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Working Paper Number 113

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January 8, 2009

Abstract

Studies of the wage effects of unions in South Africa have been concerned largely with the impact of union membership on the wages of African and White male workers. Consistent with findings in the international literature, these studies have concluded that unions compress the distribution of wages in South Africa, and more specifically, that racial inequality is lower in the union sector than in the non-union sector. In this paper, we explore whether unions in South Africa are associated with comparable gender wage effects among African workers, using data collected in the nationally representative Labour Force Surveys. In contrast to international studies, we find that the gender wage gap is *larger* in the union sector than in the non-union sector, in part reflecting the nature of occupational segregation by gender in union employment. We also consider how possible selection into union status affects our estimates, and demonstrate the difficulty of addressing this problem in the South African context by evaluating a variety of selection models.

JEL Classification: J16; J31;J51

1 Introduction

Studies on the wage effects of unions in South Africa typically find that unions compress the distribution of wages and reduce wage inequality among unionised African and White men (Moll, 1993; Schultz and Mwabu 1998; Hofmeyr and Lucas, 2001; Azam and Rospabé, 2007). There has been no research on whether unions in South Africa are associated with comparable gender wage effects, but we would expect this to be the case. In other countries, unionisation has been found to lower the male-female earnings differential by increasing female earnings by significantly more than that of male earnings (Doiron and Riddell, 1994; Aidt and Tzannatos, 2002).

In this study, we explore the gender wage gap among unionised and non-unionised African men and women using Labour Force Survey data for South Africa. We show that contrary to initial expectations, the size of the gender wage gap is higher in the unionised sector than in the non-unionised sector. Among union members, African women have significantly higher productivity-related endowments than African men. However, men have far larger returns to endowments, resulting in a gender wage gap in the unionised sector. We show that unions compress the wage distribution by flattening the earnings profile among those with more education, but that this wage compression is larger among African women than African men. Consequently gender wage inequality is greater in union jobs than in non-union jobs. Our findings are likely to reflect the kinds of jobs that are unionised and the occupational distribution by gender within the union sector, as well as the bargaining power of unions in these occupations.

It is also possible that our estimates of male-female earnings differentials are biased by incidental truncation and the endogeneity of union status (Lee, 1978; Abowd and Farber, 1982; Robinson,

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1989a; Robinson, 1989b; Blanchflower and Bryson, 2002). For example, if there is stronger positive selection into union status among women than among men, then the gender wage gap in the unionised sector will be underestimated (and our findings would be strengthened). However, we demonstrate the difficulty of addressing these selection problems, particularly in the South African context and given the data available to us.

The paper is structured as follows. Section 2 provides some background to the study and a brief review of the South African literature on the wage effects of unions. In Section 3, we present data and descriptive statistics on union membership and earnings among men and women, while Section 4 outlines the econometric evidence on the gender gap in earnings in the union and non-union sectors. The last section of the paper evaluates various methods to correct for endogeneity of union status given the data available in South Africa, and considers the implications of selection bias for our results. Section 6 provides the conclusion.

2 Background

South Africa has developed a two-tiered collective bargaining structure that includes individual unions bargaining at the plant level on behalf of their workers, and centralised bargaining councils that consist of unions and employer associations within a particular industry, occupation or area. Bargaining council agreements on wages and conditions of employment can be extended to non-parties by the Minister of Labour if the council represents a majority of workers and employers.

Prior to the 1980s, these councils mainly represented White skilled and semi-skilled workers as trade unions representing African employees were prohibited from registering with bargaining councils (or industrial councils, as they were called until 1995). Following rising unrest and strike activity among African unions during the 1970s, legislation was passed in 1979 which permitted Africans to join registered trade unions, and allowed trade unions representing Africans to register with bargaining councils. Over the 1980s, the African trade union movement strengthened, membership grew substantially, and many unions representing African workers did eventually join bargaining council negotiations. Nonetheless, plant-level bargaining has remained an important feature of the union movement in South Africa, where unions negotiate directly with management, often to obtain higher wages and benefits for union members above bargaining council determined agreements (Moll, 1993; Fallon and Lucas, 1998; Butcher and Rouse, 2001; Barker, 2007).[1]

In this context, much of the research on the impact of unions in South Africa has centred on two key issues: the effect of the emergent African trade union movement on African wages and the associated implications for racial inequality (Moll, 1993; Schultz and Mwabu, 1998; Rospabé, 2001; Butcher and Rouse, 2001; Azam and Rospabé, 2007); and the impact of collective bargaining on wage structures and employment (Moll, 1996; Fallon and Lucas, 1998; Schultz and Mwabu, 1998; Butcher and Rouse, 2001; Hofmeyr, 2002).[2]

Most of these studies have focused on African and White men. They have generally found that there is a significant union premium among African male workers of about 20 percent, although the size of the premium varies widely, from 17 percent to 100 percent, depending on how endogeneity of union status is modelled. The premium to White male union workers, however, is consistently smaller (with some studies even identifying a penalty to union membership), although these results are not always significantly different from zero.

The results in Butcher and Rouse (2001) suggest that the union premium for African workers may be attenuated somewhat due to the extension of bargaining council agreements to non-parties.

[1] While union membership rates are around 40 percent of formal sector employees, it has been estimated that bargaining council agreements only cover between 10 and 16 percent of the employed (Standing *et al,* 1996; Butcher and Rouse, 2001).

[2] More recent work has also sought to calculate comparable union premium estimates for African workers over time to identify whether unions were able to continue securing higher wages for their members over the 1990s as unemployment levels rose considerably (Hofmeyr and Lucas, 2001; Hofmeyr, 2002).

They find that non-union workers covered by bargaining council agreements do earn a premium over other workers, but that a further premium is earned by union members *within* the bargaining council jurisdictions, implying that additional gains are made for members at the plant level. They suggest that the overall effect on the union premium is likely to be small, given that only 10 to 16 percent of workers are covered by these agreements, and that many firms do apply for exemptions.

A common finding in the South African literature is that unions have an inequality-reducing effect (Moll, 1993; Schultz and Mwabu, 1998; Hofmeyr and Lucas, 2001; Butcher and Rouse, 2001; Rospabé, 2001; Azam and Rospabé, 2007). This is consistent with international evidence that unions compress the distribution of earnings of their members by securing relatively higher premiums for those with lower levels of skill or education (Card, 1996, 2001; Aidt and Tzannatos, 2002; Fairris, 2003).

The effect of unions on inequality among workers in South Africa has been identified in a number of ways. Schultz and Mwabu (1998) and Butcher and Rouse (2001) compare the union premium along the length of the wage distribution and find that the union differential is higher at the lower end of the wage distribution than at the top end of the wage distribution for both African men and White men. Unions in South Africa appear to place more emphasis on securing higher earnings among their lower skilled and less educated members. Consequently, the returns to higher levels of educational attainment and skills are lower among union than among non-union members (Moll, 1993; Schultz and Mwabu, 1998; Hofmeyr and Lucas, 2001).

Studies have also compared the benefits of union membership accruing to African workers and to White workers. In 1993, Schultz and Mwabu (1998) found a much larger union premium among African workers compared to White workers (who, on average, suffer a small penalty to union membership). They also show that although the union premium increases from the highest to the lowest decile for both race groups, the effect is far more pronounced among Africans. African workers are more likely to be unionised than White workers and they form the majority of union members in South Africa. In contrast to White men in the union sector, African men also have significantly lower levels of educational attainment. Schultz and Mwabu conclude that "union relative wage gains are larger for Africans than for Whites, reducing thereby the interracial disparities in wages in the union sector" (1998: 700).

Using more recent data for 1997 and 1999, Rospabé (2001) and Azam and Rospabé (2007) report comparable findings and reach similar conclusions. Rospabé (2001) shows explicitly that there is lower racial wage inequality in the union sector compared to the non-union sector. Given much higher rates of unionisation among African workers than White workers, unions contribute to reducing overall racial inequality among workers. Most of the racial wage inequality in South Africa is driven therefore by inequality in the non-union sector.[3]

Although much has been written about the wage effects of unions on (male) African and White workers, there has been no research that interrogates the effect of unions on gender wage inequality in South Africa. Unions are expected to bargain for fair wages for a particular job, thereby reducing employer-determined, and possibly discriminatory, wage differentials among workers with the same job. Findings from international studies suggest that unions have reduced the male-female earnings differential, as male-female earnings differences in the non-union sector contribute more to the gender earnings gap than in the union sector (Doiron and Riddell, 1994; Aidt and Tzannatos, 2002). We would therefore predict that among union members in South Africa, there would be little evidence of gender wage inequality, or at least less than what exists in the non-union sector.

[3] By creating a large differential between union and non-union workers, unions can also have inequality-increasing effects in wage employment. Hofmeyr and Lucas (2001) and Hofmeyr (2002), using various sources of data over the period 1985 to 1999 for African men, find that although unions reduce wage dispersion among their members, they also add to inequality by increasing the wage gap between union and non-union workers. Evidence presented in these two studies suggests that the wage differential between union and non-union regular workers increased steadily over this period. Hofmeyr (2002) argues that unions contributed to labour market inflexibility over the 1990s, as in this period of rising unemployment, union workers were able to maintain their position, while wages for non-union workers fell to a more market-determined level.

3 Data and descriptive results

To investigate gender wage inequality in union and non-union employment in South Africa, we use data mainly from the Labour Force Surveys (LFS) published by Statistics South Africa since 2000. The employment data in these surveys include more detailed information than was available to researchers in earlier studies on the wage effects of unions.[4] In particular, we are able to identify the size of the firm the individual works in, whether or not the job is in the public or private sector and in the formal or informal sector, and we have information on hours worked that correspond to the earnings data reported. These data were not simultaneously collected in most of the surveys from the 1980s and 1990s which were analysed in previous research.

In this section, we first present some general trends in union membership and earnings. To extend the period of analysis, we also draw from the predecessor of the LFS, the October Household Surveys (OHS) from 1995 to 1999. We then provide more detailed information on the characteristics of union members and union jobs from the September LFS 2003 (LFS 2003:2) specifically. Our study focuses on African men and women, aged 16 years and older, who have wage employment.

3.1 *General trends in union membership and earnings, 1995 – 2006*

Since 1995, levels of union membership have remained relatively constant among African workers in South Africa. Figures 1 and 2 plot unionised employment and total wage employment for African men and women from 1995 to 2006 (see Table A1 in the Appendix for a more detailed table of data). Among African men, reported union employment hovered slightly below 1.4 million workers for most of the period. Among African women, levels of union membership were considerably lower, although there was a small increase of about two percent per year, from approximately 600 000 union members in 1995 to almost 725 000 in 2006.

Figures 1 and 2 also show that total wage employment increased for both African men and women over the period. Union density rates (measured as the percentage of the wage employed who are union members) therefore have fallen; and because wage employment grew at a faster rate for women than for men, these rates have fallen more among women than men since 1995. By developing country standards, however, union density rates in South Africa would still be considered high. In 2006, 27 percent of female employees in South Africa were unionised, while the comparable figure for men was 33 percent. Aidt and Tzannatos (2002) report an average of 21 percent for a group of 24 developing countries (compared to an average of about 40 percent for a selection of OECD countries).

[Insert Figures 1 and 2 about here]

For both men and women, average hourly wages among union workers were substantially higher than among non-union workers. In the latter half of the period, on average, male union members were earning twice as much as their non-union counterparts, and female union members were earning three times as much as their non-union counterparts (Table 1).[5]

[Insert Table 1 about here]

Figures 3 and 4 plot average earnings by gender within the union and non-union sectors. The graphs show that in union employment, average hourly wages for African women are consistently higher than for African men. In contrast, non-unionised African women earned significantly less than non-unionised African men in all years except 1995. These earnings data might suggest that African women benefit the most from union representation. However, there are no controls for differences in individual characteristics or in the nature and type of employment and, as we show below, there

[4] The studies reviewed in Section 2 made use mainly of the 1985 Bureau of Market Research data, the 1993 Project for Livings Standard and Development data and the 1995 to 1999 October Household Survey data.

[5] There is some suggestion that the raw union differential widened for both groups in the first half of the period and then stabilised from about 2001 onwards, but this could be due to changes in the survey instrument over the first half of the period.

are very clear differences in the observable characteristics of union and non-union workers, and of men and women within the union sector.

[Insert Figures 3 and 4 about here]

3.2 *Characteristics of union and non-union workers, 2003*

Using data from the LFS 2003:2, Table 2 reports the mean characteristics of men and women in union and non-union employment. A key difference between these two sectors of employment is that educational attainment is higher among workers in union jobs than in non-union jobs (particularly at the post-matric level). This difference is also far more pronounced among women.

[Insert Table 2 about here]

Union jobs are almost all in the formal sector, and they are much more likely to be in the public sector and in large firms. The conditions of employment vary considerably between union and non-union workers as one would expect if unions bargain not only for higher earnings but also for more security and higher benefits for their members. A much larger proportion of workers in union jobs report having a written contract with their employer and receiving paid leave, medical aid and pension benefits.

The occupational distribution of workers in Table 3 shows clearly that union workers are also far more likely to be in skilled and semi-skilled occupations. Non-union wage employees are more likely to be in unskilled occupations, and for women, particularly in domestic work (45 percent of women in non-union jobs are domestic workers). These differences would explain a large part of the high union-non-union differential in average earnings, especially in the female sample.

[Insert Table 3 about here]

Tables 2 and 3 also reveal large differences in the characteristics of women and men *within the union sector*, particularly in educational attainment and occupational distribution. Women have more than two additional years of schooling on average, and are three times more likely than men to have attained a post-matric education. More than 65 percent of women in union employment have completed at least secondary (matric) education, compared to less than 40 percent of men, with most of the difference due to a higher proportion of women with a degree or diploma.

Another striking difference when comparing men and women within the union sector is that women in union jobs are twice as likely as men to be employed in the public sector. This is also reflected in the different occupational distributions of men and women in union employment. Almost half of African women in union jobs are employed in professional, associate professional or technical occupations (the majority of whom are nurses or teachers), compared to just over 10 percent of men in union jobs. Men in union jobs are much more likely to be employed in craft and related trades or as plant or machine operators.

In contrast, men and women in the non-union sector appear to have observable characteristics that are more similar. The main difference between non-unionised men and women is the type of unskilled and semi-skilled work that they do. Women work predominantly in elementary occupations (including domestic work), while men also have jobs in the craft or related trades and as plant or machine operators.

These differences would help explain why women in the union sector report higher average earnings than men in the union sector, whereas the opposite occurs in the non-union sector. In the next section, we investigate the gender differential in earnings further, controlling for these observable differences.

4 Unions and the gender wage gap in South Africa

If unions reduce inequality among their members, then we would expect to find little evidence of a gender wage gap in the union sector, or at least a lower gender gap in the union sector compared to the non-union sector, controlling for different endowments of workers. To test this, we first estimate standard Ordinary Least Squares (OLS) earnings equations for the pooled sample of men and women in the union sector (U), and in the non-union sector (N):

$$ln(W_i)^U = \gamma^U M_i + \beta^U \mathrm{X}_i + \varepsilon_i^U \tag{1}$$

$$ln(W_i)^N = \gamma^N M_i + \beta^N \mathrm{X}_i + \varepsilon_i^N \tag{2}$$

The dependent variable is the log of individual hourly earnings (W_i), the independent variables include a male dummy variable (M_i) and a vector of other observable and job characteristics (X_i), and ε_i is the error term.

These estimations assume that gender only has an intercept effect on the earnings functions of men and women. In the second set of regressions, we estimate separate earnings equations for men and women by union status, thereby allowing for different returns to individual characteristics. For individual i of gender j, we estimate:

$$ln(W_{ij})^U = \phi_j^U \mathrm{X}_{ij} + \varepsilon_{ij}^U (j = M, F) \tag{3}$$

$$ln(W_{ij})^N = \phi_j^N \mathrm{X}_{ij} + \varepsilon_{ij}^N (j = M, F) \tag{4}$$

Table 4 presents the results from the OLS regressions on the combined male and female samples (equations (1) and (2)). In the union sector, the raw gender differential in average log hourly wages of -0.192 is in favour of women, and this falls to -0.164 when controlling for age, marital and headship status and location of residence (Regression I). However, once the wage estimation controls for higher levels of educational attainment among women in union employment, an average gender gap of 0.134 emerges in favour of men (Regression II). When a further set of explanatory variables representing job characteristics, the formality of employment, and occupation are included (Regression III), the gender gap widens even further to 0.152, suggesting that women in union jobs are more likely than men to be employed in the more highly skilled, better-paying jobs.

[Insert Table 4 about here]

A very different picture emerges from the regressions on the non-union sample. The raw differential in average log hourly earnings in the non-union sector of 0.269 does not change much when the set of individual and then education controls are added in Regressions I and II, reflecting particularly similar educational attainment among men and women in non-union jobs. However, controlling for job characteristics, sector and occupation (Regression III) results in a large fall in the gender gap in earnings (to 0.148), which is what we would expect if men in the non-union sector gain access to better types of jobs than women.

The results therefore suggest that there is gender wage inequality in both the union and non-union sectors, with the gender differential being marginally higher (or certainly not lower) in the union sector. When we estimate equations (3) and (4), allowing the slope coefficients to vary by gender, the difference in the gender wage gap widens across the sectors (Table 5). To measure the gender differential from the separate earnings regimes, we calculate the difference between women's reported earnings and what they would earn if they were rewarded for their characteristics at the same rate as men in that sector. Assuming women had the same wage structure as men in each of the respective sectors, the estimated gender earnings gap would be 0.143 in the union sector, and 0.082 in the non-union sector.[6]

A gender wage gap in union employment arises because, even though unionised women have a better set of productivity-related endowments than men, men are rewarded for these same endowments at a higher rate. A comparison of the estimated coefficients in Table 5 reveals that this is

[6] These results are robust to different specifications of the earnings equation. In particular, when we include the number of children in the household and interaction terms between education and occupational category as regressors, we find the difference in the gender gap between the union and non-union sectors either stays the same or widens.

being driven primarily by large gender differences in returns to education in the union sector. There is no return to primary, incomplete secondary or matric education among unionised women in relation to the omitted category of no schooling, whereas unionised men earn statistically significant and substantial returns at these levels of education (especially men with a matric). Women in union jobs do earn a significant return to a post-matric education, but at half the rate that men with a degree or a diploma earn (a coefficient of 0.43 compared to 0.94).[7]

[Insert Table 5 about here]

A common finding in the South African literature is that the earnings-education profile is more compressed among union members than among non-union members, although studies have focused only on men (Schultz and Mwabu, 1998; Hofmeyr and Lucas, 2001; Hofmeyr, 2002; Azam and Rospabé, 2007). Our results for African men and women in Table 5 suggest that the flattening of the earnings profile occurs much more noticeably among *unionised women* than men. The benefits of union membership, therefore, are smaller among more educated women than among more educated men.

We explore this further by splitting the sample of the wage employed according to level of educational attainment (g): at most primary education; incomplete secondary education; and matric education or higher. We then estimate separate male and female earnings equations (including a union membership dummy, U_i), by level of education:

$$ln(W_{ig})^M = \gamma_g^M U_{ig} + \beta_g^M \mathrm{X}_{ig} + \varepsilon_{ig}^M (g \ = 1, 2, 3) \tag{5}$$

$$ln(W_{ig})^F = \gamma_g^F U_{ig} + \beta_g^F \mathrm{X}_{ig} + \varepsilon_{ig}^F (g \ = 1, 2, 3) \tag{6}$$

[Insert Table 6 about here]

[Insert Figures 5 and 6 about here]

The estimated union effects for equations (5) and (6) are reported in the upper frame of Table 6. As expected, we find that the union premium decreases with higher educational attainment for both men and women, but that the fall is more marked among women. The union differential among women with at most a primary school education is 0.38, while the differential for men is 0.241. At the top end of the educational spectrum, comprising 65 percent of women and only 37 percent of men in union employment, women earn a premium of 0.095 over non-union members, while the union differential is 0.137 for men.

Our results also corroborate evidence in the South African literature (Moll, 1993; Schultz and Mwabu, 1998; and Butcher and Rouse, 2001) that unions compress the wage distribution among their members, by securing much higher premiums among lower paid or less skilled members. We find similar evidence here for both the male and female samples, although we find also that wage compression at the upper end of the distribution is larger for women than for men. Simple plots of the distribution of log hourly wages in Figures 5 and 6 illustrate this clearly. While the union wage distributions for both men and women are further to the right of the non-union wage distributions, they are also more compressed. Among women this compression occurs mostly at the upper end of the union earnings distribution where the truncation in earnings is particularly visible.

Quantile wage regressions, for the pooled samples of African women and African men, also illustrate this result. The lower frame of Table 6 presents estimates of the union differential at the 0.2, 0.5 and 0.8 percentiles. Even controlling for observable differences, wage compression appears larger among women than men in union employment. For example, the union premium for women

[7] Although we have chosen to combine the categories degree and diploma (as it is not possible to distinguish between a *postgraduate* degree or diploma), this result is not being driven by men having more degrees than diplomas relative to women. The opposite in fact is true: 8.3 percent of unionised women have undergraduate degrees while only 3.5 percent of unionised men have degrees. Women also hold more postgraduate degrees or diplomas than men (3.3 percent compared to 1.1 percent).

at the 80^{th} quintile of the wage distribution is 0.136, while the premium for women at the bottom quintile is 0.254. For men, the comparable estimates are 0.155 and 0.207.

What might explain why more educated women receive lower returns to their education than comparably educated men in the union sector? The answer is likely to lie more in the types of jobs into which women are crowded in union employment, than in the effect of unions themselves. Although all the wage estimations control for occupational category, job characteristics and industry of employment, the occupational categories are broad and reflect occupations with diverse earnings profiles.

Women in union jobs are crowded into particular occupational categories, and within these categories, into a narrow range of jobs. In contrast, there is a far more even spread among men in union employment, across both the broad occupational categories and the more specific job types within these categories. In particular, almost half of all unionised women are employed as professionals or associate professionals, in contrast to only 10 percent of men. Furthermore, among women in these two broad occupational categories, 86 percent are teachers or nurses, while the comparable figure for men is 58 percent (the vast majority of whom are in the teaching profession).[8]

High-skilled union jobs which are female-dominated are rewarded less well than union jobs requiring comparable education and in which men are employed. The jobs into which more educated women are crowded are located mostly in the public sector and in occupations where rates of unionisation are high. This may help explain why pay scales are flattened (and institutionally determined), with less opportunity for plant-level bargaining as may be the case in the types of union jobs in which men are employed.

5 Selection and the gender wage gap

One reason for the gender gap in wages, for which we have not yet controlled, is endogeneity in union status. Because workers choose to join unions, and employers may choose particular workers for union jobs, union members may not be a random sample of all workers. If men and women in union jobs are different in unobservable ways to men and women in non-union jobs, and if these omitted characteristics are related to earnings, then OLS estimates of the gender wage gap within the union and the non-union sectors will be biased. Specifically, we would expect the gender wage gap in the union sector to be underestimated (and overestimated in the non-union sector) if there is stronger positive selection, or weaker negative selection, among women than among men into union jobs.

With the data available to us, however, we are not able generate robust estimates of the magnitude or direction of these selection effects for men and women. In this section, we briefly review a range of selection models, we explain how attempts to control for endogeneity are hampered by the available data, and we demonstrate the variability of the estimated union premium for men and women across the models.

The majority of studies on the wage effects of unions in South Africa have corrected for selection using two-stage models, estimating either a treatment effects model or an endogenous switching model (Moll, 1993; Hofmeyr and Lucas, 2001; Rospabé, 2001; Hofmeyr, 2002; and Azam and Rospabé, 2007). Whereas the former assumes that unions have only an intercept effect on wages, the latter allows for different slope effects in separate wage equations for union and non-union members. These studies typically have used the same exclusion restrictions to predict union membership: whether the individual lives in a household with other union members; the dependency ratio in the household; and an indicator of whether there were other unemployed household members.[9]

[8] Men may also hold different posts or grades within teaching and nursing.

[9] Moll (1993) and Hofmeyr and Lucas (2001) also include a dummy variable for whether individuals received medical or pension benefits as a proxy for firm size, as unions are more likely to organise within larger firms. However, it is unlikely that firm size would be redundant in the wage equation.

The only exclusion restriction that is consistently significant (and strongly positive) in the selection equations across the studies is the dummy variable for whether the individual lives with other union members, which Moll (1993: 252) describes as reflecting "household-specific tastes for unionisation, such as the political orientation and the willingness to invest union dues and time in meetings for the sake of long-term security and wage gains. It may also reflect firm strategies of recruitment of family members by employers".

In Table 7, we compare the characteristics of African union workers according to whether or not they live with another union member in the same household. The comparison suggests that co-residence among union members may predict a particular kind of union worker. Among union members, those who co-reside with other union members earn significantly more and have higher levels of educational attainment.[10] There is also some concern expressed in the literature on the use of this exclusion restriction. Hofmeyr and Lucas (2001) find that their selected-corrected estimates of the union differential are extremely sensitive to its inclusion, with their estimates of the union premium for African males varying widely, from -6.1 to 34.5 percent in 1985, and from 17.1 to 99.6 percent in 1993, depending on whether this variable is used.[11,12]

[Insert Table 7 about here]

Neither Schultz and Mwabu (1998) nor Butcher and Rouse (2001) control for selection using two-stage models, on the grounds that the data available to them do not permit estimation of suitable selection equations.[13] Butcher and Rouse (2001: 362), for example, explain that "[o]ther techniques for controlling for selection bias, such as the model suggested by Heckman (1979), are inappropriate here, as we do not have information that predicts union membership and that could plausibly be excluded from the wage equation". In order to control for unobserved heterogeneity in union status, they chose rather to estimate a household fixed effects model.

The household fixed effects model assumes that there are unobserved attributes of the household that are common across household members. The identifying variation in the model derives from households that contain at least two members who are in wage employment *and* a mix of both union and non-union workers. Using the model to control for different selection effects among men and women requires separating the samples by gender, and therefore adds the further restriction that at least two of the wage workers in the household must also be of the same gender. Not surprisingly, there are very few of these particular households in South Africa. In the LFS 2003:2, for example, only 84 households (of the 10 877 (unweighted) African households with at least one wage worker) contain both union and non-union male workers; and even fewer (74 households) include both union and non-union female workers.

Selection models that have not yet been estimated in any of the union studies on South Africa are those that make use of panel data. National longitudinal data with detailed labour market information became available in South Africa in 2007 with the release of the LFS Panel (2001-2004). Previously, the bi-annual LFSs were accessible only as cross-sectional datasets. The LFS Panel, which comprises six waves of the LFS, from September 2001 to March 2004, is designed as a rotating panel, with a 20 percent rotation of the cross-sectional sample in each six monthly wave.

The fixed effects model removes the influence of unobserved heterogeneity (the individual fixed effect), and the LFS Panel therefore offers a valuable opportunity to estimate selection-controlled union effects. However, the fixed effect estimates are particularly sensitive to measurement error in changing union status which can bias the estimated coefficients to zero (Freeman, 1984; Robinson, 1989b). Furthermore, the LFS Panel has been released as a panel of individuals, without household

[10] These findings would be consistent with assortative matching among men and women.

[11] Differences in estimates of the union premium derives also from which sample characteristics are used and whether the sample correction term is set to zero or its mean value (Hofmeyr and Lucas, 2001).

[12] Endogeneity in household composition may also "corrupt" the other typical exclusion restrictions if, for example, individuals who cannot find work join better-off households which are more likely to contain workers in union jobs.

[13] Schultz and Mwabu (1998) make no correction for selection into union status. They do correct for selection into employment (using non-earned income and assets as identifying variables in the selection equation) but report that the correction made no noticeable difference to the estimates of the wage equation for African men.

identifiers, making it even more difficult to instrument for union status as a means of correcting for possible misclassification of union status.

In Table 8, we present estimates of the union premium for African men and women from the range of selection models discussed above, using the LFS 2003:2 for the cross-sectional regressions and the LFS Panel (2001-2004) for the individual fixed effects estimation.[14] For the two-stage selection models, we use the three exclusion restrictions typically adopted in the literature for South Africa (co-residence with another union member; co-residence with unemployed household members; and the household dependency ratio).

[Insert Table 8 about here]

The table shows that both the magnitude and the direction of the selection effect are very sensitive to the type of model estimated. The two-stage models suggest that there is strong negative selection into union status, with the endogenous switching model indicating that this may be particularly so for women. The household fixed effects estimate is consistent with positive selection among women (although the union coefficient is not significant for women) and negative selection among men. In the absence of measurement error, the individual fixed effects estimates[15] would suggest the positive selection of both women and men into union status, although the fall in the fixed effects estimate (from the pooled OLS union dummy) is larger for women than men. In light of the concerns raised above, however, there do not seem to be good grounds for favouring any set of results over the other.

Attempts to control for selection bias in our estimations are complicated further because selection may also occur at other stages of the employment decision. This is particularly relevant in South Africa, where very high unemployment rates mean that employment and labour force participation are not synonymous. In addition, there may be selection among the employed into wage employment (as opposed to self-employment).

Given the difficulty of identifying independent selection equations for each of these stages without appropriate data, we do not re-estimate the gender wage gap controlling for any form of selection. We cannot motivate the direction of bias in our estimates empirically, nor can we think of any particular reason for why selection into union status might be stronger (weaker) for women compared to men. At most, we might expect greater positive selection into labour force participation and employment among women than among men (given that women's traditional role in the household would increase the female reservation wage), which would strengthen our results.

6 Conclusion

If unions bargain for equal wages for a particular job, reducing employer-determined (or discriminatory) wage differentials among workers, we would expect gender wage inequality to be largely insignificant in the union sector, or at least lower than in the non-union sector. Our study of African men and women in 2003 suggests that the gender wage gap among employees in the union sector is no lower (and even marginally higher) than the gender gap among workers in the non-union sector in South Africa. Although unionised women have high productivity-related characteristics, these are not rewarded well relative to unionised men (and non-unionised women). In particular, returns to higher education are flattened substantially among unionised women.

Our findings on the gender wage gap are likely to be due to the types of high-skilled occupations into which women are crowded in the union sector (particularly nursing and teaching), as well as the nature of union bargaining power over wage-setting in these occupations. It is possible that our results are biased by selection into union status by either employees or employers (and by selection at other stages of the labour force participation decision). However, we are neither able to control effectively for selection nor identify the likely direction of bias. We demonstrate the limited

[14] The full set of estimations is available from the authors.

[15] Approximately 19 percent of employed African men and 15 percent of employed African women changed union status over the panel.

application of different selection models in the South African context and with the data available to us, highlighting the lack of consistency in the size and direction of selection effects across the different models. It is possible that the size of the gender wage gap in the union sector is being over-estimated relative to that in the non-union sector. But this would require that there is stronger positive (or weaker negative) selection among men than among women into union employment, and we can think of no obvious reason for why this would be the case.

References

[1] Abowd, J. and Farber, H. (1982) "Job queues and the union status of workers". *Industrial and Labor Relations Review* 79:774–800.

[2] Aidt, T. and Tzannatos, Z. (2002) *Unions and collective bargaining: Economic effects in a global environment*. Washington D.C.: World Bank

[3] Azam, J. and Rospabé, S. (2007) "Trade unions vs. statistical discrimination: Theory and application to post-apartheid South Africa". *Journal of Development Economics* 84:417–444.

[4] Barker F. (2007) *The South African Labour Market. Theory and practice*. 5th ed. Pretoria: Van Schaik.

[5] Blanchflower, D. G. and Bryson, A. (2002) "Changes over time in union relative wage effects in the US and the UK revisited". NBER Working Paper 9395.

[6] Butcher, K.F. and Rouse, C.E (2001) "Wage effects of unions and industrial councils in South Africa". *Industrial and Labor Relations Review* 54(2):349–274.

[7] Card, D. (1996) "The effect of inions on the structure of wages: A longitudinal Analysis". *Econometrica*, 64(4):957-979.

[8] Card, D. (2001) "The effect of unions on wage inequality in the U.S. labour market". *Industrial and Labor Relations Review*, 54(2):296-315.

[9] Doiron, D.J. and Riddell, W.C. (1994) "The impact of unionization on male-female earnings differences in Canada". *The Journal of Human Resources* 29(2): 504–534.

[10] Fairris, D. (2003) "Unions and wage inequality in Mexico". *Industrial and Labour Relations Review*, 56(3):481-497.

[11] Fallon, P. and Lucas, R. (1998) "South African labor markets. Adjustments and inequalities". Discussion Paper 12, Southern African Department, World Bank.

[12] Hofmeyr, J. (2002) "The importance of segmentation in the South African labour market". Paper presented at the CSAE Conference, Understanding poverty and growth in Sub-Saharan Africa, Oxford.

[13] Hofmeyr, J.F and Lucas, R. (2001) "The rise in union wage premiums in South Africa". *Labour* 15(4): 685–719.

[14] Lee, L. (1978) "Unionism and wage rates: A simultaneous equations model with qualitative and limited dependent variables". *International Economic Review*, 19: 415–434.

[15] Moll, P.G. (1993) "Black South African unions: Relative wage effects in international perspective". *Industrial and Labor Relations Review,* 46(2):245–261.

[16] Robinson, C. (1989a) “Union endogeneity and self-section”. *Journal of Labor Economics* 7(1):106–112.

[17] Robinson, C. (1989b) “The joint determination of union status and union wage effects: Some tests of alternative models”. *The Journal of Political Economy* 97(3):639–667.

[18] Rospabé, S. (2001) “Making racial wage relations fair in South Africa: A focus on the role of trade unions”. DPRU Working Paper No.01/48. UCT, Development Policy Research Unit: Cape Town.

[19] Schultz, T.P. and Mwabu, G. (1998) “Labor unions and the distribution of wages and employment in South Africa”. *Industrial and Labor Relations Review*, 51(4):680–703.

[20] Standing, G.; Sender, J. and Weeks, J. (1996) *Restructuring the labour market: The South African challenge. An ILO country review.* International Labour Office, Geneva.

Tables and Figures

Figure 1. Union membership among the wage employed: African men, 1995 - 2006

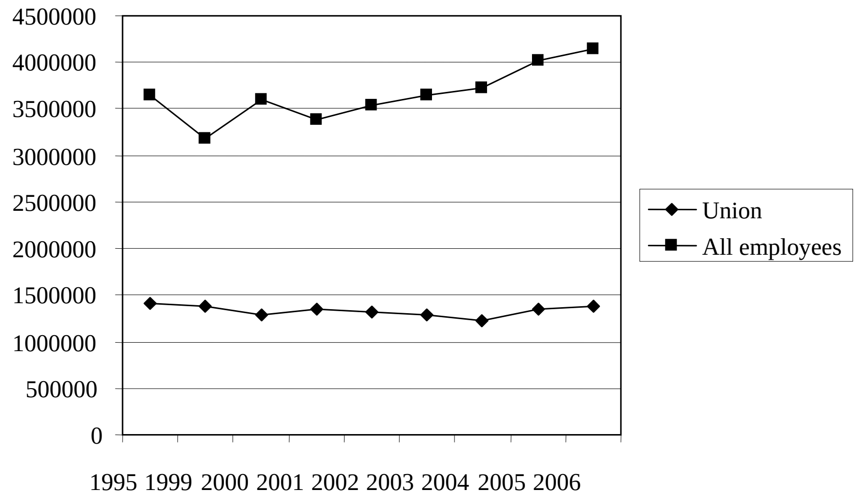
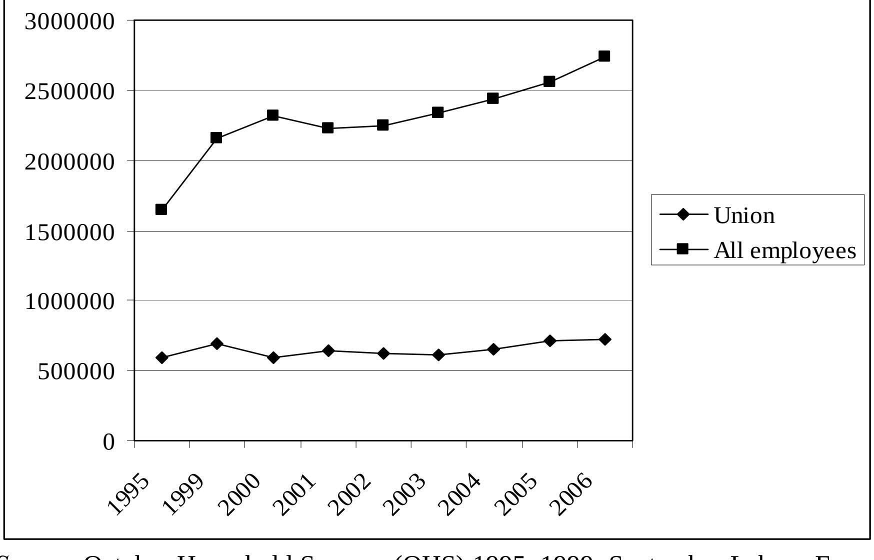


Figure 2. Union membership among the wage employed: African women, 1995 - 2006



Source: October Household Surveys (OHS) 1995, 1999; September Labour Force Surveys (LFS) 2000 – 2006.

Figure 3. Average real hourly wages among African union workers, 1995 - 2006

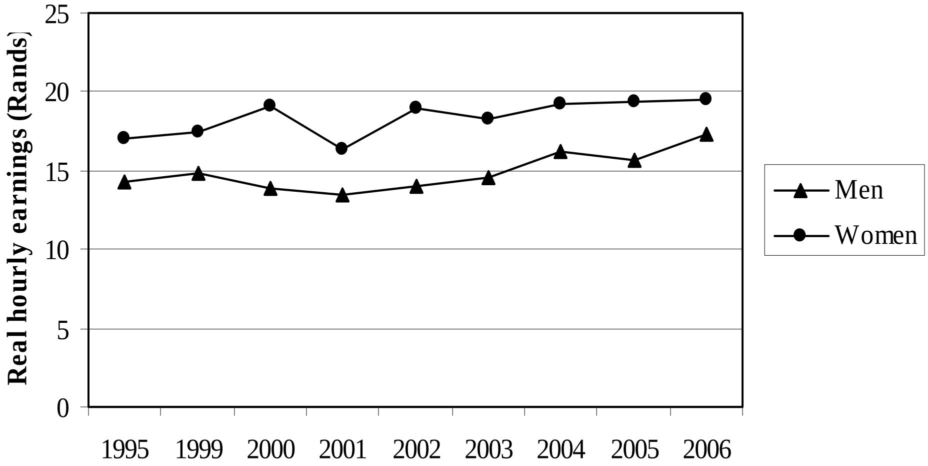
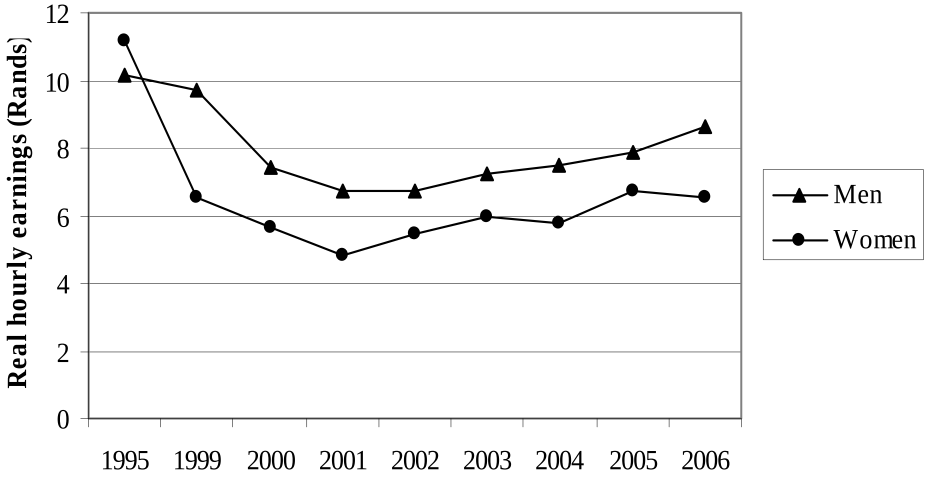
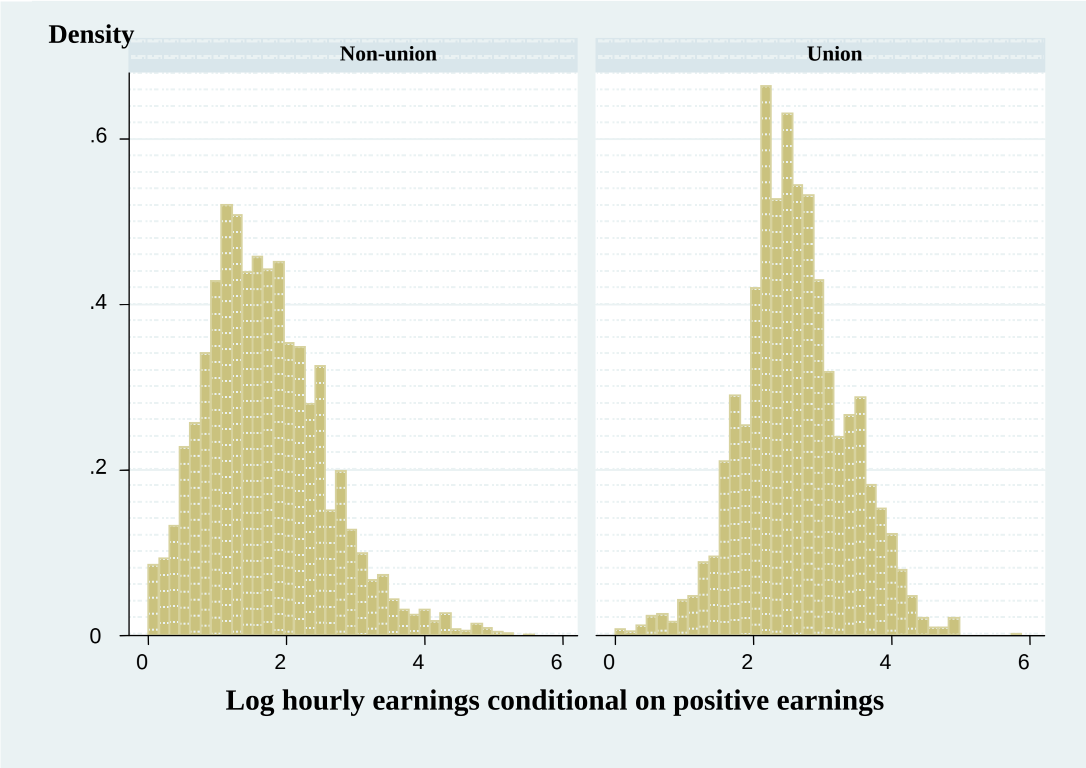


Figure 4. Average real hourly wages among African non-union workers, 1995 - 2006



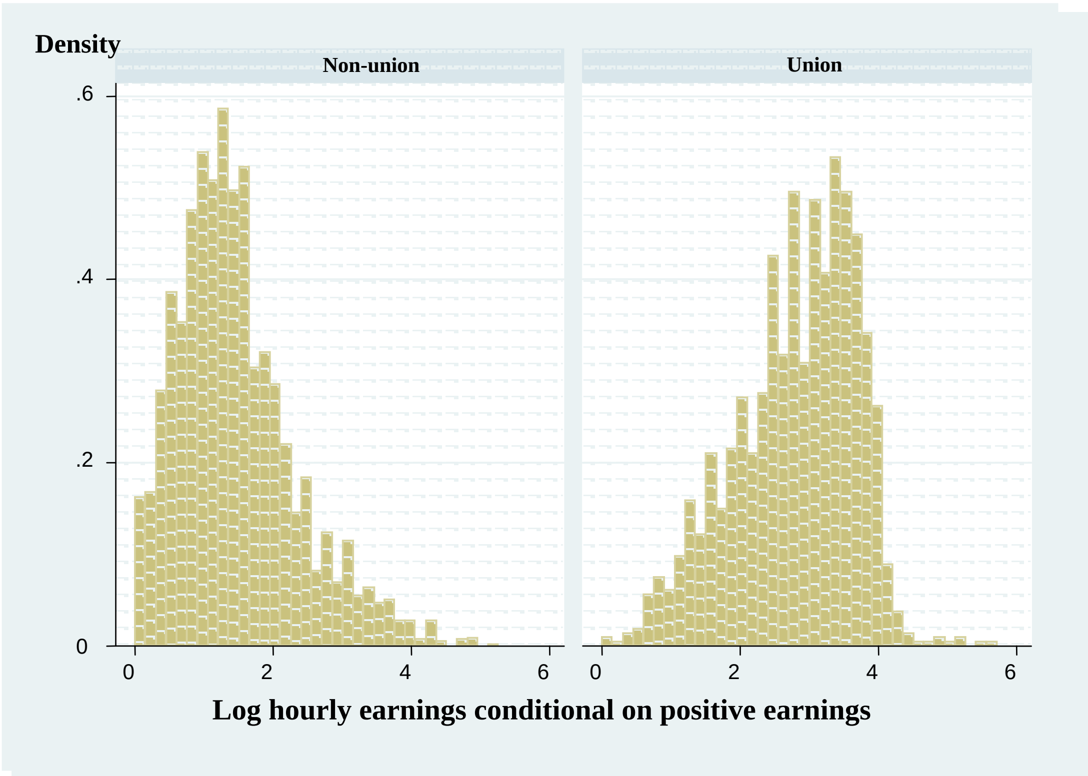
Source: OHS 1995, 1999; September LFS 2000 – 2006.
Notes: The samples include all those aged 16 years and older with wage employment whose weekly hours of work are positive and less than 140. Three outliers were excluded in 1999 and one outlier was excluded in 2005.

Figure 5. Distribution of log hourly wages, African male employees, 2003



Source: LFS 2003:2

Figure 6. Distribution of log hourly wages, African female employees, 2003



Source: LFS 2003:2

Table 1. Average real hourly wages among African women and men, 1995 - 2006

	1995	1999	2000	2001	2002	2003	2004	2005	2006
					AFRICAN WOMEN				
Union	17.03	17.40	19.06	16.41	18.94	18.32	19.25	19.32	19.47
	(0.61)	(1.44)	(1.49)	(0.40)	(1.19)	(0.53)	(0.58)	(0.87)	(0.65)
Non-union	11.14	6.53	5.64	4.82	5.47	5.95	5.76	6.72	6.55
	(0.27)	(0.63)	(0.21)	(0.17)	(0.32)	(0.22)	(0.18)	(0.40)	(0.29)
Union/non-union	1.53	2.67	3.38	3.40	3.47	3.08	3.34	2.88	2.98
					AFRICAN MEN				
Union	14.63	14.90	13.91	13.51	14.00	14.56	16.20	15.65	17.31
	(0.22)	(0.79)	(0.41)	(0.28)	(0.35)	(0.32)	(0.42)	(0.61)	(0.55)
Non-union	10.15	9.72	7.46	6.75	6.70	7.25	7.47	7.87	8.65
	(0.27)	(1.00)	(0.36)	(0.24)	(0.26)	(0.22)	(0.22)	(0.31)	(0.36)
Union/non-union	1.41	1.53	1.87	2.00	2.09	2.01	2.17	1.99	2.00

Source: OHS 1995, 1999; September LFS 2000 – 2006.
Notes: The data are weighted. Standard errors are in parentheses. The samples include all those aged 16 years and older with wage employment, whose weekly hours of work are positive and less than 140. Three outliers were excluded in 1999 and one outlier was excluded in 2005.

Table 2. Average characteristics of Africans in wage employment by union status and gender, 2003

	Union		Non-union	
	Women	**Men**	**Women**	**Men**
Individual characteristics				
Age	40.624	40.645	38.117	36.574
	(9.119)	(9.201)	(10.617)	(11.019)
Years of schooling	11.161	8.895	7.842	7.634
	(3.285)	(3.926)	(4.049)	(4.083)
No schooling	0.022	0.065	0.106	0.115
	(0.147)	(0.246)	(0.308)	(0.319)
Primary education	0.110	0.262	0.308	0.317
	(0.313)	(0.440)	(0.462)	(0.465)
Incomplete secondary	0.199	0.297	0.328	0.326
	(0.399)	(0.457)	(0.470)	(0.469)
Matric (Grade 12)	0.208	0.218	0.175	0.186
	(0.406)	(0.413)	(0.380)	(0.389)
Post-matric	0.455	0.154	0.075	0.049
	(0.498)	(0.361)	(0.263)	(0.216)
Urban	0.761	0.628	0.586	0.521
	(0.427)	(0.483)	(0.493)	(0.500)
Job characteristics				
Large firm (>50 employees)	0.360	0.597	0.146	0.244
	(0.480)	(0.491)	(0.353)	(0.430)
Public sector	0.656	0.332	0.082	0.079
	(0.475)	(0.471)	(0.275)	(0.270)
Formal sector	0.961	0.985	0.498	0.780
	(0.193)	(0.123)	(0.500)	(0.414)
Written contract	0.822	0.857	0.433	0.550
	(0.383)	(0.350)	(0.496)	(0.498)
Paid leave	0.882	0.909	0.317	0.365
	(0.332)	(0.288)	(0.465)	(0.481)
Medical aid benefits	0.615	0.519	0.092	0.118
	(0.487)	(0.500)	(0.290)	(0.323)
Pension benefits	0.890	0.896	0.234	0.309
	(0.313)	(0.306)	(0.424)	(0.462)
N	1401	2730	3752	4304

Source: LFS 2003:2
Notes: Standard deviations in parentheses. The samples include all those aged 16 to 65 years with wage employment, whose weekly hours of work are positive and less than 140.

Table 3. Occupational distribution in African wage employment, by union status and gender 2003

	Union		Non-union	
	Women	**Men**	**Women**	**Men**
Legislative/managerial	0.016	0.019	0.009	0.017
	(0.124)	(0.138)	(0.095)	(0.131)
Professional	0.091	0.034	0.016	0.016
	(0.288)	(0.180)	(0.124)	(0.127)
Technical/associate professional	0.378	0.103	0.050	0.033
	(0.485)	(0.303)	(0.219)	(0.177)
Clerks	0.128	0.082	0.085	0.045
	(0.334)	(0.275)	(0.279)	(0.208)
Service/sales	0.086	0.125	0.110	0.117
	(0.281)	(0.331)	(0.313)	(0.322)
Skilled agriculture/fishery	0.002	0.001	0.006	0.014
	(0.046)	(0.038)	(0.076)	(0.117)
Craft and related trades	0.027	0.184	0.028	0.172
	(0.163)	(0.387)	(0.166)	(0.378)
Plant/machine operators	0.047	0.286	0.027	0.194
	(0.212)	(0.452)	(0.161)	(0.396)
Elementary occupations	0.199	0.164	0.219	0.374
	(0.399)	(0.371)	(0.414)	(0.484)
Domestic workers	0.025	0.001	0.450	0.017
	(0.156)	(0.027)	(0.498)	(0.130)
	1.0	1.0	1.0	1.0

Source: LFS 2003:2

Notes: The data are not weighted. Standard deviations are in parentheses. The samples include all those aged 16 to 65 years with wage employment whose weekly hours of work are positive and less than 140.

Table 4. Earnings regressions for African men and women in the union and non-union sectors, 2003

Dependent variable=log of hourly earnings	UNION			NON-UNION		
	I	**II**	**III**	**I**	**II**	**III**
Individual characteristics						
Male	-0.164*** (0.042)	0.134*** (0.032)	0.152*** (0.029)	0.262*** (0.025)	0.287*** (0.021)	0.148*** (0.022)
Age	0.099*** (0.012)	0.083*** (0.011)	0.034*** (0.009)	0.043*** (0.007)	0.039*** (0.006)	0.016*** (0.005)
Age^2	-0.0012*** (0.0001)	-0.0008*** (0.0001)	-0.0003*** (0.0001)	-0.0005*** (0.0001)	-0.0003 (0.0001)***	-0.0002*** (0.0001)
Urban	0.296*** (0.035)	0.139*** (0.035)	0.107*** (0.029)	0.0471*** (0.025)	0.265*** (0.024)	0.196*** (0.021)
Education						
Primary education		0.061 (0.057)	0.065 (0.049)		0.192*** (0.032)	0.133*** (0.026)
Some secondary		0.262*** (0.057)	0.235*** (0.049)		0.434*** (0.034)	0.271*** (0.029)
Matric		0.746*** (0.062)	0.536*** (0.056)		0.819*** (0.042)	0.426*** (0.036)
Post-matric		1.392*** (0.064)	0.827*** (0.069)		1.923*** (0.060)	0.983*** (0.062)
Job characteristics						
Public Sector			0.338*** (0.047)			0.303*** (0.046)
Formal sector			0.218** (0.103)			0.283*** (0.029)
Large firm			0.067*** (0.025)			0.171*** (0.024)
Permanent			0.445*** (0.069)			0.198*** (0.018)
Tenure			0.022*** (0.004)			0.023*** (0.003)
Tenure^2			-0.0004*** (0.00009)			-0.0004*** (0.0001)
Part-time			0.465*** (0.069)			0.485*** (0.031)
Occupation and industry controls	No	No	Yes	No	No	Yes
R^2	0.097	0.420	0.552	0.219	0.434	0.602
N	4131	4131	4 131	8056	8056	8056

Source: LFS 2003:2

Notes: The data are weighted. Standard errors are in parentheses. The samples include all those aged 16 to 65 years with wage employment. All the regressions also control for marital status, whether the individual is the household head, and for province of residence. Regression III includes 9 occupation dummies and 11 industry dummies. *** Significant at the 1 percent level ** Significant at the 5 percent level * Significant at the 10 percent level.

Table 5. Earnings regressions for African men and women by union status, 2003

Dependent variable=log of hourly earnings	UNION		NON-UNION	
	Women	**Men**	**Women**	**Men**
Gender earnings differential $(\varphi_m - \varphi_f)X_f$ †	0.143 (0.032)		0.082 (0.029)	
Individual characteristics				
Age	0.037**	0.033***	0.024***	0.009
	(0.015)	(0.011)	(0.007)	(0.007)
Age^2	-0.0004**	-0.0003**	-0.0003***	-0.00009
	(0.0004)	(0.0001)	(0.00009)	(0.00008)
Urban	0.219***	0.051	0.220***	0.175***
	(0.045)	(0.036)	(0.028)	(0.030)
Education				
Primary education	-0.119	0.091*	0.137***	0.120***
	(0.137)	(0.051)	(0.038)	(0.036)
Incomplete secondary	-0.010	0.271***	0.239***	0.281***
	(0.136)	(0.052)	(0.041)	(0.041)
Matric	0.203	0.585***	0.423***	0.406***
	(0.146)	(0.060)	(0.051)	(0.051)
Post-matric	0.427***	0.936***	0.951***	0.958***
	(0.150)	(0.085)	(0.092)	(0.083)
Job characteristics				
Public Sector	0.388***	0.318***	0.244***	0.360***
	(0.077)	(0.058)	(0.069)	(0.061)
Formal sector	0.124	0.224*	0.299***	0.276***
	(0.117)	(0.133)	(0.053)	(0.034)
Large firm	0.052	0.082***	0.159***	0.181***
	(0.039)	(0.030)	(0.042)	(0.029)
Permanent	0.381***	0.460***	0.163***	0.226***
	(0.104)	(0.091)	(0.027)	(0.024)
Tenure	0.023***	0.021***	0.031***	0.018***
	(0.007)	(0.004)	(0.004)	(0.003)
$Tenure^2$	-0.0004**	-0.0004***	-0.0006***	-0.00002***
	(0.0002)	(0.0001)	(0.0001)	(0.00008)
Part-time	0.407***	0.528***	0.485***	0.486***
	(0.084)	(0.105)	(0.039)	(0.053)
R^2	0.624	0.525	0.610	0.595
Number of observations	1401	2730	3752	4304

Source: LFS 2003:2

Notes: The data are weighted. Standard errors are in parentheses. The samples include all those aged 16 to 65 years with wage employment. All the regressions also include controls for marital status, whether the individual is the household head, province of residence, 9 occupation dummies and 11 industry dummies, the results of which are not reported here. † The male-female log earnings differential is calculated as the difference between the estimated coefficients of the male and female sample, using the mean characteristics of the female sample, X_i. *** Significant at the 1 percent level ** Significant at the 5 percent level * Significant at the 10 percent level.

Table 6. Union differential for men and women, by education and quantile, 2003

	Women		Men	
OLS with union dummy	Coefficient	No. of observations	Coefficient	No. of observations
At most primary education	0.380*** (0.067)	1741	0.241*** (0.040)	2752
Incomplete secondary	0.288*** (0.047)	1511	0.171*** (0.036)	2214
Matric/Diploma/Degree	0.095** (0.046)	1865	0.137*** (0.043)	2028
Quantile regressions with union dummy				
Quantile 0.2	0.254*** (0.029)	5153	0.207*** (0.034)	7034
Quantile 0.5	0.203*** (0.028)	5153	0.199*** (0.023)	7034
Quantile 0.8	0.136*** (0.025)	5153	0.155*** (0.013)	7034

Source: LFS 2003:2
Notes: The data are weighted. Standard errors are in parentheses. The samples include all those aged 16 to 65 years with wage employment. The regressions contain a full set of explanatory variables that control for individual, job and regional characteristics as in the regressions reported in Table 5 above. *** Significant at the 1 percent level ** Significant at the 5 percent level * Significant at the 10 percent level.

Table 7. Characteristics of union members by co-residence with other union members, 2003

Individuals	**Lives with other union members**	**Does not live with other union members**
Hourly earnings	25.66 (0.955)	17.75 (0.360)
Age	38.50 (0.372)	40.04 (0.224)
Years of schooling	11.48 (0.112)	9.276 (0.101)
Matric	0.310 (0.021)	0.221 (0.010)
Degree/diploma	0.400 (0.021)	0.211 (0.010)
Married	0.759 (0.017)	0.626 (0.011)
N	846	3 265

Source: LFS 2003:2
Notes: The data are weighted. Standard errors are in parentheses.

Table 8. Union differential estimates for African men and women without and with selection controls

	Women	Men
NO SELECTION CORRECTION		
OLS with union dummy	0.216	0.183
	(0.032)	(0.024)
OLS on separate earnings regimes [a]	0.199	0.179
	(0.039)	(0.029)
Pooled OLS using LFS panel	0.282	0.221
	(0.013)	(0.011)
SELECTION CORRECTION		
Treatment effects [b]	0.488	0.504
	(0.067)	(0.061)
Endogenous switching [c]	0.787	0.598
	(0.145)	(0.112)
Household fixed effects	0.151	0.267
	(0.106)	(0.079)
Individual fixed effects	0.083	0.082
	(0.016)	(0.014)

Source: LFS 2003:2; LFS Panel 2001-2004

Notes: The samples include all those aged 16 to 65 with wage employment.

[a] Estimated using union characteristics.

[b] Selection coefficient is significant in both the male and female regressions.

[c] Estimated using union characteristics with the selection term set to its mean value. The selection coefficient is significant in the female and male union and non-union samples.

Table A1. Union membership among African women and men, South Africa, 1995 – 2006

	1995	1999	2000	2001	2002	2003	2004	2005	2006
					AFRICAN WOMEN				
Union members	594 411	693 383	592 925	641 513	625 419	616 990	647 188	714 895	724 955
	(15451)	(16775)	(18838)	(19160)	(19770)	(20700)	(23732)	(22270)	(23178)
Total employees	1 643 210	2 154 400	2 317 244	2 227 510	2 2469 93	2 333 150	2 438 564	2 557 220	2 738 509
	(22609)	(26140)	(33220)	(31433)	(32415)	(35016)	(39898)	(40581)	(44940)
Percent unionised	36.2	32.2	25.6	28.8	27.8	26.4	26.5	27.96	26.5
	(0.775)	(0.685)	(0.724)	(0.751)	(0.767)	(0.779)	(0.844)	(0.784)	(0.774)
					AFRICAN MEN				
Union members	1 412 064	1 384 749	1 293 049	1 343 155	1 313 649	1 291 038	1 218 705	1 348 074	1 385 364
	(24038)	(23656)	(32148)	(28515)	(30103)	(29716)	(32611)	(33816)	(35617)
Total employees	3 640 111	3 181 664	3 602 175	3 380 288	3 536 427	3 644 835	3 731 275	4 013 467	4 141 053
	(27727)	(30247)	(46443)	(38766)	(42894)	(46527)	(50853)	(52553)	(57987)
Percent unionised	38.8	43.5	35.9	39.7	37.1	35.4	32.7	33.6	33.4
	(0.552)	(0.630)	(0.743)	(0.700)	(0.721)	(0.723)	(0.757)	(0.733)	(0.755)

Source: OHS 1995, 1999; September LFS 2000 – 2006.
Notes: The data are weighted. Standard errors are in parentheses. The samples include all those aged 16 and older with wage employment.