
Post-Apartheid Trends in Gender Discrimination in South Africa: Analysis through Decomposition Techniques

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Stellenbosch Economic Working Papers: 06/08

KEYWORDS: DISCRIMINATION, GENDER, SOUTH AFRICA

JEL: J31, J71

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A WORKING PAPER OF THE DEPARTMENT OF ECONOMICS AND THE
BUREAU FOR ECONOMIC RESEARCH AT THE UNIVERSITY OF STELLENBOSCH

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ABSTRACT

Using appropriate econometric methods and 11 representative household surveys, this paper empirically assesses the extent and evolution of gender discrimination in the South African labour market over the post-apartheid period. Attention is also paid to the role that anti-discriminatory legislation has had to play in effecting change in the South African labour market. Much of the paper's focus is placed on African women who would have benefited most from the new legislative environment. African and, to a lesser extent, Coloured women received on average higher real wages than their male counterparts following changes in labour legislation. Oaxaca (1973) and Blinder (1973) decompositions reveal this to be due to both greater endowments of productive characteristics for African and Coloured women and declining gender discrimination that reached relative stability after 2000. Detailed Oaxaca-Blinder decompositions of the African gender wage gap reveal that the driving factor behind an increasing and negative explained component is improved distribution and returns to productive characteristics for women in certain occupations, as well as higher returns to education and employment in the public sector. However, African women are prevented from realising this in the form of higher earnings as a result of increasing returns to employment in certain industries for males. Decomposition results using the methodology of Juhn, Murphy and Pierce (1991, 1993) are suggestive of a sticky floor for African women in the South African labour market. The gender wage gap is therefore found to be wider at the bottom of the wage distribution than at the top.

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1. Introduction

There is no doubt that the South African labour market has been tarnished by large degrees of inequality and discrimination. In a country such as South Africa where groups prejudiced against comprise a sizable portion of the total population, discrimination can be costly to everyone. Following democratisation in 1994, much has been proposed in the way of correcting the imbalances created by the past. Most studies that have analysed discrimination in the South African labour market have focused on racial discrimination. Gender discrimination has been studied to a lesser degree, which is in stark contrast to many international studies. This paper serves to analyse the extent of gender discrimination in the South African labour market using appropriate econometric methods. The progression of gender discrimination over the period 1995 to 2005 will also be analysed, with particular attention paid to the period following the implementation of anti-discriminatory legislation.

Section 2 looks at economic theories of discrimination, and section 3 provides a background to women's position in the South Africa labour market, also looking at previous studies. Section 4 provides the data and econometric techniques employed, and section 5 reports the empirical results. Section 6 concludes.

2. Economic Theory

In general, discrimination is understood to exist when a superficial characteristic that is unrelated to an individual's actual or potential skills is used in order to restrict individuals' access to the available economic, political, and social opportunities for advancement (D'Amico, 1987: 310).

Economists distinguish between two types of discrimination. The first of these is “pure” wage discrimination, otherwise known as the “taste/preference” for discrimination by employers, employees or consumers. This type of discrimination was outlined in the seminal work of Becker (1973), who expressed discrimination as the preference by individuals to act as if they would rather incur costs than be associated with members of certain minority groups. Racial or gender prejudice blinds the employer to the true monetary cost of hiring the individual discriminated against; for example, the perceived cost of hiring a woman has been shown to exceed the actual cost (Borjas, 2005). But many economists argue that Becker’s analysis of discrimination implies that market discrimination will disappear in the “long-run”, as firms with the lowest, or zero, discrimination coefficients will eventually drive out the discriminatory employers from the market (Sapsford & Tzannatos). Arrow (1998) addressed this inconsistency by taking into account adjustment costs: if there are costs of hiring and firing, it may be costly to change the composition of the workforce as quickly as perfect competition theory proposes. The concept of pure discrimination has allowed for the notion of prejudice to be translated into the language of economics, and has aided in our understanding of why equally productive men and women are paid differently.

The second type of discrimination is known as “statistical” discrimination, whereby, for instance, women are paid less as they are deemed to be less productive on average than their male counterparts. The experience of employers over time will be to use the observable characteristic, in this case gender, as a substitute for the unobservable characteristics which cause the differences in productivity (Arrow, 1998). For instance, , women traditionally have been more likely than men to work part-time, and as a result have had fewer incentives to invest in education and training that improves earnings and job skills (Becker, 1993). The weaker labour market attachment by women has led to the conclusion that on average women tend to be less productive than men. However, over the past few decades this has changed, and in practically all developed countries the relative earnings and occupational attainment of women have all seen dramatic improvements (Bradbury & Katz, 2002).

The manner in which wage differentials can be divided into a part that is due to discrimination and that which is due to productive characteristic differences is

complicated by endogeneity effects (Johansson, 2001). A self-fulfilling prophecy may arise in the sense that if women expect not to be paid according to their human capital, they may choose to acquire less human capital than they would have in the absence of discrimination.

A further theory that offers reasons as to why a gender wage differential might exist is the theory of compensating differentials. This predicts that in jobs with more desirable working conditions the pay is likely to be lower. Workers looking for a specific set of job amenities will search out those firms that provide it (Borjas, 2005). Therefore, it could be argued that women may choose occupations that offer working conditions that accord with their family life and responsibilities at home, and may forfeit the extra pay in order to benefit from this. Alternatively, men may require higher compensation for the unattractive working conditions of their chosen occupations, for example added stress and longer working hours.

3. Women in the Labour Market

3.1 Background

In addition to the infamous laws that governed the lives of African women and men prior to 1994, apartheid acted to curb the participation of women in various aspects of life. It had profound effects on what was possible both in the private and public lives of women through a patriarchy encouraged by violence, conservatism and the rigidity of the apartheid state (Msimang, 2001: 1). Black women's participation in the workforce was indicative of the gender division of labour within the home. The most common employment of African women was that of domestic work and agriculture, whereas factory jobs for women were largely confined to Coloured women (Meer, 1985). However, unemployment for African and Coloured women remained high. Due to the low pay of these jobs and the high cost of inter-occupational movement, many of these women proceeded to remain in rural areas and lived off the remittance payments of their husbands.

White women were excluded from most forms of formal employment, and although not through legislation, were prevented from entering employment through conservative ideas about women's place in society. White women's employment patterns mirrored their family role (Naidoo & Kongolo, 2004: 128), and their opportunities were further limited by other policies that hampered their ability to take out loans or open accounts without permission from their husbands. The enforcement of such policies was determined by one's class, therefore the expectation would be that the experience of white women was likely to be less severe compared to that of women of other social classes. However, in general white women were, and remain, economically and politically disadvantaged in relation to white men. Whilst all women suffered under apartheid, the experience differed according to, amongst other things, their race, class, and religion.¹ In a patriarchal society where women were in general discriminated against, apartheid served only to magnify the situation, especially for African women.

The new democratically elected government has focused its attention on changing the laws of the country so that they could reflect the true spirit of the new Constitution. This entails redressing past injustices. Subsequent to the April 1994 elections, almost a quarter of the elected members to the National Assembly and the Senate were women. This was a dramatic change from the apartheid government in which women constituted a mere 2.8 percent of parliamentary representatives (Myakayaka-Manzini, 2002: 1). In the 1999 national election, this grew even further to a 29.8 percent representation by women, which earned South Africa a position amongst the top 10 countries in terms of representation by women in parliament. Government set itself the task of compiling legislation that would encourage the employment and education opportunities of Africans, Coloureds and Indians, disabled people and women. The Ministry of Labour was awarded the task of drawing up the framework within which employers and employees would operate in the new South Africa, ensuring the ability of all South Africans to equally compete for jobs. The legislation bearing the greatest significance for increased gender equality in the labour market was the Employment Equity Act of 1998, which came into effect at the end of 1999 (Msimang, 2001: 3).

¹ More characteristics listed in Fischer (1995)

The purpose of the Employment Equity Act was to achieve equity in the workplace by promoting equal opportunity, fair treatment, the elimination of discrimination and implementing measures to redress the disadvantages in employment experienced by certain groups. The Act promotes fair treatment by prohibiting unfair discrimination on the basis of race and gender. Unfortunately, many businesses have seen this as causing a large amount of rigidity in the labour market, and it is argued that it leads to companies “looking for a one-legged Black female” (Msimang, 2001: 3). The implementation of new labour laws that encourage affirmative action has thrown up a number of questions about identity.

The 1993 SALDRU survey revealed that women had higher unemployment rates than men in all race groups (Naidoo & Kongolo, 2004: 129), with African women suffering from the highest unemployment rate. This trend did not change over the following 12 years, with unemployment rates increasing across the board (see Table 1). More than half of African women remain unemployed, with an unemployment rate of 54 percent. This is in contrast to White males who, although experiencing an increase in unemployment, have an unemployment rate of only 6.4 percent. Within all race groups, female unemployment rates continue to be higher than those of their male counterparts. Women also continue to make up a smaller portion of the labour force, despite rising female participation rates. In 1995, women made up only 39 percent of the paid workforce, increasing only to 42 percent by 2005 (Table 2).

Table 1: Unemployment rates (broad definition), by gender and race

	African		Coloured		Indian		White	
	Female	Male	Female	Male	Female	Male	Female	Male
1993	43.9	31.6	26.4	21.0	23.0	12.5	12.9	5.3
1995	47.6	29.5	28.4	17.9	20.6	9.7	8.7	3.7
1999	51.9	36.7	28.4	19.3	23.8	17.8	7.3	6.3
2003	57.3	42.2	33.4	24.5	28.6	19.3	10.5	6.6
2005	54.3	37.8	34.9	25.2	29.4	18.2	10.2	6.4

Notes: own calculations; data for 1993 from Naidoo (2004); 1995/9 data from OHS surveys; 2003/5 data from LFS surveys (Statistics South Africa)

Table 2: Gender distribution of Labour Force with Paid Employment (percentage)

	Female
1995	38.94
1999	42.24
2003	41.90
2005	41.90

Note: own calculations; 1995/9 data from OHS surveys; 2003/5 data from LFS surveys (Statistics South Africa)

Although White women undoubtedly have suffered from gender discrimination, it has been held that they have had better access to higher status jobs. Of the formal sector managerial, executive and legislative positions held by women in 1995, almost 60 percent were filled by White women (see Table 3). Apart from associate professional occupations, White women continue to possess the larger share of jobs in more skilled occupations, although a substantial amount of occupational movement has occurred, especially within the Coloured and Indian race groups. Women have seen an increase in their share of higher skilled jobs from 1995 to 2005. The share of women in managerial and professional occupations increased from 22 and 40 percent to 29 and 46 percent respectively. When this is broken down into the different race groups, Coloured and Indian women have increased their share of all managerial jobs from 6.0 and 4.9 percent to 7.8 and 8.9 percent respectively, whereas White and African women have seen a decrease in their share of managerial jobs. This does not suggest that these groups have lost out, but rather that Coloured and Indian women were the largest beneficiaries of the increase in jobs accruing to women. From Table 4, it is observable that in every occupation women have managed to increase their share of jobs held in absolute terms, albeit to differing degrees. However, male-domination of top-level jobs continues to occur. 71 percent of managerial and executive positions, as well as 54 percent of professional positions, are held by men. It is therefore clear that a high degree of inequality continues to exist in the labour market experiences of men and women in South Africa, which could be a result of gender discrimination. The rest of this paper will attempt to quantify the importance of gender discrimination in explaining the persistence of gender wage differentials.

Table 3: Racial share of workers, by occupation

	African		Coloured		Indian		White		Total	
	1996	2006	1996	2006	1996	2006	1996	2006	1996	2006
Manager	25.4	30.0	17.3	7.9	5.9	6.7	51.4	55.4	100	100
Professional	46.7	48.0	5.8	6.4	4.7	4.3	42.7	41.3	100	100
Associates	52.2	53.0	12.9	13.3	4.1	4.4	30.8	29.3	100	100
Clerks	35.0	41.8	16.8	16.5	6.5	7.0	41.7	34.7	100	100
Service/sales	59.4	68.2	15.3	15.1	3.3	4.0	21.9	12.7	100	100
Skilled agriculture	59.4	63.8	31.4	5.4	0.0	0.3	9.2	30.5	100	100
Craft/trade	66.0	69.8	16.0	17.9	8.0	7.0	9.9	5.3	100	100
Operators	57.2	70.2	31.0	21.9	4.2	5.8	7.7	2.1	100	100
Elementary	75.6	77.1	21.0	20.1	1.0	1.5	2.3	1.2	100	100
Domestic work	87.6	91.3	11.6	8.1	0.0	0.0	0.8	0.6	100	100
Total	62.2	66.6	14.3	13.0	3.7	4.1	19.8	16.3	100	100

Note: own calculations; 1995 and 1999 data from OHS surveys; 2003 and 2005 data from LFS surveys
(Statistics South Africa)

Table 4: Share of male and female workers according to occupation

	1996		1999		2003		2006	
	Male	Female	Male	Female	Male	Female	Male	Female
Managerial	71.5	28.5	74.0	26.0	73.7	26.3	70.3	29.7
Professionals	54.9	45.1	52.7	47.3	56.0	44.0	53.8	46.2
Technicians/associates	46.5	53.5	46.7	53.3	45.6	54.4	48.1	51.9
Clerical	38.3	61.7	34.8	65.2	35.0	65.0	32.5	67.5
Service/sales	62.6	37.4	61.5	38.5	61.1	38.9	61.8	38.2
Skilled agricultural	80.9	19.1	82.4	17.6	81.5	18.5	78.7	21.3
Craft /trade	83.4	16.6	86.9	13.1	89.3	10.7	86.7	13.3
Operation	89.1	10.9	86.4	13.6	86.2	13.8	85.9	14.1
Elementary	66.0	34.0	60.5	39.5	62.6	37.4	61.9	38.1
Domestic work	12.1	87.9	4.7	95.3	5.6	94.4	1.4	98.6

Note: own calculations; 1995 and 1999 data from OHS surveys; 2003 and 2006 data from LFS surveys
(Statistics South Africa)

3.2 Previous Studies

As indicated before, studies regarding discrimination in South Africa focus mainly on racial discrimination, with only a few looking at the gender aspect. These studies tend to focus on the few years following democratisation, with currently no analysis of the impact of aforementioned legislation on gender discrimination.

In a study by Grun (2004), the development of gender discrimination over the period 1995 to 1999 is analysed for the African and White groups. Using selectivity corrected wage regressions and appropriate decomposition methods, both the direct and indirect gender discrimination trends were identified. It was found that African women experienced a higher degree of indirect discrimination - discrimination at the hiring stage - whereas White women were more affected by direct wage discrimination. Although the White gender wage gap was observed to be decreasing over the period, the extent of direct gender wage discrimination was found to have increased.

In an earlier study, Grun (2003) goes beyond a simple comparison of wage gaps by constructing a synthetic panel using data from three OHS surveys: 1995, 1997 and 1999. Sampling only full-time employed formal sector workers, the average earnings of birth cohorts from different population groups are observed over time. Wage gaps as well as the movement of cohort wages are analysed using decompositions of the wage gaps into age, cohort and year effects. In the case of Africans, the wage gap appeared to be larger for women moving into the older cohorts, whereas for whites the wage gap was largest at middle-aged cohorts.

Winter (1999) makes use of wage regressions and the Oaxaca decomposition to analyse whether or not a significant portion of the 1994 gender wage gap is attributed to discrimination. It was found that women earn, on average, 87 percent of men's wages. However, this result was found to vary after disaggregating the data by race. A very large gender wage gap was observed for the White population group, and an insignificant gender wage gap for the African group. In contrast to studies in many other countries, the larger part of the gender wage gap in the White population was

attributed to wage discrimination, and not to differences in observables. Hinks (2002) came to a similar conclusion, finding the greatest gender wage differential, as well as the greatest extent of discrimination, to exist within the White population.

4. Data and Methodology

4.1 Measuring Discrimination

4.1.1 The Oaxaca-Blinder Decomposition

In his classification of a competitive market discrimination coefficient for labour, Becker (1971) extended the model of perfectly competitive firms to include the influence of race, gender and other personal characteristics. This discrimination coefficient was defined as the difference between the observed wage ratio and that wage ratio which would exist in the absence of discrimination. Oaxaca (1973) and Blinder (1973) went on to express this difference as follows:

$$D = \frac{W^m / W^f - MP^m / MP^f}{MP^m / MP^f} \quad (1)$$

where W^m / W^f is the observed male-female average wage ratio, and MP^m / MP^f is the ratio of the male-female average marginal products (the competitive wage ratio that would exist in the case of no discrimination). Through some mathematical manipulation, this expression can be transformed into logarithmic form as follows:

$$\ln W^m - \ln W^f = \ln MP^m - \ln MP^f + \ln (D + 1) \quad (2)$$

Therefore, the difference in the log of observed wages for male and female workers is made up of two parts: the first term on the right-hand side is due to differences in male and female productive characteristics (the difference in quantities), and the second term is due to discrimination (the difference in prices).

In general, $\ln W$ can be estimated using a wage equation. Here the logarithm of wage is explained by a set of personal characteristics, including schooling, experience and race. That is:

$$\ln W = \mathbf{X}'\boldsymbol{\beta}$$

where \mathbf{X} is a vector of characteristics, and $\boldsymbol{\beta}$ is the vector of the least-square regression coefficients. Therefore, the left-hand side of (2) now becomes:

$$\ln W^m - \ln W^f = \mathbf{X}^{m'}\boldsymbol{\beta}^m - \mathbf{X}^{f'}\boldsymbol{\beta}^f \quad (3)$$

Using some basic manipulations, the terms on the right-hand side of (3) can be decomposed into either of two equivalent expressions:

$$\ln W^m - \ln W^f = \boldsymbol{\beta}^m(\mathbf{X}^m - \mathbf{X}^f) + \mathbf{X}^f(\boldsymbol{\beta}^m - \boldsymbol{\beta}^f) \quad (4)$$

$$\ln W^m - \ln W^f = \boldsymbol{\beta}^f(\mathbf{X}^m - \mathbf{X}^f) + \mathbf{X}^f(\boldsymbol{\beta}^m - \boldsymbol{\beta}^f) \quad (5)$$

The first term of the decompositions above represents the “explained” portion of the wage difference between males and females, which refers to the differences between the average productive capabilities of men and women. The second term represents the “unexplained” portion of the wage gap, which measures the differences in earnings due to the membership of a worker to a specific group, in this case, the male or female group.

However, the Oaxaca-Blinder decomposition fails to identify which wage structure would prevail in the case of no discrimination (Cotton, 1988). The discrimination component of the decomposition depends for a large part on the reference group chosen. If we assume that, in the case of (4), the female wage would be earned by all in the absence of discrimination, women would have no reason to end discrimination as their wages would remain the same, and the only change would be to lower the wages of men. Similarly, if decomposition (5) is applied, the non-discrimination wage

would be that of male workers, and men would be indifferent to ending discrimination as it would serve only to raise the wages of female workers.

A more generalised form of the Oaxaca-Blinder decomposition assumes a non-discriminatory wage structure β^* . The average wage gap can now be rewritten as:

$$\ln W^m - \ln W^f = \beta^*(X^m - X^f) + X^m(\beta^m - \beta^*) + X^f(\beta^* - \beta^f) \quad (6)$$

The interpretation of the first term on the right hand side remains the same: the wage difference due to differences in the productive characteristics of male and female workers (the “explained” portion). The discrimination component is now made up of two elements, one representing the advantage of being a male worker, and the other the disadvantage of being a female worker.

A number of methods have been offered for constructing the non-discriminatory wage structure. A general specification using a weighting matrix is:

$$\beta^* = \Omega\beta^m + (I - \Omega)\beta^f \quad (7)$$

where Ω is a weighting matrix and I is the identity matrix. If we set $\Omega = I$, this would imply that $\beta^* = \beta^m$ and equation (7) becomes the same as equation (4). Similarly, setting $\Omega = 0$ means that $\beta^* = \beta^f$ and equation (7) becomes equal to equation (5). In this study, it is assumed that $\Omega = (X'X)^{-1}(X'^m X^m)$ (Johansson et al, 2001; Oaxaca & Ransom, 1994). This produces a non-discriminatory wage structure that is equal to the β obtained by estimating the wage equation on the pooled sample of male and female wage earners.

Whether or not a valid measure of discrimination is obtained from the Oaxaca-Blinder decomposition depends on whether or not all dimensions in which male and female productivity differ are controlled for (Borjas, 2005). In reality, all variables that make up an earner’s human capital are seldom accounted for. Even if we include every relevant observable variable, factors such as ability and motivation will usually be omitted. If women happened to have lower average values for these omitted variables,

the unexplained part of the gender wage gap can be described as an “upper-bound” for discrimination.

4.1.2 Selection in Wage Equations

Most studies on gender wage gaps, including this one, make use of the simple Ordinary Least Squares regression method for estimating wage equations. This implies that only those individuals with wage employment are considered in the model. Therefore, the incidence of a large number of unemployed individuals in the sample can lead to selectivity bias. In the presence of sample selection, OLS estimation of wage equations can lead to biased and inconsistent estimators (Oaxaca & Neuman, 2004: 3). It has therefore become common practice to improve the wage equation using Heckman’s correction procedure for selectivity bias. One of the techniques proposed by Heckman proceeds in two steps: firstly, a reduced-form probit equation of the probability of having an observed wage is estimated, which is then used to calculate the Mills ratio; secondly, the inverse of the Mills ratio, also known as “Heckman’s lambda”, is included in the OLS estimation of the wage equation as an explanatory variable.

Let the employment function be given by:

$$L^* = \mathbf{H}'\boldsymbol{\gamma} + \boldsymbol{\varepsilon}$$

where L^* is a latent variable associated with employment, \mathbf{H}' is a vector of determinants of employment and $\boldsymbol{\gamma}$ the associated parameter vector and $\boldsymbol{\varepsilon}$ the error term (Oaxaca & Neuman, 2004: 4). The probability of employment is given as:

$$Prob(L^* > 0) = Prob(\boldsymbol{\varepsilon} > -\mathbf{H}'\boldsymbol{\gamma}) = \Phi(\mathbf{H}'\boldsymbol{\gamma})$$

where $\Phi(\cdot)$ is the standard normal cumulative density function.

The wage equation is, as previously, given by:

$$\ln W = \mathbf{X}'\boldsymbol{\beta} + \mathbf{u}$$

Given that wages are only observed for those individuals for whom $L^* > 0$, the expected wage of an employed individual is determined by:

$$E(\ln W | L^* > 0) = \mathbf{X}'\boldsymbol{\beta} + E(\mathbf{u} | \boldsymbol{\varepsilon} > -\mathbf{H}'\boldsymbol{\gamma}) = \mathbf{X}'\boldsymbol{\beta} + \boldsymbol{\theta}\boldsymbol{\lambda}$$

where $\boldsymbol{\theta} = \boldsymbol{\rho}\boldsymbol{\sigma}$, $\boldsymbol{\lambda} = \varphi(\mathbf{H}'\boldsymbol{\gamma})/\Phi(\mathbf{H}'\boldsymbol{\gamma})^2$, and $\varphi(\cdot)$ is the standard normal density function (Neuman & Oaxaca, 2003). The estimated equation for employed individuals may be expressed as:

$$E(\ln W | L^* > 0) = \mathbf{X}'\boldsymbol{\beta} + \boldsymbol{\theta}\boldsymbol{\lambda}$$

Correction for selectivity bias requires the following wage decomposition:

$$\begin{aligned} \ln W^m - \ln W^f & \\ &= \boldsymbol{\beta}^*(\mathbf{X}^m - \mathbf{X}^f) + \mathbf{X}^m(\boldsymbol{\beta}^m - \boldsymbol{\beta}^*) + \mathbf{X}^f(\boldsymbol{\beta}^* - \boldsymbol{\beta}^f) + (\boldsymbol{\theta}^m\boldsymbol{\lambda}^m \\ &+ \boldsymbol{\theta}^f\boldsymbol{\lambda}^f) \end{aligned}$$

The first term represents the explained component, with the following two terms representing the male advantage and female disadvantage respectively, which jointly comprise the unexplained component. However, the manner in which the final component contributes to the decomposition is more difficult to recognize. Neuman and Oaxaca (2003) provide a number of refinements to address this problem. One such approach is to net out the estimated differences in conditional means from the overall gender wage gap so that one is left with:

$$\begin{aligned} \ln W^m - \ln W^f - (\boldsymbol{\theta}^m\boldsymbol{\lambda}^m + \boldsymbol{\theta}^f\boldsymbol{\lambda}^f) & \\ &= \boldsymbol{\beta}^*(\mathbf{X}^m - \mathbf{X}^f) + \mathbf{X}^m(\boldsymbol{\beta}^m - \boldsymbol{\beta}^*) + \mathbf{X}^f(\boldsymbol{\beta}^* - \boldsymbol{\beta}^f) \end{aligned}$$

However, the decomposition above represents a decomposition of the gap in selectivity corrected, or “offered” wages, rather than of the observed wage gap.

² Heckman’s lambda or the inverse Mills ratio

It has been argued that working women are a self-selected group with better than average productive characteristics, and it is these women who are assessed in the labour market. Sapsford and Tzannatos (1993) raise the question of whether or not the market should pay non-working women, with possibly “inferior” characteristics, the same as wage employed women who are more qualified, and argue that the appropriate decomposition of the wage gap should apply to the coefficients on the *uncorrected* female wage equation, and the average value of characteristics held by *women with employment*.

4.1.3 Juhn-Murphy-Pierce Decomposition

Juhn, Murphy and Pierce (1991, 1993) extended the decomposition technique of Oaxaca and Blinder to allow for decompositions at points in the earnings distribution other than the mean. The decomposition now becomes:

$$\begin{aligned} \ln W^{m;q} - \ln W^{f;q} - (\theta^{m;q} \lambda^{m;q} + \theta^{f;q} \lambda^{f;q}) \\ = \beta^{*,q} (X^{m;q} - X^{f;q}) + X^{m;q} (\beta^{m;q} - \beta^{*,q}) + X^{f;q} (\beta^{*,q} - \beta^{f;q}) \\ + (\varepsilon^{m;q} - \varepsilon^{f;q}) \end{aligned}$$

with the superscript q specifying the value at the qth quantile.

The first three terms are interpreted as before: the explained component, the male advantage, and the female disadvantage respectively. The fourth term represents differences in the quantities and prices of unobservable characteristics resulting from changes in the distribution of the residual from the wage regression. When considering the decomposition at the mean, the fourth term takes on a zero value. It is self-evident that in this case the decomposition above will reduce to the familiar Oaxaca-Blinder form.

4.2 Data description

Data on the South African labour market are obtained from the annual October Household Surveys (OHS) from 1996 to 1999, and from the September Labour Force Surveys (LFS) from 2000 to 2006³. A large number of households across all South African provinces were sampled, thus allowing for detailed analysis of labour market conditions. The total sample included those individuals of working age, i.e. between the age of 15 and 64 years. The sample was further reduced by including only formal sector workers, primarily due to the inconsistent capturing of the informal sector. This is despite recent revisions and modifications to the questionnaires used in national household surveys. Problems still persist regarding the measurement of the informal sector and identification of informal sector workers (Muller, 2002: 2). Subsistence agriculturalists and the self-employed were also excluded from the final sample for similar reasons.

The decision to exclude domestic workers from the final sample was made as the analysis of this paper hopes to gauge the wage discrimination experience of women employed in the formal sector of the South African labour market. These women, unlike domestic workers, face lower levels of occupational discrimination, and are better able to enter formal sector employment. However, once they have entered into paid employment, they are faced with substantial levels of wage discrimination⁴. The survey design was also taken into account in the estimation of the empirical models.

³ The 1995 OHS was not used given problems with capturing the informal sector. Only September Labour Force Survey datasets were employed in order to avoid problems of seasonality which may make comparability with the OHS difficult.

⁴ The models presented in section 4.3 were run controlling for the inclusion of domestic workers. Quantitatively this did not change the main results. Due to the high concentration of African women in domestic work (which is the lowest paying occupation/industry), a positive explained component, and hence a positive and large gender wage gap in favour of African men, was observed for all years considered. Standard errors and 95% confidence intervals constructed around the unexplained components revealed that the size of the unexplained component does not differ significantly whether domestic workers are controlled for or not; the wage discrimination experience of the average African female does not appear to be significantly different after the inclusion of domestic workers. However, when the level of occupational discrimination was compared between formal workers and formal workers including domestic workers, it was discovered that the level of occupational discrimination

Hourly wage data was employed in this study due to the prevalence of female employment on a part-time basis. Therefore, a variable representing average weekly hours worked was used to calculate an hourly wage, which was also then adjusted for inflation. Due to the fact that earnings data are a mixture of both interval and point data, allowance had to be made for this by transforming the calculated real hourly wage variable into log-normal form.

4.3 Empirical Model

The variables included as regressors in the wage equations are as follows: education dummies⁵, potential experience⁶, potential experience squared, marital status, number of children in the household, whether or not the wage earner is the household head, whether the person is employed in the public or private sector, union membership, and various dummy variables for industry, occupation, and province.

Education is a form of human capital investment, and determines productivity. It is therefore expected that higher levels of education will lead to higher wages. Typically, the non-linear impact of educational attainment on wages is allowed for through the inclusion of the years of education squared (Keswell, 2001). However, variability in the coefficients on the education and education squared regressors may result when comparing a number of cross-sectional datasets over time. We would expect the returns to education to remain fairly stable over a relatively short period of time⁷. Estimates are sensitive to the fact that only one point in the education-wage distribution is analysed, namely the wage at the average level of education. Significant changes in the education-wage distribution will necessarily lead to changes in the estimates on the education variable in the wage regressions. For this

faced by the average African women was much higher after controlling for domestic workers. Results controlling for domestic work may be requested from the author.

⁵ Dummy variables included for: no/some primary education; completed primary education; some secondary education; completed secondary education; some tertiary/diploma; completed university degree or more.

⁶ Potential experience is calculated using the formula $\text{experience} = \text{age} - \text{years of education} - 6$

⁷ In the case of this study, 11 years.

reason, the non-linear impact of education on wages was modelled using various educational dummies. Potential experience is also allowed to enter the wage equations in a non-linear form, as the impact of this variable on wages is expected to be concave.

The effect of personal characteristics such as married and children on wages is thought to be ambiguous (Burger & Jafta, 2006: 16). However, given the added responsibility that the two variables possibly bring, one would expect a positive relationship between wages earned and these variables. Alternatively, the number of children in a household can also have a negative impact on wages earned, especially in the case of women, as the presence of young children may require the individual to take up a job that allows greater freedom for women to spend time at home, at the cost of lower wages. A positive relationship is expected to exist between wages and the household head variable. The reasoning is similar to that of being married and having children.

Residing in provinces with large metropolitan areas such as Gauteng and the Western Cape is expected to have a positive impact on wages, whereas residing in provinces such as the Limpopo and the Eastern Cape (which contain the old homelands) will negatively impact on wages earned.

Union membership is thought to have a positive impact on wages, due to the increased bargaining power of union members. Occupation and industry of employment are also controlled for through the use of dummy variables representing 9 occupations and 9 industries⁸. The public sector variable is included to control for the large number of women employed in this sector.

Empirical analysis proceeded using the Heckman correction for selection to estimate the wage equations. To solve the identification problem, the employment equation has to include some variables which only influence the probability of being employed and

⁸ Occupations are classified as managerial, professional, technical/associate, clerical, services/salesperson, skilled agriculture, craft/related trades, operators, elementary occupations. Industries are classified as agriculture, mining, manufacturing, utilities, construction, trade, transportation, finance/insurance and services.

not the wage, once such workers were employed. These were identified as being household variables such as marital status, number of children in the household, and whether or not the wage earner is the household head. Other variables included in the selection equation were educational level, experience, and residence in a rural or urban area. This adjustment resulted in highly unstable offered wage gaps, especially within the Indian and Coloured race groups⁹. This was for the most part attributed to the large and negative coefficients on the male lambdas, paired with relatively smaller and mostly negative coefficients on the female lambdas. It was also observed that, over the entire 11 year period, less than half of the coefficients on the female lambdas were found to be statistically significant. The difficulty in specifying the selection equation correctly is well known (Johannsen et al, 2001). Therefore, it was decided that for the purposes of this paper it would be preferable to ignore selection bias.

5. Empirical Results

5.1 Gender Wage Gap Decomposition

From figure 1, for most years African women employed in the formal sector earn higher average wages than their male counterparts, although the differential appears for the most part to be negligible. Extension of this analysis to include the informal sector would drastically alter the average wage distribution of the African and Coloured population groups. Average wage gaps would display a persistent wage gap in favour of men resulting from a relatively large number of African and Coloured women being employed in the informal sector and as domestic workers. Gender discrimination would be better observed if the male and female workers compared have a similar experience of the South African labour market. The wage gap widens slightly after 2001, but is closed by 2006 given the steeper increase in African male wage rates. This is possibly due to rising wage rates in the lower skilled occupations and industries over the past few years, which are predominantly male. Figure 2 indicates that Coloured female wage rates were lower in some years, and higher in

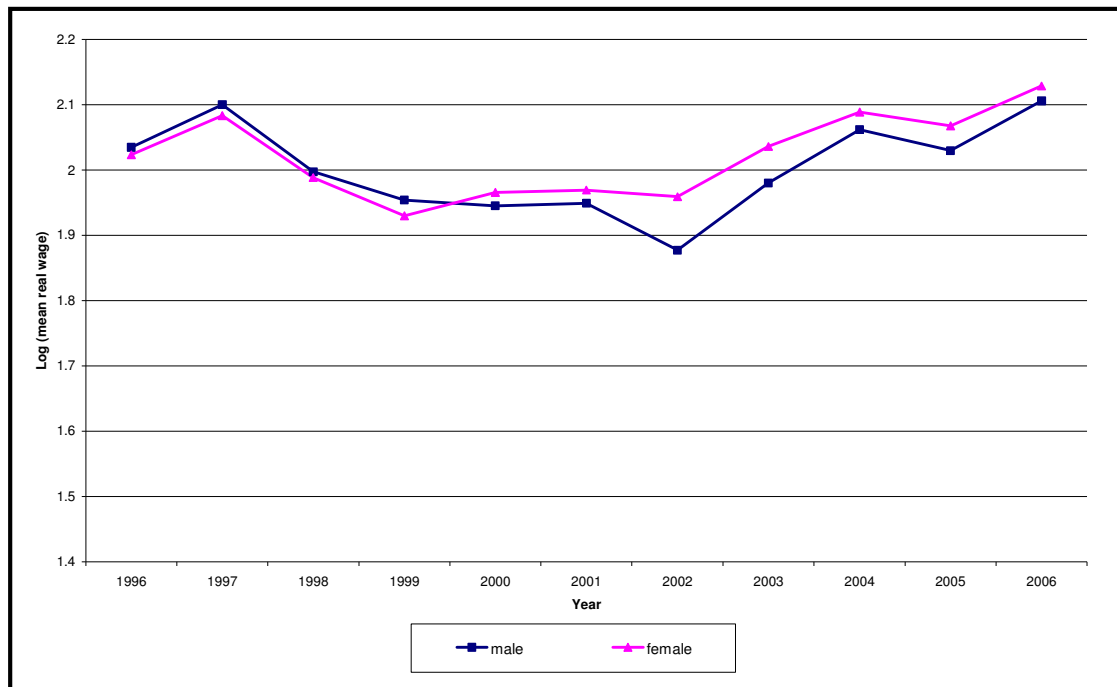
⁹ Selectivity-corrected results are available from the author on request.

others, than those of their male counterparts. For the first 4 years analysed, Coloured men on average earned higher wages than Coloured women. This is then turned on its head for the following 5 years. Interestingly, this change coincides with the adoption of the majority of employment equity legislation in 1999. From 2004 onwards, however, a more rapid increase in Coloured male wages results in an overturning of the gender wage gap in men's favour. The average Indian male wage rate was persistently higher than that of Indian females (figure 3). The gap narrows between 1999 and 2003, and slightly widens thereafter. The White population group displays a similar trend in figure 4, with men also earning on average higher wages than their female counterparts. However, the wage gap was reduced considerably between 1996 and 2006.

Table 5 presents the results of the OLS regressions on log of real wages for the whole male and female samples for 1996 and 2006 respectively. Coefficients on education variables are significant at the 1% level for all regressions barring that for the female sample of 2006. The returns to education are convex in all regressions, and the expected concave relationship between experience and earnings is also found. Once again, concavity is displayed for all regressions with regard to the relationship between experience and earnings. Returns to education are convex in all cases apart from the regressions on White male and female wages for 1996. The signs on the coefficients for all regressions are as expected¹⁰.

¹⁰ OLS regressions results for all race groups are not shown in paper, but are available from author.

Figure 1: African formal sector wage rate, by gender



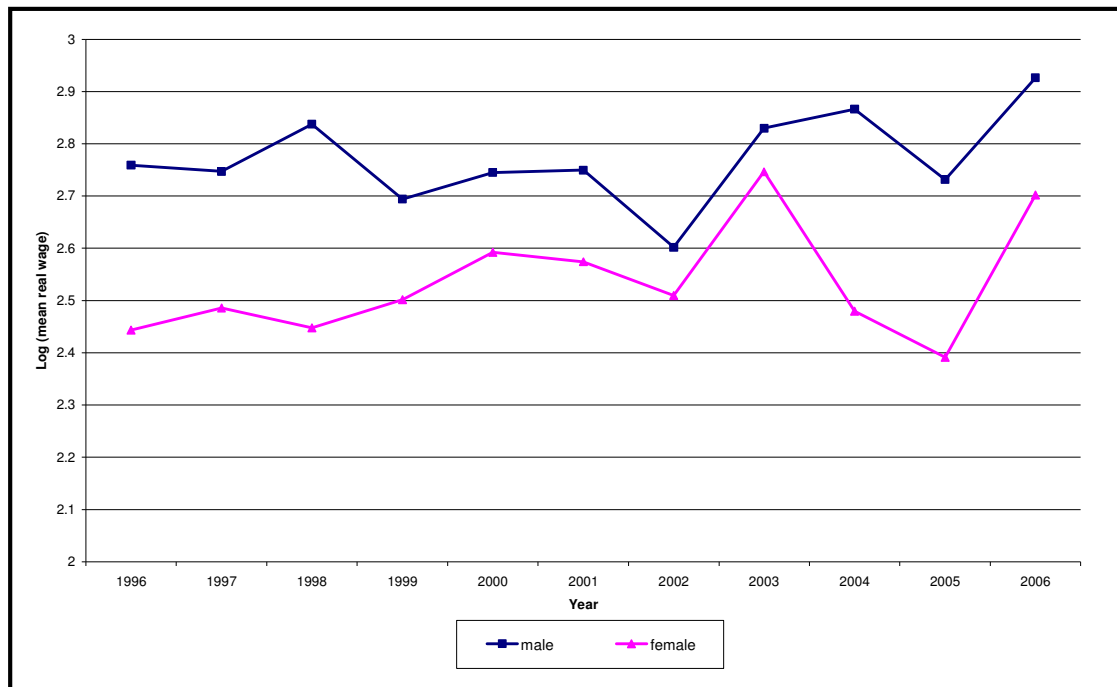
Note: own calculations; OHS surveys 1996 to 1999; LFS surveys 2000 to 2006 (Statistics South Africa)

Figure 2: Coloured formal sector wage rate, by gender



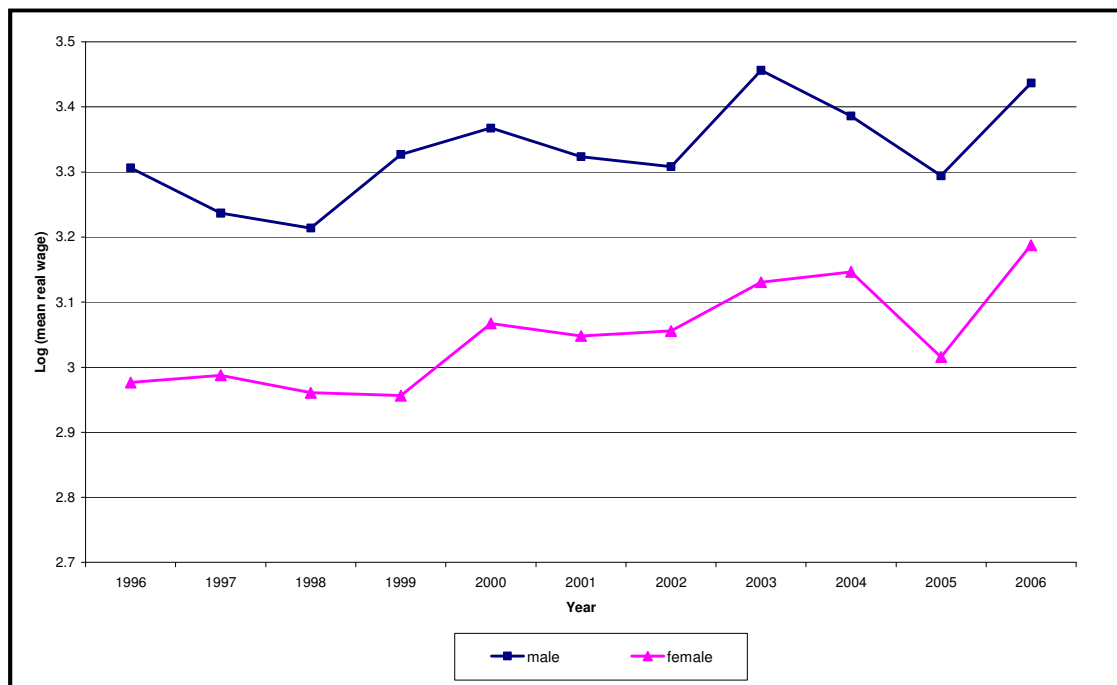
Note: own calculations; OHS surveys 1996 to 1999; LFS surveys 2000 to 2006 (Statistics South Africa)

Figure 3: Indian formal sector wage rates, by gender



Note: own calculations; OHS surveys 1996 to 1999; LFS surveys 2000 to 2006 (Statistics South Africa)

Figure 4: White formal sector wage rates, by gender



Note: own calculations; OHS surveys 1996 to 1999; LFS surveys 2000 to 2006 (Statistics South Africa)

Table 5: OLS regression on the log of real wages (whole sample)

	Dependent variable: log hourly real wage			
	1996		2006	
	male	female	male	female
Complete primary education	0.1374 (3.35)**	0.2648 (3.75)**	0.0840 (2.26)*	0.0754 (1.43)
Incomplete secondary education	0.4634 (15.91)**	0.5447 (11.98)**	0.2755 (10.38)**	0.2714 (7.14)**
Complete secondary education	0.9372 (26.03)**	0.9482 (17.9)**	0.6617 (22.35)**	0.5722 (13.74)**
Some tertiary/diploma	1.2541 (24.84)**	1.1916 (19.71)**	1.1415 (30.0)**	0.9002 (19.19)**
Complete degree/more	1.5911 (25.84)**	1.4064 (17.77)**	1.3587 (28.9)**	1.3272 (24.83)**
Potential experience	0.0334 (10.3)**	0.0346 (8.62)**	0.0231 (9.09)**	0.0151 (5.19)**
Potential experience ²	-0.00043 (7.43)**	-0.0005 (5.76)**	-0.0002 (4.18)**	-0.00012 (2.06)*
Household head	0.1084 (4.26)**	0.0721 (2.22)*	0.0564 (2.79)**	-0.0093 (0.45)
Married	0.8431 (7.07)**	0.1196 (4.27)**	0.137 (7.24)**	0.158 (7.98)**
Number of children	-0.0335 (5.16)**	-0.0392 (4.53)**	-0.0193 (3.3)**	-0.0438 (7.24)**
Union	0.201 (9.7)**	0.2023 (7.41)**	0.2172 (12.74)**	0.2153 (10.85)**
Public sector	0.3258 (5.05)**	0.222 (3.94)**	0.2091 (6.48)**	0.1842 (6.22)**
Western Cape	0.2746 (5.99)**	0.4565 (7.5)**	0.5609 (16.06)**	0.6184 (15.83)**
Eastern Cape	0.0678 (1.36)	0.2414 (3.7)**	0.2303 (6.01)**	0.2182 (5.24)**
Northern Cape	-0.0055 (0.08)	0.1738 (1.78)	0.2718 (5.39)**	0.2459 (3.98)**
Free State	-0.0838 (1.64)	0.1725 (2.46)*	0.1545 (3.86)**	0.1441 (3.11)**
Kwa-Zulu Natal	0.1138 (2.49)*	0.2668 (4.45)**	0.2649 (8.01)**	0.2854 (7.47)**
North West	0.0346 (0.69)	0.12 (2.82)**	0.1367 (3.41)**	0.2374 (4.99)**
Gauteng	0.2363 (5.29)**	0.5432 (8.96)**	0.4261 (13.43)**	0.5515 (14.6)**
Mpumalanga	-0.010 (0.19)	0.1659 (2.23)*	0.2509 (6.54)**	0.2092 (4.46)**
Legislator/manager	0.7905 (16.15)**	0.6292 (8.98)**	1.0912 (29.71)**	1.0669 (22.9)**
Professional	0.4815 (7.21)**	0.6428 (8.48)**	0.7563 (17.03)**	0.6993 (15.24)**
Technician/associate professional	0.5245	0.4804	0.5581	0.7208

	(12.91)**	(10.0)**	(17.13)**	(20.81)**
Clerk	0.3098	0.3857	0.3613	0.519
	(7.09)**	(8.48)**	(10.68)**	(17.44)**
Services/sales	0.0780	0.1484	0.0547	0.0683
	(2.16)*	(3.13)**	(1.97)	(2.1)*
Skilled agriculture	0.1158	0.112	0.1246	0.2023
	(1.69)	(1.13)	(1.24)	(1.17)
Craft/trade	0.1868	-0.0581	0.2197	0.0534
	(5.78)**	(1.0)	(9.03)**	(1.23)
Operations/assembly	0.1655	0.0345	0.0991	-0.1426
	(4.98)**	(0.46)	(3.88)**	(2.97)**
Agriculture/fishing	-0.5607	-0.5617	-0.5519	-0.3958
	(7.93)**	(7.57)**	(13.45)**	(8.47)**
Mining/quarrying	0.4394	0.3884	0.3782	0.3297
	(5.77)**	(2.42)*	(8.75)**	(3.01)**
Manufacturing	0.3232	0.0942	0.1037	0.1165
	(4.87)**	(1.52)	(3.02)**	(3.24)**
Utilities	0.3499	0.2562	0.2127	0.3987
	(4.04)**	(1.61)	(3.49)**	(4.26)**
Construction	0.0838	0.2370	-0.1708	-0.1687
	(1.16)	(1.66)	(4.44)**	(2.52)**
Wholesale/retail	0.1619	-0.1232	-0.1326	-0.2478
	(2.41)*	(2.14)*	(3.95)**	(8.17)**
Transport/communications	0.2648	0.2204	0.0737	0.2299
	(3.77)**	(2.35)*	(1.79)	(4.4)**
Finance/insurance	0.2261	0.1471	-0.1492	0.1532
	(3.27)**	(2.3)*	(4.28)**	(4.79)**
Constant	0.5569	0.3993	0.7719	0.7667
	(6.34)**	(4.2)**	(13.72)**	(11.64)**
Observations	6384	3696	9534	6189
R-squared	0.54	0.53	0.54	0.61

Note: own calculations from OHS and LFS (Statistics South Africa); t-statistic in parentheses;
* significant at 5%; ** significant at 1%

Figures 5 - 8 graphically depict Oaxaca decomposition results for the gender wage gap for all race groups. The African wage decomposition indicates that in all years considered, African men on average have greater returns to their productive characteristics than their female counterparts. This is indicated by a positive unexplained wage gap component. In contrast, the explained component of the wage gap is negative; this indicates that, on average, African women have larger endowments of productive characteristics than African men. The wage gap between these two groups was fairly small for most of the period, as any increase in the explained component was similarly matched by an increase in the unexplained component. Therefore, even though African women are shown to be on average more productive than African men, they do not benefit fully from this in the way of their earnings. Of interest is the impact that affirmative action and employment equity may

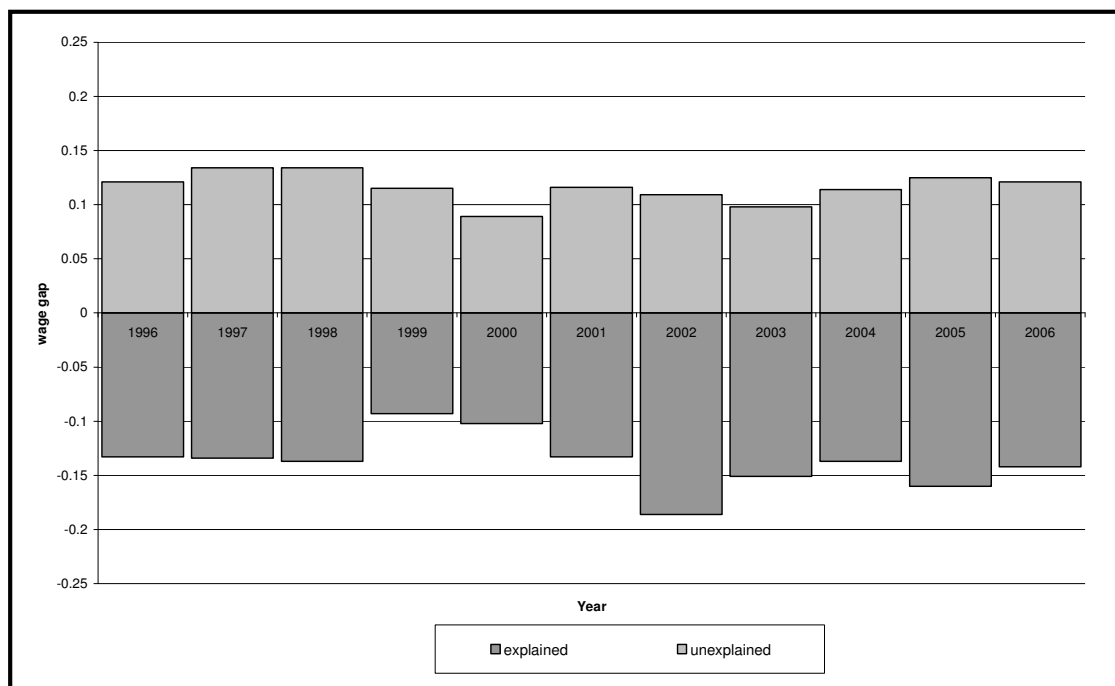
have had on gender discrimination and the gender wage gap. Observing any changes in the unexplained component, there appears to have been a decrease from 1998 until 2000, after which the component became relatively stable. Regarding the explained component, an initial decrease from 1998 to 1999 was shortly followed by an increase from 1999, resulting in a considerable increase in the wage differential in favour of African women from 2002. Therefore, whilst affirmative action and employment equity may have decreased gender discrimination post-1998 (albeit not substantially), it is possible that legislation may have improved the movement of African women into high skilled occupations and industries. Further analysis is required in order to better ascertain the impact of labour legislation on the employment and earning opportunities of African women since 1999. For the most part, it appears that discrimination as measured by the unexplained component has remained more or less stable over the 11 year period, with changes in the average earnings of women being affected largely by changes in their endowments of productive characteristics.

From figure 6, an evident decrease in the portion of the Coloured wage gap that is unexplained is observed after 1997. This led to a substantial decrease in the gender wage differential, even to the point where Coloured women began to earn higher wages than Coloured men from 1999 to 2002. As in the case of the African population, Coloured women have greater endowments of productive characteristics than Coloured men (as indicated by a negative explained component). This portion of the wage gap initially increased from 1997, but a reversal of this trend occurred from 2001. The decreasing explained component from 2001 can possibly be attributed to the closing education gap between Coloured men and women. Although Coloured women appear to be benefiting from lower levels of gender discrimination than was the case before 1999, the level of discrimination has remained virtually stable since 1998.

Empirical results based on the Indian sample are difficult to interpret, as the relatively small number of observations leads to volatility of the decomposition results, as shown in figure 7. Therefore, it is risky to make any conclusive judgments based on the data. Wage regression results for 1996 and 2006 (see Appendix, table 3) indicate a large number of insignificant regression coefficients for the Indian male and female samples.

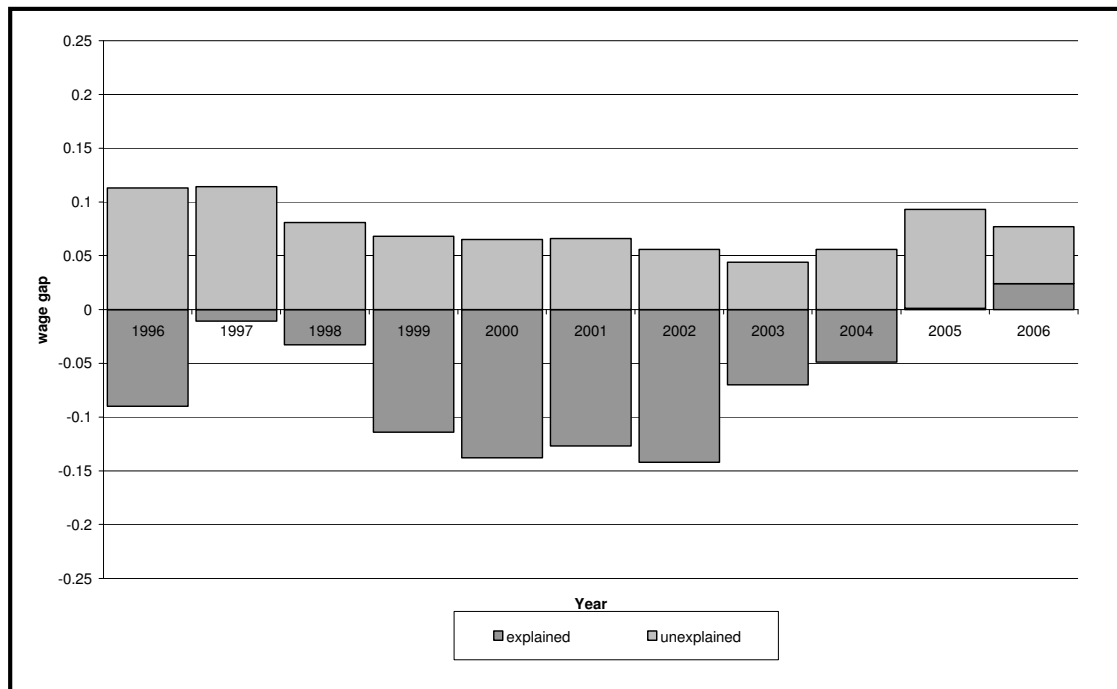
Figure 8 displays the decomposition results for the White population group. What is immediately noticeable is that, in comparison to the other population groups, the unexplained portion makes up a relatively smaller portion of the total gender wage gap. A downward trend is observed in the wage gap since 1999, which may have come about as a result of employment equity legislation (this requires further analysis). The unexplained or discrimination component also appears to be smaller, although not importantly so, in more recent years. The decreasing wage gap is largely driven by the decreasing explained component, most likely as a result of the increasing number of White women entering higher skilled occupations and industries since 1999. New legislation has made it increasingly possible for White women to compete on a more equal basis with their male counterparts. As in the case of the African and Coloured population groups, although gender discrimination (represented by the unexplained component) has been reduced since 1999, the level of discrimination has remained fairly stable for subsequent years. There is possibly more that could be done with regard to reducing gender discrimination for all population groups.

Figure 5: Decomposition of average African gender wage gap (1996-2006)



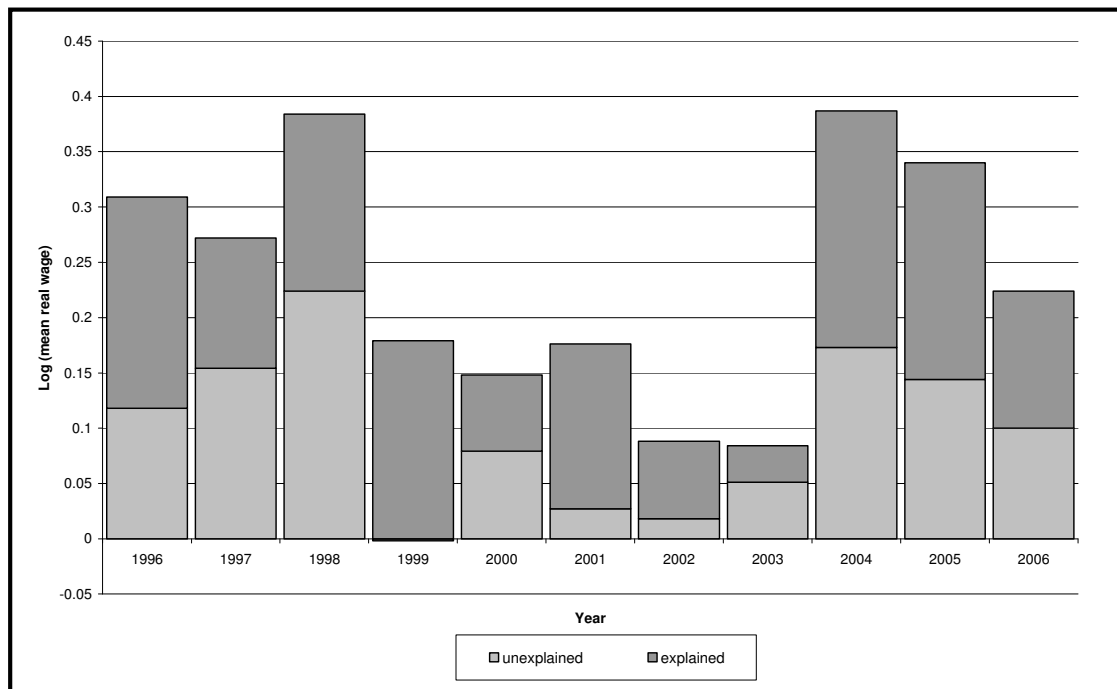
Notes: own calculations from OHS and LFS (Statistics South Africa). Wage gaps are graphed so that a positive gap corresponds to male advantage.

Figure 6: Decomposition of average Coloured gender wage gap (1996-2006)



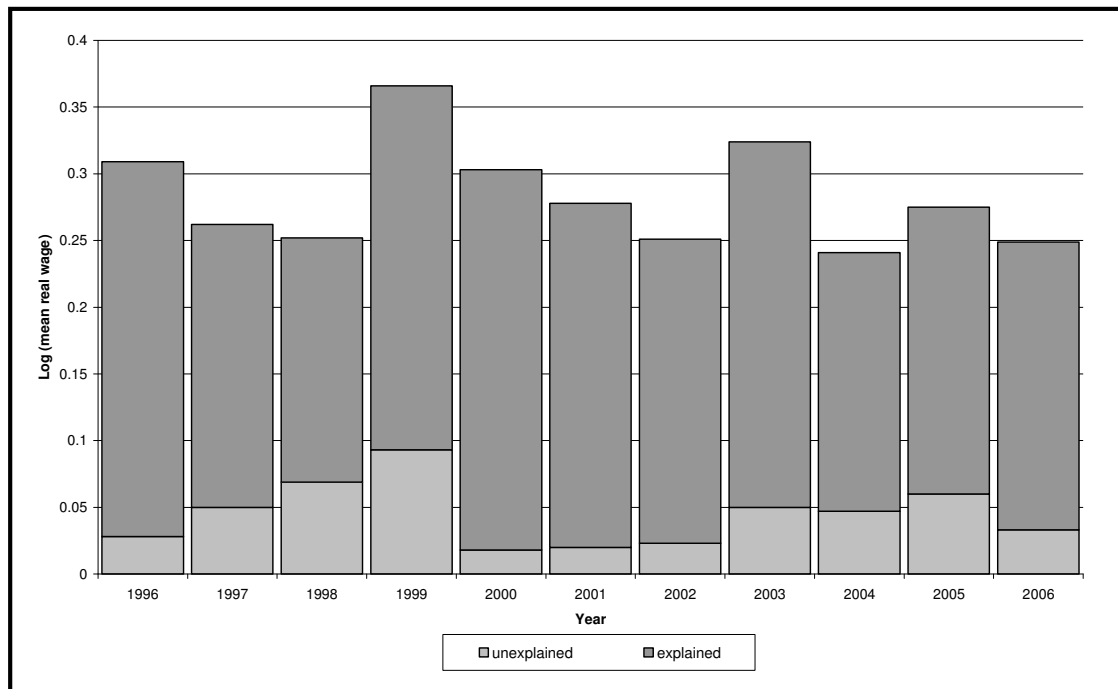
Notes: own calculations from OHS and LFS (Statistics South Africa). Wage gaps are graphed so that a positive gap corresponds to male advantage.

Figure 7: Decomposition of average Indian gender wage gap (1996-2006)



Notes: own calculations from OHS and LFS (Statistics South Africa)

Figure 8: Decomposition of average White gender wage gap (1996-2006)



Notes: own calculations from OHS and LFS (Statistics South Africa)

5.2 Detailed Wage Gap Decompositions

It is possible to further decompose the explained and unexplained shares of the wage gap into the explained and unexplained effects attributable to each of the characteristics. However, the results offered by the detailed Oaxaca-Blinder decomposition of wage differentials are not invariant to the choice of reference group (omitted group) when using dummy variables in the wage regressions (Oaxaca & Ransom, 1999). The intuition behind the solution is to obtain “true” contributions of individual variables to the wage gap as the average of the regression estimates obtained from every possible specification of the reference groups. However, Yun’s (2003) simple “averaging approach” avoids what could be the cumbersome task of running an endless number of specifications, and shows that the average estimate can be easily determined through only running one set of regression estimates with any reference group/s.

The general solution to the identification problem begins by supposing a wage equation as follows:

$$\ln W = \alpha + \sum_{l=1}^L C_l \beta_l + \sum_{j=1}^J \sum_{k_j=2}^{K_j} D_{jk_j} \beta_{jk_j} + \varepsilon$$

where there are L continuous variables (C) and J sets of categorical variables (D) with K_j categories (therefore $K_j - 1$ dummy variables). The equation above can be transformed into a “normalised” wage equation:

$$\ln W = \alpha + \sum_{j=1}^J \beta_j + \sum_{l=1}^L C_l \beta_l + \sum_{j=1}^J \sum_{k_j=2}^{K_j} D_{jk_j} (\beta_{jk_j} - \beta_j) + \varepsilon$$

Therefore, a new set of “normalised” regression coefficients on the dummy variables (denoted as β^{Yun}) and constant can be used with the original set of explanatory

variables¹¹ (X) to obtain the “true” contributions of different variables to the two components of the wage gap. The male and female wage equations are estimated as:

$$\ln W_m = X_m' \beta_m^{Yun}$$

$$\ln W_f = X_f' \beta_f^{Yun}$$

Therefore, the explained and unexplained components of the gender wage gap, with the pooled sample as the non-discriminatory group, were now estimated as:

$$\begin{aligned} \ln W^m - \ln W^f &= (\alpha_m - \alpha_f) + \beta^{*Yun}(X_m - X_f) + X_m'(\beta_m^{Yun} - \beta^{*Yun}) \\ &+ X_f'(\beta^{*Yun} - \beta_f^{Yun}) \end{aligned}$$

Only the African population group was considered for the detailed decomposition analysis. This is owing to the larger sample size of this particular group, and the expectation that affirmative action and employment equity legislation would have had the most significant impact on African women. Decomposition results for 1996, 1999, 2000, 2002, 2004 and 2006 are displayed in figures 1 to 6 of the appendix. Using the detailed decompositions, it is now possible to determine what factors account for the relative sizes and changes in the unexplained and explained components of the wage gap in figure 5. The variables of most interest to this study are those of education, public sector employment, occupation and industry, as these would have been most affected given the legislative changes in the labour market¹². The contributions of the dependent variables to the explained and unexplained components of the gender wage gap are displayed in table 6 below.

¹¹ The set of explanatory variables X includes all continuous variables (C) and dummy variables (D).

¹² Union, married, children and province were found to have negligible contributions to both the explained and unexplained components across all years. Household head was found to contribute a relatively sizeable and positive amount to the explained gap (although declining in later years). This is due to the larger share of Africans with household head status in paid employment being male. However, this was counteracted by larger and negative contributions of education, public sector employment and occupation in favour of African women.

Table 6: Contribution (percentage)¹³ of independent variables to wage gap components (selected years)

	1996	1999	2000	2002	2004	2006
<i>Explained component:</i>						
Education	99.7	149.8	133.7	77.0	102.3	83.3
Experience	-9.7	-22.7	-8.9	-6.2	-9.0	-3.8
Household head	-42.8	-49.5	-66.3	-23.1	-34.2	-21.3
Married	-16.6	-25.4	-21.2	-9.3	-12.3	-9.7
Number of children	-3.3	-3.9	-5.0	-6.3	-6.6	-4.4
Province	-3.6	-15.6	-15.8	-4.2	-5.3	-10.7
Union membership	-9.8	-4.8	-0.4	1.4	4.3	5.8
Public sector	44.6	62.7	46.9	40.5	39.2	35.1
Occupation	42.8	41.7	51.5	50.7	49.9	48.3
Industry	-1.4	-32.2	-14.5	-20.6	-28.3	-22.7
Constant	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
<i>Unexplained component:</i>						
Education	-13.7	-15.0	-13.4	-32.6	-19.9	-6.1
Experience	-36.7	74.5	9.7	123.0	71.9	127.4
Household head	-23.4	-18.0	-7.2	-12.5	-9.3	-10.0
Married	3.6	-3.9	-10.3	-7.7	-8.2	-6.1
Number of children	-21.0	-12.1	-8.9	-4.2	9.7	25.7
Province	-10.1	-18.9	-12.2	-11.3	15.5	-25.5
Union membership	-1.5	0.9	1.9	-2.8	10.4	8.0
Public sector	11.7	78.9	30.7	34.9	1.1	7.5
Occupation	-24.5	-23.5	-11.3	-7.0	7.2	3.0
Industry	35.0	63.6	40.4	79.9	55.0	25.8
Constant	180.5	-26.6	80.7	-59.6	-33.4	-49.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Notes: own calculations; 1995-1999 OHS; 2000-2005 LFS (Statistics South Africa)

¹³ Keeping in mind that the explained component for the African gender wage gap is negative, a positive contribution reflected in the table refers to a contribution in favour of African women, whereas a negative contribution refers to a contribution in favour of African men. Similarly for the unexplained component, a positive contribution would be in favour of African men and a negative contribution in favour of African women, given that the unexplained component is positive.

The contribution of the education variable to the explained component remained fairly unchanged over the period considered, implying that an educational gap in African women's favour was maintained. Table 1 of the appendix displays rising proportions of African men and women in higher levels of education, with further evidence of slightly higher concentrations of African women in complete secondary education or greater. African women are also better remunerated (although marginally so) for their level of education, as indicated by a negative unexplained component on the education variable. Education played a small role in changes in the explained and unexplained components of the wage gap.

The public sector variable, which contributes positively to the negative explained component, witnessed an increase in its contribution to the explained component from 1996 to 1999. This is perhaps to be expected given the increasing number of African women employed in the public sector after 1994. However, the contribution of the public sector to the explained component returned to the pre-1999 level shortly after. The positive contribution of the public sector to the unexplained component experienced a once-off spike in 1999. Although the relative share of African men and women employed in the public sector began to shift slightly in favour of women from 1994, public sector employment saw a decline in the absolute number of paid workers from 1997 to 1999, which may have had an impact on the earnings potential of African women employed in this sector. In recent years, the public sector has contributed negligibly, if at all, to discrimination.

As no noteworthy change in any of the other variables occurred over this period, the decrease in the explained component from 1999 must be attributed to changes in the occupation and industry variables. It is noticeable from table 6 that the contribution of occupation to the negative explained component was consistently positive (and fairly large). Additionally, the contribution of occupation to the unexplained component was in favour of African women until 2002, after which the contribution turned in favour of men (albeit negligible in size). The size of the explained portion of the occupation variable was roughly stable over the considered period. The explained component on the occupation variable in favour of women comes as a result of four occupations in particular: technicians and associate professionals (more so in earlier years), craft and trade, plant and machinery operators, and (in latter years), professionals.

With regards to occupation¹⁴, African women are able to benefit from their endowments of productive characteristics in one of two ways: an increase in the share of African women employed in high-paying occupations; and a decrease in the share of African women employed in low-paying occupations. From table 2 in the appendix, African women comprise the larger share of paid employment in technician and associate professional occupations compared to their male counterparts. They are able to benefit from this in the way of higher average earnings given the relatively high earning potential of this occupation category. Although the contribution of this occupation group to the negative unexplained component has declined as a result of a declining female share (from 57% in 1996 to 54% in 2006), benefits to women from employment in this relatively high-paying occupation are still reaped. Regarding occupations in craft and trade and plant and machinery operation, African women have benefited from a low share of paid employment in this relatively low-paying occupation. Therefore, movement up the occupational “ladder” so to speak has enabled African women to benefit from higher earnings on average.

Furthermore, given a negative unexplained component on occupation from 1996 to 2002, African women have not only benefited from productive endowments with regard to occupation, but further from higher returns to these endowments relative to men. This suggests that African females employed within certain occupation groups are likely to gain more from these higher-paying positions relative to African males. This was found to be the case for technicians and associate professionals and service and sales for 1996 and 2002, and, only in 1999, plant and machinery operators. However, despite relative gains in these occupations, higher returns to male endowments in other occupations more than counteracted these female advantages in 2004 and 2006. Male-dominated occupations such as skilled agriculture, craft and trade and professionals provide higher returns to the productive endowments of males. Therefore, despite movement up the occupational “ladder” by African women, this upward mobility does not translate fully into higher earnings given evidence that men continue to hold higher paying positions within different occupation categories. The gain in terms of higher returns for African men, however, appears to be negligible.

¹⁴ All detailed occupation and industry results for 1996 to 2006 may be requested from the author.

Comparing the contribution of occupation to that of industry, one notices a clear divergent trend. Where occupation has contributed favourably to the earnings potential of African women, industry has contributed favourably to an earnings advantage for African men given positive contributions of industry to both the explained and unexplained components of the overall wage gap. Inflation in the positive contribution of industry to discrimination was observed in 1999 to 2002, driven largely by gains in earnings for men in community and social services as well as manufacturing. The wholesale and retail industry is a further industry in which male endowments are better remunerated. African males are able to benefit from a larger employment share in relatively high-paying industries, as well as a lower employment share in relatively low-paying industries. It should be mentioned that African women are not altogether faring poorly with regard to paid employment in specific industries. Paid employment of African females in male-dominated industries, for example, business services and transport and communication, benefit females through better returns, indicating upward mobility by females within these industries to higher paying positions.

The size of the explained component on the experience variable remains stable over the entire period, although a substantial amount of volatility is observed in the unexplained component. This may perhaps be attributed to a degree of bias in the coefficients on this variable, given that the measure of potential experience was used. Given that data for actual experience are unobserved, an estimate for potential experience is used, calculated as age minus years of schooling minus age on entering school¹⁵. The use of this variable can be problematic in estimating gender wage gaps, as it can result in serious biases in the calculation of the discrimination component (Weichselbaumer & Winter-Ebmer, 2005; Nordman & Roubaud, 2006). Potential experience may be a good approximation of labour force attachment for men, but can overstate the actual experience of a group less attached to the labour market, as is the case for women.

The unexplained component on the constant provides an indication of the level of “pure discrimination” faced by African women in the formal sector. There is a clear

¹⁵ In the South African schooling system this is 6 years of age.

decline in the size of this component from 1996 to 2006, indicating that pure discrimination in the formal sector is decreasing. There may even be evidence of a degree of “favourable” discrimination in favour of African women in latter years.

The results above are important for the labour market experience of African women. As the detailed decompositions display, African women are increasingly entering into higher-skilled and higher-paid occupations. This is most likely a direct result of employment equity legislation, as it coincides with the period of its implementation. Employment in the public sector also appears to have benefited African women in terms of their employment opportunities. However, they still struggle in terms of the share of jobs held in certain industries, as well as wage discrimination in favour of men in higher-skilled occupations. Although paid employment in certain industries appears to have contributed to increasing discrimination, the size of the unexplained component has remained roughly stable from 1999 given a decline in the level of “pure” discrimination. African females gain favourably from a negative explained component driven by an educational gap as well as paid employment in the public sector. A definite step has been taken in the direction of curtailing the amount of discrimination felt by African women in the labour market. However, a large amount of gender discrimination continues to persist, which necessitates the need for well targeted policy.

5.3 Juhn-Murphy-Pierce Decompositions

The Oaxaca-Blinder method decomposes the wage differential between the average male worker and the average female worker. It therefore only allows us to assess the gender discrimination experience of the average worker, and it is difficult to ignore the fact that the gender discrimination experience may be changing over the wage distribution. Affirmative action and employment equity may indeed have impacted on the opposite ends of the wage distribution to differing degrees. Figures 9 to 14 show the Juhn-Murphy-Pierce decompositions at the 10th, 25th, 50th, 75th, 90th and 95th percentiles. As with the detailed decompositions, this analysis has been restricted to the African population.

A substantial amount of variability in the sizes of the three components is observed at the 10th percentile. This may be caused by bias in the coefficients due to sample selectivity problems outlined earlier. However, the relative importance of the unexplained component in determining the overall size of the gender wage gap at the 10th percentile is easily observed. The positive gender wage gap at the 10th percentile in favour of African men exists as a result of a large positive discrimination component (as well as unobservables component) and a largely negligible explained component. The experience of African women at the 10th percentile differs from that of the average experience, given that women no longer benefit from larger endowments of productive characteristics. The same trend is observed at the 25th percentile. Women at the 25th percentile earn lower real wages than their male counterparts as a result of large wage discrimination (observed by the positive and large explained component) and declining contributions of the explained component to the overall wage gap. Unlike the experience at the 10th percentile, there is some evidence of declining discrimination in favour of men at the 25th percentile. This does not, however, take away from the fact that discrimination more than accounts for the overall gender wage gap.

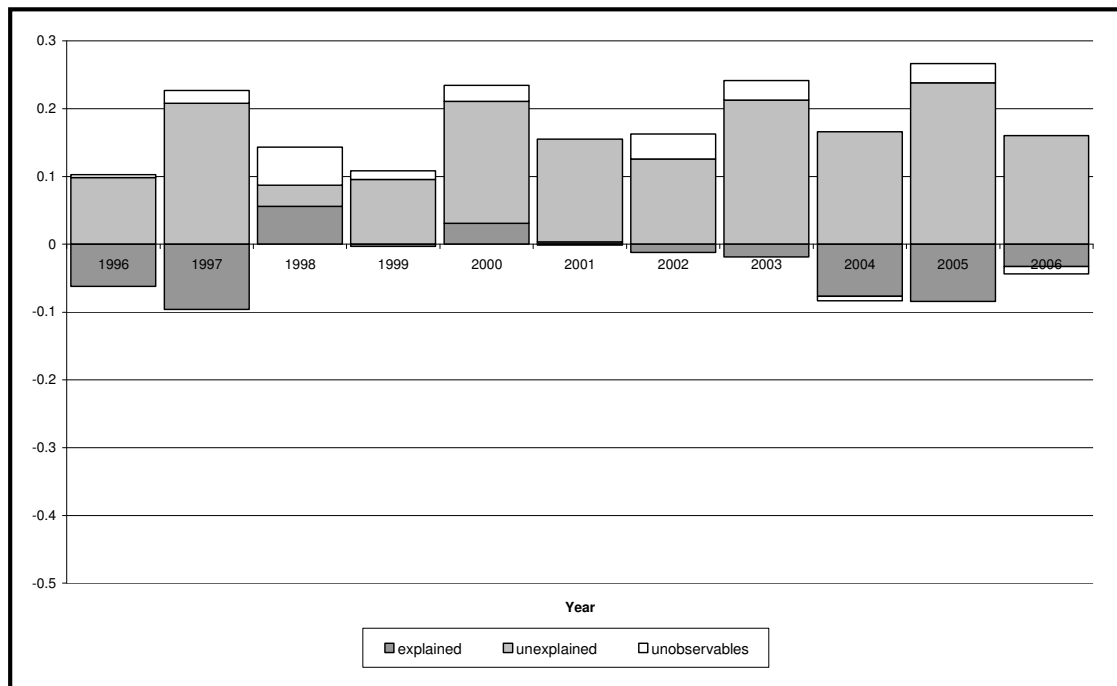
Moving up the wage distribution, the unexplained component's contribution to the overall wage gap becomes increasingly smaller (especially so at the 75th percentile). This results in a widening wage gap in favour of African women at the upper end of the wage distribution. As would be expected, the components of the wage gap follow similar trends at the mode as is found at the mean¹⁶. African women observe the largest wage gap in their favour at the 75th percentile due to a large and negative explained component. The level of discrimination is similar to that at the mean and the mode (bar the spike in 2006 of which not much can be said), showing relative stability from 1999.

African women benefit from higher earnings at the upper end of the wage distribution (90th and 95th percentiles) due to small, positive unexplained components which are more than negated by large and negative explained components. African women further benefit from the fact that their unobservable skills are better rewarded than is

¹⁶ Exceptions are observed in the case of two spikes in the unexplained component in 2001 and 2004.

the case for their male counterparts. What is clear is that the unexplained component (gender discrimination) as a proportion of the overall wage gap becomes smaller moving up the wage distribution. This coupled with a negligible negative explained component at the 10th and 25th percentiles and a sizeable negative explained component at the upper end of the wage distribution leads to a declining gender wage gap moving up the wage distribution. This is indicative of a sticky floor phenomenon in the South African formal sector. A “sticky floor” is the situation where the wage gap is found to be wider at the bottom of the wage distribution than at the top¹⁷; this is synonymous with the majority of women staying on the bottom rungs of the career ladder. There appear to be factors¹⁸ within formal sector employment that prevent women in low-level, non-managerial or support roles from gaining promotion or career development, and even where promotion occurs women may not receive proportionate wage increases. This was reflected in the detailed decomposition results where it was found that although African women have favoured from better mobility into higher-paying occupations, they have not necessarily benefited from higher remuneration once they have found paid-employment within these occupations.

Figure 9: Decomposition of African gender wage differential at 10th percentile

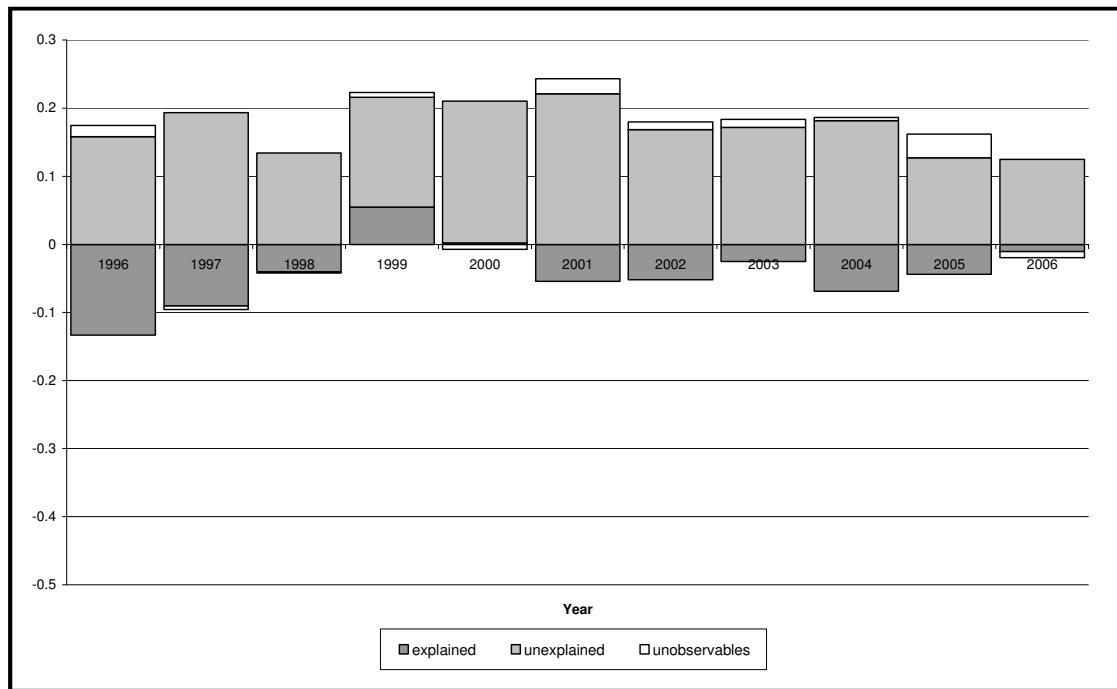


¹⁷ This is compared to a “glass ceiling” where gender gap gaps are typically wider at the top of the wage distribution than at the bottom.

¹⁸ These factors may include barriers to advancement such as family commitments, attitudes, stereotyping, and organisational structures.

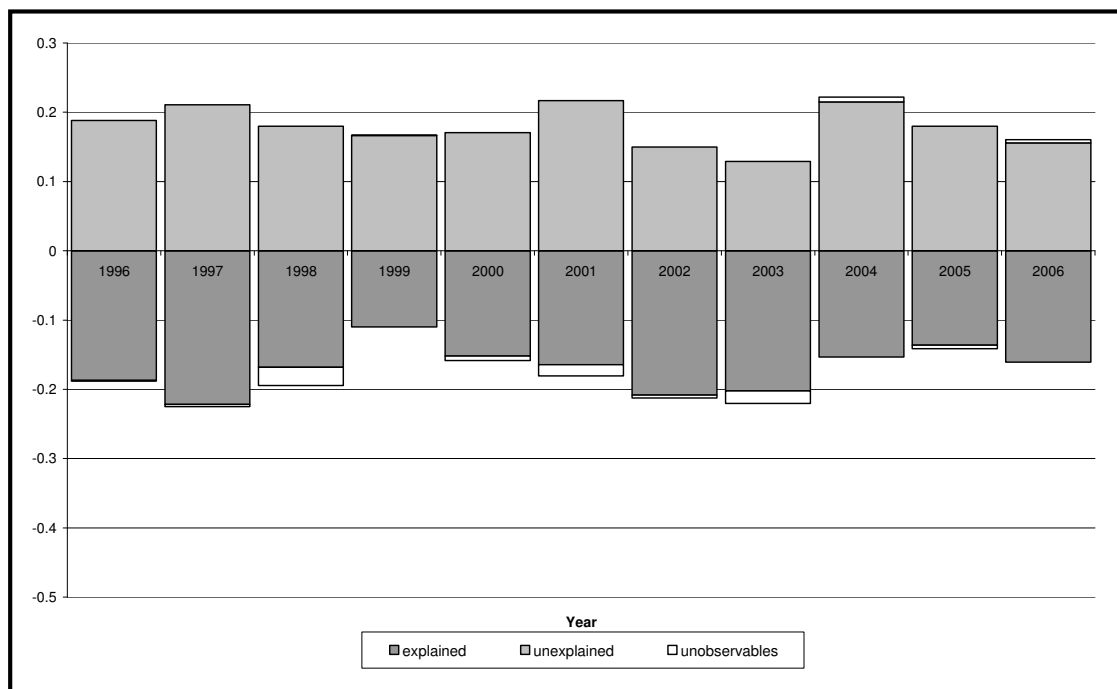
Notes: own calculations; 1995-1999 OHS; 2000-2005 LFS (Statistics South Africa)

Figure 10: Decomposition of African gender wage differential at 25th percentile



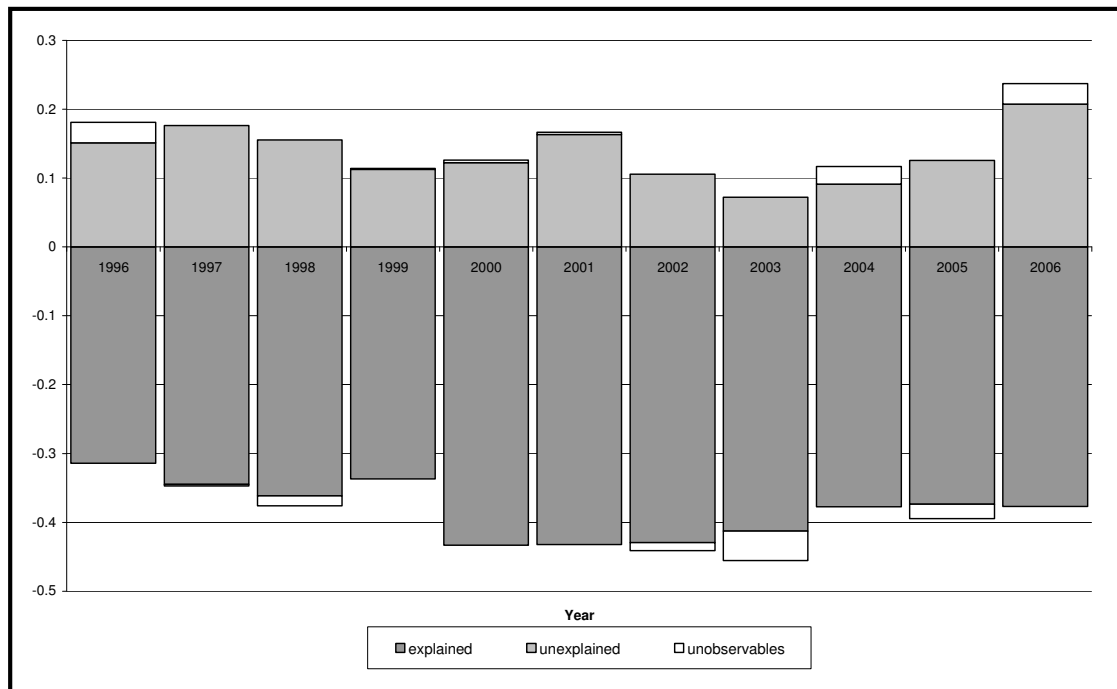
Notes: own calculations; 1995-1999 OHS; 2000-2005 LFS (Statistics South Africa)

Figure 11: Decomposition of African gender wage differential at 50th percentile



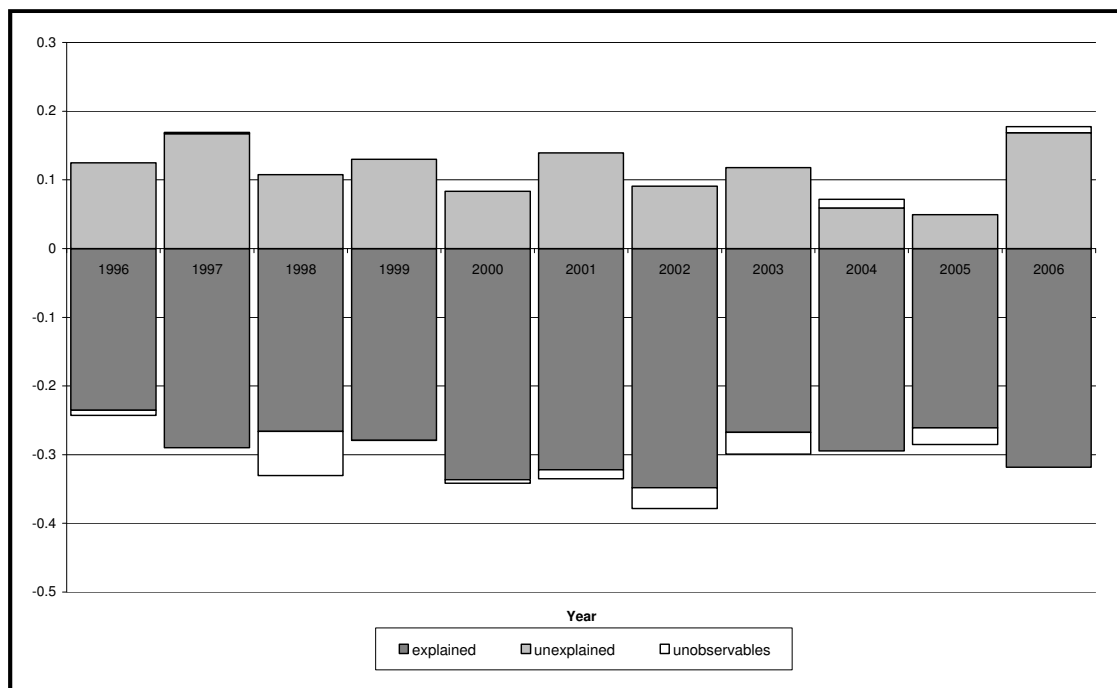
Notes: own calculations; 1995-1999 OHS; 2000-2005 LFS (Statistics South Africa)

Figure 12: Decomposition of African gender wage differential at 75th percentile



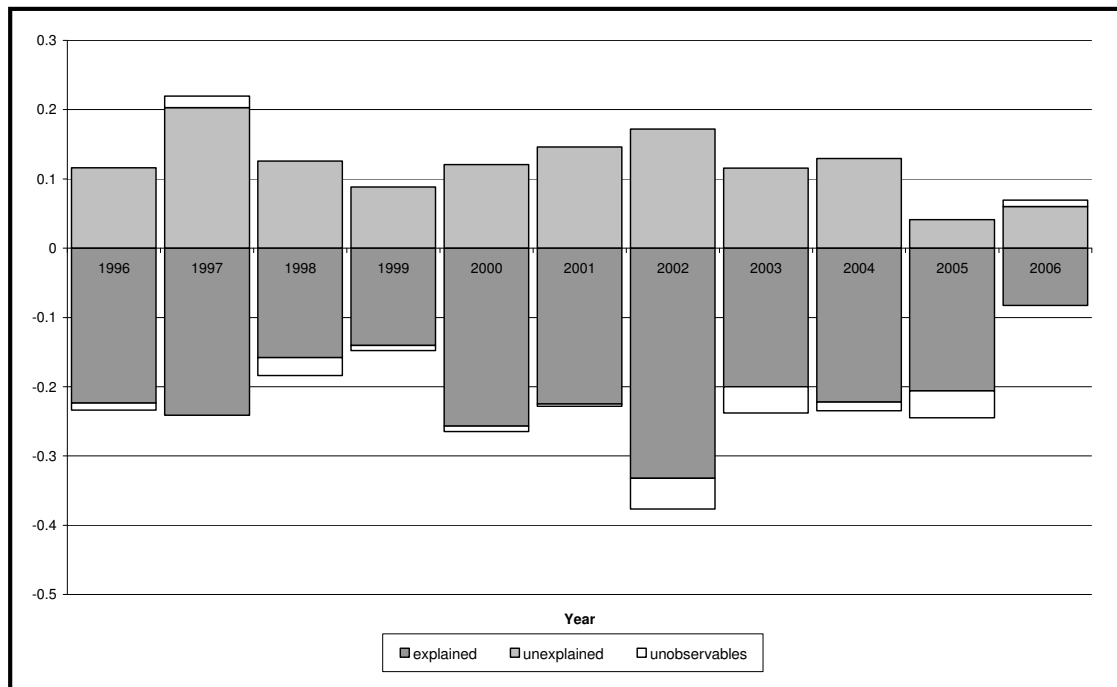
Notes: own calculations; 1995-1999 OHS; 2000-2005 LFS (Statistics South Africa)

Figure 13: Decomposition of African gender wage differential at 90th percentile



Notes: own calculations; 1995-1999 OHS; 2000-2005 LFS (Statistics South Africa)

Figure 14: Decomposition of African gender wage differential at 95th percentile



Notes: own calculations; 1995-1999 OHS; 2000-2005 LFS (Statistics South Africa)

6. Conclusion

The principal objective of this study was to determine the dynamics of the discrimination experience for women in the South Africa labour market over the post-apartheid period. Much of the focus of this paper was placed on the African population group given the expectation that any changes occurring in the labour market would have been most felt by African women. Oaxaca-Blinder decompositions revealed declining gender discrimination for the African¹⁹, Coloured and White population groups from 1997, after which it became relatively stable from 2000. Especially in the case of African women, fairly little changed regarding their experience of gender discrimination over the period analysed. African women continue to experience larger amounts of discrimination relative to Coloured and White women in the South African labour market. African and Coloured women have

¹⁹ The change in the unexplained component of the African decomposition appears to be fairly insignificant. Further confidence interval testing is needed to substantiate this.

continued to have greater endowments of productive characteristics than their male counterparts, largely due to the educational gap between those men and women who are employed.²⁰ The negative explained component combined with the positive unexplained component for these two groups has resulted in a wage gap which, at different times, varies between advantaging men and advantaging women. The opposite is true for the White population group, resulting in a positive gender wage gap in favour of men that has been decreasing since 1999.

Detailed Oaxaca-Blinder decompositions reveal that the factor driving the increasing explained component from 1999 is the improved gender distribution in certain occupations and the increasing female share in the public sector. It is further revealed that although the returns to paid employment in specific industries for men are increasing, this has been counteracted by increases in the returns to female education and female employment in specific occupations. African women are observing benefits to employment in high-paying occupations, as well as paid employment in top-level positions both in high- and low-paying occupations. Mobility up the occupational “ladder” is increasingly translated into earnings gains. However, mobility within specific industries continues to dampen the average earnings of African women, whereby male dominated industries tend to be better paid, and African men hold top-paying positions in female dominated industries. The importance of continued redistribution of male and female employment to ensure an equal labour market experience is evident. Although it does appear that employment equity and affirmative action have had some responsibility in minimising the gender discrimination experience, African women depend on an advantage in terms of their productive characteristics to lessen the impact of discrimination on women once they enter employment. Additionally, the level of “pure” discrimination in the formal sector labour market was found to decline over the period.

²⁰ Note that gender differentials in education are relatively small for the South African population, though males still experience a slight advantage in terms of post-school education. However, given selection into the labour market and into employment and occupation, females with formal employment outside of domestic service (i.e. the group of workers analysed here) tend to have better education than males.

Juhn-Murphy-Pierce decompositions reveal that the experience at the mean is much the same at both ends of the wage distribution. African women have greater endowments of productive characteristics than similarly ranked men, although this advantage is almost negligible at the 10th and 25th percentiles. The ratio of the unexplained component to the overall wage gap loses magnitude moving up the wage distribution, suggesting evidence of a sticky floor. Women in lower-paid occupations within lower-paid industries tend to be the worst hurt by discrimination in the formal sector labour market. This stresses the importance of improved education as well as skills development as a vehicle for occupational mobility for African women in the formal sector. The analysis performed in this paper would appear to suggest that, especially in the case of African women, gender discrimination in the South African labour market has not changed much since 1994. Although many positives exist in that African women employed in the formal sector on average do not appear to falling behind their male counterparts, and in some cases may even be pulling ahead, it is obvious that wage discrimination continues to be a reality of the South African labour market.

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Appendix

Table 1: Summary Statistics (African)

	1996		1999		2002		2006	
	Male	Female	Male	Female	Male	Female	Male	Female
<u>Personal Characteristics:</u>								
No/incomplete primary education	0.33	0.30	0.32	0.30	0.27	0.26	0.17	0.20
Complete primary education	0.08	0.08	0.09	0.09	0.09	0.09	0.07	0.07
Incomplete secondary education	0.34	0.34	0.33	0.31	0.33	0.30	0.37	0.33
Complete secondary education	0.18	0.17	0.18	0.17	0.21	0.17	0.28	0.23
Incomplete tertiary/diploma	0.05	0.10	0.05	0.09	0.06	0.11	0.07	0.12
Complete degree/more	0.02	0.03	0.03	0.04	0.04	0.06	0.04	0.06
Potential experience	23.22	23.15	22.79	22.75	22.51	23.53	20.72	22.52
Potential experience ²	684.06	672.72	657.57	660.36	657.48	706.66	573.83	664.68
Household head	0.71	0.33	0.80	0.44	0.80	0.45	0.77	0.47
Married	0.67	0.50	0.65	0.45	0.64	0.43	0.57	0.41
Children	1.58	1.81	1.20	1.62	1.08	1.60	1.04	1.49
Union	0.36	0.25	0.48	0.33	0.42	0.29	0.38	0.28
<u>Occupation:</u>								
Manager	0.02	0.01	0.03	0.01	0.02	0.01	0.03	0.02
Professional	0.03	0.04	0.03	0.04	0.02	0.05	0.04	0.05
Technician	0.09	0.17	0.07	0.13	0.08	0.14	0.07	0.11
Clerk	0.06	0.09	0.07	0.10	0.06	0.10	0.06	0.13
Sales/Service	0.14	0.11	0.13	0.09	0.12	0.08	0.17	0.11
Skilled worker	0.04	0.01	0.03	0.01	0.03	0.01	0.00	0.00
Craft/trade	0.18	0.06	0.18	0.04	0.18	0.04	0.19	0.04
Operators	0.18	0.02	0.23	0.04	0.24	0.04	0.18	0.03
Elementary	0.24	0.18	0.21	0.20	0.23	0.19	0.25	0.18
Domestic work	0.02	0.31	0.01	0.34	0.01	0.34	0.01	0.32
<u>Industry/Sector:</u>								
Public sector	0.19	0.29	0.18	0.23	0.16	0.24	0.16	0.22
Agriculture	0.13	0.06	0.13	0.08	0.13	0.07	0.09	0.05
Mining	0.06	0.01	0.14	0.00	0.15	0.00	0.08	0.00
Manufacturing	0.18	0.11	0.17	0.09	0.17	0.10	0.16	0.09
Utilities	0.02	0.00	0.02	0.00	0.02	0.01	0.02	0.01
Construction	0.08	0.01	0.06	0.01	0.07	0.01	0.10	0.02
Retail/Wholesale	0.14	0.15	0.13	0.14	0.12	0.12	0.17	0.17
Transport/Communications	0.08	0.01	0.06	0.01	0.06	0.02	0.07	0.02
Finance/Insurance	0.07	0.05	0.07	0.05	0.09	0.06	0.11	0.07
Community/Social/Personal services	0.20	0.32	0.19	0.27	0.17	0.28	0.18	0.26
Private households	0.04	0.29	0.02	0.34	0.02	0.34	0.01	0.32
<u>Province:</u>								
Western Cape	0.05	0.04	0.06	0.04	0.05	0.04	0.05	0.06

Eastern Cape	0.09	0.12	0.07	0.12	0.07	0.13	0.07	0.11
Northern Cape	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01
Free State	0.10	0.10	0.11	0.10	0.10	0.09	0.08	0.07
Kwa-Zulu Natal	0.18	0.21	0.16	0.21	0.19	0.22	0.18	0.20
Northwest	0.13	0.10	0.11	0.09	0.13	0.08	0.08	0.08
Gauteng	0.26	0.24	0.29	0.24	0.27	0.24	0.32	0.27
Mpumalanga	0.10	0.09	0.09	0.08	0.09	0.07	0.10	0.09
Limpopo	0.08	0.08	0.08	0.09	0.08	0.11	0.09	0.11

Notes: own calculations; 1996 and 1999 OHS; 2002 and 2006 LFS (Statistics South Africa)

Table 2: Gender share of African workers by industry

	1995		1999		2000		2002		2004		2006	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Agriculture	75	25	68	32	70	30	72	28	72	28	71	29
Mining	94	6	98	2	98	2	98	2	99	1	95	5
Manufacturing	72	28	72	28	71	29	73	27	69	31	72	28
Utilities	94	6	91	9	86	14	81	19	80	20	75	25
Construction	93	7	56	44	95	5	94	6	92	8	90	10
Wholesale/ retail	58	42	87	13	58	42	60	40	57	43	57	43
Transport/ storage	89	11	68	32	90	10	83	17	79	21	85	15
Financial/ insurance	69	31	49	51	69	31	69	31	74	26	67	33
Community/ social	49	51	49	51	48	52	47	53	49	51	48	52
Private household	19	81	8	92	7	93	6	94	6	94	4	96
Total	60	40	58	42	59	41	59	41	58	42	57	43

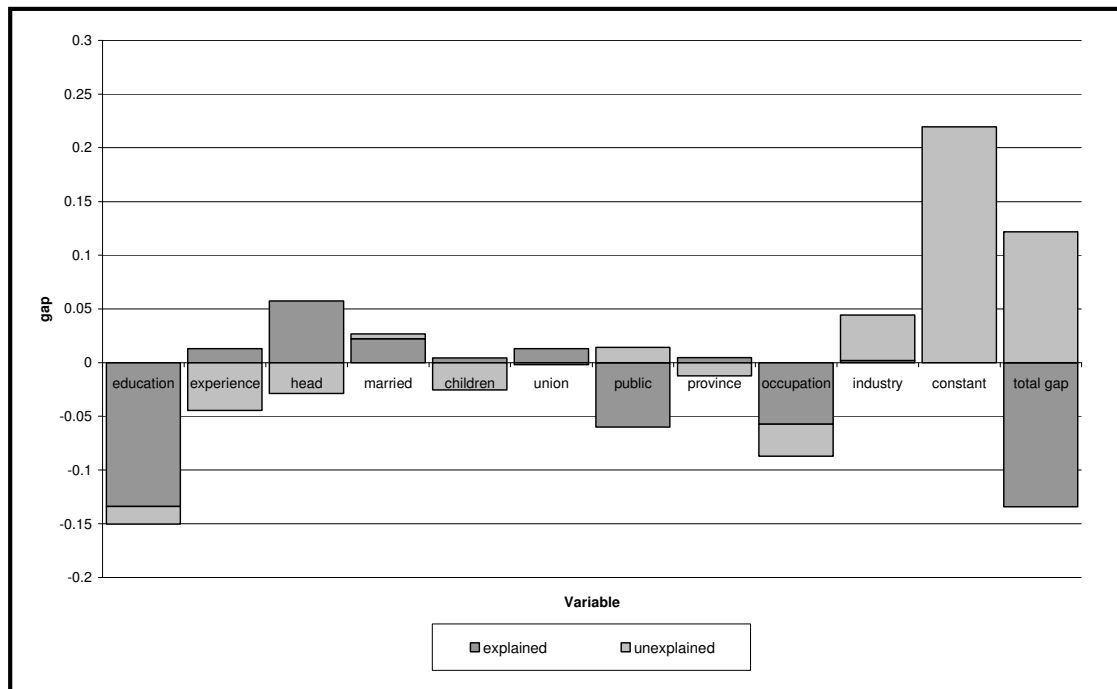
Notes: own calculations; 1996 and 1999 OHS; 2000, 2002, 2004 and 2006 LFS (Statistics South Africa)

Table 3: Gender share of African workers by occupation

	1996		1999		2000		2002		2004		2006	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Legislators/ managers	74	26	80	20	84	16	74	26	70	30	63	37
Professionals	51	49	51	49	49	51	42	58	49	51	55	45
Technicians/ associates	43	57	41	59	45	55	44	56	44	56	46	54
Clerks	50	50	46	54	48	52	47	53	40	60	36	64
Service/sales	65	35	68	32	68	32	67	33	68	32	66	34
Skilled agricultural	80	20	83	17	69	31	80	20	71	29	68	32
Craft/trade	83	17	86	14	81	19	88	12	88	12	87	13
Operators	92	8	90	10	90	10	91	9	88	12	87	13
Elementary Domestic work	66	34	59	41	61	39	63	37	64	36	65	35
Total	60	40	58	42	59	41	59	41	58	42	57	43

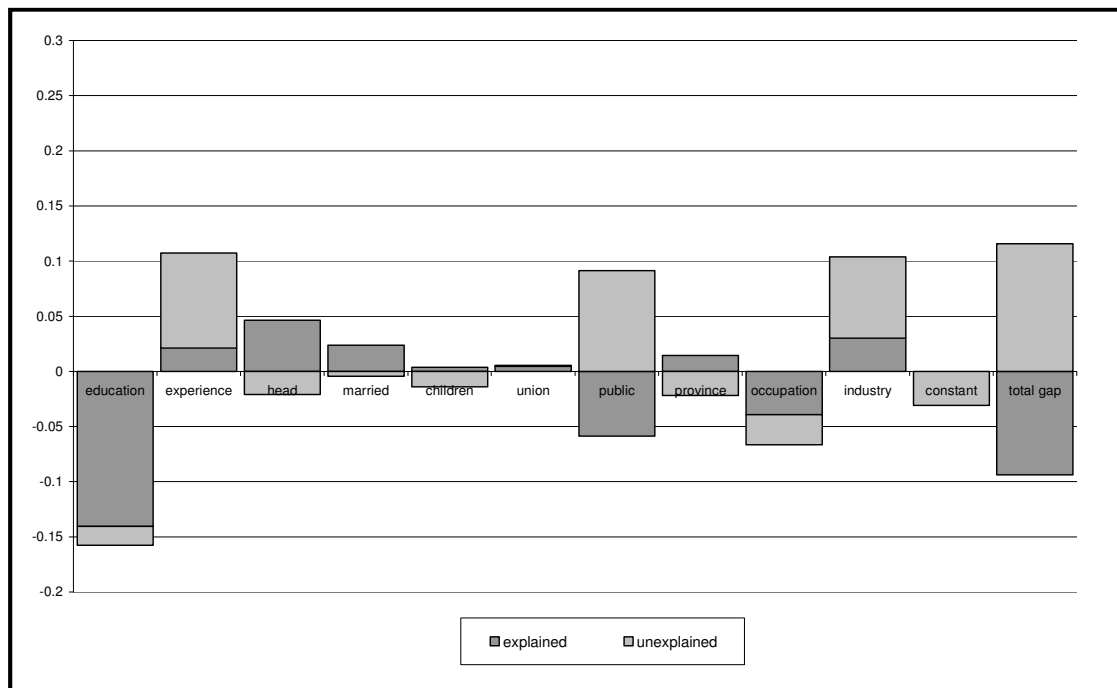
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Figure 1: Detailed decomposition of African gender wage gap (1996)



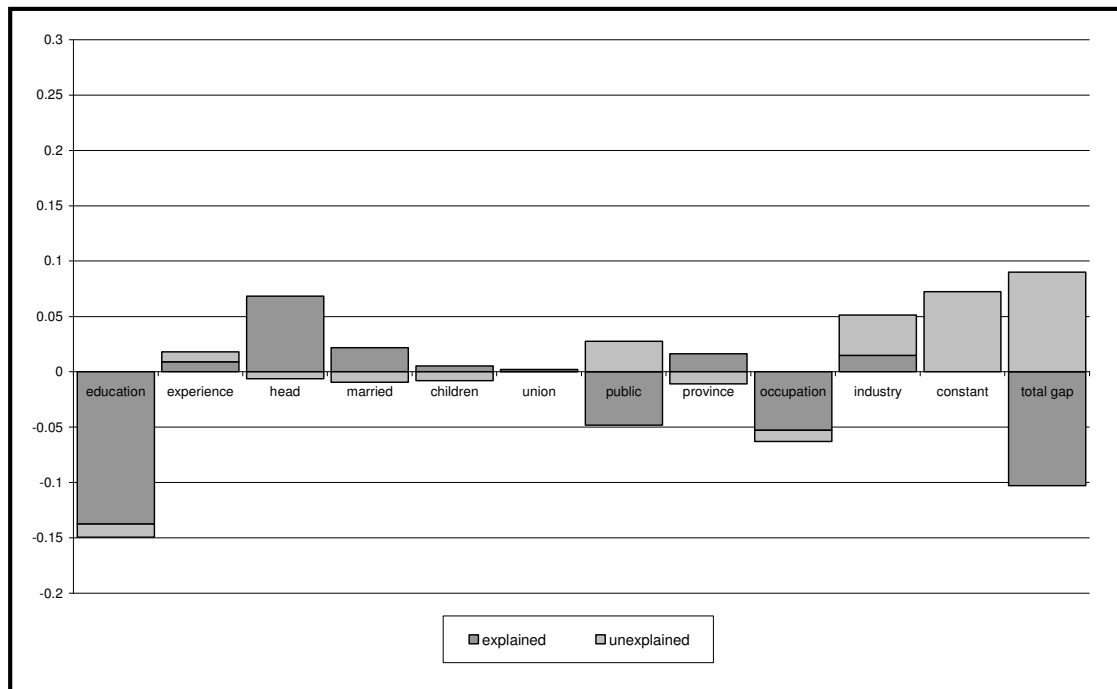
Notes: own calculations from OHS and LFS (Statistics South Africa)

Figure 2: Detailed decomposition of African gender wage gap (1999)



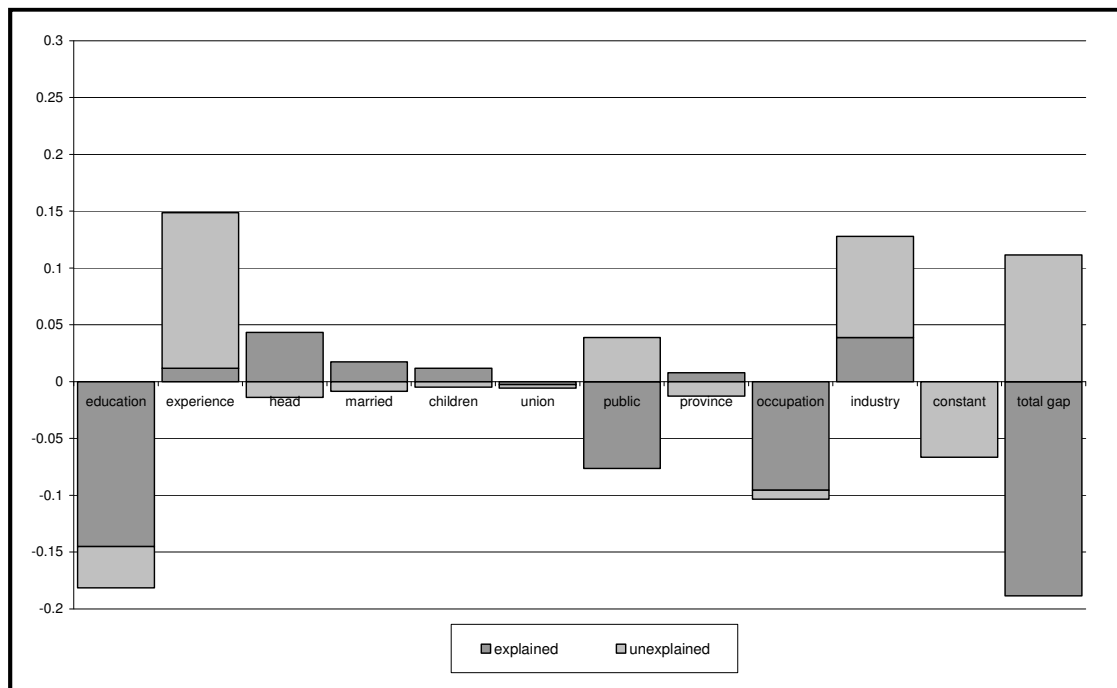
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Figure 3: Detailed decomposition of African gender wage gap (2000)



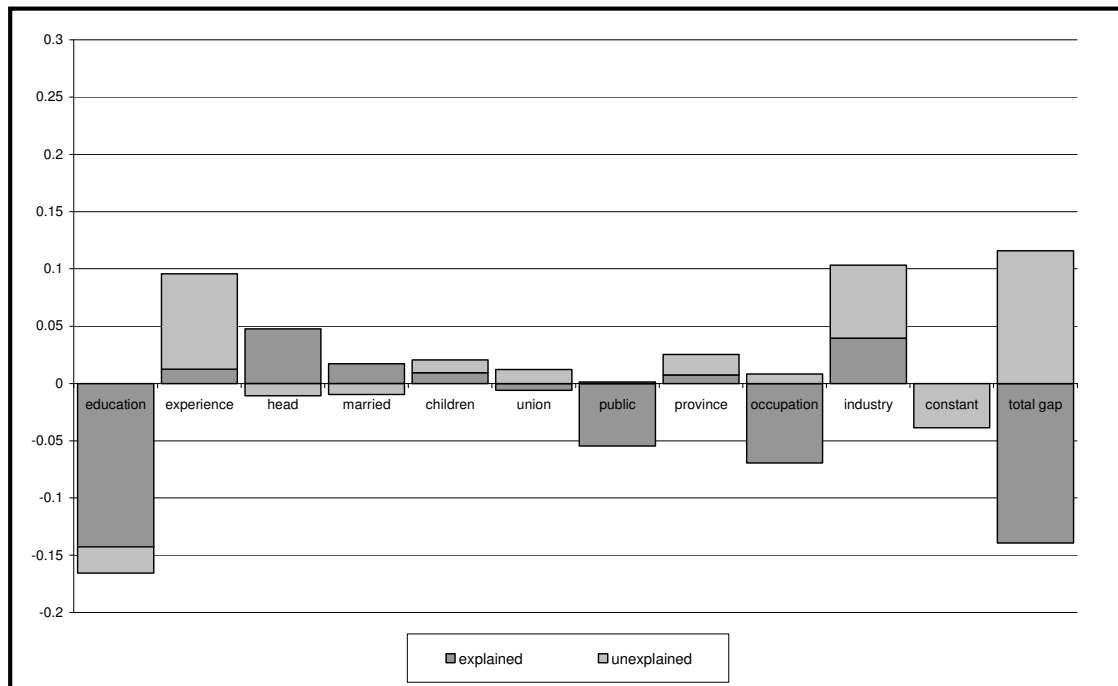
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Figure 4: Detailed decomposition of African gender wage gap (2002)



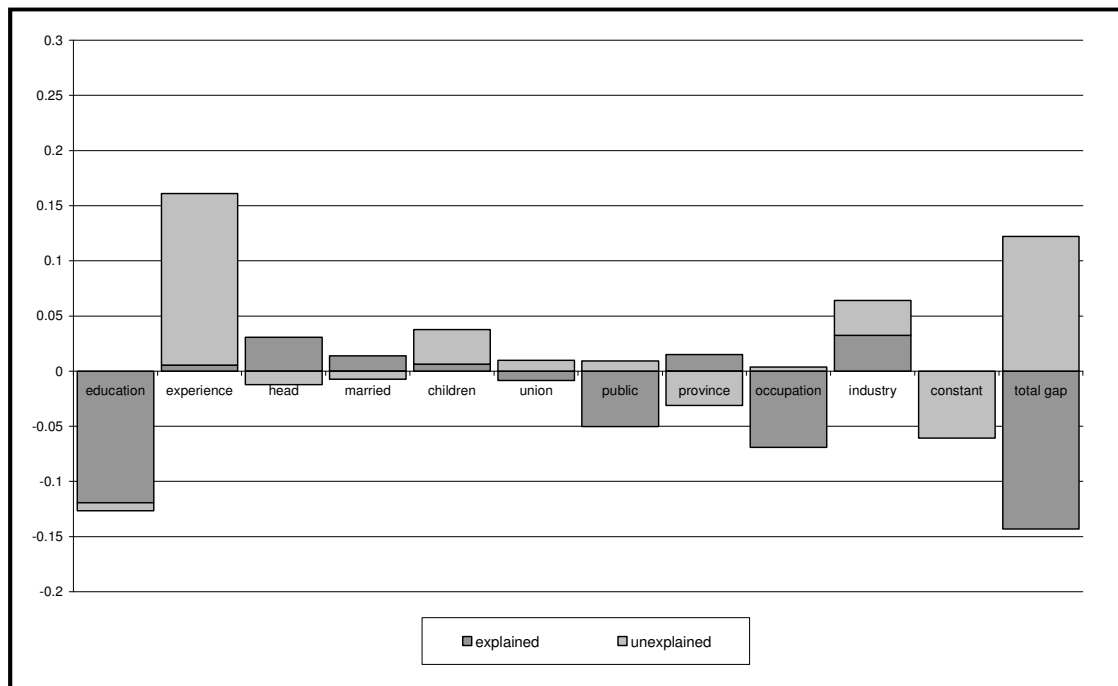
Notes: own calculations from OHS and LFS (Statistics South Africa)

Figure 5: Detailed decomposition of African gender wage gap (2004)



Notes: own calculations from OHS and LFS (Statistics South Africa)

Figure 6: Detailed decomposition of African gender wage gap (2006)



Notes: own calculations from OHS and LFS (Statistics South Africa)