School of Oriental and African Studies University of London

DEPARTMENT OF ECONOMICS WORKING PAPERS

No.132

The Distribution of Gender and Public Sector Pay Premia: Evidence from the Egyptian Organised Sector

Mona Said

December 2003

economics@soas.ac.uk
http://www.soas.ac.uk/departments/departmentinfo.cfm?navid=11

Draft: December 2003

The Distribution of Gender and Public Sector Pay Premia: Evidence from the Egyptian Organised Sector

Mona Said
Lecturer in Economics
Department of Economics, SOAS

Thornhaugh Street, Russell Square
London WC1H OXG, UK.
Email: ms101@soas.ac.uk

The Distribution of Gender and Public Sector Pay Premia:

Evidence from the Egyptian Organised Sector

Abstract

Using earnings functions estimates on a survey of Egyptian establishments conducted in 1990, standard decomposition techniques of wage differentials show that both males and females have an earnings disadvantage in the public enterprise and government sectors after correcting for a range of personal and job characteristics. Gender based pay discrimination is small in the public sector. In contrast, it is quite high by international comparisons in the private sector and mainly takes place by paying a pure rent premium to men estimated at about 82 % of female pay, with a large proportion (35 % of female pay) attributable to segregation or entry barriers facing females in certain occupations. Quantile regression methods were further used to examine the distribution of wage premia across occupations and wage quantiles. The results show that public sector wage premia exist only at the lower level of the wage distribution and gender-based pay discrimination is highest in the private sector for the low wage quantiles of unskilled workers and higher wage groups in technical and managerial positions. The paper's results highlight the need to reform pay policy in the government and the expected disproportionate impact of privatisation and civil service reform on women in the Egyptian labour market.

The Distribution of Gender and Public Sector Pay Premia: Evidence from the Egyptian Organised Sector.

"Occupational Segregation can account for more of the earnings gap than does discriminatory pay differentials within the same job and establishment." (Gunderson, 1989, p. 67)

Introduction

This paper considers the estimation of gender-based and sector-based wage differentials both between and within different sectors of ownership in Egypt. The Egyptian labour market provides an interesting case in studying public-private wage gaps for several reasons. First, aggregate published statistics show a shift in the position of public sector employees, whereby until the mid-1970s, the public/private average wage ratio was clearly to their favour, but since then the ratio has flipped and remained in favour of the private sector. This pattern coincided roughly with the change in development strategies from state-led import-substitution industrialisation to a relatively more liberalised and market-oriented economy. Second, the Egyptian case is distinctive in that an explicit public sector employment guarantee for graduates has operated in the labour market since the mid 1960s, providing an explicit selection mechanism based on educational credentials that impacted on both the allocation and remuneration of workers across the public/private divide. Third, pay reform and decentralisation of hiring and pay setting has taken place in one-component of the Egyptian public sector (public enterprises), but not the other (government sector). The differences in labour market outcomes between those two segments can therefore be taken to partially reflect the introduction of competitive pressures, as opposed to centralised or institutional arrangements, in pay setting.

In the 1960s, the Egyptian public sector was generally viewed as the primary sector of employment in the labour market offering the highest paying jobs for educated workers. The erosion of public sector wages, especially in the government, during the 1970s and 1980s has since thrown doubt on the existence of public sector pay premia when compared to 'equivalent' private sector jobs. Yet, the persistence of queues for government jobs had motivated several recent studies to examine the various factors that still maintain the relative attractiveness of public sector jobs in Egypt. Thus Shaban et al (1993) and Assaad (1997 and

2001) estimated joint models of sector choice and wage determination in the public and private sector using 1987 and 1988 household-level labour force sample survey data. The latter study also attempted to quantify the value of non-wage benefits in the public sector.

This paper contributes to this literature by estimating gender and sector wage differentials between and within public and private sector labour market, employing data from the 1990 Establishment-Level Survey. The survey contains wage data across the organised sector (government, public enterprise and private sector) that appropriately takes account of fringe benefits. This is an important concern as non-wage benefits are believed to form a large component of total compensation in the public sector. Considering only the organised sector, goes some way in correcting for differences in job characteristics (especially level of job security) which is not ordinarily possible to accomplish directly using household level surveys that do not ask questions at the establishment level.[1]

The paper also examines differences in wage setting between the public and private sector from a different angle, that is the incidence of gender-based differentials. In particular, it tests the hypothesis that gender wage differentials are more compressed in the public than in the private sector, and also tests whether after correcting for differences in characteristics or endowments, there is still evidence of gender based differentials either sector. This question is of interest in the Egyptian case as it sheds light on the importance of public employment to females. In particular, given the public sector egalitarian employment and wage determination policies, it is expected that the magnitude of gender based differential will be much lower and females will suffer from less discriminatory practices than in the private sector.

In examining whether gender pay gaps reflect discrimination two separate issues are usually dealt with in the literature.[2] One is pay discrimination, which is a situation whereby women are paid less than equally qualified men in the same job. The second is job discrimination or inter-occupational segregation, which is a situation where-by qualified women are kept out of higher paying jobs. In absence of information on tastes and preferences of women to certain jobs,[3] we can

[1] The organised sector is defined to include all government and public enterprise entities as well as the incorporated private sector comprised of limited liability, joint stock and joint venture (Investment law) and foreign firms. Employees in the latter private companies are likely to enjoy similar levels of job security and access to pensions as public sector employees. However, other factors such as lower effort required on the job and lower effective working hours remain as additional benefits in the public sector that distinguish it from the organised private sector.

[2] See Gunderson (1989), Cain (1987) and Altonji and Blank (1999) for comprehensive literature reviews of measures of gender-based discrimination. Brown et al. (1980) and Gindling (1992) discuss, in particular, the empirical and conceptual issues involved in distinguishing job and wage discrimination.

[3] In the literature on occupational segregation and gender-pay discrimination, there is a controversy on whether these factors should be eliminated from calculations of the gender gap as they themselves can reflect the accumulation of a history of discrimination in the labour market (See Lissenburgh, 1995 for a review of such literature).

only compare men and women on basis of measurable characteristics such as experience, tenure, education and job characteristics. We then can infer whether there is a remaining component that is 'unexplained' by such differences and suggest that it provides a rough or upper estimate on gender based discrimination. Thus, in what follows, 'unjustified' premia will refer to the component of the male-female wage differential that cannot be explained in measurable qualifications terms.

Besides using establishment level data and limiting the analysis to the organised sector, the paper expands on previous work in three main areas. First, gender wage premia are decomposed for each sector and the channels that give rise to unjustified male wage premia are identified. Second, occupational attainment is incorporated in the analysis to further decompose the gender gap into components attributable to pure pay discrimination within occupations as opposed to entry barriers or inter-occupational segregation. Finally, quantile regression methods are used to test whether the distribution of public (versus private) wage and male (versus female) premiums differs across wage quantiles in each occupation within the public sector.[4] The procedure throws light on the internal labour market in the public sector in terms of the distribution of wages and gender differentials for different quantiles. It also facilitates examining whether public sector wage premia (compared to the private sector) exist only for certain occupations at certain levels (for example, the lower wage echelons) rather than others.

Section II outlines the estimation strategy and the wage-determination model(s) employed in the paper to study wage differentials. Section III describes the data set and uses it to estimate ordinary least square (weighted by sampling weights) and selectivity corrected wage equations for males and females in the government, public enterprise and private sector. The main questions posed above are then tackled in Section IV, by presenting decompositions of wage differentials that allow one to differentiate between components that are explained by differences in characteristics, and those that are not explained and hence can be taken as indicators of pure sectoral premiums, or rough estimates of discrimination on basis of gender. Section V presents estimates of a model of occupational attainment for males and females and uses them in an alternative decomposition of the gender gap which isolates its inter-occupational and intra-occupational components. The distribution of wage premia within each sector and across occupations is then examined in Section VI using quantile regression methods. Section VII concludes by summarizing the results and outlining some of their policy implications.

[4] The establishment level data set is particularly suitable for addressing distributional issues as considerable care was taken in both sample design and data collection to classify employees according to the same occupational job groups in the government, public enterprise and private sectors. These classifications were also used in double checking the accuracy of reported wages in individual records against those reported in establishment records , see Zaytoon (1994).

II. Estimation Strategy

The empirical analysis in this paper proceeds in three main stages. First, wage equations were estimated separately for males and females for three sectors: government, public enterprise and private. From these, standard decomposition methods were applied to both the government and public enterprise wage premiums and to gender gaps in the three sectors. Second, a model of occupational attainment is estimated for males and females in the three sectors, and incorporated in applying an alternative gender decomposition gap formula which does not assume that gender differences in occupational distributions are all economically justifiable. Third, different quantiles of the conditional (log) wage distribution are estimated to gain further insight into forms of variation around the estimated public sector and gender based premia and their distribution across occupations. In all three stages, wage equations are estimated separately for males and females across the three sectors. This allows for differences in wage setting in the three sectors and for differences in parameter estimates by gender.

In the first stage, ordinary least squares (weighted by sampling weights, described below) were used to estimate separate wage equations for workers in the government (g), public enterprise(p) and private (r) sectors as follows

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

Where Ln (w_{is}) is log hourly wages of individual i in sector s and X is the vector of individual and job related characteristics seen to be of relevance for wage determination. This was estimated twice, once for males and once for females which yields a system of six equations.

These are then compared to selectivity corrected wage estimates, where selection terms were derived from a model of sectoral choice of government or public enterprise employment relative to private employment. The model underlying this estimation is based on the extension by Lee (1982 and 1983) of Heckman's selection model to the multinomial case and is summarised in the appendix. First, a sectoral allocation equation system (consisting of two equations for the probability of sector selection in the government and public enterprise sector, relative to the private sector) is estimated using multinomial logit maximum likelihood methods (equation A.1 in Appendix A). From this, predicted probabilities of sectoral selection are used to calculate sample selection terms (λ's) . Second, the system of six wage equations (1) above is reestimated consistently by least square regression on the same vector X of individual and job-related attributes as well as on the sample selection terms (λ's).

$$\text{Ln}\,(w_{si}) = \beta_s\,X + \sigma_s\,\lambda_s + e_s \qquad (s = g, p, r) \qquad (2)$$

Given the parameter estimates from (1), Public-Private wage differentials can be evaluated at the mean of the sample, using the following decomposition formula: [5]

$$D_s = \overline{\ln(w_s)} - \overline{\ln(w_r)} = \frac{(\beta_s + \beta_r)(\overline{X}_s - \overline{X}_i)}{2} + \frac{(\beta_s - \beta_r)(\overline{X}_s + \overline{X}_i)}{2} \qquad (s = g, p) \qquad (3)$$

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

The formula decomposes the wage differential into two main components. The first term, which is the 'explained one', is the part of the differential attributable to differences in observed characteristics of workers (X's). The second term, which is the "unexplained one", is the part of the differential resulting from differences in the pay structure, or in returns to the characteristics. Note that the unexplained component also includes the differential in base wage (the constant term) which can be interpreted as a premium or pure rent from attachment to a particular sector.[6] Similarly the same formula can be used to decompose the male-female wage gap as follows:

$$D_f = \overline{\ln(w_m)} - \overline{\ln(w_f)} = \frac{(\beta_m + \beta_f)(\overline{X}_m - \overline{X}_f)}{2} + \frac{(\beta_m - \beta_f)(\overline{X}_m + \overline{X}_f)}{2} \qquad (4)$$

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

As mentioned above this methodology, as well as any other based on the estimation of earnings functions, may lead to inaccurate measures of discrimination. It is not clear, however, whether it yields an under-estimate or over-estimate of the magnitude of actual discrimination. On one hand, it has been pointed out that there is a problem of omitted variables, including attachment to the labour force, lack of specific training, tastes, personality and interrupted careers whose impact will also be captured in the "unexplained" component.[7] In other words, one does not, in the calculation of this measure, control for a range of pre-market and extra-market factors that may result in payment of higher wages to males. It, therefore, would be more accurate to describe this

[5] This is Oaxaca's (1973) classical decomposition presented originally to analyse gender gaps.

[6] As Terrell (1993) noted, it is common practice in studies of wage differentials to combine the coefficient on the constant term with the other parameters (β's) in the decomposition and refer to this as the effect that is due to differences in 'returns'. She suggested isolating the differential in the constant term in the calculation in order not to hide valuable information on the extent of payment of a "pure-rent" component in a sector.

[7] As filer (1983) noted such a measure becomes not only a of discrimination, but also of our ignorance.

component as only providing an upper bound estimate on gender based discrimination by employers.

On the other hand, the inclusion of different job characteristics, especially occupations, in wage regressions treats the distribution across jobs by gender as if it is all justifiable. This ignores the literature on occupational attainment, which suggests that occupational distribution may derive in part from discriminatory factors. In particular, several studies have much of the discrimination against women (or other minority groups) is due to the crowding of these groups into a small number of occupations were wages and chances for promotion are low.[8] Thus the above measure may, in fact, underestimate the true magnitude of overall discrimination that women face in the labour market.

To arrive at a measure of job discrimination, one would need to fully incorporate the process of occupational attainment in the calculation of gender-based wage differentials. Thus, in the second stage of the empirical analysis in this paper, a behavioural model of occupational attainment is estimated which allows for predicting the distribution of females across occupations if they were treated in the same manner as males. This facilitates decomposing the gender gap into justifiable (in terms of productivity related differences) and unjustifiable components. And to further decompose these into intra-occupational and inter-occupational components.

Moreover, in order to be able to make statements about vertical mobility across occupations, the ordered probit model is used to estimate the pattern of occupational attainment.[9] According to this model, the conditional probability that an individual will be observed in occupation j is given by:

$$\hat{p}_{ij} = \Phi(\hat{\mu}_j - \hat{a}V_i) - \Phi(\hat{\mu}_{j-1} - \hat{a}V_i) \qquad (5)$$

Where Φ represents that standard normal cumulative density function, $\hat{a}$ the estimated coefficients and μ are the estimated separation points and V is the vector of individual level characteristics that are seen to be determinants of occupational choice.

Separate wage equations for males and females for each occupation group (j) are then estimated across the three sectors:

$$\text{Ln}\,(w_{ij}) = X_{ij}\,\beta_j + u_{ij} \qquad (j=1..k) \qquad (6)$$

[8] This may, in turn, stem from earlier sex-role socialisation that shapes preferences for certain jobs and/or discrimination prior to entry to the labour market in form of lack of access to schooling and training.

[9] The ordered probit model has the desirable feature of utilizing prior information of a ranking (say according to average income) among occupations, whereas unordered models (such as the multinomial logit ones) ignore this information. It also yields a more tractable likelihood function and a smaller set of parameter estimates than thiose derived from unordered models (Miller and Volker, 1985, p. 200-201).

Predictions from equation (5) combined with parameter estimates from equation (6) can then be used in a modified decomposition of the gender gap which expresses it as the sum of intra-occupational and inter-occupational wage components, as follows:[10]

$$\textit{Intraoccupational} = \sum_j p_j^f (\beta_j^m \overline{X}_j^m - \beta_j^f \overline{X}_j^f) = \underset{(J)}{\sum_j p_j^f \beta_j^m (\overline{X}_j^m - \overline{X}_j^f)} + \underset{(D)}{\sum_j p_j^f (\beta_j^m - \beta_j^f) \overline{X}_j^f} \qquad (7a)$$

$$\textit{Interoccupational} = \sum_j \hat{\beta}_j^m \overline{X}_j^m (p_j^m - p_j^f) = \underset{(J)}{\sum_j \hat{\beta}_j^m \overline{X}_j^m (p_j^m - \hat{p}_j^f)} + \underset{(D)}{\sum_j \hat{\beta}_j^m \overline{X}_j^m (\hat{p}_j^f - p_j^f)} \qquad (7b)$$

Where P_j^m is the proportion of male (female) workforce employed in the jth occupation. $\hat{P}_j^f$ denotes the simulated distribution of females across occupations using the male coefficients.

The formula allows for a further decomposition of both intra and inter-occupational components into those that can be viewed as either justifiable wage differences (i.e. due to differences in wage-related attributes) (J) or discriminatory wage factors (D). Note that these decompositions by occupation contain an arbitrary component, in that results depend on the fineness of occupational classifications and if estimation is conducted at broad level of say one or two-digit classifications, occupational segregation within an occupational category is ignored. Moreover, although we may arrive at a better measure by incorporating occupational segregation, we are still unable to account for pre-labour market and extra-labour market factors (such as delayed or interrupted participation and women's tastes for non-pecuniary aspects for jobs).[11]

Finally, in the third stage, quantile regression methods were used to facilitate the estimation of several alternative quantiles of the wage distribution. This provides a more detailed account of the conditional (log) wage distribution. Quantile methods are also preferred over, or along side, least square estimation due to the higher degree of robustness in estimation and reduced sensitivity to outlying observations (Koenker and Bassett, 1978) and for detecting and correcting (in

[10] This decomposition is an extension of the conventional one, in equation (3), proposed by Brown et al (1980) and Miller (1987).

[11] It is debatable, however, that even if we are able to account for these factors, they should be included in the 'explained' components of the differential. For example, interrupted careers are taken to be indicative of lack of accumulation of skills in the human capital model. This however may be a restrictive (even sexist) interpretation as it ignores the skills acquired by women in the process of performing domestic labour (Dex, 1985 and Wilkinson, 1991). Moreover, the preference and tastes of women for certain jobs, or accepting a tradeoff between pecuniary and non-pecuniary aspects of jobs, is seen in orthodox literature as a product of free choice. A feminist standpoint theorist , however, would interpret it as the "cumulative moulding ogf behavioural response, produced by a history of difference and discrimination" (Humphries, 1994, p. 8).

combination with bootstrap methods) for heteroscedasticity (Deaton, 1997). The Quantile regression method can be written in equation form as the qth quantile of the conditional log distribution of wages as a linear function of the regression variable, X:

$$\text{Quantile}_{qs}(\ln w|x) = X\beta_q \qquad (s=g,p,r) \qquad (8)$$

The model can be estimated by finding the vector (β_q) that minimizes the following expression,

$$\sum_{r<0} q\,|\ln w - x'\beta_q\,| + \sum_{r>0}(1-q)\,|\ln w - x\beta_q\,|$$

Where r is the residual , [redacted][12]

Public sector premia at the q^{th} quantile are calculated as follows

[redacted] (s = g, p) (9)

where $\ln w_s$ is average log hourly wage for government and public enterprise workers and $\ln w_s^*$ is the log hourly wage computed by multiplying the coefficients for the private wage equation times the average characteristics of the public sector workers. This is done for both males and females and it yields an estimate of the difference between what public sector employees actually obtain in the public sector and what they would have obtained had they been located in the private sector.

Similarly, the gender pay gap is calculated as follows,

[redacted] (10)

[redacted]

where $\ln w_{fq}$ is average log hourly wage females and $\ln w_{fq}^*$ is the log hourly wage computed by multiplying the coefficients for the male equation times the average characteristics of the female workers. This is computed for the three sectors.

This approach is in contrast to the one used in recent analyses of quantile regressions (see for example Poterba & Rueben,1994 and Benito, 1997) in which only one equation is estimated with public sector status and/or gender are represented by additive dummy variables. The advantage of

[12] The above minimisation problem can be easily accomplished by linear programming techniques. Standard errors are calculated from the analytic variance-covariance matrix proposed by Koenker and Bassett, 1978, or in case of suspected heteroscedasticity , bootstrap methods are used (see Deaton, 97, p.84-85 and Stata Corporation, 1997, 94-104).

the present approach is that it does not presuppose similarity in returns to characteristics across sectors and gender.[13]

III. Data and Wage Equation Estimation Results

The 1990 establishment survey was conducted by the Egyptian Central Agency for Public Mobilisation and Statistics to cover 160 establishments in the organised sector in Egypt (government, public enterprise and formal private sector) with questionnaires directed on the individual level to worker in each establishment.[14] The mean and standard deviation of log hourly wage and all explanatory variables in the wage and sector selection equation are presented in table B.1 in the appendix. The sampling process was as follows: first 160 establishments were selected in similar proportions to the actual ratios of private, public enterprise and private sector across sectors of economic activity in the organised sector. Then from each establishment, a sample of individual workers were selected but with a deliberate sampling bias that all occupations should be represented with sufficient number of observations.

Compared to household level data used in previous studies of public-private differentials, the present data set has three main advantages. First, the sample of workers is more suitable for sectoral wage comparisons as they are quite homogeneous in job characteristics and degree of formality. Second, there is likely to be a higher degree of precision in the measurement of wages and benefits as more detailed questions on these were directed at respondents**,** and individual records were compared to establishment records for consistency. Third, more consistent occupational classifications were applied across the public and private sector.

The disadvantage of this type of data, however, lies in the fact that a bias was introduced by over representing some occupations, so workers are not a random sample of the population. Thus there is a need to reweigh observations in a manner that makes the sample more representative of the population. Sampling weights were constructed using population data from the employment, wages and hours of work surveys for workers in establishments with 10 employees or more in the Egyptian organised sector. These are presented in Table 5c.1 in the appendix and were used in all regression results in the paper. A problem also emerges from a methodological point of view due to the difficulty in modelling selectivity issues in calculating wage differentials. The way the sample was drawn was such that there was a selection of establishments, on basis of institutional

[13] As will be seen in the following section, the validity of this assumption will be tested (and rejected) on basis of a Chow test of parameter equality.

[14] This Survey was conducted by the Egyptian Central Agency of Public Mobilisation and Statistics (CAPMAS) in 1990. The questionnaire was designed and the overall survey supervised by Professor Mohaya Zaytoon, Al-Azhar University, Cairo. See Zaytoon (1994) for a summary report on the data and the structure of earnings based on the results of the Survey.

sector in the organised sector (government, public enterprise and private enterprise) and the sample was stratified to represent the employment structure across sectors of economic activity. Within each ministry, enterprise or firm, the sample was further stratified to be representative of broad occupation /skill group (as provided by personnel records), but was otherwise random. Ideally a proper accounting for the biases that might occur from these sample selection processes is to simultaneously model establishment, institutional sector, sector of economic activity and occupation and useit to correct wage equations for selectivity - a task that is technically not feasible.[15]

Table B.1 in Appendix B presents summary information on sample size and average hourly wages across sectors and sexes. About 9400 workers were covered in the survey, 20% of whom are female. The government sector is more feminised than the rest of the sectors, with one third of its workforce composed of female workers. As the survey is conducted only in the organised formal sector, the public sector at large employs 66% of the workers in the survey: 22% of whom are in the government and 44% in public enterprises. Males are concentrated in the public enterprise sector (48%) and females in the government (37%). Before correcting for differences in attributes, the average log hourly wage data presented in the table show that for males, average wages are highest in the private sector and for females they are highest in the public enterprise sector. The average gender wage gap is most compressed in the public enterprise sector (only 9%), followed by the government (17%) and is much higher in the private sector (113%).

These averages, however, are not informative about the actual sector and gender differentials as they do not take account of differences in individual and job characteristics. In order to obtain such differentials we begin by applying the sample selection procedure and estimating wage equation (1) in the model above. Two reduced form multinomial logit equations for selection in the government and public enterprises relative to the private sector were estimated separately for males and females (results are in Appendix D Table 5D.1)[16] and the sample selection statistics

[15] Moreover, the identification of wage equations from sector choice equations requires exclusion restrictions by identifying variables that affect the latter and not the former. In household level data these usually are found in household and background variables. In the present data set no such variables can be identified. So we use age instead of experience in the sector choice equation as it is theoretically expected to be the correct determinant, especially for new entrants. Besides this slight difference in the covariates in the two equations, our selectivity corrected results are reliant on differences in the functional form between the sector choice and wage equation. This approach was in fact resorted to in several widely referenced studies on public-private wage differentials in developing economies, due to similar data restrictions. See for example, Van Der Gaag et al. (1989), Stelcner et al (1989). Theoretically the identification problem is solved due to differences in functional form, but the assumptions upon which these functional forms rely cannot be justified in economic terms.

[16] The results of the selection functions yield the expected results of increased probability of selection in the government and public enterprise and age. Probability of selection in the government rises sharply with education especially for the secondary and above secondary levels (i.e. levels of eligibility for the public

were computed. Six earnings equations for males and females in each sector (government, public enterprise and private sector) were then estimated with the relevant selection terms as regressors.

The selectivity corrected wage equation estimates, along side the weighted OLS results are presented in Table 1. The specification follows convention with a variety of human capital, demographic and job characteristics variables including years of experience , experience squared, number of years on the job (tenure), level of educational qualification and region of residence. Also included were controls for whether employees obtained a higher degree after appointment, whether contract is of a temporary nature as well as their occupation and sector of economic activity. With these set of controls, the estimated equations generally have high adjusted R^2 (ranging from 0.5 to 0.7, which is very high for cross-sectional regressions) and the coefficients are generally significant and of the expected sign. Chow tests on the equality of coefficients across sectors and gender, confirm that estimating separate equations for each is a superior specification.

The returns to various characteristics across sectors, particularly experience and education, are broadly similar to previous results (Shaban et al, 1993 and Assaad, 1997a) which highlight the importance of experience and educational attainment for remuneration in the government.[17] The weighted least square results (using sampling weights) show that the experience-wage profile has the usual concave shape in all three sectors, but rise at different rates in each case. Returns to experience are higher in the private sector for both males and females. They are similar in public enterprises and the government for males, but are higher in the government for females. Rewards for tenure (or on the job experience) are higher in the private sector for males and in the public enterprise sector for females. Returns to education are increasing by level of attainment in the public sector for both males and females. They are generally highest in the public enterprise sector for males and in the government for females, especially after the secondary level of schooling. For males, obtaining a higher degree after appointment is rewarded highest in the public enterprise sector and for females in the government.

Residence in lower Egypt (as compared to metropolitan areas) is associated with wage premia in the government only for males and with a penalty for females. It is associated with a penalty for males and has an insignificant impact for females in the public enterprise and private sectors. Residence in upper Egypt is associated with a wage penalty in all sectors and has an insignificant impact on female wages. As for occupational controls, managerial skills (the omitted category) are

sector employment guarantee). And consistent with results from Paper 4, these effects are much more pronounced for females.

[17] Note that the previous results mentioned earlier are based on the 1987 and 1988 household- level based labour force sample surveys which cover both organised and unorganised firms in the private sector. The present results are limited to the organised sector and employees working inside establishments in 1990.

the most highly valued in all three sectors for males. As for females, managerial skills are highly paid in the government and in the public enterprise sector , whereas in the private sector the highest returns are for clerical and specialised occupations. The activities earning a premium (compared to the omitted category of agriculture) are services in the government and public enterprise sectors and manufacturing in the private sector for both males and females.

The selectivity corrected results are in broad agreement with the least square results in terms of comparison across sector and gender groups. The results, however, show that there is significant positive selectivity in the private sector, negative selectivity in the government and no significant selection in the public enterprise sector for both sexes. These results imply that the same factors that lead workers to be selected in the government or private sector also lead them to receive higher wages in the private sector and lower wages in the government. This pattern is quite similar to what was obtained by Assaad (2001) and in line with adverse selection in the government due to the operation of the guarantee. Lack of employer choice in hiring can lead to workers with lower productivity being concentrated in the government sector. This effect applies specifically to the guarantee educational categories (above secondary degrees).[18] It may also apply to the less educated categories (below secondary) if they are hired via non-competitive channels, such as by connection and recommendation. Absence of selection in the public enterprises is consistent with the suspension of the guarantee since the late 1970's, so that its impact on labour quality was weakened in the 1990's. Positive selection of workers in the private sector is consistent with the operation of a more competitive labour market.

Yet it appears that the bias on parameter estimates was of a relatively small magnitude that the resultant wage differentials for both males and females were robust selectivity correction. This together with the reservation expressed above regarding the adequacy of representing the selection rule in the selectivity correction procedure, led to a preference for the use of the ordinary least square estimates in the following analysis of sector and gender based wage gaps. [19]

[18] These constitute 90% of female, and more than 50% of male employment in the public sector.

[19] Research in other contexts (mainly in the evaluation of manpower training and social programs) have shown that, in absence of meaningful exclusion principles, estimates differ widely when alternative selection procedures are used. This led for a preference to using experimental data in selectivity models rather than having results subject to improper representation of the selection rule (Lalonde, 1986 and Burtless and Orr, 1986). Heckman and Hotz (1989) suggested instead several specification tests that exploit the panel nature of data to test various selectivity correction procedures. Given the nature of our data, neither of these methods were available. Recent research suggest that the mean square error of OLS estimates can be much lower than two-step or MLE selection models. (See Puhani, 1997 and Kennedy, 1998 and references cited therein).

IV. Decomposition of Sector and Gender Wage Differentials

A. Sector Wage Differentials

Estimates of log hourly wages from the weighted least square estimates can be used to compute mean public-private differentials, and the parameter estimates of explanatory variables can be used to decompose these differentials into components explained by human capital characteristics or endowments and those unexplained by such factors as in equations (3). These results are presented in Table 2 below. They show that there is a positive "explained wage differential" in favour of the public sector associated with human capital, regional and job characteristics and there is an "unexplained component" in favour of the private sector. In other words, public sector employees are generally more favourably distributed with regards to their personal and job characteristics than private sector employees. Once these factors are accounted for, both males and females have an earning disadvantage in the public enterprise and government sectors. For males, this is mainly due to the presence of a pure rent element (as captured in the constant term) in the private sector and for females it is due to higher returns in the private sector to characteristics such as experience, being in clerical and specialised occupations or in manufacturing industry. The magnitude of the disadvantage is larger in the government (46% of private wages for males and 41% for females) than in the public enterprise sector (33% for males and 23% for females).

B. Impact of Adjustment for Other Job Rewards

The question arises of how much of this estimated private sector advantage would be eliminated if one considers total rewards of jobs, including any non-pecuniary ones. As mentioned in the introduction, an important extra benefit in the public sector is the higher probability of being able to complement one's income through holding a second job in the public sector - due to lower effort, monitoring, hours etc. required on these jobs. We use a methodology of estimating a probability of second job holding equation, from the available data, and then predicting that probability for certain jobs characteristics (such as industry occupation, region and sector). These predicted probabilities are used as regressors in a compensating differential equation of wages in the private sector. The estimated coefficients are used in the adjustment for differences in the probability of second job holding between public and private employees.[20]

Moreover, it is possible to utilize extraneous data provided in CAPMAS's 1990 Employment, Wages and Hours of Work Survey on the magnitude of fringe benefits and pensions in the total compensation package of public and private employees to also adjust the above public-private differentials for the difference in their incidence in the two sectors. The adjustment is shown as 'adjustment 1' at the bottom of Table 2. It decreased the private sector advantage for both males

[20] See Said (2000), Chapter 4, For the details of this methodology.

and females and even turned it into a public sector advantage for females in public enterprises. The problem with this adjustment, however, is that it is still likely to be an *under-estimate* of the correct one as it does not take account of the higher degree of job security aand higher incidence of female specific benefits (paid maternity leave, leave of absence to join husband abroad etc.) in public sector.

The second adjusted figure, reported in Table 2 as adjustment 2, include differences in pensions, fringe benefits, probability of second job holding as well as job instability between the public and private sectors. They are, however, based on the same proportions calculated using the Egyptian 1997 labour force sample survey.[21] Note that even setting change over time aside, a major difference between that and the present 1990 data set is the fact that in 1997, the private sector also included the informal or unorganised segment. Adjustment 2 is therefore likely to be an *overestimate* as there is a much higher degree of job instability and lower degree of coverage of other benefits in the informal sector than in the organised sector.

Given the arbitrariness of all such adjustments, the figures for adjustment 1 and adjustment 2 presented in Table 2 are only intended to provide rough upper and lower bounds, respectively, of the magnitude of the public-private differential. In the organised sector in Egypt, once the non-pecuniary aspects of jobs are also taken account of. They indicate that in the organised sector in Egypt, workers in the private sector have an advantage compared to similar government workers, this higher for males (in the range of 37-15%) than for females (in the range of 36%-12%). Compared to public enterprise employees, however, the private sector advantage is either smaller (28%) or non-existent (1.3% public advantage) for males. There is a clear public enterprise advantage (of 12-16%) for females.

C. Gender Wage Differentials

As for the gender (male-female) differentials, the results of applying the decomposition formula in equation 4 are shown in Table 3. They show that the unexplained component, usually attributable to discrimination, is indeed small in the public sector (12% of female wages in the government and 7% of female wages in the public enterprise sector). A large part of the differential is explained by the more favourable distribution of men with regards to observable characteristics: men have more overall and job specific experience than women in both segments of the public sector. Although there is evidence of some positive discrimination in favour of women in terms of return to several characteristics, yet a pure rent element as captured in the constant term is still being paid to men.

[21] The details of using data from this survey to estimate an adjustment for wage differentials that takes account of additional public sector non-wage benefits is provided in Said (2000), Chapter 4.

In the private sector, in terms of endowment characteristics, the most obvious advantage of males comes from their higher level of overall experience. They also have a slightly more favourable education distribution and are concentrated in more specialised and skilled manual jobs than females. However, the largest component of the differential is due to pay discrimination (amounting to 39% of female pay in the private sector). The main channel for wage discrimination is by simply paying a pure rent premium to men (as captured by the constant term).

It is important to note that returns to occupation (or job rank) were higher for females than males in the private sector. This implies that if occupational attainment was not taken into account, the gender gap would have been larger. As the above decomposition of the gap treats all occupational differences as justifiable, in the following section we assess the impact of endogenising occupational attainment behaviour in calculating the gender gap.

V. Occupational Attainment and the Gender Gap

In order to investigate the effect of gender on predicted occupational distributions, we turn to estimating a model of occupational attainment. Following the approach advocated by Greenhalgh and Steward (1985), Miller and Volker (1985) and Miller (1987), we estimate an ordered probit model to predict the probability that an individual will be employed in one of six occupational job groups, namely: (1) management, (2) specialised, (3) technical, (4) clerical (5) skilled manual , (6) unskilled manual, [22] postulated to be a function of the person's educational attainment, labour market experience and region of residence. Incorporating information on the ranking of occupations into the estimation procedure permits for explicit statements to be made concerning vertical mobility. Thus, a positive coefficient indicates a high probability of being located in a more prestigious occupation.

As can be seen from the estimates of the model presented in Table 4, education and labour market experience are both associated with an increase in the probability of being located in higher ranked occupations. The impact of education on occupational ranking is stronger in the public sector than in the private sector for both males and females. In particular, obtaining a university degree considerably raises the probability of being ranked in more prestigious jobs in the government and public enterprise sector.

[22] The advantage of this grouping of occupational attainment as opposed to the standard 7 one-digit ones (scientific & technical, managerial, clerical, sales, services, agricultural and production) is that it corresponds to actual classifications in establishment employment records. It is also possible in our classification to rank the occupations by average wages (as was done in Greenhlagh and steward , 1985) which is necessary for the estimation of the ordered probit model.

In order to highlight the underlying labour market processes, the estimates in Table 4 are used to simulate the occupational distribution for females using the male equation estimates. The latter simulation shows the occupational redistribution that females would obtain if their attributes were rewarded in the same manner as those of their male counterparts. Table 4 presents this simulation alongside actual male and female distributions. Two segregation indices were reported to compare the effects of the redistribution on occupational segregation. Both measure the degree of segregation and range from 0 to 1 (see Brown, Moon and Zoloth, 1976). A zero value indicates equal proportions of men and women in each occupation, while a value of one reflects total segregation of the sexes. The Duncan dissimilarity index represent the proportion of either men or women who would have to be transferred from one occupation to another in order to obtain equal proportions across all occupations. The segregation index is a measure of association between a person's occupation and sex, with a higher degree of association indicating segregation by sex across occupations.

The calculated indices presented in Table 5 reveal that the highest levels of actual gender based segregation are in the public-enterprise sector, followed by the government and are least in the private sector. Yet the difference in the distributional pattern in the public sector is mainly driven by the fact that females are concentrated in clerical positions (57% of females in the government and 44% in the public enterprise sector). Moreover, these results are not likely to be upheld if one examines narrower occupational distributions. Table 6 shows the five most prevalent detailed (three digits) occupations for males and females in the three sectors. Although there is a higher concentration of females in a few clerical occupations in the public sector (70% of females in the government and 60% in public enterprises are in five mostly clerical positions), yet most of these positions are also amongst the most prevalent ones for males. So actual occupational segregation is not as large as implied by the above analysis. In the private sector, however, females are concentrated in completely different "feminine" occupations. Accountancy is the only occupation to be common to both sexes in the five most prevalent occupations.

Table 5 also shows the distribution that would have prevailed if female attributes were rewarded in the same manner as those of their male counterparts. Both indices witness a drop in all three sectors. The segregation index, in particular, drops quite substantially (by a third) in the private sector. These drops in the indices reflect the strong combined effects of discrimination in the labour market and of differences in tastes.[23] In other words, occupational segregation between men and women would in each case be substantially reduced by assigning women to occupations according to the men's model of occupational attainment.

[23] Since the difference is residual, it may also contain justified differences to the extent that we have omitted or incorrectly specified personal characteristics that affect occupational attainment.

These results can be used to decompose the gender differentials using a method which incorporates the behavioural model of occupational status as presented in Table 7. They show that gender based discrimination is actually lowest in the government (1.3% of female wages). Most of the gender gap in the government (93%) is justifiable in terms of productivity related differences that favour men. The actual level of intra-occupational pay discrimination is low at around 5% of female wages. It is interesting to note that occupational segregation actually works in favour of female wages in the government.[24] In the public enterprise sector, the unjustified component of the gender gap is higher than in the government (amounting to 115% of female wages) which is almost equally divided between intra-occupational and inter-occupational factors who work in favor of men. In the private sector, where the highest incidence of gender based discrimination occurs, a very small proportion of the gender gap is justifiable (9%). The rest is due to the two forms of pay discrimination, with intra-occupational pay discrimination amounting to 47.4% and segregation to 34.7% of female wages. Both these estimates are quite high by international comparisons.[25] To sum up, compared to results from the standard decomposition of the gender gap presented in the previous section, the above estimates show that once the male and female occupational distributions are not treated as all justifiable, the discriminatory gender gap is actually smaller in the public sector and larger in the private sector than would appear from conventional methods.

VI. The Distribution of Sector and Gender Differentials across Wage Quantiles and Occupations

Estimating the public sector wage premium is complicated by the presence of different variances in the wage distributions in the public and private sectors. As can be seen from Chart 1, the private sector wage distribution has a much greater dispersion than in public enterprise or the government.Thus even if comparisons based on mean or median wages might show absence of public-private pay differencials, one would expect comparison of lower quantiles to show a premium and higher quantiles to show a penalty. Similar concerns about differences in the variance of conditional wage distributions have led Chamberlain (1994) to examine union premiums, Buchinsky (1994) to study returns to education and Poterba and Rueben (1994) to consider public sector premia at different quantiles in the US. We follow this approach and

[24] Gindling (1992) reached the same result when a similar method was applied to measure occupational segregation in Cost-Rica. In fact, he concluded that one main reason why male-female differentials are lower in Costa-Rica than in other developing countries is the fact that women are over-represented in higher paying sectors and occupations, specifically highest paying occupations in the public sector.

[25] Pay discrimination (within occupations) ranges between 14-36% in the private sectors in industrialised countries. It is estimated to be in the range of 9-28% in Costra-Rica and Occupational segregation was less than 3% of the total unexplained gender gap in Costa-Rica and only 7% in the U.K. (Miller, 1987 and Gindling , 1992).

estimate quantile regression models corresponding to equation (8). Quantile regression methods also allow one to gain more insight in the wage distribution into the three sectors by percentile of wages, and hence distinguish between higher paying and lower paying jobs in each sector.

The quantile regression estimation results and the distribution of differentials across the five quantiles (10th, 25th, 50th, 75th and 90th) are reported in Table E.1-E.3 and Charts 2-5. It is worth noting that the level of statistical significance is low for some of the estimates of the 10th and 25th quantiles. Due to suspicion of heteroscedasticity, quantile regression variances may be biased. Thus, bootstrap estimates of the assymptotic variances of the coefficients were calculated with 20 repetitions and were also reported. The results in Chart 2 show that public sector premia for both males and females decline as we go to higher quantiles and eventually all turn to negative premia at higher quantiles. The highest premium is for women in government, which is 40% at the 10^{th} quantile and remains positive until slightly after the 50th percentile, ending up at -50% at the 90^{th} quantile. The female government premium distribution follows exactly the same pattern, but turns negative at a lower stage (before the 25^{th} percentile) and drops to as low as -60% at the 90th percentile. The government and public enterprise wage premia for men are negative and lower than those for women throughout. Yet, the decline is slower as one moves from the 10^{th} to 90^{th} percentile.

A question arises as to whether the quantile regression results are solely driven by differences in the conditional or (residual) variances across sectors. This hypothesis may be assessed using result presented in Chamberlain (1996). If we let the conditional distribution of log wages in the public sector be $N(X`\beta_p, \sigma_p)$ and in the private sector to be $N(X`\beta_r, \sigma_r)$ then the wage differential at the q^{th} quantile is given by $X`(\beta_p - \beta_r) - (\sigma_p - \sigma_r)q$. Thus for $\sigma_p < \sigma_r$, this predicts that the estimated differential is larger at lower q. Table 8 presents the estimated differential using OLS regression results as we move from the 10^{th} to 90^{th} quantile of the wage distribution. It shows that in all cases, these estimates are not large enough to explain the difference implied by quantile regressions (i.e. it is less than half). In practice, therefore, our pattern of results is not accounted for solely by the fact that there is a smaller residual variance in the public sector.

It is also interesting to examine the impact of including other (non-wage) job rewards in the calculation of differentials across quantiles. As mentioned in Section 5.3.2 above, the current data set allows only to adjust for differences in the probability of second job holding. Compensating wage differential equations for the private sector were estimated for the five quantiles. and the parameter estimates of the probability of second job holding variables were used to adjust the government-private and public enterprise-private differentials. The adjustments are shown at the bottom of Tables E.1 and E.2 and in Chart 4. The adjustment shifts all curves upward but do not

change the observed pattern across quantiles. The public sector premium still exits at lower quantiles and turn into a disadvantage at higher ones. For males, the adjustment is almost uniform across quantiles. For females, it increases the premium (decreases the disadvantage more for lower quantiles.

As mentioned above, it is not possible to use the present data set to adjust for other benefits. It is however possible to use information supplied in other sources that in the Egyptian private sector higher wage quantiles are also higher benefits quantiles. Table 5.9 shows the distribution of benefits such as social security, insurance coverage, paid leave, paid sick leave and existence of contract (with the job security it entails) based on the October 1988 labour force Sample Survey (conducted less than two years before the data set used in this paper was collected). Note that the proportion is much higher for females than males, indicating the fact that females tend to be concentrated in the organised segment of the private sector anyway. For both males and females, one can clearly see a trend increase in the proportion of establishments offering all these benefits as we move to higher wage groups. This means that for higher wage quantiles, the difference between the incidence of non-wage benefits in the public and private sectors is quite small that taking them into account would not change the differential by much. Thus at these levels, private sector workers are still doing better than comparable public sector employees. Adjustment for non-wage benefits would make the curve steeper (indicating a higher public sector premium) only for lower quantiles of the wage distribution.

As for the distribution of gender differentials as shown in Chart 3. It slightly increases in the public sector as we go higher in quantiles (from -1 to 11% in the government and from -3 to 10% in public enterprises). But the distribution levels on the whole are much lower in both the government and public enterprise sectors than in the private sector. The smallest wage gap is in the government at the lower quantiles (less than the 50th quantile) and in the public enterprise sectors for the higher quantiles. The gender gap for the private sector is estimated at around 33-37% at lower quantiles (less than 50) and then it rises to reach 50% at the 90^{th} quantile.

In order to identify occupations with the largest public pay penalty and those with the largest level of gender-based discrimination, Chart 4 presents the distribution of sector differentials for each occupation. The Chart shows that females earn premiums at all wage quantiles in the public sector (both the government and public enterprise) in managerial, technical and manual occupations. Males have a wage disadvantage in all wage quantiles especially in managerial, technical and skilled manual occupations. The largest penalty for males is in the highest quantiles of managerial and specialised positions. These results are consistent with results reported from another segment of the 1990 Establishment-Survey with questions directed to employees about the extent of overstaffing and labour shortages in each occupation. They confirm that although they suffer from

overstaffing in most occupations, government agencies suffer from shortages in the supply of technical and specialised staff which they mainly attribute to their inferior wages in the government compared to other sectors.[26] Finally, Chart 5.5 shows the distribution of gender differentials across occupations. The unexplained gender-based gaps are most compressed in managerial, specialised, technical and skilled manual occupations in public enterprises and government. In the private sector, the highest level of gender-based discrimination takes place at the lower quantiles of unskilled manual and high wage quantiles of technicians and managers.

Conclusion

This paper considers the estimation of gender-based and sector-based wage differentials both between and within the public and private sector labour markets in Egypt, employing data from the 1990 Establishment-Level Survey. Using earnings functions estimates and standard decomposition techniques, it was shown that both males and females have an earning disadvantage in the public enterprise and government sectors after correcting for a range of personal and job characteristics. If total rewards are considered (including non-pecuniary benefits), this disadvantage declines but is not eliminated for government workers. It declines even further or becomes non-existent for public enterprise males and turns into an advantage for female public enterprise employees.

Also the results obtained here confirm that that the component of the gender pay that is roughly attributable to gender-based pay discrimination is small in the public sector. In contrast, it is quite high by international comparisons (amounting to 39% of female pay) in the private sector and apparently takes place by paying a pure rent premium to men. The gender gap was further decomposed into components attributable to intra-occupational pay discrimination and inter-occupational segregation. This revealed that the unexplained component is even higher, at about 82% of female pay, in the private sector, with a large proportion (34.7% of female pay) attributable to segregation or entry barriers facing females in certain occupations. Inter-occupational segregation is also substantial in the public enterprise sector, but amounts to a smaller percentage of female hourly wages. In the government sector, there is evidence of some small pay discrimination against women within occupation, but inter-occupational segregation in fact works for female pay so that the total unexplained gap is almost non-existent there.

The examination the distribution of wage premia across occupations and wage quantiles showed that public sector advantages exist only at the lower level of the wage distribution and turned into disadvantages at the higher end. The greatest public sector pay penalty appears to be in the high wage echelons of specialised occupations in the government. Gender-based pay discrimination

[26] The results are summarised in Tables 14 and 15 in Zaytoon (1994).

remains low at all wage quantiles in the public sector and is highest for the low wage quantiles unskilled workers and higher wage groups in technical and managerial positions in the private sector. To sum up, the picture that emerges from the examination of relative public job rewards within the organised sector in Egypt in 1990 is that of disadvantages at both the mean and upper end of the government wage structure. Public enterprise males are on parity with private sector counterparts at the mean, but are disadvantaged at the upper end. And female advantages observed appear to be only a reflection of lower discriminatory practices in the public sector.

The above results have several important policy implications. First, from a cost-minimisation or tax-payers point of view it might not matter that public sector employees are underpaid relative to their 'equivalent' private sector counterparts -- as long as that situation does not create an excess demand for certain types of workers. But from an equity and efficiency point of view, the existence of such wage differentials does matter. It is unlikely that workers, especially at the higher end of the wage structure, would remain in the public sector, unless they believe non-pecuniary aspects (mainly job security and low effort) of the job compensates for low wages. Alternatively, they may hold on to the job while having a second job in the private sector or supplementing income through corruption and bribery etc. Either way, we have an adverse selection story in the public sector of low productivity, less motivated workers only interested in securing some minimum income, with minimum effort, from government jobs or using public office to provide access to other types of jobs or bribes.

Second the analysis of the distribution of wage premia across quantiles and occupations revealed that one of the most disadvantaged groups in the government sector are the specialised occupations. This is true for both males and females and hence the design of civil service reform programs must give priority to reforming pay scales for these groups, especially that they identified as shortage groups in the government.

Finally, given the favourable treatment of women in the government compared to the private sector and the lower levels of discrimination there, it is likely that the burden of privatisation and civil service downsizing may fall disproportionately on women and may negatively affect the already low participation rates, unless effort is made to reduce the extent of gender-based discrimination in the private sector. In that respect, public policy focus on education and training as keys to a more equitable access to opportunities and the benefits of development for women may be insufficient. Social policy prescriptions call for further investigation into the reasons why females are concentrated in subordinate labour groups and why they appear to be paid less for similar human capital endowments in some segments of the private sector.

REFERENCES

Altonji, J. and R. Blank 1999. " Race and Gender in the Labour Market" in O. Ashenfelter and D. Card (eds.) Handbook of Labour Economics, Vol. 3. Oxford: Elsevier Science Publishers.

Assaad, R. (1997) "The effects of Public Sector Hiring and Compensation Policies on the Egyptian Labour Market" The *World Bank Economic Review*, vol. 11, no.1

Assaad, R. (2001) "An Analysis of Compensation Programs For Redundant Workers In Egyptian Public Enterprise"in M. Celasun (ed.) *State owned Enterprises in the Middle East and North Afric.* (London: Routledge)

Belman, D. and J.S. Heywood (1989) " Government Wage Differentials: a ample Selection Approach" *Applied Economics*, 21, 427-438.

Brown, R., M. Moon and B. Zoloth (1980) "Occupational Attainment and Segregation by Sex" *Industrial and Labour Relations Review*, vol.33,no.4.

Benito, A. (1997) "Wage Premia in Public and Private Sector Labour Markets" Centre of Economic Performance Seminar Paper (S. 155), London: London School of Economics.

Buchinsky, M., (1994), "Changes in the US Wage Structure 1963-1987: Application of Quantile Regression", *Econometrica*, vol.62, 2, pp.405-458.

Burtless, G. and Orr, L. (1986) "Are Classical Experiments Needed for Manpower Policy" Journal of Human Resources, 606-639.

Cain, C. 1987."Segmented Labour Markets" in J. Eatwell, M.Milgate and P. Newman (eds.), The New Palgrave: A Dictionary of Economic Theory and Doctrine. London: Macmillan.

Chamberlain, G. (1994), "Quantile Regression, Censoring and the Structure of Wages" in C. Sims and J-J Laffont (eds.) Proceedings of the Sixth World Congress of the Econometric Society, New York: Cambridge University Press.

Deaton, A.(1997) *The Analysis of Household Surveys* (Maryland: The John Hopkins University Press for the World Bank).

Dex, S. 1985. The Sexual Division of Work. Brighton: Wheatsheaf. Dickens, W. and K. Lang (1985) "A Test of Dual Labour Market Theory," *American Economic Review* 75 (September): 792-805.

Dolton, G. and H. Mackpeace and W. Van der Klaauw (1989) "Occupational Choice and Earnings Determination: the Role of Sample Selection and Non-pecuniary Factors." *Oxford Economic Papers* 41, 573-594. `

Dustmann,C. and A. Van Soest (1995) "Private and Public Wage Structures in Germany" memo, Tilburg University, Netherlands.

Filer, R., D. Hamermesh and A. Rees. 2000. The Economics of Work and Pay. London: Harper Collins and College Publishers.

Gindling, T.H. (1991) "Labour Market Segmentation and Determination of Wages in the public private-formal and informal sectors of San Jose, Costa Rica" *Economic Development and Cultural Change*, vol. 39, no. 3 :585-605.

Gindling, T. 1992. " Why Women Earn Less than Men in Costa-Rica." In G. Psacharapoulos and Z. Tzannatos. (eds.). *Women's Employment and Pay in Latin America: Case studies.* Washington, D.C.: The World Bank.

Greenhalgh, C. and M. Stewart. 1985. "The Occupational Status and Mobility of British Men and Women." *Oxford Economic Papers*, Vol. 37: 40-77.

Gunderson, M. 1989. "Male-Female Differentials and Policy Responses." Journal of Economic Literature, Vol, 27: 46-72

Gyouroko, J. and J. Tracey (1982) "An Analysis of Public and Private-Sector Wages Allowing for Endogenous Choice of Both Government and Union Status" *Journal of Labour Economics*, vol. 6, no.2.

Hartoog, J. And H. Oosterbeek (1993)"Public and Private Sector Wages in the Netherlands." *European Economic Review*, 37, 97-114.

Heckman, J. (1974) "Shadow Prices, Market Wages, and Labour Supply" *Econometrica*, 42:679-94.

Heckman, J. (1976) "The common Structure of Statistical Models of Truncation, Sample Selection and Limited dependent Variables and a Simpler Estimator for Such Models, *Annals of Social Measurement* 5 (September): 475-492.

Heckman, J. (1979) "Sample Selection as Specification Error" *Econometrica* 47:153-161.

Heckman, J.and V. Hotz (1986) "An Investigation of Labour Market Earnings of Panamanian Males: Evaluating the Sources of Inequality" *Journal of Human Resources* 21 (Fall): 507-41.

Heckman, J. and V. Hotz (1989) "Choosing among Alternative Non-experimental Methods for Estimating the Impact of Social Programs" Journal of American Statistics Association, Dec. vol. 84, no. 408.

Humphries, J. 1994. " Economics, Gender and Equal Opportunities." Paper presented at an EOC conference on the economics of equal opportunities. Manchester.

Kennedy, P. 1998. *A Guide to Econometrics*. Malden, Mass: Blackwell.

Khandker, S.R. (1992) "Earnings, Occupational Choice and Mobility in Segmented Labour Markets in India" World Bank Discussion Papers, no. 154.

Koenker, R. And Bassett, G. Jr. (1978), "Regression Quantiles" *Econometrica*, vol.46(1), Pp. 33-50.

Lalonde, R. (1986) "Evaluating the Econometric Evaluations of Training Programs with Experimental Data", *American Economic Review*, 76, 604-620

Lee, L. (1978) "Unionism and Wage Rates: A Simultaneous Equations Model with Qualitative and Limited Dependent Variables*" International Economic Review* 19 (June):415-33.

Lee, L. (1979) "Identification and Estimation in Binary Choice Models with Limited (Censored) Dependent Variables" *Econometrica* 47 (July): 977-96.

Lee, L. (1982) "Some approaches to the Correction of Selectivity Bias" *Review of Economic Studies* 49 (July):355-72.

Lee, L. (1983) "Generalized Econometric Models with Selectivity," *Econometrica* 51 (March): 507-12.

Lee, K-H and S. Nagaraj (1995) “Male-Female Earnings Differentials in Malaysis” in *Journal of Development Studies*, vol.31, no.3, pp 467-480.

Lissenburgh, P. 1995. "Occupational, Gender Segregation and Wage Determination" Ph.D Dissertation, Department of Economics and Politics University of Cambridge, Cambridge, U.K.

Macpherson, D. and B. Hirsch "Wages and Gender Composition : Why do Women's jobs pay less?" *Journal of Labour Economics*, Vol. 13, no. 3.

Maddala, G. (1983) *Limited Dependent and Qualitative Variables in Econometrics*. Cambridge: Cambridge University Press

Maddala, G. and L. Lee (1976) “Recursive Models with Qualitative Endogenous Variables,” *Annals of Social measurement* 5 (September 1976): 525-45.

Miller, P. (1987). "The Wage Effect of the Occupational Segregation of Women in Britain", 97: 885-896.

Miller, P. and P. Volker. 1985. “On the Determination of Occupational Attainment and Mobility.” *Journal of Human Resources,* Vol. 20: 197-213.

Mwabu, g. and P. Shultz (1996) " Education Returns Across Quantiles of the Wage Function : Alternative Explanations for Returns to Education by Race in South Africa" American Economic Review, 86. 335-39.

Oaxaca, R. (1973) “Male-Female Wage Differentials in Urban Labour Markets*” International Economic Review*, 14, 693-709

Peng, Y. (1992) “Wage Determination in Rural and Urban China: A Comparison of Public and Private Industrial Sectors” *American Sociological Review*, 157, 198-213.

Porteba, J.M. and Rueben, K.S. (1994) “ The Distribution of Public Sector Wage Premia: New Evidence Using Quantile Regression Methods” NBER Working Paper No. 4734.

Puhani, P. 1997b. “Foul or Fair? The Heckman Correction for Sample Selection and its Critique.” ZEW Discussion paper no.97-07, Mannheim.

Said, M. (2000) “ Labour Market Segmentation and Institutional Change: The Public-Private Pay Differential in Egypt.” Ph.D Dissertation, Department of Economics and Politics University of Cambridge, Cambridge, U.K.

Shaban,R. Al Qudsi,S. and Assad, R. (1993) " Labour Markets in Arab Countries: A survey" paper presented to the First Annual Conference on Development Economics, Initiative to encourage economic research in the Middle East and North Africa, Cairo,June 4-6.

STATA Corporation (1997). *Reference Manual to Stata 5.0* (Texas:Stata Press).

Stelcner, M. And J. Van Der Gaag (1989).”A switching Regression Model of Public -Private Sector Wage Differentials in Peru:1985-1986” *Journal of Human Resources*, XXIV, no.3, Pp 545-559.

Terrell, K. (1993) “Public-Private Wage Differentials in Haiti: Do Public Servants Earn a Rent?” *Journal of Development Economics*, 42, 293-304

Van DeGaag, J. and Wim Vijeverberg (1988) “A Switching -Regression model for Wage Determinants in the Public and private sectors of a Developing Country” *Review of Economics and Statistics,* 244-252.

Van der Gaag, J. And M. Stelcner and W. Vijerberg (1989)“Wage Differentials and Moonlighting by Civil Servants: Evidence from Cote d’Ivoire and Peru” *World Bank Economic Review*, vol.3 no.1:67-95

Van Ophem,H. (1993) “A modified Switching Regression Model for Earnings Differentials between the Public and Private Sector in the Netherlands” *Review of Economics and Statistics*, p.215-224.

Wilkinson, F. 1991. “ The Structuring of Economic and Social Deprivation and the Working of the Labour Markets in Industrial Countries.” *Labour and Society,* Vol.16: 119-138.

Zaytoon, M. (1990). "Earnings structure in the Egyptian Labour Market, a preliminary Analysis." Labour Information System Project, CAPMAS, Egypt.

Zaytoon, M. (1991). "Earnings and the Cost of Living: An analysis of recent developments in the Egyptian Economy." in Handoussa, H. and G. Potter (eds). *Employment and Structural Adjustment: Egypt in the 1990s*. Cairo: AUC Press.

Zaytoon, M. (1994) “ The Structure of Earnings in the Organised Sector: Establishment Survey” , Central Agency for Public Mobilisation and Statistics. Cairo, Egypt.

Zoloth, B. (1996) " Alternative Measures of School Segregation" Land Economics, vol. 52, No.3, pp278-285.

Zweimuller J. And R. Winter-Ebmer (1994) “Gender Wage Differentials in Private and Public Sector Jobs” *Journal of Population Economics*, 7:271-285

Table 1 Ordinary Least Square and Selectivity Corrected Wage Equation Estimates

Variable	MALES						FEMALES					
	Government		Public Enterprise		Private		Government		Public Enterprise		Private	
	OLS	*Sel. Cor.*	*OLS*	*Sel. Cor.*	*OLS*	*Sel. Cor.*	*OLS*	*Sel. Cor.*	*OLS*	*Sel. Cor.*	*OLS*	*Sel. Cor.*
Constant	-1.244 ***	-0.258	-0.041	-0.074	0.180	-0.926 ***	-1.542 ***	-1.290 ***	-0.495 **	-0.515 **	-1.930 ***	-2.048 ***
	(0.124)	(0.259)	(.0941)	(.102)	(.1066)	(.169)	(.1116)	(.158)	(.2484)	(.259)	(.4578)	(.452)
Experience	0.040 ***	0.032 ***	0.040 ***	0.040 ***	0.046 ***	0.031 ***	0.058 ***	0.357 ***	0.044 ***	0.044 ***	0.093 ***	0.074 ***
	(.003)	(.003)	(.0020)	(.00001)	(.0022)	(.002)	(.0072)	(.007)	(.0100)	(010)	(.0070)	(.008)
Experience2	-0.0004 ***	-0.0003 ***	-0.0004 ***	0.0080 ***	-0.0004 ***	-0.0003 ***	-0.0005 ***	-0.0004 ***	-0.0006 ***	-0.0006 ***	-0.0007 ***	-0.0005 ***
	(.00003)	(.00003)	(.00003)	(.001)	(.00003)	(.00003)	(.0001)	(.0001)	(.0002)	(.0002)	(.00006)	(.00007)
Tenure	0.006 **	0.005 **	0.008 ***	0.008 ***	0.010 ***	0.008 ***	-0.001	0.000	0.022 ***	0.217 ***	-0.014 *	-0.016 *
	(.002)	(.002)	(.0018)	(.031)	(.0025)	(.002)	(.0053)	(.005)	(.0631)	(007)	(.0080)	(.007)
Educational level												
Primary School	0.081	0.179 **	0.045	0.441 ***	0.179 **	0.094 **			-0.250 ***	-0.250 ***	-0.191	-0.233
	(.072)	(.073)	(.0313)	(.036)	(.0876)	(.086)			(.0077)	(.086)	(.1881)	(.185)
Preparatory School	0.231 **	0.128	0.133 ***	0.120 ***	-0.203 ***	0.136 **	0.384 **	0.323 *	0.243 ***	0.238 ***	-0.053	-0.087
	(.078)	(.081)	(.0326)	(.053)	(.0607)	(.062)	(.1897)	(.191)	(.0863)	(.064)	(.1346)	(.132)
Secondary School	0.320 ***	0.043	0.367 ***	0.334 ***	0.161 **	0.441 ***	0.455 **	0.340 *	0.322 ***	0.308 ***	-0.137 *	-0.133 *
	(.073)	(.097)	(.0337)	(.071)	(.0494)	(.059)	(.1754)	(.182)	(.0624)	(.153)	(.0811)	(.079)
Two Year College	0.293 ***	0.007	0.437 ***	0.402 ***	0.139 ***	0.424 ***	0.533 ***	0.419 ***	0.379 ***	0.363 ***	-0.120	-0.147
	(.0865)	(.108)	(.0550)	(.099)	(.0781)	(.089)	(.1794)	(.186)	(.0856)	(.122)	(.1375)	(.135)
University	0.650 ***	0.297 ***	0.604 **	0.540 **	0.514 ***	1.022 ***	0.793 ***	0.701 ***	0.595 ***	0.575 ***	0.362 ***	0.484 ***
	(.0874)	(.119)	(.5084)	(.044)	(.0678)	(.090)	(.1615)	(.166)	(.1082)	(.131)	(.1205)	(.122)

Higher degree after appointment	0.112	**	0.115	**	0.135	***	0.135	***	0.127	*	0.124	*	0.179	***	0.195	***	0.0003		0.0003		-0.083		-0.074	
	(.0372)		(.036)		(.0442)		(.027)		(.0706)		(.069)		(.04497)		(045)		(.1101)		(.077)		(.1562)		(.154)	
Region																								
Lower Egypt	0.321	***	0.258	***	-0.324	***	-0.339	***	-0.361	***	-0.180	***	0.034		-0.010		-0.261	***	-0.267	***	-0.195	***	-0.213	***
	(.0262)		(.029)		(.0183)		(.022)		(.0282)		(.035)		(.0315)		(.037)		(.0770)		(.053)		(.0645)		(.063)	
Upper Egypt	-0.123	***	-0.280	***	-0.106	***	-0.115	***	-0.122	***	-0.190	***	0.009		-0.047		0.089		0.070		0.088		0.944	
	(.0239)		(.043)		(.0194)		(.066)		(.0349)		(.035)		(.0306)		(.039)		(.0480)		(.096)		(.0682)		(.067)	
Job Characteristics																								
Job Group: Specialised	-0.401	***	-0.375	***	-0.376	***	-0.371	***	-0.577	***	-0.527	***	-0.142		-0.141		-0.508	**	-0.504	**	1.211	***	0.968	***
	(.0609)		0.(.060)		(.06059)		(079)		(.0695)		(068)		(.1502)		(.149)		(.0690)		(.206)		(.4268)		(.4244)	
Technical	-0.310	***	-0.271	***	-0.356	***	-0.350	***	-0.773	***	-0.685	***	-0.153		-0.135		-0.543	**	-0.539	**	0.672		0.535	
	(.0804)		(.080)		(.0788)		(.081)		(.0878)		(.087)		(.1671)		(.166)		(.2062)		(.229)		(.4330)		(.427)	
Clerical	-0.379	***	-0.351	***	-0.496	***	-0.489	***	-0.746	***	-0.677	***	-0.139		-0.120		-0.639	***	-0.634	***	1.225	***	1.025	***
	(.0808)		(.080)		(.0814)		(.083)		(.0883)		(.087)		(.1639)		(.163)		(.2291)		(.218)		(.4287)		(.425)	
Skilled Manual	-0.179	*	-0.172		-0.386	***	-0.379	***	-0.911	***	-0.819	***	-0.433		-0.419		-0.378		-0.375		0.537		0.431	
	(.1083)		(.107)		(.0833)		(.088)		(.0929)		(.092)		(.3166)		(.315)		(.2174)		(.232)		(.4362)		(.430)	
Unskilled Manual	-0.394	***	-0.400	***	-0.403	***	-0.396	***	-1.024	***	-0.976	***					-0.430		-0.426		0.210		0.048	
	(.1092)		(.108)		(0880)		(.031)		(.0979)		(.096)						(.2318)		(.282)		(.4453)		(.442)	
Activity:Industry	0.525		0.539	**	-0.353	***	-0.353	***	0.404	***	0.402	***					-0.151	**	-0.151	**	0.474	***	0.517	***
	(1.217)		(1.20)		(.0317))		(033)		(.0364)		(.035)						(.2815)		(.063)		(.0994)		(.098)	
Services	0.499	***	0.501	***	-0.158	***	-0.157	***	0.323	***	0.334	***	0.243	***	0.241	**	0.381	***	0.380	***	0.346	***	0.378	***
	(.0451)		(.044)		(.0335)		(.099)		(.0410)		(.040)		(.0827)		(.082)		(.0635)		(.063)		(.1048)		(.103)	

Selection Term		-0.425 ***		0.077		0.742 ***		-0.117 **		0.024		0.366 ***
		(.098)		(0.099)		(.169)		(.053)		(.088)		(.084)
Adjusted R2	**0.61**	**0.61**	**0.55**	**0.55**	**0.49**	**0.50**	**0.62**	**0.62**	**0.72**	**0.72**	**0.59**	**0.60**
Sample Size	**1400**		**3586**		**2474**		**701**		**562**		**655**	
Chow Tests of Equality of Coefficients												
H_0:male coefficients= female coefficients	**20.30**		**45.58**		**4.46**							
H_0: government sector coefficients= private sector coefficients	**37.69**						**18.82**					
H_0: public enterprise coefficients= private sector coefficients			**91.77**						**78.00**			
H_0: government coefficients= public enterprise coefficients					**21.60**						**13.20**	

Source: CAPMAS, 1990 Establishment Survey.
Notes: The dependent variable in the wage equation is log hourly wages in 1990 Egyptian Pounds. Standard errors, corrected for heteroscedasticity using White's (1990) method, are in parenthethis. * denotes significance at the 10 percent level, ** denotes significance at the five percent level and * denotes significance at the 1 percent level. The Chow (1960) test is an F test of the null hypothesis of equal coefficients between two equations (see Kennedy, 1998, p. 56 for the generic form of all Chow type tests). The relevant critical value F.o1 = 1.90.**

Table 2 Decomposition of Public-Private Pay Differentials

Variable Name	Males				Females			
	Government-Private		Public enterprise-Private		Government-Private		Public Enterprise-Private	
	explained	unexplained	explained	unexplained	explained	unexplained	explained	unexplained
Experience	0.303	-0.082	0.238	-0.083	0.379	-0.360	0.362	-0.515
Experience squared	-0.094	0.042	-0.072	0.020	-0.040	0.036	-0.005	0.018
Tenure	0.078	-0.042	0.072	-0.017	-0.042	0.131	0.021	0.331
Educational level								
Primary School	0.001	-0.002	0.004	-0.005	0.001	0.030	-0.004	-0.002
Preparatory School	-0.001	0.011	0.000	0.008			0.006	0.020
Secondary	0.013	0.045	-0.025	0.043	0.019	0.203	-0.007	0.158
Two Year College	0.001	0.006	-0.004	0.009	0.060	0.033	0.046	0.025
University	0.021	0.043	-0.126	0.017	0.024	0.093	-0.070	0.050
Higher degree after appointment	0.010	-0.001	-0.000	0.000	0.050	0.009	-0.001	0.003
Region								
Lower Egypt	0.002	0.235	0.041	0.013	0.020	0.061	0.090	-0.017
Upper Egypt	-0.019	-0.000	-0.004	0.003	0.048	-0.009	-0.010	0.000
Job Characteristics								
Job Group: Specialised	-0.042	0.056	0.088	0.037	0.070	-0.331	-0.017	-0.420
Technical	-0.016	0.073	0.008	0.057	-0.009	-0.060	-0.004	-0.088
Clerical	-0.023	0.057	0.044	0.025	0.138	-0.350	0.018	-0.478
Skilled Manual	0.071	0.121	-0.267	0.229	-0.016	-0.367	0.092	-0.346
Unskilled Manual	0.014	0.108	0.084	0.076	-0.004	-0.002	0.074	-0.028
Activity:Industry	-0.263	0.036	0.003	-0.485	-0.150	--	0.012	-0.419
Services	0.274	0.106	-0.003	-0.122	0.180	-0.029	-0.006	0.010
Total of Characteristics	0.330	0.811	0.081	-0.176	0.727	-0.913	0.598	-1.698
Constant Term		-1.423		-0.221		0.388		1.435
Total Pay Differential (unadjusted)	0.330	-0.613	0.081	-0.397	0.727	-0.525	0.598	-0.263

Implied Public Sector Premium (%)				
Unadjusted	*-45.8%*	*-32.8%*	*-40.8%*	*-23.1%*
Adjusted (using Adjustment #1)	*-36.8%*	*-28.5%*	*-35.7%*	*1.2%*
Adjusted (using Adjustment #2)	*-18.3%*	*1.3%*	*-11.8%*	*15.8%*

Source: CAPMAS, 1990 Establishment Survey.

Notes: All entries are for differential in mean logarithm of hourly wages. The implied value of the public sector premium is calculated as exponent of the unexplained component of the differential minus 1.
Adjustment #1 is the public sector premium adjusted for differences in the probability of second job holding between the public and private sectors (using estimates based on the 1990 Establishment Survey) , as well as for differences in incidence of pensions and fringe benefits (from Table 4, CAPMAS, Employment, Wages and Hours of Work Survey, 1990).
Adjustment #2 is the public sector premium adjusted for public-private differences in probability of second job holding, pensions, fringe benefits as well as job instability (based on 1997 Egyptian Integrated Household Survey Estimates). See text for details.

Table 3 Decomposition of Male-Female Pay Differentials

Variable Name	Government		Public enterprise		Private	
	explained	unexplained	explained	unexplained	explained	unexplained
Experience	0.270	-0.284	0.155	-0.058	0.339	-0.450
Experience squared	-0.111	0.073	-0.089	0.078	-0.005	0.055
Tenure	0.015	0.093	0.048	-0.183	-0.002	0.163
Educational level						
Primary School	0.001	0.001	-0.002	0.013	-0.018	0.007
Preparatory School	-0.001	-0.006	-0.008	-0.009	-0.001	0.001
Secondary	-0.074	-0.055	-0.049	0.010	-0.001	0.095
Two Year College	-0.015	-0.014	-0.012	0.002	-0.011	0.011
University	0.002	-0.048	-0.043	0.001	0.053	0.044
Higher degree after appointment	-0.022	-0.008	-0.001	0.005	0.015	0.006
Region						
Lower Egypt	0.006	0.078	-0.009	-0.017	-0.032	-0.057
Upper Egypt	-0.027	-0.039	-0.001	-0.025	0.016	-0.035
Job Characteristics						
Job Group: Specialised	0.011	-0.098	0.057	0.020	0.019	-0.486
Technical	-0.023	-0.019	-0.040	0.016	-0.002	-0.180
Clerical	0.079	-0.078	0.127	0.025	-0.002	-0.354
Skilled Manual	-0.030	0.013	-0.079	-0.004	0.017	-0.398
Unskilled Manual	-0.024	-0.039	-0.022	0.001	-0.004	-0.159
Activity:Industry	0.000	0.000	0.001	-0.142	0.028	-0.040
Services	-0.013	0.244	0.003	-0.120	-0.031	-0.007
Total of Characteristics	0.044	-0.186	0.034	-0.387	0.379	-1.784
Constant Term		0.298		0.454		2.110
Total Pay Differential	0.044	0.113	0.034	0.067	0.379	0.326
Implied Discrimination Coeficient (%)		11.9%		6.9%		38.6%

Source: CAPMAS, 1990 Establishment Survey.
Notes: All entries are for differential in mean logarithm of wages. The discrimination coeficient is calculated as exponent of unexplained component of the differential minus 1.

Table 4 Estimates Of the Ordered Probit Model of Occupational Attainment

Variable	MALES			FEMALES		
	Government	Public Enterprise	Private	Government	Public Enterprise	Private
Experience	0.049 ***	0.044 ***	0.052 ***	-0.014	0.055 *	0.054 ***
	(.005)	(.003)	(.004)	(.021)	(.029)	(.010)
Experience2	-0.0003 ***	-0.0003 ***	-0.0004 ***	0.0015 ***	-0.0005	-0.0003 ***
	(.00007)	(.00005)	(.00006)	(.0005)	(.0007)	(.0001)
Educational level						
Primary School	1.378 ***	0.579 ***	0.218	1.643 *	0.168	0.704 *
	(.201)	(.105)	(.169)	(.969)	(.399)	(.365)
Preparatory School	2.539 ***	1.519 ***	0.757 ***	2.746 ***	1.024 ***	0.319
	(.189)	(.095)	(.108)	(.402)	(.235)	(.264)
Secondary School	3.836 ***	3.016 ***	2.177 ***	3.250 ***	3.348 ***	1.798 ***
	(.155)	(.075)	(.072)	(.313)	(.239)	(.152)
Two Year College	3.906 ***	3.208 ***	2.491 ***	3.724 ***	3.721 ***	2.250 ***
	(.207)	(.136)	(.128)	(.353)	(.329)	(.240)
University	6.755 ***	5.735 ***	4.390 ***	6.384 ***	6.463 ***	3.860 ***
	(.205)	(.162)	(.095)	(.358)	(.436)	(.187)
Region						
Lower Egypt	-0.064	0.313 ***	0.277 ***	-1.272	0.013 *	0.193
	(.082)	(.055)	(.051)	(.142)	(.202)	(.113)

Upper Egypt	-0.045	0.224 ***	0.132 *	0.174	0.952	0.072
	(.080)	(.058)	(.068)	(.136)	(.228)	(.130)
Ancillary Parameters						
First Separation Point	1.088	-0.588	0.585	-0.588	-1.433	-0.184
	(.112)	(.061)	(.067)	(.302)	(.289)	(.138)
Second Separation Point	2.401	2.557	2.015	2.557	2.265	1.880
	(.142)	(.080)	(.080)	(.321)	(.279)	(.174)
Third Separation Point	4.175	3.103	2.808	3.100	4.598	2.909
	(.182)	(.086)	(.087)	(.361)	(.347)	(.184)
Fourth Separation Point	5.412	4.616	3.763	4.620	4.929	3.474
	(.193)	(.108)	(.097)	(.364)	(.353)	(.191)
Fifth Separation Point	8.901	7.342	6.238	7.340	8.999	6.650
	(.258)	(.193)	(.130)	(.467)	(.583)	(.342)
Log Likelihood	**-1086.27**	**-2329.36**	**-2496.29**	**-384.19**	**-291.85**	**-634.44**
Sample Size	**1391**	**3541**	**2403**	**697**	**529**	**631**

Source: CAPMAS, 1990 Establishment Survey.

Notes: The dependent variable is occupational / job group ordered in an ascending order by average wage. The ancillary parameters are the various seperation points (threshold levels) that model the categori ordered probit model . Standard errors are in parenthethis. * denotes significance at the 10 percent level, ** denotes significance at the five percent level and *** denotes significance at the 1 percent level.

Table 5 Predicted and Actual Occupational Distributions

Job Group	Managerial	Specialised	Technical	Clerical	Skilled Manual	Unskilled Manual	**Duncan's Index of Dissimilarity v's actual male**	**Segregation Index v's actual male**
	A. Government							
Actual Distributions								
Male (P^m)	0.02	0.33	0.16	0.22	0.13	0.14		
Female (P^f)	0.00	0.34	0.06	0.57	0.04	0.03	0.34	0.21
Predicted Female Distribution								
Using Male Coeficients	0.02	0.35	0.28	0.29	0.04	0.03	0.20	0.09
	B. Public Enterprise							
Actual Distributions								
Male (P^m)	0.02	0.20	0.14	0.14	0.38	0.13		
Female (P^f)	0.01	0.31	0.05	0.44	0.17	0.02	0.41	0.24
Predicted Female Distribution								

Using Male Coeficients	0.03	0.26	0.30	0.10	0.29	0.02	0.22	0.13
	C. Private							
Actual Distributions								
Male (P^m)	0.05	0.27	0.16	0.11	0.30	0.12		
Female (P^f)	0.00	0.24	0.10	0.17	0.43	0.05	0.20	0.10
Predicted Female Distribution								
Using Male Coeficients	0.05	0.31	0.13	0.13	0.16	0.24	0.17	0.03

Source: CAPMAS, 1990 Establishment Survey.

Note: Duncan's Index of Dissimilarity = $0.5 \Sigma |P_{mi} - P_{wi}|$ where P_{mi} and P_{wi} are the proportion of females and males respectively in the i^{th} job group.

Segregation Index = $\Sigma T_t (P_i - P)^2/TP(1-P)$ where P_i is the proportion of females and Ti is the total number of people in the i^{th} job group.

Table 6 Top Five Three Digit Occupations in 1990 Establishment Survey, by Gender and Sector

Sector	Male		Female	
	Occupation	*% of total employment*	*Occupation*	*% of total employment*
Government	Office Clerics	17%	Office Clerics	38%
	Building Caretakers	13%	Book Keepers	9%
	Engineering Technicians	7%	Accountants	9%
	Accountants	5%	Typists	9%
	Book Keepers	3%	Unspecified specialised posts [1]	4%
	Total Top Five Occupations	**46%**	**Total Top Five Occupations**	**69%**
Public Enterprise	Office Clerics	9%	Office Clerics	39%
	Building Caretakers	9%	Accountants	8%
	Engineering Technicians	6%	Typists	5%
	Accountants	6%	Chemical Operation Workers	4%
	Truck drivers	4%	Book Keepers	4%
	Total Top Five Occupations	**34%**	**Total Top Five Occupations**	**59%**
Private Sector	Accountants	8%	Sewing and Embroidery Worker	14%
	Truck Drivers	7%	Typists	13%
	Building Care Takers	7%	Unspecified Production workers	9%
	Engineering Technicians	6%	Accountants	6%
	Managers	4%	Qualified Nurses	4%
	Total Top Five Occupations	**31%**	**Total Top Five Occupations**	**45%**

Source: CAPMAS, 1990 Establishment Survey. Notes: Occupations are ordered in descending order according to the their proportion in total employment.

Table 7 Intraoccupational-interoccupational Decomposition of Gender Wage Gaps

	Government	Public Enterprise	Private
Total Gender Gap (in log hourly wage)	0.15	0.09	0.75
Intra Occupational	0.19	0.13	0.44
Justified	0.14	0.06	0.05
Discrimination	0.05	0.07	0.39
Inter Occupational	-0.04	-0.04	0.32
Justified	0.00	-0.11	0.02
Segregation	-0.04	0.07	0.30
Proportion of Total Gap			
Justified Intra Occupational	0.91	0.63	0.06
Justified Inter Occupational	0.02	-1.16	0.03
Intra Occupational Discrimination	0.33	0.74	0.52
Inter Occupational Segregation	-0.26	0.78	0.40
Unjustified Component as Proportion of Total Gap	0.07	1.52	0.92
Percent of Female Hourly Wage			
(1) Justified Intra Occupational	14.5%	6.0%	4.8%
(2) Justified Inter Occupational	0.3%	-10.1%	2.0%
(3) Intra Occupational Discrimination	5.1%	7.1%	47.4%

(4) Inter Occupational Segregation	-3.8%	7.5%	34.7%
Unjustified Component as % of Female Hourly Wage (3+4)	1.3%	14.6%	82.1%

Source: Calculated using equations (7a) and 7(b) based on CAPMAS, 1990 Establishment Survey. Notes: The unjustified component as % of female hourly wages is calculated as the exponent of the differential in log hourly wages minus 1.

Table 8 Difference in Public Premia in moving from the 10th to 90th Wage Quantile

	Difference in premia yielded by quantile regressions	Proportion due to difference in residual variance from OLS Regressions.
Males		
Government-Private	-0.35	-0.18
Public Enterprise-Private	-0.88	-0.14
Females		
Government-Private	-0.53	-0.22
Public Enterprise-Private	-0.72	-0.15

Source: Tables E.1 - E.3.

Table 9 Incidence of Non-wage Benefits Across Quantiles of the Wage Distribution (1988 Labour Force Sample Survey).

(Percent of private sector establishments offering the benefit)

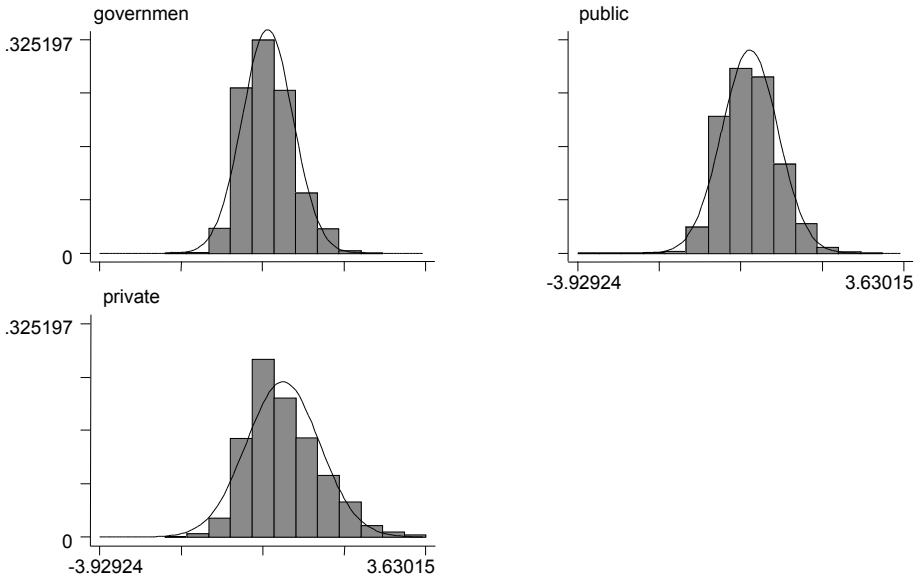
Benefit	MALES					FEMALES				
	Quantile					*Quantile*				
	0.1	*0.25*	*0.5*	*0.75*	*0.9*	*0.1*	*0.25*	*0.5*	*0.75*	*0.9*
Social Security	39.5	44.9	52.8	57.5	59.0	70.3	72.9	74.6	77.7	79.4
Medical Insurance	19.5	24.0	30.0	34.1	34.8	51.8	54.0	57.1	56.7	55.9
Paid Vacation	20.4	26.0	32.4	36.0	37.4	44.4	56.7	58.7	61.1	61.7
Paid Sick Leave	20.8	27.1	33.7	36.2	37.4	51.8	62.2	65.0	64.4	63.7

Source: Author's calculation based on raw data of 1988 Labour Force Sample Survey.

Notes: Private Establishments are limited to non-agricultural sector establishments employing 10 or more employees (which is broadly taken to represent the "organised sector").

Chart 1: Distribution of Log Hourly Wages by Sector and Gender

A. Males



B. Females

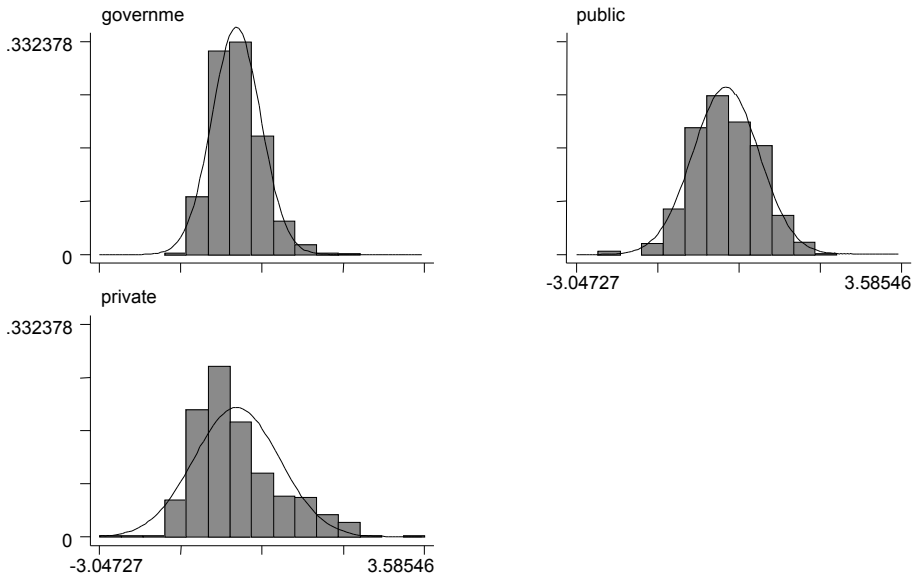
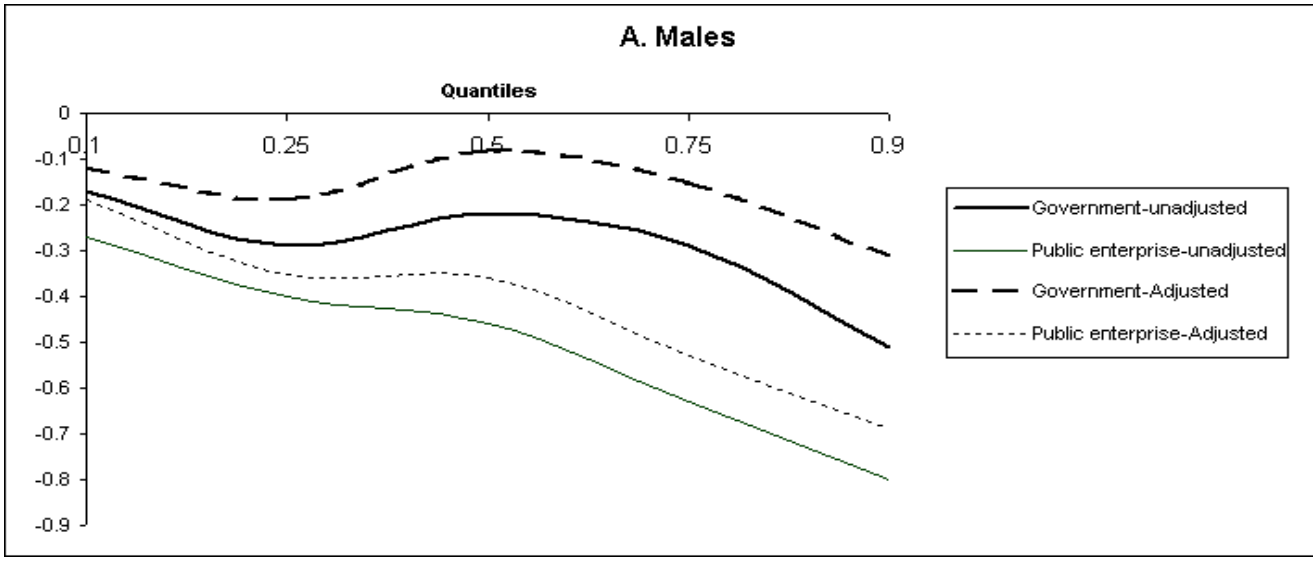
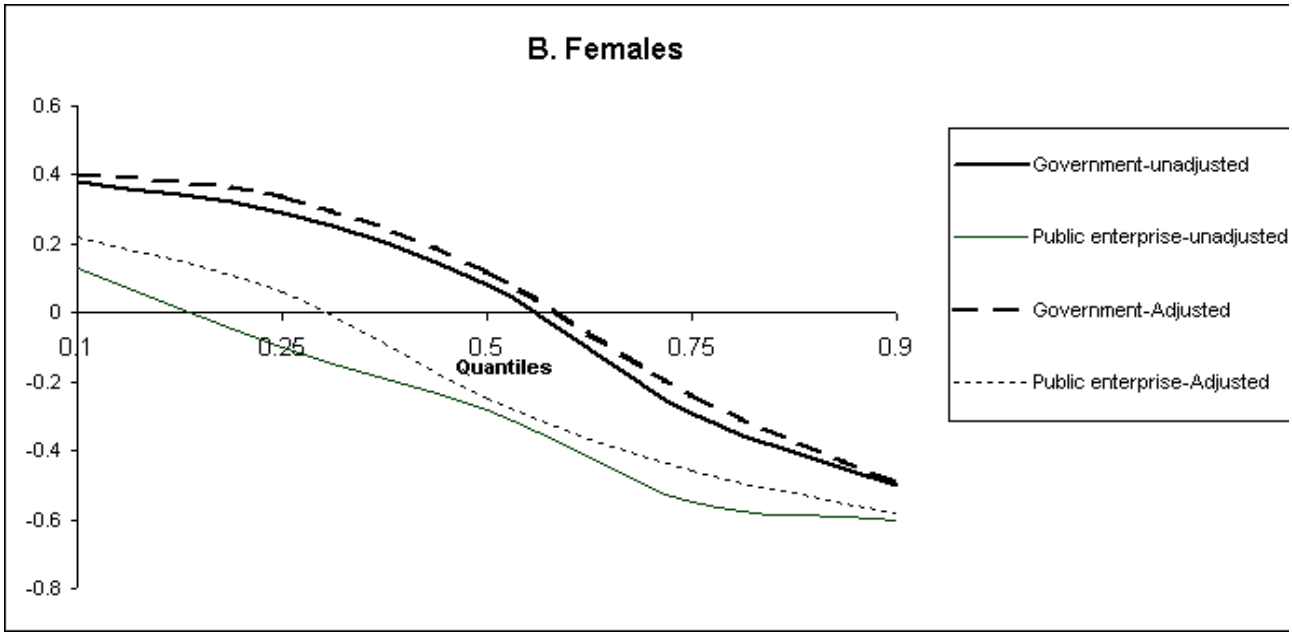


Chart 2 The Distribution of Public Sector Wage Premia

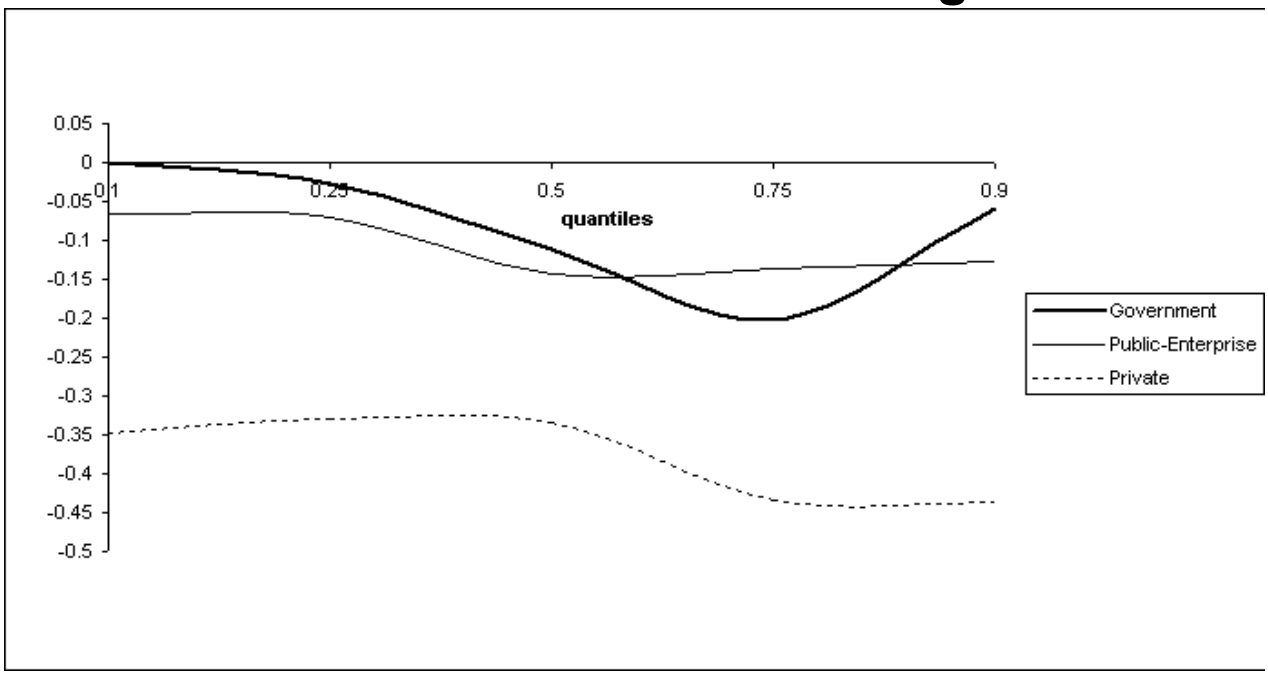




Source: Tables E.1 - E.3.

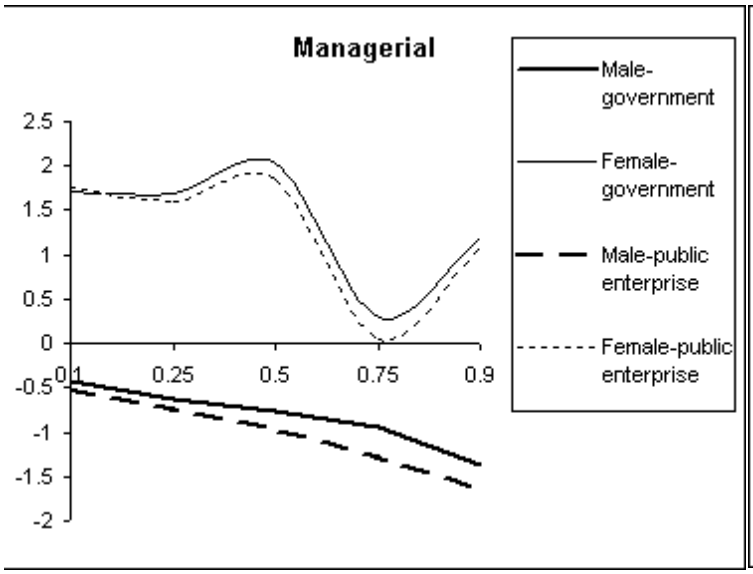
Notes:Solid lines are the public wage premia unadjusted for differences in non-wage ben
Dashed lines are the public wage premia adjusted for the public-private differences i
Probability of second-job holding.

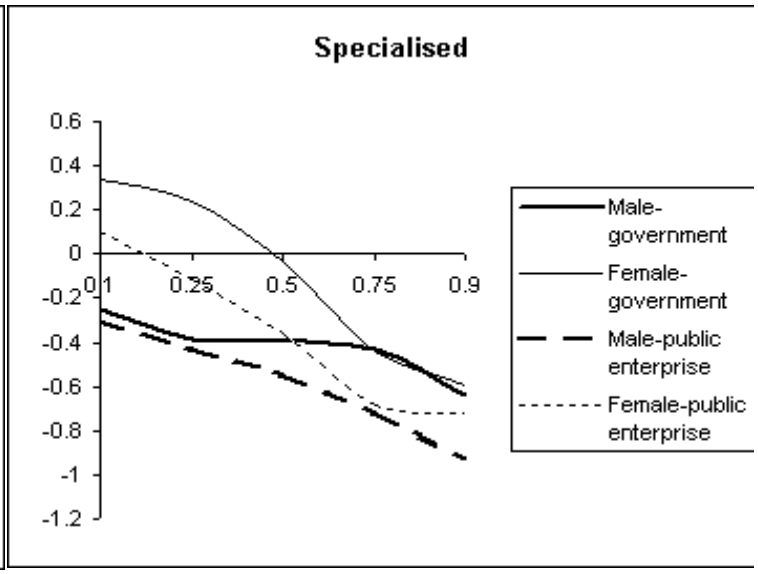
Chart 3 The Distribution of Gender Wage Differentia

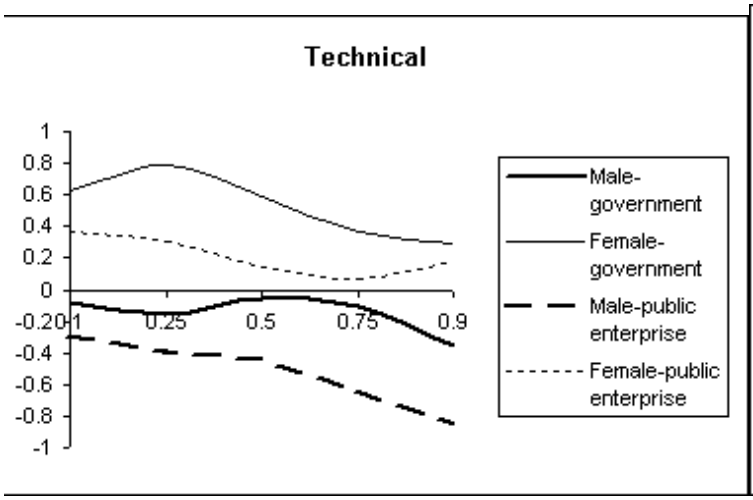


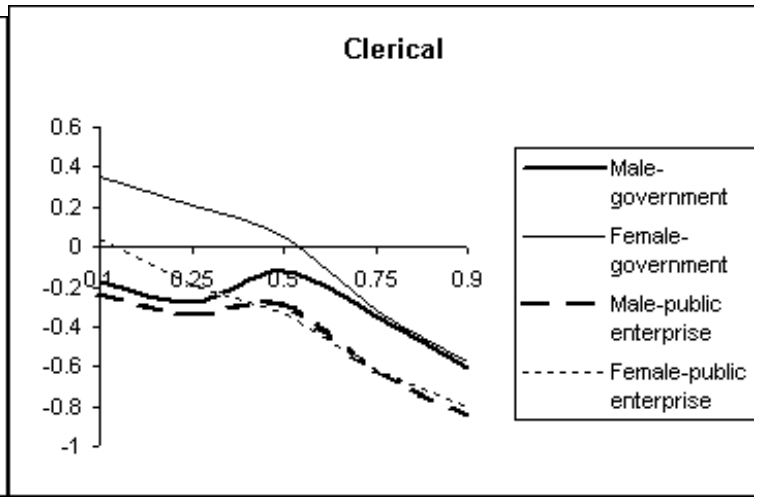
Source: Tables E.1 - E.3.

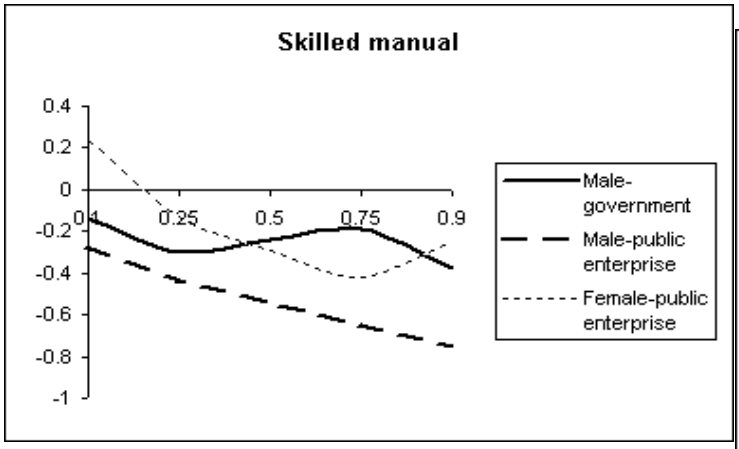
Chart 4 Public-Private Wage Differentials across quantiles and Occupations

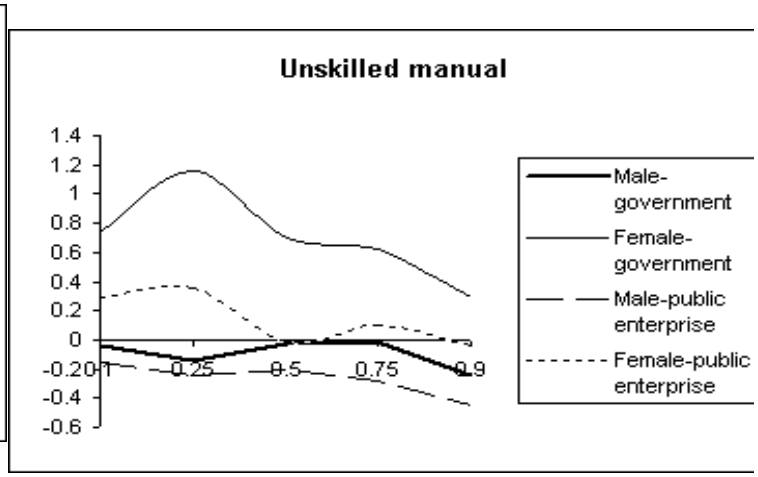






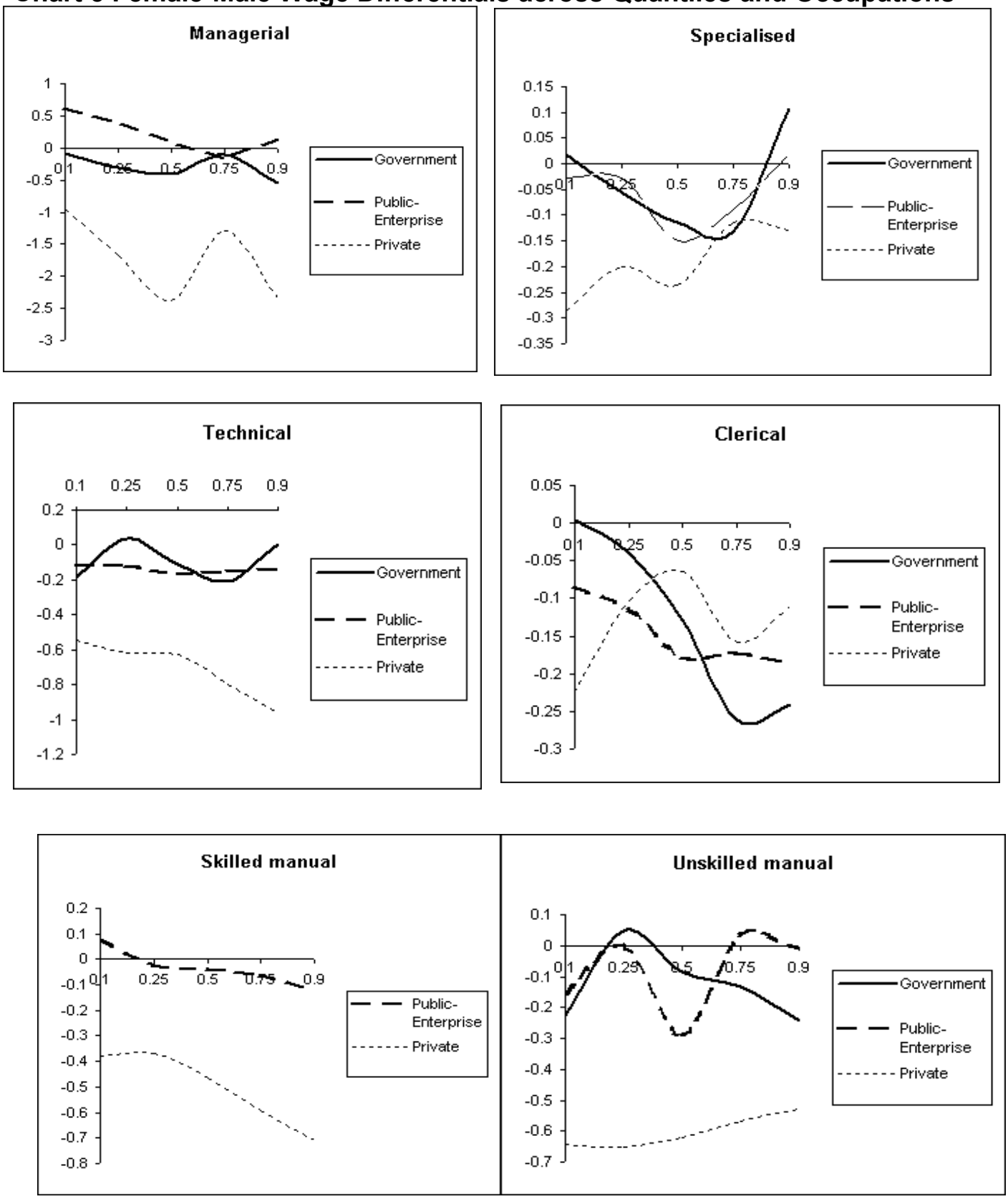






Source: Tables E.1 - E.3.

Chart 5 Female-Male Wage Differentials across Quantiles and Occupations



Source: Tables E.1 - E.3.

APPENDIX 5.A The Joint Model of Sector Selection and Wage Determination

The correction for sector selection bias implemented on wage equations in this paper is based on a variant of the standard two stage selectivity model (studied by Heckman, 1976 and 1979), with a multinomial logit selection rule (developed by Lee 1982 and 1983) which predicts the probability of selection in three sectors of employment. [27] In this model, it is assumed that there are three distinct sectors in the labour market: government, public enterprise and private denoted by g, p and r respectively. The natural logarithm of hourly wages of individual i in sector s are determined by the following relationship:

$$\ln\left(w_{s_i}\right) = \beta_s X_i + u_s \qquad (s = g, p, r) \qquad \text{(A.1)}$$

Where X is the vector of productivity-related characteristics of each individual, the β's are vectors of parameters to be estimated and the u's denote random disturbances assumed to have zero mean conditional on X.

As for the process of sectoral allocation of workers, like in the binary choice model of Paper 4, it is postulated that an individual is observed working in a particular sector only if he or she both desires to be in that sector and can find employment in that sector. Thus, the unobserved propensity of individual i to work in sector s can be written as:

$$I^*_{s_i} = \gamma_s Z_i + \eta_s \qquad (s = g, p, r) \qquad \text{(A.2)}$$

Where Z is the vector of variables that affect employee preferences for sectors or employer preference for workers, γ is vector of parameters to be estimated and η's are random disturbances assumed to have zero mean conditional on Z. I is a polychotomous variable with values g, p, r and I = s if the worker is allocated to the s^{th} sector. This occurs if his or her unobserved propensity (determined by the individual or supply side factors and employer or demand side factors) is largest in that sector:

$$I_i = s \quad \text{if} \quad I^*_s > \text{Max} I^*_j \qquad (j = g, p, r : j \neq s) \qquad \text{(A.3)}$$

If we assume that η's are independently and identically distributed with type I extreme value distribution, then workers' sectoral allocation (equation system A.2) can be analysed using the multinomial logit model, which yields the following probabilities of sectoral allocation:

$$P_{s_i} = \text{Prob}\left(I_i = s\right) = \frac{\exp\left(\gamma_s Z\right)}{\sum_{s=g,p,r} \exp\left(\gamma_s Z\right)} \qquad (s = g, p, r) \qquad \text{(A.4)}$$

[27] See Maddala (1983: 275-278) for a general formulation of these types of polychotomous-choice models. .

Where P_{si} is the probability that individual i will be allocated to sector s. Note that only two sets of γ 's can be determined independently as the sum of probabilities equals 1. If we adopt $\gamma_r = 0$, then the parameter estimates in the sectoral allocation equation system (A.4) should be interpreted as the effect of a given characteristic on the probability of allocation to sector s relative to the probability of allocation to private sector (i.e. P_s / P_r). Now returning to the wage equation (equation system 1), Ln w_{si} is observed if individual ii is allocated to sector s. Taking the expectation of (A.1) conditional on the outcome of the sectoral allocation process yields:

$$E\left[\ln\left(w_{Si}\right)\middle|I_i = s\right] = \beta_S X_i + E\left(u_S \middle| I_i = s\right) \qquad \left(s = g, p, r\right) \quad \text{(A.5)}$$

If $E\left(u_s \middle| I_i = s\right) \neq 0$ this means that individuals in a given sector do not constitute a random subset of the population, but are non-randomly selected on basis of their unobserved characteristics. Using Lee's (1982) procedure to correct for selectivity, the conditional expectation in (A.5) above can be written as :

$$E\left(u_S \middle| I_i = s\right) = \sigma_s \lambda_s \qquad \left(s = g, p, r\right) \quad \text{(A.6)}$$

where

$$\lambda_S = \phi \frac{\left[\Phi^{-1}\left(P_S\right)\right]}{P_S} \qquad \left(s = g, p, r\right) \quad \text{(A.6-a)}$$

Φ and ϕ are standard univariate normal density and distribution functions, respectively. λ's are inverse Mill's ratios (sample selection terms) from the multinomial logit selection model. The parameters of the system of equations in (A.1) can be estimated consistently by least square regression of log wages on X's and the λ's as additional regressors.[28]

[28] Lee (1983) noted that the presence of selectivity will require a correction for inconsistent standard errors of the wage equations as the error terms are heteroscedastic.

APPENDIX B. Descriptive Statistics on Variables Used in Estimation

Table B.1: Means and Standard Deviations of Variables by Sector and Gender

Variable	Male						Female						Total	
	Government		Public Enterprise		Private		Government		Public Enterprise		Private			
	mean	*S.D.*	*mean*	*S.D.*	*mean*	*S.D.*	*mean*	*S.D.*	*mean*	*S.D.*	*mean*	*S.D.*	*mean*	*S.D.*
Log Hourly Wage	-0.039	0.578	0.060	0.648	0.317	0.850	-0.192	0.494	-0.031	0.675	-0.438	0.872	0.062	0.729
Age	42.05	9.81	39.96	9.26	36.55	9.78	35.92	7.84	35.26	8.09	28.76	8.81	38.01	9.87
Age^2	1864.53	856.55	1682.54	770.31	1431.48	803.91	1351.46	605.56	1308.53	589.10	904.91	640.10	1542.00	802.52
Experience	18.30	11.58	16.45	11.16	11.88	11.52	12.79	8.02	13.30	7.85	7.53	9.87	14.44	11.27
$Experience^2$	468.98	783.95	394.79	792.01	273.64	880.55	227.65	268.24	238.28	265.03	153.41	853.57	335.18	777.85
Tenure	16.98	10.21	14.93	10.24	7.28	8.71	12.15	7.82	12.45	7.59	5.98	8.48	12.24	10.20
No qualification	0.24	0.43	0.39	0.49	0.32	0.47	0.04	0.19	0.13	0.33	0.21	0.41	0.29	0.46
Primary school	0.03	0.17	0.04	0.21	0.02	0.14	0.00	0.07	0.02	0.14	0.02	0.15	0.03	0.17
Preparatory school	0.05	0.21	0.07	0.25	0.04	0.20	0.05	0.21	0.07	0.26	0.04	0.20	0.06	0.23
Secondary school	0.35	0.48	0.24	0.43	0.25	0.43	0.56	0.50	0.45	0.50	0.38	0.49	0.31	0.46
Above Secondary	0.04	0.20	0.04	0.20	0.03	0.18	0.08	0.27	0.07	0.25	0.05	0.21	0.04	0.20
University and above	0.28	0.45	0.15	0.36	0.31	0.46	0.27	0.44	0.22	0.41	0.25	0.44	0.23	0.42
Higher Deg. after Appoint.	0.12	0.33	0.06	0.23	0.03	0.18	0.13	0.34	0.06	0.25	0.02	0.15	0.06	0.24

Greater Cairo	0.39	0.49	0.59	0.49	0.43	0.50	0.49	0.50	0.78	0.41	0.52	0.50	0.52	0.50
Lower Egypt	0.30	0.46	0.21	0.41	0.40	0.49	0.26	0.44	0.13	0.34	0.30	0.46	0.28	0.45
Upper Egypt	0.31	0.46	0.20	0.40	0.16	0.37	0.25	0.43	0.09	0.28	0.18	0.38	0.20	0.40
Managerial	0.02	0.15	0.02	0.15	0.05	0.21	0.00	0.05	0.01	0.11	0.00	0.06	0.03	0.16
Specialised	0.33	0.47	0.20	0.40	0.27	0.45	0.34	0.47	0.31	0.46	0.24	0.43	0.26	0.44
Technical	0.16	0.37	0.14	0.34	0.16	0.36	0.06	0.24	0.05	0.22	0.10	0.30	0.13	0.34
Clerical	0.22	0.41	0.14	0.35	0.11	0.31	0.57	0.50	0.44	0.50	0.17	0.38	0.19	0.40
Skilled manual	0.13	0.34	0.38	0.48	0.30	0.46	0.00	0.07	0.17	0.37	0.43	0.50	0.28	0.45
Unskilled manual	0.13	0.34	0.13	0.33	0.12	0.32	0.03	0.16	0.02	0.15	0.05	0.21	0.11	0.31
Agriculture	0.06	0.24	0.06	0.24	0.15	0.36	0.02	0.15	0.13	0.33	0.06	0.23	0.09	0.28
Industry	0.00	0.03	0.59	0.49	0.61	0.49	0.00	0.00	0.53	0.50	0.63	0.48	0.46	0.50
Services	0.94	0.24	0.35	0.48	0.24	0.43	0.98	0.15	0.34	0.47	0.31	0.46	0.45	0.50
Selection term	1.56	0.39	0.76	0.35	1.26	0.34	1.18	0.59	1.07	0.52	1.35	0.36	--	--
Sample Size	**1400**		**3586**		**2474**		**701**		**562**		**655**		**9380**	

Source: CAPMAS, 1990 Establishment Survey.

Notes: With the exception of log hourly wages, age, experience and the selection term all variables in the above table are dummies, therefore the mean refers to the percentage of the relevant variable in the sample.

PENDIX C. Occupation weights Used in Wage Regressions

ole C.1 Occupation Weights in the 1990 Establishment Survey

	Sample Observations (n_i)			Population (N_i)			Weights [(Ni/ni)/SNi/ni]		
upation	Government	Public Ent.	Government	Public Ent.	Private	Private	Government	Public Ent.	Private
nical and Scientific	810	967	0.141	0.078	0.101	72492	0.141	0.078	0.101
agerial and inistrative	16	47	0.423	0.232	0.066	10851	0.423	0.232	0.066
ical	807	973	0.090	0.080	0.133	52604	0.090	0.080	0.133
s	17	172	0.011	0.067	0.202	19788	0.011	0.067	0.202
ices	214	511	0.158	0.044	0.182	56068	0.158	0.044	0.182
cultural	35	8	0.080	0.371	0.105	4108	0.080	0.371	0.105
uction	202	1469	0.098	0.128	0.211	198842	0.098	0.128	0.211
l	2101	4147	1	1	1	414753	1	1	1

ce: The number of observations are from CAPMAS, 1990 Establishment Survey.The population figures for the government and public enterprise sectors are from CAPMAS, lts of the 1986 Population Census. The population figures for private enterprises are from CAPMAS "Employment, Wages and Hours of Work Survey", 1989 as it it is limited only to organised establishments in the private sector.

APPENDIX D. Multinomial Logit Estimates of Sector Selection Equation

Table D.1: Sector Selection Equation Estimates

Variable	MALES				FEMALES			
	Government		Public Enterprise		Government		Public Enterprise	
	prob	*S.E.*	*prob*	*S.E.*	*prob*	*S.E.*	*prob*	*S.E.*
Constant	-5.363 ***	0.515	-1.272 ***	0.333	-12.151 ***	0.987	-7.150 ***	0.860
Age	0.160 ***	0.024	0.133 ***	0.016	0.507 ***	0.052	0.415 ***	0.049
Age^2	-0.001 ***	0.000	-0.001 ***	0.000	-0.005 ***	0.001	-0.005 ***	0.001
Primary school	0.575 *	0.262	0.234	0.189	0.558	0.794	0.235	0.440
Preparatory school	0.128	0.206	-0.531 ***	0.136	1.677 ***	0.390	0.187	0.314
Secondary school	0.728 ***	0.106	-1.031 ***	0.078	2.019 ***	0.234	-0.873 ***	0.174
Above Secondary	0.680 ***	0.214	-1.146 ***	0.170	2.002 ***	0.328	-0.799 ***	0.301
University and above	0.430 ***	0.103	-2.179 ***	0.087	1.297 ***	0.240	-1.761 ***	0.196
Lower Egypt	-0.108	0.092	-0.753 ***	0.069	0.792 ***	0.160	-0.373 *	0.162
Upper Egypt	0.795 ***	0.102	-0.041	0.085	0.765 ***	0.167	-1.218 ***	0.220
Log Likelihood	**-6046.097**				**-1710.905**			
Goodness of fit- χ^2	**1774.860**				**783.16**			
Sample Size	**7460**				**1918**			

Source: CAPMAS, 1990 Establishment Survey.

Note: The dependent variable is equal to 1 if person is employed in government; it is equal to 2 if employed in public enterprises and is equal to 3 if employed in the private sector. Parameters of the private sector equation are normalised to zero to serve as the reference category.

APPENDIX E. Estimates of Quantile Regressions of Wage Equations

Table E.1 Quantile Regressions of Wage Equations: Government

Variable	MALES										FEMALES									
	Quantile										*Quantile*									
	0.1		*0.25*		*0.5*		*0.75*		*0.9*		*0.1*		*0.25*		*0.5*		*0.75*		*0.9*	
Experience	0.040	***	0.045	***	0.039	***	0.032	***	0.028	***	0.064	***	0.063	***	0.062	***	0.056	***	0.052	***
	(.003)		(.003)		(.003)		(.004)		(.004)		(.008)		(.007)		(.004)		(.007)		(.010)	
	(.003)		(.007)		(.005)		(.002)		(.0072)		(.009)		(.009)		(.011)		(.016)		(.019)	
Experience2	-0.0004	***	-0.0005	***	-0.0003	***	-0.0003	***	-0.0002	***	-0.0008	***	-0.0008	***	-0.0007	***	-0.0005	***	-0.0005	*
	(.00002)		(.00002)		(.00003)		(.00003)		(.00002)		(.0002)		(.0001)		(.0001)		(.0001)		(.0002)	
	(.00009)		(.0001)		(.0001)		(..00006)		(.00005)		(.0002)		(.0003)		(.0002)		(.0002)		(.0003)	
Tenure	0.012	***	0.008	***	0.004		0.011	***	0.012	***	0.002		0.006		0.003		0.002		0.005	
	(.002)		(.002)		(.002)		(.003)		(.003)		(.003)		(.004)		(.003)		(.005)		(.005)	
	(.004)		(.004)		(.004)		(.006)		(.004)		(.008)		(.006)		(.009)		(.013)		(.019)	
Educational Level																				
Primary School	0.092		0.089		0.094		0.069		0.106		0.077		-0.170		-0.422	***	-0.005	***	-0.094	
	(.072)		(.090)		(.076)		(.082)		(.080)		(.080)		(.153)		(.123)		(.112)		(.123)	
	(.064)		(.099)		(.097)		(.058)		(.091)		(.407)		(.332)		(.404)		(.746)		(.911)	
Preparatory School	0.173	*	0.282	***	0.285	***	0.154	**	0.192	**	-0.188	***	-0.207		-0.415	***	-0.327	***	-0.294	***
	(.088)		(.086)		(.080)		(.080)		(.076)		(.072)		(.132)		(.085)		(.090)		(.102)	

	(.138		(.145)		(.096)		(.041)		(.074)		(.460)		(.225)		(.232)		(.655)		(.955)	
Secondary School	0.224	***	0.298	***	0.283	***	0.248	***	0.230	***	-0.096	**	-0.142		-0.322	***	-0.267	***	-0.222	***
	(.083)		(.087)		(.077)		(.079)		(.092)		(.051)		(.124)		(.078)		(.074)		(.079)	
	(.101)		(.116)		(.077)		(.047)		(.080)		(.463)		(.241)		(.239)		(.633)		(.979)	
Two Year College	0.226	**	0.305	**	0.229	***	0.285	***	0.213	**	0.004		-0.000		-0.225		-0.207	**	-0.167	*
	(.095)		(.101)		(.093)		(.095)		(.096)		(.062)		(.129)		(.081)		(.083)		(.098)	
	(.112)		(.127)		(.118)		(.052)		(.097)		(.442)		(.249)		(.231)		(.633)		(.992)	
	0.464	***	0.577	***	0.510	***	0.568	***	0.624	***	0.177	***	0.087		-0.105	***	0.113		0.102	
	(.105)		(.102)		(.094)		(.096)_		(.049)		(.060)		(.133)		(.086)		(.103)		(.190)	
	(.110)		(.120)		(.084)		(.093)		(.114)		(.454)		(.272)		(.250)		(.649)		(1.02)	
Higher degree after appointment	0.113	***	0.097	**	0.041	***	0.065		0.083	*	0.162	***	0.141	***	0.088	***	0.155	***	0.053	
	(.039)		(.042)		(.044)		(.046)		(.036)		(.028)		(.036)		(.029)		(.054)		(.111)	
	(.050)		(.038)		(.076)		(.057)		(.046)		(.055)		(.064)		(.042)		(.111)		(.115)	
Region																				
Lower Egypt	0.071	**	0.096	***	0.262	***	0.623	***	0.614	***	0.008		-0.006		-0.053	***	-0.019	*	0.342	***
	(.028)		(.030)		(.029)		(.033)		(.030)		(.027)		(.029)		(.019)		(.028)		(.043)	
	(.028)		(.041)		(.106)		(.037)	(.0222)	(.022)		(.023)		(.038)		(.027)		(.024)		(.091)	
Upper Egypt	-0.079	***	-0.119		-0.204	***	-0.163	***	-0.111	***	-0.054	*	-0.071	**	-0.110	***	-0.056		0.251	***
	(.025)		(.028)		(.027)		(.030)		(.102)		(.028)		(.029)		(.019)		(.028)		(.044)	
	(.025)		(.028)		(.021)		(.026)		(.032)		(.021)		(.032)		(.034)		(.028)		(.116)	
Job Characteristics																				
Job Group: Specialised	-0.312	***	-0.358	***	-0.460	***	-0.388	***	-0.660	***	-0.228	**	-0.546	***	-0.363	***	-0.085		0.143	
	(.068)		(.077)		(.081)		(.101)		(.115)		(.106)		(.133)		(.061)		(.065)		(.096)	
	(.091)		(.077)		(.086)		(.140)		(.235)		(.354)		(.331)		(.347)		(.415)		(.645)	
Technical	-0.238	**	-0.274	***	-0.426	***	-0.404	***	-0.677	***	-0.313	**	-0.480	***	-0.348	***	-0.090		-0.112	
	(.094)		(.102)		(.100)		(.117)		(.117)		(.129)		(.150)		(.077)		(.108)		(.214)	

	(.114)		(.084)		(.093)		(.133)		(.226)		(.388)		(.333)		(.318)		(.435)		(.633)	
Clerical	-0.296	***	-0.322	***	-0.497	***	-0.368	***	-0.654	***	-0.188		-0.514	***	-0.371	***	-0.082		-0.020	
	(.094)		(.099)		(.099)		(.117)		(.138)		(.120)		(.142)		(.073)		(.106)		(.212)	
	(.109)		(.095)		(.096)		(.146)		(.226)		(.3702)		(.318)		(.338)		(.419)		(.637)	
Skilled Manual	-0.195		-0.185		-0.295	***	-0.282	**	-0.565	***	-0.074		-0.437	***	-0.414	***	1.340	***	0.952	***
	(.126)		(.131)		(.124)		(.141)		(.144)		(.121)		(.161)		(.142)		(.137)		(.185)	
	(.158)		(.132)		(.090)		(.161)		(.259)		(.650)		(.628)		(.952)		(.1.13)		(1.28)	
Unskilled Manual	-0.355	***	-0.317	**	-0.542	**	-0.494	***	-0.773	***	-0.775	***	-0.833	***	-0.923	***	-0.577	***	-0.886	***
	(.129)		(.133)		(.127)		(.143)		(.121)		(.146)		(.203)		(.117)		(.147)		(.264)	
	(.149)		(.144)		(.099)		(.154)		(.273)		(.643)		(.416)		(.402)		(.607)		(1.08)	
Activity:Industry	0.643	***	0.547	***	0.410	***	0.696	***	0.441	***										
	(.074)		(.078)		(.081)		(.095)		(.076)											
	(.270)		(.273)		(.309)		(.366)		(.355)											
Services	0.235	***	0.335	***	0.486	***	0.828	***	0.675	***	0.216	***	0.151	**	0.095	*	0.224	***	0.777	***
	(.054)		(.049)		(.051)		(.063)		(.205)		(.055)		(.071)		(.053)		(.071)		(.088)	
	(.046)		(.094)		(.107)		(.053)		(.054)		(.120)		(.092)		(.070)		(.035)		(.152)	
Constant	-1.369	***	-1.344	***	-0.985	***	-1.262	***	-0.662	***	-1.225	***	-0.696	***	-0.383	***	-0.705	***	-1.210	***
	(0.137)		(.145)		(.145)		(.176)				(.126)		((.203)		(.123)		(.163)		(.297)	
	(.176)		(.217)		(.160)		(.163)		(.294)		(.608)		(.412)		(.401)		(.645)		(1.001)	
Psuedo R^2	**0.38**		**0.39**		**0.40**		**0.44**		**0.45**		**0.45**		**0.44**		**0.45**		**0.41**		**0.41**	
Sample Size	**1384**										**694**									
Predicted Wage Differentials:																				

Government-Private										
Unadjusted	-0.17	-0.29	-0.22	-0.29	-0.51	0.38	0.29	0.08	-0.29	-0.50
Adjusted for differences in probability of second job holding	-0.12	-0.19	-0.08	-0.15	-0.31	0.40	0.34	0.12	-0.24	-0.49
Female-Male						-0.01	-0.04	-0.12	-0.21	-0.11

Source: CAPMAS, 1990 Establishment Survey.

Note: The dependent variable is log hourly wages in 1990 Egyptian Pounds. Analytic standard errors calculated using a kernel density function are reported in the first parenthethis. Bootstrap standard errors calculated using 20 iterations are reported in the second parenthesis. * denotes significance at the 10 percent level, ** denotes significance at the five percent level and *** denotes significance at the 1 percent level.

Table E.2 Quantile Regressions of Wage Equations: Public Enterprise

Variable	MALES										FEMALES									
	Quantile										*Quantile*									
	0.1		*0.25*		*0.5*		*0.75*		*0.9*		*0.1*		*0.25*		*0.5*		*0.75*		*0.9*	
Experience	0.033	***	0.032	***	0.041	***	0.044	***	0.043	***	0.032	***	0.020	***	0.029	***	0.045	***	0.035	***
	(.002)		(.001)		(.002)		(.001)		(.003)		(.009)		(.001)		(.007)		(.0005_)		(.006)	
	(.002)		(.002)		(.003)		(.004)		(.005)		(.024)		(.017)		(.013)		(.010)		(.013)	
Experience2	-0.0004	***	-0.0004	***	-0.0004	***	-0.0004	***	-0.0004	***	-0.0002		-0.0002	***	0.0001		-0.0003	***	-0.0003	
	(.00002)		(.00001)		(.00002)		(.00001)		(.00003)		(.0002)		(.00003)		(.0001)		(.00001)		(.0001)	
	(.00002)		(.00003)		(.00005)		(.00004)		(.00002)		(.0003)		(.0002)		(.0003)		(.0002)		(.0003)	
Tenure	0.010	***	0.012	***	0.006	***	0.006	***	0.013	***	0.018	***	0.024	***	0.013	**	0.010	***	0.013	**
	(.002)		(.001)		(.002)		(.001)		(.003)		(.006)		(.001)		(.005)		(.0004)		(.006)	
	(.002)		(.003)		(.003)		(.004)		(.004)		(.019)		(.014)		(.010)		(.008)		(.012)	
Educational Level																				
Primary School	-0.011		0.004		0.067	*	0.126	***	0.182	***	0.169	***	-0.026	**	-0.209	***	-0.443	***	-0.683	***

	(.054)		(.023)		(.039)		(.030)		(.069)		(.053)		(.015)		(.066)		(.005)		(.066)		
	(.054)		(.061)		(.057)		(.033)		(.047)		(.239)		(.057)		(.116)		(.292)		(.336)		
Preparatory School	0.140	***	0.129	***	0.155	***	0.194	***	0.111		0.653	***	0.628	***	0.448	***	0.184	***	-0.056		
	(.050)		(.022)		(.039)		(.032)		(.072)		(.078)		(.011)		(.052)		(.004)		(.078)		
	(.050)		(.054)		(.034)		(.057)		(.054)		(.307)		(.210)		(.141)		(.098)		(.122)		
Secondary School	0.436	***	0.361	***	0.379	***	0.381	***	0.312	***	0.677	***	0.741	***	0.618	***	0.381	***	0.240	***	
	(.064)		(.023)		(.039)		(.029)		(.072)		(.067)		(.011)		(.054)		(.003)		(.073)		
	(.064)		(.031)		(.051)		(.045)		(.090)		(.351)		(.225)		(.131)		(.127)		(.151)		
Two Year College	0.374	***	0.462	***	0.528	***	0.418	***	0.345	***	0.683	***	0.706	***	0.665	***	0.494	***	0.336	***	
	(.086)		(.032)		(.054)		(.039)		(.082)		(.075)		(.013)		(.064)		(.004)		(.083)		
	(.086)		(.088)		(.055)		(.061)		(.093)		(.396)		(.215)		(.136)		(.138)		(.194)		
University	0.440	***	0.527	***	0.643	***	0.667	***	0.693	***	0.907	***	0.968	***	0.888	***	0.717	***	0.616	***	
	(.077)		(.033)		(.055)		(.041)		(.097)		(.071)		(.013)		(.065)		(.005)		(.083)		
	(.077)		(.061)		(.075)		(.050)		(.120)		(.399)		(.232)		(.134)		(.153)		(.263)		
Higher degree after appointment	0.006	***	0.121	***	0.131	***	0.106	***	0.097	***	0.125	***	0.058	***	0.044		-0.007		0.052	***	
	(.050)		(.023)		(.042)		(.033)		(.053)		(.052)		(.009)		(.043)		(.004)		(.031)		
	(.050)		(.043)		(.047)		(.029)		(.034)		(.056)		(.053)		(.076)		(.070)		(.097)		
Region																					
Lower Egypt	-0.240	***	-0.291	***	-0.335	***	-0.341	***	-0.369	***	0.144	***	0.038	***	-0.162	***	-0.452	***	-0.648	***	
	(.028)		(.012)		(.023)		(.018)		(.041)		(.053)		(.008)		(.038)		(.002)		(.054)		
	(.028)		(.012)		(.017)		(.024)		(.026)		(.076)		(.046)		(.066)		(.078)		(.118)		
Upper Egypt	-0.017		-0.090	***	-0.104	***	-0.072	***	-0.118	***	0.089	**	0.340	***	0.220	***	0.020	***	0.093		
	(.028)		(.013)		(.023)		(.019)		(.042)		(.045)		(.007)		(.033)		(.002)		(.038)		
	(.028)		(.016)		(.019)		(.018)		(.016)		(.526)		(.069)		(.057)		(.057)		(.113)		
Job Characteristics																					

Job Group: Specialised	-0.511	***	-0.472	***	-0.321	***	-0.273	***	-0.373	***	-0.821	***	-0.768	***	-0.440	***	-0.184	***	-0.973	***
	(.070)		(.031)		(.054)		(.041)		(.094)		(.056)		(.020)		(.087)		(.006)		(.056)	
	(.070)		(.052)		(.040)		(.078)		(.135)		(.090)		(.096)		(.146)		(.357)		(.417)	
Technical	-0.630	***	-0.492	***	-0.307	***	-0.229	***	-0.246	**	-0.774	***	-0.773	***	-0.366	***	-0.220	***	-1.099	***
	(.083)		(.039)		(.068)		(.053)		(.119)		(.089)		(.023)		(.100)		(.007)		(.083)	
	(.083)		(.068)		(.085)		(.098)		(.178)		(.188)		(.155)		(.189)		(.398)		(.520)	
Clerical	-0.777	***	-0.675	***	-0.413	***	-0.380	***	-0.342	***	-0.939	***	-0.927	***	-0.494	***	-0.240	***	-0.963	***
	(.086)		(.039)		(.068)		(.052)		(.122)		(.069)		(.022)		(.094)		(.007)		(.074)	
	(.086)		(.068)		(.082)		(.084)		(.164)		(.172)		(.124)		(.163)		(.370)		(.494)	
Skilled Manual	-0.595	***	-0.504	***	-0.351	***	-0.286	***	-0.277	**	-0.411	***	-0.304	***	-0.025	***	-0.034		-0.845	***
	(.103)		(.044)		(.075)		(.056)		(.136)		(.082)		(.024)		(.107)		(.008)		(.086)	
	(.103)		(.076)		(.086)		(.098)		(.198)		(.393)		(.258)		(.135)		(.402)		(.536)	
Unskilled Manual	-0.721	***	-0.509	***	-0.341	***	-0.285	***	-0.319	**	-1.089	***	-0.275	***	-0.141	***	0.046		-0.263	**
	(.110)		(.046)		(.081)		(.061)		(.146)		(.090)		(.028)		(.123)		(.009)		(.120)	
	(.110)		(.081)		(.088)		(.096)		(.207)		(.434)		(.302)		(.341)		(.447)		(.555)	
Activity:Industry	-0.210	***	-0.308	***	-0.425	***	-0.494	***	-0.523	***	-0.349	***	-0.331	***	-0.216	***	0.029	***	0.032	
	(.045)		(.020)		(.037)		(.030)		(.064_)		(.038)		(.007)		(.030)		(.002)		(.040)	
	(.045)		(.042)		(.053)		(.046)		(.084)		(.087)		(.052)		(.069)		(.069)		(.118)	
Services	-0.219	***	-0.214	***	-0.230	***	-0.123	***	-0.137	**	0.120	***	0.268	***	0.416	***	0.526	***	0.557	***
	(.051)		(.022)		(.039)		(.030)		(.064)		(.037)		(.007)		(.030)		(.002)		(.038)	
	(.051)		(.044)		(.047)		(.043)		(.090)		(.101)		(.075)		(.052)		(.061)		(.112)	
Constant	-0.267	*	-0.107	**	-0.033		0.107		0.341	**	-0.718	***	-0.596	***	-0.765	***	-0.731	***	0.450	***
	(.119)		(.052)		(.092)		(.071)		(.170)		(.105)		(.027)		(.121)		(.009)		(.106)	
	(.119)		(.119)		(.110)		(.118)		(.268)		(.391)		(.244)		(.200)		(.358)		(.560)	

Psuedo R^2	**0.31**	**0.38**	**0.40**	**0.41**	**0.37**	**0.41**	**0.53**	**0.57**	**0.55**	**0.46**
Sample Size	**3504**					**527**				
Predicted Wage Differentials: Public Enterprise-Private										
Unadjusted	-0.27	-0.40	-0.46	-0.63	-0.80	0.13	-0.10	-0.28	-0.55	-0.60
Adjusted for difference in probability of second job holding	-0.19	-0.35	-0.36	-0.53	-0.69	0.22	0.06	-0.25	-0.46	-0.58
Female-Male						-0.03	-0.07	-0.15	-0.12	-0.10

Source: CAPMAS, 1990 Establishment Survey.

Note: The dependent variable is log hourly wages in 1990 Egyptian Pounds. Analytic standard errors calculated using a kernel density function are reported in the first parenthethis. Bootstrap standard errors calculated using 20 iterations are reported in the second parenthesis. * denotes significance at the 10 percent level, ** denotes significance at the five percent level and *** denotes significance at the 1 percent level.

Table E.3 Quantile Regressions of Wage Equations: Private Sector

Variable	MALES										FEMALES									
	Quantile										Quantile									
	0.1		*0.25*		*0.5*		*0.75*		*0.9*		*0.1*		*0.25*		*0.5*		*0.75*		*0.9*	
Experience	0.046	***	0.052	***	0.054	***	0.049	***	0.052	***	0.076	***	0.095	***	0.091	***	0.092	***	0.075	***
	(.003)		(.002)		(.002)		(.002)		(.003)		(.006)		(.007)		(.006)		(.009)		(.008)	
	(.006)		(.004)		(.004)		(.004)		(.008)		(.009)		(.014)		(.011)		(.013)		(.013)	
Experience2	-0.0008	***	-0.0008	***	-0.0008	***	-0.0005	***	-0.0004	***	-0.0006	***	-0.0008	***	-0.0008	***	-0.0008	***	-0.0006	***
	(.00003)		(.00002)		(.00003)		(.00004)		(.00002)		(.00004)		(.00005)		(.00005)		(.0001)		(.00006)	
	(.0001)		(.00009)		(.0001)		(.00008)		(.0002)		(.0001)		(.0001)		(.0001)		(.0002)		(.0001)	
Tenure	0.031	***	0.026	***	0.018	***	0.016	***	0.015	***	-0.018	***	-0.017	***	-0.003		0.002		0.003	
	(.004)		(.002)		(.002)		(.002)		(.003)		(.006)		(.008)		(.006)		(.011)		(.008)	
	(.005)		(.003)		(.005)		(.004)		(.006)		(.011)		(.013)		(.016)		(.015)		(.013)	
Educational Level																				
Primary School	0.315	***	0.143	*	-0.018		0.031		-0.214		0.149		0.008		-0.238	*	-0.149		0.002	
	(.112)		(.071)		(.110)		(.087)		(.139)		(.095)		(.154)		(.143)		(.235)		(.164)	
	(.081)		(.064)		(.049)		(.143)		(.098)		(.553)		(.392)		(.198)		(.223)		(.243)	
Preparatory School	-0.007		-0.013		-0.090		-0.030		-0.133		0.131		-0.019		-0.047		-0.076		-0.168	
	(.089)		(.059)		(.077)		(.061)		(.103)		(.119_)		(.133)		(.111)		(.205)		(.142)	
	(.057)		(.072)		(.087)		(.092)		(.147)		(.114)		(.132)		(.091)		(.163)		(.165)	
Secondary School	0.237	***	0.156	***	0.164	***	0.238	***	0.087		0.110	**	0.052		-0.174	***	-0.189		-0.092	
	(.078)		(.042)		(.056)		(.046)		(.084)		'(.049)		(.069)		(.064)		(.126)		(.109)	

	(.049)		(.042)		(.050)		(.068)		(.076)		(.114)		(.085)		(.061)		(.085)		(.165)		
Two Year College	0.308	***	0.129	*	0.153		0.141	*	-0.058		0.188	**	0.175		-0.106		0.046		0.027		
	(.115)		(.073)		(.093)		(.077)		(.129)		(.089)		(.128)		(.162)		(.215)		(.176)		
	(.059)		(.080)		(.106)		(.145)		(.171)		(.195)		(.187)		(.162)		(.174)		(.252)		
University	0.564	***	0.481	***	0.601	***	0.585	***	0.358		0.553	***	0.809	***	0.449	***	0.353	***	0.279	*	
	(.112)		(.063)		(.080)		(.068)		(.120)		(.078)		(.105)		(.103)		(.201)		(.158)		
	(.083)		(.080)		(.114)		(.129)		(.074)		(.329)		(.197)		(.186)		(.174)		(.184)		
Higher degree after appointment	0.035		0.070		0.122		0.099		0.059	***	0.192	***	0.193		-0.158		-0.346		-0.392	***	
	(.098)		(.062)		(.082)		(.067)		(.108)		(.046)		(.153)		(.133)		(.227)		(.082)		
	(.107)		(.092)		(.125)		(.094)		(.078)		(.188)		(.108)		(.121)		(.187)		(.176)		
Region																					
Lower Egypt	-0.160	***	-0.228	***	-0.310	***	-0.461	***	-0.526	***	-0.183	***	-0.130	**	-0.187	***	-0.215	***	-0.016		
	(.042)		(.025)		(.034)		(.028)		(.047)		(.038)		(.060)		(.055)		(.094)		(.071)		
	(.033)		(.047)		(.039)		(.041)		(.039)		(.069)		(.046)		(.062)		(.074)		(.120)		
Upper Egypt	-0.042		0.002		-0.063		-0.167	***	-0.246	***	0.185	***	0.010		-0.015		-0.008		0.077		
	(.054)		(.032)		(.042)		(.034)		(.056)		(.041)		(.061)		(.059)		(.114)		(.090)		
	(.055)		(.049)		(.043)		(.055)		(.074)		(.088)		(.057)		(.064)		(.082)		(.087)		
Job Characteristics																					
Job Group: Specialised	-0.444	***	-0.506	***	-0.466	***	-0.687	***	-0.845	***	0.620	***	1.520	***	1.972	***	0.925	***	1.517	***	
	(.109)		(.058)		(.075)		(.062)		(.102)		(.098)		(.195)		(.273)		(.288)		(.173)		
	(.130)		(.114)		(.136)		(.150)		(.165)		(.389)		(.880)		(.753)		(.800)		(.722)		
Technical	-0.515	***	-0.677	***	-0.657	***	-0.940	***	-1.108	***	0.416	***	1.264	***	1.441	***	0.106		0.420	***	
	(.141)		(.081)		(.099)		(.083)		(.134)		(.123)		(.218)		(.285)		(.307)		(.200)		
	(.158)		(.130)		(.180)		(.178)		(.177)		(.521)		(.953)		(.694)		(.794)		(.729)		
Clerical	-0.571	***	-0.640	***	-0.684	***	-0.842	***	-1.019	***	0.669	***	1.732	***	1.987	***	0.772	**	1.271	***	
	(.144)		(.080)		(.101)(		(.086)		(.133)		(.117)		(.208)		(.280)		(.297)		(.186)		

	(.170)		(.120)		(.181)		(.163)		(.182)		(.511)		(.929)		(.704)		(.831)		(.712)	
Skilled Manual	-0.596	***	-0.746	***	-0.705	***	-1.040	***	-1.341	***	0.383	***	1.435	***	1.395	***	0.109		0.346	*
	(.157)		(.085)		(.105)		(.087)		(.145)		(.134)		(.224)		(.291)		(.312)		(.194)	
	(.160)		(.126)		(.194)		(.204)		(.183)		(.558)		(.947)		(.670)		(.784)		(.740)	
Unskilled Manual	-0.687	***	-0.855	***	-0.840	***	-1.179	***	-1.560	***	0.067		0.921	***	1.039	***	-0.191		0.223	
	(.171)		(.092)		(.113)		(.095)		(.162)		(.170)		(.253)		(.305)		(.363)		(.256)	
	(.171)		(.161)		(.203)		(.208)		(.179)		(.537)		(.1043)		(.695)		(.736)		(.744)	
Activity:Industry	0.387	***	0.377	***	0.397	***	0.410	***	0.347	***	0.259	***	0.385	***	0.407	***	0.196		0.407	***
	(.056)		(.032)		(.044)		(.036)		(.064)		(.067)		(.099)		(.088)		(.161)		(.133)	
	(.078)		(.048)		(.052)		(.041)		(.064)		(.192)		(.122)		(.160)		(.181)		(.071)	
Services	0.315	***	0.339	***	0.335	***	0.244	***	0.254	***	0.113		0.224	**	0.313	***	0.224		0.423	***
	(.067)		(.038)		(.050)		(.040)		(.070)		(.070)		(.106)		(.092)		(.161)		(.118)	
	(.066)		(.051)		(.067)		(.045)		(.086)		(.187)		(.109)		(.131)		(.168)		(.114)	
Constant	-0.923	***	-0.458	***	-0.114		0.648	***	1.369	***	-2.103	***	-3.036	***	-2.719	***	-1.012	**	-1.282	***
	(.176)		(.098)		(.123)		(.104)		(.173)		(.144)		(.252)		(.314)		(.393)		(.294)	
	(.213)		(.188)		(.239)		(.231)		(.221)		(.546)		(.971)		(.675)		(.863)		(.775)	
Psuedo R^2	**0.21**		**0.24**		**0.30**		**0.36**		**0.39**		**0.26**		**0.30**		**0.39**		**0.46**		**0.47**	
Sample Size	**2334**										**623**									
Predicted Wage Differentials:																				
Female-Male											-0.36		-0.33		-0.37		-0.43		-0.49	

Source: CAPMAS, 1990 Establishment Survey. Note: The dependent variable is log hourly wages in 1990 Egyptian Pounds. Analytic standard errors calculated using a kernel density function are reported in the first parenthethis. Bootstrap standard errors calculated using 20 iterations are reported in the second parenthesis. * denotes significance at the 10 percent level, ** denotes significance at the five percent level and *** denotes significance at the 1 percent level.