A Cohort Analysis of Gender Wage Differentials in Sri Lanka: 1996-2004

Ashani Abayasekara
Australian National University
and
Dileni Gunewardena
University of Peradeniya

Received: 21 November 2013
Accepted: 7 July 2015

Abstract

Changing patterns over time in female school enrolments and labour force participation can be expected to have an impact on the gender wage gap. This study uses cohort analysis and data from the Department of Census and Statistics' Quarterly Labour Force Surveys from 1996 to 2004 to examine gender wage differentials in three age cohorts corresponding to different periods of labour force attachment. Results indicate that despite larger wage gaps, gender discrimination in the private sector, for full-time workers, has declined marginally over time, whereas young female public sector full-time workers face more discrimination than middle and old cohort workers.

Keywords: Gender wage gaps, Cohort Analysis, Blinder-Oaxaca decomposition, Female Labour Force Participation

1. Introduction

Gender wage inequality characterizes labour markets all over the world. According to the human capital approach to wage determination, in a labour market free of discrimination, unequal wages are the result of unequal productivity. Differences in productivity are attributed to differences in human capital accumulation, generally measured in terms of productivity enhancing characteristics such as endowments of schooling and experience. Group discrimination (such as sex or race discrimination) is apparent when the average

wage of a group in the labour market is not proportional to its average productivity (Aigner and Cain 1977). Empirical analyses based on the methodology initiated by Oaxaca (1973) and Blinder (1973) enable the decomposition of gender wage gaps into a component attributable to gender differences in productive endowments and to a residual unexplained component. Given the usual assumptions regarding bias and model specification, the latter can be considered a measure of discrimination.

Changing patterns over time in female school enrolments and labour force participation over time can be expected to have an impact on their accumulation of human capital, both in terms of schooling and experience, and thereby to be reflected in the decomposition of wage gaps into explained and unexplained components. One could expect that with no change in discrimination, reductions in the schooling and experience gaps between men and women will result in proportionately smaller gender wage gaps. Alternatively, disproportionate changes in wage gaps will reveal whether discrimination has decreased over time or not. Ideally, the availability of repeated cross sections of comparable labour force data over a very long period of time would enable the exploration of the effect of changes in productivity enhancing characteristics such as schooling and experience on gender wage gaps over time. In the absence of such data, the variation in age composition of males and females in repeated cross sections of labour force data over a much shorter period can be exploited by using cohort analysis (Dolton et al., 2008).

In Sri Lanka, particularly over the last half-century, female school enrolments have increased, to the extent that female enrolment exceeds male enrolment at secondary level. Female employment opportunities have expanded from predominantly agricultural wage work in the pre-independence era to include a narrow set of state-dominated occupations (teaching, nursing,

clerical, and finance-related jobs) in the 1940s through the 1970s; since the 1980s women have also taken manufacturing jobs in export industries and service industries as well as overseas (Kiribanda, 1997).

The increase in female accumulation of human capital and the expansion of the range of occupations open to females in Sri Lanka suggest that at the turn of the millennium, younger females might have higher wages and face a smaller gender wage gap than older cohorts. Existing evidence from several studies that follow the Oaxaca-Blinder approach (Ajwad and Kurukulasuriya 2002), though not strictly comparable, indicates that the unconditional mean wage gap has indeed declined over time for women of all ages, but that the remaining gap is more than completely unexplained. That is, while women have (more than) caught up with men in terms of productive characteristics they continue to be paid less than men having the same characteristics, which could be termed 'discrimination' (Gunewardena 2010). The lack of a comparable data set of labour force data over a long time period has precluded the analysis of how these changes may have affected changes in the aggregate wage gap and its component parts. The application of cohort analysis to explore such changes by examining how the overall gap differs by exploiting variation in the age composition of the labour force has hitherto been unexplored in the Sri Lankan literature.

The present study attempts to fill this gap by drawing on a cohort-analysis approach that has been used to analyse wage differentials in European countries (Dolton et al., 2008). The objective of the analysis is to identify (1) if patterns in overall gender wage gaps vary by age cohort, and (2) whether the extent to which the gap can be explained by gender differences in human capital endowments (or by discrimination) also differs by age cohort. This exercise will throw light on whether discrimination has decreased over time, and whether females entering

the labour market can be expected to face less discrimination than their forebears did. The study also examines if results differ by part-time and full-time status of workers, as this distinction has been ignored in previous work in Sri Lanka. Further, it controls for non-random selection of females into the labour force, the neglect of which can potentially lead to understating the gender wage gap.

The paper is structured as follows. Section 2 reviews the existing literature on gender wage differentials. Section 3 describes the methodological approach and dataset used in the analysis of gender wage differentials in this study. Section 4 discusses the results of the econometric analysis that is undertaken. Section 5 concludes.

2. Literature Review

In this section, we begin by outlining the theoretical approach to the study of gender wage gaps, and follow it with selected examples from the large international literature. We follow this with a description of the Sri Lankan labour market for men and women, highlighting trends that could have had an effect on the gender wage gap over time. We conclude this section by showing how the present study addresses existing gaps in the Sri Lankan literature on gender wage gaps.

An abundant literature exists on explanations of gender wage differences. The first explanations come from the early 1970s and are based on both Mincer and Polachek's (1974) human capital theory and on Becker's (1971) discrimination theory. According to Mincer and Polachek, gender wage gaps are due to endowment differences in individual characteristics. Women invest less in their own human capital (education, experience, etc.) because, firstly, they anticipate career breaks, and secondly because women take into account the

fact that their professional career may be shorter than men's due to family responsibilities.

Becker (1971) argues that economic agents belonging to a specific group can have discriminatory preferences against members of another group. The fact of hiring a person of a discriminated group may imply an additional psychological cost to the employer, which may cause the employer to demand compensation for this, by way of offering lower wages to the discriminated group. Alternatively, employers may discriminate by requiring members of another group to demonstrate higher productivity than other workers when they are hired (or promoted) to the same job. Even if employers do not have discriminatory preferences, they may pay lower wages or practice discrimination in hiring or promoting members of another group because they perceive their employees or customers to have discriminatory preferences.

Bergmann (1989) argued that occupational segregation can explain gender wage gaps, even among men and women who have similar endowments of human capital. If women are actively prevented from entering certain 'male' occupations, they "crowd" other occupations generally regarding as acceptable for women. As a result market equilibrium wages in these latter occupations are depressed owing to the oversupply of (female) labour into these occupations, even if both employments require the same level of qualifications. Alternatively, 'female' occupations may require fewer qualifications and facilitate a better work/life balance. Within the theory of occupational choice, women are inclined to self-select, i.e. move towards such jobs by choice.

Empirical studies on wage determination and gender wage differentials originated with the methodology proposed by Oaxaca (1973) and Blinder (1973) where the wage differential is decomposed into the effects of differences in

productivity-enhancing characteristics (education, job experience etc.) and a residual "unexplained" component. Under the usual assumptions relating to specification and bias, this latter unexplained component can be considered a lower-bound estimate of discrimination. When wage gaps are caused by endowment differences, as the explanation proposed by Mincer and Polachek (1974), they will be explained largely by differences in endowments, whereas if gender wage gaps are due to discrimination, as described by Becker (1971) and Bergmann (1989), the unexplained residual or "discrimination" component will dominate.

World Bank (2001) compiled a review of empirical studies that used this approach and were conducted in the 1980s and 1990s in developed and developing countries.[1] According to this review, the unexplained (discrimination) component ranged from as little as 4% or as much as 147% of the entire wage gap. [2] In the majority of the studies reviewed, the unexplained (discrimination) component ranged from 70 to 90 percent, in countries as diverse as Canada, China and Columbia.

In the western world, as female human capital accumulation has increased over time, and relative pay gaps have tended to decrease, more recent studies have attempted to capture potential changes in the relative importance

---

1 Appendix 3, Relative Earnings of Women and Men Adjusted for Differences in Human Capital, p. 301-306, World Bank, *Engendering Development*, 2001.

2 An analysis of monthly wages of Urban workers in manufacturing in Tanzania in 1980 conducted by Psacharapoulos and Tzannatos (1992) showed average female wages to be 86% of male wages and 4% of the gap to be unexplained. A similar study by the same authors using weekly wage data in Honduras in 1989 found a gap of 81% of which 147% was unexplained. A gap of over 100% indicates that in the absence of discrimination women would (should) have earned more than men owing to better human capital endowments.

of discrimination over time and in different types of work. One such example is a study of twelve European countries by Dolton et al. (2008) that analyzed wage differences in three specific age groups to capture changes in the wage gap through time and across part-time and full-time workers. This study found that wage disparities faced by part-time workers, especially older workers could be attributed to discrimination. By contrast, Pastore and Marcinkowska (2004) found that wage gaps among young people in Italy were largely unexplained (by endowments of human capital and experience) relative to wage gaps among adults.

Several European studies also found occupational segregation to be a significant source of wage disparities: about 11% of the wage gap in Italy was accounted for by the segregation of women in low wage industries (Pastore and Marcinkowska 2004), while Lauer (2000) found that among West-German full-time private sector employees since the mid-1980s, occupational segregation was found to be a significant source of wage disparities, in addition to the lower human capital endowments and lower returns to endowments of women. Occupational and industrial segregation also played a role in explaining gender wage differentials according to a study of five European countries based on data from the 1995 European Structure of Earnings Survey (Plasman and Sissoko 2004).

Many contributions to the recent literature focus on the issue of selectivity or non-random sample selection. If selection into employment is non-random, this may affect the resulting gender wage gap. Specifically, if women who are employed tend to have relatively high-wage characteristics (compared to those who are unemployed or not in the labour force), and if female employment rates are low, gender wage gaps may be understated simply because women with low wage characteristics would not feature in the observed

wage distribution. Blau and Kahn (2006) find evidence that sample selection implies that the 1980s' gains in women's relative wage offers are overstated and that it may also explain part of the slowdown in convergence between male and female wages in the 1990s. Albrecht et al. (2004) estimate gender wage gaps in the Netherlands having corrected for selection of women into market work and conclude that were all Dutch women working full-time, the gender wage gap would be much higher.

While there is substantial rigorous empirical work on gender wage differentials in developed countries, the body of similar research in developing countries is considerably smaller. The available evidence points to endowments of education and experience being important explanations of wage disparities while the sector of employment is also important. Glick and Sahn (1997) analyze gender earnings differences in Guinea distinguishing between public sector employment, private sector employment and self-employment. Their results indicate that education plays an important role in allocating labour force participants among sectors and that there are wage differences by sector. In a study of Indonesia, Deolalikar (1993) finds that males earn significantly more and participate more in the labour market than females at all levels due to average differences in levels of schooling. Job tenure and experience also influence labour force participation and the gender wage gap. Appleton et al. (1999) argue that lack of experience and discrimination against married women are plausible explanations for greater gender wage differentials in Cote d' Ivoire. Negatu (1993) argues that differences in labour supply behaviour usually arise from disparities in productivity endowments, including demographic variables such as age, sex and marital status, using Lesotho as a case study.

Studies on gender wage gaps in Sri Lanka (Ajwad and Kurukulasuriya 2002; Gunewardena 2009, 2010) find unexplained gaps or discrimination to account for most or all of the gender wage gap, than different productive

endowments. This is not surprising given that Sri Lanka has parity in primary school enrolment and higher female secondary school enrolment. However, while these studies recognized the importance of changes over time in educational attainment and female labour force participation they do not attempted to incorporate the time factor in their analysis.

In what follows, we describe changes over the last fifty years in Sri Lanka's female labour force participation and potential changes in the educational and experience endowments of females. We show that these can be divided into three distinct periods which are then associated with three different age cohorts corresponding to their periods of labour force attachment (Table 1).

Until the late 1970s, much of the expansion in female labour force participation is attributed to female labour supply factors of rising literacy and educational attainment as well as to the expansion of the services sector dominated by teaching, health care, clerical and finance-related occupations, which were considered types of employment more acceptable to women (Kiribanda, 1997). These job opportunities were mainly provided by the state, and thus much of the early momentum to female employment came from the public sector, within a formal structure of wages. Disparity in wages was unlikely unless the actual jobs done by men and women were different. As Gunewardena et al. (2009) suggest, any gender wage discrimination in these jobs would be due to segregation within broad occupational categories, or of women not being promoted – or not choosing to be promoted. These were jobs available to women with education and some mobility as many of them would be in the urban centres of the country.

With the liberalization of the economy in 1977, GDP growth rates rose sharply in the 1980s, with simultaneous increases in labour force participation, growing at 4.1% in the first half of the decade and 3.3% in the second half of the

decade (Kiribanda 1997) which was primarily due to exceptional increases in female labour force participation. The surge in female employment opportunities in the 1980s was mainly attributable to the establishment of a large number of export-oriented industries in the country's free trade zone areas and elsewhere (Kiribanda, 1997). These jobs were mainly in the Sri Lankan private sector with unregulated wages.

Many of the female employment opportunities created since the 1980s were those in the lower end of the distribution, and did not necessarily require a high level of education, though most required mobility. Although almost three quarters of employment in the export oriented Board of Investment (BOI) industries is female, these are concentrated in semi-skilled, unskilled and trainee positions, while less than one third of supervisory (technical) and a little over one fourth of administrative positions are occupied by women (BOI 1996). Similarly, the majority of female migrant workers overseas are in jobs at the lower end of the distribution. [3] There is also evidence that many of the newer jobs are not covered by anti-discriminatory regulations (Gunaratne, 2002; Jayaweera et al., 2000).

These trends in employment could have differing implications for human capital accumulation. On the one hand, the increase in female accumulation of human capital and in access to a wider range of occupations suggest that younger females might have higher wages and face a smaller gender wage gap than older cohorts. On the other hand, females entering the labour force in the late 1970s and early 1980s (older females) may have had higher levels of education than young females today. That is, females who entered the labour force in the earlier era could be those who self-selected into employment

[3] Information on wages and characteristics of overseas workers is not available in the QLFS and thus not included in this analysis.

because of their higher educational levels compared to females who remained out of the labour force. Such self-selection may be less today, especially as the female jobs available do not necessarily require higher levels of education. This implies that the younger group may have lower wages (and thus higher gaps) than the former. These results may also differ according to sector.

The three age cohorts Indicated in Table 1 below correspond to an individual's labour force attachment in the distinct periods as described above. The open economy period is further divided into an early period of expansion and a later period of stabilisation.

Table 1
Description of the Three Age Cohorts

Age Cohort	Labour Force Attachment	Significance of Time Period
46-58	1966-1978	Closed economy – limited amount of jobs (for females)
30-45	1979-1994	Open economy – rise in female labour force participation
18-29	1995-2004	Stable female labour force participation

The analysis is conducted separately for the three age cohorts and separately for the public and private sectors, and it also distinguishes between part-time and full-time workers in both sectors. Firstly, gender earnings differentials could differ between the public and private sectors for a variety of reasons; compliance with equal pay legislation is more likely in the public sector, and wages and promotion schemes are less likely to be subject to individual variation. On the other hand, the public sector is often regulated by political constraints rather than profit constraints, and thus any tastes for discrimination are more likely to persist. Secondly, performing specific gender pay gap decompositions for full-time and part-time workers separately can provide valuable insights given the importance of part-time work as a determinant of gender differentials.

3. Methodology

3.1 Background

The literature decomposing wage gaps originated from Mincerian wage equations (Mincer 1974) where earnings depend on productive, income-generating characteristics that individuals possess such as schooling and experience, as given in the equation below.

$$\ln(Y_i) = \beta X_i + u_i \qquad (1)$$

where Y is the wage variable and X is a vector including all productivity-related characteristics for the i^{th} individual.

Blinder (1973) and Oaxaca (1973) showed that mean wage gaps between groups could be decomposed into the effects of differences in average endowments of observable human capital and other productive characteristics, termed the characteristic effect or explained component (first term on the right in equation 2) and differing returns to those characteristics, termed the coefficients effect or unexplained component or discrimination (second term). The insight behind this method is that in the absence of discrimination, the estimated effects of individuals' observed characteristics are identical for each group.

$$\overline{\ln y_m} - \overline{\ln y_f} = \beta_m(\overline{X}_m - \overline{X}_f) + \overline{X}_f(\beta_m - \beta_f) \qquad (2)$$

The formulation of equation (2) assumes that in the absence of discrimination, the 'true' wage structure is the male wage structure, β_m, i.e. females would be paid as if they were males. The decomposition using the alternative assumption that the 'true' wage structure is the female wage structure, β_f, is given by,

$$\overline{\ln y_m} - \overline{\ln y_f} = \beta_f(\bar{X}_m - \bar{X}_f) + \bar{X}_m(\beta_m - \beta_f) \qquad (3)$$

3.2 *Data – Sample Selection and Variable Definitions*

The data used in this study are from the Quarterly Labour Force Surveys (QLFS) for the period from July 1996 to May 2004 conducted by the DCS.[4] The survey covers the whole island except the Northern and Eastern provinces, which were the two most severely affected by the conflict with the separatist Liberation Tigers for Tamil Eelam (LTTE) movement during the survey period.[5] The survey is administered to approximately 4000 housing units per quarter. The sample is selected using a two-step stratified random sampling procedure with no rotation, and a new random sample is drawn each quarter.[6]

The selected sample for this study includes all individuals between the ages of 18 and 58,[7] who were employees in their main occupation of work, who were "usually employed" in the previous 12 months,[8] and who had worked at least one hour in the week prior to when the survey was administered.[9]

[4] These years are used because the data are comparable. Links to the QLFS survey schedule are available at http://www.statistics.gov.lk/samplesurvey/index.htm

[5] The 2003 survey included the Eastern province and the 2004 survey includes both provinces except Mullaitivu and Killinochchi districts in the Northern province; for comparability households in the Northern and Eastern provinces have been excluded from the 2003 and 2004 samples.

[6] The QLFS is not a panel

[7] While 55 is the retirement age in Sri Lanka, age 58 was chosen to include many older individuals who were still working at that age.

[8] Defined by the DCS as those who worked for 26 weeks or more during the previous 12 months (Gunewardena *et al.* 2007).

Individuals who were self-employed or worked with or without pay for a family operated farm or business, and agricultural workers and any individuals who were currently attending a school or educational institution are excluded from the analysis. Households in the 2003 and 2004 samples that are from the Northern and Eastern provinces are also excluded from the main analysis in order to maintain comparability. The sample includes formal and informal sector employees, but sample separation is not possible. Finally, the sample consists of only those individuals with non-missing observations on all regressors.

The definition of earnings underlying the gender wage gap used throughout the analysis is the log of hourly wages from the main occupation, where hourly wages are calculated as earnings in the last month from the main occupation divided by the hours usually worked in a month, calculated as 30/7 times hours usually worked in a given week. Nominal values are converted into real terms using the Sri Lanka Consumer Price Index (SLCPI) with a base period of 1995-1997 (Central Bank of Sri Lanka 2005). [10]

Schooling is defined into 5 categories: no schooling and primary (reference category), lower secondary, completed GCE O/L, completed GCE A/L and post-secondary; age is included separately and is measured in years. Formal and informal training are included as dummy variables with no training as the reference category. Dummy variables are also included for marital status (1 if currently married), ethnicity (Tamil and Moor, with Sinhalese as the reference category), regional dummies for 7 provinces for which the data was available with the Western province as the reference, and 9 year dummies with 1996 as the reference period. Moreover, a second model is estimated which also includes

[10] The SLCPI is based on a national consumption basket and includes price information from all districts of the country, unlike the previously used Colombo Consumer's Price Index (CCPI), and is the price index officially used in updating the poverty line.

controls for eight major categories of occupations in addition to the other variables mentioned above. The reference category of senior officials and managers and the second category of professionals correspond to high skilled white-collar jobs, while the third and fourth categories of technicians and associate professionals and clerks correspond to low-skilled white-collar jobs. The last four categories are low-skilled occupations – sales and service workers, craft and related workers, plant and machine operators and those in elementary occupations.

3.3 Selectivity Issues

Sample selection bias refers to problems where the dependent variable is observed only for a restricted, nonrandom sample. For example, observations on hours worked are available only for those who work – for those whose wage exceeds their reservation wage.[11] Those working may not form a random subgroup of the (sampled) population, but differ systematically in observed and unobserved aspects, from those not employed. Not only are there significant gender differences in labour supply choices, but it is also possible that non participants or part-time workers are actually potential low wage earners. If that is the case, then failure to account for participation behaviour is likely to result in downward estimates of the gender pay gap.

Female labour force participation in Sri Lanka was about 31% in the reference period which is less than half of that of males, and female unemployment in the same period was more than twice that of males. The lower participation of women coupled with higher unemployment rates raises concerns of selectivity bias which can be present in the labour force participation

[11] The reservation wage is the lowest wage rate at which a worker would be willing to accept a particular type of job.

choice as well as in the form of selection into wage employment and work category (part-time vs. full-time work employment).

Selectivity correction is necessary when one wishes to make inferences about *all* women of working age rather than just those in the given sample. Wage regression results which do not account for selectivity issues should be thus interpreted as being *conditional on the selected samples*. In the absence of selectivity correction, the coefficients in the regressions are biased estimates of *returns* to covariates. The term 'returns to endowments' would then reflect returns to endowments of the given samples, and not those of the working age population in general.

Selectivity-correction techniques for mean regressions are well known, although accurate empirical estimation is often difficult due to issues relating to identifying instruments or exclusion restrictions. Given the multiple employment outcomes possible in the labour market, a method proposed by Lee (1983) is used, which extends the Heckman two-step procedure to a multiple outcome model using multinomial logit.[12] Any explanatory variables that are observed only among wage employees are excluded, and thus only Model 1 is estimated, which does not include controls for occupation.[13]

---

[12] The following possible labour market outcomes are considered for all males and females in the sample who are not currently schooling: (1) public sector part-time wage employment, (2) public sector full-time wage employment, (3) private sector part-time wage employment, (4) private sector full-time wage employment, and (5) no employment and agricultural employment.

[13] An explanation of Lee's (1983) selectivity correction methodology and the results of the Lee (1983) model are presented in Appendix I of Abayasekara (2009).

4. Data Analysis and Results

Table 2 provides details of the breakdown of the sample by gender, sector and work category for all three age cohorts. We interpret differences by age-cohort to be evidence of secular trends. Female shares have increased over time in the pooled sample (both sectors, full-time and part-time), from 25% in the oldest cohort, to 30% in the middle cohort and 35% in the youngest cohort. Private sector participation has increased especially for female workers, while the importance of part-time work for younger females is less than for the middle and older cohorts, implying a secular decline. Although public sector part-time work accounts for a smaller share in younger cohorts, females continue to dominate this sector.[14]

[14] These individuals are most likely teachers, whose work less than 35 hours a week.

Table 2

Sample size by sector, age category, work-status and gender

Age and work status	Public Sector			Private Sector			Total	
	Male	Female	Female %	Male	Female	Female %	Total	Female %
Full Time								
18-29	2,175	1,080	33%	9,933	5,353	35%	1,8541	35%
30-45	5,818	2,963	34%	11,297	3,506	24%	2,3584	27%
46-58	3,380	1,214	26%	4,954	1,033	17%	1,0581	21%
Part Time								
18-29	112	296	73%	489	189	28%	1,086	45%
30-45	531	1,216	70%	665	327	33%	2,739	56%
46-58	311	532	63%	308	175	36%	1,326	53%
Total	12,327	7,301	37%	27,646	10,583	28%	57,857	31%

Source: Authors' calculations from QLFS 1996-2004

We next examine raw wage gaps, by examining mean wage gaps and visually comparing the wage distribution for males and females (Figure 1). The results show considerable variation by age-group, sector and full-time/part-time status, supporting our empirical strategy of disaggregation by these categories.

4.1 Raw Wage Distributions and Unconditional Mean Wages

The examination of unconditional (raw) mean wage gaps (Table 6) reveals that (1) for the pooled sample, young females earn less than young males whereas old females earn more than old males, (2) public sector workers experience small wage gaps which are negative (female-favouring) for the middle and old age cohorts, and that (3) the gaps are large and positive (male-favouring) in the private sector, especially among part-time workers.

The estimated mean raw gap in mean log hourly wages is 0.089 (8.9% of male wages) for the young cohort and a minute 0.015 (0.15% of male wages) for the middle cohort, although this gap is not significantly different from zero. The raw gap is a negative value of 0.039 (3.9% of female wages) for the older cohort, indicating that older females earn *more* than older males. This may be due to the fact that in Sri Lanka, (the limited number of) females entering the labour force before the 1980s, especially those in the public sector, were highly educated compared to females of today. The result of high wage gaps among young workers is consistent with Dolton *et al*'s (2008) findings for eleven European countries, where the raw gender wage gap is largest for the young age group.

Disaggregation by sector and work category reveals mean log wage gaps to be very different in the public and private sectors and also between work categories. In the public sector, those working part-time of all three age cohorts experience small gaps, and these gaps are statistically insignificant at the 5% level of significance. Public sector full-time female hourly wages of the middle and old cohorts are 6% higher than male hourly wages. This result is consistent with other studies done for Sri Lanka (Gunewardena 2008, Gunewardena *et al.* 2007), and is not surprising, given the relatively high productive characteristics of females and the possible selection of higher quality females into public sector employment. However, this is a unique result for Sri Lanka, the only other similar result in the literature being that of the public sector in Italy, where public sector mean male log wages are not significantly different from mean female log wages (Arulampalam *et al.* 2006).

The findings are drastically different in the private sector. Part-time gaps are as high as 42%, 57% and 62% for the young, middle and old age cohorts respectively. The raw gaps for full-time workers, though smaller in magnitude to those of part-time workers, are still considerably higher than public sector gaps,

at 11%, 26% and 38% for the three age cohorts.[15] Large private sector raw gaps are consistent with the existing Sri Lankan literature. Higher wage gaps among part-time workers are also observed in France, Greece, Ireland, Portugal and Spain (Dolton *et al.* 2008). The large gaps in the private sector compared to the public sector may be evidence to the fact that greater compliance with equal pay legislation is more likely in the public sector. It is also interesting to note that private sector wage gaps are largest (smallest) for the old (young) cohort, indicating a gradual improvement in gender wage equality conditions in the private sector over time.

Figure 1 provides a picture of wages across the entire distribution, rather than just at the means.[16] Male wage distributions are shown by a solid line and female wage distributions by a lighter dotter line. In the pooled sample, the female distribution is bi-modal for the middle and old age cohorts, the female distribution is bi-modal. The male distribution lies "within" the female distribution, and is characterized by a higher density function around the mode and a lower dispersion. Disaggregation by sector and work category (second to fourth rows) shows that among full time workers, the female public sector wage distribution lies almost entirely to the right of the corresponding male distribution while the female private sector distribution lies to the left of the private sector male distribution. Gaps are larger for older cohorts and largest among private sector part-time workers.

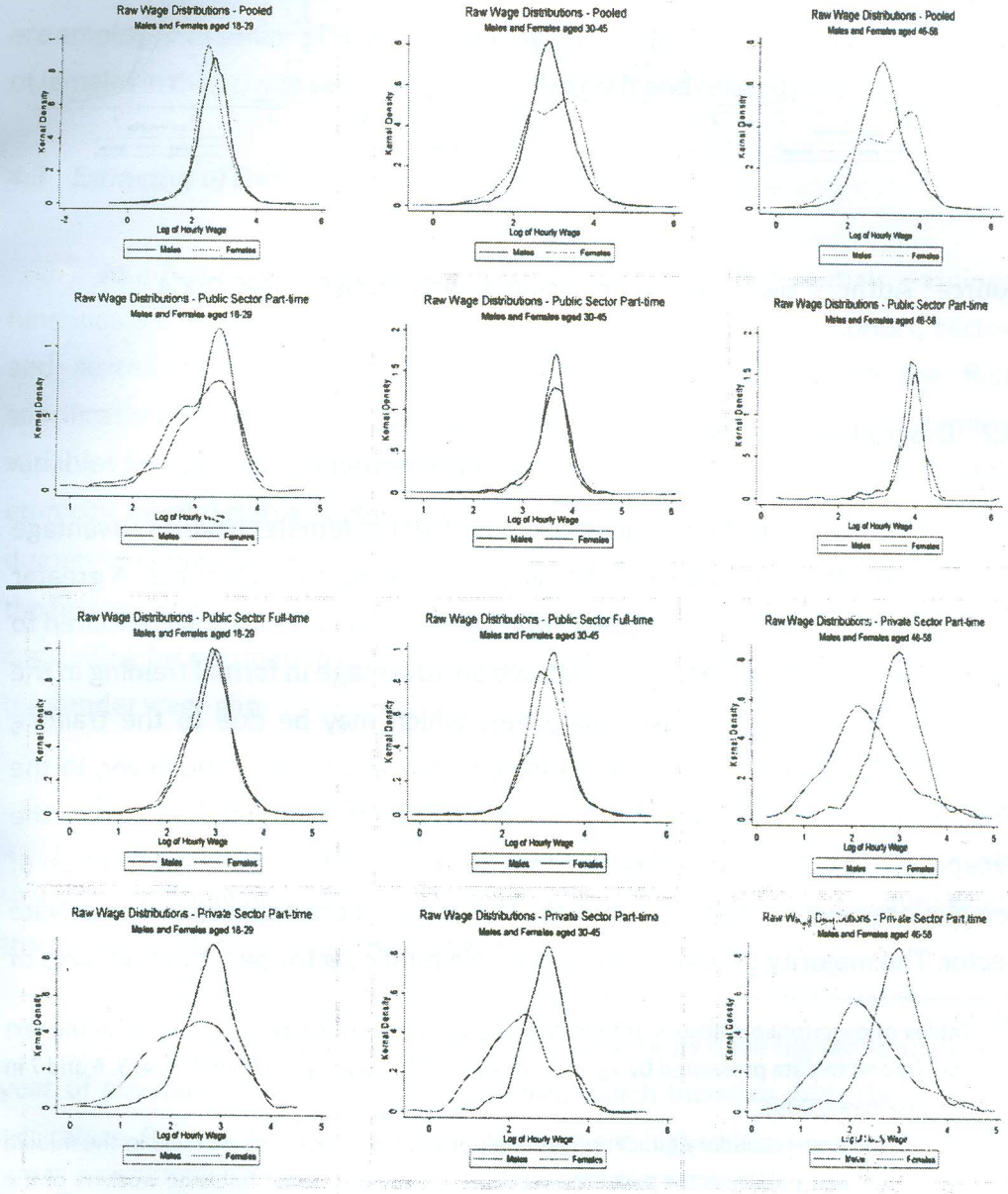
---

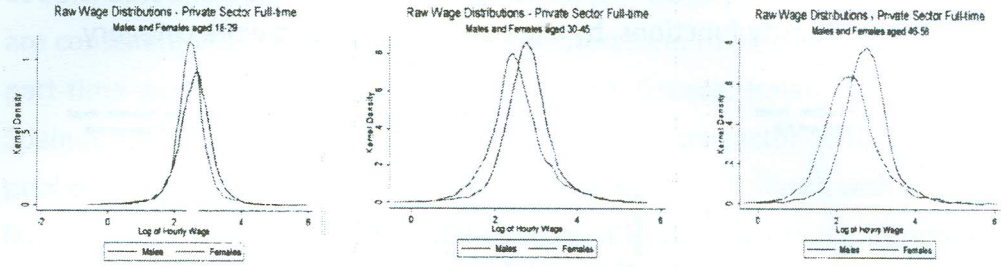
[15] Mean raw wage gaps in the private sector are all significant at the 5% level of significance.

[16] The density functions in Figure 1 were estimated using an Epanechnikov kernel estimator

Figure 1

Kernel density functions, by age cohort, sector and work category





Source : Authors' own calculations using data from QLFS 1996-2004

4.2 Descriptive Statistics

Summary statistics of the data [17] indicate that females have an advantage in endowments of productive or earnings-generating characteristics. A greater percentage of females have A/level and post-secondary education compared to males in both sectors [18], and females have an advantage in formal training in the public sector in all three age categories, which may be due to the training received by teachers and nurses (Gunewardena *et al.* 2007). However, in the private sector males have higher formal and informal training. With the exception of public sector workers of the young cohort, a smaller proportion of females are married than male, and the disparity is more apparent in the private sector. The majority of both male and female public sector part-time workers of

[17] Tables of descriptive statistics are omitted in the interest of space. Descriptions in the text correspond to data presented by age, sector and work category in Tables 2, 3, 4, 5, 6 and 7 in Abayasekara (2009).

[18] Except for post-secondary education among public sector part-time workers in the middle age cohort and public sector part-time workers and private sector full-time workers of the old cohort, females have a higher level of education than males, and this difference is quite large

the young cohort are professionals (66% and 92% respectively) whereas almost half of male public sector full-time workers are sales and service workers and 34% of females are clerks. A greater proportion of private sector full-time males are employed as senior officials and managers and professionals, while over 50% of females in the private sector are engaged in craft and related jobs.

4.3 Estimates of Earnings Functions

As a first step toward decomposing gender wage differentials, earnings functions are estimated separately for men and women, by age-cohort, sector and part-time/full-time status. Two specifications are used. In the first specification, the vector of regressors include age in quadratic form, dummy variables for education, whether any (formal or informal) training was received, ethnicity, marital status, region and year. The second specification also includes dummy variables for eight occupational categories. Our preferred estimates are the first specification, because occupational choice is arguably endogenous, and controlling for occupation can result in an underestimation (overestimation) of the gender wage gap.

Earnings functions results[19] (Tables 3, 4 and 5) indicate that while men and women are rewarded by the labour market for productive characteristics like schooling, training and experience (proxied by age), the relative magnitude of these rewards differ by age group, sector and work category.

Full-time public sector females of all age groups have higher returns per year of schooling at all levels of education, which increase with the level of education. Returns to formal training and age are higher for men of the young

[19] The regression results discussed and presented here are those of model 1, which does not include controls for occupation.

and middle cohorts while women are rewarded more than men for being married.[20] Returns to age and marriage are insignificant for the old cohort. The returns to education and to formal and informal training for both male and female public sector part-time workers belonging to the young cohort are statistically insignificant.

For young and middle part-time workers in the private sector, females have higher returns per year of lower and upper secondary schooling than males, while the latter have higher returns per year of post-secondary education. However, old males in the private sector in both work categories have higher returns than females per year of schooling at all levels except post-secondary education, which may be a reflection of the better productive characteristics of older males compared to older females in the private sector. Females have an advantage over males with respect to formal training whereas the result is reversed for informal training. While young males experience a marital wage premium and positive returns to age, private sector females experience *negative* returns to age and for being married in contrast to the public sector. Returns to age are greater for women of the middle cohort in both work categories. The impact of age on wages is positive for old men and negative for old women working full-time. Full-time private sector females are rewarded for age and for being married, but by a lesser amount than their male counterparts.

For all three age cohorts in both sectors, males and females are disadvantaged in terms of earnings (they experience negative returns) for being located in a province other than the Western province.

---

[20] This surprising result is consistent with Gunewardena (2008) who finds similar results for public sector females

Evidence of selectivity bias is found for male private sector and female public sector full-time workers belonging to the middle cohort. However, including the number of other household members who are public sector employees as an additional instrument[21] reveals selectivity bias among male public sector workers as well.[22]

[21] The other instruments used are number of children in the household in three age categories (younger than six, six to ten and eleven or older) and number of elderly.

[22] This is consistent with the findings of Gunewardena *et al.* (2007)

Table 3

Regression Results, Public and Private Sectors, Ages 18-29, without occupation controls

Variable	Public PT		Public FT		Private PT		Private FT	
	Male	Female	Male	Female	Male	Female	Male	Female
Lower secondary	-0.306 (0.255)	-0.329 (0.388)	0.113*** (0.032)	0.222** (0.101)	0.063 (0.054)	0.298** (0.151)	0.082*** (0.012)	0.168** (0.018)
Completed GCE O/L	-0.023 (0.271)	-0.207 (0.352)	0.157*** (0.032)	0.478*** (0.095)	0.138* (0.080)	0.392** (0.182)	0.195*** (0.015)	0.329*** (0.019)
Completed GCE A/L	-0.035 (0.249)	-0.201 (0.352)	0.205*** (0.035)	0.620*** (0.094)	0.398*** (0.128)	0.447** (0.196)	0.454*** (0.019)	0.427*** (0.021)
Post-secondary	0.001 (0.320)	-0.078 (0.357)	0.516*** (0.059)	0.845*** (0.103)	0.842** (0.374)	0.754** (0.313)	0.920*** (0.048)	0.829*** (0.053)
Formal training	0.202 (0.130)	0.067 (0.061)	0.128*** (0.022)	0.098*** (0.030)	0.156** (0.083)	0.375** (0.153)	0.150*** (0.014)	0.095*** (0.015)
Informal training	-0.365 (0.281)	0.327 (0.515)	-0.251*** (0.067)	-0.229* (0.126)	0.233*** (0.075)	-0.131 (0.205)	0.120*** (0.019)	0.046 (0.028)
Age	-0.122 (0.378)	0.604** (0.246)	0.104** (0.053)	0.035 (0.093)	0.068 (0.111)	-0.377 (0.290)	0.091*** (0.024)	0.076*** (0.028)
Age squared	0.003 (0.008)	-0.011** (0.005)	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.002)	0.007 (0.006)	-0.001*** (0.001)	-0.001** (0.001)
Tamil	-0.001 (0.191)	0.042 (0.102)	-0.262*** (0.046)	0.056 (0.085)	-0.211** (0.086)	0.191 (0.205)	-0.090*** (0.016)	-0.039* (0.021)
Moor	0.060 (0.195)	-0.092 (0.086)	0.007 (0.061)	0.080 (0.111)	0.075 (0.092)	0.071 (0.229)	0.005 (0.018)	0.107** (0.048)
Married	0.153 (0.121)	0.158** (0.063)	0.013 (0.022)	0.109*** (0.031)	0.074 (0.056)	-0.114 (0.138)	0.088*** (0.012)	0.063*** (0.016)
Central province	0.296 (0.211)	0.082 (0.091)	-0.135*** (0.030)	-0.143*** (0.043)	-0.118* (0.710)	-0.229 (0.166)	-0.168*** (0.095)	-0.187*** (0.018)
Southern	-0.050 (0.207)	-0.023 (0.097)	0.070** (0.030)	-0.187*** (0.045)	-0.125* (0.070)	-0.210 (0.220)	-0.120*** (0.016)	-0.173*** (0.019)
North western	0.065 (0.200)	-0.004 (0.123)	-0.037 (0.031)	-0.173*** (0.045)	-0.182** (0.086)	-0.261 (0.174)	-0.136*** (0.016)	-0.134*** (0.019)
North central	-0.180 (0.222)	-0.075 (0.120)	-0.102*** (0.031)	-0.099** (0.050)	-0.219* (0.115)	-0.104 (0.278)	-0.158*** (0.024)	-0.136*** (0.026)
Uva	-0.259 (0.213)	0.065 (0.104)	-0.124** (0.040)	-0.188** (0.060)	-0.218** (0.103)	-0.370 (0.257)	-0.202*** (0.026)	-0.110*** (0.033)
Sabaragamuwa	-0.421* (0.248)	-0.055 (0.119)	-0.085** (0.033)	0.187*** (0.052)	-0.274*** (0.088)	-0.434** (0.178)	-0.373*** (0.016)	-0.171*** (0.019)
Constant	4.103 (4.665)	-5.303* (3.121)	1.153 (0.640)	1.392 (1.143)	1.659 (1.303)	6.659 (3.441)	1.033*** (0.284)	1.177*** (0.319)
Sample size	112	296	2175	1080	489	189	9933	5353
R^2	0.22	0.17	0.14	0.22	0.09	0.15	0.24	0.21

Standard errors in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%

Table 4

Regression Results, Public and Private Sectors, Ages 30-45, without occupation controls

Variable	Public PT		Public FT		Private PT		Private FT	
	Male	Female	Male	Female	Male	Female	Male	Female
Lower secondary	0.131	0.538***	0.167***	0.317***	0.114**	0.211**	0.137***	0.249***
	(0.115)	(0.116)	(0.019)	(0.050)	(0.048)	(0.103)	(0.012)	(0.024)
Completed GCE O/L	0.527***	0.603***	0.307***	0.492***	0.282***	0.402***	0.345***	0.529***
	(0.096)	(0.105)	(0.019)	(0.043)	(0.066)	(0.121)	(0.014)	(0.026)
Completed GCE A/L	0.540***	0.621***	0.485***	0.670***	0.827***	0.879***	0.720***	0.841***
	(0.091)	(0.104)	(0.020)	(0.043)	(0.105)	(0.148)	(0.018)	(0.030)
Post-secondary	0.718***	0.828***	0.919***	1.008***	0.904***	1.290***	1.200***	1.180***
	(0.090)	(0.104)	(0.024)	(0.046)	(0.163)	(0.208)	(0.033)	(0.062)
Formal training	0.090***	0.061***	0.155***	0.156***	0.023	0.442***	0.217***	0.175***
	(0.031)	(0.017)	(0.014)	(0.018)	(0.072)	(0.140)	(0.014)	(0.030)
Informal training	-0.090	0.015	0.045	-0.027	0.126**	-0.512***	0.162***	-0.072
	(0.130)	(0.205)	(0.034)	(0.075)	(0.057)	(0.177)	(0.017)	(0.048)
Age	0.077	-0.024	-0.028	-0.018	0.097	0.123	0.028	0.084**
	(0.059)	(0.034)	(0.022)	(0.030)	(0.072)	(0.152)	(0.018)	(0.035)
Age squared	-0.001	0.001	0.001*	0.000	-0.001	-0.002	0.000	-0.001**
	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.002)	(0.000)	(0.000)
Tamil	-0.069	-0.038	-0.114***	0.019	-0.100	0.347*	-0.088***	0.034
	(0.061)	(0.037)	(0.033)	(0.048)	(0.079)	(0.207)	(0.016)	(0.033)
Moor	0.002	0.052	0.097***	0.172***	0.142*	0.002	0.020	0.075
	(0.060)	(0.035)	(0.036)	(0.058)	(0.073)	(0.195)	(0.018)	(0.063)
Married	0.069	0.105***	0.074***	0.121***	0.113**	0.056	0.111***	0.055***
	(0.044)	(0.026)	(0.018)	(0.019)	(0.052)	(0.096)	(0.013)	(0.019)
Central province	-0.052	-0.044*	-0.143***	-0.137***	-0.243***	-0.275**	-0.202***	-0.289***
	(0.050)	(0.027)	(0.018)	(0.025)	(0.055)	(0.132)	(0.015)	(0.029)
Southern	-0.109**	-0.076***	-0.182***	-0.120***	-0.098*	-0.063	-0.187***	-0.336***
	(0.051)	(0.026)	(0.017)	(0.024)	(0.059)	(0.140)	(0.015)	(0.031)
North western	-0.099*	-0.088***	-0.097***	-0.137***	-0.257***	-0.156	-0.170***	-0.268***
	(0.056)	(0.031)	(0.019)	(0.027)	(0.061)	(0.126)	(0.016)	(0.031)
North central	-	-0.263***	-0.187***	-0.174***	-0.136	0.484*	-0.170***	0.194***
	0.120***	(0.035)	(0.020)	(0.031)	(0.093)	(0.265)	(0.025)	(0.049)
	(0.063)							
Uva	-0.130**	-0.089***	-0.254***	-0.202***	-0.361***	-0.547**	-0.276***	-0.289***
	(0.060)	(0.032)	(0.024)	(0.034)	(0.078)	(0.246)	(0.023)	(0.044)
Sabaragamuwa	-0.112*	-0.034	-0.195***	0.159***	-0.329***	-0.456***	-0.426***	-0.331***
	(0.064)	(0.033)	(0.021)	(0.028)	(0.073)	(0.121)	(0.016)	(0.032)
Constant	1.131	2.904***	2.978***	2.456***	0.820	0.191	1.898***	0.673
	(1.083)	(0.636)	(0.640)	(0.561)	(1.342)	(2.811)	(0.334)	(0.634)
Sample size	531	1216	5818	2963	665	327	11297	3506
R^2	0.28	0.27	0.31	0.29	0.23	0.34	0.33	0.35

Standard errors in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%

Table 5

Regression Results, Public and Private Sectors, Ages 46-58, without occupation controls

Variable	Public PT		Public FT		Private PT		Private FT	
	Male	Female	Male	Female	Male	Female	Male	Female
Lower secondary	0.085	0.719***	0.170***	0.383***	0.064	0.058	0.150***	0.277***
	(0.120)	(0.175)	(0.025)	(0.066)	(0.083)	(0.168)	(0.019)	(0.050)
Completed GCE O/L	0.525***	0.855***	0.375***	0.682***	0.300***	-0.031	0.379***	0.541***
	(0.091)	(0.161)	(0.022)	(0.056)	(0.112)	(0.162)	(0.020)	(0.051)
Completed GCE A/L	0.622***	0.874***	0.607***	0.883***	0.789***	0.450	0.769***	1.111***
	(0.088)	(0.160)	(0.025)	(0.058)	(0.228)	(0.332)	(0.031)	(0.075)
Post-secondary	0.820***	1.024***	0.943***	1.175***	1.306***	1.347***	1.272***	1.974***
	(0.087)	(0.159)	(0.029)	(0.062)	(0.224)	(0.327)	(0.058)	(0.157)
Formal training	0.114***	0.030	0.170***	0.128***	0.156	0.681***	0.305***	0.254***
	(0.040)	(0.035)	(0.019)	(0.030)	(0.130)	(0.216)	(0.025)	(0.076)
Informal training	-0.072	-0.192	0.043	0.061	0.207**	0.241	0.178***	0.100
	(0.151)	(0.193)	(0.050)	(0.174)	(0.089)	(0.326)	(0.028)	(0.104)
Age	-0.022	0.210	-0.041	-0.098	0.368	-0.787	0.121*	-0.414**
	(0.164)	(0.142)	(0.069)	(0.120)	(0.269)	(0.543)	(0.066)	(0.169)
Age squared	0.001	-0.002	0.001	0.001	-0.004	0.008	-0.001*	0.004**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.003)	(0.005)	(0.001)	(0.002)
Tamil	-0.138	0.003	-0.217***	0.019	-0.201*	0.420**	-0.041*	-0.025
	(0.104)	(0.086)	(0.045)	(0.087)	(0.117)	(0.207)	(0.037)	(0.057)
Moor	-0.156**	-0.041	-0.035	0.284***	0.184	0.287	0.029	0.254**
	(0.078)	(0.118)	(0.050)	(0.104)	(0.139)	(0.251)	(0.018)	(0.103)
Married	0.012	0.027	0.049	0.129***	0.008	0.198*	0.162***	0.169***
	(0.106)	(0.046)	(0.047)	(0.033)	(0.104)	(0.119)	(0.029)	(0.037)
Central province	0.162***	0.051*	-0.175***	-0.225***	-0.011	-0.454***	-0.188***	-0.274***
	(0.062)	(0.051)	(0.024)	(0.033)	(0.096)	(0.160)	(0.022)	(0.056)
Southern	0.018	-0.034	-0.202***	-0.184***	0.049	-0.370**	-0.194***	-0.190***
	(0.058)	(0.048)	(0.023)	(0.039)	(0.089)	(0.185)	(0.023)	(0.061)
North western	-0.065	0.022	-0.186***	-0.156***	-0.033	-0.369**	-0.120***	-0.183***
	(0.070)	(0.061)	(0.026)	(0.043)	(0.103)	(0.175)	(0.025)	(0.059)
North central	0.038	-0.188**	-0.294***	-0.336***	0.311	0.132	-0.227***	0.075
	(0.083)	(0.016)	(0.030)	(0.055)	(0.193)	(0.380)	(0.042)	(0.126)
Uva	0.042	0.038	-0.288***	-0.209***	0.110	-0.291	-0.328***	-0.246***
	(0.077)	(0.070)	(0.033)	(0.061)	(0.168)	(0.376)	(0.036)	(0.095)
Sabaragamuwa	0.042	-0.145**	-0.200***	0.177***	-0.042	-0.442**	-0.336***	-0.273***
	(0.075)	(0.057)	(0.029)	(0.046)	(0.105)	(0.183)	(0.024)	(0.061)
Constant	3.163	-3.195	3.597**	4.593	-6.305	21.877	-0.553	12.758***
	(4.232)	(3.630)	(1.773)	(3.063)	(6.938)	(13.896)	(1.705)	(4.322)
Sample size	311	532	3380	1214	308	175	4954	1033
R^2	0.38	0.18	0.37	0.39	0.19	0.28	0.31	0.39

Standard errors in parentheses. * significant at 10%, ** significant at 5%, *** significant at 1%

4.3 Decomposition Results

In order to decompose the differences in the raw wage distribution into differences in characteristics (attributes) and differences in the coefficients (returns),

the Oaxaca-Blinder (1973) decomposition is applied to estimates derived from the mean regressions (Table 6).[23] Decompositions are performed for the entire (pooled) sample as well as according to sector and work category, separately for each age cohort. A positive gap indicates that male wages are higher than female, and a negative gap indicates that female wages are higher than male. The 'unexplained' wage gap is the part of the gap that remains once covariates are controlled for, i.e. the measure of discrimination. It is presented in both its forms, i.e. evaluated at male characteristics $[X_m(\beta_m-\beta_f)]$ (presented in the second and fifth columns) and at female characteristics $[X_f(\beta_m-\beta_f)]$ (presented in the third and sixth columns). The interpretation of the estimated wage gap when evaluated at male (female) characteristics is the difference between the actual male (female) wage distribution and the male (female) distribution if males (females) were paid like females (males), or on the other hand, if females (males) had the identical characteristics as males (females), but were still paid like females (males).

The results indicate that women are underpaid, in both public and private sectors in all age cohorts, and in the absence of discrimination would earn more on average than men because of their better productive endowments. This is indicated by the positive 'unexplained' gaps, implying that regardless of whether females are paid more or less than males, they are *underpaid*, i.e., they are paid less than they should be given their productive characteristics. These findings are consistent with previous Sri Lankan studies and similar to Montenegro (2001) for Chile and Sakellariou (2004) for the Philippines.

Table 6 indicates that in the pooled sample, once characteristics are controlled for, the unexplained mean wage gap is significantly positive (male favouring), even where the raw gap was negative, for the younger cohort. For the middle cohort, even though the raw wage gap was insignificant, a large

[23] Results in Table 6 are based on the specification that excludes controls for occupation.

unexplained gap is evident. However, for the oldest age cohort indicate that the negative (female favouring) raw gap is attributed to higher returns to (higher) endowments among females. These results are similar to those for Finland, France and Spain, where for both categories of workers women seem to be better endowed than men (Dolton *et al.* 2008).

Among all three age cohorts, unexplained wage gaps are largest for those working part-time in the private sector, implying this group faces the largest discrimination. However, among full-time workers, within the young cohort, public sector workers experience larger unexplained gaps than their private sector counterparts. This is in contrast to the other two age cohorts, where public sector full-time workers while facing negative or female-favouring raw wage gaps experience minute unexplained gaps, which are much less than the private sector gaps. Given that young females have a substantial advantage over males in terms of endowments, this result can be interpreted to mean that young females in full-time work in the public sector are underpaid. On the other hand, the unexplained gap (discrimination) for part-time workers in the private sector is largest for the middle cohort, though the raw wage gap is largest for older workers. However, discrimination is highest for old full-time workers in the private sector and smallest for the young cohort for both part-time and full-time workers. Thus, it appears that though still larger in magnitude, discrimination in the private sector, in particular for full-time workers, has declined marginally over time, whereas young female public sector full-time workers face more discrimination than middle and old cohort workers.

---

[24] This result is due to better endowments of part-time females in the middle cohort compared to those of the old cohort.

[25] The large male favouring gaps and discrimination among the old cohort for full-time workers in the private sector is partly due to better endowments among males compared to females, a result not observed for other decompositions.

The figures in the last two columns of table 6 give the proportion of the raw wage gap that is due to differences in returns as a percentage. This indicates that in the pooled sample for the young cohort, over 100 percent of the gap (approximately 175%) is due to the existence of "discrimination" – in the absence of "discrimination", young females would earn more than young males. The estimates for the old cohort are much higher at 370% when evaluated at male characteristics. These results are consistent with previous results for Sri Lanka (Ajwad and Kurukulasuriya 2002, Gunewardena 2002, Gunewardena *et al.* 2007) and similar to Blau and Kahn's (2003) results for UK, New Zealand, Bulgaria, Israel, Poland and Slovenia. When the sample is disaggregated by sector, there appears to be a substantial amount of discrimination among public sector full-time workers belonging to the young cohort.

Table 6

Gender Gap as a Percentage of Male Gap & Percentage Raw Gap Unexplained

Sample	Gap as % of Male Wages			Unexplained as a % of Raw		
	Raw Gap	Unexplained Gap		Raw Gap	Unexplained Gap	
		Male Ch*	Female Ch*		Male Ch*	Female Ch*
Pooled: 18-29	3.3	5.8	6.0	100	173.0	178.7
Pooled: 30-45	-	5.3	7.5	-	-	-
Pooled: 46-58	-1.3	-5.0	-3.2	100	372.5	240.0
Ages 18-29						
Public Full time	1.7	5.3	8.8	100	310.2	514.3
Private Part time	15.0	18.9	20.3	100	126.2	135.3
Private Full-time	4.1	4.8	5.1	100	117.8	123.4
Ages 30-45						
Public Full time	-1.9	-2.5	-2.1	100	133.3	112.3
Private Part time	19.8	22.0	24.0	100	111.1	121.3
Private Full-time	9.2	10.2	11.4	100	110.9	124.1
Ages 46-58						
Public Full time	-1.8	-2.0	-1.6	100	113.8	87.9
Private Part time	21.3	21.9	17.0	100	103.1	80.2
Private Full-time	13.9	11.6	11.3	100	84.0	81.4

Note: this table provides unexplained wage gaps for model 1 which excludes controls for occupation - indicates that the wage gaps are insignificant
Public sector part-times wage gaps are insignificant
* Ch denotes 'characteristics'

Many of the results discussed previously do not change after including controls for occupation: (1) women continue to be underpaid (men overpaid) throughout the overall distribution, (2) and estimated wage gaps continue to be larger than raw wage gaps,[26] indicating that in the absence of discrimination women would earn more than men, even after controlling for occupation. However, unexplained (estimated) wage gaps *are larger when occupation is controlled for* except for public sector full-time workers in the young cohort and private sector full-time workers in the old cohort.

Higher conditional wage gaps with controls for occupation is consistent with the idea of females selecting into occupations that reward their characteristics better, and is not consistent with the more generally observed explanation of occupational segregation[27] where females are tracked into lower paying occupations and industries. Therefore, it appears that while the majority of Sri Lankan women are able to choose occupations in which their (better) characteristics are rewarded better, *within these broad occupational categories or occupations they continue to be underpaid.* The larger disparity within, rather than between occupations can be explained by the fact that men hold jobs that better pay within these occupations or industries (Gunewardena *et al.* 2007). For example, while 71% of school teachers and garment industry employees are female, only 21% of school principals and 26% of employees in administrative positions in the garment industry are women (Department of Census and Statistics 2001, Sri Lanka Bureau of Foreign Employment 2002).

---

[26] Except for private sector full-time workers in the old cohort

[27] Occupational segregation (by gender) is the concentration of females in particular types of (low paying) jobs

It is interesting to note that the two decompositions for which this result (higher unexplained gaps when occupation controls are included) does not hold – young public sector and old private sector full-time workers – are the two groups of female workers experiencing the largest amount of discrimination relative to their other full-time counterparts. These findings thus suggest that the high level of discrimination faced by these workers may be partly attributable to occupational segregation.[28]

5. Conclusion

We expected that private sector wage gaps in both work categories indicate a gradual improvement in relative female wages over time, shown by decreasing raw wage gaps for younger cohorts. However this situation is reversed in the public sector, where females in the young age cohort experience the highest wage gap.

Conditional wage gaps indicate that women are underpaid (men overpaid) in both sectors within all age cohorts, and that all cohorts in the public sector and the young and middle cohorts in the private sector would earn more on average than men in the absence of discrimination because of better productive endowments. This indicates that despite superior characteristics, women are disadvantaged in the labour market.

Conditional wage gaps are smaller for most of the decompositions (though still larger than unconditional wage gaps) when occupation is excluded from the regression, which is consistent with females selecting into occupations

[28] This idea is confirmed by the descriptive statistics (see section 4.2), where 34% of young public sector full-time females are clerks, and old private sector full-time females dominate elementary occupations.

that better reward their characteristics, and is not consistent with the concept of occupational segregation.

However, conditional wage gaps are *larger* with no occupational controls for young public sector and old private sector full-time workers. This implies that part of the (high) amount of discrimination faced by these women can be explained by occupational segregation, which can be due to either the tracking of women into lower paying jobs, or women themselves choosing to remain in convenient (and low-paying) jobs.

Interpretations of these results are conditional on the selected sample used in this study, but some tentative explanations for the results and policy implications can be suggested. Firstly, in all samples except old private sector full-time workers, conditional wage gaps are larger than unconditional wage gaps. Two explanations are feasible. One is the existence of discrimination, either "in favour" of men or actively "against" women. The other relates to model specification. As Gunewardena *et al.* (2007) point out, one can argue that the model suffers from omitted variable bias; for example that raw ability is not accounted for, if one defines ability as including characteristics that enable men to compete better in the labour market, specially in a society like Sri Lanka where women have less mobility and a greater responsibility for child-rearing, which restricts them from working late hours, traveling on the job, moving to areas with better-paying jobs etc. These factors cause women to be paid less for a variety of reasons (they do not get hired into better-paying jobs, they are disregarded for promotion, or they self-select into convenient, but low-paying jobs etc.).

Thus, important policy implications involve going beyond the standard policies to improve womens' productive characteristics (which in present day Sri Lanka would refer to increasing womens' human capital in science and

technology related fields where they still lag behind at tertiary education level), to policies that endorse gender equity in hiring and in the workplace (compliance with maternity leave regulations, introduction of parental leave, day-care centers at the workplace) which in turn will reduce intermittent female labour force participation and thereby enhance their human capital characteristics.[29] However such policies would not be fully effective unless they go beyond the market place into the household[30] in order to enable women to access the characteristics necessary to compete better in the labour market.

The second important finding of this study is that the magnitude of the gender wage gap changes significantly depending on the age group, sector and work category. Anti-discrimination policies should first target young public sector full-time females, private sector part-time female workers, especially middle-aged workers, and also older full-time females who face relatively high discrimination compared to their public sector counterparts.

However, this study does find evidence of occupational segregation as being partly responsible for high discrimination among young public sector and old private sector workers, hence re-emphasizing the need of policies that seek to remove existing barriers (discriminatory preferences, low mobility of women) which lead to the concentration of these women in low-paying jobs.

---

[29] The findings of Plasman and Sissoko (2004) who study gender wage differentials in 5 European countries support the conclusion that within states providing protection, generous leave benefits and public support for child care, women are encouraged to invest more in their human capital characteristics, which reduces gender differences in endowments and thereby the wage gap.

[30] This refers to gender equity in the household in terms of sharing family responsibilities equitably

References

Abayasekara, Ashani. (2009). "An Analysis of Gender Wage Differentials in Sri Lanka: 1996-2004." Department of Economics and Statistics, University of Peradeniya. Unpublished B.A. Dissertation.

Aigner, Dennis J. and Cain, Glen G. (1977). "Statistical Theories of Discrimination in Labour Markets." *Industrial and Labour Relations Review, 30*(2), pp. 175-187.

Ajwad, Mohamed Ihsan and Kurukulasuriya, Pradeep. (2002). "Ethnic and Gender Wage Disparities in Sri Lanka." *Sri Lanka Economic Journal, 3*(1), pp. 1-26.

Albrecht, J., Vuuren, A. van and Vroman, S. (2004). "Decomposing the Gender Wage Gap in the Netherlands with Sample Selection Adjustment." IZA Discussion Paper No. 1400.

Appleton, S., Hoddinott, J. and Krishnan, P. (1999). "The Gender Wage Gap in Three African Countries." *Economic Development and Cultural Change, 47*(2), pp. 289-312.

Arulampalam, Wiji, Booth, Alison L. and Bryan, Mark L. (2006). "Is there a Glass Ceiling over Europe? Exploring the Gender Pay Gap across the Wage Distribution." Discussion Paper No. 510, Centre for Economic Policy Research, Research School of Social Science, Australia National University.

Becker, Gary S. (1971). "The Economics of Discrimination." 2nd edition. Chicago: University of Chicago Press.

Bergmann, Barbara. (1989). "Does the Labour Market for Women's Labour Need Fixing?" *Journal of Economic Perspectives, 3*, pp. 43-60.

Berndt, Ernst R. (1991). "The Practice of Econometrics: Classic and Contemporary." New York: Addison-Wesley Publishing Company, Inc.

Blau, Francine D. and Kahn, Lawrence M. (2006). "The US Gender Pay Gap in the 1990s: Slowing Convergence." Working Paper No. 508, Princeton University. [http://www.irs.princeton.edu/pubs/pdfs/508.pdf]

Blau, Francine D. and Kahn, Lawrence M. (2003). "Understanding International Differences in the Gender Pay Gap." *Journal of Labour Economics, 21*(1), pp. 106-144.

Blau, Francine D. and Kahn, Lawrence M. (1996). "Wage Structure and Gender Earnings Differentials: An International Comparison." *Economica, 63*(250), pp. S29-62.

Blinder, Alan. (1973). "Wage Discrimination: Reduced Form and Structural Estimates." *Journal of Human Resources, 18*(4), pp. 436-455.

Brown, R., Moon, M. and Zoloth, B. (1980). "Incorporating Occupational Attainment in Studies of Male-Female Earnings Differentials." *Journal of Human Resources, 15*, pp. 3-28.

Buchinsky, M. (1998). "The Dynamics of Changes in the Female Male Distribution in the USA: A Quantile Regression Approach." *Journal of Applied Econometrics, 13*, pp. 1-30.

Central Bank of Sri Lanka. (2005). *Annual Report 2005*. Colombo: Central Bank of Sri Lanka.

Committee on the Elimination of Discrimination against Women (CEDAW). (2002). Concluding Observations of the Committee on the Elimination of Discrimination against Women, U.N. Doc. A/57/38 (Part I), paras. 256-302.

Cotton, J. (1988). "On the Decomposition of Wage Differentials." *Review of Economics and Statistics, 70*(2), pp. 236-243.

Deolalikar, A.B. (1993). "Gender Differences in the Returns to Schooling in Enrolment Rates in Indonesia." *The Journal of Human Resources, 28*(4), pp. 899-934.

Department of Census and Statistics. (1996-2004). *Quarterly Reports of the Sri Lanka Labour Force Survey*. Colombo: Department of Census and Statistics.

Department of Census and Statistics. (2004). *Bulletin of Labour Force Statistics of Sri Lanka.* Issue No. 29. [http://www.statistics.gov.lk/samplesurvey/bul2004q1.pdf].

Dolton, Peter, Marcenaro-Gutierrez, Oscar and Skalli, Ali. (2008). "Gender Wage Differentials in Europe."

[http://personal.rhul.ac.uk/uqte/004/Education%20and%20Inequality%20Book/Chapter%2011%20_%20Dolton%20et%20al.doc]

Glick, P. and Sahn, D. (1997). "Gender and Education Impacts on Employment and Earnings from Conakry, Guinea." *Economic Development and Cultural Change, 45*, pp. 793-824.

Guneratne, Camena. (2002). "International Labour Standards and Women in Sri Lanka." Study Series No. 24, Centre for Women's Research.

Gunewardena, Dileni. (2006a). "Female Labour Supply in the Sri Lankan Economy: Hearts and Spades and a Failed Revolution." Paper presented at the Centre for Policy Alternatives workshop on Good Governance and Peace Building in Sri Lanka.

Gunewardena, Dileni. (2006b). "Exploring Gender Wage Gaps in Sri Lanka: A Quantile Regression Approach." PMMA Network Session Paper. Pep Network, www.pep-net.org.

Gunewardena, Dileni. (2008). "An Analysis of Gender and Ethnic Wage Differentials in Sri Lanka: 1996-2004." Working Paper, Department of Economics & Statistics, University of Peradeniya. [http://www.pdn.ac.lk/econ/analysis/%20of%20%wage%20inequality_revisedJuly28.pdf]

Gunewardena, Dileni *et al.* (2009). "Glass Ceilings, Sticky Floors or Sticky Doors? A Quantile Regression Approach to Exploring Gender Wage Gaps in Sri Lanka." In Ravi Kanbur and Jan Svejnar, ed. *Labour Markets and Economic Development*, London: Routledge/Taylor and Francis.

Gunewardena, Dileni. (2010). "An Analysis of Gender and Ethnic Wage Differentials among youth in Sri Lanka" in Gunatilake, Ramani, Markus Meyer and Milan Vodopivec, ed. *The Challenge of Youth Unemployment in Sri Lanka,* Washington, D.C.: World Bank.

Heckman, J. (1979). "Sample Selection Bias as a Specification Error." *Econometrica, 47*(1), pp. 153-163.

Jayaweera, Swarna, Sanmugam, Thana and Rodrigo, Chandra. (2000). "Invisible Women: Workers in Subcontracted Industries in Sri Lanka." Study Series No. 15, Centre for Women's Research.

Juhn, C. H., Murphy, K. and Pierce, B. (1993). "Wage Inequality and the Rise in Returns to Skills." *Journal of Political Economy, 101*(3), pp. 410-442.

Kiribanda, B.M. (1997). "Population and Employment" in Lakshman, W. D. (ed.) *Dilemmas of Development*. Colombo: Sri Lankan Association of Economists, pp. 223-249.

Koenker, R. and Bassett, G. (1978). "Regression Quantiles." *Econometrica, 46*, pp. 33-50.

Lee, L. F. (1983). "Generalized Econometric Models with Selectivity." *Econometrica, 51*(2), pp. 507-512.

Machado, J. and Mata, J. (2005). "Counterfactual Decompositions of Changes in Wage Distributions using Quantile Regression." *Journal of Applied Econometrics, 20*, pp. 445-465.

Mincer, Jacob and Polachek, Solomon W. (1974). "Earnings of Women". *Journal of Political Economy, 82*: pp. 76-108.

Nanayakkara, A.G.W. (2004). "Employment and Unemployment in Sri Lanka: Trends, Issues and Options." Colombo: Department of Census and Statistics.

Negatu, M. (1993). "Labour Supply and the Distribution of Economic Well-being: A Case Study of Lesotho." PhD Thesis, University of Gothenburg.

Neumann, Shoshana and Oaxaca, Ronald. (2005). "Wage Differentials in the 1990s in Israel: Endowments, Discrimination and Selectivity." *International Journal of Manpower, 26*(3), pp. 217-236.

Neumark, David. (1988). "Employers' Discriminatory Behaviour and the Estimation of Wage Discrimination." *Journal of Human Resources, 23*(3), pp. 279-295.

Oaxaca, Ronald. (1973). "Male-Female Wage Differentials in Urban Labour Markets." *International Economic Review, 14*(3), pp. 693-709.

Olivetti, C. and Petrongolo, B. (2005). "Unequal Pay or Unequal Employment? A Cross-Country Analysis of Gender Gaps." CEP Discussion Papers dp0711, Centre for Economic Performance, LSE.

Pastore, Francesco and Marcinkowska, Izabela. (2004). "The Gender Wage Gap among Young People in Italy." CELPE Discussion Paper No. 82.

Plasman, Robert and Sissoko, Salimata. (2004). "Comparing Apples with Oranges: Revisiting the Gender Wage Gap in an International Perspective." IZA Discussion Paper No. 1449.

Reimers, C. (1983). "Labour Market Discrimination against Hispanic and Black Men." *Review of Economics and Statistics, 65*(4), pp. 570-579.

Rica, Sara de la, Dolado, Juan J. and Llorens, Vanesa. (2005). "Ceiling and Floors: Gender Wage Gaps by Education in Spain". IZA Discussion Paper No. 1483.

Sri Lanka Bureau of Foreign Employment. (2002). *Statistical Handbook 2002*. Colombo: SLBFE.

Acknowledgement:

The authors thank the editors, anonymous referees and participants at the Centre for Women's Research (CENWOR) Conference 2010 for useful comments. Permission from the Department of Census and Statistics to use Labour Force Survey data is gratefully acknowledged.