HAVE ECONOMIC REFORMS PAID OFF? GENDER OCCUPATIONAL INEQUALITY IN THE NEW MILLENNIUM IN EGYPT

Fatma El-Hamidi and Mona Said

Working Paper No. 128
February 2008

Fatma El-Hamidi: Principal and corresponding investigator. Address: 391 Glenwood Dr., Monroeville, PA 15146, USA. Department of Economics, University of Pittsburgh, Pittsburgh-PA, USA fatma@pitt.edu and felhamidi@gmail.com.

Mona Said: Economics Department, American University in Cairo, Egypt. mona_said@aucegypt.edu.

Abstract

This study assesses the impact of recent liberalization measures and institutional changes in Egypt on gender wage and occupational inequality. Using newly released Labor Force Sample Surveys (LFSS) for the years 2000-2004, a slight drop in public sector employment and a comparable increase in private sector employment for women is observed. Regardless of sector of employment, women still earn less than men, with private sector workers being the worst. To remedy this situation, policy tools should deal with both inter- and intra-occupational discrimination in accordance with the type of occupation. Direct informational campaigns and equality planning at the school, university and workplace; systematic statistical frameworks for monitoring gender pay differentials; social security and taxation policies that treat women as individuals not just spouses as well as family policies that emphasize parental leave schemes, reduced working hours and flexible working arrangements are all policies that were tried with success in the Japanese and Nordic labor markets, and merit consideration while women are encouraged to enter the private sector labor market in larger numbers in Egypt.

ملخص

تتناول هذه الدراسة بالتقييم تأثير إجراءات التحرير الاقتصادي والتغييرات المؤسسية في الآونة الأخيرة في مصر على أجور الجنسين وعدم المساواة الوظيفية بينهما. واستنادا إلى بحوث العمالة بالعينة للسنوات ٢٠٠٠-٢٠٠٤، الصادرة مؤخرا، حدث انخفاض ضئيل في معدلات تشغيل المرأة في القطاع العام وزيادة مقابلة لها في هذه المعدلات في القطاع الخاص. وبغض النظر عن قطاع التشغيل، مازالت أجور النساء أدنى من الرجال، ويزيد الأمر سوءا في حالة العمالة بالقطاع الخاص. ولتحسين هذا الوضع، يتعين أن تعالج أدوات السياسة الاقتصادية التمييز الوظيفي بين مجالات العمل المختلفة وداخل مجال العمل الواحد وفقا لنوعية الوظيفة. وهناك بعض السياسات التي حققت نجاحا في أسواق العمل في اليابان ودول شمال أوروبا، مثل إطلاق حملات للتوعية المباشرة، وتخطيط المساواة في المدارس والجامعات وأماكن العمل، واتباع أطر عمل إحصائية نظامية لمراقبة الفروق بين أجور الجنسين، وتطبيق سياسات للضمان الاجتماعي والضرائب تعامل النساء كأفراد في المجتمع وليس مجرد زوجات تابعات، بالإضافة إلى تبني سياسات للأسرة تؤكد على أهمية توفير إجازات لرعاية الأطفال، وخفض عدد ساعات العمل، واتباع ترتيبات عمل أكثر مرونة. وهذه السياسات يستدعي الأمر أخذها في الاعتبار في مصر في وقت نشجع فيه المرأة على دخول سوق العمل بأعداد أكبر في القطاع الخاص.

I. INTRODUCTION

It is by now well-documented that observed labor market outcomes differ significantly along gender lines in most developing economies. Differences range from rates of participation in economic activities, to occupational choice, to sectoral allocation, to unemployment, as well as wage distribution. Wages, primarily, are important indicators of economic well-being and of personal success. Thus, the level of women's pay relative to men's is a revealing indicator about women's progress in the labor market and their status in the household.

The gender pay gap—women's disadvantage in earned income relative to men—is linked to hidden and overt discrimination practices in employment and wages. Wage-based discrimination occurs when workers with identical productivity characteristics receive unequal treatment in remuneration. Occupational segregation exists when women dominate in certain occupations and men in others, resulting in lower earnings and in efficiency loss (lower productivity).

In the Middle East and North Africa, including Egypt, gender-based occupational segregation is widely reported in the labor markets. On one hand, labor laws prohibit women from performing certain jobs considered dangerous or unhealthy or that require work at night. On the other hand, tradition, social pressure and commitment to the family are discouraging women from taking better-paid jobs, and thus confining themselves to particular employment opportunities. In the development literature, public sector employment and export-oriented industries are highlighted as two important potential avenues of feminization of labor force, but both serve to increase segregation. Regardless of causes, occupational segregation plays a very important role in the size of the gender pay gap.

The present study aims to understand the determinants of female occupational decisions, and gender-based wage discrimination in the new millennium in Egypt. As such, the paper in essence analyzes the impact of recent economic and institutional changes including privatization and the signing of several trade liberalization agreements on the status of women in the Egyptian labor market.

We use labor force survey data collected over the period 2000-2004 to examine changes in female labor participation and occupational choice during a time of economic reform and institutional change. We apply econometric analyses of micro data from consecutive,

nationally-representative household surveys conducted over those five years. Utilizing five years in lieu of one time cross section data offers increased level of robustness to the estimates. In particular, we test the following two hypotheses. First, we examine whether the increased contraction of the public sector and the labor flow from the public to the private sector has made women worse off than otherwise, and led to imbalance against women's wages. Second, we examine whether jobs that have recently experienced feminization in the private sector (or have lower entry barriers relative to jobs) pay their employees less, and whether this trend was exacerbated with advancing towards market economy.

The rest of this paper is organized as follows. Section II presents a brief review of the previous empirical literature linking economic reforms, globalization and trade liberalization to gender gaps in the developing world, MENA and Egypt in particular. Section III outlines, in brief, the estimation methodology and the wage determination model. Section IV describes the data set and provides a descriptive analysis of the data, and selectivity corrected wage equations. The main questions posed above are then tackled in Section V, by presenting decompositions of wage differentials. Section VI concludes by summarizing the results and outlining some of their policy implications.

II. Impact of Structural Reforms, Globalization and Trade liberalization on Gender Gaps: Review of the Literature

Globalization, defined as the increasingly free flow of ideas, labor, capital, technology, goods and services, has become a major force for global integration, but much remains to be understood about its potential social and economic effects. Amongst other things, these developments are impacting upon the structures of employment and pay, especially along gender lines. While women are joining the global workforce in increasing numbers, the changing nature of employment as a result of globalization and trade liberalization has impacted their work and the rest of their lives dramatically. Remarkably, some developing countries, which exported a growing proportion of their manufactured output to the developed countries, tended to employ a rising proportion of females in their manufacturing sectors (Wood 1991).

Trade liberalization measures are usually introduced in the context of wider structural adjustment programs which essentially aim to decrease the returns of factors of production in the previously protected import-substitution sectors and in non-tradables, while raising those

returns in exportables and formerly unprotected import-competing sectors, to induce factors to move accordingly (Horton, Kanbur, and Mazumdar 1994:5). In the majority of cases, structural adjustment policies involve a retrenchment of the public sector either through cuts in public expenditures and investments or, alternatively, through the privatization of government enterprises. Furthermore, cutbacks in the public sector, which generally come with structural adjustment are more likely to affect female workers disproportionately because of the concentration of women in a few sectors of economic activity (Haddad et al. 1995; Sparr 1994; Afshar and Dennis 1992). Moreover, the increased burden which women face at home due to cutbacks in social expenditure places a barrier on their ability to respond to the changing opportunity structures caused by structural adjustment.

Evidence shows that liberalized trade tends to increase the availability of paid jobs for women, particularly in export-oriented sectors. But certain barriers, such as discrimination, low quality of skills and gender inequalities in terms of access to resources, may impede women's ability to benefit from trade expansion (Swamy 2004). In what follows, we present a brief review of some of the recent empirical literature on impact of trade liberalization on gender pay gaps in the developing world, MENA region in general, and Egypt in particular.

How Did Trade Affect Gender Gaps in the Developing World?

Trade expansion appears to occur in labor-intensive exports from developing countries to developed countries, especially in women-dominated manufacturing of garments, shoes, jewelry and electronics. A study of 35 developing countries found a strong positive correlation between the female intensity of manufacturing (the number of female workers per 100 male workers) and export growth (Wood 1991). In most of these countries, the female intensity of manufacturing increased between the early 1960s and mid-1980s. In some countries it increased dramatically for example, by nearly five times. Egypt, Mauritius, Bangladesh, India, Madagascar are some examples of countries that benefited from such trade. In Bangladesh, about two million jobs had been created in the garment industry by 1998, of which two-thirds were held by women (Paul-Mazumdar and Begum 2002). In Madagascar, women accounted for three-quarters of the country's nearly 140,000 textile and apparel workers in 1999 (Nicita and Razzaz 2003).

Expanding markets—especially in labor-intensive export industries like textile and clothing, footwear, horticulture and data processing—is well accomplished in low-income

developing countries with a large surplus of cheap and mostly unskilled female labor. There are 200-odd export processing zones (EPZs) created by some 50 developing countries to attract foreign investors seeking to reduce production costs by outsourcing non-core functions to low-cost sites. While these EPZs usually pay better than agriculture or domestic service, women—who represent 80 percent of workers in these zones—are again confined to low-paid and low-skilled jobs, earning 20-50 percent less than men, according to the United Nations Development Fund for Women (UNCTAD 2004).

Women employed in export-oriented manufacturing typically earn more than they would have in traditional sectors. Many of these women had never earned cash income before.[1] The impact of trade on the gender wage gap depends on the relative magnitude of several opposing effects. The gender wage gap may be reduced because trade, like domestic deregulation, can increase competition among firms. The resulting pressure to cut costs can result in less discrimination against women with comparable skills to men, and therefore greater equality in wages. This effect may be particularly strong in industries where market concentration was initially high—that is, in industries dominated by a few firms. Trade often results in a premium on skills. The resulting increase in the wage gap between skilled and unskilled workers may increase the gender wage gap, given that in most countries the average man has a higher level of labor market skills and experience than does the average woman. To put it differently, unlike men, women in general experience frequent detachment from the labor market for reasons related to marriage, pregnancy, and caring for children, and so they end up with fewer years of experience. Unskilled workers are often employed on a temporary basis. Women's lack of skills relative to men increases the likelihood that they are employed as temporary workers, with little ability to negotiate wages or work conditions. Accordingly, a large influx of unskilled women workers into the labor force, caused by the expansion of export industries, may exert downward pressure on their wages (Swamy 2004).

Thus, the wage gap does not necessarily disappear over time. In successful export-oriented economies—such as Hong Kong, Malaysia, the Republic of Korea and Singapore—female wages reached a plateau of 58-65 percent of male wages, proving that "the competitive

[1] In the above-mentioned study of Madagascar, 85 percent of the women who found new employment in the textile sector had never directly received any monetary income, compared with 15 percent of new male entrants (Nicita and Razzaz 2003).

forces arising from foreign trade did not eliminate the wage gap," according to an UNCTAD study prepared for the São Paulo conference (2004).

A cross-country study that investigated the impact of trade on the gender wage gap suggests that within occupations, increasing trade in most cases is associated with narrowing gender wage gaps (Oostendorp 2004). An exception is found for high-skill occupations in poorer countries, where there is no evidence that trade has a narrowing gender wage gap impact. Insofar as skills tend to be relatively homogeneous within narrowly defined occupations, the contraction of the gender wage gap can be seen as evidence that there is less labor market discrimination as trade increases. Some country-level analyses support the hypothesis that trade reduces discrimination, while others do not.

A study by Black and Brainerd (2002) used U.S. data to test whether increased openness in the period 1977–94 induced employers to reduce discrimination against women, by estimating the differential effect of increased imports on concentrated versus competitive industries. The results showed that, after controlling for skills, the gender wage gap narrowed more rapidly in concentrated industries than in competitive industries. Applying the same methodology, similar but less significant results were obtained by Artecona and Cunningham (2002) for Mexico for the period 1987–93. Berik, Y.van der Meulen, and J. Zveglich Jr. (2003), on the other hand, found the opposite effect for the Republic of Korea and Taiwan, that is, an increase in international competitiveness between 1980 and 1999 in concentrated industries was associated with a widening of the gender wage gap.

Evidence on Gender Wage Gaps and Segregation in the MENA Region

Job segregation and wage discrimination play a major role in discouraging women employment in the MENA region as well as other regions across the globe. Although in MENA tradition has a powerful role in dictating which jobs are appropriate, respectful and acceptable for women, (which also tends to be low-waged ones), wage and job discrimination also affect the reservation wage, which is the cutoff point at which individuals decide that work is preferable than other ways to use their time (World Bank 2004).

In comparison to other developing regions of the world, MENA appears to be within the normal range of wage discrimination. However, MENA is atypical because women generally have more education than men, holding the same position. So, due to women's higher levels of education and qualifications in the MENA region, if wage discrimination

were eliminated, a woman's wage would be higher than a man's, and generally higher than the average man's. In the MENA region, women also have more difficulty finding work in the private sector. With Morocco as an exception, the private sector seems to discriminate against women more than the public sector. In fact, in Egypt, Iran, Tunisia and Yemen, the public sector engages in positive discrimination in favor of women. As for occupational segregation, for the three MENA countries for which data is available (Egypt, Iran and Morocco), occupational and industrial segregation has increased over the past decade in all cases except industry segregation in Iran (World Bank 2004).

Structural Adjustment, Trade Liberalization and Gender Gaps in Egypt

For a variety of reasons, mostly having to do with lack of access to appropriate data, much of the evidence on the effects of structural adjustment on the Egyptian labor market in general, and on the employment status of women in particular does not rely on systematic and repeated empirical analysis to support its claims. These claims must therefore be considered in most cases as a set of premises that require further assessment and verification.

The existing literature on the Egyptian labor market is also largely confined to data collected in the 1980s and 1990s.The general picture that emerges from these studies is that employer's discrimination in Egypt is a major barrier against women's employment and participation within the labor force, particularly for married women. Moghadam (1998) claims that employers in Egypt widely believe that women's labor productivity declines after marriage and childbearing, hence, their absenteeism is bound to be higher than that of men. As a result, it is argued that women prefer low-commitment and high-turnover employment. Furthermore, Al-Bassusi (2002) has described working conditions in particular areas of the private sector as "unsuitable and hard" for women, thus discouraging them from pursuing careers in certain fields. In addition, Barsoum (2004) argues that small private firms do not give female employees the same sense of security a larger, more populated workplace would. Hence, she emphasizes that the larger the workplace setting, the less women face the danger of encountering sexual harassment. Accordingly, there are numerous grounds for which the public sector would be more appealing for female employment in comparison to the private sector.

Several studies have looked at the effects of structural adjustment on gender gaps in the Egyptian labor market: Nassar (1998); Assaad and Arntz (2005); Assaad and El-Hamidi

(2001 and 2007); Said (1999 and 2003) and El-Hamidi (2003 and 2006). Given the recent diminishing role of the public sector as the employer of last resort, and the increasingly key role the private sector is set to play in employment generation in Egypt, prospects of future employment for women are bleak. Some of these studies documented that paid female employment in the private sector lags drastically behind the growth of the female labor force and well behind the growth of male employment in that sector as well, which suggests that there are significant barriers to women employment in the private sector. If access to the private sector for women continues to be restricted and public sector employment is shrinking, development gains in the last 50 years, especially those of women, will be at stake.

Thus, while structural adjustment policies and retrenchment of the government sector limits the prospects of women's paid employment opportunities outside the government sector, the opportunities in the private sector are highly segmented across gender lines. Assaad and Arntz (2005) identify a total of just nine job types constituting 95 percent of female nongovernmental paid work. Moreover, a comparison between 1988 and 1998 data indicated that these few limited employment fields for women are being further defeminized. Furthermore, such an overcrowding of female employment in a limited number of work fields also causes a downward pressure of wages. In the Egyptian private sector, women are paid significantly less than men even when their human capital characteristics are controlled for. In the decade between 1988 and 1998, Said (2003) demonstrates that gender wage inequalities have risen for women. Hence, this comprises another obstacle to women's employment because their earnings are frequently below the opportunity cost of their times, particularly after marriage.

Other recent studies show how most of the wage differential in Egypt is explained by intra-occupational segregation and women's segregation to less profitable jobs (Said 2003; World Bank 2004). By the early 1990s, there existed a substantial wage differential between men and women, ranging from 6 percent in the public sector to 76 percent in the private sector. After controlling for education and training, the differential is only 12 percent of female wages in the government, while it is left at 39 percent in the private sector. Not only are differentials bigger in the private sector, but studies of their composition draw attention to the presence of substantial unjustified discrimination (Said 1999; 2003). Ninety percent of the differential in the public sector is attributable to differences in productivity, whereas this is true of less than 10 percent in the private sector. The remaining portion of the wage premium

includes intra-occupational pay discrimination (i.e., different pay for a comparable job) and segregation that leads women to more likely work in sectors with low productivity.

Yet more recent studies utilizing the 2006 Egypt Labor Market Panel Survey (ELMPS) data in Egypt show that after a period of de-feminization (1988-1998), some sectors operated as magnets to women during (1998-2006). These sectors include clothing and food manufacturing (Assaad and El-Hamidi 2007). This possibility helped compensate for declining trend of female employment in both government and public sectors and decline in participation amongst illiterate women and those with vocational secondary degrees. Feminization is an important edge for many countries facing liberalized trade regimes while seeking to build their export manufacturing sector. The question remains whether newly created opportunities have been jobs of sufficiently high wage conducive to curtail gender pay gaps in the private sector.[2]

III. "ABSTRACTED" ESTIMATION METHODOLOGY

The primary focus of this paper is occupational segregation and gender pay differences in the Egyptian labor market. The model underlying this estimation is based on human capital theory, which suggests that pay differences can be explained by differences in workers' endowments of 'human capital': investments in education, training and work experience that tend to increase pay because of their positive impact on productivity. Using the model of human capital earnings function introduced by Mincer (1974), the wage determination equation is identified as follows:

$$\text{Ln}W = \beta_0 + \beta_1 \text{EDU} + \beta_2 \text{EXP} + \beta_3 \text{EXP}^2 + u \qquad \text{(A)}$$

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

Because an employer might value a worker with a particular certificate more than a worker without one, and to allow for estimated rate of return to vary by level of schooling, dummies for levels of education are used instead of years of schooling.

[2] There is preliminary evidence that gender wage gaps have also been on the decline (Said 2007).

The modified Mincerian earnings function is:

$$\mathrm{Ln}W = \beta_0 + \sum\beta_k \mathrm{E.Dum}_{ik} + \quad \beta_2 \mathrm{EXP} + \beta_3 \mathrm{EXP}^2 + u \qquad (1)$$

Where E.Dum consists of dummies for different levels of education.

However, the coefficient estimates of the OLS estimation of the classical model could suffer from what is now known as 'self-selection bias'. Whenever a considerable portion of the female working-age population does not participate in the labor market, it is reasonable to assume that the family background, skills and talents that influence occupational choice of women who do participate (the "select pool") are different from those of women who do not participate. In this respect, the productivity characteristics and wages of women may not be readily comparable to those of men, who tend to exhibit full participation rates. Estimating the previous classical earnings function without taking into account the possibility that family background and ability might influence occupational attainment, could give biased results.

In order to solve the problem of sample selection bias, Heckman (1979) suggests estimating two equations. First the participation equation is estimated through a multinomial logit model, for the purpose of this study, the probability of having to choose a particular occupation, at the time of the survey (using the entire sample: workers and non-workers). From the multinomial logit results, a selection variable (the inverse Mills ratio term) is created. This estimate is used in the second step, as an additional regressor in the wage equation, yielding consistent estimates of the coefficients free of censoring bias. The details of this two-stage estimation model are presented in Appendix A of this paper.

In examining whether gender pay gaps reflect discrimination, two separate issues are usually dealt with in the literature. 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 whereby qualified women are kept out of higher paying jobs. In absence of information on tastes and preferences of women to certain jobs, we can only compare men and women on the 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' premium will refer to the component of the male-female wage differential that cannot be explained in measurable qualifications terms.

Standard decompositions of wage differentials 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 the one hand, it has been pointed out that there is a problem of omitted variables, including attachment to the labor force, lack of specific training, tastes, personality and interrupted careers whose impact will also be captured in the "unexplained" component.[3] 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. Therefore, it would be more accurate to describe this 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, again, ignores the literature on occupational attainment, "selection bias", which suggests that occupational distribution may derive in part from discriminatory factors. In particular, several studies attribute much of the discrimination against women (or other minority groups) to the crowding of these groups into a small number of occupations where wages and chances for promotion are low.[4] Thus the above measure may, in fact, underestimate the true magnitude of overall discrimination that women face in the labor 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, as explained in Appendix B. Thus, in the first stage of the empirical analysis in this paper, a behavioral 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. It also helps to further decompose these gaps into intra-occupational and inter-occupational components. Appendix B presents two alternative measures of gender gaps decompositions used in the paper.

[3] As Polachek (1975) noted, such a measure becomes not only of discrimination, but also of our ignorance, because differences in characteristics can arise from discrimination (for example with unequal access to education) and differences in coefficient values can arise for legitimate reason (such as failure to properly account for work expectations).

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

IV. DATA, OCCUPATIONAL CHARACTERISTICS OF THE SAMPLE AND EMPIRICAL RESULTS

Data Description

The analysis uses recent Labor Force Sample Surveys (LFSS) from CAPMAS,[5] on the labor market for the years 2000-2004.[6] The data is very rich and unique in its coverage and consistency. The importance of this study stems from the fact that the analysis covers five consecutive years (2000 through 2004), with a large sample size that ranges between 170,000 and 340,000 individuals. The sample includes 360 urban clusters and 240 rural clusters, a total of 600 clusters, each containing 70 households. The working sample in this study is wage workers in the organized formal sector, public and private with further focus on private sector workers. As there was no way to allocate the income into returns to labor and returns to capital, self-employed workers were excluded from the analysis.

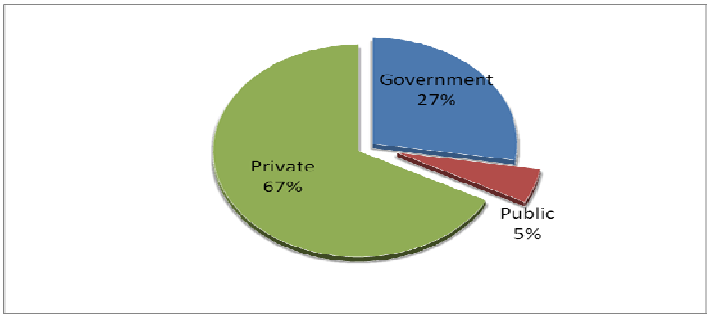
Sample Characteristics

In this section, we describe the data and detail sample characteristics. For simplicity purposes, we report years 2000, 2002 and 2004 if there is a fixed trend throughout the years, otherwise, discrepancies are reported. A preliminary look at the data shows key characteristics of the Egyptian labor market. Figure 1 displays the distribution of the Egyptian labor force by sector of employment for year 2004. By and large, the formal private sector employs 67 percent of the working population, the government sector contracts 27 percent; whereas the public sector secures a meager 5 percent of wage workers.

Figure 1. Distribution of Wage Workers by Sector of Employment, 2004

[5] Starting the year 2000, CAPMAS has undertaken new and comprehensive Labor Force Sample surveys with a sample size of about 48 thousand households representing all governorates (urban and rural). CAPMAS has undertaken bi-yearly LFSS in 2000 through 2002, and quarterly for 2003 and 2004.

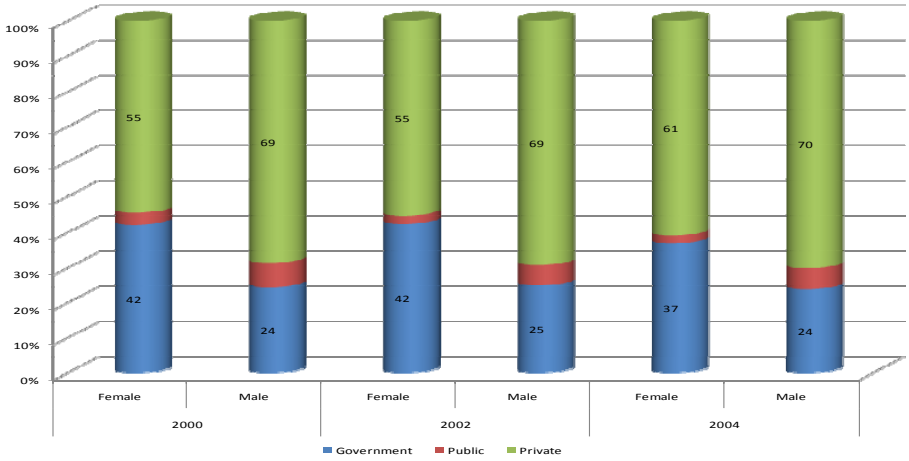
[6] Data is made possible by a grant from the Fulbright Association to the principal investigator, 2005.



Source: Authors' own calculations; LFSS 2000-2004.

Careful examination of the data introduces an interesting picture. Figure 2 uncovers decreased concentration of women in the public and government sector from 45 percent in 2000 to 39 percent in 2004 at the benefit of private sector employment.

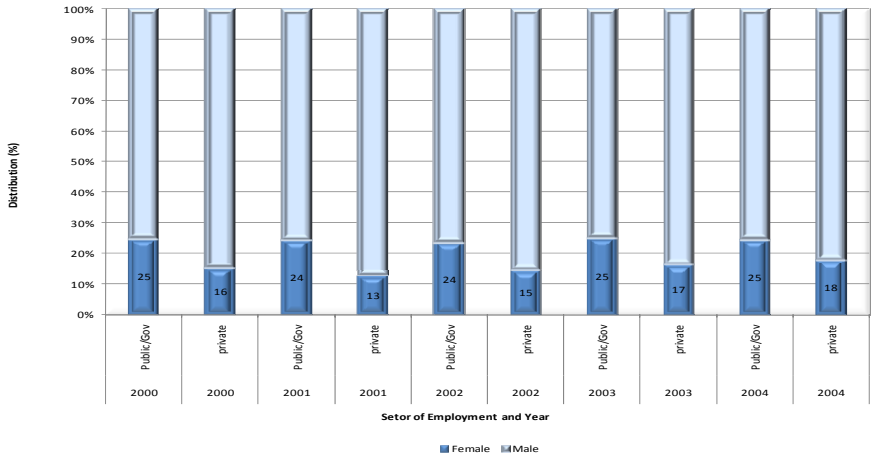
Figure 2. Distribution of Employment by Gender and Sector (%)



Source: Authors' own calculations; LFSS 2000-2004.

A remarked pattern appears with regard to labor force participation in Figure 3. In 2002, employment of women dropped by one percentage point in both public and private sectors, which is attributed to women dropping out of the labor force. By 2004, women gained their lost share in the public sector, and surpassed their previous levels in the private sector by representing 18 percent of total employment in 2004 (up from 15 percent; a 20 percent increase). This signifies the new role of the private sector and the fact that the increased participation of women in the labor force is in part absorbed by that sector.

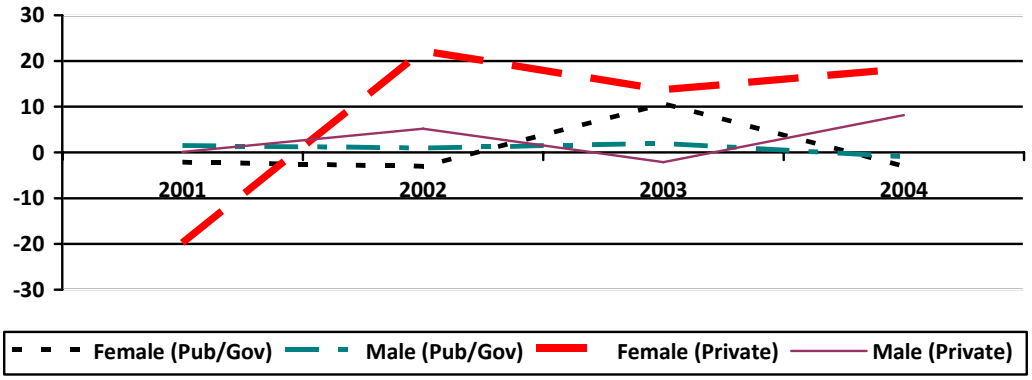
Figure 3. Distribution of Employment by Gender and Sector (%)



Source: Authors' own calculations; LFSS 2000-2004.

Figure 4 as well confirms the increased growth rate of employment of both genders in the private sector and a declining trend in public sector employment at large (public and government), with an accelerated rate for women.

Figure 4. Annual Rate of Change in Employment Growth by Sector and Gender



Source: Authors' own calculations; LFSS 2000-2004.

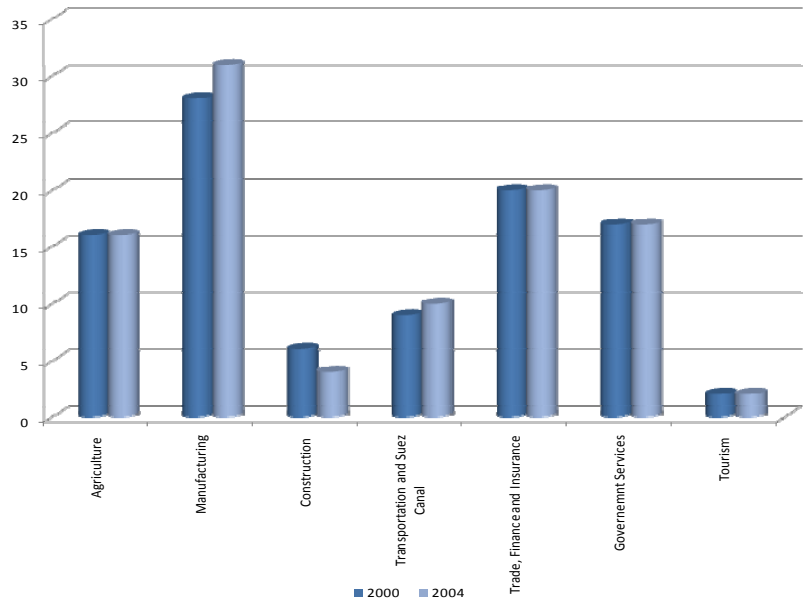
Several macro developments may have contributed to previous micro outcomes. The slow decline in women employment in the public sector was due to the privatization practices themselves. The privatization processes were rather slow and socially costly: the planned privatization firms in 1991 were 314. Only 191 have been privatized by 2002, and merely nine of the 35 planned to privatize in 2004 were actually carried out. Commerce has been the sector most affected by privatization, followed by food processing, tourism and construction.

Other macroeconomic consequences reinforced the micro outcomes. By late 2001 and early 2002, the world economy, including Egypt, went into recession. The September 11 attacks contributed to plummeting tourism, oil and Suez Canal revenues. Although population growth rate modestly dropped from 2.1 percent in 2000 to 1.9 percent in 2004, [7] and after years of positive GDP growth from 1993 to 2000, Egypt experienced a repeated decline in its GDP growth. According to the IMF, [8] the growth of real GDP dropped by 3.8 percent in 2001, by 8.3 percent in 2002, and by 7 percent in 2003, and declined by another of 5.3 percent in 2004. By 2005, there was a turning point to a positive growth of 19 percent and by another 12 percent in 2006. Among factors contributing to the change of direction in GDP growth is the exchange rate policy. In 2004, the Egyptian economy was driven by export revenues. The 25 percent depreciation on the Egyptian pound against the US dollar following the introduction of partial floating of the exchange rate benefited exports, and resulted in a current account surplus of nearly $3.7 billion at the end of 2003/2004 (IMF 2007). The depreciation of the Egyptian pound against the dollar, though aided exports level and the value of the GDP at large, it inflicted a huge burden on the average worker. The depreciation contributed to augmented inflation. Between 2002 and 2003, the CPI grew by 22 percent, and by 197 percent between 2003 and 2004. Whereas some economists believe that the Egyptian CPI is heavily weighted by subsidized commodities and price controls and therefore is not a good measure of inflation, the WPI (wholesale price index)—a less distorted measure—showed an alarming inflation rate of 10 percent in 2003 and 22 percent in 2004 (IMF 2007). Furthermore, the internal structure of the GDP as well changed between 2000 and 2004.

The manufacturing sector is evidently becoming the cornerstone of the Egyptian economic development. As portrayed in Figure 5, manufacturing and transportation (including Suez Canal revenues) witnessed an increase in their share of GDP between 2000 and 2004 (by 11 percent for both sectors). Seven major industries account for over 80 percent of establishments in the manufacturing sector: textile, food and beverage; and furniture, followed by non-metallic minerals, metal production, chemicals and basic metals.

Figure 5. The Structure of GDP by Economic Activity

[7] African Development Bank (2005).
[8] IMF (2007).

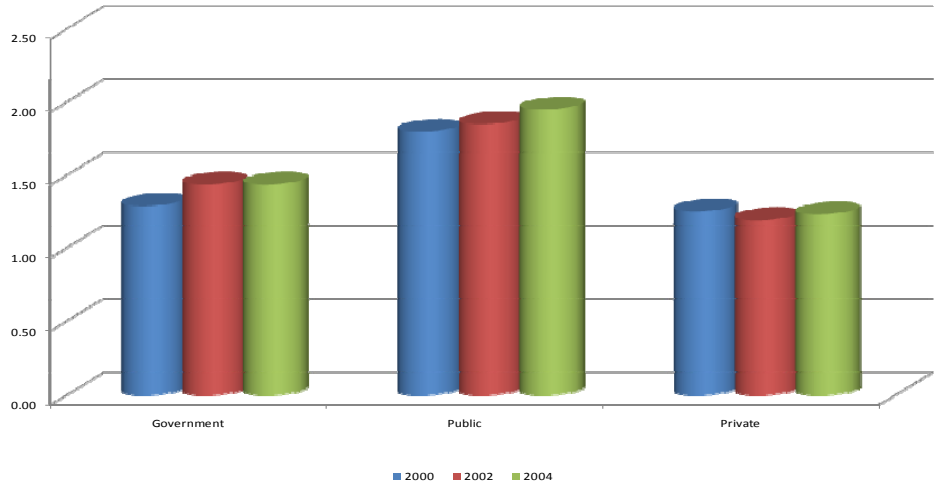


Source: Authors' own calculations; LFSS 2000-2004.

Turning to wage levels, and before correcting for differences in attributes, graphing the median real hourly wage (Figures 6A and 6B) confirms the fact that of all three sectors, public sector workers are exclusively the winners in terms of receiving the highest median wages, with men's wages exceeding those of women. During the period 2000-2004, women earned an average of 85 percent of men's wages, in both public and government sectors, compared with 70 percent of men's earnings in the private sector. Fortunately, between 2000 and 2004, women's real wages in the public sector have risen by nine percent, compared to barely one percent for men, an indication of progressing towards a greater equal distribution of wages in the public sector. A careful examination of both graphs reinforces the relative advantage men have over women in terms of "between sectors/within gender" wage distribution. For example, in 2004, government sector men earned an average of 76 percent of males' public sector wage, and private sector male workers earned 71 percent of their public employees' counterparts. These figures were 76 percent and 63 percent respectively for women, attesting to a wider internal gap between private and public sector wages for women relative to those of men. A critical finding that deserves further attention is the accelerated drop in private to public wage gap for males compared to those of females between 2000 and 2004. Women's private to public wage gap dropped by 9 percent, whereas men's relative wage gap dropped by 19 percent. By these measures, it is fair to conclude that the Egyptian labor market is

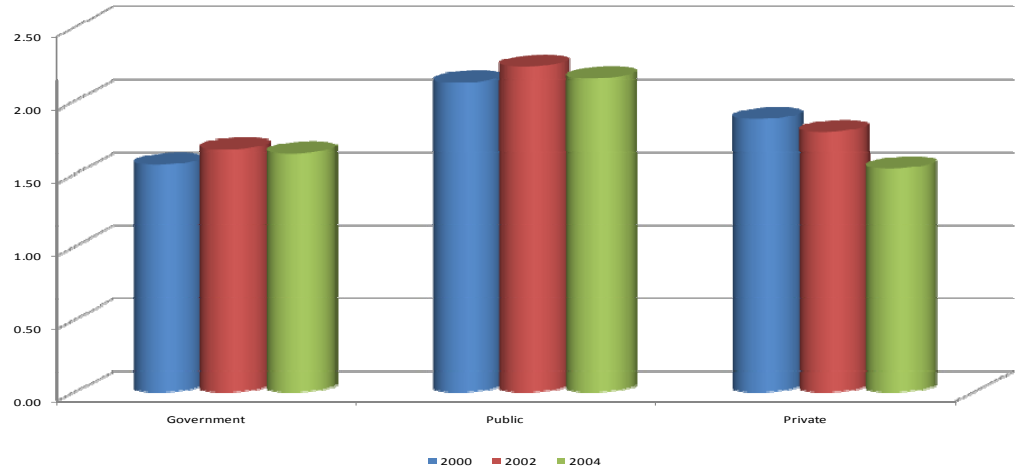
believed to have been moving towards a market economy in terms of labor remuneration, in particular relative equitable wage distribution between men and women.

Figure 6A. Median Real Hourly Wages of Female Workers by Sector of Employment



Source: Authors' own calculations; LFSS 2000-2004.

Figure 6B. Median Real Hourly Wages of Male Workers by Sector of Employment



Source: Authors' own calculations; LFSS 2000-2004.

The previous analysis presented preliminary evidence that the private sector is becoming the new device of employment creation; especially that after years of slow privatization, Egypt is taking strides towards privatizing the public sector and rationalizing government employment. Therefore, the focal point of the upcoming analysis is devoted to the private sector.

We begin examining the private sector by assessing which of its occupations has had a major role in facilitating the transition to a market economy, particularly in lifting employment barriers and in embracing women workers during the period 2000-2004. The literature concerning the division of labor by sex distinguishes between vertical and horizontal occupational segregation. Horizontal segregation is described whereby different groups work in different types of work (i.e., heavy manual labor is normally carried out by men, while women are clustered in social services). Vertical segregation is characterized by one group (men) tending to dominate in higher rank occupations with considerable authority and better rewards, whereas the other is crowded in lower status jobs (women). Additionally, the International Labor Organization defined sex-dominated occupations as "those consisting of more than 80 percent of the same sex."

Table 1 asserts increased participation of women in the private sector, from 16 percent of total work force in 2000 to 18 percent in 2004. More importantly, the table shows how females are highly represented in occupations related to education; with an average of 48 percent of total workers being women, and 42 percent of total employment in the educational sector (Table 2). Ironically, this occupation represents only 2 percent of all female employment (Table 1, column 3). Occupations coming next in terms of lower barriers to women's entrance (or more welcoming and accommodating to women workers) are agriculture and health professions (with 30 percent of total employment being women in 2004 in each occupation). However, agricultural jobs account for over 75 percent of working women in the private occupations (and 76 percent of all females in the agricultural sector as an economic activity), whereas the health profession holds less than one percent of all working women in private occupations in 2004, and nearly two percent in that economic sector.

Furthermore, reconsidering Table 1, it is obvious that male-dominated jobs outnumber those of women. Setting aside horizontal segregation represented in production work and vocational occupations, for reasons related to cultural and societal norms, vertical segregation is visibly manifested in managerial services and other professional occupations, among others, with men dominating at least 88 percent of these occupations. In fact, women tend to be employed in a narrower range of occupations because male-dominated occupations are greater in number (nine occupations for men vs. three for women).

Table 1. Distribution of Females by Occupation; and Contribution of Each Occupation in Total Female Employment

	% of Females in Each Occupation		% of Females in Total Occupations*		% Distribution of Females by Occupation*	
Occupation/Year	2000	2004	2000	2004	2000	2004
Legis. & Mang.	5.60	4.73	0.63	0.60	4.03	3.30
Health Prof.	25.63	30.78	0.13	0.13	0.82	0.75
Educators	48.00	48.29	0.33	0.37	2.09	2.03
Oth. Prof.	11.55	13.29	0.31	0.31	1.97	1.74
Tech. Asst.	14.24	12.33	0.36	0.32	2.32	1.76
Clerk	17.20	21.60	0.23	0.29	1.48	1.62
Sales	18.37	19.11	0.81	0.77	5.16	4.28
Services	11.08	9.10	0.34	0.25	2.20	1.39
Agric.	25.59	30.04	11.24	13.68	71.65	75.89
Vocational	4.04	4.17	0.77	0.69	4.89	3.83
Prod. Workers	3.23	3.88	0.23	0.29	1.47	1.60
Others	9.05	9.26	0.30	0.33	1.89	1.82
Total			**15.69**	**18.03**	**100.00**	**100.00**

Source: Authors' own calculations; LFSS 2000-2004.

* The sum of each column may not add up to the total due to rounding errors.

Table 2. Distribution of Females by Economic Activity; and Contribution of Each Economic Activity in Total Female Employment

	% of Females in Each Economic Activity		% of Females in Total Economic Activities*		% Distribution of Females by Economic Activities*	
Econ. Act/Year	**2000**	**2004**	**2000**	**2004**	**2000**	**2004**
Agriculture	25.80	30.37	11.15	13.56	71.44	75.59
Fishing	NA	0.87	NA	0.01	NA	0.05
Mining.	3.33	3.32	0.01	0.01	0.06	0.03
Manufact.	8.84	9.84	1.14	1.17	7.28	6.49
Elect. & Water	13.12	2.01	0.01	0.00	0.08	0.01
Contr.	1.47	1.24	0.16	0.12	1.02	0.69
Retl & Trd.	9.99	9.56	1.70	1.63	10.88	9.06
Hotels & Rest	3.87	3.59	0.09	0.09	0.57	0.51
Transport	2.05	2.34	0.13	0.15	0.86	0.83
Finance	15.44	18.68	0.03	0.04	0.21	0.20
Real State	12.64	10.56	0.28	0.23	1.82	1.29
Pub. Adminst.	7.56	20.38	0.02	0.06	0.11	0.33
Education	46.69	41.74	0.43	0.43	2.76	2.38
Hlth & Srvs	42.43	46.53	0.29	0.34	1.83	1.90
Social Srvs	7.59	5.87	0.10	0.08	0.64	0.42
Domestics	15.64	14.09	0.07	0.04	0.44	0.21
Intl. Org.	32.86	NA	0.00		0.02	NA
Total			15.61	17.94	100.00	100.00

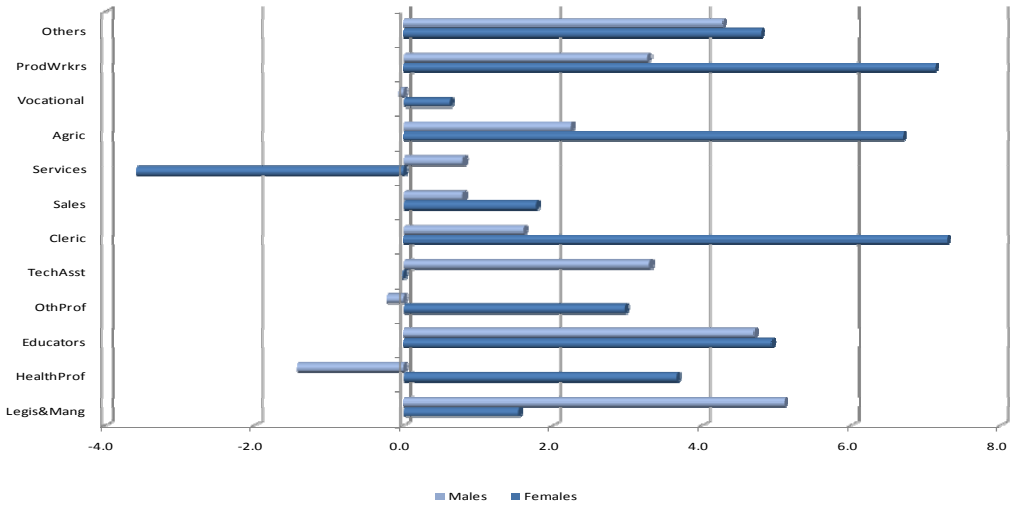
Source: Authors' own calculations; LFSS 2000-2004.

* The sum of each column may not add up to the total due to rounding errors.

Figure 7 depicts the annual growth rate of employment by occupation during 2000-2004 periods. The figure shows that the most newly attracting females' occupations are typically male-dominated jobs such as: clerks or "white-collar" jobs (in retail and trade sector contributing 9 percent of total women employment in 2004); and production workers or "blue-collar" jobs (in manufacturing sector contributing 7 percent of total women employment, followed by agriculture with an annual average absorption of employment at 7 percent, education and health professionals at 5 percent and 4 percent, respectively). Except for agriculture jobs, which contribute over three quarters of total female employment, clerk and production workers combined contribute a little over 3 percent of total female employment (Table 1).

Contrarily, managerial occupations, education and technical assistance are the fastest growing occupations for males, with an average annual increase between 3 percent and 5 percent. Occupations in services, which employ 1.4 percent of total female employment, are losing women at an average of 4 percent yearly, while health professionals and vocational occupations are slightly losing male employment.

Figure 7. Average Annual Growth of Employment by Occupation, Private Sector Workers, 2000-2004



Source: Authors' own calculations; LFSS 2000-2004.

Following Assaad (2006), a different approach to analyze occupational distribution is to group employment by occupation and economic activity into three categories: professional workers (i.e., legislators, managers, health professionals and educators); white-collar workers (i.e., technical assistance, clerks and sales and services) and blue-collar workers (i.e., vocational, production workers and others). Because segregation and discrimination issues are not pertinent to agricultural employment, we report results on private non-agriculture wage work only.

Table 3 and Figures C-1 and C-2 in the Appendix present selective characteristics of private sector workers by the aforementioned three occupational categories. Both the table and graphs maintain that males on average have more years of experience than females, which is due to the fact that women experience frequent detachment from the labor market for reasons related to marriage, childbearing, and/or caring for the elderly. A closer look at these figures shows that women's earnings are lower than those of male counterparts regardless of the job they perform, even when they (women) have greater years of education than men, as in professional and white-collar jobs. Women also endured greater deterioration in their real wages than men. As a matter of fact, women in white-collar jobs suffered a painful loss of 18 percent of their purchasing power between 2000 and 2004. Professionals came second in terms of experiencing a decline in real wages (4 percent) during the same time period. Blue-collar jobs came next with a fall of about 2 percent of real wages. The losses of men were more homogenous than those of women. On average, men lost about 7 percent of their real wages in professional, white and blue-collar jobs.

Table 3. Characteristics of Non-Agricultural Private Sector Workers by Occupational Groups

Occupational Categories	Female-2000	Male-2000	Female-2002	Male-2002	Female-2004	Male-2004
Professionals						
Mean Age	36.54	42.15	34.16	42.35	37.46	43.18
Mean Years of Experience	17.71	21.36	12.55	20.86	9.71	17.29
Mean Years of Schooling	10.57	8.22	11.42	8.05	11.18	8.25
Median Real Hourly Wage	1.88	2.50	1.49	2.38	1.79	2.31
White Collars						
Mean Age	31.55	32.91	26.04	33.28	30.94	33.78
Mean Years of Experience	16.78	18.59	7.23	17.06	7.57	10.98
Mean Years of Schooling	6.86	7.04	8.83	7.56	8.20	7.67
Median Real Hourly Wage	1.25	1.75	1.07	1.79	1.03	1.64
Blue Collars						
Mean Age	31.18	33.35	26.85	34.27	34.14	34.02
Mean Years of Experience	17.59	19.13	8.75	18.48	10.08	12.92
Mean Years of Schooling	3.89	4.10	6.41	4.57	3.85	4.76
Median Real Hourly Wage	1.25	1.88	1.19	1.79	1.23	1.74

Source: Authors' own calculations; LFSS 2000-2004.

Reconstructing Table 1 using the new occupational categories yields comparable results (Tables 3 and 4). Excluding workers in agriculture, which absorbs about three quarters of total female employment compared to a little over one third of total male employment, presents a distinct profile. By 2004, white-collar jobs ranked first in terms of women concentration (38 percent of total women employment, excluding agriculture), while blue-collar jobs ranked first in men concentration (50 percent of total male employment, excluding agriculture). According to real wage ranking, which designated women in white-collar jobs as the lowest wage earners (at the same level of agriculture workers), it is safe to say that women appear to be concentrated in low paying jobs—be it agriculture or white-collar jobs, compared with men who are in a relatively better position—with concentration and a relative higher wage in blue-collar jobs than white-collars.

Table 4. Distribution of Private Sector Workers by Occupational Category and Gender (%)

Occupational Categories	Females 2000	Males 2000	Females 2002	Males 2002	Females 2004	Males 2004
Professionals	33	28	27	32	34	31
White Collar	40	19	47	19	38	19
Blue Collar	27	53	26	49	28	50
Total	100	100	100	100	100	100

Source: Authors' own calculations; LFSS 2000-2004.

It is crucial at this point to evaluate how broad or narrow gender wage gaps are between and within occupations (Table 5). Between 2000 and 2004, the wage gap (women wages/men wages), widened only for white-collar workers (by 12 percent)—remember, we have just

established that white-collar occupations have the highest concentration of women relative to other occupations—excluding agriculture, while ranking the lowest earned wage. Surprisingly, wage gap in blue-collar jobs closed by 6 percent followed by professionals (4 percent).

Table 5. Real Hourly Gender Wage Gap

Occupational Categories	2000	2004
Professional	0.75	0.78
White Collar	0.71	0.63
Blue Collar	0.67	0.71

Source: Authors' own calculations; LFSS 2000-2004.

Occupational Segregation and International Comparisons

To end this descriptive analysis it is informative to examine a more direct measure of (horizontal) occupational segregation that is most commonly used in international studies. This statistical measure is the Duncan index of dissimilarity (ID), which ranges from 0.0 (no segregation) to 1.0 (complete segregation). Table 6 below reports the ID for all sectors, then separately for three special industries or sectors that witnessed an increasing trend of feminization in the new millennium in Egypt. The table also shows the number of occupational categories used in each case, as the ID values tend to increase with the number of occupational codes classified.[9]

Table 6. Index of Dissimilarity in the Non-Agricultural Labor Market, 2000-2004

[9] The relationship resembles a log function with a slope generally around 0.06. The ID values need to be treated with caution whenever the number of occupational codes is less than 50 (Anker 1998).

Occupation	Index 2000	*No. of Categories*	Index 2004	*No. of Categories*
Professionals	0.360	*24*	0.402	*26*
White Collars	0.336	*38*	0.346	*38*
Blue Collars	0.611	*54*	0.610	*54*
Special Industries:				
Food Manufacturing				
Professionals	0.365	*12*	0.659	*13*
White Collars	0.441	*12*	0.239	*15*
Blue Collars	0.546	*13*	0.657	*14*
Textile/Garment				
Professionals	0.297	*10*	0.267	*12*
White Collars	0.339	*9*	0.259	*9*
Blue Collars	0.386	*10*	0.392	*13*
Education/Health				
Professionals	0.709	*59*	0.723	*68*
White Collars	0.462	*59*	0.528	*65*
Blue Collars	0.627	*67*	0.514	*74*

Source: Authors' own calculations; LFSS 2000-2004.

As can be seen from the above table, occupational segregation is a more serious issue in blue-collar than in white-collar and professional jobs in Egypt. Over the period 2000-2004, it has been increasing in professional jobs, however, in comparison to the two other groups where it has been stable. Among the new sectors that are feminizing, occupational segregation has been increasing also among professionals in food manufacturing, education and health. The textile industry, however, tended to have much lower and decreasing (in professional and white-collar jobs) or near stable (in blue-collar jobs) levels of occupational segregation.

The increase in recorded occupational segregation since 2000 in the non-agricultural labor market in Egypt should be of great concern however, as it follows a period of decreasing segregation between 1990 and 2000, as reported in previous studies (e.g., Anker 2003). In fact, as shown in Table 7 below, the MENA region in general tends to be the region with the highest indicators of gender-based occupational segregation, in comparison to all other regions. This is not just the case as measured by the ID index (horizontal segregation), but also as indicated by the share of females in non-agricultural sector and the percentage of females in administrative and managerial positions (vertical segregation). Within the MENA region, however, and up until 2000, Egyptian indicators were overall better than other countries in the sample (e.g., Jordan and Iran). With the magnitude of the recorded increase in

the ID above, it is perhaps likely that Egypt might no longer maintain its relatively more egalitarian position, even by MENA region standards. This calls for the need for a more in-depth study of occupational segregation in Egypt in light of new data.

Table 7. International Comparison of Measures of Gender-based Occupational Segregation around the Year 2000

	Egypt	MENA	Developed Countries	Transition Economies	Asia	Latin America
Vertical segregation (females in administrative and managerial positions in percent)	10.2	8.0	27.6	32.9	15.3	32.8
Female share in non-agricultural labor force	17.1	14.8	44.8	44.4	42.3	41.0
Dissimilarity, ID in non-agricultural labor force, 1990-2000)	-0.069	-0.063	-0.033	0.015	0.005	-0.003

Source: Anker (2003).

Empirical findings based on the two-stage estimation model

The previous descriptive analysis argued for a simplified sketch of the non agricultural private sector of the Egyptian labor market between 2000 and 2004. It has already been shown, primitively, that the concentration of women in low paying economic sectors and occupations is a likely leading factor of the extent of the gender pay gap. The measurement of occupational segregation, however, is of great concern. First, the segregation of women and men into different occupations reflects customary gender stereotypes in Egypt. These stereotypes define both women and men according to a limited set of expectations, which are particularly confining for women in terms of economic and societal roles. In fact, gender stereotypes on the job are one of the invisible barriers that keep women from certain occupations and particular positions. In reality, there is growing awareness, supported by empirical evidence in many countries, that the pay in occupations dominated by women is lower even when the effect of variables such as the different levels of education or years of experience required are taken into account. Identifying the cause and effect of a certain relationship between women's over-presence in some occupations and wages is very difficult because numerous factors are at work. For example, do jobs pay less simply because they are disproportionately occupied by women? Are women assigned or allocated to low paying jobs? Or is it that women elect to settle for lower paying and lower status jobs for reasons related to their own and family background characteristics? Besides, how much does the male wage earner model influence wage-setting in these occupations?

According to economic theory, an individual's occupational attainment is a function of the employer's willingness to hire that person (labor demand) and the individual's desire to work in a particular occupation (labor supply). Labor demand is determined by the individual's MPL (Marginal Productivity of Labor), which in turn is a function of human capital. Labor supply is derived from an individual's utility function, which includes at least the wage of the occupation, a taste for the work involved, and family size (Brown, Moon, and Zoloth 1980). In this context, wage discrimination may result in one group being paid a wage higher than its MPL, or the other group being paid a wage lower than its MPL. Likewise, discrimination may occur in occupational attainment when either one group is allocated to occupations that require better skills than they possess or another group is allocated to occupations that require skills less than what they have.

Becker (1975) attributed differences in occupational attainment and earnings between two groups to two factors, namely, differences in individual productivity-related characteristics and non productivity-related characteristics, such as gender, race, or sector of employment. However, if equally productive individuals with the same level of human capital and other productivity-related characteristics are being treated differently in terms of occupational attainment and earnings due to their gender, race, or other non-productivity related characteristics, it is regarded as discrimination.

The previous part of this section offered conventional and unrefined type of analysis, which returned several conclusions. These key results, however, are not informative about the actual occupation 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, estimating the wage equation and carrying out wage decomposition detailed in the methodology in Appendix A.

The following empirical analysis proceeds at two levels. First, determinants of occupational attainment are estimated separately for male and female private sector workers for years 2000, 2002 and 2004. This step allows for predicting the distribution of women across occupations if they were treated in the same way as men. Second, wage equations are estimated separately for males and females including selection terms obtained from the first step. This methodology further facilitates decomposing the gender pay gap in the second step into justifiable (in terms of productivity related differences) and unjustifiable components

(Oaxaca 1973); and further decomposing gender pay differences into intra-occupational and inter-occupational components (Brown 1980). The analysis is done separately for males and females across the three occupational categories: professional, white-collars, and blue-collars. This allows for differences in wage setting in the three aggregate occupations and for differences in parameter estimates by gender.

A reduced form multinomial logit model is utilized to capture how certain variables, which influence occupational demand and supply decisions, affect the probability of an individual i working in an occupation j, (Pi j). The independent variables included in the occupational attainment equation are age, levels of education, region of residence, marital status, number of children in the household, size of the household and the share of public and government sector workers in total employment by governorate. The last variable is a proxy for the level of employment available at the public sector for prospective employees. A large share of employment in public and government sectors signals shrinking employment opportunities in these sectors. The model is estimated for males and females separately.[10] As the coefficients obtained from the multinomial model do not reflect directly the probability effects, the marginal effects of the regressors on the probabilities are calculated. In particular, a positive (negative) coefficient means that the variable has a positive (negative) effect on the relative probability of working in that occupation.

Tables (B-1 through B-3) in the appendix present marginal effects of the explanatory variables on the probability of occupational choice derived from a multinomial logit model, by gender for years 2000, 2002 and 2004. Since these marginal effects are not constant for all values of the explanatory variables, as it is the case in OLS, the effects at the sample means for the continuous variables and for the reference state for dummy variables are reported. In the case of continuous variables, the reported marginal effect is the partial derivative of the probability with respect to that variable, and in the case of a dummy variable, it represents the effect of a change from 0 to 1.

In what follows, only results of year 2004 (Table B-3) are considered, unless otherwise indicated. The table reveals that most of the coefficients are significant at the 1 percent level.

[10] To do so, we first conduct an *F*-test to see if there is a structural difference. The test suggests that there is a statistically significant difference between males and females in the equations explaining occupational attainment. The calculated *F*-statistic is 9.53, which is greater than the critical value at the 1 percent significance level. Hence, the null hypothesis of no structural difference can be rejected.

Professional women have higher probability working in regions other than Metropolitan cities, and that probability is higher in rural than urban regions. Males in rural Egypt are not so lucky in engaging in professional jobs. White-collar workers of both genders have higher probability to be working in the metropolitan than any other region, a result of concentration and centralization of government and public offices in these mega cities. Age has a negative relation with joining white or blue-collar jobs for both genders. An additional year reduces the probability of working in both sectors and the effect is noticeable for women rather than men.

An interesting result is observed as regards to levels of education. In compliance with preceding descriptive statistics, the effect of education on occupational attainment operates in the anticipated directions. Intermediate levels of education play a significant role in increasing an individual's chances to opt for white-collar types of occupations, and the effect for women is almost one and half times that of men. Many blue-collar workers are associated with lower levels of education. Perhaps the reason for this result is that it requires more skills (and so more human capital) to work as a clerk or secretary, than to operate a machine. Workers with higher levels of education (university and above) are more likely to join the ranks of professional occupations.

The effect of marital status on occupational attainment has mixed results. Being married reduces the probability of women working in a professional occupation by 6 percent, but increases that of men by 11 percent. Being married reduces the probability of working in a blue-collar job for both genders. This result is in line with a recent study on the Egyptian labor market conducted using 2005 data, which found that blue-collar workers are likely to be unmarried newly entrants to the labor market who are in the age group of 15-24 (Assaad and El-Hamidi 2007). The positive sign of children dummies for both men and women in professional jobs and the negative sign for the same variable on men and women of blue-collar jobs are interesting and in line with previous results. Most professional women are either teachers or health professionals (nurses). Besides, flexible working hours, and low rates of human capital depreciation are typical job characteristics, which could be combined with household chores and childbearing responsibilities. The size of the household does not prove to be an effective predictor in occupational attainment.

Finally, the effect of the share of public and government sector employment by governorate is as anticipated, at least for women. Controlling for all covariates, but this

variable, seems to affect the occupational decision for women. Greater employment in that sector increases the likelihood of women preferring blue-collar occupations by 2 percent. This is a compelling result. After years of ERSAP and queuing for the "time long guaranteed" jobs in public and government sectors, the market is finally sending the proper signals. The effect of these variables on men's occupational attainment is trivial.

The structural difference in occupational attainment between men and women indicates that they may be treated differently in the private labor market. Differential treatment is more likely to be an outcome of a preferential treatment by employers rather than a market outcome. To evaluate the degree to which women are treated differently with regards to occupational attainment, occupational distribution for women is predicted using the estimated parameters of the occupational attainment model for men. The difference between actual and predicted occupational distributions for women may indicate the degree of differential treatment in favor of men or against women. Results are reported in Table 8.

Table 8 indicates that in 2004 if women had been treated equal to their male counterparts, about 4 percent less women would have obtained professional jobs; roughly 8 percent more women would have acquired white-collar jobs and almost 4 percent fewer women would have been engaged in blue-collar jobs. In other terms, it appears that women are denied access to professional and blue-collar jobs alike.

Table 8. Actual and Predicted Probabilities of Female Occupational Distribution

Occupational Categories	Predicted 2000	Actual 2000	Predicted 2002	Actual 2002	Predicted 2004	Actual 2004
Professionals	28	33	16	27	30	34
White Collar	49	40	62	47	46	38
Blue Collar	23	27	21	26	24	28

Source: Authors' own calculations; LFSS 2000-2004.

Estimates of wage equations

The conventional model used to examine wage differentials is based on the human capital wage function laid out by Mincer (1974) and explained in the estimation methodology section of Appendix B.

Tables B-4 through B-6 present selectivity corrected earnings equations for years 2000, 2002 and 2004. The coefficients are generally significant and of the expected sign.[11]

Results of 2004 are discussed thereafter, unless otherwise indicated. Regardless of the type of occupation, an additional year of experience increases women's wages. Although these results point to a low rate of return to experience, (between 5 percent and 6 percent), it is higher than that of men. This could be due to the fact that most women workers have limited work experience and, therefore, additional years of experience signal commitment to work and lower rate of turnover. Perhaps also the learning curve at the initial period is very high. As a result, the return to this experience is very high. Returns to education are generally higher for women in white and blue-collar jobs than men, but lower in professional occupations, than their male counterparts. Though this may indicate decreasing the inequality gap between the two ends of the occupational spectrums; it is widening the gender wage gap in the higher occupational categories. Region of residence also influences the wage rate. In general, residing in metropolitan areas is associated with wage premium at all occupational categories.

Apart from professional workers, who appear to be selected based on their observed characteristics, the results point to a uniform significant negative selection term, which in turn means that occupational attainment in white and blue-collar jobs is not random, and that other unobservables determine choosing a particular occupation. Negative selection terms indicate that unobservable characteristics, such as ability, taste, social pressure or other unmeasured factors are inversely related to the probability of the chosen occupation (or that positive coefficients of measured determinants of occupational attainment, such as education, age and marital status will increase the probability of employment in that particular occupation). So workers with higher probability of employment in that occupation will earn higher wages conditional upon employment in that occupation.

Gender wage gap decompositions

In what follows, we look at the effect of a period of structural adjustment on wage inequality. We follow the literature and use the methodology detailed in Appendix A to sort out the differences in wages between male and female workers that are due to endowments and those

[11] Chow tests on the equality of coefficients across occupational categories and gender confirm that estimating separate equations for each gender is justified.

due to discrimination, i.e., the explained from the unexplained. We grouped differences due to discrimination and differences due to selection bias in one "unexplained" factor. The unexplained term may include a problem of omitted variables, including attachment to the labor force, lack of specific training, tastes, personality and/or interrupted careers.

Table 9 presents wage decompositions for males and females by occupational categories, which separate between justifiable (i.e., explained) and unjustifiable (i.e., unexplained or pure premium) components. The table also provides the predicted wage that women would receive if they were treated fairly (i.e., as men). The positive sign in the explained column indicates that men enjoy a productivity wage advantage over women by the amount indicated. In other words, men have higher levels of education and/or experience, in addition to residing in regions of high demand on their labor than women, therefore, the difference in the wage gap is justified in accordance to human capital differences.

Table 9. Decomposition of Wage Differentials by Gender and Occupational Categories-Standard Decomposition

Occupational Categories	Female Wage	Male Wage	Raw Wage Difference	Wage Gap as % of Fem. Wage	% Explained Due to Endowment	% Unexplained Due to Discrimination	Predicted Female Wages at Male's Parameters
Professionals							
2000	3.29	4.02	0.73	22%	39.2	60.8	4.32
2004	2.39	3.32	0.93	39%	38.0	62.0	3.67
White Collars							
2000	1.69	2.28	0.59	35%	58.3	41.7	2.83
2004	2.19	2.51	0.32	15%	41.1	58.9	1.99
Blue Collars							
2000	1.64	2.43	0.79	48%	0.3	99.7	2.77
2004	1.58	2.38	0.80	51%	22.9	77.1	2.39

Source: Authors' own calculations; LFSS 2000-2004.

Conversely, if there was negative sign in the explained portion then this would indicate that the labor market exhibits some favoritism towards men vis-à-vis women. In other words, women on average have higher endowments in terms of levels of education and/or experience, and should have earned more than what they are currently paid.[12] Large components of decomposition results are not unique to this study. Considerable figures have been reported for cases in developing countries which results from omitted variables problems

[12] To clarify this point, recall the first term on the right hand side of equation (7), $\sum \hat{\beta}_m (\overline{X}_m - \overline{X}_f)$. Given $\hat{\beta}_m$ is a positive term, the negative sign results from the term $(\overline{X}_m - \overline{X}_f)$, which points to advanced levels of education for women over men. When the negative difference is multiplied by higher male returns, it results in lower values of the wage gap due to endowments.

and distortions in the labor markets. Moreover, the unexplained components include selection errors (resulting from occupational attainment module). Lower probability of employment in a typical occupation contributes to the overall discrimination. Therefore, a large contribution of sample selection to wage differentials may offset other factors that work to narrow the wage gap.

Schooling or certification and years of experience are not treated similarly across occupations. It seems that years of experience are more valued in the labor market regardless of the occupation. Table 3 above already pointed to the fact that women, on average, have more years of schooling but lower years of experience.

It is evident from Table 9 that higher male wages are justified according to human capital theory predictions for all occupational categories, though at varying degrees. Recall the characteristics of workers in Table 3, male workers in general are older; less educated, but have more years of experience than their female counterparts. Decomposition figures in the table support the argument that experience is exceptionally valued in these types of occupations than certification. It is also clear from Table 9 that the part of the wage gap that is due to pure premium or discrimination has increased considerably between 2000 and 2004 for white-collar occupations. Blue-collar jobs on the other hand reported a significant level of discrimination against women. The good news is that although wage premiums started in 2000 at high levels for male workers, the component of the wage gap attributed to discrimination has dropped in 2004 considerably for that group.

Finally, the last column of the table conveys the following message: by 2004, if the two groups had been treated equally according to their personal endowments, professional women would have earned 11 percent more, on average, than their current male counterparts' wages. Blue and white-collar women would have earned comparable wages in the first and a 20 percent less in the second type of occupation.

To sum up, previous outcomes then are indicative of the presence of a relatively high unexplained wage differential when the differences in endowments are taken into account in all three types of occupations. In terms of type of endowments that is most valued, the Egyptian labor market credits years of experience at the expense of years of schooling, a type of endowment women by their social position have less of.

Advancing the previous estimation by adding occupational distribution into the decomposition assessment breaks down the wage gap further into a portion that is due to differences between occupations and a portion due to differences within occupations.

Table 10. Decomposition of Wage Differentials by Gender and Occupational Categories Between and Within Occupations

Occupational Categories	Inter-Occupation		Intra-Occupation	
	% of Wage Gap Due to		% of Wage Gap Due to	
	Endowments	Discrimination	Endowments	Discrimination
Professionals				
2000	-17.45	5.82	-24.83	136.46
2004	-26.74	10.03	1.73	114.98
White Collars				
2000	2.38	-30.92	69.10	59.44
2004	-3.82	-29.29	55.84	77.27
Blue Collars				
2000	-11.11	-26.67	4.39	133.40
2004	1.43	2.60	3.23	92.75

Source: Authors' own calculations; LFSS 2000-2004.

Table 10 shows wage decomposition taking into account within and between occupational allocations. There may appear some differences between results of this methodology and the standard methodology of decomposition above (Table 9). The reason for the different findings is that, in the standard decomposition, average male workers are compared with average female workers regardless of their type of job. In this decomposition, Brown, Moon and Zoloth (1980) compare average male workers with average female workers within and across occupational categories.

Once more, the negative sign in the endowment (explained) column indicates that if women had been treated the same as men within each occupation, their earnings would have been higher than men's, possibly due to unobserved attributes. Conversely, the positive sign in the explained column indicates that men have higher levels of education and/or experience than women, and therefore the difference in the wage gap is justified in accordance with the human capital theory predictions.

The table in general reveals the fact that the observed gap between men and women's wages is almost exclusively due to intra-occupational differences in wages (i.e., pure discrimination).

Moreover, differences between genders in their occupational allocation contributed to lowering the wage gap between both sexes—as indicated by the negative contribution of inter-occupation differentials. Results are uniform across occupations except in the case of blue-collars in 2004.

Comparing decomposition results of blue-collar wages between 2000 and 2004 points to an interesting observation. The contribution of inter-occupation wage gap has widened and it appears that a greater part of the wage gap is attributed to occupational distribution. In other words, the concentration of women in low paying blue-collar jobs and men in higher paid blue-collar jobs explains a greater difference in the wage gap in 2004 compared to 2000.

Taking into account the occupational distribution effect leads to a significant increase in the unexplained portion of the earnings gap for blue-collar occupations. Blue-collar workers experienced intra-occupational discrimination that amounted to 113 percent in 2000, and to 93 percent in 2004. The contribution of the explained component of the wage difference for blue-collars dropped from 23 percent (using standard decomposition) to 5 percent (using this decomposition). Furthermore, the table points to a drop in occupational segregation effect and a rise in pure wage discrimination for white-collar occupations (this is indicated by the negative sign of the unexplained portion between occupations, which acted in the interest of women in 2004, narrowing the wage gap by 29 percent). Professionals experienced similar, but minor effects. The previous finding that 38 percent of the professional wage gap in 2004 is justified based on endowment differences (standard decomposition, Table 9), is now dismissed and replaced by controlled by intra-occupational discrimination.

The large contribution of the intra-occupational differences in wages is not unique to this study. Kidd and Shannon (1994) reported comparable results for the Canadian labor force, with 102 percent intra-occupational wage differentials.

In summary, once male and female occupational distributions are not evenly or justifiably distributed, the explained part of the wage gap is smaller than would emerge from conventional methods. Comparing the two decomposition results indicates that the rise in the unexplained portion is due to intra-occupational earnings differences and discrimination in favor of men and against women, and to the unequal treatment of males and females productivity related characteristics. Simply put, much of the differences in the overall gender

wage gap in Egypt cannot be explained by the differences in workers' productivity-related characteristics. The differences are due to labor market discrimination.

Finally, it is worth taking into consideration the fact that although we may arrive at a better measure of wage difference decomposition by incorporating occupational distribution, we are still unable to account for pre-labor market and extra-labor market factors (such as delayed or interrupted participation and women's tastes for certain jobs).

V. Conclusion and Policy Recommendations

This paper attempts to extend the analysis and test some of the major claims of previous literature on the Egyptian labor market regarding the impact of recent economic liberalization measures and institutional changes on gender pay gaps by means of econometric analyses of micro data from consecutive, nationally-representative household surveys conducted over five years (2000-2004).

Crude analysis of the occupational distribution of the sample underlying the estimation is that the gender distribution within government and public sectors are almost constant throughout the years. Only recently, we notice a drop in female employment in the public sector and a comparable increase in the private sector. While this trend indicates that the increased participation in the labor force is absorbed by the private sector when their employment in the public or government sector drops, it confirms that those sectors (public and government) remain preferred by women.

We also examine whether occupational segregation is a major source of the gender pay differential, and attempt to estimate the proportion being attributable to segregation or entry barriers facing females in certain occupations. Our estimates show that occupational segregation and the crowding of women in blue-collar jobs are becoming a more serious issue in pay differences than pure pay discrimination against women, whereas pure wage discrimination is a rather important issue for professional and white-collar women. Therefore, policies that target inter-occupational components to close the wage gap may have far-reaching effects on blue-collar workers, whereas policies targeting equal pay for equal jobs will have a greater success for professional and white-collar workers.

Egypt is a country with very limited natural resources, but abundant labor resources and low productivity levels are major constraints on Egypt's competitiveness. The newly signed

trade agreements between Egypt and other parties (i.e., COMESA, FTA and QIZ) all predict a promising future for Egypt and its demographic gift of abundant labor force, especially that most of these trade agreements fall in the textile and clothing industries, followed by food production: two sectors of the economy that recently started sending signals of increased success only if planned properly according to market signals.

In order for Egypt to be globally competitive, it needs to boost its productivity and restrain labor cost. The manufacturing sector is increasingly becoming the engine of growth in terms of job creation potential and exporting capabilities. Examining sectors of the economy that contribute to the growth of the GDP reveals a constant value added of services sector at 50 percent from 2000 to 2004 (with an average rate of growth of 3 percent).Value added (as percent of GDP) out of the agriculture sector dropped from 17 percent in 2000 to 16 percent in 2004 (with an average growth rate of 3 percent); industry value added (as percent of GDP) rose from 33 percent in 2000 to 34 percent in 2004, (with an average growth rate of 4 percent); of which 19 percent is attributed to value added by the manufacturing sector alone (with an average growth rate of 6 percent).

Our results point out that policymakers need to consider a broader range of issues if both women and men—and the economy as a whole— are to reap the full benefits of export promotion. These include skills acquisition, a nondiscriminatory labor market, and unemployment benefits. Women's education and skill accumulation are the most important factors determining the impact of trade and economic reform on women's employment and the gender wage gap. As long as women remain less qualified than men, they are likely to remain in lower paying, less secure jobs, even if better-paying jobs become available through trade expansion. Education and skills also provide greater flexibility and power to negotiate wages and other work conditions.

Yet a strategy that aims at increasing women's participation, simply by raising their educational achievements is going to be counterproductive, as this has been shown to lead to an excess supply of educated women. More attention should be paid to the burden that social reproduction places on women, and to the creation of incentives that encourage private firms to employ women. Enactment and enforcement of antidiscrimination laws are also critical as wage discrimination often persists with trade expansion and structural adjustment.

Karshenas (1997) advocates the importance of providing an appropriate system of incentives so that gender norms about the division of labor in the work sphere can also result in lower wages for women. If gender norms force women into a small number of occupations, these occupations can become overcrowded, thus lowering wages. If it is true that a large part of the wage differential can be explained through segregation, we could argue that this segregation is nurtured by the expectation societies put on women. Because of the role women are expected to play within the household, they have to resort to more flexible/informal employment, or to the government sector, and in both cases they earn lower wages just because of the sector they chose.

Given the inferior treatment in terms of pay of professional and white-collar women in the private sector, and barriers to entry that they face in blue-collar occupations, it is likely that the burden of privatization and public sector downsizing at large may disproportionately fall on women. Even though certain segments of the private sector are now feminizing, this is not associated with a decrease in gender based occupational segregation, with the possible exception of the textile and garments industry. Food-processing, education and health sectors, which employ an increasing portion of women in the private sector, are actually witnessing a rise in such segregation in the new millennium.

Consequently, policies designed to prevent discrimination in the labor markets have at least two positive outcomes: a rise in earnings of the disadvantaged group and an increase in total productivity. To foster a competitive labor market, policy should promote equal pay within occupations. Both job mismatch and discrimination within each job category may result in reduced labor productivity.

While it is true that changing the gender structure of employment and eliminating obstacles to the individual's free and informed choices is likely to be a very slow process, due to its many links to history and culture, clear aims and public support from men as well as women, at sufficiently high levels of government have been demonstrated to achieve sustainable results in many parts of the world. As such, simple public policy prescriptions centered on education and training as keys to a more equitable access to the job market may be insufficient. Policy tools should deal with both inter- and intra-occupational discrimination in accordance with type of occupation.

Four types of policies were tried with success in Nordic and Japanese labor markets. The first set includes direct projects to reduce segregation, such as general awareness-raising and information campaigns, mentoring of women managers and equality planning at the school, university and workplace. A second set of policies aims to reduce gender pay differentials directly through systematic statistical frameworks for monitoring gender pay differentials, pay equity schemes involving job evaluation, information campaigns and drafting of new legislation. Third, taxation and social security regulations need to be redrafted to treat women as individuals and not just spouses. Finally, and perhaps most significantly, are family policies that emphasize parental leave schemes, reduced working hours and flexible working and distance working arrangements, which have been instrumental in eliminating obstacles to the individual's free and informed choices of occupation, regardless of what stereotyped or actual characteristics one has (Melkas and Anker 2003). The results of the present study suggest that at least some of these direct measures merit consideration in the Egyptian policy circles, while women are encouraged to enter the private sector labor market in larger numbers in the new millennium.

APPENDIX A: ESTIMATION METHODOLOGY

A1. FIRST STAGE: MULTINOMIAL LOGIT MODEL

Ignoring the fact that the distribution of individuals between different occupations is not random offers potential bias in wage estimation (Heckman 1979). Therefore, we assume that individuals determine their choice of occupational attainment, and hence they face four mutually exclusive alternatives when it comes to joining the labor market: Working in the agricultural sector *(j=0*), working in the professional sector (legislators, managers, health professionals and educators; *j=1*), working in white-collar occupations (technical assistance, clerks and sales and services; *j=2*) or working in blue-collar occupations (vocational, production workers and others; *j=3*).

The functional form of the multinomial logit model (Maddala 1983) is employed as follows:

$$\Pr(Y_{it} = j \mid Y_{it-1} = k) = \frac{\exp(B'_j Z_i)}{\sum_k \exp(B'_k Z_i)'} \text{,.....} j,\ k = 0,1,2,3 \quad \text{(A-1)}$$

Where:

$y_i = 0$ if employed in agricultural occupations

$y_i = 1$ if employed in professional occupations

$y_i = 2$ if employed in white-collar occupations

$y_i = 3$ if employed in blue-collar occupations

The probability that the i^{th} individual selects the j^{th} occupation is:

$$P_{ji} = exp\ (\beta'_j X_i) /[1 + \sum_{j=0}^{3} exp(\beta'_j X_i)] \quad \text{(A-2)}$$

Where the subscript *j=0, 1, 2, 3 is* for type of occupation, X_i is a vector of independent variables and β_j *is* the parameter vector for occupational choice (*j*).

To obtain the marginal effects of a covariate, x*i*, on the choice probability to state *j, Pj*, is given by:

$$\frac{dP_j}{dx_i} = P_j[\beta_j - \sum_k P_k\beta_k], \qquad \text{(A-3)}$$

Where β_j and β_k are the relevant elements of the parameter vector β (Greene 2003).

Thus, the marginal effects are to be interpreted as the change in the probability of ending in a particular state *j* given a change in an explanatory variable x_{it}.

This step is followed by constructing the selection term as follows:

$$\lambda \text{ j} = \phi \text{ (Hj) / } \Phi\text{(Hj)} \qquad \text{(A-4)}$$

where Hj = Φ^{-1}(Pj); $\varphi(.)$ and $\varphi(.)$ are the standard normal density and distribution functions, respectively.

Explanatory variables that enter into the logit model include variables that determine the reservation wage: educational dummies and age. Levels of education are captured by six dummy variables: Illiterate (base), read and write, primary, middle, secondary and university. It is assumed that higher educational attainment imply selecting a professional occupation, followed by white-collar jobs. Regional differences in occupational characteristics are captured by regional dummies as follows: Metropolitan, lower urban, upper urban, lower rural, upper rural. Other control variables are family background characteristics such as: marital status, number of children below 6 years of age and the size of the household. It is expected to find the presence of young kids and the greater the size of the household to be associated with choosing a less risky/less demanding type of job. In addition, the proportion of workers in the public and government sectors by governorate is added as a proxy for the size of demand on employment from public/government sector side.

A2. SECOND STAGE: EARNINGS FUNCTION

Estimating the parameters in the first stage allows calculating the selection term, to correct for selectivity bias, which is then entered linearly into the wage equation. The dependent variable in the wage equation is the log real hourly wages. Log hourly wages are used (instead of hourly or weekly wages) because they reduce the effects of wage outliers. The model therefore is:

$$\text{Ln}W = \beta_0 + \sum \beta_k \text{E.Dum}_{ik} + \beta_2 \text{EXP} + \beta_3 \text{EXP}^2 + \sum \beta_j \text{ Reg. Dum}_{ij} + \beta_4 \lambda + u \qquad \text{(A-5)}$$

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

Following Mincer (1974), we use levels of education and years of experience (EXP) as the main explanatory variables. Levels of education are captured by six dummy variables: Illiterate (base), read and write, primary, middle, secondary and university. Regional differences are captured by five dummies as follows: Metropolitan, lower urban, upper urban, lower rural, upper rural.

Experience variables are included in the model since workers with more years of job experience are likely to earn more (Higher experience is often associated with higher skills and higher productivity). A firm is likely to use higher wages to induce experienced workers to stay on in their jobs, as the cost of training new workers could be very expensive. The experience squared variable is included to capture the possibility of a non-linear relationship between experience and earnings. We expect a positive sign of the experience variable for the reason that working experience is likely to contribute to enhancement of the individual's human capital, and a negative coefficient of experience squared as marginal returns from experience tend to decline over the lifetime.

In this regard, it is important to keep in mind that the wage equation is built on a number of limiting assumptions. For instance, it assumes that workers have equal abilities and confront equal opportunities. Second, there is the problem of "ability" and the associated difficulty of measuring the quality of education. Human capital theory suggests that ability is likely to be positively correlated with schooling. Therefore, neglecting the ability factor from the regression equation may very well result in upward bias in the estimated returns to schooling. As a result, and because the survey data does not include variables that could be used as a proxy of ability, this problem is ignored in our estimations. A large portion of wage differences that cannot be explained by differences in human capital measured by educational attainment and experience highlights the importance of other unobservables such as firm size or firm profitability. A high paying industry (i.e., finance) is so because it attracts the most skilled and simply because it pays a premium to its employees. Other high paying industries (i.e., gas) offer high wages merely because the entire industry pays above average wages. Wage equations also disregard direct costs of schooling and overlook earnings while at school. Besides, they assume a fixed yearly return of schooling.

A further complexity of the human capital model is that the wage equation assumes that education is assigned randomly across the population. As a matter of fact, education is endogenous and estimating wage-education relationship may result in upward or downward bias, depending on how workers form their education preferences. This is significant particularly in rural regions where educating women is considered secondary to that of men.

Research into why, on average, women earn less than men has a long history. To the extent that human capital variables are unable to explain pay differences between men and women, the remainder of the pay differential has typically been taken as evidence of 'discrimination'. While there continues to be debate as to why a sizeable gender pay differential persists, it is well-established that wages are lower in occupations that employ proportionately more females. Yet, occupational segregation is only one possible source of the gender pay differential, and the theoretical literature predicts gender segregation but not necessarily at the level of occupations. Further decomposition in gender gap to take inter-occupational segregation into account provides another dimension in the unexplained component and points to the proportion being attributable to segregation or entry barriers facing females in certain occupations.

A3. THIRD STAGE: DISCRIMINATION ANALYSIS

In this part, we present the theoretical framework used for the analysis of the male-female earnings differentials. Earnings differentials between males and females can either be attributed to differences in human capital endowments or differences in the rewards to human capital. Following standard human capital theory, the performance of an individual in the labor market is largely dependent on his or her endowment of human capital. Based on the assumption that workers are paid according to their marginal product, differences in socioeconomic profiles should explain most of the variation in earnings across people. Yet, earnings differentials between genders can also be due to discrimination, i.e., differences in the rewards for the same endowment. In general, the residual, i.e., the part of the earnings differential that cannot be explained by endowment differences is used as a proxy for the extent of earnings discrimination.

Two methods of the wage gap decomposition are utilized. First, the standard Oaxaca-Blinder decomposition. Second, the wage deferential is further decomposed by disaggregating

occupational differences into explained and unexplained portions as this can provide better estimates of across-occupation and within-occupation wage differentials.

The overall sample selection adjusted wage differential between male and female workers can be decomposed into different components: (1) A portion due to differences in average characteristics, such as experience, region and education. (2) A portion due to differences in the parameters of the wage function, caused by labor market discrimination and other omitted factors, and (3) a portion due to differences in selectivity bias.

Adopting the methodology, which was first utilized by Oaxaca (1973) and Blinder (1973), the differences in the logarithmic wages between males and females are written as:

$$\Delta \ln W = \ln \overline{W}_m - \ln \overline{W}_f \qquad \text{(A-6)}$$

Where *m* refers to male workers and *f* to female workers, the operator Δ represents the mean difference between male and female wages. First, separate selectivity corrected wage equations are estimated for male and female workers. The estimated wage equations are then used to decompose the observed wage differential between male and female workers into components due to personal characteristics, parameters and sample selectivity bias.

If the average observed log wage for type *j* worker is $ln\overline{W}_{ij} = \sum_i lnW_{ij}/n_j$, the average observed characteristics, $\overline{X} = \sum_i X_{ij}/n_j$ and the average sample selectivity bias term $\bar{\lambda} = \sum_i X_{ij}/n_j$ where n_j is the number of individuals in a *j* group. In this case, *j*=male (*m*), female (*f*).

Suppose that $\hat{\beta}_m$ is the competitive wage and female workers are compensated at the same wage as male workers. Then, the predicted mean wage for female workers using competitive wages is given by $\hat{\beta}_m \overline{X}_f$. In other terms, the previous equation can be written, including the selection term, as:

$$\ln \overline{W}_m - \ln \overline{W}_f = \sum \hat{\beta}_m \overline{X}_m - \sum \hat{\beta}_m \overline{X}_f + \sum \hat{\beta}_m \overline{X}_f + \sum \hat{\beta}_f \overline{X}_f + \sum \left(\hat{\delta}_m \overline{\lambda}_m - \hat{\delta}_f \overline{\lambda}_f \right)$$

$$= \sum \hat{\beta}_m \left(\overline{X}_m - \overline{X}_f \right) + \sum \left(\hat{\beta}_m - \hat{\beta}_f \right) \overline{X}_f + \sum \left(\hat{\delta}_m \overline{\lambda}_m - \hat{\delta}_f \overline{\lambda}_f \right) \qquad \text{(A-7)}$$

The first term on the right-hand side of the equation is the differences in the endowments of wage-determining characteristics (*X's*) between male and female wages, evaluated according to the male worker pay structure ($\hat{\beta}_m$). This portion can also be interpreted as the wage gain female workers would experience if they had the same characteristics on the average as male workers. The second term on the right-hand side is the portion due to differences in pay structure (coefficients, $\hat{\beta}'s$) between male and female workers. It is the wage gain female workers would experience, given their mean characteristics, if they were compensated as male workers. The last term represents the wage differential attributed to sample selection bias. Accordingly, we run into an index number problem (Oaxaca 1973; Jones 1983). The problem arises when heterogeneous characteristics (X variables) are summed with two sets of wages (for males and females). Following the approach employed by Reimers (1983), which uses an unweighted average of each type of worker coefficients, the wage differential can be decomposed as:

$$\ln\overline{W}_m - \ln\overline{W}_f = 0.5\left(\overline{X}_m - \overline{X}_f\right)\left(\hat{\beta}_m + \hat{\beta}_f\right)\overline{X}_f + 0.5\left(\overline{X}_m + \overline{X}_f\right)\left(\hat{\beta}_m - \hat{\beta}_f\right) + \left(\hat{\delta}_m\overline{\lambda}_m - \hat{\delta}_f\overline{\lambda}_f\right) \qquad \text{(A-8)}$$

Brown, Moon, and Zoloth (1980) expanded the model and incorporated the distinction between across-occupation and within-occupation wage differences into the analysis of wage differentials. Their model can be written as follows (Brown, Moon, and Zoloth 1980; Kidd and Shannon 1996; Meng 1998):

$$\overline{\ln W_M} - \overline{\ln W_F} = \frac{\sum_j \overline{\ln W_M}\,(P_j^M - \hat{P}_j^F)}{QD} + \frac{\sum_j \overline{\ln W_M}(\hat{P}_j^F - P_j^F)}{OD}$$

(*AcrossOccupationsWageDifferences*)

$$+ \frac{\sum_j P_j^F\,(\alpha_j^M - \alpha_j^F)}{I} + \frac{\sum_j P_j^F\,X_j^F\,(\beta_j^M - \beta_j^F)}{WD}$$

$$+ \frac{\sum_j P_j^F\,\beta_j^M\,(X_j^M - X_j^F)}{PD}$$

(*WithinOccupationsWageDifferences*)

Where a bar over a variable denotes the mean value, superscripts *M* and *F* refer to male worker and female worker, respectively. P_j^M and P_j^F are the observed proportion of male and female workers in occupation *j*. $\hat{P}^F j$ measures the proportion of the sample of female

workers who would be in occupation *j* if female workers were allowed the same occupational choice as male employees.

Overall, the mean log wage difference shown in the previous equation consists of four distinct components. Brown, Moon, and Zoloth (1980) defined *QD* and *OD* as the explained and unexplained occupational segregation respectively. *I* and *WD* represent the unexplained within-occupation wage differences, while *PD* represents the explained within-occupation wage differences. The 'explained' term refers to wage differentials resulting from gender differences in productivity-related characteristics. The 'unexplained' term refers to wage differentials that cannot be accounted for on the basis of productivity endowments and is commonly interpreted as a measure of labor market discrimination.

Summing up, decomposition of the gender wage gap differential involves three steps. First, the multinomial logit model is employed to predict the occupational distribution of female employees in the absence of discrimination. Second, wage functions are estimated to obtain αj and βj for male and female workers, respectively. Third, the information obtained in the first and second steps are then used to calculate QD, OD, I, WD and PD that might be summed to obtain the wage differential between male and female workers.

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 a 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-labor market and extra-labor market factors (such as delayed or interrupted participation and women's tastes for non-pecuniary aspects for jobs).[13]

[13] 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 labor (Dex 1985; Wilkinson 1991). Moreover, the preferences and tastes of women for certain jobs, or accepting a tradeoff between pecuniary and non-pecuniary aspects of jobs, are seen in orthodox literature as a product of free choice. A feminist standpoint theorist, however, would interpret it as the "cumulative molding of behavioral response, produced by a history of difference and discrimination" (Humphries 1994, p. 8).

APPENDIX B: TABLES

Table B1. Marginal Effects of Multinomial Logit Model of Occupational Attainment, in the Non-Agricultural Private Sector, 2000

Variables	Year 2000-Females			Year 2000-Males		
	Prof.	White Collar	Blue Collar	Prof.	White Collar	Blue Collar
Age	0.050***	-0.032***	-0.018***	0.018***	-0.012***	-0.006***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Age Sq.	-0.049***	0.037***	0.013***	-0.007***	0.015***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Region of Residence (Metro=base)						
Lower Urban	0.146***	-0.135***	-0.011***	0.037***	-0.040***	0.003***
	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Lower Rural	0.188***	-0.225***	0.037***	-0.024***	-0.046***	0.069***
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Upper Urban	0.008**	0.020***	-0.029***	-0.044***	0.027***	0.017***
	(0.004)	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)
Upper Rural	0.174***	-0.208***	0.034***	-0.080***	-0.050***	0.130***
	(0.005)	(0.004)	(0.004)	(0.001)	(0.001)	(0.001)
Levels of Education (Illiterate=base)						
Read & Write	0.149***	-0.150***	0.002	0.073***	0.033***	-0.106***
	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Primary	0.173***	-0.153***	-0.020***	0.044***	0.078***	-0.121***
	(0.005)	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)
Intermediate	0.113***	0.082***	-0.195***	0.110***	0.215***	-0.325***
	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Secondary	0.309***	-0.103***	-0.206***	0.153***	0.321***	-0.474***
	(0.005)	(0.005)	(0.001)	(0.002)	(0.002)	(0.001)
University+	0.756***	-0.373***	-0.383***	0.692***	-0.060***	-0.632***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)
Married	-0.006***	0.064***	-0.058***	0.090***	-0.035***	-0.055***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Children 0-6	-0.058***	0.030***	0.028***	0.006***	0.008***	-0.014***
	(0.002)	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)
Size of HH	0.002***	0.003***	-0.005***	-0.001***	-0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share of Pub/Gov. Emp.	-0.022***	0.014***	0.008***	-0.015***	0.007***	0.008***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
No. of Observations	497153	497153	497153	5755351	5755351	5755351

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' own calculations; LFSS 2000-2004.

Table B2. Marginal Effects of Multinomial Logit Model of Occupational Attainment, in the Non-Agricultural Private Sector, 2002

Variables	Year 2002-Females			Year 2002-Males		
	Prof.	White Collar	Blue Collar	Prof.	White Collar	Blue Collar
Age	0.038***	-0.014***	-0.024***	0.020***	-0.013***	-0.007***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age Sq.	-0.039***	0.013***	0.026***	-0.007***	0.014***	-0.007***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Region of Residence (Metro=base)						
Lower Urban	0.028***	-0.050***	0.021***	0.049***	-0.050***	0.001*
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Lower Rural	0.009***	-0.005***	-0.004***	-0.027***	-0.063***	0.090***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.000)	(0.001)
Upper Urban	0.042***	-0.008***	-0.034***	-0.044***	0.008***	0.037***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Upper Rural	0.022***	-0.059***	0.037***	-0.081***	-0.047***	0.129***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Levels of Education (Illiterate=base)						
Read & Write	0.003*	0.057***	-0.060***	0.096***	0.016***	-0.112***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Primary	-0.028***	0.043***	-0.015***	0.128***	0.040***	-0.169***
	(0.003)	(0.004)	(0.002)	(0.001)	(0.001)	(0.001)
Intermediate	-0.127***	0.317***	-0.190***	0.123***	0.187***	-0.310***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Secondary	0.160***	0.068***	-0.228***	0.200***	0.257***	-0.458***
	(0.003)	(0.003)	(0.001)	(0.002)	(0.002)	(0.001)
University+	0.478***	-0.102***	-0.376***	0.668***	-0.064***	-0.603***
	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)	(0.000)
Married	-0.029***	0.047***	-0.017***	0.088***	-0.035***	-0.053***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Children 0-6	0.051***	-0.020***	-0.031***	-0.001	-0.020***	0.020***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Size of HH	0.002***	-0.003***	0.002***	0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share of Pub/Gov Emp.	0.004***	0.002***	-0.006***	-0.022***	0.003***	0.019***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
No. of Observations	823738	823738	823738	6113756	6113756	6113756

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' own calculations; LFSS 2000-2004.

Table B3. Marginal Effects of Multinomial Logit Model of Occupational Attainment, in the Non-Agricultural Private Sector, 2004

Variables	Year 2004-Females			Year 2004-Males		
	Prof.	White Collar	Blue Collar	Prof.	White Collar	Blue Collar
Age	0.050***	-0.024***	-0.027***	0.020***	-0.010***	-0.010***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Age Sq.	-0.046***	0.018***	0.028***	-0.007***	0.011***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
Region of Residence (Metro=base)						
Lower Urban	0.023***	-0.027***	0.004*	0.027***	-0.048***	0.021***
	(0.003)	(0.003)	(0.002)	(0.001)	(0.000)	(0.001)
Lower Rural	0.170***	-0.195***	0.025***	-0.020***	-0.063***	0.083***
	(0.003)	(0.002)	(0.002)	(0.001)	(0.000)	(0.001)
Upper Urban	0.044***	-0.044***	-0.001	0.012***	-0.012***	-0.001
	(0.003)	(0.003)	(0.003)	(0.001)	(0.001)	(0.001)
Upper Rural	0.133***	-0.245***	0.112***	-0.033***	-0.089***	0.122***
	(0.004)	(0.003)	(0.004)	(0.001)	(0.001)	(0.001)
Levels of Education (Illiterate=base)						
Read & Write	0.143***	-0.054***	-0.088***	0.089***	0.008***	-0.097***
	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Primary	0.027***	0.036***	-0.062***	0.104***	0.034***	-0.138***
	(0.005)	(0.005)	(0.002)	(0.001)	(0.001)	(0.001)
Intermediate	-0.042***	0.278***	-0.236***	0.108***	0.192***	-0.300***
	(0.003)	(0.003)	(0.002)	(0.001)	(0.001)	(0.001)
Secondary	0.172***	0.077***	-0.248***	0.166***	0.282***	-0.448***
	(0.005)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)
University+	0.713***	-0.287***	-0.426***	0.670***	-0.058***	-0.612***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)
Married	-0.056***	0.074***	-0.018***	0.113***	-0.038***	-0.075***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Children 0-6	0.050***	0.004**	-0.054***	0.005***	-0.002***	-0.002***
	(0.002)	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)
Size of HH	0.002***	0.002***	-0.004***	-0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Share of Pub/Gov. Emp.	-0.009***	-0.007***	0.016***	-0.002***	0.002***	-0.001***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
No. of Observations	555268	555268	555268	6374678	6374678	6374678

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' own calculations; LFSS 2000-2004.

Table B4. Selectivity Corrected Wage Equation Estimates, Non-Agricultural Private Sector Workers, 2000

Variables	Prof.		White Collar		Blue Collar	
	Female	Male	Female	Male	Female	Male
Experience	0.044***	0.014***	0.009***	0.011***	0.052***	0.024***
	(0.002)	(0.001)	(0.001)	(0.000)	(0.002)	(0.000)
Experience Sq.	-0.055***	-0.025***	-0.016***	-0.015***	-0.082***	-0.047***
	(0.003)	(0.002)	(0.002)	(0.001)	(0.005)	(0.001)
Region of Residence (Metro=base)						
Lower Urban	-0.775***	-0.367***	-0.563***	-0.209***	-0.138***	-0.231***
	(0.010)	(0.006)	(0.007)	(0.003)	(0.009)	(0.002)
Lower Rural	-1.143***	-0.201***	-0.711***	-0.281***	-0.114***	-0.433***
	(0.012)	(0.006)	(0.010)	(0.002)	(0.008)	(0.002)
Upper Urban	0.276***	-0.011**	-0.364***	-0.119***	-0.343***	-0.162***
	(0.008)	(0.004)	(0.006)	(0.003)	(0.011)	(0.002)
Upper Rural	-1.016***	-0.177***	-0.239***	-0.171***	-0.255***	-0.548***
	(0.029)	(0.009)	(0.016)	(0.004)	(0.012)	(0.002)
Levels of Education (Illiterate=base)						
Read & Write	-0.454***	-0.602***	-0.108***	0.025***	0.395***	0.117***
	(0.032)	(0.016)	(0.013)	(0.004)	(0.010)	(0.001)
Primary	-2.114***	0.099***	0.580***	-0.148***	0.098***	0.076***
	(0.045)	(0.022)	(0.017)	(0.005)	(0.015)	(0.002)
Intermediate	-1.245***	-0.527***	0.368***	-0.208***	-0.270***	-0.163***
	(0.026)	(0.015)	(0.016)	(0.005)	(0.009)	(0.002)
Secondary	-3.574***	-1.573***	0.122***	0.113***	-0.103***	-0.229***
	(0.037)	(0.018)	(0.011)	(0.006)	(0.018)	(0.006)
University+	4.709***	2.594***	0.421***	0.373***	0.278***	-0.056***
	(0.049)	(0.021)	(0.011)	(0.004)	(0.021)	(0.007)
Lambda	5.152***	3.570***	-0.365***	0.991***	-0.542***	-0.695***
	(0.050)	(0.022)	(0.032)	(0.013)	(0.026)	(0.005)
Constant	0.772***	0.651***	0.358***	0.375***	-0.015	1.011***
	(0.031)	(0.017)	(0.015)	(0.006)	(0.022)	(0.005)
Observations	48870	176734	71634	398135	35244	1154552
R-squared	0.50	0.20	0.26	0.15	0.23	0.15

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' own calculations; LFSS 2000-2004.

Table B5. Selectivity Corrected Wage Equation Estimates, Non-Agricultural Private Sector Workers, 2002

Variables	Prof.		White Collar		Blue Collar	
	Female	Male	Female	Male	Female	Male
Experience	0.008***	-0.009***	0.030***	0.024***	-0.007***	-0.004***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Experience Sq.	-0.016***	0.016***	-0.095***	-0.049***	0.021***	0.008***
	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
Region of Residence (Metro=base)						
Lower Urban	-0.343***	-0.125***	0.013***	-0.172***	-0.152***	-0.078***
	(0.007)	(0.006)	(0.004)	(0.003)	(0.004)	(0.002)
Lower Rural	-0.488***	-0.137***	-0.063***	-0.268***	-0.184***	-0.334***
	(0.008)	(0.008)	(0.005)	(0.003)	(0.004)	(0.002)
Upper Urban	0.099***	0.015***	-0.016***	-0.145***	-0.333***	-0.062***
	(0.007)	(0.006)	(0.004)	(0.003)	(0.005)	(0.002)
Upper Rural	-0.096***	-0.176***	-0.061***	-0.119***	-0.342***	-0.380***
	(0.011)	(0.008)	(0.006)	(0.004)	(0.005)	(0.002)
Levels of Education (Illiterate=base)						
Read & Write	0.000	0.646***	0.164***	-0.170***	0.114***	0.234***
	(0.000)	(0.021)	(0.011)	(0.005)	(0.008)	(0.002)
Primary	0.000	0.070***	0.487***	-0.264***	0.432***	0.218***
	(0.000)	(0.023)	(0.011)	(0.006)	(0.008)	(0.002)
Intermediate	0.346***	0.614***	0.031***	-0.428***	-0.295***	0.014***
	(0.018)	(0.020)	(0.012)	(0.006)	(0.006)	(0.002)
Secondary	-0.155***	-0.427***	0.463***	-0.310***	-0.375***	-0.273***
	(0.026)	(0.023)	(0.010)	(0.007)	(0.010)	(0.006)
University+	0.245***	1.291***	0.484***	0.292***	-0.328***	-0.060***
	(0.036)	(0.027)	(0.009)	(0.005)	(0.023)	(0.008)
Lambda	1.294***	2.619***	-0.361***	-1.324***	-1.641***	-0.579***
	(0.041)	(0.025)	(0.018)	(0.014)	(0.015)	(0.006)
Constant	-0.178***	0.191***	-0.168***	0.342***	0.976***	1.076***
	(0.018)	(0.022)	(0.011)	(0.006)	(0.008)	(0.005)
Observations	74152	204739	233009	450251	117500	1193318
R-squared	0.21	0.14	0.13	0.11	0.19	0.16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' own calculations; LFSS 2000-2004.

Table B6. Selectivity Corrected Wage Equation Estimates, Non-Agricultural Private Sector Workers, 2004

Variables	Prof.		White Collar		Blue Collar	
	Female	Male	Female	Male	Female	Male
Experience	0.061***	-0.005***	0.051***	0.041***	0.046***	0.036***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)	(0.000)
Experience Sq.	-0.113***	0.009***	-0.067***	-0.071***	-0.078***	-0.064***
	(0.004)	(0.002)	(0.004)	(0.001)	(0.004)	(0.000)
Region of Residence (Metro=base)						
Lower Urban	-0.095***	-0.117***	-0.217***	-0.041***	-0.103***	-0.081***
	(0.009)	(0.004)	(0.006)	(0.002)	(0.007)	(0.001)
Lower Rural	-0.358***	-0.121***	-0.273***	-0.103***	-0.220***	-0.088***
	(0.008)	(0.005)	(0.008)	(0.002)	(0.006)	(0.002)
Upper Urban	-0.067***	-0.038***	0.077***	0.021***	-0.004	-0.039***
	(0.007)	(0.003)	(0.006)	(0.002)	(0.008)	(0.001)
Upper Rural	-0.439***	-0.054***	-0.343***	-0.043***	0.217***	-0.104***
	(0.014)	(0.006)	(0.012)	(0.003)	(0.010)	(0.002)
Levels of Education (Illiterate=base)						
Read & Write	-0.382***	0.313***	0.087***	0.097***	0.289***	0.111***
	(0.036)	(0.016)	(0.011)	(0.003)	(0.007)	(0.001)
Primary	-0.900***	0.382***	0.235***	0.040***	0.185***	0.120***
	(0.055)	(0.017)	(0.013)	(0.004)	(0.008)	(0.002)
Intermediate	-0.167***	0.685***	0.466***	0.151***	0.178***	0.141***
	(0.027)	(0.014)	(0.014)	(0.004)	(0.007)	(0.001)
Secondary	-0.442***	0.181***	0.429***	0.288***	0.022	0.174***
	(0.033)	(0.016)	(0.012)	(0.005)	(0.016)	(0.004)
University+	0.575***	0.707***	0.709***	0.563***	0.602***	0.222***
	(0.046)	(0.020)	(0.010)	(0.004)	(0.016)	(0.004)
Lambda	0.836***	2.526***	-0.209***	-0.412***	-0.371***	-0.078***
	(0.048)	(0.020)	(0.019)	(0.010)	(0.016)	(0.004)
Constant	0.150***	-0.407***	-0.311***	-0.041***	-0.022*	0.292***
	(0.027)	(0.014)	(0.010)	(0.004)	(0.012)	(0.003)
Observations	92118	314806	153603	810057	77283	2199802
R-squared	0.24	0.15	0.16	0.23	0.15	0.26

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' own calculations; LFSS 2000-2004.

Figure C1. Median Real Wage and Mean Years of Schooling by Occupational Categories

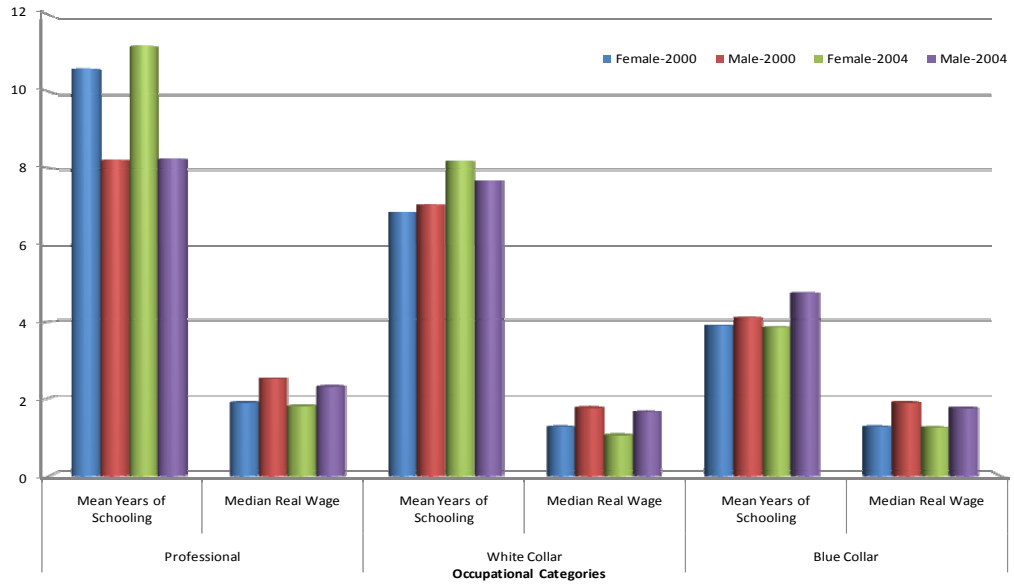
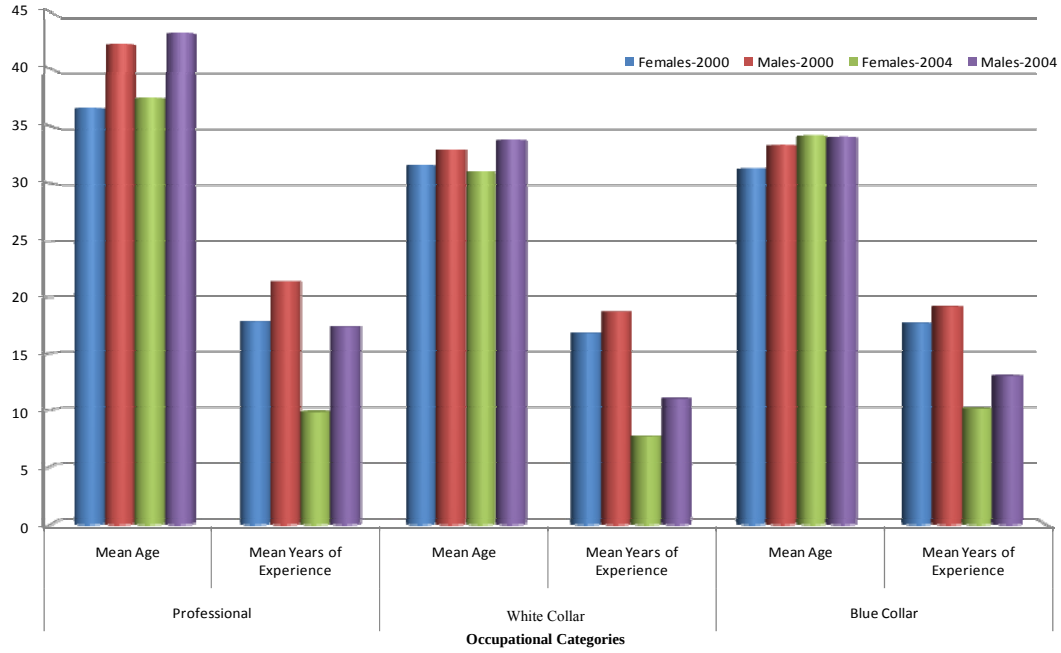


Figure C2. Mean Age and Mean Years of Experience by Occupational Categories



Source: Authors' own calculations; LFSS 2000-2004.

REFERENCES

African Development Bank. 2005. Report on Arab Republic of Egypt.

Afshar, H., and C. Dennis. eds. 1992. *Women and adjustment policies in the third world*. New York: St. Martin's Press.

Anker, R. 1998. *Gender and jobs: Sex segregation of occupations in the world*. Geneva: ILO.

Anker, R. 2003. *Gender-based occupational segregation in the 1990s.* ILO Working Paper 16. Geneva: ILO. September.

Artecona, R., and W. Cunningham. 2002. *Effects of trade liberalization on the gender gap in Mexico.* Policy Research Report on Gender and Development. Washington, D.C.: World Bank.

Assaad, R., and F. El-Hamidi. 2001. Is all work the same? A comparison of the determinants of female participation and hours of work in various employment states in Egypt. In *Research in Middle East Economics, Vol. 4. The Economics of Women and Work in the Middle East and North Africa.* Elsevier Science B.V., Mine Cinar ed, Netherlands.

Assaad, R. and F. El-Hamidi. 2007. Forthcoming. *Assessing female labor force in Egypt then 1998, and now 2006.* ERF Working Paper. Egypt: Economic Research Forum

Assaad, R., and M. Arntz. 2005. Constrained geographical mobility and gendered labor market outcomes under structural adjustment: Evidence from Egypt. Canada: *World Development* 33 (3): 432-454.

Assaad, R. 2006. *Institutions, household decisions and economic growth in Egypt.* In *Explaining Growth in the Middle East*. Nugent, J., and Pesaran, H. Editors. Canada: Elsevier Publishers.

Barsoum, G. 2004. *The employment crisis of female graduates in Egypt: An ethnographic account.* Cairo Papers in Social Science. 25 (3). Egypt: American University in Cairo Press.

Bassusi Al., N., and S. Amin. 2002. *Wage work to prepare for marriage: Labor force entry for young women in Egypt.* Paper presented at the annual meeting of the Population Association of America. Atlanta.

Becker, Gary S. 1975. *Human Capital*. 2nd ed. Chicago: University of Chicago Press.

Berik, G., Y. van der Meulen Rodgers, and J. Zveglich Jr. 2003. *International trade and wage discrimination: Evidence from East Asia.* Policy Research Working Paper 3111. Washington, D.C.: World Bank.

Black, S., and E. Brainerd. 2002. *Importing inequality? The impact of globalization on gender discrimination.* Discussion Paper 3532. London: Center for Economic Policy Research.

Blinder, A.S. 1973. Wage discrimination: reduced form and structural Estimates. *Journal of Human Resources*. 8 (4): 436-455. University of Wisconsin Press.

Brown, R. S., M. Moon, and B. S. Zoloth. 1980. Incorporating occupational attainment in studies of male-female earnings differentials. *The Journal of Human Resources*. 15 (1):3–28.

Brown.1980. Occupational attainment and segregation by sex. *Industrial and Labor Relations Review*, 33 (July):506-517.

Dex, S. 1985. The sexual division of work. Brighton: Wheatsheaf.

Dickens, W., and K. Lang. 1985. A Test of Dual Labor Market Theory. *American Economic Review* 75 (September): 792-805.

El-Hamidi, F. 2003. *Labor supply of Egyptian married women when self-employment is an option: Participation and hours of work*. Paper presented at the annual meeting of the Middle East Economic Association (MEEA), in collaboration with the Allied Social Science Associations (ASSA). Washington, D.C.

El-Hamidi, F. 2006. General or vocational? Evidence on school choice, returns, and sheep skin effects from Egypt 1998. *Journal of Policy Reform*. 9 (2): 157-176.

Greene, W. 2003. *Econometric Analysis*, 5th ed. Prentice Hall, Upper Saddle River, NJ.

Haddad, L., L.R. Brown, A. Richter, and L. Smith 1995. The Gender dimensions of economic adjustment policies: Potential interactions and evidence to date. *World Development*. 23 (6): 881-896.

Heckman, J. J. 1979. Sample selection bias as a specification error. *Econometrica.* 47(1):153-161.

Horton, S., R. Kanbur, and D. Mazumdar. 1994. *Labor markets in an era of adjustment: An overview.* In Labor markets in an era of adjustment. Vol. I. Issues Papers. Washington, D.C.: The World Bank, EDI Development Studies.

Humphries, J. 1994. *Economics, gender and equal opportunities*. Paper presented at an EOC conference on the economics of equal opportunities. Manchester.

IMF (International Monetary Fund). World Economic Outlook. 2007.

Jones, F.L. 1983. On decomposing the wage gap: A critical comment on blinder's method. *Journal of Human Resources*. 18 (1): 126-130.

Karshenas M. 1997. *Economic liberalization, competitiveness and women's employment in the Middle East & North Africa.* ERF Working Paper 9705. Cairo, Egypt: Economic Research Forum for the Arab Countries, Iran & Turkey (ERF).

Kidd, M. P., and M. Shannon. 1994. An update and extension of the Canadian evidence on gender wage differentials. *The Canadian Journal of Economics*. Vol. 27(4): 918-938.

———. 1996. Does the level of occupational aggregation affect estimates of the gender wage gap? *Industrial and Labor Relations Review*. 49 (2):317–329.

Maddala, G. S. 1983. *Limited dependent and qualitative variables in econometrics.* Cambridge: Cambridge University Press.

Meng, X. 1998. Gender occupational segregation and its impact on the gender wage differential among rural-urban migrants: A Chinese case study. *Applied Economics*, 30 (1):741-752.

Melkas, H., and R. Anker. 2003. *Towards gender equity in Japanese and Nordic labor markets: A tale of two paths*. Geneva: ILO.

Mincer, J. 1974. *Schooling, experience and earnings.* New York: National Bureau of Economic Research.

Moghadam, V. 1998. *Women, work and economic reform in the Middle East and North Africa*. Boulder, London: Lynne Rienner Publishers.

Nassar, Heba. 1998. *Structural adjustment and women's employment in Egypt*. Workshop on Economic Restructuring and Women in the Middle East: Gender, Jobs and Activist Organizations. Brown University, Thomas Watson Jr. Institute for International Studies.

Nicita, A., and S. Razzaz. 2003. *Who benefits and how much? How gender affects welfare impacts of a booming textile industry*. Policy Research Working Paper. 3029. Washington, D.C.: World Bank.

Oaxaca, R. 1973. Male-female wage differentials in urban labor markets. *International Economic Review*. 14 (3): 693-709.

Oostendorp, R. H. 2004. *Globalization and the gender wage gap.* Policy Research Working Paper 3256. Washington, D.C.: World Bank.

Paul-Mazumdar, P., and A. Begum. 2002. *The gender imbalances in the export oriented garment industry in Bangladesh*. Policy research report on gender and development. Working Paper 12. Washington, D.C.: World Bank.

Polachek, S. W. 1975. *Potential biases in measuring male-female discrimination. Journal of Human Resources*, 10, 205-229.

Reimers, C. 1983. Labor market discrimination against Hispanic and black men. *Review of Economics and Statistics*, 65 (4): 570-579.

Said, M. 2007. *The Fall and Rise of Earnings and Inequality in Egypt: New Evidence From the ELMPS, 2006*. ERF Working Paper, No. WP0708. http://www.erf.org.eg/cms.php?id=publication_details&publication_id=830

Said, M. 2003. *The distribution of gender and public sector pay premia: Evidence from the Egyptian organized sector.* SOAS Economics Department Working Paper No. 132. London, UK: School of Oriental and African Studies, University of London.

Said, M. 1999. The distribution of gender differentials & public sector wage premia in Egypt. Economic Research Forum for the Arab Countries, Iran & Turkey, Working Paper 9925. Cairo, Egypt.

Sparr, P. ed. 1994. *Mortgaging women's lives.* Feminist Critiques of Structural Adjustment. London and New Jersey: Zed Books.

Swamy, G. 2004. *The impact of international trade on gender equality? Do women benefit from expansions in international trade?* PREM Notes 86. Poverty Reduction and Economic Management Network. Washington, D.C.: World Bank.

UNCTAD. 2004. Report of the United Nations Conference on Trade and Development on its Eleventh Session. São Paulo, Brazil.

Wilkinson, F. 1991. The structuring of economic and social deprivation and the working of the labor markets in industrial countries. *Labor and Society*. 16 (2):119-138.

Wood, A. 1991. North-south trade and female labor in manufacturing: An asymmetry. *Journal of Development Studies*. January.

World Bank. 2004. *Gender and development in the Middle East and North Africa*. Washington, D.C.: World Bank.