Wage differentials between the public and private sectors in the South African labour market

A Paper presented to the

School of Economics

University of Cape Town

In partial fulfilment of the requirements for

Masters in Commerce (Economics)

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Leigh Lakay*

Abstract

This study uses a cross sectional data set from South Africa's Labour Force Survey to investigate wage differentials and employment decisions between the public and private sectors in South Africa. To obtain robust estimates of the wage differential, two econometric techniques are employed. These are OLS estimation and the standard switching regression applied under full information maximum likelihood. After controlling for worker's characteristics and sector selection bias through full information maximum likelihood, we find a public sector advantage. The public sector wage premium varies between 6% and 421% depending on race, gender, trade union affiliation and educational attainment. The wage advantage is largest for workers with no educational attainment. The wage premium for African and White workers in the public sector is substantially larger than for Coloured and Indian workers. The sector selection estimation reveals that Coloured and White workers are significantly less likely to work in the public sector than African workers.

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1. Introduction

In developing countries in particular and in South Africa specifically, a large proportion of formal sector employees are employed in the public sector (Woolard, 2002; Stelcner, Van der Gaag and Vijverberg, 1988 and Bosch, 2006). This observable fact has drawn attention to public-private sector wage differentials the world over. Questions raised include whether workers with the same productivity traits receive equal remuneration in either sector or whether public sector workers are underpaid? If so, why is the demand for public sector employment so high? Particularly, South Africa has struggled to fill administrative and professional vacancies in the public sector.

Many studies have focussed on cross-sectional developed-country public-private sector wage differentials, with few studies evaluating these relationships for developing countries (for recent work see Dustman and van Soest, 1998; Mueller, 1998; Disney and Gosling, 2003; Lokshin and Jovanovic, 2005)[1].Despite wage differentials' vital importance for labour market policy, especially in search of increased economic growth and employment, estimates of wage differentials in South Africa are rather limited. Bhorat (2000) employed a percentile differential approach to disaggregate wage differentials for male workers in South Africa. While his study does not specifically focus on public-private sector wage differentials, his results illustrated that the racial wage gap is more severe than the gender wage gap.

Notably there is a lack of panel estimates for public-private sector wage differentials in both developed and developing country contexts. This is a weakness in the

[1] See Bender (1998) for a thorough review.

literature. While cross-sectional analyses can be useful in pin-pointing exactly what transpired at a particular point in time, panel data provide insights into transitions over time that are occurring in an economy. Disney and Gosling (2003) and Henley and Thomas (2000) undertake panel studies of public-private sector wage differentials in Britain. Both studies reveal a wage advantage for public sector employees. To my knowledge, panel studies for developing countries are more difficult to locate.

Approximately 20% of formal non-agricultural workers in South Africa are employed in the public sector (Bosch, 2006)[2]. Many international studies have shown that there are significant differences in individual characteristics of workers between the public and private sectors, leading to significant differences in both conditional and unconditional wages between the two sectors (Casero and Seshan, 2006). As I will show, a similar picture emerges for South Africa and we observe significant differences in individual characteristics between the two sectors. Given the size of the public sector in South Africa, the size of the public-private sector wage differential is of key importance as it may affect competition for and allocation of workers between sectors. It is also likely to be contentious as government is "required by the Constitution to lead by example" (Woolard, 2002:1). Given this situation, it is important to ascertain whether the public-private sector wage differential is predominantly a reflection of the differences in the characteristics or whether there are other factors at play. Woolard (2002) investigates wage levels and inequality in the public sector of the South African labour market. Based on ordinary least squares (OLS) estimation, she finds that a public sector premium exists for all public sector workers with the exception of graduates and diplomats. This finding is consistent with similar studies testing for public-private wage differentials. Bhorat (2000)

[2] Woolard (2002) estimates approximately 16% of formal sector workers are employed in the public sector.

approaches the wage differential problem differently by focussing on the racial wage cleavage. Testing for the presence of selection bias yielded an insignificant lambda coefficient and the author proceeded with OLS regression[3]. Bhorat (2000) does not investigate a public-private sector wage differential, but the inclusion of the trade union variable in his analysis reveals that trade union membership significantly influences workers wages in South Africa.

This paper aims to evaluate public-private sector wage differentials for South Africa using two different econometric techniques that control for human capital and other observable worker characteristics while simultaneously controlling for unobserved worker characteristics that could be correlated with wages and sector selection. An important aspect of the study of wage differentials is that sample selection bias and endogeneity is prevalent due to the non-random way in which individuals exercise their choice of sector and type of employment decisions. Switching regression models are typically utilised to overcome such biases (Adamchik and Bedi, 2000; Panizza and Qiang, 2005). The existing South African work (Woolard, 2002; Bhorat, 2000) that I reviewed above, has not used these switching models and a major part of the rationale of this paper is to ascertain whether better econometric practice actually makes a difference to their conclusions.

The paper is organised as follows. Section 2 provides a brief overview of the data and important definitions. Section 3 presents a basic literature review of the origins of the switching regression model and recent panel studies. Section 4 discusses the econometric methodology. The main findings are presented in Section 5. The next section presents wage differentials based on the full information maximum likelihood

[3] Bhorat (2000) employed the Heckman two-step method to test for the presence of selection bias. The lambda coefficient was insignificant and the author concluded that no selection bias was present

methodology. Section 7 summarises and concludes with a discussion of policy implications of the results for South Africa.

2. Data and Definitions

The core data used in the analytical investigation of pay premia comes from a cross-section of the Labour Force Surveys (LFS), representing the period September 2002. The LFS is a rotating panel survey conducted bi-annually, covering approximately 30 000 households.

The first stage of sampling for the LFS consists of 3 000 primary sampling units (PSUs) with at least 100 dwellings per PSU based on the enumerator areas of the 1996 Population Census. Thereafter 10 units are systematically drawn from each PSU. Special dwellings such as hospital, prisons and hotels are specifically excluded from the sample. Each dwelling is visited on five different occasions at most. As a result, wave 4 (LFS 2001:2) to wave 8 (LFS 2003:2) would constitute the 5 occasions on which the same dwellings were visited before a new sample was drawn.

The LFS is specifically designed to elicit detailed information about respondents' labour market activities and asks distinct questions about the sector of employment and trade union affiliation (Statistics South Africa, 2002). A breakdown of these probing questions allows the level of government employment or affiliation to a government enterprise to be established. Specific questions are put to respondents about the type of employment they are in, and this enables workers to be classified according to the International Standard Classification of Occupations (ISCO) classification. This enables the construction of an occupation variable that will be

used for identification in the sector-selection equation. This type of information would be useful in examining individuals' movements both within occupations and between public and private sector employment.

The study sample consists of individual workers, aged between 15 and 65 years for which information is available for wages and all other relevant attributes. This age restriction is in accordance with South African labour regulations, where individuals are eligible for employment at 15 years whilst the mandatory retirement age has been capped at 65 years and 60 years for males and females respectively. For the purposes of this study, incomplete records were ignored. Only employed individuals with positive earnings were included in this study.

Respondents were classified as public sector workers if they work in central, provincial or local government or are employed in parastatals such as Telkom or Transnet where government has some shareholding. Private sector workers are those employed for a private business or household, business leagues or professional associations. For the purposes of this study, the private sector self-employed are excluded.

3. A Review of the Econometric Literature on Estimating Public and Private Wage Differentials

a. Origins of the Switching Regression Model

The seminal work on the endogenous switching regression models for public-private wage differentials is that of Gyourko & Tracy (1988). Many previous studies that

evaluated public-private and union-nonunion wage differentials treat union status as endogenous, but failed to recognise that workers also exercise some choice over sector of employment. Failure to recognise that sector choice is endogenous could lead to selection bias of the estimated wage equation coefficients (Gyourko and Tracy, 1988, Panizza and Qiang, 2005 and Lokshin and Jovanovic, 2003). Gyourko and Tracy (1988) applied their model across four different labour market states; namely, private/non-union, private/union, public/non-union and public/union in the United States of America. Focussing on the public-private sector wage differential, they found a small but significant public sector wage advantage of 3.8%. The authors highlight the importance of calculating both conditional and unconditional wage differentials for policy reasons, as unconditional wage differentials are exposed to larger sampling errors. According to Gyourko and Tracy (1988) the unconditional wage represents the average wage an individual who is chosen at random from the population with the same observable characteristics as the average public sector worker would receive. Unconditional characteristics do not take selection effects into consideration when calculating expected wages. The conditional differential represents a random worker from each sector with the same observable characteristics. Having observed the choice of sector, the differential represents both the returns to the observable characteristics and levels and returns of unobservable characteristics. Moreover, given that the OLS method yields biased coefficients due to distributional assumptions and forms the basis of their quantitative calculation, both conditional and unconditional wage differentials are more appropriate for observing the true wage differential.

b. Literature on Developing Countries (Cross-Sectional estimates)

Van der Gaag and Vijverberg (1988) investigate if a wage differential exists in the formal sector of the Côte d'Ivoire labour market, where the formal sector of an economy is divided into the public and private sectors. Highlighting the assumption that wages are set equal to marginal productivity under the Mincerian approach, they argue that there are many reasons that this may not hold true. Non-competitive market forces such as unions and employment legislation contribute to falsifying this assumption. In addition to this, the problem of increasing wage differentials between the sectors is more pronounced in countries where the public sector dominates wage employment. Having raised these concerns, Van der Gaag & Vijverberg (1998) contribute to existing literature by constructing and estimating a switching regression model that is robust to sector choice and that consists of two wage equations and one "switching" equation. The importance of the switching equation is to account for the endogeneity that arises when individuals are assigned either a dummy variable to indicate their sector status or when separate equations are estimated for each sector. By treating sector choice as an endogenous variable, they find that Ordinary Least Squares (OLS) estimates reveal a substantial premium to public sector workers. OLS results do not correct for the selection bias, which they show to be quite large.

They emphasise that OLS estimates based on sector-specific samples yield significantly biased results, driven by the unobserved characteristics of workers. Their results show the relative importance of human capital defined as years of education and experience over qualifications (diplomas acquired). Women are preferred over men in the public sector and the completion of high school is an important determinant of obtaining a job in the public sector.

Lokshin and Jovanovic (2003) evaluate wage differentials and sector employment in Yugoslavia for the period 1995 to 2000. They initially reject OLS in favour of a Full Information Maximum Likelihood (FIML) specification, where the system of equations (the two wage equations and the switching equation) is estimated simultaneously. Aware that the joint normality of the error terms assumption is a restrictive one and could yield biased results if it does not hold, the authors relax this assumption and estimate the system of equations under a Semi-Parametric Full Information Maximum Likelihood (SPFIML) method. The FIML method is rejected in favour of the SPFIML method. Parametric techniques entail the explicit modelling of the functional form of a given dependent variable and explanatory variables. Semi-parametric techniques involve the relaxation of the distributional assumptions of the error terms vis-à-vis the explanatory variables while allowing for consistent estimation of the β's. The parametric approach requires the specification of the distribution of the error terms whereas the semi-parametric approach is not dependant on this assumption. If the incorrect form of the distribution of the error terms is assumed, it could result in inconsistent estimates of the β's (Hsiao, 2003).

Their estimations based on this FIML methodology suggest that there is a private sector wage advantage for men but an insignificant wage premium for women. Men who have completed high school or professional school have a significant private sector premium. No wage premium exists for women, except those with professional school or university education. The sector equation draws attention to the higher likelihood of single people being employed in the private sector. The number of jobholders in the household has a positive and significant effect on obtaining a job in the private sector for women but not for men.

Panizza and Qiang (2005) evaluate public-private sector wage differentials for 13 Latin American countries allowing for different assumptions about the correlation structure between the sectoral and wage equations. One assumption the authors impose is that public (private) sector workers perform better in the public (private) sector than random individuals from the sample[4]. Illustrated by the alternative assumptions is that OLS estimations can be robust to selectivity bias. Irrespective of the econometric technique applied, a public sector wage premium is observed, with females enjoying a larger premium than men. The male premium ranges from 4% to 28% while the female premium is anywhere between 19% and 37%. An important observation noted by Panizza and Qiang is that earnings inequality is lower amongst public sector workers. In addition, the premium to public sector workers is inversely related to a worker's position in the distribution of wages. Put simply, public sector workers at the bottom end of the public sector wage distribution benefit from a large premium over private sector workers at similar points on the private sector wage distribution. The opposite prevails for workers at the top end of the public and private sector wage distributions (Katz and Kruger, 1991 and Blank 1993 cited in Panizza and Qiang, 2005). As will be illustrated later, similar results are found for South Africa.

Thus, it can be seen that in order to overcome the problems of endogenous sector selection a number of sophisticated econometric fixes have been proposed. The use of panel data can also assist to overcome two common problems of selection bias and measurement error in cross-sectional data, as is shown in the Disney and Gosling (2003) paper reviewed below.

[4] Positive selection in either sector

c. Longitudinal estimates for Pay Premia

Disney and Gosling (2003) evaluate public sector pay premia for Britain in the 1990's. They argue that contrary to common belief, cross sectional estimates are not necessarily biased upwards due to selection bias and panel data estimates are not necessarily biased downwards due to endogeneity and measurement error in the data. To demonstrate this, they adopt a novel instrumental approach to the estimation of the pay premia. The first instrument is robust to measurement error and is conditioned on the probability of the individual being in the public sector in period *i* doing occupation O at time *t*, minus the probability of the individual working in the public sector at time *t*-1 doing the same occupation. Disney and Gosling employed this method to overcome changes in sector status due to unobserved worker characteristics. Hence all changes in public sector status are exogenously determined by privatisations. The second instrument only looks at occupation at time $t - 1$, ignoring differences in occupation at time *t*. Their results show that a wage premium exists for men in the public sector, although it is statistically insignificant. Men with college education earn significantly less in the public sector than men with college education in the private sector. Women experience a wage premium in the public sector that is significantly different from their private sector counterparts. Similar results are found for women with college education as for men with college education.

This approach was applied to the available South African panel data but results were inconclusive due to the lack of sufficient employees who transition between public and private sector employment[5].

[5] The study sample only has a 3% movement between sectors, either to the public sector or from the public to the private sector.

The release of more recent cross-sections of the LFS will enable future study on long-term wage differentials in South Africa. Cross-sectional estimates are the starting point for short-term wage differential estimates while panel data could reveal more information about long-term trends[6].

4. Methodology

The existence of the public and private sectors influences the formal-sector employment decisions within the labour market (Lokshin and Jovanovic, 2003). If the formal sector of the labour market is only portioned into the public and private sectors, an individual will compare the net benefits in each sector in choosing between the two. A two-step process is involved in sector selection. The first step is the decision of whether or not to attempt to obtain a public sector job. The second step entails being offered a public sector job (Van der Gaag and Vijverberg, 1988). The probability of an individual being offered a public sector job depends on the characteristics of that worker observable to the employer.

To evaluate possible differences in wages between the two sectors, a human capital model is set up taking a common Mincerian form (Mincer and Polachek, 1974):

$$\ln w_i^P = X_i \beta_i^P + \varepsilon_i^P \qquad (1)$$

$$\ln w_i^{NP} = X_i \beta_i^{NP} + \varepsilon_i^{NP} \qquad (2)$$

[6] See appendix

where the superscript P denotes the public sector, the superscript NP denotes the private sector, X_i is a matrix of wage determining explanatory variables, β is the corresponding coefficients to be estimated and ε is the error term.

We can formalise a worker's choice of sector by equating the log wages of equations (1) and (2). A worker will try to obtain a public sector job if

$$(\ln w_i^P - \ln w_i^{NP}) > Z_i\lambda + u_i \qquad (3)$$

where Z_i is a vector of variables influencing a worker's choice to work in the public sector and u_i is a composite error term. This equation summarises the two step process where the expected wage in the public sector needs to be large enough to encourage the worker to seek public sector employment and secondly the worker is chosen from the queue of workers (Van der Gaag and Vijverberg, 1988).

This paper proceeds by estimating equations (1) and (2) based on two alternative assumptions about the correlation of the error terms $\varepsilon_i^P, \varepsilon_i^{NP}$ and u_i. The first method is simple OLS regression to illustrate the presence of a wage premium in either sector. This accords with the existing South African work. The second method is the FIML method of switching regression. Generally, OLS estimation of equations (1) and (2) may lead to inconsistent estimates of the coefficients due to selection bias stemming from sample selection and worker self-selection into sectoral employment. Moreover, OLS produces biased results due to worker characteristics that may be unobservable to the econometrician but that affect both wages and sector selection. A common method utilised to overcome this selection problem is the endogenous switching

method (Van der Gaag and Vijverberg, 1988, Heitmueller, 2004 and Lokshin and Jovanovic, 2003).

If we substitute (1) and (2) into (3) and assume that all variables that determine wages also determine the probability of obtaining a public sector job then the following results:

$I = 1$ if $L_i\delta + v_i > 0$ (the individual has a public sector job) (4)

$I = 0$ otherwise (5)

where $v_i = \varepsilon_i^P - \varepsilon_i^{NP} - u_i$ and the vector L includes all exogenous variables in vectors X and Z. Equations (4) and (5) illustrate that individual i will be employed in the public sector if the gains from employment are positive and in the private sector otherwise (Lokshin and Jovanovic, 2003). Given the above structure and the assumption of joint normality of the distribution of the error terms, consistent estimates can be achieved by maximum likelihood estimation. This method yields unbiased estimates of the coefficients of the variables X_i, Z_i and L_i.

5. Descriptive Statistics

For the purposes of analysing the public-private sector wage gap, the sample is restricted to full-time employed individuals who reported positive earnings and hours worked for September 2002.

This sample is similar in composition to the Woolard (2002) and Bhorat (2000) studies undertaken to examine wage differentials in South Africa. The limited number of observations in this study is due to the manner in which respondents were questioned during the period, resulting in incomplete records that were not useful for the purposes of this study. Tables 1a and 1b below summarise the characteristics of the respondents.

Table 1a: Selected summary statistics of variables used in the analysis

Males

	Public		**Private**	
	Mean	***St Dev***	**Mean**	***St Dev***
Age	40.37*	9.81	37.53*	11.01
Education	10.16*	4.17	8.12*	4.43
Experience	11.90*	8.58	7.33*	8.30
Trade Union	0.742		0.319	
Marital Status				
Married	0.753		0.664	
Education				
No education	0.042		0.104	
Complete Primary	0.158		0.349	
Incomplete High	0.064		0.104	
Complete High	0.590		0.389	
Tertiary	0.146		0.054	
Race				
African	0.711		0.666	
Cloured	0.125		0.173	
Indian	0.033		0.042	
White	0.131		0.119	

Note: * indicates that the difference is statistically different from zero at the 95 percent confidence level.
Source: Author's own calculations using LFS

The total sample size for the analysis is 12 409 observations. Of this, 3 296 individuals are employed in the public sector while 9 113 individuals are employed in the private sector. Of all female workers, 34% are employed in the public sector and 66% employed in the private sector. For males, 22% are employed in the public sector and 78% are employed in the private sector. Approximately half of all public sector workers are female while only 34% of all private sector workers are female. The experience variable is calculated as strictly the number of years worked, as the age minus schooling minus 6 could lead to inflated experience estimations.

Table 1b: Selected summary statistics of variables used in the analysis

Females

	Public		**Private**	
	Mean	***St Dev***	**Mean**	***St Dev***
Age	39.88*	8.91	35.08*	9.99
Education	12.58*	3.24	9.96*	4.00
Experience	10.95*	8.40	5.46*	6.45
Trade Union	0.748		0.223	
Marital Status				
Married	0.552		0.495	
Education				
No education	0.021		0.058	
Complete Primary	0.070		0.229	
Incomplete High	0.034		0.099	
Complete High	0.668		0.559	
Tertiary	0.207		0.055	
Race				
African	0.721		0.525	
Coloured	0.105		0.221	
Indian	0.029		0.050	
White	0.145		0.204	

Note: * indicates that the difference is statistically different from zero at the 95 percent confidence level.
Source: Author's own calculations using LFS

Analysis reveals that both male and female public sector workers are significantly older, more experienced and have an average of 2 more years of education than private sector workers. On the other hand private sector workers work approximately 4 more hours per week than public sector workers. Compared to male private sector workers, 9% more public sector workers are married. The racial distribution of workers between sectors reveals that the private sector employs a larger percentage of White workers than the public sector. For African individuals, a larger proportion of workers are employed in the public sector. Trade union membership is prevalent in the public sector.

Table 2a : Hourly log wage by race, education and gender

	Males			
	Public		**Private**	
	Mean	***St Dev***	**Mean**	***St Dev***
All Workers	2.981*	*0.834*	2.044*	*1.080*
Trade Union	3.079*	*0.736*	2.479*	*0.712*
Education				
No education	2.191*	*0.792*	1.272*	*0.826*
Compete Primary	2.290*	*0.632*	1.567*	*0.850*
Incomplete High	2.315*	*0.731*	1.867*	*0.791*
Complete High	3.109*	*0.716*	2.506*	*0.985*
Tertiary	3.701*	*0.644*	3.597*	*0.877*
Race				
African	3.166*	*0.754*	2.231*	*0.88*
Coloured	3.205*	*0.704*	2.264*	*0.892*
Indian	3.057*	*0.771*	2.941*	*0.724*
White	3.591*	*0.593*	3.419*	*0.808*

Note: * indicates that the difference between the public and private sector log wage is statistically
different from zero at the 95 percent confidence level.
Source: Author's own calculations

Male workers in the public sector earn, on average, significantly higher wages than their counterparts in the private sector. Woolard (2002) suggests this can be attributed to high levels of human capital within the public sector and that individuals within the public sector are duly rewarded with higher wages due to individual attributes. Closer inspection of the educational attainment reveals public sector workers do have significantly higher levels of education, supporting Woolard's claim. The gender breakdown reveals that females earn more in the public sector than the private sector, while males also experience a wage premium in the public sector.

Table 2b : Hourly log wage by race, education and gender

	Females			
	Public		**Private**	
	Mean	***St Dev***	**Mean**	***St Dev***
All Workers	3.099*	*0.785*	1.999*	*1.096*
Trade Union	3.209*	*0.662*	2.254*	*0.906*
Education				
No education	2.117*	*0.653*	0.828*	*0.609*
Compete Primary	2.101*	*0.743*	1.173*	*0.765*
Incomplete High	2.334*	*0.710*	1.659*	*0.790*
Complete High	3.412*	*0.684*	2.398*	*0.959*
Tertiary	3.520*	*0.667*	3.228*	*0.965*
Race				
African	3.030*	*0.805*	1.555*	*0.972*
Coloured	3.080*	*0.776*	1.931*	*0.912*
Indian	3.269*	*0.553*	2.563*	*0.710*
White	3.420*	*0.635*	3.075*	*0.825*

Note: * indicates that the difference between the public and private sector log wage is statistically different from zero at the 95 percent confidence level.
Source: Author's own calculations

Examining mean wages by race reveals some interesting information. For females, African workers earn the lowest wages amongst all race groups in the public sector,

while for males Indian workers earn the lowest wages. For females, African and Coloured workers earn similar wages in the public sector while White workers have the highest wage. In the private sector, African workers earn the lowest wages for both genders. Male Coloured and African workers earn roughly the same wage in the private sector, with White workers earning significantly higher wages than any of the race groups in the private sector.

Examining wages by educational breakdown reveals some critical information. Workers in the private sector are heavily penalised for no educational attainment, especially females. The public sector pays generally the same wages for female workers from no education to complete primary school education. Workers in the public sector with incomplete high school education earn approximately the same as workers with completed high school education in the private sector. Moving from incomplete high school education to tertiary education in the public sector delivers approximately the same reward as moving from compete high school education to tertiary education in the private sector for females. It appears that there are large rewards for those who attain tertiary education in the private sector, with the mean log hourly wage increasing from 2.398 to 3.228 for females and from 2.506 to 3.597 for males.

Given South Africa's economic and political history, it is not surprising that White wages are significantly higher than all other races. Moreover, the government is committed to correcting the injustices of the past and this could be a possible explanation for the higher wages at the lower end of the educational distribution, where the majority of African and Coloured individuals would fall in terms of the educational distribution.

6. Estimation Results

6.1 The Sector Choice equation

Table 3 reports the estimates of the sector selection equation under FIML estimation for males and females respectively. A positive coefficient indicates that a variable contributes to the likelihood of obtaining public sector employment rather than private sector employment. All estimations include the application of clustering and weights.

Table 3: FIML estimation of the sector selection equation

	Males		Females	
Variables				
Constant	-3.8548	(1.0179)**	-3.4616	(0.5836)*
Age	0.0551	(0.0229)**	0.0672	(0.0276)**
Age^2	-0.0006	(0.0002)	-0.0009	(0.0003)**
Experience	0.0253	(0.0044)*	0.0327	(0.0055)*
$Experience^2$	0.0000	(0.0005)*	0.0000	(0.0000)*
Married	-0.0631	(0.0844)	-0.1172	(0.0076)
Trade Union	0.8509	(0.0752)*	0.7811	(0.0738)*
Education				
Primary completed or less	0.1287	(0.1663)	-0.1925	(0.1122)***
Incomplete High School	0.0423	(0.1671)	-0.3593	(0.2678)
Complete High School	0.3276	(0.1682)***	-0.1568	(0.2029)
Tertiary Education	0.7267	(0.1451)*	0.1060	(0.2477)
Race				
Coloured	-0.0824	(0.0781)*	-0.2354	(0.1332)***
Indian	-0.1046	(0.0989)	-0.3159	(0.0960)*
White	-0.1704	(0.0998)***	-0.5430	(0.1237)*
Occupation				
Professionals	-0.4821	(0.1869)*	0.4678	(0.1871)**
Technical and associate professionals	0.1021	(0.1520)	0.4741	(0.1597)*
Clerks	0.1299	(0.1480)	0.1552	(0.1868)*
Service workers & shop & market sales workers	0.2039	(0.0840)**	-0.3865	(0.2021)
Skilled agricultural and fishery workers	-0.0473	(0.1766)	0.0906	(0.3526)**
Craft and related trade workers	-0.017	(0.1183)	0.0035	(0.2765)
Plant and machine operators and assemblers	-0.4053	(0.1210)*	-0.1062	(0.2958)
Elementary Occupation	0.1671	(0.1142)	-0.1630	(0.1944)
Industry				
Mining	-0.7201	(0.2076)*	0.0349	(0.5296)
Manufacturing	-0.1024	(0.1884)	-0.2124	(0.2716)
Electricity and Gas	2.525	(0.2195)*	2.7957	(0.3545)*
Construction	1.2046	(0.1923)*	1.7505	(0.4084)*
Wholesale & retail trade	0.0248	(0.1779)	0.0861	(0.3041)
Transport & storage	1.7963	(0.1252)*	1.7716	(0.2787*
Financial Intermediation	0.3598	(0.1731)**	0.5682	(0.2487)**
Community and Social Work	2.7311	(0.1365)*	2.4382	(0.2313)*

Private Households	-4.8025	(0.2134)*	-5.5599	(0.3597)*

Source: Author's own calculations using LFS
Robust standard errors in parentheses
* Statistically significant at the 1% level
** Statistically significant at the 5% level
*** Statistically significant at the 10% level

The set of explanatory variables for this estimation include: educational dummies with no education serving as the omitted category, a dummy variable indicating marital status, racial dummies with African the omitted category, occupational dummies with legislators, senior officials and managers as the omitted category, industry dummies with agriculture as the omitted category, and age and experience variables. A trade union dummy variable was included in the estimation with a value of one representing trade union membership and a value of zero indicating no trade union affiliation. These variables are the standard explanatory variables for wage and sector determination. The variables chosen for this study compare favourably with similar studies.

For both males and females, experience has a positive and significant effect on the probability of being employed in the public sector. Females are less likely than males to gain employment in the public sector. Although insignificant, males with incomplete primary school education and incomplete high school education are no less likely than those males with no formal education to gain employment in the public sector. Complete high school education and tertiary education significantly affects the likelihood of public sector employment for males. On the other hand for females all educational attainment above primary school does not significantly affect the likelihood of obtaining public sector employment. For females, all races are significantly less likely than African female workers to gain public sector employment. Trade union membership significantly determines the probability of

gaining public sector employment. A male worker with trade union affiliation is 85% more likely than a male worker with no trade union affiliation to obtain employment, compared to a female trade union member who is 78% more likely than a female non-trade union worker to obtain employment in the public sector. For males, White and Coloured individuals are less likely than Africans to be employed in the public sector, while Indian individuals' employment probabilities in the public sector are insignificantly different from Africans. For males, only three occupations are flagged as significantly different to the reference category of legislators, senior officials and managers. The industry variables reveal some interesting information too. Males in the mining sector are less likely to be employed in the public sector. This is in contrast to females in the mining industry who are insignificantly different from the omitted category of agriculture. Males in the electricity and gas sector, construction, transport and storage and community and social work sectors are significantly more likely to gain public sector employment. A similar finding emerges for females. This finding appears to support the composition of these industries where the public sector drives these types of projects.

6.2 Wage Equations

Tables 4a, 4b, 5a and 5b present the OLS and FIML estimation estimates of the sector-specific wage equations. OLS differs from FIML in that OLS does not take account of the fact that some unobserved characteristics that influence the probability of sector selection also affect the wages a worker receives once in a given sector. Neglecting these selection effects leads to biased results of the relative earnings in both sector (Lokshin and Sajaia, 2004). By estimating these equations simultaneously, the FIML method corrects for these selection biases in the wage equations.

The set of explanatory variables include age and its square, experience and its square, education dummies with no education being the omitted category, racial dummies with African being the omitted category and occupational dummy variables with legislators, senior officials and managers as the omitted category. The main focus of this section is the FIML results as it accounts for the endogeneity inherent in the study. .

Table 4a: OLS estimation of the wage equation for the private and public sectors

	Males			
	Public		**Private**	
Variables				
Constant	1.8999	(0.4228)*	0.4413	(0.2108)***
Age	0.0231	(0.0203)	0.0656	(0.0079)*
Age2	-0.0002	(0.0002)	-0.0007	(0.0000)*
Experience	0.0118	(0.0040)*	0.0085	(0.0030)**
Experience2	0.0000	(0.0000)*	0.0000	(0.0000)**
Trade Union	0.3172	(0.0553)*	0.5843	(0.1039)*
Education				
Primary completed or less	0.0559	(0.1262)	0.2363	(0.0524)*
Incomplete High School	0.1027	(0.1374)	0.4705	(0.0513)*
Complete High School	0.5564	(0.1126)*	0.8467	(0.0615)*
Tertiary Education	0.8324	(0.1413)*	1.2659	(0.0977)*
Race				
Coloured	0.2032	(0.0486)*	0.2371	(0.0938)**
Indian	0.2817	(0.0586)*	0.4495	(0.0695)*
White	0.4469	(0.0549)*	0.7198	(0.0481)*
Occupation				
Professionals	-0.0067	(0.1082)	0.1151	(0.1082)
Technical and associate professionals	-0.1789	(0.0954)***	-0.2036	(0.0903)**
Clerks	-0.4675	(0.1155)*	-0.5677	(0.0902)*
Service workers & shop & market sales workers	-0.5651	(0.1012)*	-1.0078	(0.0848)*
Skilled agricultural and fishery workers	-0.8231	(0.1459)*	-1.1736	(0.1157)*
Craft and related trade workers	-0.6043	(0.1294)*	-0.5639	(0.0926)*
Plant and machine operators and assemblers	-0.6003	(0.1486)*	-0.7826	(0.1032)*
Elementary Occupation	-0.8518	(0.1154)*	-1.1169	(0.0988)*
Observations	1675		6006	
R-squared	0.4821		0.5712	

Source: Author's own calculations using LFS

Robust standard errors in parentheses

* Statistically significant at the 1% level

** Statistically significant at the 5% level

*** Statistically significant at the 10% level

For males in the private sector, individual characteristics affect earnings significantly. Age and experience contribute significantly to the determination of wages for men in the private sector. This is in contrast to male public sector workers whose wages are significantly influenced by experience only. For both sectors, trade union affiliation represents large gains in wages. A trade union worker in the public sector earns approximately 32% more than a non trade-union member in public service. In the private sector the wage advantage appears much larger. Male workers in the private sector who subscribe to a trade union earn approximately 58% more than workers who have no trade union affiliation. Returns to education at all levels are significantly different from zero for males in the private sector. In the public sector, completed primary schooling and incomplete high school education is insignificantly different from no formal schooling. Males in the private sector with completed high school earn on average 55% more than public sector workers with no education.

Table 4b: OLS estimation of the wage equation for the private and public sectors

	Females			
	Public		**Private**	
Variables				
Constant	1.9103	(0.5640)*	0.5201	(0.2108)***
Age	0.0388	(0.0227)	0.0536	(0.0079)*
Age2	-0.0004	(0.0002)	-0.0005	(0.0000)*
Experience	0.0090	(0.0025)*	0.0119	(0.0030)**
Experience2	0.0000	(0.0000)*	0.0000	(0.0000)**
Trade Union	0.2892	(0.0359)*	0.2528	(0.0565)*
Education				
Primary completed or less	0.0007	(0.0917)	0.2246	(0.0945)**
Incomplete High School	-0.0218	(0.1352)	0.4456	(0.1042)*
Complete High School	0.4066	(0.1418)**	0.8437	(0.1024)*
Tertiary Education	0.7131	(0.2009)*	1.0529	(0.1323)*
Race				
Coloured	0.0976	(0.0298)*	0.3439	(0.1125)*
Indian	0.1776	(0.0550)*	0.5122	(0.1103)*
White	0.2273	(0.0739)*	0.6685	(0.0698)*
Occupation				
Professionals	-0.2364	(0.1139)***	0.2994	(0.1437)***
Technical and associate professionals	-0.2598	(0.1529)	-0.1431	(0.0504)**
Clerks	-0.4405	(0.1741)**	-0.4510	(0.0602)*
Service workers & shop & market sales workers	-0.8854	(0.2194)*	-0.8001	(0.0932)*
Skilled agricultural and fishery workers	-0.9046	(0.2994)*	-1.2750	(0.1505)*
Craft and related trade workers	-0.8856	(0.2828)*	-0.7697	(0.0952)*
Plant and machine operators and assemblers	-0.7333	(0.2052)*	-0.8168	(0.1718)*
Elementary Occupation	-0.9111	(0.2325)*	-1.0679	(0.1067)*
Observations	1621		3107	
R-squared	0.3868		0.5571	

Source: Author's own calculations using LFS

Robust standard errors in parentheses

* Statistically significant at the 1% level

** Statistically significant at the 5% level

*** Statistically significant at the 10% level

Evaluation of the OLS estimates for females in the public and private sectors reveal a similar picture to the OLS estimates for males in these sectors respectively. Returns to education are markedly higher in the private sector for females than they are for females in the public sector. All occupation coefficients are significantly different from the reference category. Relative to males, female returns to trade union membership are much smaller. Females in the public sector with trade union membership earn 28% more than females who do not belong to a trade union. Males in the same position earn 31% more. Trade union affiliation yields a larger return to females in the public sector than females in the private sector.

Table 5a: FIML estimation of the wage equation for the private and public sectors

	Males			
	Public		**Private**	
Variables				
Constant	2.1549	(0.4875)*	0.4427	(0.2108)**
Age	0.0185	(0.0210)	0.0655	(0.0079)*
Age2	-0.0002	(0.0002)	-0.0007	(0.0000)*
Experience	0.0104	(0.0040)*	0.0085	(0.0030)*
Experience2	0.0000	(0.0000)*	0.0000	(0.0000)*
Trade Union	0.2490	(0.0580)*	0.5818	(0.1036)*
Education				
Primary completed or less	0.0589	(0.1252)	0.2351	(0.0509)*
Incomplete High School	0.0932	(0.1405)	0.4689	(0.0507)*
Complete High School	0.5295	(0.1137)*	0.8434	(0.0609)*
Tertiary Education	0.7845	(0.1433)*	1.2614	(0.0969)*
Race				
Coloured	0.1971	(0.0405)*	0.2377	(0.00937)**
Indian	0.3210	(0.0729)*	0.4515	(0.0699)*
White	0.4613	(0.0570)*	0.7227	(0.0476)*
Occupation				
Professionals	-0.0061	(0.1082)	0.1083	(0.1076)
Technical and associate professionals	-0.1998	(0.0957)**	-0.2071	(0.0951)**
Clerks	-0.4910	(0.1155)*	-0.5686	(0.0902)*
Service workers & shop & market sales workers	-0.5822	(0.1018)*	-1.0078	(0.0848)*
Skilled agricultural and fishery workers	-0.8600	(0.1431)*	-1.1734	(0.1158)*
Craft and related trade workers	-0.5839	(0.1240)*	-0.5619	(0.0962)*
Plant and machine operators and assemblers	-0.5454	(0.1372)*	-0.7791	(0.1026)*
Elementary Occupation	-0.8548	(0.1152)*	-1.1151	(0.0986)*

Source: Author's own calculations using LFS
Robust standard errors in parentheses
* Statistically significant at the 1% level
** Statistically significant at the 5% level
*** Statistically significant at the 10% level

FIML yields similar results to the OLS estimations[7]. A very interesting finding is that of trade union membership. The return to trade union membership is smaller in the

[7] A Wald test rejects equality of regression coefficients between the public and private sectors

public service at 25% (compared to 31% calculated using OLS). The private sector trade union membership gain is stable at 58%. This leads to larger wage gains for male trade union members who are employed in the private sector. For both males and females in the public sector, age does not significantly affect wages. Experience appears to be the more influential factor, as evidenced in both the OLS and FIML estimations. In the public sector, only completed high school and tertiary qualifications significantly differ in their effects on wages from no educational attainment. All occupations except for Professionals earn significantly less than legislators, senior officials and managers in both the public and private sectors.

Table 5b: FIML estimation of the wage equation for the private and public sectors (females)

	Females			
	Public		**Private**	
Variables				
Constant	1.9494	(0.4875)*	0.5225	(0.2893)***
Age	0.0380	(0.0210)	0.0534	(0.0119)*
Age2	-0.0004	(0.0002)	-0.0006	(0.0001)*
Experience	0.0087	(0.0040)*	0.0116	(0.0034)*
Experience2	0.0000	(0.0000)*	0.0000	(0.0000)*
Trade Union	0.2738	(0.0328)*	0.2373	(0.0503)*
Education				
Primary completed or less	0.0095	(0.1252)	0.2209	(0.0948)**
Incomplete High School	-0.0095	(0.1405)	0.4416	(0.1044)*
Complete High School	0.4138	(0.1137)*	0.8352	(0.1039)*
Tertiary Education	0.7153	(0.1433)*	1.0412	(0.1340)*
Race				
Coloured	0.0998	(0.0405)*	0.3504	(0.1149)*
Indian	0.1846	(0.0729)*	0.5222	(0.1108)*
White	0.2360	(0.0570)*	0.6824	(0.0736)*
Occupation				
Professionals	-0.2401	(0.1082)	0.2461	(0.1502)
Technical and associate professionals	-0.2660	(0.0957)**	-0.1749	(0.0487)*
Clerks	-0.4389	(0.1155)*	-0.4560	(0.0590)*
Service workers & shop & market sales workers	-0.8783	(0.1018)*	-0.7983	(0.0936)*
Skilled agricultural and fishery workers	-0.9096	(0.1431)*	-1.2686	(0.1496)*
Craft and related trade workers	-0.8648	(0.1240)*	-0.7590	(0.0957)*
Plant and machine operators and assemblers	-0.7154	(0.1372)*	-0.8035	(0.1705)*
Elementary Occupation	-0.9048	(0.1152)*	-1.0625	(0.1068)*

Source: Authors own calculations using LFS

Robust standard errors in parentheses

* Statistically significant at the 1% level

** Statistically significant at the 5% level

*** Statistically significant at the 10% level

For females in the private sector, individual characteristics affect earnings significantly. All but one of the coefficients is significant, the professional occupation category. As expected, the coefficients on education and experience are positive and sizeable, but still smaller than those of males in the private sector. Returns to education at all levels are significantly different from zero for the private sector. In particular, returns to education for females are markedly higher in the private sector. All racial earnings are significantly different from zero. The largest earnings advantage is captured by White workers. On the other hand, in the public sector, earnings of individuals with completed primary or incomplete high school do not vary significantly from those with no educational attainment.

For the public sector, only those with completed high school or above enjoy an earnings advantage. Indian individuals' wages are significantly different from African individuals' wages, with female Indian workers earning 18% more than female African workers in the public sector. This figure is 52% for the private sector.

While an understanding of the factors allocating workers into private versus public formal employment is important in its own right, in any analysis of the wage differentials, it functions as a control for the endogeneity that results from the fact there is indeed sector selection that precedes actual earnings. Indeed we do observe substantial differences in coefficients between the two methodologies. For this reason, we proceed by calculating wage differentials based on the FIML estimations only.

7. Wage Differentials

Given the selection equation and sector-specific wage equations presented in section 5, we can compute wage differentials from our study sample. There are two distinct methods for calculating wage differentials from selection models (Gyourko and Tracy, 1988). When calculating unconditional wage differentials from expected wages in each labour market sector, the selection effect is set to zero. In contrast, the conditional wage differential includes the selection effects in the expected wages in each labour market sector.

Table 6: Predicted log wages conditional on being employed in the particular sector

	Males			
	Public		**Private**	
	Mean	***St Dev***	**Mean**	***St Dev***
All Workers	3.081*	*0.570*	2.059*	*0.846*
Trade Union	3.192*	*0.504*	2.564*	*0.672*
Education				
No education	2.164*	*0.233*	1.194*	*0.412*
Compete Primary	2.237*	*0.309*	1.497*	*0.495*
Incomplete High	2.386*	*0.344*	1.833*	*0.438*
Complete High	3.157*	*0.358*	2.482*	*0.669*
Tertiary	3.720*	*0.326*	3.588*	*0.614*
Race				
African	2.971*	*0.541*	1.766*	*0.638*
Coloured	3.026*	*0.542*	1.873*	*0.675*
Indian	3.341*	*0.454*	2.748*	*0.582*
White	3.639*	*0.398*	3.314*	*0.58*

Note: * indicates that the difference between the public and private sector log wage is statistically different from zero at the 95% confidence level.

For all male public sector workers, the average predicted log hourly wage is 3.081 (R 21.78) compared to private sector workers who earn 2.059 (R7.84). This represents a

basic wage differential in favour of public sector workers of 177%. Male members of trade unions earn substantially larger wages in the public sector than in the private sector. The average male employee in the public sector who subscribes to a trade union earns an hourly log wage of 3.192 (R24.34) compared to male private sector employees who subscribe to trade unions who earn 2.56 (R12.99). This represents a wage differential between the public and private sector for male trade union members of approximately 87%.

Differences in earnings can vary depending on the characteristics of workers such as sector of employment, age, race, gender, level of experience, trade union affiliation and educational attainment. Tables 6 and 7 presents wage differentials between the public and private sectors by trade union affiliation, educational attainment and race.

Table 7: Predicted log wages conditional on being employed in the particular sector

	Females			
	Public		**Private**	
	Mean	***St Dev***	**Mean**	***St Dev***
All Workers	2.989*	*0.526*	1.819*	*0.779*
Trade Union	3.096*	*0.471*	2.057*	*0.667*
Education				
No education	2.169*	*0.185*	1.194*	*0.307*
Compete Primary	2.212*	*0.260*	1.241*	*0.358*
Incomplete High	2.287*	*0.305*	1.555*	*0.408*
Complete High	3.070*	*0.347*	2.278*	*0.592*
Tertiary	3.554*	*0.262*	3.174*	*0.588*
Race				
African	2.927*	*0.524*	1.488*	*0.547*
Coloured	2.898*	*0.513*	1.768*	*0.595*
Indian	3.175*	*0.433*	2.596*	*0.486*
White	3.350*	*0.389*	3.028*	*0.481*

Note: * indicates that the difference between the public and private sector log wage is statistically different from zero at the 95% confidence level.

Within the public sector, males earn approximately 9.6% more than females. A racial breakdown reveals a significant wage advantage for White workers over other racial groups in the public sector, ranging from 19% to 57% and 34% to 95% for females and males respectively. Males earn 27% more than females in the private sector. The racial breakdown in the private sector reveals a similar pattern to the public sector, but the wage differential is substantially larger for White workers, varying between 76% and 370% for males and 54% to 366% for females.

Comparing wage differentials of the public and private sectors by educational attainment, we observe higher differentials at lower educational levels. Accordingly female public sector employees with no education earn on average 330% more than their private sector counterparts. The wage differential narrows substantially for both genders as educational attainment is increased. The wage advantage for male public sector workers with completed secondary school is 96%. For male workers with a tertiary qualification, the wage premium is narrowed substantially. Significantly, female workers in the public sector with a tertiary qualification enjoy significant wage advantages over females with the same educational attainment in the private sector.

If wage differentials favour public sector workers almost repeatedly, then it becomes interesting to evaluate whether those workers currently employed in the private sector would have a similar wage advantage if they chose private sector employment instead.

Table 8 presents simulated results of a public (private) sector worker's log hourly wage if they were employed in the private (public) sector.

Table 8a: Predicted log wages conditional on being employed in the alternative sector

	Males			
	Public		**Private**	
	Mean	***St Dev***	**Mean**	***St Dev***
All Workers	2.906*	*0.830*	2.605*	*0.576*
Trade Union	2.849*	*0.483*	3.094*	*0.721*
Education				
No education	1.481*	*0.394*	2.083*	*0.263*
Compete Primary	1.760*	*0.458*	2.183*	*0.299*
Incomplete High	2.138*	*0.498*	2.290*	*0.325*
Complete High	2.976	*0.546*	2.944	*0.419*
Tertiary	3.876*	*0.513*	3.650*	*0.409*
Race				
African	2.751*	*0.784*	2.389*	*0.421*
Coloured	2.790*	*0.752*	2.506*	*0.457*
Indian	3.258*	*0.679*	3.133*	*0.375*
White	3.726*	*0.626*	3.476*	*0375*

Note: * indicates that the difference between the public and private sector log wage is statistically different from zero at the 95% confidence level.

For male public sector workers, the expected log hourly wage in the private sector is 3.094 (R13.53), while for private sector workers, the expected log hourly wage in the public sector is 2.849 (R17.27). This is a wage premium for the average private sector worker of 27%, unconditional on the sector of employment. Male public sector workers who switch to private sector employment maintain their earnings advantage. The average private sector worker with no education can expect to earn less if employed in the public sector instead.

Table 8b: Predicted log wages conditional on being employed in the alternative sector

Females

	Public		**Private**	
	Mean	***St Dev***	**Mean**	***St Dev***
All Workers	2.481	*0.762*	2.448	*0.514*
Trade Union	2.592*	*0.693*	2.685*	*0.434*
Education				
No education	1.065*	*0.282*	2.049*	*0.211*
Compete Primary	1.333*	*0.359*	2.084*	*0.757*
Incomplete High	1.706*	*0.436*	2.117*	*0.297*
Complete High	2.586*	*0.469*	2.738*	*0.404*
Tertiary	3.326	*0.480*	3.388	*0.352*
Race				
African	2.301*	*0.711*	2.281*	*0.395*
Coloured	2.332*	*0.434*	2.482*	*0.701*
Indian	2.925*	*0.572*	2.892*	*0.422*
White	3.282*	*0.518*	3.151*	*0.400*

Note: * indicates that the difference between the public and private sector log wage is statistically different from zero at the 95% confidence level.

For female public sector workers, the expected log hourly wage in the private sector is 2.481 (R11.95), while for private sector workers, the expected log hourly wage in the public sector is 2.448 (R11.56). This represents a statistically insignificant wage advantage of 3%. At lower levels of education, if female public sector workers were employed in the private sector, they would still earn a wage premium. Females with tertiary qualification can choose to work in either sector as the wages are insignificantly different between the sectors. The race variables indicate that female private sector employees who switch to the public sector would have the wage advantage.

8. Summary and Policy Options

In this paper I have analysed the differences in wages across the formal sector labour market in South Africa and investigated the factors that influence a worker's probability of employment in either sector. This latter step is a contribution to the South African literature as, up to this point, the empirical work has not given recognition to the fact that public and private sector employment may be a choice. The main findings follow.

Females who are members of trade unions are less likely than male trade union members to gain employment in the public sector. For both males and females, individuals with higher levels of work experience are more likely to be working in the public sector. Female individuals with completed primary schooling or less are less likely to work in the public sector than workers with no educational attainment. Notably, Coloured and White workers are less likely than African workers to work in the public sector. Individuals associated with electricity, construction and community, and social work are more likely than individuals associated with the agricultural industry to be employed in the public sector.

Examination of the wage structure of the South African labour market reveals that the differences in wages between the public and private sectors are positive and high. During September 2002, the average wage in the public sector was 174% larger than the average wage in the private sector. Once in the public sector, the average male earns 177% more than his private sector counterpart. Similarly for females, the average public sector worker earns 222% more than her private sector counterpart.

The wage structure differs across the two sectors. Wage distributions illustrate that public sector pay is higher at most educational levels and experience, but tapers at the highest educational levels. Pedersen *et al* (1990) allude to a smaller variance in the distribution of public sector wages, a characteristic of public sector pay around the world. They argue that this reflects more rigid pay scales than in the private sector. The narrower wage distribution in the public sector is attributed to the higher mean wages of the lower-income earners in the public sector when compared to the private sector. Scrutiny of pay scales in the South African public sector coupled with the results of this analysis support Pedersen *et al*'s claim of pay rigidity in the public sector. The findings also show there is a differing underlying process in wage determination between the public and private sectors. The determination of pay scales in the public and private sectors appear to be different at a surface level, but it would be informative to thoroughly investigate pay scales to determine its effect on wages and employment. Moreover, it would be useful to explore the differences arising out of this study with LFS panel data.

The question arises of the consequences of the wage differential in the formal sector of the labour market. It does not appear that public sector employees are more efficient than their private sector counterparts, given that if private sector employees were employed in the public sector instead, the wage differential partly swings in their favour. It could be argued for that reason public sector employees are 'lucky' in their selection into employment in the public sector.

Another issue that is related to the results of the paper is whether an increase in public sector wages could reduce corruption and thereby lead to a more efficient public

service. This is an important issue in public management and retention of staff. Contrary to common belief public sector workers earn higher wages than an identical private sector worker, so raising the public sector wage would not be an optimal policy solution. Increasing public sector wages would add significantly to public expenditure while not guaranteeing a decrease in corruption or an increase in government efficiency (Panniza and Qiang, 2005).

An alternative suggestion for the large wage premiums that exist on a racial basis could be explained by means of government policy to promote the employment of previously disadvantaged individuals in the workplace. This argument is weak given the results, which show that White workers have a larger public sector wage differential than Black workers. The wage differential for Black males is 233% in favour of public sector employees while for White workers it is 38%. Closer examination of the White/Black wage differential within the public sector exposes an earnings advantage for White workers over Black workers[8]. Arguably, the Black/White wage gap is smaller in the public sector than in the private sector. It could therefore be weakly argued that the state is indeed acting as 'leading by example'. This type of non-market character of wage differentials is reasoned by Lindauer and Sabot (1983) as distorting the allocation of human resources and as a result negatively impacting on economic growth. With ASGISA and the attainment of 6% economic growth as the main government economic policy over the next few years, an investigation into the non-market nature of wage differentials in South Africa is required if the country is to capitalise on such extensive wage differentials.

[8] White workers in the public sector have an earnings advantage over all other races.

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APPENDIX

The panel data set used to illustrate the potential of panel estimates for observing long-term wage differentials comes from the South African Labour Force Survey, covering the period September 2002 to September 2003.

In September 2001 a completely new sample was drawn from Statistics South Africa's Master Sample. This sample of 30 000 households was the basis for 4 subsequent waves. However, the meta-data that Statistics South Africa releases with each cross-section, details that there was a 20% out-rotation of households for each interview wave, and a 20% in-rotation of households to maintain the sample size (Statistics South Africa, 2002). Due to the lack of repeat observations across all waves for these 20% of households, they were effectively excluded from the analysis. In September 2004 a new sample was drawn based on the Population Census of 2001, limiting the nature of the derived panel to 3 years (Statistics South Africa, 2005).

Statistics South Africa (SSA) states that in each cross-section of the LFS households retained the same unique household identifier, enabling the linking of cross-sections to form a large panel data set (Statistics South Africa, 2003). Based on this information, a unique identifier at the individual level was created by concatenating the household number with the person identifier number. Cross-sections are pooled to form the panel data set based on the recurrence of individuals across all periods, conditioning on age, race and gender. This method is shown to be flawed by Ranchhod and Dinkelman (2006) as SSA has confirmed that the person orders within households are not maintained across cross-sections.

These estimates should be considered unconditional estimates due to the application of the switching regression model to panel data. As no variable was included in the study to account for time-varying individual characteristics, the results below are an indicator of the potential impact panel studies could have on policy formation in future.

Table A: FIML of sector selection applied to panel data set of LFS

Variables		Public
Constant	-2.5044	(1.0179)*
Age	0.0179	(0.0488)
Age^2	-0.0004	(0.0006)
Experience	0.0843	(0.0179)*
$Experience^2$	-0.0014	(0.0005)*
Female	-0.3032	(0.1208)*
Marital Status	-0.0558	(0.1200)
Education		
Primary completed or less	-0.4867	(0.2492)**
Incomplete High School	-0.4466	(0.2415)**
Complete High School	-0.3096	(0.2566)
Tertiary Education	0.0066	(0.3058)
Race		
Coloured	-0.3994	(0.1248)*
Indian	0.0105	(0.1989)
White	-0.4776	(0.1696)*
Occupation		
Professionals	-0.0486	(0.2617)
Technical and associate professionals	0.1522	(0.2416)
Clerks	0.2929	(0.2559)
Service workers & shop & market sales workers	0.0456	(0.2585)
Skilled agricultural and fishery workers	-0.4097	(0.5081)
Craft and related trade workers	0.3077	(0.2646)
Plant and machine operators and assemblers	0.0593	(0.2671)
Elementary Occupation	0.1595	(0.2613)
Industry		
Mining	-0.7693	(0.4255)**
Manufacturing	0.3300	(0.3146)
Electricity and Gas	2.6073	(0.3407)*
Construction	1.7817	(0.3486)*
Wholesale & retail trade	0.3752	(0.3120)
Transport & storage	2.6377	(0.3146)*
Financial Intermediation	1.1809	(0.3508)*
Community and Social Work	3.4059	(0.3205)*
Private Households	-3.6734	(0.5899)*

Table B: OLS estimation of the wage equation for the private and public sectors

	Public		Private	
Variables				
Constant	1.5141	(0.4476)*	0.1981	(0.2779)
Age	0.0734	(0.02021)*	0.0842	(0.0124)*
Age2	-0.0008	(0.0002)*	-0.0008	(0.0002)*
Experience	0.0073	(0.0075)	0.0268	(0.0051)*
Experience2	-0.0001	(0.0002)	-0.0004	(0.0002)*
Female	-0.1618	(0.0347)*	-0.2233	(0.0362)*
Education				
Primary completed or less	-0.1603	(0.1363)	0.3999	(0.0761)*
Incomplete High School	0.1777	(0.1201)	0.7184	(0.0767)*
Complete High School	0.4682	(0.1223)*	1.0574	(0.0812)*
Tertiary Education	0.7089	(0.1351)*	1.5001	(0.1148)*
Race				
Coloured	0.1900	(0.0472)*	0.1459	(0.0382)*
Indian	0.0456	(0.1148)	0.3921	(0.0655)*
White	0.3275	(0.0470)*	0.5624	(0.0597)*
Occupation				
Professionals	-0.1676	(0.1088)	-0.3111	(0.1201)*
Technical and associate professionals	-0.1632	(0.1032)	-0.3098	(0.0915)*
Clerks	-0.5039	(0.1060)*	-0.5964	(0.0838)*
Service workers & shop & market sales workers	-0.5355	(0.1117)*	-0.9319	(0.0908)*
Skilled agricultural and fishery workers	-0.9238	(0.2141)*	-0.8919	(0.2573)*
Craft and related trade workers	-0.6777	(0.1359)*	-0.5456	(0.0808)*
Plant and machine operators and assemblers	-0.7259	(0.1249)*	-0.7704	(0.0841)*
Elementary Occupation	-0.8179	(0.1187)*	-1.0774	(0.0846)*
NxT	*1206*		*1734*	
R-square	*0.4081*		*0.5084*	

Source: Authors own calculations

Robust standard errors in parentheses

* Statistically significant at the 5% level

** Statistically significant at the 10% level

Table C: FIML estimation of the wage equation for the private and public sectors[9].

	Public		Private	
Variables				
Constant	1.8592	(0.5341)*	0.2080	(0.3798)
Age	0.0665	(0.0246)*	0.0837	(0.0167)*
Age2	-0.0007	(0.0003)*	-0.0009	(0.0002)*
Experience	-0.0039	(0.0110)	0.0266	(0.0070)*
Experience2	0.0001	(0.0003)	-0.0004	(0.0002)**
Female	-0.1407	(0.0428)*	-0.2244	(0.0504)*
Education				
Primary completed or less	-0.1011	(0.1417)	0.3968	(0.1103)*
Incomplete High School	0.2021	(0.1372)	0.7157	(0.1098)*
Complete High School	0.4618	(0.1406)*	1.0534	(0.1154)*
Tertiary Education	0.6659	(0.1583)*	1.4931	(0.1549)*
Race				
Coloured	0.2203	(0.0590)*	0.1486	(0.0551)*
Indian	0.1147	(0.1186)	0.3947	(0.0919)*
White	0.3972	(0.0758)*	0.5653	(0.0799)*
Occupation				
Professionals	-0.2118	(0.1102)**	-0.3212	(0.1398)**
Technical and associate professionals	-0.2285	(0.1063)*	-0.3193	(0.1246)*
Clerks	-0.5505	(0.1088)*	-0.5980	(0.1080)*
Service workers & shop & market sales workers	-0.5910	(0.1199)*	-0.9325	(0.1181)*
Skilled agricultural and fishery workers	-0.9867	(0.2061)*	-0.8901	(0.3471)*
Craft and related trade workers	-0.6243	(0.1385)*	-0.5445	(0.1062)*
Plant and machine operators and assemblers	-0.7251	(0.1353)*	-0.7744	(0.1106)*
Elementary Occupation	-0.8808	(0.1293)*	-1.0765	(0.1100)*

Source: Authors own calculations
Robust standard errors in parentheses

* Statistically significant at the 5% level

** Statistically significant at the 10% level

[9] A Wald test rejects equality of regression coefficients between the public and private sectors

Table D: Predicted log wages conditional on being employed in the alternative sector

	Public		Private	
	Mean	***St Dev***	**Mean**	***St Dev***
All Workers	3.096*	*0.524*	2.855*	*0.631*
Gender				
Females	3.081*	*0.530*	2.862*	*0.547*
Males	3.105*	*0.520*	2.850*	*0.694*
Education				
No education	2.580*	*0.168*	1.381*	*0.231*
Compete Primary	2.549*	*0.258*	1.909*	*0.323*
Incomplete High	2.945*	*0.302*	2.420*	*0.429*
Complete High	3.368*	*0.393*	2.937*	*0.386*
Tertiary	3.992*	*0.394*	3.555*	*0.362*
Race				
African	2.909*	*0.409*	2.761*	*0.597*
Coloured	3.025*	*0.471*	2.740*	*0.543*
Indian	3.284*	*0.389*	3.001*	*0.579*
White	3.809*	*0.396*	3.482*	*0.553*

Note: * indicates that the difference between the public and private sector log wage is statistically different from zero at the 95% confidence level.