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Measuring and Operationalizing Job Quality in Egypt

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Abstract

Given data constraints and the complexity of the concept, it is already quite challenging to operationalize the notion of job quality for wage and salary employment, but even more so for non-wage workers. This paper addresses this challenge and attempts to formulate a measure of job quality at the individual job level. We combine information on actual and estimated earnings with information on access to social insurance, regularity of employment, work hours, and nature of workplace into an index of job quality and we investigate the individual and enterprise-level determinants of such an index. Although our findings show that on the whole job quality appears to have declined in Egypt over the 1998 to 2006 period, it has in fact increased among wage and salary workers in the private sector, and most noticeably among workers in microenterprises. The overall decline can be partially attributed to measurement issues related to non-wage workers and to a compositional shift of the workforce away from what is generally considered high-quality public sector employment.

1. Introduction

There has been an increasing concern in recent years with the notion of “decent work,” since the International Labour Organization (ILO) introduced the concept in 1999. According to the ILO, decent work covers a number of dimensions, including income security, opportunities for skill acquisition, job security, job safety, regularity of employment, and voice and representation. As challenging as it is to operationalize this notion for wage and salary employment, the difficulty pales in comparison to devising a measure of job quality for self-employed and unpaid family workers. The difficulty is further compounded in Egypt by the fact that there are no statistical sources that provide a reliable measure of the earnings of non-wage workers.

This paper has two objectives: (i) to define and operationalize a measure of job quality for both wage and non-wage workers, and (ii) to investigate the worker and enterprise-specific determinants of job quality. A central part of the notion of job quality is clearly the level of income that the worker is able to secure from that job. This is often far from being a straightforward exercise for non-wage workers. The first step in this paper

is to estimate earnings from non-wage work. This methodology relies on using estimates of household consumption and other individual characteristics to infer the earnings of each non-wage worker in the household. The information on earnings is then combined with information on access to social insurance, regularity of employment, working hours, nature of workplace, and voice representation into a composite measure of job quality. Under the second objective of the paper, the derived measure of job quality is explained as a function of worker characteristics, such as education, training, occupation, and experience, and enterprise characteristics, such as the size of the enterprise and its sector of economic activity.

This paper relies on data from two nationally representative Egypt Labor Market Surveys (ELMSs): the 1998 Egypt Labor Market Survey (ELMS98) and the 2006 Egypt Labor Market Panel Survey (ELMPS06). The ELMPS06 is the second round of what is intended to be a periodic longitudinal survey that tracks the labor market and demographic characteristics of the households and individuals interviewed in the ELMS98. The two ELMSs are rich sources of information on labor market conditions in Egypt, including employment status, unemployment, job mobility, earnings, migration, and household enterprises; however, they do not include a full consumption and income module, and thus cannot provide direct measures of household income poverty. Moreover, no data was collected directly in either survey on the earnings of self-employed and household enterprise workers. To overcome those limitations, two additional datasets are used in this study: the 1999/2000 Household Income and Expenditure Consumption Survey (HIECS99) and the 2004/2005 Household Income and Expenditure Consumption Survey (HIECS04). The HIECSs are household budget surveys that contain information about consumption expenditures on more than 550 items of goods and services. The HIECSs are combined with the ELMSs using a two-stage estimation technique to estimate household consumption for the ELMSs samples. In a further step, these consumption estimates are combined with estimates of non-labor income and wage earnings to produce earnings estimates for non-wage workers.

The rest of the paper is organized in seven additional sections. Section 2 presents a brief background and a review of the related literature on job quality and its determinants. In Section 3 we describe the data sources and the encountered measurement challenges. Section 4 lays out our framework for measuring job quality. This section also explores different measures of job quality. Section 5 investigates whether the estimated measure of job quality produces results that correspond with expectations

about the main characteristics of good quality jobs. Section 6 relates the developed index of job quality to other information from the ELMSs to examine the dynamics of job quality over the period 1998–2006. Section 7 uses multivariate regression techniques to investigate the determinants of job quality. Section 8 concludes the paper.

2. Literature Review

In what follows, we review and discuss briefly different methodologies that have been proposed in the literature for measuring job quality. This section also discusses expected determinants of job quality in light of the results of previous studies.

2.1 Job Quality: Theoretical and Empirical Consideration

The 87th Session of the International Labour Conference formalized the definition of decent work as “opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity” (Anker et al., 2003). Following this definition, a first series of discussions about the creation of a decent work index started in late 1999 when the ILO established the InFocus Programme on Socio-Economic Security to compensate for the absence of systematic data that could monitor the dynamics and the causal mechanisms of, above all, workers’ insecurity (Standing, 2002).

In fact, the initial intent of the ILO was to provide measurements of job security, but subsequently their intent was broadened to include measurements of “decent work” that extended beyond the traditional exclusive focus on wages and hours of work. The first effort undertaken was the Enterprise Labour Flexibility and Security (ELFS) Surveys, aimed at collecting data on employment and income security, which was followed by People’s Security Surveys (PSSs) (Standing, 2002). In particular, the PSSs differ from traditional household surveys as they combine objective, attitudinal, and normative questions on the actual socio-economic situation of respondents, their perception of security and insecurity, the resources available to them for coping with insecurity and their opinions on social justice and norms regarding security and insecurity (Anker, 2002). Different studies emanating from ILO officials have used data from different PSSs to compile different Decent Work Indices (DWIs).

Besides the ILO's PSSs of individual job quality, the most comprehensive attempt at measuring quality of jobs was by Statistics Finland, which carried out five Quality of Work Life Surveys (QWLs) between 1977 and 2003 (Sutela, 2005). Most other studies, including the present one, use traditional Household Panel Surveys, (e.g., the British Household Panel Survey [BHPS] in Clark, 2001).

As job quality is a multifaceted concept, a wide range of indicators have been proposed by several studies. Bonnet et al. (2003) divides indicators into *input indicators* (such as the enactment of basic laws and ILO Conventions), *process indicators* (mechanisms whereby legal provisions are translated into reality, e.g. public spending on a particular form of security), and *outcome indicators* indicating whether or not processes are effective in ensuring workers' protection. The following table is mainly based on Anker's (2002) identification of eight macro-areas that can account for the multifaceted approach to job quality.

Table 1: Sub-indicators of Job Quality

Category	Indicators	Reference
(1) Basic security Basic work and non-work aspects of people's lives	<ul style="list-style-type: none"> *Basic needs (housing, education, safety/violence, health care, environment, and food) *Debt and financial crises experienced *Perceived sufficiency of income *Excessive hours of work (more than 50 hours per week) and extreme hours (above 60 hours) *Insufficient hours of work 	Anker (2002); Anker et al. (2003); Brown, Pintaldi (2005)
(2) Income security Presence of a sufficient income	<ul style="list-style-type: none"> *Cash and non-cash wages/benefits *Whether salary is below half the median national value *Fluctuations in income and wage arrears *Past income levels and future expectations *Savings measured as cumulative income *Availability of official income supports 	Anker (2002); Anker et al. (2003); Mehran (2005)
(3) Labor market security Security of having income-generating work	<ul style="list-style-type: none"> *Unemployment experiences and presence of unemployment benefits *Recent changes in number of people employed at the respondent's work place *Consequences of the possible loss of current work. 	Anker (2002)

continued ►

<p>(4) Employment security Security from loss of current work and the security/capability of keeping one's main job</p>	<ul style="list-style-type: none"> *Contract type (written, oral or absent) *Occupation and place of work *Paid sick and annual leave *Employer's contributions to social insurance *Regularity/tenure of employment *Perceptions of work satisfaction *Likelihood of pregnant women losing their job *Effect of globalization on work. 	<p>Anker (2002) Mehran (2005)</p>
<p>(5) Skills reproduction security Obtaining marketable skills</p>	<ul style="list-style-type: none"> *Formal/informal training received *Mismatch between qualification and work content (skill-related underemployment) *Use of qualifications at work *Expectations for own children's education. 	<p>Anker (2002); Brown and Pintaldi (2005)</p>
<p>(6) Job security Career possibilities and advancements</p>	<ul style="list-style-type: none"> *Experiences with advances and setbacks in working life and future expectations *Perceived importance of following a particular profession 	<p>Anker (2002)</p>
<p>(7) Work security Occupational safety and working conditions</p>	<ul style="list-style-type: none"> *Absence from work due to illness, stress, and injuries *Overwork *Sexual harassment *Discrimination *Safety of working conditions *Provision for occupational injury compensation *Childcare availability. 	<p>Anker (2002)</p>
<p>(8) Voice representation security Having a collective voice to represent one's rights and interests at work</p>	<ul style="list-style-type: none"> *Presence of trade unions *Coverage by a collective wage bargaining coverage rate *Employer's concern of employees 	<p>Anker (2002); Anker et al. (2003)</p>

Perhaps the main difficulty in measuring job quality is that it is not based solely on objective quantitative criteria (e.g. wage) but on a series of complex issues that involve qualitative and/or subjective aspects that are difficult to encapsulate in a quantitative indicator (for detailed discussion see Anker et al. [2003]).

2.2 Determinants of Job Quality in the Literature

The main reason behind constructing an index of job quality is to assess the interaction between job quality and other aspects of people's lives such as poverty, education, gender, and age. Results from several studies show that there indeed exists a link between job quality and workers' quality of life. Beyond the clear link between poor earnings and poverty, dangerous or unstable work environments can result in high levels of vulnerability (through lay-offs or work-related injuries). For instance, for small-scale operators in the informal sector the home usually becomes the workplace and, therefore, poor living standards result in dire working conditions and vice versa (ILO, 1999).

Even though different studies employ different measures of bad jobs, a similar profile of workers with bad jobs emerges from a number of studies. Generally, women tend to have worse jobs than men in both developing and developed countries. Young new entrants are also generally exposed to worse working conditions than older workers, especially when existing regulations provide excessive protection to incumbent workers at the expense of new entrants who are often relegated to informal types of employment. Informal employment is often associated with lower quality jobs and employees are more likely to have decent jobs than the self-employed. A negative relationship between job satisfaction and unionization has been found in several studies that focus on industrial countries (e.g., in the United States [Freeman, 1978; Borjas, 1979], Canada [Meng, 1990], and the United Kingdom [Clark 1996]). Clark (2001) shows that unionism (that reduces both quits but either decreases or has little effect on job satisfaction) and tenure (associated with much lower quit rates but no effect on job satisfaction) may have an ambiguous effect on job satisfaction.

Based on the analysis of data from five countries, the study by Ritter and Anker (2002) shows how factors like pay, non-wage benefits, nature of work, autonomy, opportunities for promotion, and skill-upgrading tend to move up and down together, meaning that good jobs tend to score high on most of them. The authors also highlight a positive correlation between education, earnings, and total job satisfaction and a statistically significant positive relationship between acquisition of transferable skills and job satisfaction. These results suggest that in-firm skill upgrading increases the likelihood of finding a job in case of job-loss and, together with higher earnings, it has a beneficial impact on job satisfaction. Surprisingly, pay exhibits as strong a relationship with job satisfaction as job safety and job security.

3. Data Sources and Measurements Challenges

The analysis in this paper mainly relies on data from the two nationally-representative Egypt Labor Market Surveys (ELMSs): the 1998 Egypt Labor Market Survey (ELMS98) and the 2006 Egypt Labor Market Panel Survey (ELMPS06), which is a household survey recently conducted by the Economic Research Forum (ERF) in cooperation with the Egyptian Central Agency for Public Mobilization and Statistics (CAPMAS). The ELMPS06 is the second round of what is intended to be a periodic longitudinal survey that tracks the labor market and demographic characteristics of the households and individuals interviewed in the ELMS98 as well as new households that have formed as a result of splits in the original households, and a refresher sample made up of entirely new households. The ELMPS06 sample consists of a total of 8,349 households distributed as follows: (i) 3,684 households from the original ELMS98 survey, (ii) 2,167 new households that emerged as a result of splits in the original households, and (iii) a refresher sample of 2,498 households. Of the 23,997 individuals interviewed in 1998, 22,987 were still alive or in the country in 2006 and 17,357 of those (75.5%) were successfully re-interviewed in 2006, forming a panel that can be used for longitudinal analysis.¹ The 2006 sample contains an additional 19,743 “new” individuals. Of these, 2,663 individuals joined the original 1998 households, 4,880 joined the split households, and 12,200 were part of the refresher sample of households.

The ELMSs are rich sources of information on labor market conditions in Egypt, including employment status, unemployment, job mobility, wage earnings, migration, and household enterprises. They also contain great deal of information on the household members’ demographic and socioeconomic characteristics, housing conditions, ownership of durable goods, and access to basic services and infrastructure. More specific to the objective of this paper, the data from the ELMSs address a number of job quality issues. The surveys collect information on the presence of legal contract, social insurance coverage, health insurance, paid vacations,

1 An analysis of the attrition from the sample showed that it was essentially due to the random loss of identifying records rather than any systematic attrition process. No significant association was found between the probability of attrition and household and individual characteristics in 1998. Weights based on the probability of non-response were used to correct for attrition in the panel data. See Assaad and Roushdy (2009).

paid sick leave, unionization, regularity of employment, hours of work, whether the work is in a fixed establishment, the form of the workplace, the enterprise size, the proportion of women in the workplace, and the incidence of training opportunities.

However, as mentioned previously, the ELMSs do not include a full consumption and income module and can therefore not provide direct measures of household income poverty. To overcome this limitation the 1999/2000 Household Income and Expenditure Consumption Survey (HIECS99) and the 2004/2005 Household Income and Expenditure Consumption Survey (HIECS05) are used in combination with the ELMSs. The HIECSs are household budget surveys implemented by CAPMAS. They contain information of consumption expenditures on more than 550 items of goods and services. The HIECSs are generally considered the major source of information on household income and expenditure in Egypt. The ELMSs and the HIECSs contain a great deal of information, in common, on the household members' demographic and socioeconomic characteristics, housing conditions, ownership of durables, access to basic services, and the neighborhood infrastructure. However, detailed information on the household total income and expenditure is only provided in the HIECSs, while detailed information on labor market conditions, employment status, different aspects of job quality and household enterprises are only available in the ELMSs. Accordingly, we use a two-stage estimation technique to combine information from the HIECS04 with the ELMPS06, and the HIECS98 with the ELMS98, in order to estimate per capita consumption for the ELMS98 and ELMPS06 samples. The detailed information of this two-stage estimation technique is summarized in Appendix B.

A second major data limitation of the ELMSs is the absence of any information on the earnings of non-wage workers, since ELMSs collected earnings data from only the wage and salaried workers. Nevertheless, to overcome this limitation, we developed a methodology to estimate monthly earnings for individual self-employed and household enterprise workers. This methodology basically assumes that total household income is equal to total household consumption (predicted according to the methodology outlined above and discussed in detail in Appendix B), and allocates the total household income (excluding non-labor income and wage earnings) over the household enterprise workers based on the number of hours worked.

Section 4 takes on the challenge of measuring job quality among both wage and non-wage workers. The general framework for measuring job quality in this paper is mainly based on Anker's (2002) framework discussed above.

4. Measuring Job Quality

Based on a careful assessment of the different methodologies that have been proposed in the literature for measuring decent work and given the limitation of available data, we decided to employ the following set of indicators (see Table A1 in the appendix for the descriptive statistics of this set of indicators), which can be grouped into four broad categories, to develop a composite measure of job quality for wage workers:

1. Income security: defined in terms of having an adequate income, access to social insurance and access to medical care.
2. Employment security: defined in terms of the regularity of employment, the presence of a legal employment contract, paid sick leave, and paid annual leave.
3. Voice representation security: defined in terms of being a member of a trade union or professional syndicate.
4. Work security: defined in terms of having adequate working hours, a decent workplace, and reasonable commuting distance to work.

Similarly, job quality is measured along the same four dimensions for household enterprise, self-employed workers, and employers. However, since the presence of legal employment contract and the incidence of paid sick leave and annual leave are not relevant for non-wage workers, employment security for this group of workers is defined in terms of the regularity of employment only. Thus, for sake of comparability between the measure of job quality for wage and non-wage workers, when compiling a job quality index for all workers, only the common set of indicators will be used—i.e. these three variables (contract, paid sick leave and annual leave) are excluded from the job quality index of all workers. Also, for simplicity, from this point forward we will denote the following six indicators—whether the worker has access to social insurance, medical care, contract, paid sick leave, and paid annual leave, and whether he/she is a member of a trade union or a professional syndicate—as the institutional variables.

Since the ELMSs provide earnings data for only wage and salaried workers, the greatest challenge in measuring job quality for non-wage workers lies in estimating earnings. Accordingly, as discussed in the previous section, we estimate the earnings of this group of workers from household non-wage income using the methodology outlined above.

The nature of workplace is provided under quite detailed categories in the ELMSs. We grouped those categories into five groups that, in our judgment, can be ranked from worst to best. The first group includes all mobile workers who mentioned streets, mobile carts, or huts as their place of work. The second group includes those who work at their own home, in another house, or in a field/farm. The third group consists of trucks, small trucks, taxis, minibuses, or motorized rickshaws as workplaces. Under the fourth group come shops, kiosks, a room, or a number of rooms. Finally, the fifth category of workplaces includes offices, flats, buildings, or factories.

There is no official ILO definition of full-time work largely because the definition of full-time work varies from country to country or is even left undefined in some. In this paper we take full-time work to mean 40 hours per week. Since adequate working hours and more importantly finding a full-time job if wanted are important elements of job quality, two measures are included among the components of the job quality index (JQI): a measure of the degree of involuntary underemployment and a measure of the degree of overemployment. We measure the degree of involuntary underemployment by the number of hours worked below 40 hours if the individual is involuntarily working less than 40 hours. The degree of overemployment is measured by number of hours worked above 40 hours. Thus, each of those two indicators will take on the value 0 in case the individual is fully employed and will increase with the number of hours worked below or above 40 hours.

All the institutional variables and the regularity of employment are binary indicators, which each takes the value one if the characteristic is satisfied and zero otherwise. Each of the non-binary indicators is normalized using the formula: $[\text{value} - \text{Minimum}] / [\text{Maximum} - \text{Minimum}]$, to allow us to gauge the worker's situation in comparison to other workers. The descriptive statistics (Tables A2) and correlation matrix (Table A4) of the normalized job quality indicators are presented in Appendix A.

Once a series of job quality indicators have been identified and normalized, these normalized scores can be combined into a single index by either averaging the normalized set of indicators into an unweighted score that varies from 0 to 1, or by using available data reduction techniques such as

factor analysis.² In this paper we apply factor analysis techniques to produce weighted indices of job quality for wage and non-wage workers.³

However, an important question arises here: *Should all variables be combined using a one-step factor analysis technique?* In other words, should we treat all the selected job quality indicators the same or should variables such as the institutional variables be treated differently? One could argue that the institutional variables generally come together as one package and measure the formality of employment, which is itself a dimension of job quality. Also, in the case of self-employed workers or employers, it could be argued that these variables are optional job characteristics that they can opt for or not depending on their preferences and that they should be treated differently. To investigate this question we develop and compare between a one-stage JQI (1SJQI), which treats all job quality indicators the same, and a two-stage JQI (2SJQI), which first creates an institutional (formality) factor using factor analysis, which is then introduced as a single job quality indicator together with the other non-institutional indicators in a second stage factor analysis.

Table A3 in the Appendix shows the resulting scoring coefficients of the developed JQIs for wage workers. The factor analysis produced a single factor for the wage workers group.⁴ The distribution of the 1SJQI and 2SJQI are shown in Figure 1 and 2. Figure 1 illustrates that the 1SJQI has a symmetric bimodal distribution that clearly distinguishes between workers falling on the high levels of the job quality distribution and those on the lower end of the distribution. According to the 1SJQI distribution, most wage workers fall on either the lower or higher level of the job quality distribution, and very few workers fall in the middle of the distribution, suggesting a very large influence for the institutional variables that often come as a package. In contrast, Figure 2 shows that the 2SJQI also has a trimodal distribution with a long lower tail. Thus, based on this

2 Although any such procedure may produce a seemingly simple measure of job quality, it should be carefully interpreted since it may in fact obscure the real complexity underlying the job quality concept (Ritter and Anker, 2002).

3 In a previous paper we conducted a comparison between several unweighted and weighted job quality indices for non-wage workers. The results show that there is a great correspondence between the weighted JQI produced from the factor analysis and the unweighted JQI produced from averaging the normalized scores (their correlation coefficient exceeds 0.92). Nevertheless, the weighted JQI has an interesting distribution that is more consistent with expectations (see Assaad and Roushdy 2007).

4 The factor analysis produced a single factor in the sense that its eigenvalue exceeds one, while the eigenvalues associated with all the next factors are lower than 1.

2SJQI, most wage workers fall in the middle of the job quality distribution with a few workers on the right having good jobs and a few on the left having poor jobs.

Furthermore, a thorough investigation of Table A2, A3, and A4 confirms that the institutional variables (in particular access to paid sick and annual leave) are mainly what drive the remarkable symmetric bimodal distribution of the 1SJQI for wage workers. Also, surprisingly, earning plays a smaller role in capturing job quality than the effect of the institutional variables.⁵ In the rest of this paper we will depend on the 2SJQI approach which clearly produces a more intuitive and defensible distribution.

Figure 1: Distribution of Wage Workers 1SJQI, 2006



Figure 2: Distribution of Wage Workers 2SJQI, 2006



So far, we have used only 2006 data to construct the JQI. However, in order to compare the evolution of job quality from 1998 to 2006, we

5 This has been investigated in detail in Assaad and Roushdy (2007). In that paper we conducted a detailed comparison between the results of the JQI when consecutively excluding the institutional variables and earnings from its components among non-wage workers in the agriculture sector. The results show that the institutional variables are not only the cause of this trimodal distribution of the JQI, but also the nature of work place. However, when those different JQIs are used to identify the workers and enterprise-specific determinants of job quality, they produced quite similar results.

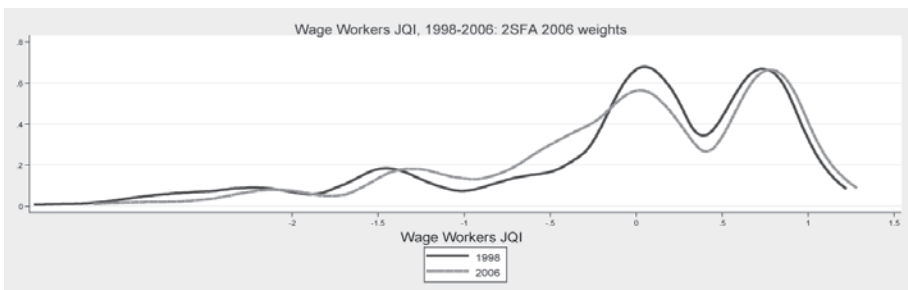
need to decide which weighting scheme we will use to construct the index over time. Three possible weighting alternatives are investigated in Figure 3, to compare between the two surveys years, namely using weights obtained from the ELMS98 dataset only, using weights obtained from the ELMPSo6 dataset only, and using weights based on pooling together the data from the two surveys. The figure shows that the three weighting strategies lead to quite similar distributions for the JQI. Hence, from this point forward we will depend on the pooled data weights to construct the JQI using the two-stage technique. The three graphs of Figure 3 illustrate that, although the average job quality of wage workers was quite stable through the period 1998–2006, a slight deterioration in the quality of jobs has been observed toward the upper-middle part of their job quality distribution.

Figure 3: Distribution of Wage Workers 2SJQI, 1998–2006

A. 1998 weights



B. 2006 weights



C. Combined-year weights

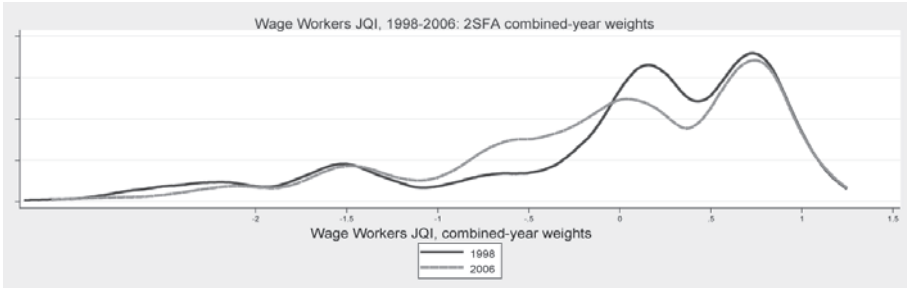
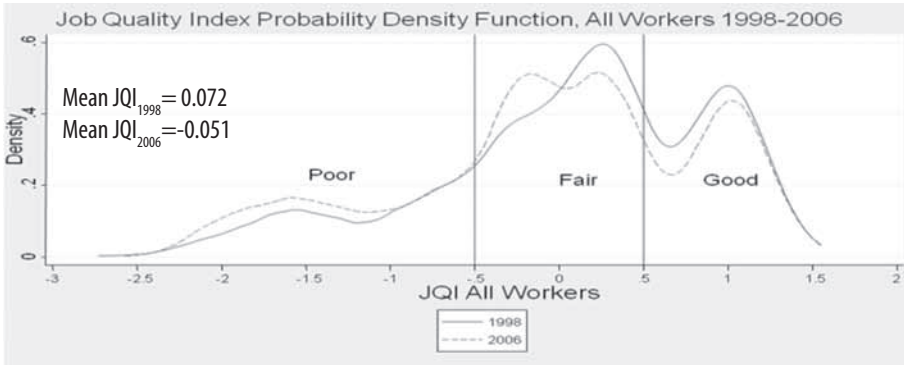


Figure 4 compares the distribution of job quality for all workers over the two survey years using the pooled data weights. Now the mean job quality for the two years is assigned a JQI of zero and the index is measured in units of standard deviations from this mean. In contrast to the distribution for just wage and salary workers, this figure shows that, on average, job quality has deteriorated significantly from 1998 to 2006 among all workers. The mean of the JQI for all workers has declined from 0.072 in 1998 to -0.051 in 2006. This deterioration occurred toward the middle, upper-middle, and low ends of the job quality distribution. As we will see below, this deterioration among non-wage workers is most probably the result of measurement issues rather than a real deterioration in the quality of jobs.

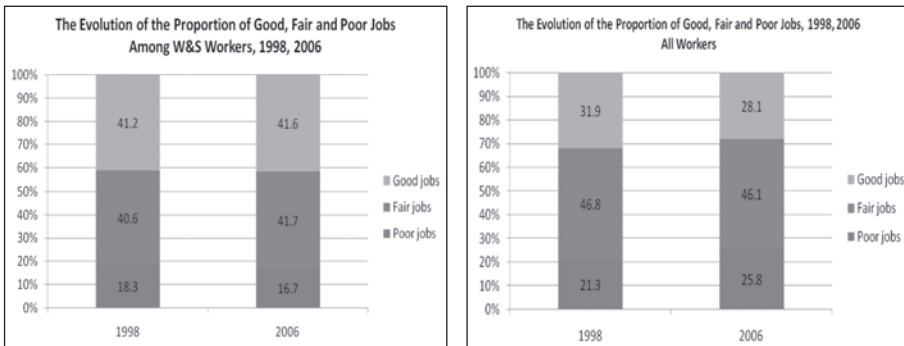
To facilitate comparisons across years and across groups of workers and jobs, we use the natural breaks in the trimodal job quality distribution shown in Figure 4 to classify jobs into good, fair, and poor jobs. We define goods jobs as jobs that have a JQI value of greater than 0.5, meaning that they are jobs whose JQI is at least one half a standard deviation above the mean job quality in the pooled data. We define fair jobs as having a JQI of between -0.5 and 0.5 (if $-0.5 \leq \text{JQI} \leq 0.5$) and poor jobs as having a JQI less than -0.5.

Figure 4: Distribution of 2SJQI for All Workers, 1998–2006 (using pooled data weights)



Based on this three-group classification, Figure 5 demonstrates the evolution of the proportion of good, fair, and poor quality jobs through the 1998–2006 period. The right panel of Figure 5 shows that the proportion of good jobs has declined among all workers over the 1998–2006 period, while the proportion of poor jobs has increased. However, among wage workers (left panel), the proportion of good jobs has been stable and there has been a decline in the proportion of poor jobs in favor of fair jobs.

Figure 5: Evolution of Good, Fair, and Poor Jobs, 1998–2006



5. Characteristics of Good Jobs

The general expectation is that good jobs are those that are indefinite in duration, provide social insurance and medical insurance coverage, and are in high-quality workplaces. This section investigates whether the results obtained from the developed JQI fits with these expectations about the main characteristics of good quality jobs.

Table 2 shows the proportion of good, fair, and poor jobs by basic job characteristics for all workers. The table indicates that, among all workers, almost all good jobs have the necessities of permanent or regular work (97%), social (94%) and medical (80%) insurance coverage, a high-level quality of workplace (93%), and offers wage or salary jobs (92%).

Table 3 investigates the availability of the institutional characteristics among wage workers by job quality. Among wage and salary workers, most good jobs have contracts, paid vacations, and paid sick leave and all offer regular employment. Poor jobs have virtually none of the above features and are mostly irregular. Good Jobs are also more highly paid, although the wage range of good jobs overlaps significantly with that of the lower quality jobs. The median monthly wage is about 522 LE in good quality jobs, compared to 390 LE for fair jobs, and 260 LE for poor jobs.

Table 2: Proportion of Jobs by Job Quality that Have Listed Feature, All Workers, 2006

	Good Jobs	Fair Jobs	Poor Jobs	All Jobs
Permanent (regular) work	97%	88%	66%	85%
Social insurance coverage	94%	27%	7%	41%
High-quality workplace (office, flat, building, factory)	93%	27%	7%	41%
Wage and salary work	92%	57%	41%	63%
Medical insurance	80%	17%	5%	32%
Managers, professional, or technical occupations	59%	24%	10%	30%
Unionization	55%	14%	3%	23%
Use of computers	24%	7%	4%	11%

Table 3: Proportion of Jobs by Job Quality that Have Listed Features, Wage and Salary Workers, 2006

	Good Jobs	Fair Jobs	Poor Jobs	All Jobs
Contract	94%	36%	16%	57%
Paid vacations	86%	30%	11%	50%
Paid sick leave	85%	29%	11%	49%
Regular employment	100%	95%	39%	88%
Monthly earnings in 2006 (LE)				
Median	522	390	260	410
5th percentile	217	130	65	127
95th percentile	2,400	910	660	1,416

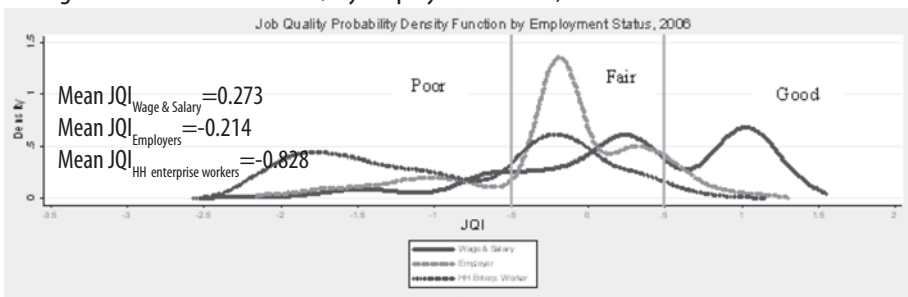
6. The Dynamics of Job Quality in Egypt: Who Gained and Who Lost in the Race for Better Jobs?

As shown in section 4 above, there was a slight deterioration in average job quality among wage and salary workers between 1998 and 2006 resulting primarily from the deterioration of the quality of “fair” jobs. However, there was a significant deterioration in the job quality when all workers are included in the index, suggesting that the deterioration was concentrated among non-wage workers. These trends must be considered with a high degree of caution given the measurement issues relating to measuring job quality among non-wage workers in the first place as well as the issues relating to even measuring the incidence of non-wage work, especially among women in rural areas.

We can clearly see from Figure 6 that job quality varies significantly by employment status. In 2006, most good quality jobs were occupied by wage and salary workers, whose mean JQI was 0.273. The majority of employers are deemed to have fair jobs, with a mean JQI of -0.214. Household enterprise workers, who include both the self-employed and unpaid family workers, are distributed among fair and poor jobs, with a mean JQI of -0.828. From these results it appears that the JQI may exaggerate differences in job quality among wage and non-wage workers by weighing heavily institutional aspects of employment that rarely apply to non-wage workers. This suggests that any comparisons of job quality between wage and non-wage workers should be made with caution and that most analyses should look separately at these two groups.

We also know from previous work (Assaad and El-Hamidi, 2009) that ELMPS06 did a better job than ELMS98 in measuring the participation of rural women in agricultural activity as self-employed and unpaid family workers. The newly added female workers are likely to be fairly marginal workers and are thus more likely to have poor jobs. This difference in measurement, as we will see below, could very well explain the deterioration in job quality experienced we see in the data from 1998 to 2006. To abstract from these potential measurement problems relating to non-wage work among women, we will in what follows present results separately for wage and salary and non-wage workers.

Figure 6: Distribution of 2SJQI by Employment Status, 2006



The second most important distinction among workers when it comes to job quality is sector of employment. As shown in Figure 7, public sector workers, who generally hold formal jobs, have jobs that are concentrated in the good and fair job categories, whereas private sector wage and salary workers are distributed throughout the job quality distribution and mostly concentrated in the middle of the distribution. Although the mean JQI in the public sector has remained about the same at about 0.684, we do notice that the density of fair jobs in the public sector is falling and that of poor job is rising from the very low levels of 1998. More specifically, Figure 8 shows that the proportion good jobs in the public sector has increased from 60% in 1998 to 67% in 2006, that of fair jobs has declined from 38 to 28% and that of poor jobs has increased from just over 1% to nearly 6%.

As a sign of positive developments in the Egyptian labor market, the mean JQI for wage and salary workers in the private sector has increased from -0.249 to -0.067. This reflects a reduction in the density of poor jobs and an increase in the density of fair jobs. This is confirmed in Figure 8, which shows that the proportion of poor jobs among wage and salary

workers in the Egyptian private sector has declined from 37 to 25% and that of fair jobs has increased from 45 to 55% between 1998 and 2006.

Figure 7: Distribution of Job Quality for Wage Workers by Sector of Ownership

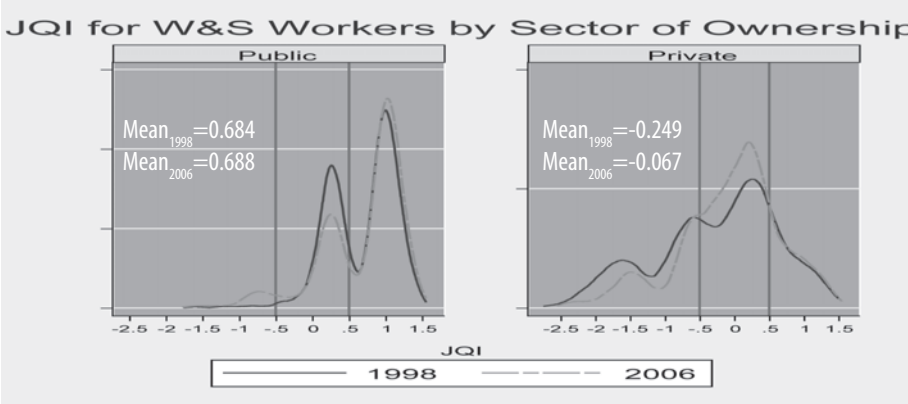
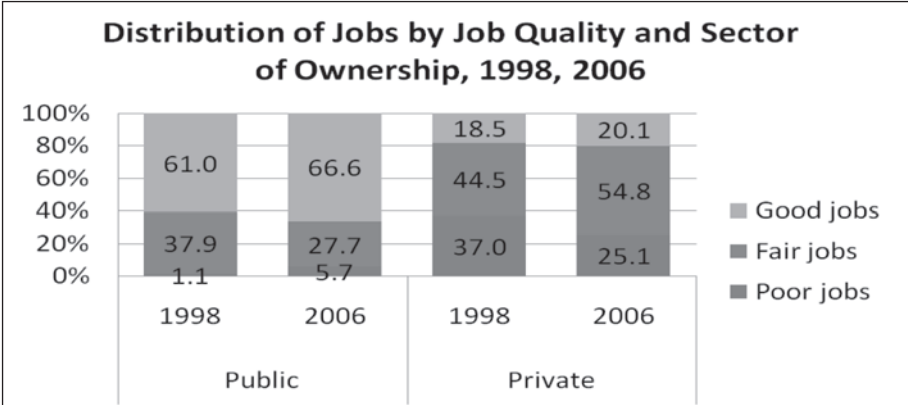


Figure 8: Evolution of Good, Fair and Bad Jobs for Wage Workers by Sector of Ownership, 1998–2006



On average, in the private sector, job quality is lowest among wage workers of the agriculture and construction economic activities groups (Figure 9), but has improved in both groups during the 1998–2006 period. In contrast, job quality is highest in the finance, insurance, and real estate sector but has been declining, followed by manufacturing and public services. Figure 10 shows that the evolution of job quality distribution by occupation follows a fairly predictable pattern among wage workers. As one expects, job quality is highest among professionals and senior officials and lowest among agriculture workers. The main notable trends over

time are an improvement in job quality among professionals, a deterioration among technicians and associated professionals and among clerks, an improvement among agricultural and craft workers, and a substantial improvement among workers in elementary occupations.

Figure 9: Mean Job Quality in Private Wage and Salary Employment by Sector of Economic Activity, 1998–2006

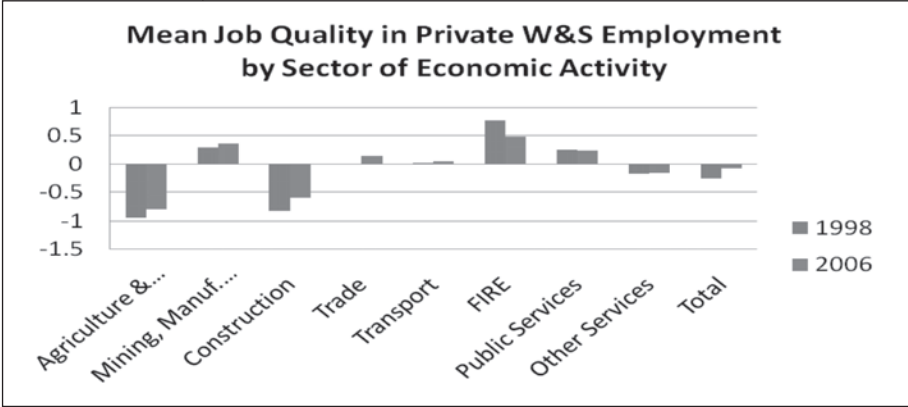


Figure 10: Mean Job Quality in Private Wage and Salary Employment by Occupation, 1998–2006

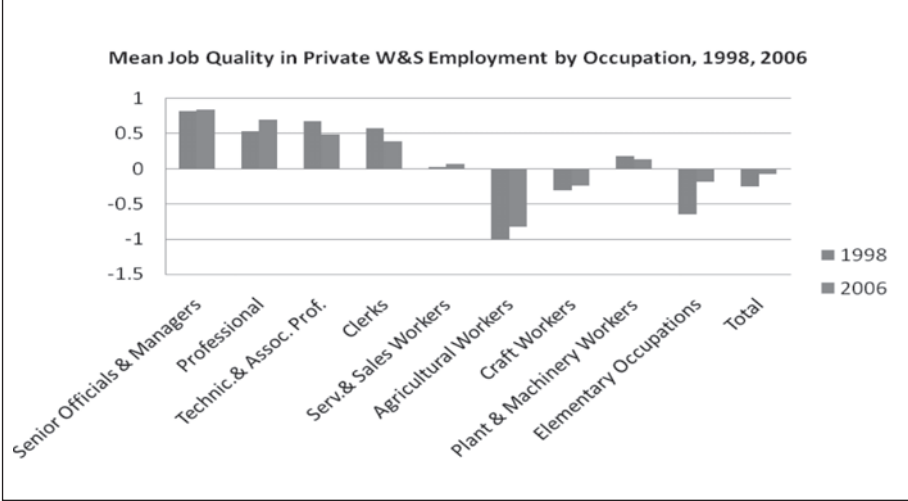
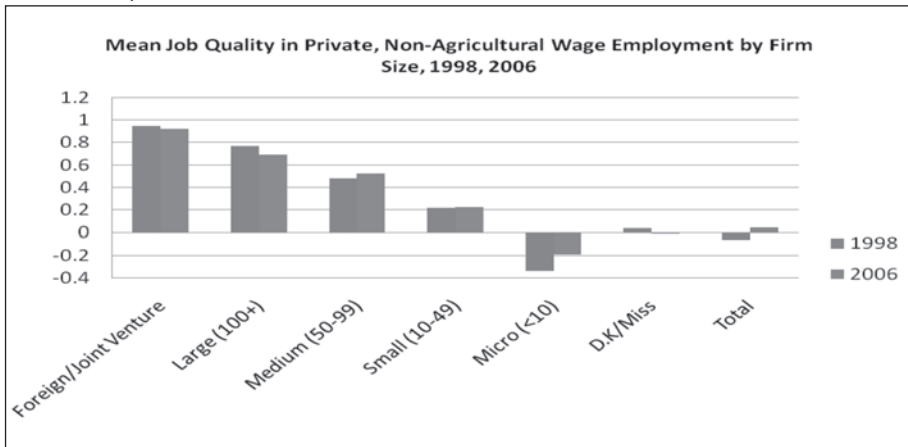


Figure 11 and 12 illustrate that job quality in the non-agricultural private sector strongly depends on both firm size and type. Microenterprises have the lowest average job quality, but it has improved substantially during the 1998–2006 period. Although, the share of the microenterprises

has been declining slightly, they still represent around 60% of private non-agricultural wage and salary employment in 2006 (Figure 13). Thus an improvement in job quality in this segment of the private sector is clearly very meaningful.

Figure 11: Mean Job Quality in Private, Non-Agriculture Wage and Salary Employment by Firm Size, 1998–2006



As shown in Figure 12, employment in the joint-venture/foreign and the large domestic segments of the Egyptian private sector is mostly made up of good jobs, but the share of good jobs in both these sectors has fallen slightly from 1998 to 2006. These two sectors together make up only 12% of private non-agricultural wage and salary employment.

More than half of jobs in medium enterprise are good jobs as well and, unlike their larger counterparts, the share of good jobs in this size category is rising. Finally small enterprises, which produce mostly fair and good jobs, have seen their share in the overall distribution of employment in the sector increase from 13 to 17%, another good sign.

Figure 12: Distribution of Job Quality in Private Non-Agricultural Wage and Salary Employment by Firm Type and Size

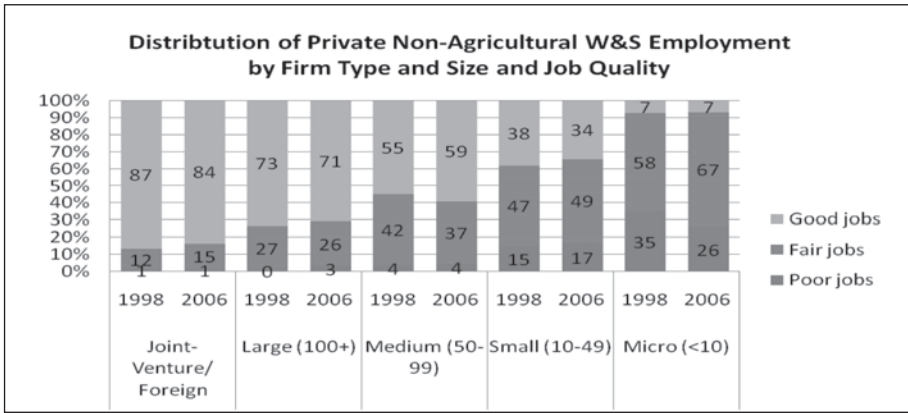


Figure 13: Distribution of Private Non-Agricultural Wage and Salary Employment by Firm Type and Size

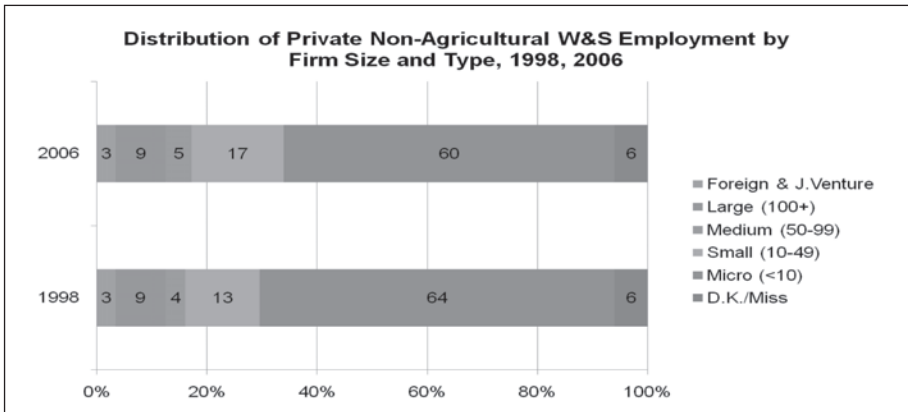
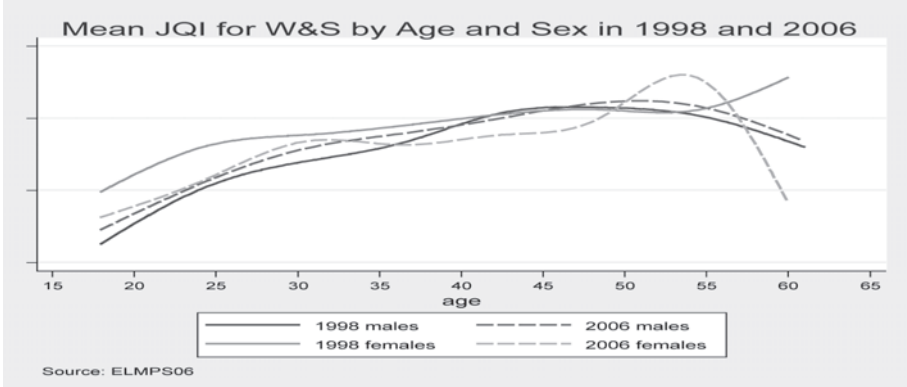


Figure 14 and 15 shows the distribution of mean job quality by age and gender for wage and non-wage workers, respectively, suggesting how job quality changes over the life cycle. Figure 14 shows that job quality for wage and salary earners tends to improve over the individual life cycle for both males and females, with the greatest rate of improvement between the ages of 18 and 29. Over the period 1998 to 2006, job quality has improved slightly for males across all ages. In contrast, job quality has deteriorated markedly for young and middle aged females in recent years. This deterioration is most likely due to the reduced access to public sector work from 1998 to 2006, which has affected women more than

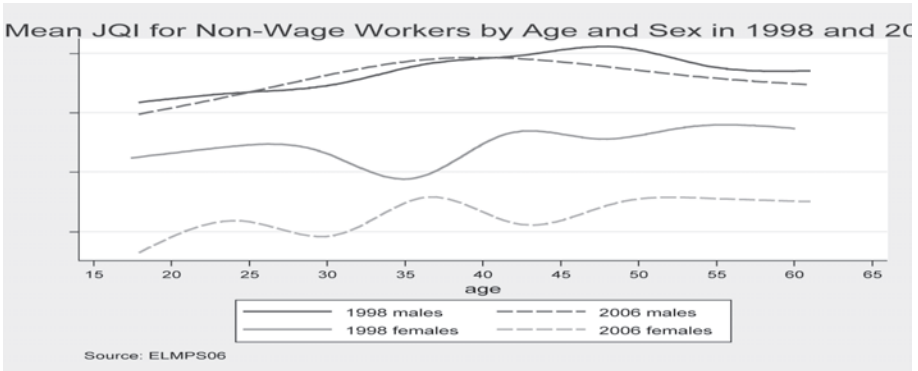
men because of their heavier reliance on such work (see Assaad, 2009 and Assaad and El-Hamidi, 2009).

Figure 14: Mean Job Quality for Wage and Salary Workers by Age and Sex, 1998–2006



The pattern of job quality over the life cycle for male non-wage workers is similar to that for wage and salary workers. Job quality increases steadily until the ages of 40 to 50 and then declines as the worker ages. There is not much difference between 1998 and 2006 except for older male non-wage workers who experienced a decline in job quality over that period. The pattern for female non-wage worker is unstable over the life cycle and over time. The steep drop in job quality for this group between 1998 and 2006 reflects the measurement issue we discussed above whereby home-based non-wage work in agriculture, animal husbandry, and the processing of agricultural products was better measured in 2006, leading to the capture of many more low quality jobs in 2006 than in 1998.

Figure 15: Mean Job Quality for Non-Wage Workers by Age and Sex, 1998–2006



As expected, average job quality rises steadily with education, especially among wage and salary workers (Figure 16). However, for a given level of education, there has been a significant drop in job quality over time. This is especially true for those with basic education and secondary education among wage and salary workers and for most educational levels among non-wage workers. Since educated workers have been far more reliant on public sector work than less-educated workers, a drop in job quality among the more educated may be a symptom of the shift in employment toward the private sector that has been happening over the past two decades. We will get back to this issue when we investigate the determinants of job quality below.

Figure 16: Mean Job Quality by Education Attainment for Wage and Non-Wage Workers, 1998–2006



Figure 17 investigates further the distribution of job quality among young wage workers (age 15–29) with secondary or higher education. Overall the figure indicates that job quality has declined among both male and female educated wage and salary workers, with the average JQI among these workers falling from 0.253 to 0.134 for males and from 0.291 to 0.147 for females. The density of good jobs has decreased for both groups, consistent with a reduction in the incidence of public sector employment, and the density of fair jobs has increased for males and that of poor jobs for females. These results suggest that the returns to education in terms of job quality have declined in Egypt during the period 1998–2006. It remains to be seen whether this is simply due to the fact that they are getting different kinds of jobs (in different sectors, industries, and types of firms or

whether the oversupply of educated workers is resulting in lower returns to education in the same types of jobs.

Figure 17: Distribution of JQI among Youth (15–29) with Secondary or Higher Education by Sex, 1998–2006

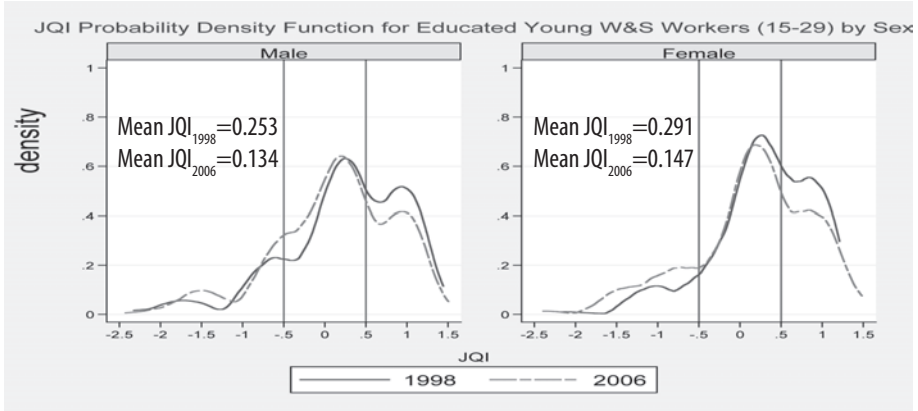
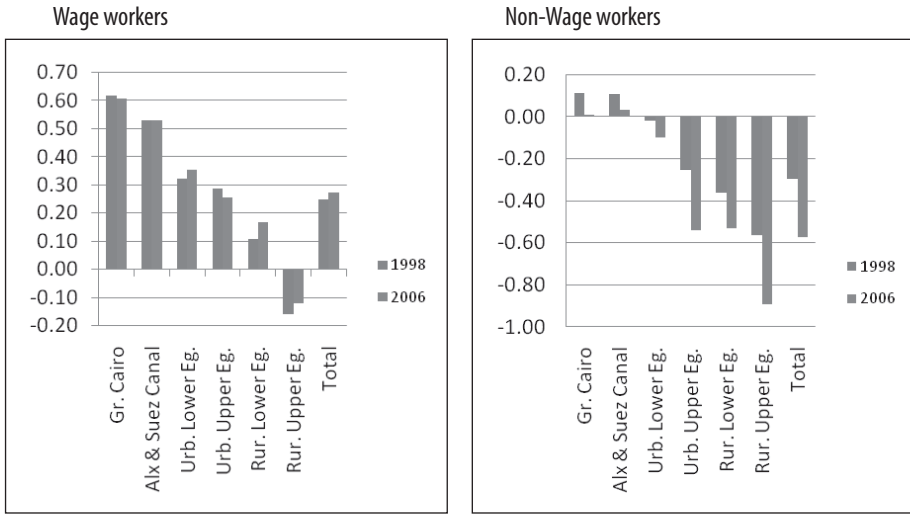


Figure 18 shows the pattern of job quality by region of residence. The regional pattern is fairly predictable, with Greater Cairo having the highest job quality, followed by the other metropolitan regions of Alexandria and the Suez Canal cities. Lower Egypt has higher average job quality than Upper Egypt and urban areas have higher job quality than rural areas. There are few notable changes over time in the regional pattern, except for noticeable improvement in rural job quality in both Lower and Upper Egypt among wage and salary workers. The deterioration seen among non-wage workers is subject to the same measurement issue we discussed earlier.

Figure 18: Mean JQI by Region, 1998–2006

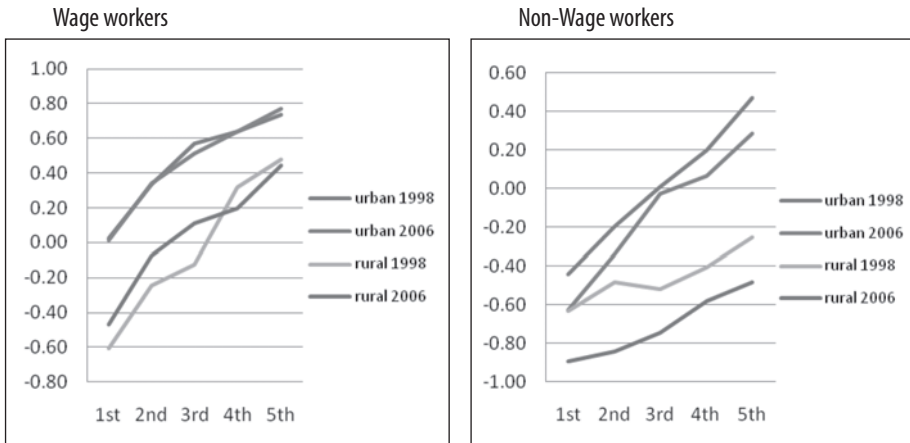


We move next to an investigation of the pattern of job quality by household wealth status. Household poverty or wealth status is measured using a household wealth index. Following Filmer and Pritchett (2001), a proxy for household wealth has been constructed, for each of the ELMS98 and the ELPMS06 household samples, using factor analysis based on household asset ownership and housing characteristics information.⁶ Asset scores were constructed separately for urban and rural areas, since the relationship between household assets and household wealth may significantly differ in the urban vs. the rural context. The wealth index in each of the two areas is then divided into quintiles of the respective distributions. The average job quality by wealth quintile in urban and rural areas and over time is shown in Figure 19 for both wage and salary and non-wage workers. As expected, average job quality rises sharply with wealth in both urban and rural areas. There is no significant difference in the pattern for wage and salary workers in urban areas from 1998 to 2006, but there is an increase in job quality among poorer rural wage and salary workers. The reduction in job quality seen for non-wage

6 The variables used to construct the asset score include a number of housing quality variables such as the number of rooms, the materials of the roof, walls, and floors, connections to piped water, telephone, electrical and sewerage systems, and ownership of 23 durable consumer goods. See Filmer and Pritchett (2001) for the methodology used to construct the asset score.

workers is still consistent with the measurement story described below and should therefore be somewhat discounted.

Figure 19: Mean JQI by Wealth Quintiles and Urban/Rural Location, 1998, 2006



In general, this analysis suggests that while overall job quality may have declined in Egypt the measured decline may be somewhat exaggerated due to measurement problems relating to non-wage workers in agriculture. Some of the decline can also be attributed to shift in the composition of the workforce from the public to the private sectors. However, if we restrict our attention to wage and salary workers in the private sector, we can see a distinct improvement in job quality led by an improvement in the job quality of microenterprise workers and a shift in the composition of this private sector workforce toward somewhat larger firms. The main caveat to this trend is that, controlling for education, job quality appears to have declined, suggesting that as the composition of the workforce shifts toward more educated workers, there was no commensurate increase in job quality.

7. Determinants of Job Quality

This section is devoted to investigating the workers and enterprise-specific determinants of job quality among wage and non-wage workers. After reviewing the literature and carefully examining the correlations among the existing variables, we decided to explore the interlinkage between the

developed 2SJQI and a set of workers and enterprise characteristics to explore more fully who gets the good jobs, where the good jobs are found, and what happened to this pattern over time (see Table A5 in the Appendix for the descriptive statistics of the selected set of variables). The ordinary least squares (OLS) regression technique is used to model job quality.

Worker-specific characteristics, which are common for both wage and non-wage workers, include the following seven variables: age, gender, marital status, education, employment status, years of experience, and occupation. Education is measured by five dummy variables indicating whether the individual can read and write but has no certificate, has less than an intermediate education, has an intermediate education, has an above intermediate education, and has a university or higher education. Illiterate is the omitted category. The individual employment status is captured by three dummies indicating whether the individual is an employer, is self-employed, or is an unpaid family worker. Wage worker is the omitted category. Occupation is measured by the three dummies indicating blue collar high skill, white collar low skill, and blue collar low skill. The white color high skill occupation group is the omitted category.

The set of enterprise-specific characteristics consists of four variables: the region where the enterprise is located, the enterprise economic activity, the legal status of the enterprise, and a sector-firm size composite variable. The ELMPS06 divides Egypt into six regions: Greater Cairo, Alexandria and the Suez Canal cities, Urban Lower Egypt, Urban Upper Egypt, Rural Lower Egypt, and Rural Upper Egypt. Hence, in the regression analysis there are five regional dummies, with Greater Cairo as the excluded category.

The enterprise economic activity is captured by the five dummies indicating whether the enterprise belongs to (i) a broad manufacturing and mining group that includes mining and quarrying, manufacturing, electricity, gas and water supply activities; (ii) construction; (iii) a broad trade group, including wholesale and retail trade, hotels, and restaurants; (iv) transportation, storage, and communication; and (v) other services. The agriculture and fishing industry group is the reference economic activity group. The enterprise sector and size composite variable is captured in the regression models by the following four dummies: private enterprises with 50 or more workers, private enterprises with 10–50 workers, private enterprises with less than 10 workers. All non-private enterprises (including government, public sector, joint-venture, foreign and others enterprises) constitute together the reference category. The legal status of the enterprise is measured by the five dummies indicating individual, partnership,

other, and a “do not know or no legal status” category. Government and public enterprises represent together the reference category.

The regression results are presented in Table 4. Several model specifications are investigated in this table to capture the gender and year effects on job quality. Column 1 only includes the main effects of all regressors without any interaction terms. In Column 2 the female dummy is interacted with all the individual characteristics, while in Column 3 the female dummy is interacted with both the individual and enterprise characteristics. Column 4 includes the year dummy interactions with the individual characteristic, and Column 5 includes the year dummy interactions with both the individual and enterprises characteristics.

Model 1 shows that controlling for various worker and enterprise characteristics, job quality has not changed significantly in Egypt between 1998 and 2006. Once interactions with gender are introduced, however, as in Models 2 and 3, we see that job quality has improved for males, by about 0.03 units and deteriorated for females by 0.12 units.⁷ Model 1 also shows that on average, women’s job quality is 0.38 units below that of men, controlling for all other characteristics. This difference is extremely large. It is larger, for instance, than the difference in job quality between an illiterate worker and one educated at the university level. Most of this difference is due to differences in job quality between male and female non-wage workers rather than between male and female wage workers. This demonstrated in Model 2, where the un-interacted sex dummy is now indicative of the gender difference in job quality in the reference category, namely wage and salary workers. The sex dummy is now positive and mildly significant. However, the interactions of the sex dummy with employer, self-employed, and unpaid family worker are highly negative and significant, confirming that this is where the large gender differences lie.

As we have seen in Figures 14 and 15 above, job quality has an inverse U-shape relationship with age, similar to the typical age profile for earnings. Again, there are important gender differences here, with the age-job quality profile being a lot less steep for females than for males. Although the coefficient on marriage is not significant in all regression models, the female interaction term with marriage (Models 2 and 3) is negative and significant. This reveals that marriage might have a negative effect on job quality for females, but not for males.

7 Note that one unit of the JQI is equal to one standard deviation.

As discussed in the previous section, job quality significantly increases with education among all workers. There is no significant difference in the impact of education on job quality for men and women as indicated by the insignificant sex-education interactions in Models 2 and 3. While the bivariate results indicate that the impact of education is weakening over time, the multivariate results show the opposite. The positive interactions between the round dummy and the intermediate, above intermediate, and higher education levels suggest that the returns to education in terms of job quality are increasing. How can these two results be reconciled? The main interpretation must be in the shifts in sectoral composition for educated workers. If educated workers were more concentrated in the public sector in 1998 and then moved to the private sector in 2006, this could explain the observed drop in their job quality in the bivariate result. However, once a sector is controlled for, as in Models 4 and 5, there is in fact an increase in return to education.

Age of entry to the labor market is negative and significant in all models, except when the gender interaction terms are included in the model, suggesting that an individual's experience at work significantly increases job quality. Table 4 also shows that blue collar high skill, and low skill workers tend to have significantly lower job quality in comparison to the white collar high skill occupation group. However, the results from Models 4 and 5 show that the job quality of blue collar low-skilled workers has improved faster than that of other occupational groups. This could explain the improvement in job quality we saw in the microenterprise category of firms.

Employers have significantly higher job quality relative to wage workers, while self-employed and unpaid family workers occupy the lowest quality jobs. However, female employers have lower job quality than both male employers and female wage workers as indicated by the large negative interaction term between the female and employer dummies in Models 2 and 3. Also, the negative and significant coefficients of the 2006 round with each of self-employment and unpaid family-worker dummies indicate that job quality for these two groups of workers has declined more rapidly than for wage and salary workers (see Models 4 and 5).

On the enterprise characteristics front, in all regression specifications, job quality is significantly lower among those working in regions other than Greater Cairo, with the lowest job quality being measured in rural Upper Egypt. Additionally, the male-female gap in job quality is larger in urban and rural Lower and Upper Egypt compared to the Greater Cairo

and Alexandria regions (Model 3). The regional difference in job quality has not changed much over time.

Compared to agriculture and fishing, job quality is higher in all economic activity groups, except construction. It is highest in the broad manufacturing group we defined, followed by transport, storage and communications. Female job quality is higher than male job quality in construction, but this is because females rarely engage in manual construction work, so the few females in the industry are probably in white collar occupations. The only industry group to have seen a deterioration in job quality worse than that of agriculture and fishing is the construction industry.

Workers in the private sector have lower job quality than those in the public, joint-venture, and foreign enterprises sector, regardless of firm size. Confirming the bivariate results, job quality goes up steadily with firm size in the private sector. The gender gap in job quality is lowest in large and medium-sized private enterprises, as indicated by the positive interactions with the female dummies for these size categories in Model 3. There has been no significant change in the pattern of job quality with firm type and size from 1998 to 2006 as indicated by the insignificant interaction terms with the round dummy in Model 5. This suggests that the observed improvement in job in microenterprises in the bivariate data is due to compositional shifts in this size category.

Finally, the legal status of the firm has some impact on job quality. The other category, which includes joint-stock corporations and limited liability companies in the private sector, has higher job quality than either public firms or other private sector firms.

8. Conclusions

Job quality is a multi-faceted concept that combines notions of income security, social protection, and decent working conditions. Operationalizing the concept at the level of an individual job is a fairly challenging endeavor that requires access to high quality survey data. The challenge is compounded in the case of workers who work for themselves or for their families because many of the institutions regulating labor markets don't apply in their case and because of the difficulty in measuring their earning from work. We take on the challenge of operationalizing and measuring the concept of job quality in this paper, cognizant of the limitations of existing data, but confident of the value that such an analysis brings to the understanding of labor markets.

Our estimates of job quality combine information at the level of a single job on earnings, access to social insurance and legal employment contracts, regularity of employment, work hours, and nature of workplace into an index of job quality. We find that a two-stage estimation process that first combines various institutional aspects of jobs into a single formality index and then uses factor analysis to combine this index with other aspects of employment provides more meaningful results than a one-stage index that combines all measures of job quality in a single index at once.

Based on the index we develop, we classify jobs as good, fair, or poor. As expected, good jobs tend to be of indefinite duration, benefit from social insurance coverage, and are located in high quality workplaces (like offices and factories). Eighty percent of those jobs benefit from health insurance. Among wage and salary workers, good jobs have legal contracts, provide paid vacations and sick leave, and fairly good pay (a median of LE 522/month in 2006). Poor jobs are for the most part informal and thus do not benefit from social insurance coverage, medical insurance, or unionization. They have a high percentage of irregular work (34% as compared to 3% for good jobs). Wage and salary workers in poor jobs rarely have contracts, paid vacations, or sick leave, and get relatively low pay (median LE 260/month in 2006).

We find that average job quality for all workers in Egypt has deteriorated somewhat over the 1998–2006 period, but that this result must be qualified by some measurement issues related to measuring non-wage employment, especially among women in agriculture. Job quality among wage and salary workers has actually improved slightly, with most of the improvement concentrated among those working for the private sector. The improvement among wage and salary workers in the private sector can be attributed to a noticeable improvement in job quality among workers in microenterprises, who constituted 60% of all private non-agricultural wage and salary workers in the private sector, and to a lesser extent to an improvement in job quality in medium-sized firms (50–99 workers). It can also be partially attributable to an upward shift in the size distribution of firms in the private sector, especially to the increase in the proportion of employment in small firms of 10 to 49 workers.

While job quality has improved among wage and salary workers, the overall improvement does not seem to have kept pace with the improving educational composition of the work force. As a result, job quality appears to have declined for workers with given levels of education. Our multivariate results suggest, however, that this decline is due to a compositional

shift in the employment of educated workers from the public sector to the private sector. Once sector of employment and other enterprise characteristics are taken into account, job quality for educated workers appears to be increasing faster than for illiterate workers.

Our examination of the dynamics of job quality by region and wealth status revealed that job quality among poorer wage and salary workers in rural areas has improved. Although this is good news, it appears to be countered by the apparent deterioration of job quality among poorer rural non-wage workers.

The results of the multivariate analysis of the determinants of job quality revealed that women have a significantly lower job quality than men in Egypt, but that the difference is primarily due to gender differences in job quality among non-wage workers. Moreover, the gender gap in job quality appears to be increasing, primarily because of the closing off of the public sector option, which educated women had relied on heavily for employment. The evidence also suggests that the gender gap in job quality is smaller in medium and large enterprises than it is in small and microenterprises, suggesting that women would benefit from a continued shift in the size distribution of firms in the Egyptian private sector toward larger firms.

Table 4: Coefficient Estimates from an OLS Regression of JQI on Selected Worker and Enterprise Characteristics for Wage and Non-Wage Workers, 1998–2006

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Worker Characteristics					
Round=2006	-0.0002	0.0344***	0.0361***	-0.1830***	-0.3113***
Age	0.0259***	0.0321***	0.0315***	0.0228***	0.0219***
Age ²	-0.0003***	-0.0004***	-0.0003***	-0.0002***	-0.0002***
Female	-0.3821***	0.2021*	0.2877	-0.2579***	-0.2515***
Married	-0.0213	0.0237	0.0183	-0.0189	-0.0145
Education (illiterate=omitted category)					
Read & write	0.1199***	0.0807***	0.0780***	0.1370***	0.1191***
Less than intermediate	0.1301***	0.0915***	0.0921***	0.1524***	0.1342***
Intermediate	0.1905***	0.1110***	0.1102***	0.1339***	0.1100***
Above intermediate	0.2041***	0.1243***	0.1248***	0.1421***	0.1146***
University & higher	0.2876***	0.1950***	0.1957***	0.2094***	0.1835***
Worker's age at entry to labor market	-0.0040***	-0.0004	-0.0004	-0.0045**	-0.0047**

continued ►

Occupation (white collar high skill=omitted category)					
Blue collar high skill	-0.0567***	-0.0605***	-0.0561***	-0.0789***	-0.0814***
White collar low skill	-0.1410***	-0.1201***	-0.1087***	-0.1760***	-0.1947***
Blue collar low skill	-0.1357***	-0.1497***	-0.1404***	-0.2259***	-0.2379***
Employment status (wage and salary=omitted category)					
Employer	0.1032***	0.0921***	0.1072***	0.0598*	0.0205
Self-employed	-0.3033***	-0.2163***	-0.2073***	-0.2167***	-0.2522***
Unpaid family worker	-0.2270***	-0.0633**	-0.0583**	-0.1633***	-0.1964***
Enterprise Characteristics					
Region (Greater Cairo=omitted category)					
Alexandra & Suez Canal	-0.0669***	-0.0691***	-0.0678***	-0.0667***	-0.0537*
Urban Lower	-0.1476***	-0.1503***	-0.1280***	-0.1499***	-0.1239***
Urban Upper	-0.2400***	-0.2295***	-0.2044***	-0.2403***	-0.2049***
Rural Lower	-0.2367***	-0.2440***	-0.1806***	-0.2421***	-0.2336***
Rural Upper	-0.3793***	-0.3500***	-0.3151***	-0.3719***	-0.3353***
Enterprise Economic Activity (agriculture & fishing=omitted category)					
Broad manufacturing group	0.4142***	0.4164***	0.4404***	0.4124***	0.4227***
Construction	0.0250	-0.0035	0.0085	0.0199	0.1494**
Wholesale & retail trade, hotel & restaurant	0.2621***	0.2506***	0.2692***	0.2566***	0.2156***
Transp., storage & communication	0.3701***	0.3499***	0.3701***	0.3646***	0.3685***
Other services	0.2260***	0.1874***	0.2124***	0.2181***	0.1948***
Enterprise Sector/Size (public, joint-venture & foreign=omitted category)					
private enterprises with 50+ workers	-0.1175**	-0.1233**	-0.1244**	-0.1212**	-0.0902
private enterprises with 10–50 workers	-0.3504***	-0.3628***	-0.4026***	-0.3545***	-0.3406***
private enterprises with < 10 workers	-0.5817***	-0.5781***	-0.6144***	-0.5840***	-0.5858***
Enterprise Legal Status (government and public enterprises=omitted category)					
Individual	0.0056	0.0104	0.0257	0.0021	0.0343
Partnership	0.0895*	0.1063*	0.1120*	0.0905*	0.1101
Other	0.1683***	0.1909***	0.1857***	0.1622***	0.2247**

continued ►

No legal status/Do not know	-0.2726***	-0.2495***	-0.2471***	-0.2673***	-0.4460***
Female x Worker Characteristics					
Female x Round=2006		-0.1180***	-0.1299***		
Female x Age		-0.0184***	-0.0158***		
Female x Age2		-0.0003***	-0.0002***		
Female x Married		-0.1049***	-0.0742**		
Female x Education (illiterate=omitted category)					
Female x Read & write		0.0111	0.0223		
Female x Less than intermediate		-0.0581	-0.0521		
Female x Intermediate		0.0134	0.0285		
Female x Above intermediate		-0.0065	0.0056		
Female x University & higher		0.0408	0.0275		
Female x Age of entry to labor market		0.0008	0.0007		
Female x Occupation (white collar high skill=omitted category)					
Female x Blue collar high skill		0.0197	-0.0287		
Female x White collar low skill		-0.1717***	-0.2139***		
Female x Blue collar low skill		-0.0262	-0.0659		
Female x Employment Status (wage & salary=omitted category)					
Female x Employer		-0.2739***	-0.3863***		
Female x Self-employed		-0.4687***	-0.5623***		
Female x Unpaid family worker		-0.3681***	-0.4717***		
Female x Enterprise Characteristics					
Female x Region (Greater Cairo=omitted category)					
Female x Alexandra & Suez Canal			0.0226		
Female x Urban Lower			-0.0815*		
Female x Urban Upper			-0.0941**		
Female x Rural Lower			-0.2641***		

continued ►

Female x Rural Upper			-0.1434***		
Female x Enterprise Economic Activity (agriculture & fishing=omitted category)					
Female x Broad manufacturing group			-0.1248*		
Female x Construction			0.5754***		
Female x Whole s.& retail trade, hotel & rest.			-0.0180		
Female x Transp., storage & communication			-0.0641		
Female x Other services			-0.1107		
Female x Enterprise Sector/Size (public, joint-venture & foreign=omitted category)					
Female x private enterprises 50+ workers			0.2299**		
Female x private enterprises 10–50 workers			0.2122**		
Female x private enterprises <10 workers			0.0112		
Female x Enterprise Legal Status (government and public enterprises=omitted category)					
Female x Individual			-0.0865		
Female x Partnership			-0.0223		
Female x Other			0.0465		
Female x No legal status/Do not know			-0.0200		
Round 2006 x Worker Characteristics					
Round 06 x Age			0.0065	0.0078	
Round 06 x Age2			-0.0001	-0.0001	
Round 06 x Female			-0.1822***	-0.1918***	
Round 06 x Married			-0.0050	-0.0091	
Round 06 x Education (illiterate=omitted category)					
Round 06 x Read & write			-0.0280	-0.0054	
Round 06 x Less than intermediate			-0.0313	-0.0060	
Round 06 x Intermediate			0.0845**	0.1156***	

continued ►

Round 06 x Above intermediate				0.0948*	0.1312**
Round 06 x University & higher				0.1252**	0.1577***
Round 06 x Age of entry to labor market				0.0007	0.0010
Round 06 x Occupation (white collar high skill=omitted category)					
Round 06 x Blue collar high skill				0.0357	0.0328
Round 06 x White collar low skill				0.0525	0.0704
Round 06 x Blue collar low skill				0.1333***	0.1486***
Round 06 x Employment Status (wage & salary=omitted category)					
Round 06 x Employer				0.0589	0.0826*
Round 06 x Self-employed				-0.1265***	-0.0954*
Round 06 x Unpaid family worker				-0.0754*	-0.0585
Round 06 x Enterprise Characteristics					
Round 06 x Region (Greater Cairo=omitted category)					
Round 06 x Alexandria & Suez Canal					-0.0168
Round 06 x Urban Lower					-0.0371
Round 06 x Urban Upper					-0.0553*
Round 06 x Rural Lower					-0.0121
Round 06 x Rural Upper					-0.0523
Round 06 x Enterprise Economic Activity (agriculture & fishing=omitted category)					
Round 06 x Broad manufacturing group					-0.0075
Round 06 x Construction					-0.1699**
Round 06 x Wholes. & retail trade, hotel, rest.					0.0761

continued ►

Round 06 x Transp., storage & communication					0.0060
Round 06 x Other services					0.0508
Round 06 x Enterprise Sector/Size (public, joint-venture, and foreign =omitted category)					
Round 06 x private enterprises 50+ workers					0.0324
Round 06 x private enterprises 10–50 workers					0.0651
Round 06 x private enterprises <10 workers					0.0580
Round 06 x Enterprise Legal Status (government and public enterprises=omitted category)					
Round 06 x Individual					-0.0338
Round 06 x Partnership					-0.0095
Round 06 x Other					-0.0739
Round 06 x No legal status/Do not know					0.2366**
Constant	-0.0486	-0.2530***	-0.2770***	0.0477	0.1184
<i>Number of workers</i>	<i>16109</i>	<i>16109</i>	<i>16109</i>	<i>16109</i>	<i>16109</i>

* p<0.05; ** p<0.01; *** p<0.001

Appendix A: Descriptive Statistics

Table A1: Descriptive Statistics of Job Quality Indicators, 1998–2006

Original Variables	Mean/percent	Std. Dev.	Min	Max
Wage Worker				
Has social insurance	0.614	0.487	0	1
Has medical insurance	0.549	0.498	0	1
Has contract	0.606	0.489	0	1
Paid casual leave	0.553	0.497	0	1
Paid sick leave	0.550	0.498	0	1
Member of trade union	0.366	0.482	0	1
Real monthly earnings	525.195	1405.729	0	66240
Regular worker	0.881	0.323	0	1
Hours of work per week	47.371	15.077	0	126
Commuting time to work in minutes	29.761	36.416	0	720
Work place				
Street/mobile worker	0.135	0.342	0	1
Own home, house, or field/farm	0.066	0.247	0	1
Truck, taxi, microbuses, or motorized rickshaws	0.033	0.180	0	1
Shop, kiosk, or room(s)	0.094	0.292	0	1
Office, flat, building, or factory	0.672	0.470	0	1

Non-Wage Worker				
Has social insurance	0.193	0.395	0	1
Has medical insurance	0.036	0.185	0	1
Has contract	0.005	0.072	0	1
Paid casual leave	0.001	0.039	0	1
Paid sick leave	0.001	0.036	0	1
Member of trade union	0.054	0.227	0	1
Real monthly earnings	590.914	531.124	0	6353
Regular worker	0.975	0.155	0	1
Hours of work per week	45.648	22.329	0	140
Commuting time to work in minutes	14.974	27.456	0	690
Work place				
Street/mobile worker	0.149	0.356	0	1
Own home, house, or field/farm	0.513	0.500	0	1
Truck, taxi, microbuses, or motorized rickshaws	0.032	0.175	0	1
Shop, kiosk, or room(s)	0.236	0.424	0	1
Office, flat, building, or factory	0.070	0.255	0	1

Table A2: Descriptive Statistics of Normalized Job Quality Indicators, 1998–2006

Normalized Variables	Mean/ percent	Std. Dev.	Min	Max
Wage Worker				
Social insurance	0.614	0.487	0	1
Health insurance	0.549	0.498	0	1
Contract	0.606	0.489	0	1
Paid casual leave	0.553	0.497	0	1
Paid sick leave	0.550	0.498	0	1
Member of a trade union	0.366	0.482	0	1
Earnings	0.304	0.258	0	1
Job stability	0.881	0.323	0	1
Underemployment	0.061	0.152	0	1
Overemployment	0.360	0.394	0	1
Commuting time to work	0.351	0.279	0	1
Nature of work place	0.775	0.369	0	1

Non-Wage Worker				
Social insurance	0.193	0.395	0	1
Health insurance	0.036	0.185	0	1
Contract	0.005	0.072	0	1
Paid casual leave	0.001	0.039	0	1
Paid sick leave	0.001	0.036	0	1
Member of a trade union	0.054	0.227	0	1
Earnings	0.360	0.271	0	1
Job stability	0.975	0.155	0	1
Underemployment	0.173	0.286	0	1
Overemployment	0.474	0.400	0	1
Commuting time to work	0.184	0.197	0	1
Nature of work place	0.391	0.300	0	1

Table A3: Factor Analysis Scoring Coefficients of Wage Workers' JQIs, 2006

Normalized Variables	1SJQI	2SJQI
Social insurance	0.149	0.150
Health insurance	0.156	0.187
Contract	0.136	0.116
Paid casual leave	0.268	0.300
Paid sick leave	0.227	0.267
Member of a trade union	0.037	0.030
Institutional Factor Analysis		0.270
Earnings	0.035	0.131
Job stability	0.058	0.275
Underemployment	-0.022	-0.215
Overemployment	-0.020	-0.211
Commuting time to work	0.008	0.050
Nature of work place	0.055	0.241
<i>Number of workers</i>	<i>12192</i>	<i>12192</i>

Table A4: Correlation Matrix of the Normalized Job Quality Indicators and 2SJIQ, 1998–2006

Normalized Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Wage Worker												
(1) 2SJIQ	1.000											
(2) Social insurance	0.641	1.000										
(3) Health insurance	0.629	0.850	1.000									
(4) Contract	0.662	0.844	0.854	1.000								
(5) Paid casual leave	0.646	0.836	0.919	0.864	1.000							
(6) Paid sick leave	0.642	0.831	0.921	0.858	0.969	1.000						
(7) Member of a trade union	0.400	0.548	0.564	0.512	0.556	0.553	1.000					
(8) Earnings	0.419	0.276	0.246	0.236	0.257	0.257	0.290	1.000				
(9) Job stability	0.752	0.437	0.402	0.449	0.406	0.404	0.265	0.231	1.000			
(10) Underemployment	-0.526	-0.072	-0.048	-0.064	-0.056	-0.056	-0.014	-0.145	-0.228	1.000		
(11) Overemployment	-0.437	0.010	0.037	0.013	0.029	0.029	0.044	-0.128	-0.134	0.654	1.000	
(12) Commuting time to work	0.295	0.111	0.102	0.172	0.127	0.114	0.027	0.153	0.126	-0.107	-0.134	1.000
(13) Nature of work place	0.784	0.535	0.534	0.580	0.541	0.535	0.328	0.186	0.566	-0.119	-0.048	0.167

continued ▼

Table A5: Descriptive Statistics of Variables Included in the Regression Analysis, All Workers, 1998–2006

Variables	Mean	Std. Dev.	Min	Max
2SJQI	0.136	0.837	-2.589	1.532
Round=1998	0.357	0.479	0.000	1.000
Round=2006	0.643	0.479	0.000	1.000
WORKER CHARACTERISTICS				
Age	37.157	13.182	6.000	90.000
Age ²	1554.353	1072.531	36.000	8100.000
Female	0.761	0.427	0.000	1.000
Male	0.239	0.427	0.000	1.000
Married	0.692	0.462	0.000	1.000
Education				
Illiterate	0.224	0.417	0.000	1.000
Read & write	0.077	0.266	0.000	1.000
Less than intermediate	0.152	0.359	0.000	1.000
Intermediate	0.293	0.455	0.000	1.000
Above intermediate	0.060	0.237	0.000	1.000
University & higher	0.194	0.396	0.000	1.000
Worker's age of entry to labor market	18.328	6.482	5.000	72.000
Occupation				
White collar high skill	0.370	0.483	0.000	1.000
Blue collar high skill	0.208	0.406	0.000	1.000
White collar low skill	0.344	0.475	0.000	1.000
Blue collar low skill	0.078	0.268	0.000	1.000
Employment Status				
Unpaid family worker	0.653	0.476	0.000	1.000
Employer	0.126	0.332	0.000	1.000
Self employed	0.112	0.315	0.000	1.000
Unpaid family worker	0.109	0.312	0.000	1.000
ENTERPRISE CHARACTERISTICS				
Region				
Greater Cairo	0.170	0.376	0.000	1.000
Alexandra & Suez Canal	0.120	0.325	0.000	1.000
Urban Lower	0.170	0.376	0.000	1.000

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Urban Upper	0.208	0.406	0.000	1.000
Rural Lower	0.177	0.381	0.000	1.000
Rural Upper	0.155	0.362	0.000	1.000
Enterprise Economic Activity				
Agriculture & fishing	0.208	0.406	0.000	1.000
Broad manufacturing group	0.169	0.375	0.000	1.000
Construction	0.034	0.181	0.000	1.000
Whole s.& retail trade, hotel & restaurant	0.189	0.392	0.000	1.000
Transp., storage & communication	0.053	0.225	0.000	1.000
Other services	0.346	0.476	0.000	1.000
Enterprise Sector/Size				
Non-private enterprises	0.400	0.490	0.000	1.000
Private enterprises with 50+ workers	0.039	0.193	0.000	1.000
Private enterprises with 10–50 workers	0.052	0.223	0.000	1.000
Private enterprises with < 10 workers	0.509	0.500	0.000	1.000
Enterprise Legal Status				
Government and public enterprises	0.386	0.487	0.000	1.000
Individual	0.349	0.477	0.000	1.000
Partnership	0.062	0.241	0.000	1.000
Other	0.020	0.141	0.000	1.000
No legal status/Do not know	0.182	0.386	0.000	1.000
<i>Number of workers</i>	<i>16109</i>			

Appendix B

Estimating Per Capita Consumption in the Egypt Labor Market Surveys

The Egypt Labor Market Surveys (ELMSs) do not contain a full consumption module. We follow the methodology laid out below to estimate per capita consumption, and thus household poverty. The main idea behind the method is to combine information from the Household Income, Expenditure and Consumption Surveys (HIECS) with the ELMSs to obtain the consumption estimates. Household consumption is estimated in this study using a two-stage estimation technique. This technique allows us to combine detailed income and expenditure information available from the HIECSs, with the rich labor market information available from the ELMSs. The two-stage approach will combine the HIECS 99–00 with the ELMPS98, and HIECS04–05 with the ELMPS06 to estimate per capita consumption for the ELMS samples. This will typically involve the following three steps:

1. Identifying household characteristics available in the HIECSs and the ELMSs

This stage involves comparing the HIECS and the ELMS questionnaires to identify common household variables found in the four datasets. This has not been a major constraint on the analysis, because a large set of common variables is available in all four datasets. In this paper, the choice of the final set of explanatory variables is based on a thorough review of the poverty literature and a careful investigation of the descriptive statistics of the common set of explanatory variables and their correlation with the poverty measures.

2. Estimating per capita consumption using the HIECSs data

This stage is the first step of the two-step estimation approach. In this first-step, each of the two HIECS data is used to estimate per capita consumption as a function of the chosen common set of household characteristics. A log-linear function of per capita consumption of household I , y_i , is estimated for each of the HIECS samples⁸:

8 This paper uses consumption rather than income to measure household welfare. Consumption is often preferred over income when measuring welfare, since consumption data are likely to be subject to less fluctuation over time and to fewer measurement errors (see Deaton, 1997).

$$\ln y_i = X_i' \beta + \varepsilon_i$$

where X_i is a vector of cluster-level characteristics of household I ; and ε_i is a disturbance term that is distributed as $N(0, \sigma^2)$. Of course, some of the explanatory variables selected in the first stage are endogenous, which would bias the estimation results. For instance, the ownership of durables is particularly among the set of endogenous variables, since it is closely determined by the household living standard and thus by the poverty status (Astrup and Dessus, 2001). However, as discussed in Minot (2000), the possible endogeneity of some of the explanatory variables is less of a concern in the current analysis since the main objective here is to predict the level of poverty (or $\ln y_i$), rather than to study the determinants of poverty or to assess the impact of each explanatory variable.

3. Predicting per capita consumption for the ELMSs samples

In this stage, the regression models developed in the previous step and the ELMSs data are used to predict per capita consumption for each of the two rounds of ELMs.

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