table 1 below. The poverty lines were converted to real terms using the consumer price index, setting 2018 as the base year. The poverty line for 2012 was inflated by the CPI of 2018 to get an estimate of the poverty line in 2018. This was done separately for the five regions of Egypt. Hence, for Egypt the low monthly earnings line based on 2012 poverty lines increased from around 900 LE per month in 2012 LE to 2150 LE per month in 2018 LE. It was lowest at 2002 LE in rural Lower Egypt and highest at 2350 LE per month in rural Upper Egypt reflecting the differences in family size and dependancy ratios.

Table 1. Per Capita Region-Specific Low Earnings line in 2012 (based on 2011 poverty line)

Region	in 2012 L.E	in 2018 L.E
Metropolitan	926	2215
Lower Egypt Urban	845	2021
Lower Egypt Rural	837	2002
Upper Egypt Urban	878	2100
Upper Egypt Rural	983	2351
Total Egypt	899	2150

Source: Authors' calculations ELMPS 1988 – 2018
Note: CPI in 2012 is 0.418 (2018=1)

Table 2 presents the share of wage earners that can be classified as low-earners (i.e. below the low earnings line), by gender, age group, region, educational attainment, sector of activity and institutional sector. This proportion increased from 51% in 2012 to 57% in 2018. The increase was greatest for women compared to men, for whom the proportion in 2018 was 68%, and for older workers (50 to 64 years old). Youth remained the group with the highest incidence of working poor, at around 72%. The highest proportions of low earners were still in rural Upper

Egypt (69%) and for those in the agricultural sector (67%). The situation has also worsened for educated wage earners, with post-secondary and above education, whereby the share of low earners went up from 37% in 2012 to 47% in 2018, and for government workers (it went up from 45% in 2012 to 55% in 2018).

Table 2. Percentage below low earning line, using real monthly wages across total sample and subgroups, ages 15-64, 2012-2018

	2012	2018	Change in %
			2012-2018
Total	51	57	*13*
Sex			
Male	49	55	*13*
Female	57	68	*18*
Age Group			
15-24	72	72	*1*
25-34	55	59	*8*
35-49	44	55	*25*
50-64	34	46	*36*
Region			
Metropolitan	42	50	*18*
Urban Lower Egypt	47	51	*10*
Rural Lower Egypt	51	60	*18*
Urban Upper Egypt	56	57	*1*
Rural Upper Egypt	62	69	*12*
Educational Attainment			
None	65	66	*1*
Basic and Secondary	52	59	*12*
Post-Secondary and Above	37	47	*25*
Sector of Activity			
Agriculture	71	67	*-6*
Industry	47	53	*15*
Services	49	56	*14*
Institutional sector			
Government	45	55	*23*
Public enterprise	31	35	*12*
Private	61	60	*0*

Source: Authors' calculations ELMPS 1988 - 2018

3. The influence of circumstances on wages and mobility within the distribution

This section considers mobility within the wage distribution in two ways. First, in line with the equality of opportunity paradigm (Roemer, 1998), it explores the role of circumstances in determining wage outcomes. Second, it examines the characteristics of those individuals who moved up and down in quintile rank across survey waves. These approaches are complementary in that one is closely related to the literature on inter-generational mobility as it looks at wage distributions based on parental characteristics, while the other focuses on individuals' own movements in the distribution across different waves.

For equality of opportunity to prevail in a society, circumstances should not provide individuals with better outcomes. If equality of opportunity prevailed, then there would not be differences in wage distributions based on circumstance characteristics. One way to assess the presence of inequality of opportunity is to plot box and whisker distributions for wages by different circumstance characteristics. If inequality of opportunity exists, these distributions would be distinct.

The circumstances that individuals are born into continue to play a determinant role in individuals' wages. Looking at wage outcomes by father's education, there is a consistent ordinal ranking across each wave where the higher the father's level of education, the higher the typical wages of the individual (Figure 10). However, compared to 1988, a father having basic or secondary education has seemed to make less of a difference over time, where in 2018, only individuals whose father has a post-secondary or above education seem to have substantially higher wages, which is consistent with Assaad et al. (2018) and Enbaby and Galal (2015).[4]

Observing individuals' wage distributions by their mother's level of education also presents a ranking where the higher their education, the greater the wages. There does not seem to be a big difference in wages based on whether an individuals' mother has either none, or basic and secondary education. There is an apparent stronger association between higher wages for individuals with mothers that post-secondary or higher education.

Comparing wages by whether an individual is born in a rural or urban area does display a consistent ordering where urban-born individuals have higher wages than rural-born ones. However, the differences have narrowed from 2012 to 2018.

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[4] In the 1998 ELMPS, father's education is known only for those fathers not in the household, unlike in following waves where it is recorded for all fathers.

Figures 10. Distribution of real monthly wages by father's level of education, full sample, ages 15-64, 2018 Egyptian pounds, 1988-2018
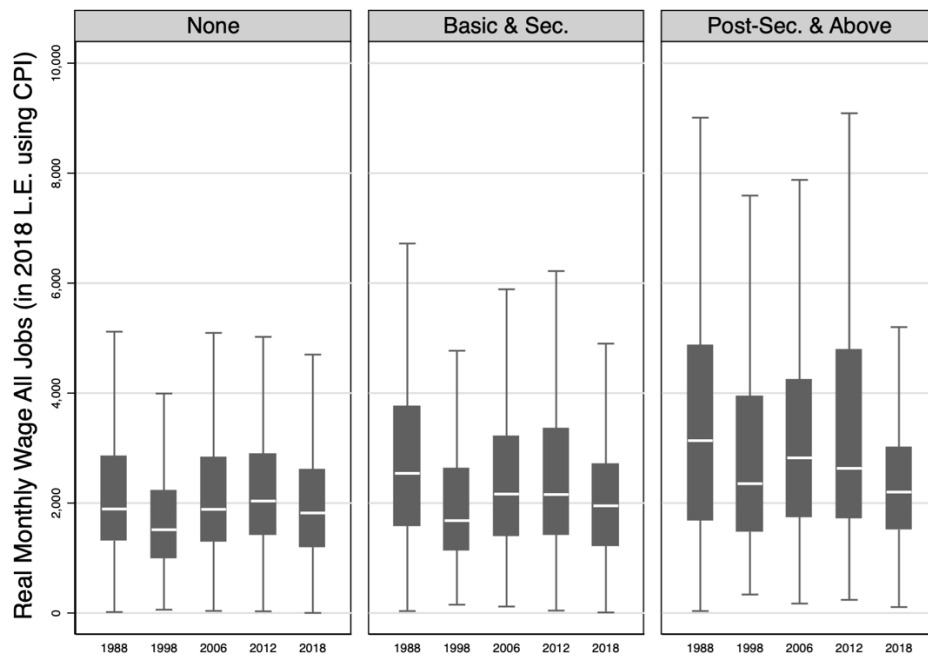
Source: Authors' calculations ELMPS 1988 - 2018

Figure 11. Distribution of real monthly wages by mother's level of education, full sample, ages 15-64, 1988-2018
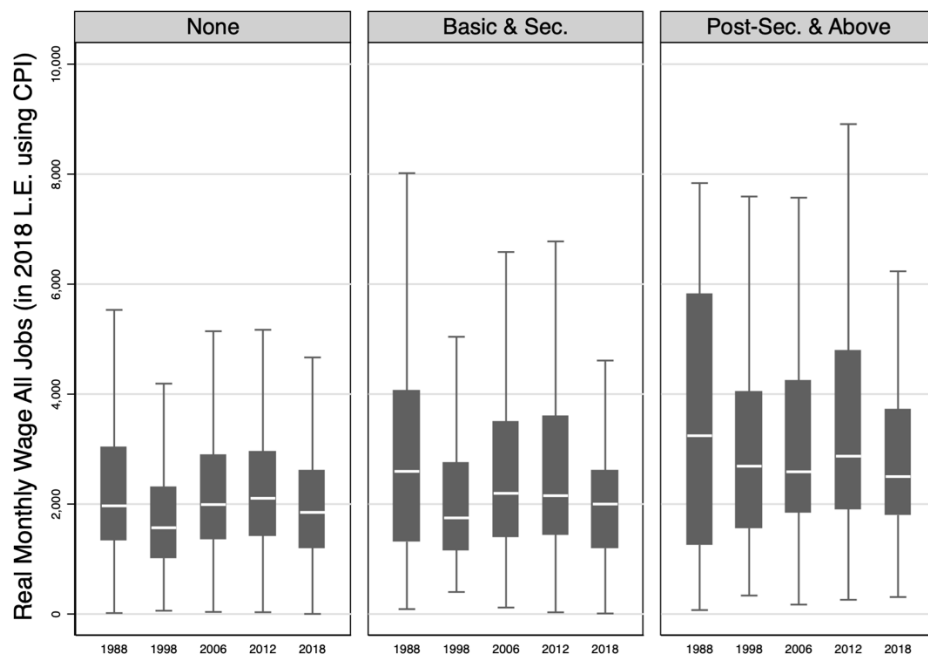
Source: Authors' calculations ELMPS 1988 - 2018

Figure 12. Distribution of real monthly wages by location of birth, ages 15-64, 2018 Egyptian pounds, 1988-2018
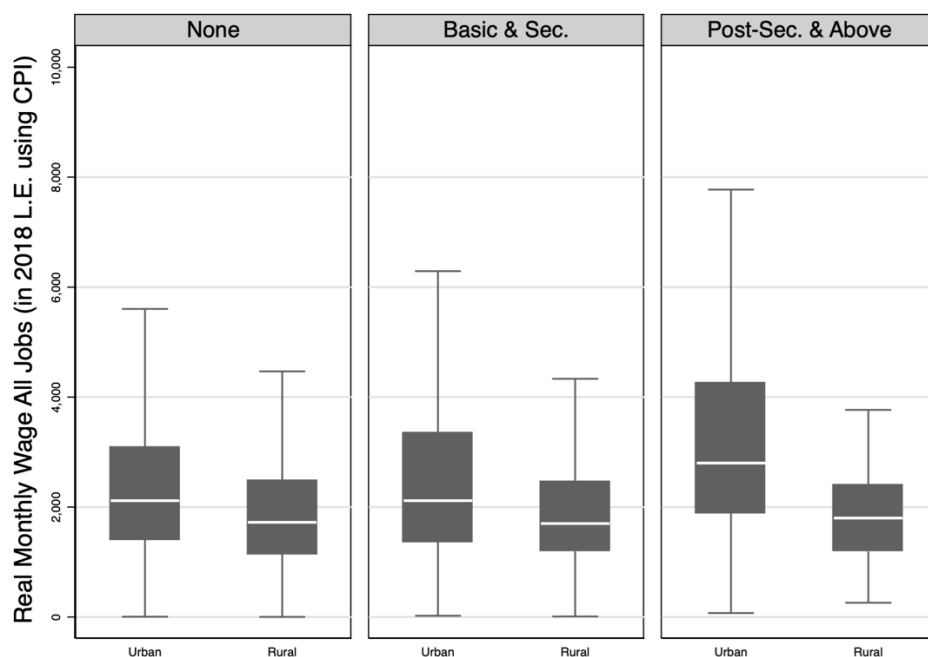
Source: Authors' calculations ELMPS 1988-2018

Turning to wage mobility within the earnings distribution, the panel aspect of the data allows us to explore how individuals have shifted in rank from one wave of the data to the next. Figure 13 presents the percentage of individuals that have either moved upwards, downwards or remained within the same wage quintile rank across pairs of waves . The columns in each graph show the individual ranks in the wave, and each column includes the share of individuals by their quintile rank in the following wave. The sample consists of those individuals with positive wages and ages 15-64 in both waves of a pair, thus it represents the more well-off in the population. New entrants are not included and workers who remain in the labor force would be expected to move up the distribution over time based on experience. Additionally, individuals earning low wages may have left wage work or employment altogether. Despite this, it can provide some useful information about who has been performing relatively well compared to others.

The overall level of mobility since has remained mostly unchanged. Figure 13 shows that in both 2012 and 2018. Downward mobility has increased for those who started in the top wage quintile; about 39% of individuals in the top quintile remained there from the previous wave in 2018, 47% in 2012, and 57% in 2018. At the lower end of the distribution, just over 70% of individuals from the first quintile have improved their rank in the following wave, and this indeed has been the pattern from 1998 till 2018, so not much changed in that respect.

Figure 13. Wage quintile rank by previous wave wage quintile rank (percentage), ages 15-64, wage workers in both waves
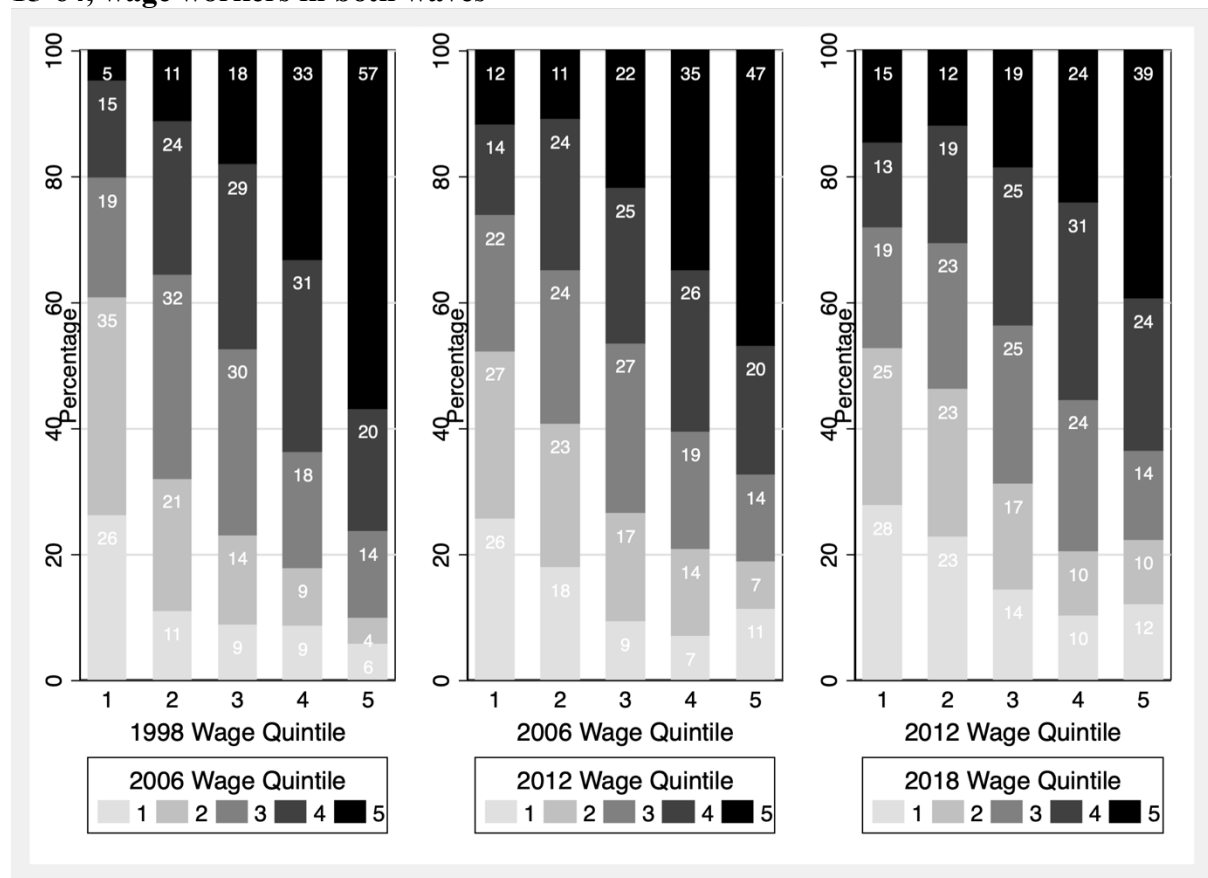
Source: Authors' calculations ELMPS Panel 1998-2018

Figure 14 displays a scatter plot with a kernel-weighted local polynomial regression for the relationship between wage growth from 2012 to 2018 and wage percentile in 2012. The lower an individuals' wage percentile rank in 2012, the higher their wage growth to 2018. Conversely, the higher an individuals' wage percentile rank in 2012, the greater their chances of experiencing a decline in real wages. This change is highly consistent for all subgroups, by sex, sector and formality, level of education, and occupational skill level.

Figure 14. Wage growth, ages 15-64 in 2012, 2018 Egyptian pounds, percent change in wages 2012-2018 by wage percentile in 2012, by sex, sector, education, and skill level
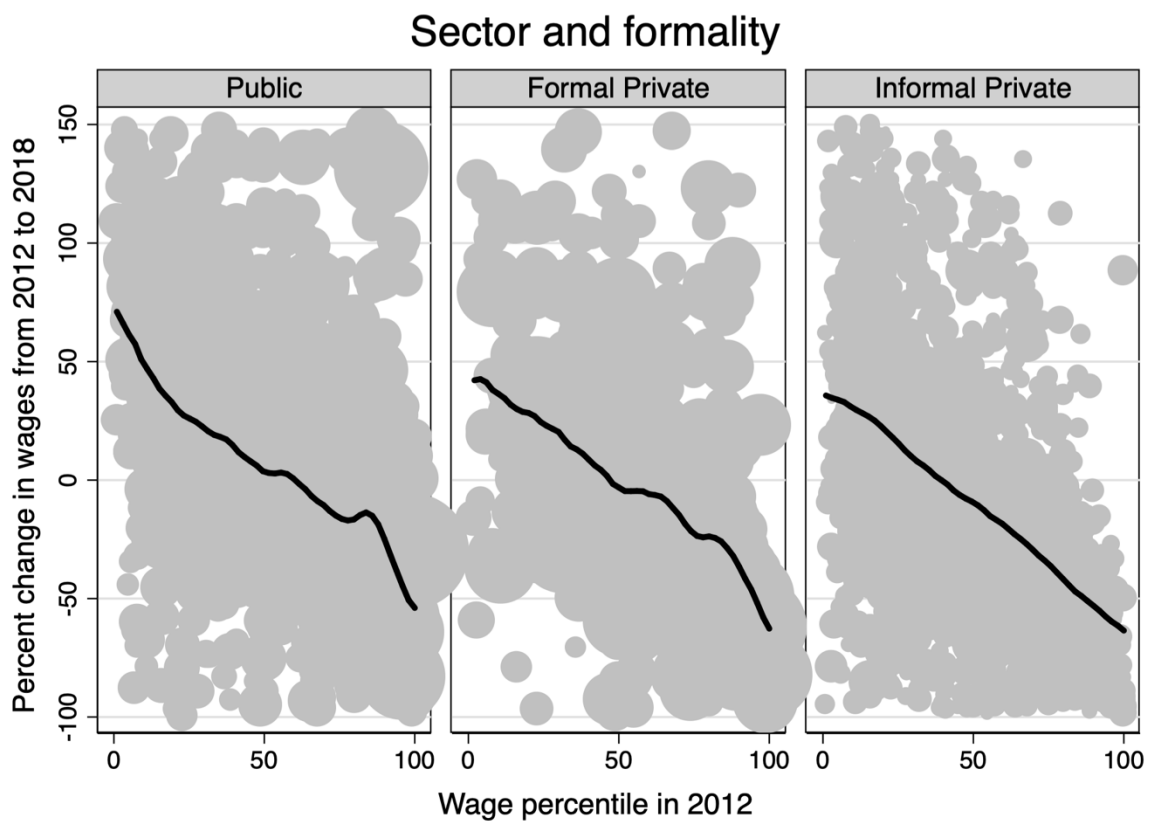
Occupational skill-level

Education
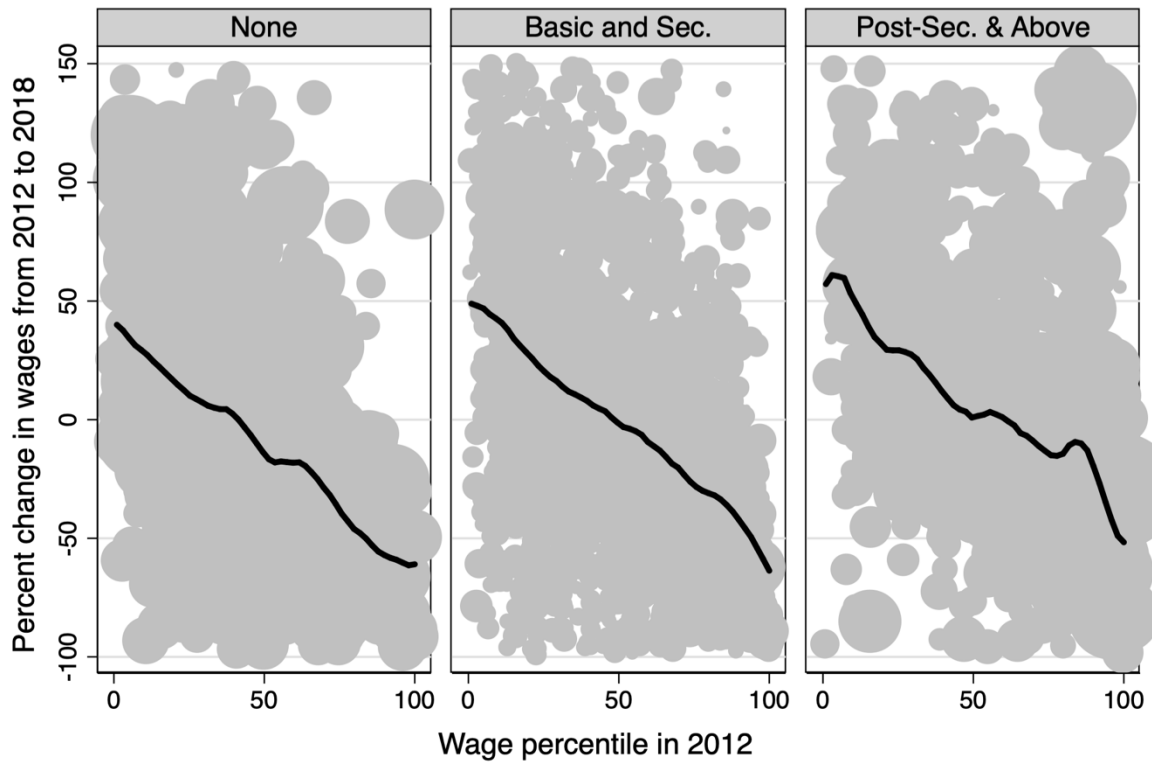
Source: Authors' calculations ELMPS 2012-2018

Note: Occupational skill levels have been arranged as follows: High – managers, technicians, and associate professionals; Medium – clerical support, service and sales, and craft and trade workers; Low – agricultural, plant and machinery, and other elementary occupations.

4. Estimating returns to education and wage differentials by sector and gender

To explore some possible explanations for the evolution of wages and inequality recorded above, in this section we measure gender- and sector-based wage differentials, and incremental returns to education from Mincerian wage equation estimates that correct for individuals' differences in characteristics and returns to those characteristics.

We follow a methodology similar to Said (2015) using an ordinary least squares regression to estimate wages in the public (p), and private (r) sectors as follows:

$$Ln\ (w_{is}) =\ X_{is}\beta_s +\ u_s \qquad\qquad (s = p, r)$$

where $Ln\ (w_{is})$ is log hourly wages of individual i in sector s and X is the set of individual and job related characteristics known to be of relevance in determining wages. This is estimated for males (m) and females (f), resulting in four equations.

Given the parameter estimates from the above regressions, public-private wage differentials can be measured at the mean of the sample, using the following decomposition formula:

$$D_p = \ln(\overline{w_p}) -\ \ln(\overline{w_r}) = \frac{(\beta_p + \beta_r)(\bar{X}_p - \bar{X}_r)}{2} + \frac{(\beta_p - \beta_r)(\bar{X}_p + \bar{X}_r)}{2}$$

D_p refers to the wage differential between the public and the private sector. $Ln(\overline{w})$ refers to the mean of log wages. This 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. 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. 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:

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

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

We can see the uncorrected (crude) gender (male/female) mean wage ratio in 2018 remained at 1.13 for the total sample, which was similar to the level in 2006 and the ratio based on 2012 ELMPS data reported in the ILO global wage report 2018/19 for hourly wages: 1.14. This ratio, upon correction, turned out to be negative, indicating greater women's hourly earnings

compared to men. However, this result has been attributed to the clustering of women in highly-paid jobs and the lack of their representation on the lower end of the spectrum (ILO, 2018).

Table 3 below presents crude sector and gender wage gaps, expressed as differentials (as opposed to ratios), as well as corrected differentials based on the method outlined above for 2012 and 2018. Crude sector and gender wage differentials are simply differences in the means of log hourly wages. Compared to 2012, crude sector wage premiums have slighly declined for males but increased for females in 2018. The crude gender gap in favor of men increased in both the private and public sectors.

Corrected sector wage differentials are generated on the basis of ordinary least square estimaes of log hourly wage equations for the full sample, as well as for males and females separately in the public and private sectors, for 2012 and 2018. The descriptive statistics on variables used in regressions are presented in tables A7 and A8, and the regression estimates are shown in tables A9 and A10. The 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). Similarly, corrected gender wage differentials are the difference between predicted female wages using the female equation and their predicted wages using the male equation.

Traditionally the corrected gender wage gap has been very compressed or even positive (i.e indicating higher wages for women) in the public sector (Said, 2015). But, as seen in Table 3 below, between 2012 and 2018, the gender gap turned from 8% in favor of women in the public sector to 7% in favor of men. In the private sector the deterioration of the gender wage gap has even been more notable from 27% in 2012 to around 60% in favor of men. In terms of public sector wage differentials, it decreased from around 22% to 12% for males, and slightly from 65% to 62% for women. The latter is a large differential and shows thar the continued attractveness of public sector employment for women in Egypt is based on both wage and non wage (job security) reasons.

Table 3. Corrected Sector and Gender Wage Differentials

	2012		2018	
	Crude	*Corrected*	*Crude*	*Corrected*
Sector Wage Differentials				
Male Public-private	0.00	0.22	-0.09	0.12
Female Public-private	0.49	0.65	0.69	0.62
Gender Wage Differentials (Female-Male)				
Public sector	0.08	0.08	0.22	-0.07
Private Sector	-0.40	-0.27	-0.56	-0.60

Source: Authors' calculations ELMPS 2012-2018

Based on the above regression results, it is also possible to calculate incremental rates of return to education. These are the annualized, percentage increase in wages for one more year of school within a level, displayed in Table A11. Middle school is compared to elementary school,

vocational and general secondary compared to middle, and post secondary and university compared to general secondary. The results indicate that returns to education are still much higher in the public than private sector, except for female university graduates where they are rewarded better for their credential in the private sector. This might be a positive selection story where only the best educated and skilled women are able to participate in the labor market and can find jobs in the private sector, or educated women will only accept the private sector when highly paid. Rising returns for women between 2012 and 2018 in private sector are observed for middle school, post secondary and university levels are consistent with rising inequality amongst them, but the premium they receive in the public sector seems to be for secondary levels. For men, returns declined especially for general and vocational secondary and above levels. The "vocational track" remains as the most inferior one for men.

5. Conclusion

Using data from several rounds of the ELMPS, this paper explored trends in inequality and mobility in the Egyptian wage structure. The analysis points to declining real wages and incomes and a rise in inequality between 2012 and 2018. These findings were robust to using different measures of inequality that were sensitive to variations in different parts of the distribution, and to definitions of income that included transfers and non-wage income.

As a result of the above trends, the share of those below the low wage line (working poor) increased, including for older workers, workers with higher education and government workers, and not just for youth and those in informal employment. Inequality of opportunity was persistent, but did not vary much over time.

Focusing on the panel data (those with wages in multiple waves of the survey) reveals a consistent and sizable degree of mobility within the wage distribution. The ones who tended to fare better from 2012 to 2018 were males, those in the public sector, and those with higher skills and education, however the differences across subgroups was not large. There is a high degree of inequality among women and by sex in the main sample, with a large corrected gender wage gap (broadly indicative of gender-based discrimination), especially in private sector, that reached 60% in 2018 (compared to only 27% in 2012). Overall, there is evidence that vulnerable groups (including those who have high representation amongst the working poor) and women have fared worse in terms of wage and income developments over the period 2012-2018 in Egypt. In particular, the results indicate recent real wage/income erosion and dispersion in Egypt were consistent with widening gender segmentation. Returns to education, which increased for women who have below university qualifications, and for women university graduates in the private sector, are consistent with rising inequality and public sector pay premia observed for them. But this is not case for men, for whom returns at almost all levels have declined in both sectors, and so have returns to experience. Thus, the latest increasing inequality trends do not seem to be associated with the standard human capital explanations.

The findings of the paper call attention to policies and intervetions to help generate higher paying and decent jobs for new entrants and especially women in the labor market. Previous studies showed that investing in the social service sector, the care economy and knowledge

intensive services are particularly attractive to women and are associated with higher wages and productivity for those kind of workers (see Said et al., 2018 and references therein). Moreover, policies that address different types of gender-based discrimination and inferior treatment of women in the workplace are very necessary given the current level of wage inequality between men and women in the Egyptian private sector. These can include gender diversity incentive schemes and sharing the burden of female protective legislation (such as maternity leave, by paying it out of social security funds) with employers, to incentivize them to hire, retrain and promote women across different occupations.

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Table A1. Median real monthly wages in 2018 Egyptian pounds for full sample and subgroups, ages 15-64, 1988-2018

	Median					N					Change (in percent)			
	1988	1998	2006	2012	2018	1988	1998	2006	2012	2018	88-98	98-06	06-12	12-18
Total	1,982	1,599	2,038	2,153	1,950	4,205	4,702	7,464	10,160		-19	27	6	-9
Sex														
Male	2,162	1,681	2,112	2,153	2,000	3,305	3,683	5,917	8,370	8,979	-22	26	2	-7
Female	1,531	1,364	1,750	1,914	1,700	900	1,019	1,547	1,790	1,591	-11	28	9	-11
Age Group														
15-24	1,459	1,165	1,411	1,674	1,396	982	878	1,415	1,598	1,483	-20	21	19	-17
25-34	1,856	1,441	1,856	2,033	1,820	1,412	1,333	2,537	3,992	3,883	-22	29	10	-10
35-49	2,530	1,748	2,275	2,336	2,000	1,296	1,778	2,475	3,144	3,655	-31	30	3	-14
50-64	2,594	2,185	2,798	2,751	2,172	515	713	1,037	1,426	1,549	-16	28	-2	-21
Region														
Urban	2,342	1,855	2,351	2,392	2,000	2,810	3,294	4,503	5,000	4,050	-21	27	2	-16
Rural	1,686	1,324	1,816	1,914	1,800	1,395	1,408	2,961	5,160	6,520	-21	37	5	-6
Sector of Activity														
Agriculture	1,499	1,120	1,427	1,722	1,560	534	364	617	1,066	1,551	-25	27	21	-9
Manufacturing	2,522	1,748	2,046	2,177	2,000	1,117	1,241	1,983	2,937	3,078	-31	17	6	-8
Services	2,090	1,569	2,116	2,153	2,000	2,245	2,957	4,773	6,027	5,354	-25	35	2	-7
Skill level														
Low	1,686	1,427	1,646	1,814	1,733	875	776	1,426	3,015	3,148	-15	15	10	-4
Medium	2,018	1,452	1,881	2,153	1,800	1,998	2,182	3,128	3,589	4,843	-28	30	14	-16
High	2,540	1,849	2,422	2,508	2,167	1,266	1,744	2,908	3,556	2,463	-27	31	4	-14
Sector and Formality														
Public	1,712	1,398	1,656	1,914	1,560	1,409	1,569	2,914	4,881	6,293	-18	18	16	-18
Private Formal	2,198	1,613	2,220	2,392	2,100	2,300	2,656	3,564	4,058	3,144	-27	38	8	-12
Private Informal	2,249	2,017	2,406	2,392	2,000	496	477	986	1,221	1,133	-10	19	-1	-16
Education														
Illiterate	1,686	1,250	1,712	1,797	1,517	1,077	709	997	1,394	1,542	-26	37	5	-16
Read and Write	2,162	1,427	1,936	1,856	1,800	616	411	434	382	633	-34	36	-4	-3
Less than Intermediate	2,018	1,662	1,834	1,914	1,560	604	790	1,107	1,577	1,537				
Intermediate	1,874	1,445	1,881	2,153	2,000	1,012	1,356	2,713	3,866	4,288				
Above Intermediate	2,216	1,619	2,351	2,392	2,050	235	413	446	443	367				
University	3,027	2,185	2,678	2,567	2,167	661	1,018	1,766	2,488	2,201	-28	23	-4	-16

Source: Authors' calculations ELMPS 1988-2018

Table A2. Mean real monthly wages in 2018 Egyptian pounds for full sample and subgroups, ages 15-64, 1988-2018

	Mean					N					Change (in percent)			
	1988	1998	2006	2012	2018	1988	1998	2006	2012	2018	88-98	98-06	06-12	12-18
Total	2,435	1,880	2,442	2,549	2,278	4,205	4,702	7,464	10,160	10,570	-23	30	4	-11
Sex														
Male	2,569	1,927	2,529	2,606	2,324	3,305	3,683	5,917	8,370	8,979	-25	31	3	-11
Female	1,927	1,682	2,099	2,293	2,056	900	1,019	1,547	1,790	1,591	-13	25	9	-10
Age Group														
15-24	1,746	1,338	1,670	1,884	1,741	982	878	1,415	1,598	1,483	-23	25	13	-8
25-34	2,262	1,744	2,277	2,397	2,197	1,412	1,333	2,537	3,992	3,883	-23	31	5	-8
35-49	2,917	2,047	2,698	2,737	2,406	1,296	1,778	2,475	3,144	3,655	-30	32	1	-12
50-64	3,017	2,485	3,254	3,178	2,589	515	713	1,037	1,426	1,549	-18	31	-2	-19
Region														
Urban	2,762	2,207	2,795	2,879	2,503	2,810	3,294	4,503	5,000	4,050	-20	27	3	-13
Rural	1,979	1,543	2,078	2,247	2,119	1,395	1,408	2,961	5,160	6,520	-22	35	8	-6
Sector of Activity														
Agriculture	1,678	1,323	1,653	1,851	1,988	534	364	617	1,066	1,551	-21	25	12	7
Manufacturing	2,832	2,100	2,509	2,669	2,298	1,117	1,241	1,983	2,937	3,078	-26	19	6	-14
Services	2,541	1,900	2,540	2,614	2,360	2,245	2,957	4,773	6,027	5,354	-25	34	3	-10
Skill level														
Low	1,936	1,662	2,047	2,115	2,086	875	776	1,426	3,015	3,148	-14	23	3	-1
Medium	2,362	1,715	2,169	2,341	2,175	1,998	2,182	3,128	3,589	4,843	-27	26	8	-7
High	3,012	2,245	2,983	3,114	2,684	1,266	1,744	2,908	3,556	2,463	-25	33	4	-14
Sector and Formality														
Public	1,986	1,639	2,023	2,164	1,946	1,409	1,569	2,914	4,881	6,293	-17	23	7	-10
Private Formal	2,645	1,948	2,690	2,839	2,676	2,300	2,656	3,564	4,058	3,144	-26	38	6	-6
Private Informal	2,791	2,450	2,860	3,014	2,720	496	477	986	1,221	1,133	-12	17	5	-10
Education														
Illiterate	1,916	1,438	1,966	2,002	1,935	1,077	709	997	1,394	1,542	-25	37	2	-3
Read and Write	2,455	1,709	2,255	2,245	2,146	616	411	434	382	633	-30	32	0	-4
Less than Intermediate	2,267	1,842	2,193	2,222	2,014	604	790	1,107	1,577	1,537	-19	19	1	-9
Intermediate	2,357	1,743	2,255	2,429	2,233	1,012	1,356	2,713	3,866	4,288	-26	29	8	-8
Above Intermediate	2,400	1,890	2,646	2,790	2,562	235	413		443	367	-21	40	5	-8
University	3,623	2,653	3,249	3,254	2,752	661	1,018	1,766	2,488	2,201	-27	22	0	-15

Source: Authors' calculations ELMPS 1988-2018

Table A3. Inequality measures for real monthly wages, full sample and subgroups, ages 15-64, 1988-2018

	GE(-1)	GE(0)	GE(1)	GE(2)	Gini
Total					
1988	0.45	0.22	0.20	0.22	0.34
1998	0.26	0.20	0.19	0.22	0.34
2006	0.28	0.20	0.20	0.25	0.34
2012	0.32	0.21	0.21	0.25	0.34
2018	0.58	0.26	0.25	0.33	0.37
Sex					
Male					
1988	0.35	0.20	0.18	0.21	0.33
1998	0.25	0.19	0.18	0.21	0.33
2006	0.25	0.19	0.19	0.24	0.33
2012	0.31	0.21	0.20	0.25	0.34
2018	0.54	0.25	0.23	0.31	0.36
Female					
1988	0.69	0.29	0.24	0.29	0.37
1998	0.28	0.22	0.21	0.26	0.36
2006	0.35	0.25	0.24	0.30	0.37
2012	0.34	0.24	0.23	0.29	0.36
2018	0.75	0.32	0.30	0.44	0.40
Location					
Urban					
1988	0.53	0.24	0.20	0.22	0.35
1998	0.23	0.18	0.18	0.20	0.33
2006	0.29	0.21	0.21	0.25	0.35
2012	0.33	0.22	0.21	0.26	0.35
2018	0.48	0.26	0.25	0.35	0.37
Rural					
1988	0.33	0.17	0.15	0.17	0.30
1998	0.24	0.18	0.17	0.20	0.32
2006	0.25	0.18	0.17	0.21	0.31
2012	0.29	0.19	0.18	0.22	0.32
2018	0.63	0.25	0.23	0.30	0.36
Sector and formality					
Public					
1988	0.36	0.19	0.17	0.20	0.32
1998	0.21	0.18	0.18	0.22	0.33
2006	0.24	0.19	0.19	0.23	0.33
2012	0.27	0.20	0.20	0.24	0.34
2018	0.43	0.22	0.23	0.32	0.35
Formal private					
1988	0.41	0.23	0.20	0.21	0.35
1998	0.20	0.16	0.16	0.18	0.31
2006	0.22	0.18	0.18	0.22	0.33
2012	0.26	0.20	0.21	0.26	0.34
2018	0.26	0.21	0.23	0.33	0.34
Informal private					
1988	0.40	0.21	0.18	0.19	0.33
1998	0.30	0.20	0.18	0.20	0.33
2006	0.26	0.19	0.18	0.21	0.33
2012	0.32	0.19	0.17	0.20	0.32
2018	0.60	0.25	0.23	0.28	0.36

	GE(-1)	GE(0)	GE(1)	GE(2)	Gini
Education					
Illiterate					
1988	0.23	0.15	0.14	0.15	0.29
1998	0.26	0.18	0.17	0.19	0.32
2006	0.30	0.19	0.17	0.19	0.32
2012	0.26	0.17	0.16	0.19	0.31
2018	0.75	0.29	0.28	0.38	0.39
Read and Write					
1988	0.27	0.17	0.15	0.17	0.30
1998	0.21	0.17	0.17	0.19	0.32
2006	0.25	0.18	0.18	0.22	0.32
2012	0.24	0.19	0.21	0.29	0.33
2018	0.46	0.27	0.26	0.37	0.38
Less than Intermediate					
1988	0.54	0.23	0.18	0.18	0.33
1998	0.27	0.19	0.17	0.20	0.32
2006	0.23	0.18	0.17	0.21	0.32
2012	0.30	0.19	0.18	0.22	0.32
2018	0.88	0.31	0.29	0.42	0.39
Intermediate					
1988	0.53	0.24	0.20	0.23	0.35
1998	0.21	0.17	0.17	0.21	0.32
2006	0.24	0.18	0.18	0.23	0.32
2012	0.29	0.19	0.18	0.21	0.32
2018	0.44	0.22	0.21	0.28	0.34
Above Intermediate					
1988	0.73	0.26	0.19	0.20	0.33
1998	0.21	0.16	0.16	0.19	0.31
2006	0.21	0.17	0.16	0.19	0.31
2012	0.28	0.20	0.20	0.25	0.34
2018	0.40	0.24	0.24	0.34	0.36
University					
1988	0.60	0.23	0.19	0.19	0.34
1998	0.21	0.17	0.16	0.18	0.32
2006	0.29	0.22	0.21	0.25	0.36
2012	0.35	0.24	0.22	0.26	0.36
2018	0.43	0.23	0.22	0.29	0.35

Source: Authors' calculations ELMPS 1988-2018
Note: GE(0) is the mean logarithmic deviation, GE(1) is the Theil index, and GE(2) is half the square of the coefficient of variation.

Table A4. Inequality measures of pre-transfer income, transfers, and post-transfer income, full sample and subgroups, ages 15-64, 2012-2018

		p90/p10		GE(-1)		GE(0)		GE(1)		GE(2)		Gini	
		2012	2018	2012	2018	2012	2018	2012	2018	2012	2018	2012	2018
Full Sample	Pre-transfer income	12.91	23.57	2.03	12.50	0.60	0.86	0.74	1.25	3.84	54.75	0.54	0.61
	Transfers	14.17	33.33	1.24	3.01	0.61	1.24	0.68	1.04	2.47	1.82	0.56	0.72
	Post-transfer income	14.67	80.00	2.06	8.67	0.61	0.93	0.73	1.21	3.59	53.38	0.55	0.62
Sex													
Pre-transfer income	Male	9.67	12.34	1.43	6.65	0.54	0.72	0.73	1.27	3.85	60.00	0.53	0.58
	Female	21.12	68.00	2.80	21.55	0.68	1.18	0.67	1.10	2.05	4.10	0.56	0.68
Transfers	Male	14.17	29.89	1.30	2.84	0.62	1.24	0.68	1.08	2.51	1.91	0.56	0.73
	Female	14.17	34.44	1.18	3.16	0.60	1.23	0.67	1.00	2.43	1.73	0.56	0.71
Post-transfer income	Male	9.49	84.33	1.23	6.15	0.52	0.86	0.69	1.24	3.51	59.64	0.52	0.59
	Female	22.49	62.00	2.72	11.09	0.73	1.02	0.73	0.99	2.46	3.88	0.58	0.65
Region													
Pre-transfer income	Urban	8.65	14.59	0.94	7.92	0.48	0.87	0.64	1.60	2.68	84.26	0.51	0.62
	Rural	14.80	26.30	2.47	13.45	0.65	0.82	0.82	0.89	5.22	4.52	0.56	0.59
Transfers	Urban	12.71	45.56	1.02	4.07	0.48	1.37	0.46	1.03	0.87	1.55	0.49	0.72
	Rural	12.60	23.33	1.19	2.38	0.65	1.11	0.86	0.99	5.13	1.88	0.59	0.70
	Urban	9.17	91.00	1.15	6.50	0.49	0.94	0.61	1.48	2.40	82.89	0.51	0.62
	Rural	17.53	71.00	2.43	9.13	0.68	0.90	0.83	0.90	5.13	4.58	0.57	0.60
Education													
Pre-transfer income	Illiterate	19.10	46.00	2.84	19.86	0.75	0.97	0.96	0.90	6.68	3.07	0.60	0.63
	Read and Write	10.36	40.00	2.05	9.34	0.50	0.96	0.54	1.18	1.19	9.27	0.50	0.64
	Less than Intermediate	13.33	40.56	2.22	10.65	0.56	0.94	0.66	1.07	4.00	7.56	0.51	0.63
	Intermediate	8.00	11.69	1.04	8.91	0.41	0.82	0.47	1.74	1.54	112.43	0.45	0.61
	Above Intermediate	6.74	12.82	0.62	6.52	0.42	0.67	0.53	0.72	1.41	1.98	0.49	0.54
	University	8.00	7.50	1.05	2.75	0.57	0.55	0.81	0.71	3.80	3.06	0.56	0.52
Transfers	Illiterate	10.00	32.22	0.82	2.64	0.50	0.95	0.63	0.71	3.21	1.09	0.52	0.62
	Read and Write	12.23	25.56	1.13	2.53	0.56	1.16	0.58	1.01	1.34	1.72	0.54	0.71
	Less than Intermediate	13.11	32.22	1.14	2.92	0.58	1.24	0.67	1.06	2.81	1.85	0.55	0.72
	Intermediate	14.56	37.22	1.25	3.40	0.60	1.33	0.65	1.07	2.28	1.72	0.54	0.73
	Above Intermediate	17.90	54.56	1.38	4.94	0.52	1.51	0.41	1.06	0.52	1.52	0.48	0.73
	University	19.23	52.22	1.60	4.96	0.56	1.54	0.54	1.10	1.66	1.62	0.50	0.74
Post-transfer income	Illiterate	15.22	60.00	2.17	8.73	0.70	0.87	0.91	0.85	6.26	3.25	0.59	0.60
	Read and Write	9.58	73.33	1.65	6.65	0.47	0.95	0.51	1.09	1.16	8.88	0.49	0.62
	Less than Intermediate	13.87	66.87	2.37	8.40	0.56	0.94	0.62	0.99	3.46	7.01	0.50	0.61
	Intermediate	11.06	72.00	1.42	8.39	0.46	0.95	0.48	1.68	1.46	111.35	0.47	0.62
	Above Intermediate	7.50	28.57	0.86	6.56	0.44	0.72	0.51	0.67	1.30	1.77	0.48	0.54
	University	9.11	111.92	1.12	4.35	0.57	0.76	0.77	0.74	3.41	3.10	0.55	0.55

Source: Authors' calculations ELMPS 1988-2018
Note: Calculations are for positive incomes.

Figure A1. Hourly wages in 2018 Egyptian pounds for full sample, ages 15-64, 1998-2018
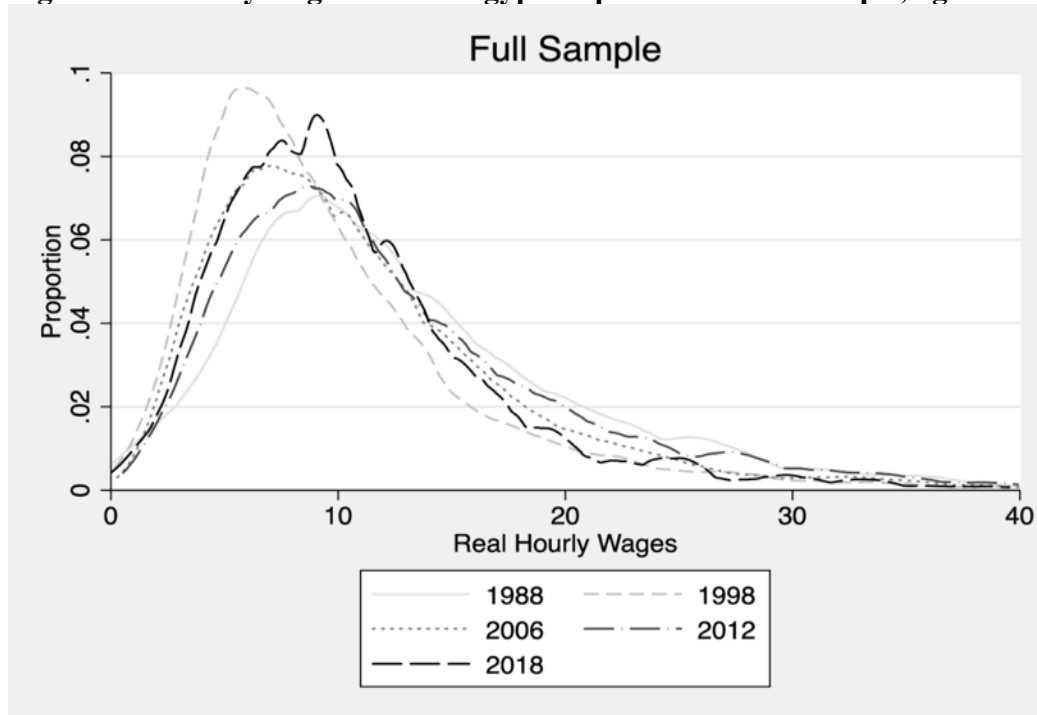
Source: Authors' calculations ELMPS 1988-2018

Table A5. Hourly wages in 2018 Egyptian pounds for full sample and subgroups, ages 15-64, 1998-2018

	Median				Mean				N			
	1998	2006	2012	2018	1998	2006	2012	2018	1998	2006	2012	2018
Total	8.2	9.6	10.8	9.6	9.9	11.7	13.6	11.3	4,696	7,465	10,159	10,644
Gender												
Male	8.2	9.6	10.6	9.6	9.9	11.7	13.5	11.2	3,685	5,918	8,374	9,066
Female	8.0	9.6	11.6	9.6	9.8	11.6	14.3	11.4	1,011	1,547	1,785	1,578
Age group												
15-24	5.8	6.7	8.5	7.5	6.7	7.8	10.0	8.8	878	1,416	1,600	1,503
25-34	7.7	8.8	9.9	9.0	9.0	10.6	12.3	10.4	1,326	2,536	3,994	3,900
35-49	9.2	11.3	12.0	10.0	10.8	13.1	14.8	11.8	1,774	2,476	3,145	3,694
50-64	11.7	14.4	14.7	12.3	13.7	16.2	17.7	13.9	718	1,037	1,420	1,547
Region												
Urban	9.4	11.2	12.0	10.0	11.4	13.4	15.1	12.2	3,293	4,502	4,993	4,070
Rural	7.2	8.7	10.1	9.2	8.3	9.9	12.2	10.6	1,403	2,963	5,166	6,574
Sector of Activity												
Agriculture	6.7	7.6	9.0	8.8	7.9	8.8	10.2	10.3	364	618	1,067	1,585
Manufacturing	8.4	9.8	11.0	9.6	10.2	11.7	13.7	11.2	1,243	1,980	2,945	3,120
Services	8.3	10.0	11.1	9.9	10.2	12.2	14.1	11.6	2,948	4,776	6,017	5,315
Skill Level												
Low	7.4	7.8	9.0	8.8	8.6	9.2	10.9	10.2	774	1,429	3,019	3,212
Medium	7.3	8.7	10.0	8.7	8.6	9.9	11.8	10.3	2,184	3,128	3,586	4,879
High	10.2	12.6	14.7	12.0	12.5	15.2	17.6	14.3	1,738	2,906	3,554	2,436
Sector and Formality												
Public	8.6	11.3	13.1	11.8	10.7	13.6	16.2	13.8	2,653	3,563	4,060	3,103
Private Formal	9.7	10.5	10.9	9.6	11.2	12.7	14.4	11.7	467	983	1,209	1,079
Private Informal	6.9	7.8	9.2	8.3	8.3	8.8	10.9	9.8	1,380	2,719	4,535	5,724
Education												
Illiterate	6.7	7.9	9.0	8.3	7.9	9.3	10.8	9.8	708	998	1,399	1,612
Read and Write	7.3	8.2	9.0	8.8	8.7	9.9	11.7	10.5	412	434	382	645
Less than Intermediate	7.8	8.7	9.3	8.3	8.8	9.7	11.2	9.7	787	1,107	1,575	1,553
Intermediate	7.5	9.4	10.5	9.6	9.0	10.9	12.8	10.7	1,352	2,714	3,864	4,287
Above Intermediate	9.0	11.3	11.8	10.7	10.8	12.6	14.9	12.2	415	446	444	362
University	12.0	13.7	14.8	12.0	14.5	16.3	18.1	14.4	1,017	1,765	2,485	2,183

Source: Authors' calculations ELMPS 1988-2018

Table A6 (a). Income Sources in 2018 Egyptian pounds for subgroups, aged 15-64, 1998-2018

		Median			Mean			N	
		2012	2018	% Change	2012	2018	% Change	2012	2018
Total									
Pre-transfer income		1,794	1,300	-27.5	2,641	2,307	-12.6	16,813	18,970
Transfers		-	50		288	409	41.8	16,813	18,970
Total Income		1,929	1,522	-21.1	2,975	2,541	-14.6	16,813	18,970
Sex									
Pre-transfer income	Male	2,153	1,542	-28.4	3,309	2,677	-19.1	11,417	13,650
	Female	1,316	342	-74.0	2,046	1,428	-30.2	3,345	5,320
Transfers	Male	-	50	-	223	320	43.8	11,947	13,650
	Female	140	50	-64.3	446	620	39.0	4,866	5,320
Total Income	Male	2,196	1,745	-20.5	3,374	2,856	-15.3	11,947	13,650
	Female	1,196	875	-26.8	2,016	1,791	-11.2	4,866	5,320
Location									
Pre-transfer income	Urban	2,153	1,522	-29.3	3,241	2,908	-10.3	7,434	6,683
	Rural	1,495	1,200	-19.7	2,196	1,932	-12.0	9,379	12,287
Transfers	Urban	-	50	-	366	508	38.8	7,434	6,683
	Rural	-	50	-	230	347	50.4	9,379	12,287
Total Income	Urban	2,392	1,820	-23.9	3,672	3,183	-13.3	7,434	6,683
	Rural	1,674	1,350	-19.4	2,458	2,140	-12.9	9,379	12,287
Sector of Activity									
Pre-transfer income	Agriculture	797	565	-29.2	1,541	1,656	7.4	3,477	4,344
	Manufacturing	2,392	1,875	-21.6	3,141	3,027	-3.6	3,489	3,768
	Services	2,272	1,800	-20.8	3,473	2,971	-14.4	7,576	7,419
Transfers	Agriculture	-	50	-	209	391	87.0	3,477	4,344
	Manufacturing	-	50	-	176	262	48.6	3,489	3,768
	Services	-	50	-	229	341	48.7	7,576	7,419
Total Income	Agriculture	983	894	-9.0	1,775	1,868	5.2	3,477	4,344
	Manufacturing	2,392	2,000	-16.4	3,213	3,133	-2.5	3,489	3,768
	Services	2,392	1,930	-19.3	3,613	3,098	-14.3	7,576	7,419
Skill level									
Pre-transfer income	Low-skilled	1,435	1,046	-27.1	2,080	1,941	-6.7	5,767	6,266
	Medium-skilled	2,118	1,571	-25.8	2,614	2,734	4.6	4,430	6,621
	High-skilled	2,751	2,000	-27.3	4,308	3,643	-15.4	4,515	3,266
Transfers	Low-skilled	-	50	-	189	340	80.5	5,767	6,266
	Medium-skilled	-	50	-	185	322	74.6	4,430	6,621
	High-skilled	-	50	-	264	348	31.7	4,515	3,266
Total Income	Low-skilled	1,507	1,251	-17.0	2,259	2,115	-6.3	5,767	6,266
	Medium-skilled	2,153	1,733	-19.5	2,691	2,854	6.1	4,430	6,621
	High-skilled	2,870	2,167	-24.5	4,478	3,781	-15.6	4,515	3,266

Source: Authors' calculations ELMPS 1988-2018

Table A6 (b): Income Sources in 2018 Egyptian pounds for subgroups, aged 15-64,2012-2018

		Median			Mean			N	
		2012	2018	% Change	2012	2018	% Change	2012	2018
Sector and Formality									
Pre-transfer income	Public	2,392	2,000	-16.4	3,613	3,098	-14.3	3,625	3,258
	Private formal	2,631	2,000	-24.0	4,657	3,059	-34.3	1,632	1,463
	Private informal	1,814	1,500	-17.3	2,462	2,602	5.7	8,227	9,310
Transfers	Public	-	50		227	323	42.3	3,625	3,258
	Private formal	-	50		232	348	49.5	1,632	1,463
	Private informal	-	50		188	300	59.5	8,227	9,310
Total Income	Public	2,472	2,100	-15.0	3,765	3,241	-13.9	3,625	3,258
	Private formal	2,791	2,050	-26.5	4,784	3,190	-33.3	1,632	1,463
	Private informal	1,914	1,544	-19.3	2,588	2,720	5.1	8,227	9,310
Education									
Pre-transfer income	Illiterate	919	500	-45.6	1,567	1,378	-12.1	3,919	4,322
	Read and Write	1,727	1,300	-24.7	2,373	2,371	-0.1	707	1,226
	Less than Intermediate	1,579	1,000	-36.7	2,175	1,713	-21.2	2,802	2,984
	Intermediate	1,914	1,500	-21.6	2,511	2,753	9.6	5,643	6,792
	Above Intermediate	2,392	1,800	-24.7	3,593	2,779	-22.7	609	529
	University	2,631	2,000	-24.0	4,512	3,068	-32.0	3,118	3,089
Transfers	Illiterate	-	50		251	374	49.0	3,919	4,322
	Read and Write	-	50		231	333	44.4	707	1,226
	Less than Intermediate	-	50		255	386	51.8	2,802	2,984
	Intermediate	-	50		282	395	39.8	5,643	6,792
	Above Intermediate	-	50		266	532	100.0	609	529
	University	-	50		396	509	28.7	3,118	3,089
Total Income	Illiterate	1,283	921	-28.2	1,979	1,651	-16.6	3,919	4,322
	Read and Write	1,914	1,550	-19.0	2,750	2,616	-4.9	707	1,226
	Less than Intermediate	1,821	1,250	-31.4	2,462	1,924	-21.9	2,802	2,984
	Intermediate	2,067	1,667	-19.4	2,787	2,969	6.5	5,643	6,792
	Above Intermediate	2,392	2,050	-14.3	3,914	3,098	-20.9	609	529
	University	2,870	2,050	-28.6	4,886	3,292	-32.6	3,118	3,089

Source: Authors' calculations ELMPS 2012-2018

Table A7 (a). Means and Standard Deviations by Sector and Gender, Egypt, 2012

	Male				Female				Total	
Variable	**Public**		**Private**		**Public**		**Private**			
	mean	*S.D.*	*mean*	*S.D.*	*mean*	*S.D.*	*mean*	*S.D.*	*Mean*	*S.D.*
Real Hourly Wage (in 2012 prices)	6.79	6.85	5.68	16.26	6.68	5.15	3.99	4.21	5.97	10.58
Real Monthly Earnings (in 2012 prices)	1200.49	810.43	1100.81	777.40	1024.44	699.66	739.63	689.41	1071.72	763.09
Log Real Hourly Wage (in 2012 prices)	1.88	0.56	1.66	0.57	1.88	0.55	1.41	0.59	1.76	0.55
Experience	29.09	11.21	21.79	10.97	23.26	11.00	13.79	7.74	23.65	11.64
Experience squared	971.45	681.34	594.99	604.55	661.86	551.37	250.01	317.10	694.88	648.22
Illiterate	0.07	0.25	0.13	0.34	0.14	0.34	0.17	0.38	0.15	0.35
Read and Write	0.04	0.20	0.05	0.21	0.04	0.20	0.05	0.21	0.06	0.24
Less than Intermediate	0.11	0.31	0.20	0.40	0.16	0.37	0.11	0.31	0.14	0.35
Intermediate	0.36	0.48	0.37	0.48	0.37	0.48	0.30	0.46	0.41	0.49
Above Intermediate	0.06	0.24	0.04	0.20	0.04	0.20	0.04	0.19	0.03	0.18
University and above	0.36	0.48	0.20	0.40	0.25	0.43	0.33	0.47	0.21	0.41
Greater Cairo	0.16	0.37	0.27	0.44	0.23	0.42	0.41	0.49	0.21	0.41
Alexandria and Canal Cities	0.07	0.25	0.11	0.32	0.11	0.31	0.16	0.36	0.09	0.29
Urban Lower Egypt	0.11	0.31	0.11	0.31	0.17	0.38	0.11	0.31	0.10	0.31
Rural Lower Egypt	0.10	0.30	0.05	0.21	0.12	0.33	0.04	0.20	0.08	0.27
Urban Upper Egypt	0.36	0.48	0.33	0.47	0.28	0.45	0.24	0.43	0.31	0.46
Rural Upper Egypt	0.21	0.41	0.13	0.34	0.09	0.28	0.05	0.21	0.21	0.41
Sample Size	**3,052**		**5,226**		**1,434**		**349**		**10,061**	

Source: Authors' calculations ELMPS 2006-2018

Table A7 (b). Means and Standard Deviations by Sector and Gender, Egypt, 2018

	Male				Female				Total	
Variable	Public		Private		Public		Private			
	mean	S.D.	mean	S.D.	mean	S.D.	mean	S.D.	mean	S.D.
Real Hourly Wage	14.06	12.30	12.81	13.98	13.56	10.40	8.44	7.32	12.74	12.60
Real Monthly Earnings	2897.88	2705.60	2938.88	3064.56	2413.16	2034.21	1714.11	1597.00	2623.59	2636.81
Log Real Hourly Wage	2.53	0.59	2.38	0.65	2.53	0.58	2.05	0.61	2.42	0.61
Experience	23.79	11.27	15.26	10.84	19.12	10.80	9.39	10.44	17.58	11.63
Experience2	692.87	591.91	350.37	461.23	482.12	452.29	196.88	364.18	444.51	514.41
Illiterate	0.05	0.21	0.15	0.36	0.02	0.13	0.17	0.38	0.15	0.35
Read and Write	0.05	0.21	0.07	0.25	0.00	0.06	0.05	0.21	0.06	0.24
Less than Intermediate	0.08	0.27	0.16	0.37	0.01	0.12	0.11	0.31	0.14	0.35
Intermediate	0.40	0.49	0.44	0.50	0.33	0.47	0.30	0.46	0.41	0.49
Above Intermediate	0.06	0.23	0.03	0.16	0.08	0.28	0.04	0.19	0.03	0.18
University and above	0.37	0.48	0.15	0.36	0.55	0.50	0.33	0.47	0.21	0.41
Greater Cairo	0.14	0.35	0.23	0.42	0.15	0.36	0.40	0.49	0.20	0.40
Urban Lower Egypt	0.07	0.25	0.08	0.27	0.09	0.28	0.10	0.30	0.08	0.27
Rural Lower Egypt	0.10	0.29	0.10	0.30	0.17	0.38	0.11	0.31	0.10	0.30
Urban Upper Egypt	0.09	0.29	0.06	0.24	0.14	0.35	0.06	0.23	0.08	0.27
Rural Upper Egypt	0.41	0.49	0.33	0.47	0.35	0.48	0.26	0.44	0.33	0.47
Alexandria and Canal Cities	0.20	0.40	0.19	0.39	0.10	0.30	0.07	0.25	0.22	0.42
Sample Size	**4,924**		**3,796**		**1,123**		**393**		**10,236**	

Source: Authors' calculations ELMPS 2006-2018

Table A9. Ordinary Least Square Estimates of Log Hourly Wage Equations, 2012

VARIABLES	(1) Total	(2) Male Private	(3) Male Public	(4) Female Private	(5) Female Public
Experience	0.029***	0.025***	0.024***	0.040***	0.032***
	(0.001)	(0.003)	(0.004)	(0.011)	(0.005)
Experience squared	-0.000***	-0.000***	-0.000*	-0.001**	-0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education (omitted category illiterate)					
Literate without diploma	0.044	0.119**	0.170***	0.063	0.246
	(0.029)	(0.053)	(0.066)	(0.208)	(0.191)
Elementary school	0.082***	0.110***	0.137**	0.111	0.979***
	(0.021)	(0.038)	(0.059)	(0.134)	(0.331)
Middle school	0.123***	0.125***	0.333***	0.201	0.282
	(0.025)	(0.048)	(0.064)	(0.168)	(0.173)
General high school	0.275***	0.307***	0.580***	0.483***	0.485***
	(0.035)	(0.067)	(0.080)	(0.181)	(0.164)
Vocational high school	0.231***	0.199***	0.582***	0.142	0.510***
	(0.017)	(0.034)	(0.048)	(0.098)	(0.136)
Post-secondary institute	0.329***	0.386***	0.644***	0.329**	0.556***
	(0.028)	(0.057)	(0.063)	(0.154)	(0.144)
University	0.538***	0.562***	0.927***	0.631***	0.781***
	(0.018)	(0.038)	(0.049)	(0.095)	(0.136)
Constant	1.154***	1.142***	0.809***	0.858***	0.777***
	(0.020)	(0.041)	(0.059)	(0.097)	(0.138)
Observations	10,061	3,052	5,226	349	1,434
R-squared	0.165	0.103	0.224	0.222	0.231

Source: Authors' calculations ELMPS 2006-2018
Standard Errors in parentheses: ***P <0.01, ** P<0.05, *P<0.1

Table A10. Ordinary Least Square Estimates of Log Hourly Wage Equations, 2018

VARIABLES	(1) Total	(2) Male Private	(3) Male Public	(4) Female Private	(5) Female Public
Experience	0.025***	0.023***	0.022***	0.014	0.013**
	(0.002)	(0.003)	(0.004)	(0.009)	(0.006)
Experience squared	-0.000***	-0.000***	-0.000***	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education (omitted category illiterate)					
Literate without diploma	0.108***	0.129**	0.326***	-0.038	-0.084
	(0.032)	(0.054)	(0.082)	(0.170)	(0.302)
Elementary school	0.081***	0.088*	0.147*	-0.003	0.796***
	(0.029)	(0.047)	(0.089)	(0.161)	(0.187)
Middle school	0.160***	0.170***	0.325***	0.237	0.314
	(0.030)	(0.050)	(0.080)	(0.155)	(0.196)
General high school	0.188***	0.081	0.502***	-0.204	0.935***
	(0.040)	(0.067)	(0.096)	(0.183)	(0.168)
Vocational high school	0.173***	0.150***	0.468***	-0.060	0.714***
	(0.021)	(0.036)	(0.061)	(0.110)	(0.115)
Post-secondary institute	0.213***	0.208***	0.624***	0.253	0.569***
	(0.037)	(0.070)	(0.083)	(0.182)	(0.128)
University	0.404***	0.319***	0.789***	0.248**	1.004***
	(0.022)	(0.041)	(0.062)	(0.102)	(0.116)
Constant	1.943***	2.004***	1.612***	1.831***	1.353***
	(0.024)	(0.041)	(0.077)	(0.103)	(0.116)
Observations	9,726	3,607	4,642	384	1,093
R-squared	0.084	0.037	0.144	0.068	0.216

Source: Authors' calculations ELMPS 2006-2018
Standard Errors in parentheses: ***P <0.01, ** P<0.05, *P<0.1

Table A11. Annualized Incremental Returns to Education in Egypt (percentage), 2012-2018

	2012	2018	2012-2018 percentage points of increase/decrease
Male Public			
Middle School	6.5	5.9	*-0.6*
General Secondary	8.2	5.9	*-2.3*
Vocational Secondary	8.3	4.8	*-3.5*
Post Secondary	2.1	4.1	*1.9*
University	8.7	7.2	*-1.5*
Male Private			
Middle School	0.5	2.7	*2.2*
General Secondary	6.1	-3.0	*-9.0*
Vocational Secondary	2.5	-0.7	*-3.1*
Post Secondary	2.6	4.2	*1.6*
University	6.4	6.0	*-0.4*
Female Public			
Middle School	-23.2	-16.1	*7.2*
General Secondary	6.8	20.7	*13.9*
Vocational Secondary	7.6	13.3	*5.7*
Post Secondary	2.4	-12.2	*-14.6*
University	7.4	1.7	*-5.7*
Female Private			
Middle School	3.0	8.0	*5.0*
General Secondary	9.4	-14.7	*-24.1*
Vocational Secondary	-2.0	-9.9	*-7.9*
Post Secondary	-5.1	15.2	*20.4*
University	3.7	11.3	*7.6*
Total			
Middle School	4.1	5.3	*1.2*
General Secondary	5.1	0.9	*-4.1*
Vocational Secondary	3.6	0.4	*-3.2*
Post Secondary	1.8	0.8	*-1.0*
University	6.6	5.4	*-1.2*

Source: Authors' calculations ELMPS 2012-2018