South African Trade Unions: an Overview for 1995 to 2005

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ABSTRACT

Trade unions played an important role in South Africa's transition from apartheid in 1994 and continue to play a very public role in the South African economy. Trade unions are found to have had an increasingly positive effect on members' wages, although it appears that this increase has resulted in part from changes in the composition of union membership. Unions also had an inequality-reducing character, with union premiums for workers at the lower end of the wage distribution being greater than those for workers at the higher end of the wage distribution.

Keywords: Wage level and structure, Trade unions, Objectives, Structure and effect
JEL codes: J31, J51

INTRODUCTION

The importance and complex nature of trade unions have rendered them an important subject of investigation in a range of research fields (Card, Lemieux and Riddell, 2004: 528). South African trade unions in recent years have been particularly vocal in their demands for unionised workers and indeed in their opinions on economic issues in South Africa. South African unions are therefore often in the public eye and are seen by many as creating unnecessary rigidity in the labour market. (Business Day 14 April 2008).

Unions engage in three broad categories of activities: traditional wage setting activities, political activities; and maintaining and influencing relationships between their members and employers. Union activity may result in increased wages, which implies possible changes in wage equality within markets and between workers. An important aspect of the South African labour market is the fact that union wage benefits are extended to nonunionised workers through the Industrial Council system (Butcher and Rouse, 2001: 349-350).

The supposed influence of unions on wages, productivity, unemployment and economic growth warrants investigation of and the quantification of the impact of unions, especially in the case of South Africa in which trade unions and the rigidity implied by their actions create some contention in both the economic and political arena. This study investigates the estimated union wage premium (the excess of unionised workers' wages over than of their nonunion counterparts) in South Africa for the period 1995 to 2005. The aim is not exact measurement of the union premium or union wage gap, but to disentangle the broad trend of the premium so as to obtain an indication of the extent and trend of union power over the last decade (Hildreth 1999).

Section 1 presents a theoretical discussion of the influence of unions on wages and briefly examines empirical research on South Africa. Section 2 discusses specific econometric problems pertaining to the measurement of the union premium and potential compensation for these problems. Five econometric methods are discussed: Ordinary least squares (OLS) regression, the treatment effects model, the switching model, Oaxaca-Blinder decomposition of the union premium and quantile regression. Section 3 reviews the institutional character of unions and collective bargaining in South Africa, providing a historical sketch and descriptive analysis of South African union membership. The estimated union wage premium for 1995 to 2005 is discussed in section 4. Section 5 concludes.

1. UNIONS AND WAGES

Wages within a specific firm or industry are determined primarily by factors affecting the demand for and supply of labour, mediated within the institutional realm of the market and by the resulting "power struggle" between employers and employees.

Although unions influence many areas of the economy, their role in wage negotiations attracts the most attention. Unions influence earnings by compressing wages within unionised sectors and by decreasing wage inequality (although the fact that unions aim to increase wages for members could enhance inequality between workers with similar characteristics). Wages play a pivotal role in perceptions of fairness, equality and efficiency within a country, and so the influence that unions have on wages is a highly contentious issue. Indeed, the relationship between unions and earnings is often controversial. (Altman, 2005: 1). This chapter discusses the theoretical background to this relationship before discussing empirical research on South Africa.

1.1 UNIONS AND EARNINGS: UNION WAGE PREMIUM

Fang and Verma (2002) distinguish between two measures of the union wage premium (the excess of union workers' wages over that of their nonunion counterparts). The "raw" union premium refers to the gross union premium independent of human or workplace influences. The "adjusted" premium is however a more accurate reflection of the union premium. The adjusted premium reflects comparable differences across firms, taking account of human capital and firm specific characteristics (Feinberg-Daniela and Lonti, 2006: 29).

The origin of the union premium and its effect on profits is the focus of the analysis of this premium. Freeman and Medoff (1984) understand the union premium to result from rents extracted from monopolies in exclusive positions. Blanchflower and Bryson (2004) extend the possible origin of the union premium to three sources. The first of these is the possibility that union workers are more productive than nonunion workers, therefore increasing profits for firms which in turn results in higher wages. If this is the case, the union premium implies little penalty in terms of employment. Secondly, union workers may be concentrated primarily in an environment or industry in which significant profits are made, resulting in higher remuneration for workers. The concentration of union workers in such industries may be the result of either the choice of employers to hire mainly union members, or of workers' job choice. Either way, there seems to be limited injury to either worker of employer. However, increased union density can cause a potential union wage premium. The third possibility is that the wage premium is a "tax on normal profits", implying adverse effects for investment, employment and price

levels. This often forms the basis for criticism of union activity (Blanchflower and Bryson, 2004).

1.2 THE UNION PREMIUM IN SOUTH AFRICA

Mwabu and Schultz (1997) use quantile regression on 1993 data, finding the union premium for workers in the lowest decile of the wage distribution to be eight times larger than that received by union workers in the highest decile of the wage distribution. Their findings support the notion that low earning workers derive the most benefits from union participation, as indicated by the larger union premium they receive.

Hofmeyr and Lucas (2001) calculate an increase in the union premium for black urban males from 8 percent in 1985 to 26.5 percent in 1993, adjusted for personal and industry characteristics. This increase could be the result of a change in either membership composition or in the rewards to workers' productive characteristics. The authors conclude that the increase can be ascribed to differences in earnings structure between union and nonunion workers, regardless of attributes of individual workers (Hofmeyr and Lucas, 2001: 686).

Butcher and Rouse (2000) observe a union premium of 20 percent for black workers and 10 percent for white workers, using the 1995 October Household Survey[1]. An industrial council premium of 6 to 10 percent is estimated for black nonunion workers, acting as a rough measure of the extension of union benefits to nonunion members through collective bargaining. However, despite this extension, union workers still earn marginally more than nonunion workers do if both groups are covered by industrial council agreements: union workers earn a uniform wage premium, regardless of industrial council coverage. Butcher and Rouse (2000) report that the least skilled workers benefit most from both industrial council agreements and union membership.

Using data from household surveys in 1993, 1995 and 1999, Hofmeyr (2002) finds a significant wage differential between formal sector black male union members and those who do not belong to unions. Hofmeyr concludes that union workers have been able to maintain their wage and employment levels, relative to their nonunion counterparts, indicating some protection for workers belonging to unions. According to this study, the labour markets appear to be segmented with restricted movement between segments, possibly implying an inefficient allocation of resources and human capital.

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[1] The authors make use of gross monthly income rather than hourly earnings as an earnings measure which may be the source of differences between their estimates and those estimated in other studies of the same time period (Butcher and Rouse 2000:19).

2. STATISTICAL THEORY & METHODOLOGIES

The measurement of wage premiums (be it union premiums, gender premiums etc) is conditional on the circumstances within an era and often reflects the contemporary research of the time. (Fang and Verma, 2002). The best method for the measurement of the union premium is still under debated. The remainder of the chapter discussed different econometric techniques used in the estimation of the union premium.

2.1 SAMPLE SELECTION BIAS

In his seminal paper, Heckman (1979) introduces a solution to the problem of sample selection bias. In the case of selection into a certain sample, whether by choice (self-selection) or not (employment selection, for example), the estimation acquired using OLS will produce inconsistent results. Therefore using non-random samples will result in biased population estimates[2]. Selection may be based on observable or unobservable characteristics.

The decision to join a union may contain some sample selection bias since the sample of wage earners from which union members come excludes non-participants in the labour market, regardless of their level of education, experience and so on. The coefficients observed are therefore biased as the influence of other earnings determinants is not accurately represented (Lewis, 1986: 1140).

Heckman (1979) proposes a selection term, derived from a binary response model (probit), to control for selection into a particular state. From this preliminary estimation, an Inverse Mills Ratio (λ)[3] is calculated and included as an additional variable in the

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[2] An example is the modeling of earnings, which is only observed for those with employment, restricting one to a non-random sample.

[3] The Inverse mills Ratio is calculated as $\hat{\lambda}_i = \frac{\phi(\gamma Z_i)}{\Phi(-\gamma Z_i)}$

where

Z_i is a $m \times 1$ vector of explanatory variables (observations) for individual *i* in the probit

γ is a $m \times 1$ vector of estimated parameters from probi $\phi(x)$ is a standard normal density function

$\Phi(x)$ is a cumulative standard normal distribution function

earnings function (Heckman, 1979 and Lee, 1979). The ratio included corrects for over- and underestimation of the influence of individual observations and aims to correct inconsistencies of coefficients by treating it as an omitted variable problem (Wooldridge, 2002: 247).

2.1.1 Relevance of the Selection Term

The appropriateness of the selection term is often questioned, however, since the selection term is decidedly sensitive to the specification of the model. Furthermore, there is substantial variance in results (Lewis, 1986; Freeman and Medoff, 1984). Selection models are also questioned, since selection may be double-sided but in opposite directions for workers with high and low measured skill. Positive selection occurs for lower-skilled workers since they stand to benefit more from union membership, and negative selection for skilled workers. This begs the question whether some part of the wage premium should be attributed to the correlation between earnings and unobserved skills factors.

2.1.2 Endogenous Union Status

Union premiums are typically estimated using OLS with a union dummy variable that captures the effect of unions on earnings. However, research has evolved to view union membership as an endogenous decision. Evidence exists which indicates that union status may indeed involve some form of self-selection and therefore that the independent choice variable is correlated with some unobservable variables captured by the error term. Furthermore, the possibility of reverse causality between the union decision and potential earnings exists. An endogenous union membership decision renders error terms heteroscedastic, implying biased OLS estimates.

Although the reverse causality between wage and union membership is recognized, it is of limited importance on an aggregate level. Unions do contend for higher wages for their members, but they are unable to increase the level of earnings for the entire workforce. It is therefore safe to assume causality to run primarily from earnings to unionization (Hirsch, 1980).

As discussed earlier, sample selection models suffer shortcomings and so despite the fact that endogenous union status is theoretically conceivable, econometrics techniques fail to measure it in any satisfactory manner.

2.2 ECONOMETRIC METHODS

Five econometric techniques are used in this paper to track the union premium in South Africa between 1995 and 2005. These techniques include OLS regression, the treatment effects model, the switching model , a Oaxaca-Blinder decomposition and quantile regression.

2.2.1 OLS Regression

OLS wage regression (in this case) estimates the proportional impact of variables on wages (Blackburn, 2005).

$$log\ W_i = a + \beta\ X_i + \delta\ U_i + \eta_i \qquad (1)$$

Equation 1 relates the log of hourly earnings to household and workers characteristics (X_{ij}) and captures the effect that union membership might have on hourly earnings through the inclusion of a dummy variable (U_i). The error term is $\eta_i \sim \mathrm{N}\left(0, \delta^2\right)$.

OLS only allows an intercept shift between union and nonunion workers, however, and so rewards are not allowed to differ between union and nonunion workers. OLS estimation also treats union membership as an exogenous variable, therefore running the risk of simultaneity bias. This method does not allow the measurement or estimation of differences in unobservable characteristic between union and nonunion workers (Addison and Hirsch, 1986: 124). Lewis (1986) suggests that OLS estimates of the union coefficient (δ) will be biased upwards because higher wages result in higher quality workers subsequent to screening. This upward bias therefore implies a positive correlation between omitted variables and union membership. OLS estimates should therefore be regarded as the upper bound of the estimated mean union premium (Lewis, 1986). Despite the aforementioned drawbacks of OLS regression, it serves as a useful method to which to compare other techniques[4].

[4] Preconditions apply to the OLS technique and estimates are only consistent if the error term is independently distributed from the regressors. OLS assumes errors from regressions are homoscedastic and are normally distributed. Heteroscedasticity causes inefficiency. Blackburn (2005) concludes that log-wage models using OLS estimations may overstate the union impact by as much as 20-30 percent due to

2.2.2 Treatment Effects Model

The treatment effects model allows for endogenous union status, therefore controlling for the possibility of correlation between the independent choice variable and some unobserved variables captured by the error term, and the possibility of reverse causality between union membership and potential earnings. As with OLS, however, returns to productive characteristics are assumed constant over union and nonunion workers,

$$\log W_i = \alpha + \beta X_i + \delta U_i + \eta$$

indicating an intercept effect.

$$\log W_i = \alpha + \beta X_i + \delta U_i + \eta$$

log

(2)

According to this model, union status (U_i) is endogenous. The model therefore differs from standard OLS where U_i enters as an exogenous dummy variable (Azam and Rospabe, 2005). In contrast, endogenous union membership is modeled as a latent variable U_i^*, which in this case is an observed decision. U_i^* is presumed to be a linear function of a set of exogenous variables Z_i(which includes at least one variable relating to union status and not to earnings), and a random component, u_i ,

$$U^*_i = \gamma Z_i + u_i ,$$

with the observed decision:

$$U_i = \begin{cases} 1 \;\; if \;\; U_i^* \geq 0 \\ 0 \;\; otherwise \end{cases} \qquad \text{and } (u_i ; \varepsilon_i) \sim \text{bivariate normal } \left[0,0,1,\delta_{\varepsilon_i},\rho_i\right]$$

A number of problems arise. If unobservable variables influencing earnings are correlated with the union membership decision, $\rho_i \neq 0$, and self-selection results. The sample will therefore not be random and the estimates obtained using OLS regression will be biased.

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heteroscedasticity and strongly doubts the efficiency of "robust" standard errors in correcting for this problem (Blackburn 2005:3). His study also rejects the normality assumption of the error terms, indicating biased estimates (although these biases are considered small in magnitude). Blackburn proposes the use of quasi maximum-likelihood methods that impose less stringent requirements on the error terms and remain consistent even if the underlying distribution is incorrect.

Union participation may be accounted for by using a binary mechanism in the form of a probit. From this, a selection term like that of Heckman (1979) and Lee (1978) may be derived and included in the earnings regression to correct for the sample selection problem (Booth, 1986; Hirsch, 1980; Deery and Decieri, 1990). The earnings regression therefore becomes

$$log\ W_i = \beta\ X_i + \delta' U_i + \rho_i \delta_{\varepsilon_i} \left(\frac{\phi(\gamma\ Z_i)}{\Phi(\gamma\ Z_i)} \right) + \eta_i \qquad (3)$$

The exact union premium for both the treatment effects model and the OLS method may be calculated as

$$\hat{u}_j = \exp(\hat{\delta}) - 1$$

Since both these models draw from OLS estimation, they suffer from the same drawbacks. The model requires consideration of the selectivity correction term in the earnings function. If the correction term (λ) is set to zero, the union premium may be interpreted as the gap between predicted earnings conditional on mean union characteristics and those conditional on mean nonunion characteristics. This assumes that samples are drawn at random from the population. The inclusion of the selection term in the earnings function serves only to obtain unbiased estimates of coefficients.

Alternatively, correlation between the error terms of the earnings equation and those of the selection equation may occur. In this case, the selection term will not be zero, indicating the influence of unobservable factors on both the earnings and decision processes. The mean value of the correction term is therefore integrated into the estimation of the union premium. Observed and unobserved characteristics are therefore held constant when earnings are compared. This results in a potentially broader interpretation of the union premium, although some of the variables which are held constant are ultimately unidentified. Certain conclusions about attribute differences between union members and nonunion members may be reached as a result of the inclusion of the mean correction term. These conclusions are however conditional on estimated values of unobserved variables, particularly in the case of a binary selection instrument (Hofmeyr and Lucas, 2001: 707).

2.2.3 Switching Model

Both the treatment effects and the OLS models discussed assume the β_j coefficients to be the same for both unionised and nonunionised workers, implying that workers' productive characteristics are rewarded the same way in both sectors. A switching model

corrects for this by allowing separate earnings regimes for the different sectors, which is the equivalent of interacting the union effect with each variable in a single regression equation.

$$log\ W_i^u = \beta_1^u\ X_i^u + \eta_i^u \quad (4)$$

$$log\ W_i^n = \beta_1^n\ X_i^n + \eta_i^n \quad (5)$$

A switching model will capture the union premium more accurately in sectors having different earnings structures.

The switching model estimates the union premium by

$$\hat{u}_j = \exp\left[\left(\beta^u - \beta^n\right)\overline{X}_n\right] - 1$$

$\overline{X}$ may be a vector of mean characteristics from either the union sample, the nonunion sample or a pooled sample (Azam and Rospabe, 2005: 26)[5]. Using the nonunion vector as the reference group means that the union premium should be interpreted as the additional income that nonunion members would earn if they joined a union given their existing attributes. If the union vector is used it means that the union premium represents the amount by which union members' income would fall in the absence of union membership, given their existing attributes.

2.2.4 Oaxaca-Blinder Decomposition

The traditional Oaxaca-Blinder (1973) decomposition method is widely used in economics, primarily to measure discrimination. The technique compares the wage structures of two distinct groups and decomposes the mean wage gap between the groups into a component which can be attributed to differences in the average productive characteristics of the two groups (the "explained" component) and the component that results from differences in the compensation structures between the groups (the "unexplained" component). The unexplained component is deemed an estimate of discrimination in the market (Oaxaca and Ransom, 1999: 1). In this study, the unexplained component is understood to be the union effect.

As in the switching model, potential complications enter with the choice of reference group (union or nonunion). Unlike in the switching model, however, the results obtained vary significantly depending on the group chosen as a reference group.

[5] The choice of sector does not influence the results obtained.

$$\ln(\overline{W}u) - \ln(\overline{W}n) = \Delta\overline{X}'\beta_u + \overline{X}'_n\Delta\beta \quad (6)$$

$$\ln(\overline{W}u) - \ln(\overline{W}n) = \Delta\overline{X}'\beta_n + \overline{X}'_u\Delta\beta \quad (7)$$

Equation 6 assumes that union wages will prevail in the absence of discrimination because the union earnings structure is used as reference weight for differences in characteristics. Equation 7 assumes that nonunion wages will prevail in the absence of discrimination. Neuman and Oaxaca (2004: 6) refer to this as the "familiar index number problem". Neumark (1988) explains that the choice of reference group is contingent on the nature of discrimination, implying the possibility that another earnings structure in addition to the binary choice categories might prevail in the absence of discrimination[6]. Decomposition using the pooled earnings structure is therefore proposed to result in a more adequate reflection of competitive structures in the market (Neumark, 1988; Oaxaca and Ransom, 1994). It also produces the lowest standard errors for estimated differences.

2.2.5 Quantile Regression

Quantile regression is used to investigate whether unions reduce inequality in the wages received by workers[7]. The method of quantile regression minimizes the absolute deviations of observations from the regression line (Kuan, 2004: 1). By minimizing the absolute deviations rather than the sum of the squared deviations, quantile regression is less sensitive to outliers, which do not have as much leverage on the estimates obtained using quantile regression as they do using OLS regression.

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[6] "Decomposing the wage differential between two groups to estimate wage discrimination should not be considered an algebraic exercise independent of the nature of the underlying discriminatory behavior" (Neumark 1988:294).

[7] Regression is broadly understood to be the quantification of the relationship that exists between the dependent (or response) variable and the explanatory variables (or covariates) (Yu, Lu and Stander, 2003: 332). Because ordinary least squares (OLS) regression is run for the whole sample, this method reports the mean relationship for the entire sample. OLS regression minimizes the sum of the squared errors in the conditional distribution of the dependent variable and so the estimate which it yields is the mean function of the conditional distribution of the response variable (Kuan, 2004: 1). OLS regression is therefore inadequate if one is interested in investigating what is happening in different parts of the sample (or in this particular case, at different points in the wage distribution) (Yu et al, 2003: 332). One characteristic of OLS regression that is particularly problematic is its sensitivity to outliers. Because OLS minimizes the sum of squared residuals, larger errors result in a "loss" in the precision of OLS estimates (Gujarati, 2003: 19)

Quantile regression is basically the fitting of a line to data points so that a given proportion of the data points lie below the line and the rest lie above the line (Deaton, 1997: 79). If, for example a quantile regression is run at the 80th percentile, then 80% of the data points will lie below the regression line and 20% of the data points will lie above the line. Therefore, this regression is run for the 80th percentile of the error structure. For this paper, quantile regressions are run at the 20th percentile, at the 50th percentile and at the 80th percentile. In this process, deviations of the observations below the fitted regression line (i.e. the bottom 20% of observations of the wage distribution) are weighted four times as heavily as those 80% of observations above the fitted regression line (at a ratio of 4:1). Similarly, the quantile regressions run at the 80th percentile are regressions run for the entire sample weighting the deviations of the top 20% of the wage distribution more heavily than those of the remainder of the wage distribution below the line.

An advantage of quantile regression is that this method makes it possible to formulate hypotheses that "suggest interactions between the residuals and the covariates such that the effect of a covariate will differ for individuals, depending on their position in the distribution of residuals" (Schultz and Mwabu, 1998: 685). We are therefore able to provide a less "parametrically restrictive" description of the way in which covariates affect the entire distribution of wages, illuminating the hypotheses on the mechanisms generating (in this particular case) wage inequality.

3. SOUTH AFRICAN UNIONS IN CONTEXT

3.1 INDUSTRIAL COUNCILS IN THE SOUTH AFRICAN LABOUR MARKET: THE EXTENSION OF UNION WAGE BENEFITS

3.1.2 Industrial Councils in the South African Labour Market: The Extension of Union Wage Benefits

An important aspect of the South African labour market that is pertinent to any investigation of the impact of trade unions is the fact that union wage benefits are not extended exclusively to trade unions members (Butcher and Rouse, 2001: 349-350). The industrial council system that exists in South Africa provides for the extension of union wage and working condition stipulations to some non-unionised workers.

It is therefore important to acknowledge that any investigation into the effect that trade unions have on wage structures and wage distribution in South Africa should not be limited to the investigation of paid-up union members alone or as distinct from workers who do not belong to a trade union. However, data containing the number of industrial councils that are currently in existence as well as how many workers are covered by different industrial councils are difficult to get hold of. Even when the data do exist, they are often imprecise. Industrial council coverage is therefore not controlled for in this analysis, although it is acknowledged that industrial councils have the effect of extending union wage premia and benefits to non-unionised workers. This study is limited to unions and the extent of their influence independently of industrial council coverage.

3.2 SOUTH AFRICAN APPLICATION

3.2.1 Data

Fifteen data sets are used in this study, namely the October Household Survey (OHS) for 1995 to 1999, and the biannual Labour Force Survey (LFS) for 2000 to 2005. The sample is limited to black male workers[8] because the union effect is most pronounced among this group. It is also presumed that workers from different race groups have difference earnings structures, rendering it appropriate to estimate separate functions for each group (Hofmeyr and Lucas, 2001; Moll, 1993). Further, by focusing on one demographic group, it is possible to abstract from issues of racial and gender discrimination and to isolate the union effect. Only workers employed in the formal sector[9] are included in the study. Further, workers earnings a monthly income in excess of R200 000 are excluded since they are regarded as outliers[10].

3.2.2 Union Coverage and Composition

3.2.2.1 Union Density

[8] This is a strategy also adopted by other authors in the field, such as Hofmeyr and Lucas (2001) and Moll (1993).

[9] Workers employed in the informal sector, domestic workers, subsistence agriculture workers and the self-employed are excluded.

[10] Additional errors may exist in the data, namely the omission of fringe benefits, time used to measure earnings, nonrandom samples and the misclassification of union participation.

Table 2 and figure 1 report union density amongst employed black workers between 1995 and 2005. It is evident that union density (as a percentage of the employed labour force) peaked in 1997, after which it appeared to decline. This was the case for both male and female workers. The decline in union membership post-1997 may perhaps be explained in part by the disincentive to join unions created by the extension of bargaining agreements to nonunionised workers[11]. However, this does not necessarily signify a decline in union power. Union power should rather be judged by the ability of unions to increase the wages of their members.

TABLE 2: UNION DENSITY FOR BLACK EMPLOYED WORKERS

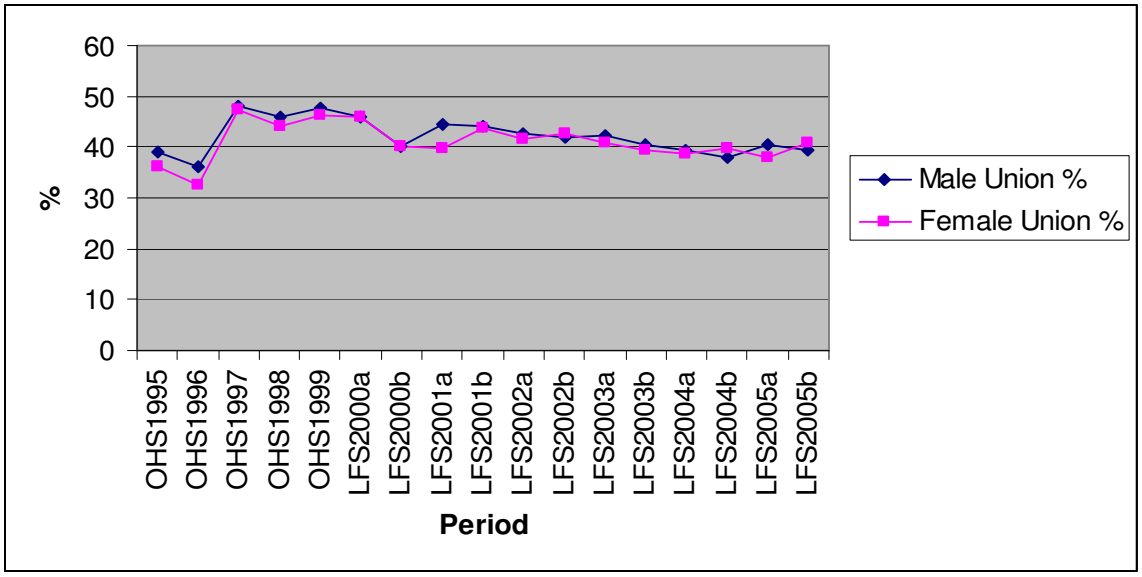
	Male Union %	Total Employed Black Males	Female Union %	Total Employed Black Females
OHS1995	38.97	3,501,996	36.22	1,580,069
OHS1996	36.18	2,906,060	32.57	1,383,022
OHS1997	48.10	2,619,650	47.33	1,103,032
OHS1998	46.08	2,706,178	44.10	1,213,334
OHS1999	47.88	2,629,823	46.31	1,264,545
LFS2000a	45.86	2,436,509	45.93	1,258,217
LFS2000b	40.10	3,000,945	40.15	1,368,944
LFS2001a	44.47	2,831,238	39.63	1,324,872
LFS2001b	44.11	2,871,162	43.56	1,353,037
LFS2002a	42.56	2,898,290	41.69	1,402,830
LFS2002b	41.98	2,964,317	42.63	1,376,572
LFS2003a	42.17	2,971,252	40.67	1,429,005
LFS2003b	40.35	2,993,906	39.26	1,415,316
LFS2004a	39.49	3,095,936	38.55	1,514,700
LFS2004b	37.89	3,050,731	39.68	1,492,753

[11] Pencavel (2005) reports a decline in private sector union membership in many industrial countries, including Britain, New Zealand, Canada, Australia and Japan.

LFS2005a	40.40	3,162,041	38.07	1,495,135
LFS2005b	39.33	3,220,504	40.96	1,571,036

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

FIGURE 1: UNION DENSITY FOR BLACK EMPLOYED WORKERS BETWEEN 1995 AND 2005



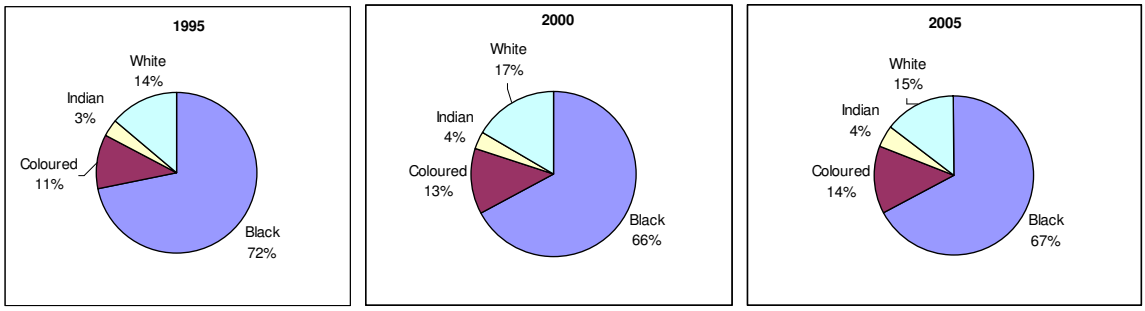
Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

3.2.2.2 Union Density by Race

The racial composition of unions has remained largely unchanged since 1995[12]. Black male and female workers comprise the largest part of union members, followed by white, coloured and Indian workers respectively.

[12] It must be noted however, that incomplete survey questionnaires (particularly in questions pertaining to race and earnings) complicate data processing.

FIGURE 2: RACIAL COMPOSITION OF UNIONS IN 1995, 2000 AND 2005



Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

Table 3 indicates an increase in union density amongst all except black male workers between 1995 and 2005.

TABLE 3: UNION DENSITY BY RACE FOR EMPLOYED MALE WORKERS

	Black	Coloured	Indian	White	Total
OHS1995	38.97	29.14	29.99	28.31	1,854,628
OHS1996	36.18	33.88	33.56	30.17	1,572,991
OHS1997	48.10	38.28	37.01	27.32	1,754,048
OHS1998	46.08	38.93	29.00	24.92	1,687,314
OHS1999	47.88	35.06	33.48	36.26	1,728,987
LFS2000a	45.86	32.78	34.64	34.37	1,585,279
LFS2000b	40.10	31.05	34.08	28.45	1,686,992
LFS2001a	44.47	33.14	29.54	32.91	1,732,104
LFS2001b	44.11	32.95	30.42	34.33	1,767,113
LFS2002a	42.56	32.39	30.63	28.75	1,683,957

LFS2002b	41.98	30.95	34.91	28.64	1,684,727
LFS2003a	42.17	31.70	36.98	30.00	1,711,589
LFS2003b	40.35	32.9	36.84	30.77	1,667,937
LFS2004a	39.49	29.46	36.42	27.81	1,656,942
LFS2004b	37.89	31.50	30.26	29.87	1,566,498
LFS2005a	40.40	36.73	35.35	27.82	1,717,804
LFS2005b	39.33	37.04	44.88	35.27	1,811,375

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

By 2005, union membership was most prevalent amongst Indian workers and appeared to be increasing for all but black male workers.

3.2.2.3 Private and Public Sector Union Density

Union density is generally in most countries larger in the public than in the private sector due to the fact that the public sector is often characterized by a strong bureaucratic undertone, creating an environment in which workers feel they need a collective voice (Blanchflower, 1996). Further, wage negotiations are easier since market forces do not "discipline" this sector (Bean and Holden, 1994: 13).

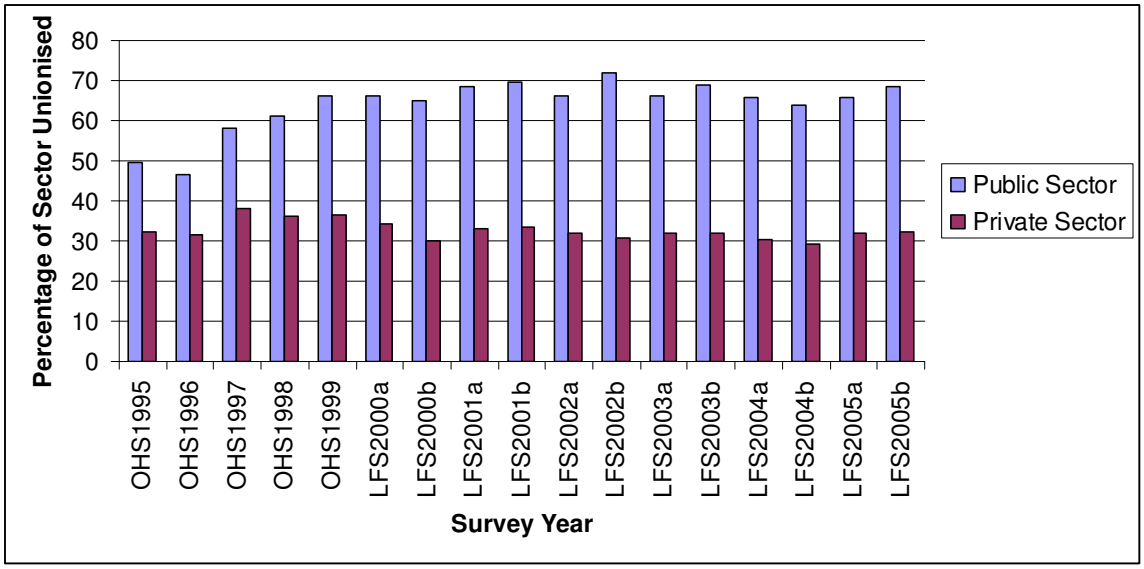
TABLE 4: UNION DENSITY BY SECTOR FOR MALE WORKERS (ALL RACES)

	Public	Private
OHS1995	49.79	32.37
OHS1996	46.59	31.43
OHS1997	57.89	38.1
OHS1998	61.28	36.1
OHS1999	66.27	36.63
LFS2000a	66.01	34.28
LFS2000b	65.19	30.17
LFS2001a	68.54	33.09
LFS2001b	69.8	33.42
LFS2002a	66.01	31.79
LFS2002b	71.75	30.65
LFS2003a	66.01	32.08
LFS2003b	68.88	31.89
LFS2004a	65.63	30.4
LFS2004b	63.73	29.15
LFS2005a	65.96	32.04
LFS2005b	68.4	32.27

Source: Own calculations for OHS 1995-1999 and LFS 2000-1005

Table 4 indicates that union density in the South African public sector increased between 1995 and 2005, while union density in the private sector displayed a stable trend. Public sector union density peaked in 2002 and is substantially larger than in the private sector . The large union density in the public sector may possibly also be explained by closed shop agreements that still apply in the public sector, implying that workers may be required by firm regulations to join a union.

FIGURE 3: UNION DENSITY BY SECTOR FOR MALE WORKERS (ALL RACES)



Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

3.2.2.4 Composition of Unions

A longstanding question in the literature is whether the union wage premium is exclusively the result of union bargaining or whether membership composition (and therefore differences in worker attributes between unionised and nonunionised workers) plays a role in the gap between the wages received by unionised workers and those received by their nonunionised counterparts. Table 5 compares the productive characteristics of union and nonunion workers.

TABLE 5: MEAN CHARACTERISTICS OF UNION AND NONUNION WORKERS (ALL RACES)

Union	Education	Experience	Tenure	Age
OHS1995	9.65	21.42	9.36	37.09
LFS2000a	9.77	22.46	10.93	38.33
LFS2000b	10.03	22.76	10.73	38.83
LFS2005a	10.43	23.32	11.21	39.77
LFS2005b	10.64	22.68	10.37	39.36
Nonunion				
OHS1995	8.86	20.73	6.59	35.62
LFS2000a	9.57	19.35	6.30	35.02
LFS2000b	9.56	19.86	5.65	35.48
LFS2005a	10.25	19.15	5.47	35.44
LFS2005b	10.18	19.12	5.01	35.32

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

It is clear that at the mean, the productive characteristics of unionised and nonunionised workers differ. Unionised workers appear to have invested more in human capital, illustrated by higher mean levels of education and experience amongst union members relative to nonunion workers. The difference is more pronounced for experience levels, while the difference in education levels between the two groups appears to have diminished by 2005. The difference in tenure between the two groups has become more pronounced between 1995 and 2005, possibly as a result of bargaining agreements that increased job security amongst union members. The average age for union members has increased since 1995, indicating the possibility that workers of a particular generation remain union members for longer.

4. EMPIRICAL ANALYSIS

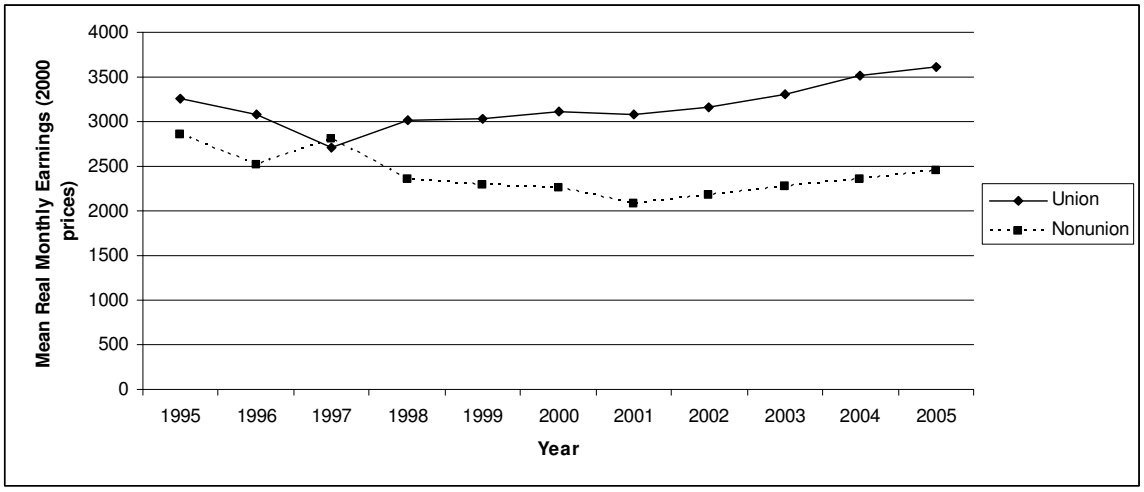
This study aims to track the union premium in South Africa over the period 1995 to 2005. The objective of the study is not therefore to add new determinants to the union decision and earnings function. The five methods discussed in section 2 are applied to all the available data sets, rendering the results obtained less sensitive to survey-specific sampling errors.

4.1 TRENDS IN EARNINGS LEVELS

4.1.1 General Trends for Black Workers

Wages of unionised workers appeared to have increased over the 10 year period under investigation, while those of nonunionised workers remained fairly stable. This growth in union wages was visible from 2002 onwards, as illustrated in figure 6.

FIGURE 6: MEAN REAL MONTHLY EARNINGS FOR ALL WORKERS (2000 PRICES)



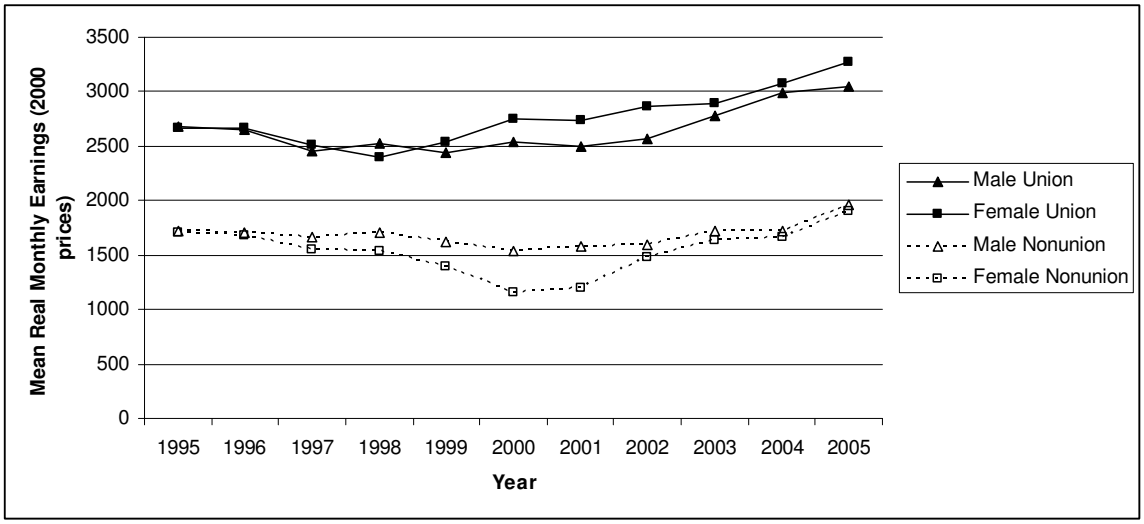
Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

The wage differential between unionised and nonunionised workers was evident from 1997 and increased in subsequent years. The growth in union wages may be explained by increasing union power over the period under consideration, as well as by increased economic growth since 2002(because increased economic growth may reflect increasing

productivity amongst workers, therefore resulting in a higher skills levels amongst unionised workers). This is explored later in section 4.2.

FIGURE 7: MEAN REAL MONTHLY EARNINGS FOR BLACK WORKERS (2000 PRICES)

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005



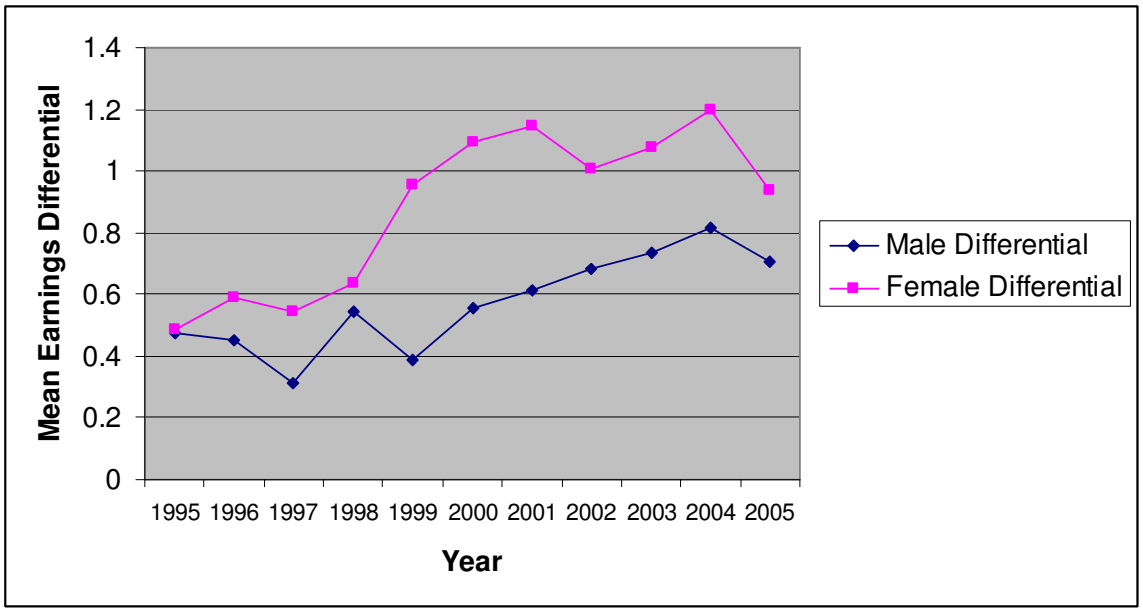
Amongst black workers (both male and female), unionised workers earned substantially more than their nonunionised counterparts. On average, union wages appeared to increase over time, escalating particularly after 2002. Further, female unionised workers appeared to earn a higher average wage than their male counterparts. Despite similar union densities between male and female workers, female workers appeared to derive greater benefits from their status as union members – a finding largely in line with what theory predicts[13].

Figure 7 also shows that wages of nonunionised workers decreased slightly after 1999, but returned to their original level by 2005. Further, male workers in this sector appeared to earn slightly more than female workers (in line with traditional discrimination theory (Deery and De Cieri, 1991)). Interestingly, while the gender wage gap increased over time among union workers, it appeared to decrease over time among nonunion workers.

[13] Female workers are considered more "vulnerable" within the setting of the labour market and are therefore expected to derive more benefit from wage increases and job security associated with union membership.

Figure 8 shows a similar trend: the union wage gap[14] for both male and female black workers appeared to diverge over time. The differential increased for both groups of workers up until 2004, after which it decreased.

FIGURE 8: MEAN EARNINGS DIFFERENTIAL BETWEEN UNION AND NONUNION BLACK WORKERS



Source: Own calculations form OHS 1995-1999 and LFS 2000-2005

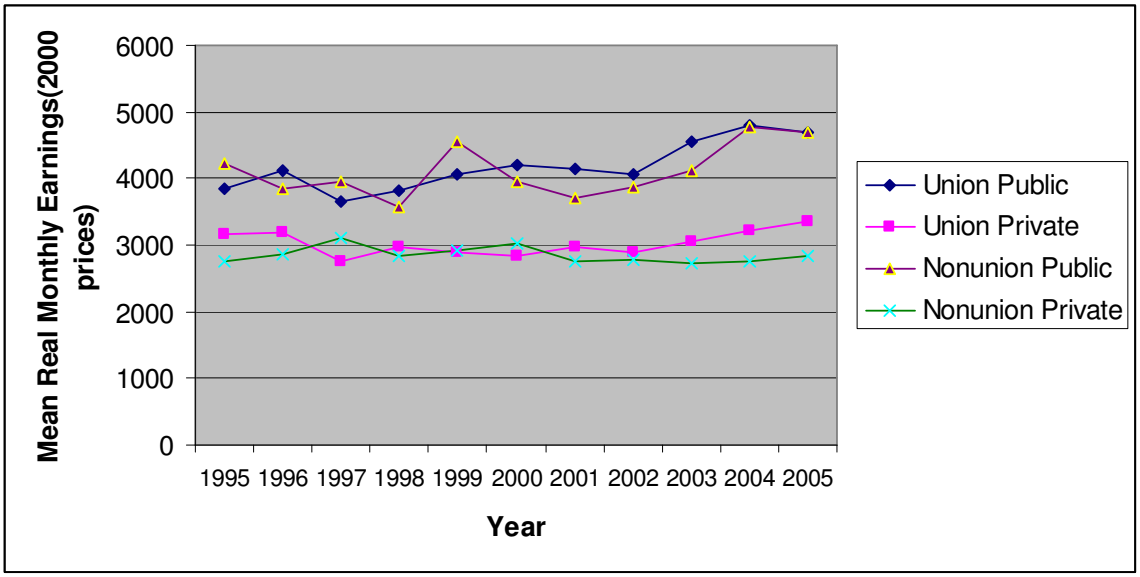
In sum, it appears that the wages of unionised workers increased over the period under investigation, while those of nonunionised workers remained largely stable. This may indicate that unions were effective in securing wage increases for their workers, particularly from 2002 onwards. This is supported by the results obtained regarding the mean earnings differential between unionised and nonunionised workers: the earnings differential increased unambiguously for males between 1995 and 2005, while females experienced an increased differential in every year except 2002. Although the differential for both males and females decreased between 2004 and 2005, the general trend over the 10 year period indicates that unionised workers received higher wages than those of their nonunionised counterparts – a finding that further suggests that unions were largely effective in securing higher wages for their members

[14] Calculated as [(mean monthly union wage)/(mean monthly nonunion wage)]-1, measured in 2000 prices.

4.1.2 Public and Private Sector Earnings Trends

Figure 9 below illustrates higher public sector earnings (relative to private sector earnings) for the entire period between 1995 and 2005.

FIGURE 9: MEAN REAL MONTHLY EARNINGS (2000 PRICES) FOR MALES WORKERS IN THE PUBLIC AND PRIVATE SECTOR



Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

A strong union effect was evident in the public sector because mean union earnings increased from 1997 onwards, reflecting the trend in union density and suggesting an association between increased union density and increased union earnings. The union influence in the private sector was considerably smaller: mean private sector earnings remained stable over the decade under investigation. The divergence between union and nonunion earnings in the public sector may be explained by the prevalence of closed shop agreements in the largest part of this sector, suggesting that the private sector union premium may have been larger than that in the public sector. However, public sector earnings were higher than private sector earnings at the mean as a result of closed shop agreements.

Unions may therefore be seen to have been considerably more effective at increasing the wages of their members in the public sector than was the case for their members in the private sector.

The difference in the earnings structures prevalent in the public and private sectors suggest that these sectors should be analysed independently of each other. However, data constraints rendered the separate analysis of these sectors impossible and so a dummy variable for the public sector was included in order to control for differences in the data generating processes in the public and private sectors.

4.2 UNION WAGE PREMIUM

Hildreth (1999: 6) regards the union wage premium as a proxy for union power. Union premiums over time may therefore be considered a rough indication of changes in union bargaining power (Hildreth, 1999: 6). However, the wages paid to workers are also dependent on the size of the firm, its productivity and other cost related factors (Arbache and Carneiro, 1999: 1875). Furthermore, Freeman and Medoff (1984) argue that union power is associated with the sensitivity of labour demand to wage increases: the less sensitive labour demand is, the higher the potential wage gains from union membership. Finally, the size of the union premium is dependent on the ability of the unions to organize large groups of workers. Larger groups therefore imply larger potential wage premiums (Blanchflower and Bryson, 2004: 386).

An analysis of the union wage premium will provide an indication of the extent of union power over the last decade. A decomposition of the results investigates the drivers of changes in the premium and whether its trends over time may correctly be ascribed to union power.

4.2.1 Functional Form of Earnings Estimation

The dependent variable (as per Mincerian tradition) is the natural logarithm of the hourly wage rate[15] (Mincer, 1974). The earnings functions aim to capture the full effect of human capital advances on earnings by incorporating education level, human capital investment and experience in a specific functional form. Additional structural and personal variables are also accounted for.

A logarithmic functional form investigates the relative difference between wages of union and nonunion workers, allowing for an alternative analysis in the form of the differences in standard deviation of the log of wages between union and nonunion earnings functions.

[15] This study uses the logarithm of hourly wages, including bonuses and overtime, excluding tax, which is in accordance with earnings literature, since hourly wages control for the disparity in hours worked (Hofmeyr and Lucas 2001:697).

This serves as a crude indication of the dispersion of earnings. A smaller standard deviation therefore indicates less dispersion (Freeman, 1980: 6).

4.2.2 The Union Wage Premium in South Africa

The analysis begins with an OLS model of earnings in which standard variables and an exogenous union dummy variable is included to capture the union wage effect. This method assumes that worker characteristics are rewarded similarly in the unionised and nonunionised sectors. Hence, only an intercept shift between union members and nonunion members applies (Addison and Hirsch, 1986: 124). Next, allowance is made for the possibility of endogenous union membership. A selection term derived from a probit is included to correct for this possible selction bias. Additional variables are included in the probit, namely age and the number of employed members in the household. Finally, a standard switching model is used, recognizing the potential difference in the reward of attributes (and therefore differences in the coefficients) between union and nonunion workers.

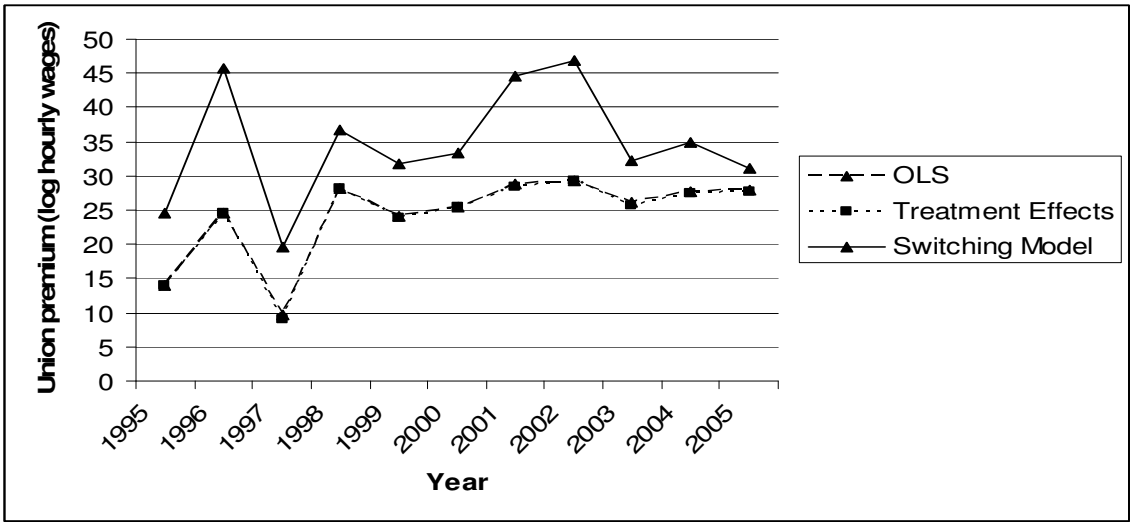
TABLE 6: UNION WAGE PREMIUM 1995 – 2005

	OLS	Treatment Effects Model	Switching Model
1995	14.03	14.04	24.54
1996	24.58	24.56	45.77
1997	9.59	9.08	19.53
1998	28.13	28.19	36.70
1999	24.14	23.96	31.84
2000	25.48	25.39	33.37
2001	28.78	28.30	44.69
2002	29.26	29.32	46.90
2003	26.11	25.75	32.13
2004	27.77	27.42	34.91
2005	28.02	27.75	31.09

Source: Own calculations form OHS 1995-1999 and LFS 2000-2005

Table 6 indicates that all three estimation methods result in the same pattern for the union premium. The union wage premium estimated using the OLS model and the treatment effects model are similar, but the union wage premium estimates obtained using the switching model are considerably larger. Indeed, the union wage premium estimated for 1995 using OLS and the treatment effects is approximately 14 percent while the switching model places the union premium at slightly less than 25 percent in the same year. Hofmeyr and Lucas (2001) estimate a union premium of 26.5 percent for black workers using the SALDRU 1993 dataset while Butcher and Rouse (2000) estimate a union wage premium of 20 percent for black workers using OHS 1995. It appears therefore that the OLS and switching methods form boundaries for possible estimates. The large decrease in the union wage premium suggests data-related problems in 1997 – an occurrence that affected earnings estimations in that year.

FIGURE 10: ESTIMATED UNION WAGE PREMIUM 1995 – 2005



Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

With the exception of the significant decrease in the union premium in 1997, the union wage premium increased between 1995 and 2002. The sharp decrease in 1997 was likely the result of errors related to the October Household survey of that year, as noted above. From 1998 onwards, the union wage premium increased steadily, although OLS estimates

fluctuated between 25 and 28 percent after 2000. On average, however, the union wage premium estimated using OLS did not change much between 1998 and 2005.

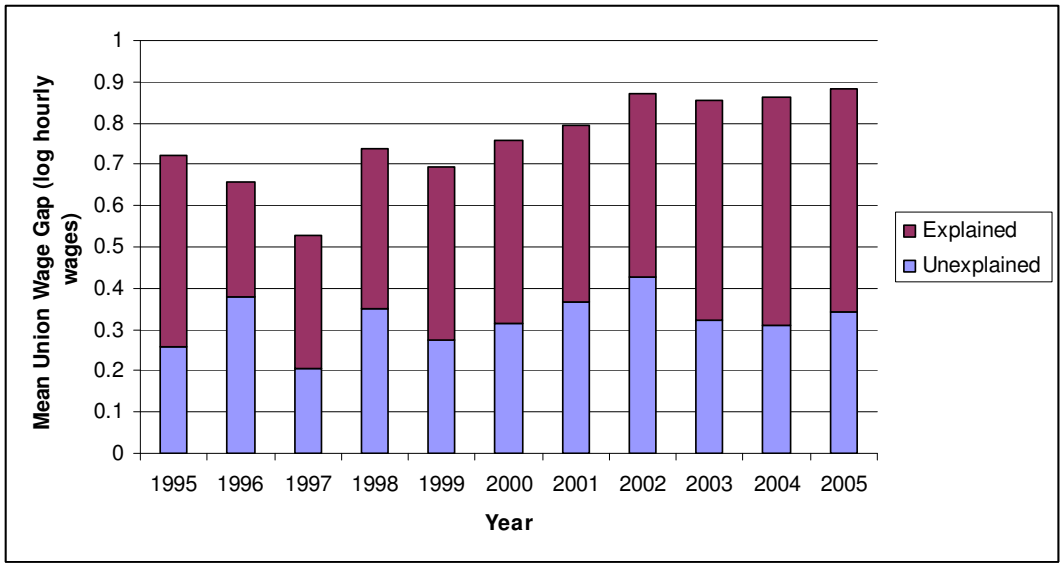
All three the models see the union wage premium reaching a maximum in 2002, after which estimates from OLS and the treatment effects technique remained stable. The switching model estimates a decrease in the union premium in 2003, after which it remained stable. This demonstrates a countercyclical trend when seen in the context of accelerated economic growth during the same period. Interesting to note is that the union premium broadly follows the trend in union density in the public sector, with density in the public sector reaching a maximum in 2002.

Mean union earnings increased significantly over the period under investigation, despite the fact that the union premium remained stable after 2002. The relevant question remains whether this increase was the product of a change in union composition or a pure union effect. Indeed, the substantial decrease (around 14 percent) of the union premium estimated using the switching model indicates that the gap between the coefficients obtained for unionised workers and those obtained for nonunionised workers decreased between 2002 and 2003. That is, the productive characteristics of these two groups of workers were rewarded somewhat more similarly from 2003 onwards. This may indicate that the composition of union workers had some influence on the increase in mean union earnings after 2002. The fact that unionised workers experienced increased wages coupled with the fact that the difference between the rewarding of characteristics between unionised and nonunionised workers became smaller may suggest that some of the more productive nonunionised workers given their characteristics may have joined unions between 2002 and 2003, therefore changing the composition of the unionised sector and ultimately increasing the wage level of unionised workers in the years following 2002. This confirms the aforementioned speculation that higher levels of economic growth may well have resulted in an increase in the level of skills amongst unionised workers and therefore in an increase in union wage levels.

4.2.3 Decomposition

The mean union-nonunion wage gap is calculated using the switching model and is subsequently decomposed using the method employed by Oaxaca (1973). The unexplained component of this decomposition can be ascribed to a pure union effect. For comparative purposes, the nonunion group is indicated as the reference category since this group was used as the base in the switching model (Moll 1993). This indicates that nonunion wages would prevail in the absence of unions, rendering the wage gap an indication of the increase in wages that nonunionised workers would receive upon joining a union (Neumark, 1988; Oaxaca and Ransom, 1994).

FIGURE 12: OAXACA-BLINDER DECOMPOSITION OF MEAN UNION WAGE GAPS (2000 PRICES)



Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

The results obtained from the Oaxaca decomposition are in line with those reported in the previous section. The year 1997 saw a significant decrease in the average wage gap after which an increasing trend between union and nonunion workers was observed until 2002. The average wage gap remained stable until 2005.

The unexplained component of the wage gap peaked in 2002, indicating that the wage gap between union and nonunion workers was not driven by differences in the characteristics of workers. Despite a decline after 2002, there was an average increase in the unexplained component since 1995, indicating a union effect that was neither explained by worker characteristics, nor captured by our models. Interestingly, the explained component of the wage gap increased more during the last decade than the unexplained component, therefore supporting the possibility of an increasing compositional effect discussed above, in which the wage gap was affected by changes in unobserved worker attributes. This may serve as partial justification for the fact that unionised workers earn higher wages than their nonunionised counterparts. In an effort to identify the main drivers of the wage gap, we decompose the wage gaps for 1995, 2002 and 2005[16]. The detailed decomposition follows the method employed by Yun (2003).

[16] The wage gap in 2002 is investigated since for all four preceding methods, the wage premium reached a maximum in that year. In addition the unexplained component of the wage gap also reached a maximum in that year.

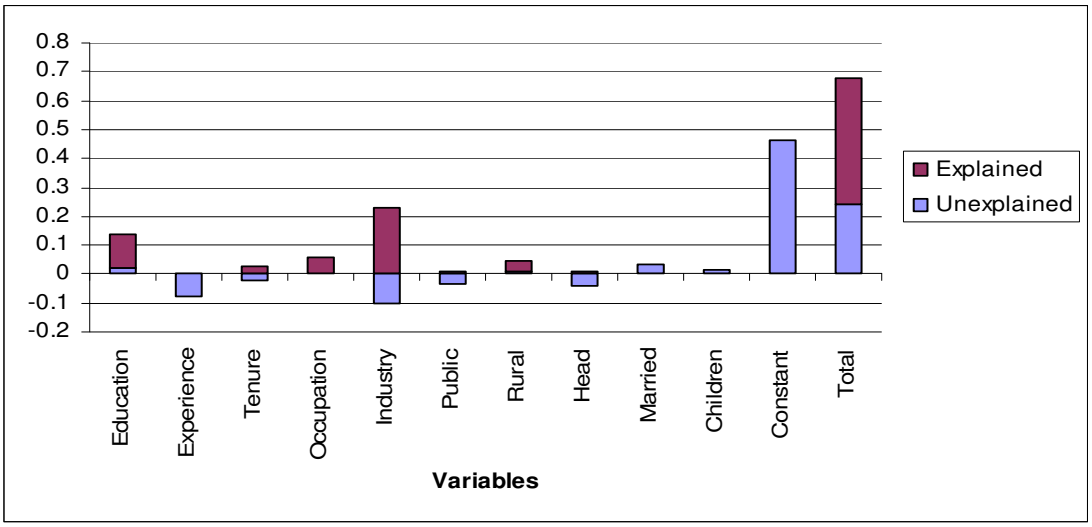
TABLE 7: ABSOLUTE VALUE OF UNEXPLAINED COMPONENT OF THE WAGE GAP OBTAINED IN THE OAXACA DECOMPOSITION

	Total	Explained	Unexplained
1995	0.722	0.464	0.258
1996	0.656	0.277	0.379
1997	0.529	0.322	0.207
1998	0.738	0.386	0.352
1999	0.693	0.418	0.275
2000	0.759	0.445	0.314
2001	0.796	0.431	0.365
2002	0.872	0.446	0.426
2003	0.854	0.532	0.322
2004	0.863	0.553	0.310
2005	0.882	0.539	0.343

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

4.2.3.2 Detailed Decomposition

FIGURE 13: DETAILED WAGE DECOMPOSITION FOR 1995

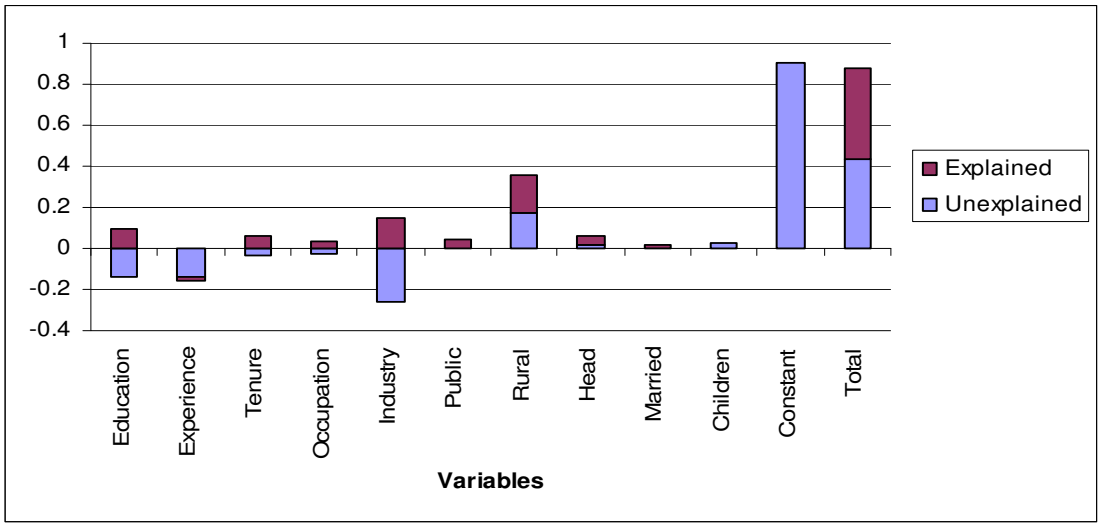


Source: Own calculations form OHS 1995

Figure 13 indicates that in 1995 the explained component of the wage gap was largely driven by differences in the levels of educational attainment between unionised and nonunionised workers, as well as by factors specific to the industry and occupation in which workers found themselves. The "union advantage" may therefore be justified by human capital differences, as well as by job specific differences. However, union membership was negatively associated with experience, and the union premium was negatively associated with the level of experience that a worker had. This indicates possible wage compression among union workers.

The largest driver of the union wage gap (specifically of the unexplained component) was the constant term, implying that the pure union effect (i.e. the increase in wages resulting from union wage bargaining) union union influence was the main determinant of the union-nonunion wage gap. Therefore in 1995 the premium earned by unionised workers relative to their nonunionised counterparts was largely driven by union attachment and not worker attributes.

FIGURE 14: DETAILED WAGE DECOMPOSITION FOR 2002

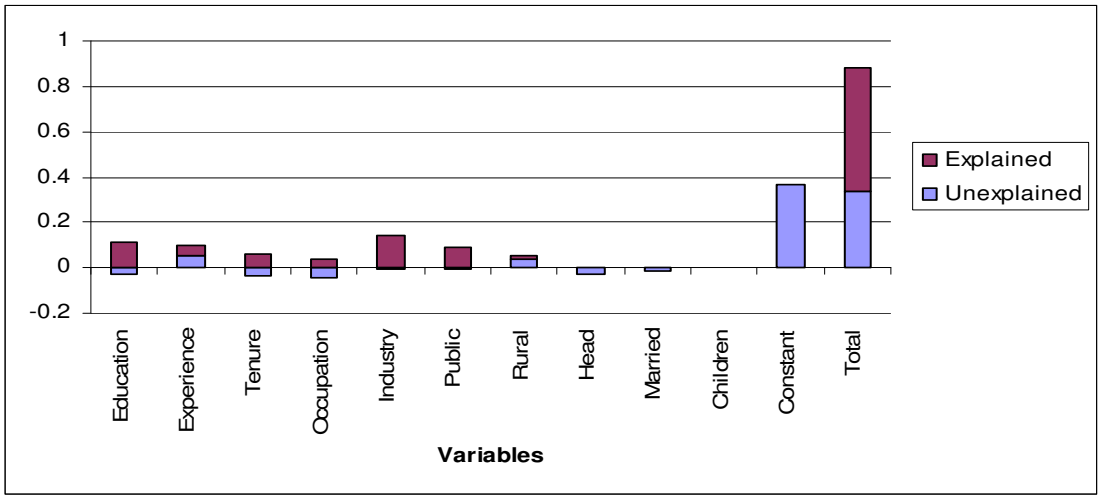


Source: Own calculations from LFS 2002

Figure 14 indicates that union attachment had a negative impact on the compensation for education, experience, tenure, industry and occupation, indicating the possibility of increased wage compression among union workers compared to 1995.

The constant term in 2002 was larger than the total wage gap – possibly a result of the negative rewards accruing to experience. It appears that the union-nonunion wage gap in 2002 was driven primarily by the pure union effect discussed earlier as illustrated by the size of the constant term within the unexplained element. This result indicates the substantial power that unions exerted during the wage setting process.

FIGURE 15: DETAILED WAGE DECOMPOSITION FOR 2005



Source: Own calculations from LFS 2005

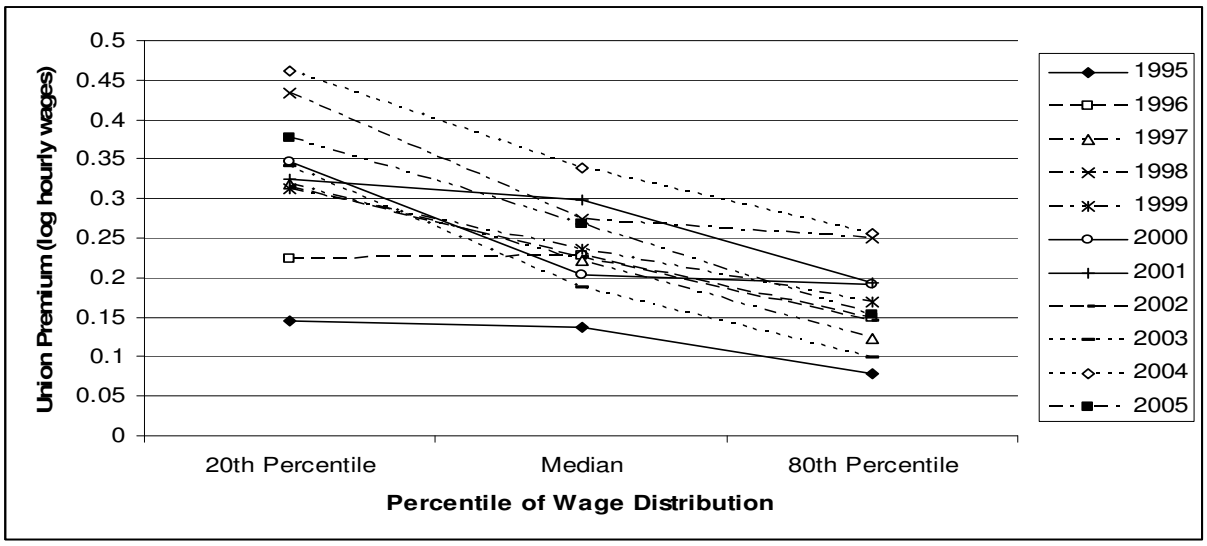
Although the influence exerted by unions on wages was still evident in 2005, it appeared less pronounced, supporting the stabilizing trend noted in the estimated conditional union wage premiums. Human capital seemed to have played a more prominent role in the explanation of the union-nonunion wage gap than it did in 1995, indicating the increased compositional effect in wage determination, even among unionised workers. Further, the negative association with the industry and human capital variables had decreased relative to 2002, indicating the possibility of a decline in wage compression among unionised workers. This may serve as further evidence that the composition of the union sector had undergone transformation, with increasingly skilled workers joining unions and the rewards for their superior attributes resulting in a lesser degree of compression within the union sector.

Wage differentials are often used as a proxy for union power over time. The increase in the union wage premium over the last decade, regardless of its magnitude or method of estimation, indicated that unions in South Africa were influential. Although union membership still indicated a possible wage benefit in 2005, the compositional effect within unions seemed to have become an increasingly important factor in explaining the union-nonunion wage gap towards the end of the decade, suggesting that the advantage that unionised workers had relative to their nonunionised counterparts was increasingly based on worker characteristics and not simply on the effectiveness with which unions were able to secure additional benefits for their members.

4.2.4 Quantile Regression

Quantile regression was used to investigate whether unions play a role in remedying inequality in the South African labour market. In order to investigate this, the estimated union premium was observed in quantile regressions run at the 20th, 50th and 80th percentiles of the wage distribution.

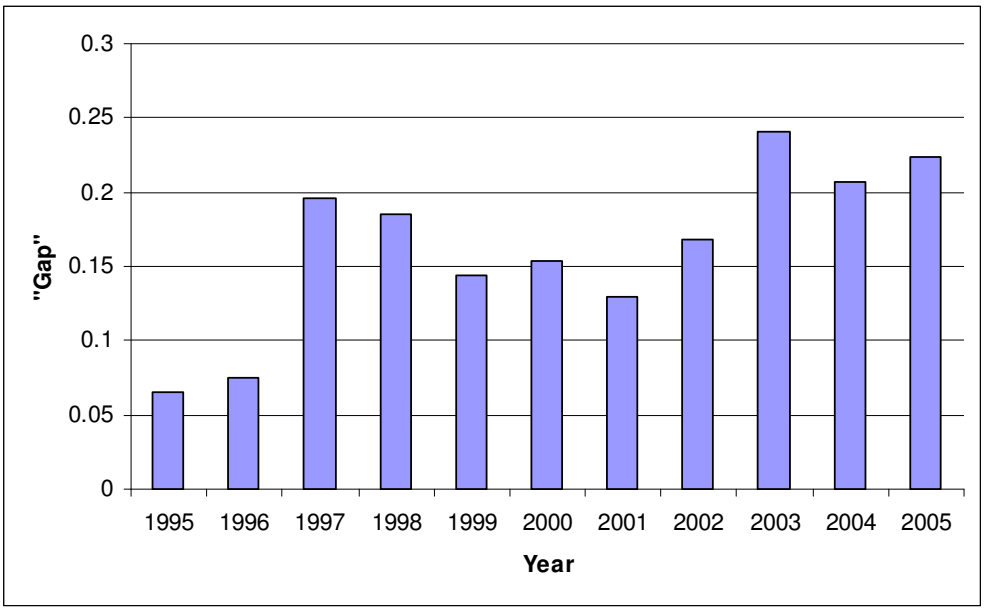
FIGURE 16: ESTIMATES OF THE UNION PREMIUM USING QUANTILE REGRESSION



Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

From figure 16, it is clear that the advantage of belonging to a union was greatest for workers at the lower end of the wage distribution, becoming smaller as one moved up the wage distribution. This implies that unions may well be geared towards the needs of workers at the lower end of wage distribution (and therefore most likely at the lower end of the skills distribution). It was more beneficial for "poorer" workers to belong to unions than it was for richer workers. Union membership may therefore be seen to have decreased the level of inequality within the union sector since the advantage of belonging to a union was greatest for workers at the lower end of the wage distribution.

FIGURE 17: GAP BETWEEN 20TH PERCENTILE UNION PREMIUM AND 80TH PERCENTILE UNION PREMIUM



Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

Figure 17 indicates that the difference between the premium received by workers at the lower end of the wage distribution and that received by workers at the higher end of the wage distribution followed a generally increasing trend from 2002 onwards. There was a substantial increase in this differential in 1997, driven mainly by an increase in the premium received by workers at the lower end of the distribution (as opposed to an increase amongst workers at the upper end of the distribution), after which the differential decreased until 2001. From 2002 onwards, the differential increased, peaking in 2003.

Unions may therefore be said to have had an inequality reducing character over the decade under investigation.

5. CONCLUSION

Collective bargaining structures are traditionally "the outcome of a country's economic and social fabric" (Pencavel, 2005: 76), while the specific influence of unions is contingent on the "economic, legal and structural environment" (Hirsch, 2004: 425). Value systems differ across countries and hence the response of institutional structures to bargaining pressures will vary.

This is of particular relevance in South Africa, where unions have played an integral role in labour markets leading up to democracy in 1994. Since then, the role of trade unions in the mediating processes has increased and unions continue to wield considerable political influence (Wood, 1998). We may therefore question whether union power (proxied by their ability to raise wages for members) ultimately exerts positive or negative influences on the South African labour market. Indeed many South African employers ascribe the growth in capital-intensive production to restrictive labour legislation and labour related problems owing to collective bargaining, ultimately increasing the perceived cost of labour (Fallon, 1992: 23). These changes have affected the unskilled most severely, creating considerable scope for concern against the backdrop of huge level of earnings inequality in the country.

This study estimated the union wage premium for the period 1995 to 2005 in an effort to discern a trend in union power. A substantial increase in the average union wage premium was observed over the period. Detailed decompositions of the wage gap demonstrated that the advantage enjoyed by unionised workers was largely driven by the power that unions had to increase the earnings of their members, and not by differences in the attributes of unionised and nonunionised workers. However, despite the fact that the union wage gap was attributed predominantly to union power, the compositional effect had gained importance over the last decade, indicating that the premium was becoming increasingly driven by union interaction with differences in worker characteristics.

Interestingly, the final section of the empirical analysis suggested that South African unions had a certain inequality-reducing character about them since the union premium enjoyed by poorer workers (or at least workers at the lower end of the wage distribution) was larger than their counterparts at the higher end of the wage distribution. Indeed, this inequality-reducing characteristic of unions appeared to be increasing.

6. APPENDIX

OLS Estimates (The treatments effect model render quantatively similar results and detailed estimations are therefore excluded)

Absolute t-values indicated in parentheses, significance at 5% level.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Education	**-0.0551**	**-0.0397**	**-0.0230**	**0.0128**	**-0.0239**	**-0.0349**	**-0.0299**	**-0.0587**	**-0.0531**	**-0.0583**	**-0.0611**
	(8.39)	(3.31)	(2.48)	(1.06)	(2.29)	(3.46)	(4.06)	(7.30)	(7.68)	(7.24)	(7.11)
Education2	**0.0088**	**0.0082**	**0.0063**	**0.0034**	**0.0068**	**0.0074**	**0.0074**	**0.0097**	**0.0095**	**0.0092**	**0.0093**
	(17.39)	(9.49)	(9.67)	(3.68)	(8.50)	(10.61)	(13.91)	(16.04)	(18.72)	(16.45)	(15.16)
Experience	**0.0200**	**0.0228**	**0.0194**	**0.0214**	**0.0239**	**0.0195**	**0.0293**	**0.0312**	**0.0323**	**0.0276**	**0.0228**
	(7.20)	(4.84)	(4.89)	(3.68)	(5.15)	(4.63)	(9.32)	(10.96)	(11.77)	(9.00)	(7.37)
Experience2	**-0.0003**	**-0.0003**	**-0.0003**	**-0.0003**	**-0.0003**	**-0.0003**	**-0.0004**	**-0.0004**	**-0.0004**	**-0.0004**	**-0.0003**
	(6.38)	(4.39)	(4.64)	(2.67)	(3.92)	(4.02)	(7.47)	(8.62)	(9.67)	(7.16)	(5.04)
Tenure	**0.0127**	**0.0134**	**0.0129**	**0.0134**	**0.0140**	**0.0124**	**0.0117**	**0.0136**	**0.0140**	**0.0159**	**0.0132**
	(12.25)	(7.00)	(8.79)	(6.19)	(7.95)	(7.69)	(10.36)	(12.37)	(13.37)	(13.66)	(10.40)
Occ2	**0.2846**	**0.4318**	**0.3898**	**0.7475**	**0.4225**	**0.5803**	**0.4033**	**0.3281**	**0.3737**	**0.4949**	**0.7273**
	(4.40)	(4.95)	(8.00)	(6.05)	(5.07)	(6.50)	(5.79)	(4.03)	(5.46)	(6.60)	(10.60)
Occ3	**0.3715**	**0.3594**	**9.3483**	**0.5068**	**0.3584**	**0.3311**	**0.4372**	**0.3360**	**0.4009**	**0.4438**	**0.4505**
	(10.22)	(6.32)	(7.33)	(6.70)	(5.31)	(5.76)	(10.38)	(8.58)	(11.78)	(10.61)	(11.49)
Occ4	**0.1390**	**0.1635**	**0.0694**	**0.1968**	**0.1810**	**0.1343**	**0.2560**	**0.1302**	**0.2156**	**0.2276**	**0.2598**
	(4.33)	(2.87)	(1.48)	(2.59)	(3.45)	(2.77)	(7.07)	(3.77)	(6.02)	(5.67)	(6.27)
Occ5	**0.0612**	**-0.0693**	**-0.0432**	**0.0324**	**-0.0823**	**-0.1235**	**-0.0527**	**-0.2098**	**-0.0783**	**-0.0882**	**-0.1167**
	(2.13)	(1.48)	(1.22)	(0.59)	(1.84)	(2.71)	(1.72)	(7.10)	(2.42)	(2.85)	(3.55)
Occ6	**0.2904**	**0.0624**	**0.0031**	**0.0456**	**0.1068**	**-0.0047**	**0.1805**	**0.0895**	**0.2686**	**-0.0191**	**0.0929**
	(2.91)	(0.71)	(0.04)	(0.70)	(1.61)	(0.07)	(2.97)	(1.47)	(3.83)	(0.23)	(0.78)
Occ7	**0.1697**	**0.0753**	**0.0973**	**0.0470**	**0.0607**	**0.0022**	**0.1103**	**0.0421**	**0.1321**	**0.0924**	**0.0725**
	(6.62)	(1.85)	(3.17)	(1.04)	(1.54)	(0.06)	(4.24)	(1.77)	(5.68)	(3.64)	(2.45)
Occ8	**0.1266**	**0.1189**	**0.0597**	**0.0768**	**0.0239**	**0.0373**	**0.1122**	**0.0167**	**0.0883**	**0.0596**	**0.0826**
	(6.26)	(3.10)	(2.21)	(1.89)	(0.69)	(1.32)	(4.70)	(0.76)	(4.11)	(2.68)	(3.31)
Indus2	**0.6715**	**0.8938**	**0.9066**	**0.8961**	**0.7526**	**0.9357**	**0.8162**	**0.8950**	**0.7286**	**0.7252**	**0.6747**
	(22.41)	(14.17)	(18.05)	(15.08)	(15.86)	(23.33)	(24.73)	(29.57)	(24.12)	(23.18)	(16.60)
Indus3	**0.8364**	**0.8751**	**0.9457**	**1.0976**	**0.9035**	**0.9235**	**0.7721**	**0.8760**	**0.6777**	**0.5937**	**0.5065**
	(31.45)	(14.31)	(19.72)	(18.14)	(18.09)	(21.25)	(22.89)	(28.39)	(21.74)	(17.94)	(13.29)
Indus4	**0.9719**	**0.8958**	**1.0284**	**1.1547**	**1.1051**	**1.0661**	**0.9796**	**0.8405**	**0.8339**	**0.7613**	**0.5656**
	(15.80)	(7.78)	(13.32)	(9.22)	(9.82)	(4.97)	(15.11)	(11.48)	(11.86)	(10.81)	(7.87)
Indus5	**0.6829**	**0.6980**	**0.8987**	**0.9537**	**0.7890**	**0.7782**	**0.6552**	**0.7143**	**0.5313**	**0.4346**	**0.3741**
	(19.33)	(10.90)	(16.30)	(13.28)	(12.54)	(14.68)	(16.52)	(20.19)	(15.07)	(11.45)	(8.87)

Indus6	**0.7279**	**0.7650**	**0.8117**	**0.8946**	**0.6991**	**0.7336**	**0.5796**	**0.6747**	**0.4195**	**0.3597**	**0.3206**
	(22.34)	(12.38)	(16.26)	(13.59)	(12.79)	(15.59)	(16.82)	(21.04)	(13.27)	(10.86)	(8.47)
Indus7	**0.8318**	**0.8470**	**0.8765**	**1.0059**	**0.8840**	**0.8767**	**0.7254**	**0.8116**	**0.6446**	**0.5482**	**0.4197**
	(24.38)	(12.48)	(16.03)	(13.12)	(14.14)	(15.71)	(16.67)	(17.90)	(14.58)	(12.05)	(8.54)
Indus8	**0.8554**	**0.8385**	**0.8511**	**0.8928**	**0.8263**	**0.7383**	**0.7226**	**0.8009**	**0.5686**	**0.4718**	**0.3899**
	(19.65)	(11.43)	(13.64)	(11.98)	(12.19)	(11.92)	(16.81)	(19.24)	(12.57)	(11.51)	(8.56)
Indus9	**0.7750**	**0.7527**	**0.6507**	**0.8484**	**0.9106**	**0.8864**	**0.7609**	**0.8327**	**0.6672**	**0.5346**	**0.3961**
	(13.62)	(6.54)	(7.19)	(7.83)	(8.59)	(14.19)	(15.35)	(18.82)	(13.19)	(13.10)	(8.11)
Indus10	**0.2568**	**0.3665**	**0.5775**	**0.1940**	**0.1285**	**0.2362**	**0.0066**	**-0.2755**	**0.0237**	**0.0811**	**-0.0608**
	(4.26)	(3.31)	(4.33)	(1.17)	(0.95)	(1.66)	(0.05)	(2.45)	(0.16)	(1.05)	(0.70)
Public	**0.1694**	**0.2523**	**0.4226**	**0.2864**	**0.1075**	**0.2142**	**0.2401**	**0.2376**	**0.2725**	**0.3178**	**0.3371**
	(3.04)	(2.33)	(5.07)	(2.83)	(1.07)	(4.60)	(5.70)	(6.31)	(6.06)	(9.19)	(8.79)
Rural	**-0.1163**	**-0.2202**	**-0.2158**	**-0.2877**	**-0.1771**	**-0.2241**	**-0.2322**	**-0.2015**	**-0.1891**	**-0.2309**	**-0.2242**
	(7.32)	(7.36)	(9.99)	(8.99)	(6.07)	(8.19)	(13.40)	(12.20)	(10.95)	(12.60)	(11.74)
Head	**0.0903**	**0.0863**	**0.0859**	**0.0136**	**0.0711**	**0.0947**	**0.0836**	**0.0799**	**0.0991**	**0.0943**	**0.0425**
	(4.61)	(2.60)	(3.19)	(0.29)	(1.86)	(3.12)	(3.40)	(3.69)	(4.51)	(3.96)	(1.78)
Married	**0.0533**	**0.0993**	**0.0209**	**0.0433**	**0.0710**	**0.0827**	**0.0512**	**0.0392**	**0.0540**	**0.0249**	**0.0639**
	(2.78)	(3.01)	(0.80)	(1.01)	(2.33)	(3.13)	(2.51)	(2.02)	(2.90)	(1.22)	(3.00)
Children	**-0.0040**	**-0.0143**	**0.0028**	**-0.0039**	**-0.0134**	**-0.0071**	**-0.0138**	**-0.0223**	**-0.0167**	**-0.0124**	**-0.0198**
	(0.92)	(1.74)	(0.50)	(0.45)	(1.78)	(1.02)	(2.55)	(4.35)	(3.08)	(2.06)	(3.03)
Union	**0.1313**	**0.2197**	**0.0916**	**0.2479**	**0.2163**	**0.2270**	**0.2529**	**0.2566**	**0.2320**	**0.2451**	**0.2470**
	(8.40)	(7.89)	(4.36)	(7.54)	(7.84)	(9.47)	(13.12)	(14.26)	(12.10)	(12.51)	(11.15)
_cons	**0.6473**	**0.3757**	**0.4440**	**0.1968**	**0.2054**	**0.2629**	**0.1424**	**0.1236**	**0.1946**	**0.4717**	**0.6319**
	(14.78)	(4.69)	(6.58)	(2.20)	(2.61)	(3.41)	(2.76)	(2.56)	(4.18)	(9.41)	(12.32)
Observations	9456.0000	4178.0000	6818.0000	4046.0000	6363.0000	9001.0000	13495.0000	13111.0000	12336.0000	12251.0000	12266.0000
Rsquared	0.5500	0.4558	0.3694	0.4372	0.3997	0.4603	0.4947	0.5557	0.5445	0.5310	0.4708

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

Output For Union Sector Workers

Absolute t-values indicated in parentheses, significance at 5% level.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Education	**-0.0504**	**-0.07247**	**-0.03231**	**0.012701**	**-0.01951**	**-0.06283**	**-0.04441**	**-0.06983**	**-0.0612**	**-0.05359**	**-0.06463**
	(4.5)	(3.87)	(2.4)	(0.69)	(1.45)	(3.67)	(4.59)	(8.18)	(6.47)	(4.13)	(5.44)
Education2	**0.008147**	**0.008749**	**0.006105**	**0.002905**	**0.006103**	**0.008856**	**0.007302**	**0.009651**	**0.010243**	**0.008118**	**0.00991**
	(10.36)	(6.83)	(6.66)	(2.03)	(5.84)	(8.1)	(10.1)	(14.88)	(14.42)	(10.26)	(13.19)
Experience	**0.010751**	**0.021708**	**0.008891**	**0.020333**	**0.023945**	**0.021427**	**0.016892**	**0.023936**	**0.035381**	**0.012329**	**0.029824**
	(2.5)	(2.93)	(1.51)	(2.14)	(3.45)	(3.26)	(3.16)	(5.45)	(8.43)	(2.44)	(5.79)

Experience2	**-0.00011**	**-0.00034**	**-0.00015**	**-0.00026**	**-0.00033**	**-0.00034**	**-0.00024**	**-0.00031**	**-0.00043**	**-0.00012**	**-0.00033**
	(1.54)	(2.71)	(1.53)	(1.55)	(2.94)	(3.21)	(2.78)	(4.42)	(6.19)	(1.37)	(3.87)
Tenure	**0.009978**	**0.013046**	**0.013268**	**0.015138**	**0.012672**	**0.011629**	**0.008439**	**0.009505**	**0.009756**	**0.013574**	**0.007639**
	(6.29)	(4.74)	(6.73)	(4.45)	(5.48)	(5.04)	(5.73)	(6.78)	(7.08)	(8.24)	(4.31)
occ2	**0.282886**	**0.462095**	**0.444497**	**0.79626**	**0.421065**	**0.173026**	**0.244123**	**0.17523**	**0.249675**	**0.34258**	**0.434356**
	(3.27)	(4.34)	(7.48)	(4.64)	(4.12)	(1.64)	(3.65)	(2.29)	(3.25)	(4.41)	(5.4)
occ3	**0.41397**	**0.348783**	**0.282392**	**0.577306**	**0.335368**	**0.297489**	**0.403044**	**0.265026**	**0.350587**	**0.356289**	**0.395607**
	(9.23)	(4.72)	(4.73)	(5.96)	(4.21)	(3.84)	(7.39)	(5.73)	(7.84)	(6.18)	(8.04)
occ4	**0.120236**	**0.03207**	**0.070262**	**0.22167**	**0.094853**	**0.15894**	**0.200945**	**0.101533**	**0.218794**	**0.192449**	**0.222105**
	(2.85)	(0.38)	(1.1)	(2.38)	(1.41)	(2.4)	(4.27)	(2.25)	(4.64)	(4.06)	(4.08)
occ5	**0.11934**	**-0.0694**	**-0.00298**	**0.216636**	**-0.03003**	**-0.02636**	**-0.03008**	**-0.16358**	**0.061221**	**-0.06408**	**-0.04787**
	(3.13)	(0.96)	(0.06)	(2.49)	(0.47)	(0.39)	(0.67)	(4)	(1.19)	(1.47)	(0.93)
occ6	**-0.09669**	**-0.03238**	**-0.1207**	**0.060343**	**0.016909**	**-0.03882**	**-0.1302**	**-0.05388**	**0.368825**	**0.015875**	**0.209476**
	(0.41)	(0.25)	(1.1)	(0.41)	(0.14)	(0.39)	(1.67)	(0.64)	(2.41)	(0.14)	(1.14)
occ7	**0.195004**	**0.070644**	**0.086311**	**0.115991**	**0.107747**	**0.025958**	**0.06956**	**0.042903**	**0.216541**	**0.059208**	**0.011509**
	(5.29)	(1.28)	(2.02)	(1.67)	(1.93)	(0.57)	(1.8)	(1.3)	(6.07)	(1.49)	(0.22)
occ8	**0.121328**	**0.090161**	**0.059885**	**0.074776**	**0.022668**	**0.086734**	**0.097679**	**-0.01859**	**0.125254**	**-0.01734**	**0.040799**
	(4.19)	(1.59)	(1.61)	(1.23)	(0.46)	(1.99)	(2.68)	(0.63)	(3.77)	(0.5)	(1)
indus2	**0.449493**	**0.187601**	**0.482353**	**0.649874**	**0.515001**	**0.628809**	**0.550738**	**0.531528**	**0.605793**	**0.699587**	**0.617531**
	(9.64)	(1.22)	(4.08)	(6.23)	(6.93)	(7.84)	(8.29)	(8.44)	(8.85)	(7.27)	(4.93)
indus3	**0.663911**	**0.246118**	**0.564912**	**0.911542**	**0.7148**	**0.67385**	**0.539456**	**0.51797**	**0.621196**	**0.610163**	**0.4637**
	(14.33)	(1.6)	(4.8)	(8.63)	(8.39)	(8)	(7.93)	(7.86)	(8.61)	(6.05)	(3.65)
indus4	**0.784599**	**0.312713**	**0.626806**	**1.039471**	**0.845906**	**1.065555**	**0.827582**	**0.487381**	**0.819337**	**0.719155**	**0.720702**
	(7.14)	(1.27)	(4.29)	(5.62)	(6.83)	(7.34)	(8.8)	(4.64)	(8.31)	(6)	(5.06)
indus5	**0.465375**	**0.024763**	**0.501145**	**0.841857**	**0.464091**	**0.625169**	**0.517823**	**0.44145**	**0.479846**	**0.422915**	**0.253745**
	(6.28)	(0.14)	(3.68)	(6.66)	(3.65)	(5.7)	(6.17)	(5.84)	(5.91)	(3.9)	(1.63)
indus6	**0.530894**	**0.141636**	**0.4671**	**0.691405**	**0.576597**	**0.458416**	**0.362514**	**0.311473**	**0.356098**	**0.303941**	**0.166362**
	(9.71)	(0.86)	(3.85)	(5.69)	(5.74)	(4.96)	(4.87)	(4.34)	(4.72)	(3)	(1.27)
indus7	**0.689073**	**0.275545**	**0.539896**	**0.821215**	**0.887402**	**0.720112**	**0.687579**	**0.640743**	**0.723878**	**0.752524**	**0.464747**
	(13.27)	(1.73)	(4.4)	(5.87)	(9.31)	(7.37)	(9.17)	(8.52)	(8.3)	(7.25)	(3.49)
indus8	**0.639088**	**0.022512**	**0.526644**	**0.606706**	**0.506393**	**0.27066**	**0.388572**	**0.327134**	**0.297942**	**0.259997**	**0.161779**
	(9.8)	(0.13)	(3.81)	(4.51)	(5.24)	(2.42)	(4.42)	(4.11)	(2.74)	(2.38)	(1.22)
indus9	**0.697295**	**0.562183**	**0.44953**	**0.644682**	**0.465467**	**0.681835**	**0.667956**	**0.546119**	**0.6225**	**0.644802**	**0.326884**
	(7.53)	(2.96)	(2.71)	(4.4)	(3.41)	(6.69)	(7.38)	(6.68)	(7.29)	(6)	(2.49)
indus10	**0.301592**	**-0.49941**	**0.434542**	**0**	**-0.35776**	**0.093745**	**0.625664**	**0.002045**	**-0.29713**	**0**	**0.137486**
	(0.81)	(1.39)	(2.36)	0	(1.25)	(0.3)	(6.72)	(0.02)	(4.05)	(0)	(0.7)

Public	**0.022246**	**-0.22199**	**0.214508**	**0.23425**	**0.354307**	**0.195006**	**0.134286**	**0.218686**	**0.252231**	**0.229007**	**0.299341**
	(0.26)	(1.15)	(1.62)	(1.71)	(3.03)	(3.09)	(2.04)	(4.06)	(4.98)	(4.12)	(5.21)
Rural	**-0.09249**	**-0.1665**	**-0.14796**	**-0.20842**	**-0.08063**	**-0.14757**	**-0.1524**	**-0.10569**	**-0.07794**	**-0.14888**	**-0.11485**
	(4.25)	(3.98)	(5.13)	(4.76)	(2.17)	(4.39)	(7.67)	(5.25)	(3.58)	(5.5)	(4.23)
Head	**0.0713**	**0.026937**	**0.116894**	**0.070811**	**0.017069**	**0.138119**	**0.149444**	**0.071166**	**0.080996**	**0.076988**	**0.019176**
	(2.66)	(0.54)	(3.05)	(0.91)	(0.27)	(2.67)	(3.86)	(2.12)	(2.26)	(2.14)	(0.47)
Married	**0.069179**	**0.079236**	**-0.00938**	**0.030251**	**0.009042**	**0.016498**	**0.01046**	**0.022894**	**0.014435**	**0.039601**	**0.039909**
	(2.54)	(1.62)	(0.26)	(0.46)	(0.23)	(0.44)	(0.36)	(0.81)	(0.56)	(1.31)	(1.18)
Children	**0.0056034**	**-0.00891**	**-0.00908**	**0.014724**	**-0.01824**	**-1.9E-05**	**-0.00677**	**-0.00735**	**-0.01285**	**0.001452**	**-0.01462**
	(0.87)	(0.72)	(1.15)	(1.11)	(1.93)	0	(0.97)	(1.12)	(1.57)	(0.18)	(1.32)
_cons	**1.083947**	**1.550172**	**1.145109**	**0.574896**	**0.728378**	**0.814858**	**0.940409**	**0.94778**	**0.438492**	**1.023123**	**0.911205**
	(14.99)	(8.59)	(8.03)	(3.58)	(5.64)	(6.21)	(9.58)	(10.96)	(4.74)	(8.75)	(6.58)
Observations	3377	1583	3281	1891	3127	3898	6134	5719	5375	4912	4856
Rsquared	0.4071	0.2688	0.2427	0.2361	0.2979	0.3475	0.3727	0.4235	0.4689	0.4414	0.4069

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

Output for Nonunion Sector Workers

Absolute t-values indicated in parentheses, significance at 5% level.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Education	**-0.0578**	**-0.0373**	**-0.02052**	**0.005762**	**-0.03426**	**-0.02316**	**-0.02054**	**-0.05653**	**-0.05043**	**-0.06285**	**-0.0635**
	(7.03)	(2.47)	(1.61)	(0.37)	(2.22)	(1.82)	(1.96)	(4.75)	(5.29)	(6)	(5.28)
Education2	**0.009221**	**0.008865**	**0.006627**	**0.004287**	**0.007712**	**0.00676**	**0.007407**	**0.00992**	**0.00909**	**0.009981**	**0.009243**
	(13.55)	(7.88)	(7.23)	(3.51)	(6.58)	(7.41)	(9.79)	(10.83)	(12.93)	(13.1)	(10.17)
Experience	**0.024148**	**0.024593**	**0.026412**	**0.023831**	**0.024412**	**0.021474**	**0.037685**	**0.037291**	**0.03176**	**0.035962**	**0.020032**
	(6.72)	(4.12)	(4.98)	(3.23)	(3.92)	(4.08)	(9.83)	(9.99)	(8.98)	(9.28)	(5.06)
Experience2	**-0.00038**	**-0.00038**	**-0.00043**	**-0.0003**	**-0.00031**	**-0.00029**	**-0.00051**	**-0.00053**	**-0.00048**	**-0.00051**	**-0.00026**
	(6.42)	(3.89)	(4.85)	(2.48)	(2.87)	(3.43)	(7.86)	(8.14)	(7.98)	(8.02)	(3.67)
Tenure	**0.01419**	**0.012753**	**0.01374**	**0.012011**	**0.015929**	**0.012885**	**0.015375**	**0.017419**	**0.01726**	**0.01807**	**0.018346**
	(10.41)	(5.06)	(6.33)	(4.24)	(5.91)	(5.89)	(9.44)	(10.74)	(10.96)	(11.03)	(9.55)
occ2	**0.268363**	**0.383992**	**0.323622**	**0.736374**	**0.484604**	**0.897574**	**0.672082**	**0.651311**	**0.60078**	**0.783706**	**1.004242**
	(2.94)	(3.15)	(3.65)	(4.06)	(3.28)	(7.51)	(5.1)	(4.07)	(4.63)	(6.32)	(9.24)
occ3	**0.330819**	**0.386095**	**0.436041**	**0.525658**	**0.373378**	**0.359876**	**0.463963**	**0.422411**	**0.51262**	**0.518536**	**0.463921**
	(5.57)	(4.67)	(5.82)	(3.85)	(3.12)	(4.57)	(7.56)	(6.42)	(9.55)	(8.75)	(7.26)
occ4	**0.159172**	**0.277008**	**0.056564**	**0.178858**	**0.285496**	**0.128902**	**0.286729**	**0.132504**	**0.22142**	**0.22427**	**0.262266**
	(3.31)	(3.84)	(0.83)	(1.5)	(3.61)	(1.78)	(5.19)	(2.71)	(4.19)	(3.6)	(4.21)
occ5	**0.012908**	**-0.03914**	**-0.06648**	**-0.10332**	**-0.13185**	**-0.17834**	**-0.07286**	**-0.24861**	**-0.14933**	**-0.1045**	**-0.15725**

	(0.31)	(0.66)	(1.36)	(1.46)	(2.12)	(2.83)	(1.79)	(6.23)	(3.6)	(2.52)	(3.75)
occ6	**0.336487**	**0.084638**	**0.073724**	**0.04295**	**0.119988**	**-0.01476**	**0.276309**	**0.12784**	**0.23569**	**-0.01946**	**0.046366**
	(3.12)	(0.84)	(0.82)	(0.6)	(1.58)	(0.17)	(3.41)	(1.67)	(3.14)	(0.21)	(0.32)
occ7	**0.137126**	**0.086712**	**0.094977**	**-0.00433**	**-0.00357**	-0.00054	0.140082	0.01606	0.08324	0.094652	0.096047
	(3.87)	(1.54)	(2.18)	(0.07)	(0.06)	(0.01)	(3.87)	(0.49)	(2.73)	(2.9)	(2.76)
occ8	**0.136637**	**0.147692**	**0.063339**	**0.092655**	**0.031255**	**0.002047**	**0.109123**	**0.032678**	**0.0745**	**0.103643**	**0.09099**
	(4.93)	(2.87)	(1.6)	(1.71)	(0.63)	(0.05)	(3.39)	(1.05)	(2.63)	(3.58)	(2.88)
indus2	**0.794817**	**0.951174**	**0.998248**	**0.979069**	**0.836921**	**1.018656**	**0.844268**	**0.903998**	**0.77557**	**0.721356**	**0.667105**
	(17.21)	(9.62)	(14.47)	(11.87)	(10.59)	(17.97)	(16.12)	(18.35)	(14.97)	(15.21)	(11.32)
indus3	**0.827574**	**0.842804**	**0.971097**	**1.051671**	**0.91191**	**0.931487**	**0.75039**	**0.865448**	**0.63814**	**0.529407**	**0.458061**
	(23.78)	(10.91)	(16.88)	(12.75)	(13.97)	(17.57)	(17.1)	(22.51)	(16.19)	(14.17)	(11.36)
indus4	**0.978411**	**0.824504**	**1.074629**	**0.986922**	**1.119407**	**0.752375**	**0.886982**	**0.819825**	**0.70539**	**0.803405**	**0.32467**
	(13.9)	(6.85)	(10.38)	(5.66)	(5.4)	(1.97)	(8.81)	(7.06)	(6.27)	(7.46)	(3.12)
indus5	**0.715783**	**0.702421**	**0.92012**	**0.912085**	**0.877505**	**0.75229**	**0.612228**	**0.693242**	**0.50877**	**0.407486**	**0.356233**
	(17.11)	(9.4)	(14.28)	(10.38)	(11.73)	(11.76)	(12.77)	(16.25)	(12.08)	(9.29)	(8.2)
indus6	**0.749031**	**0.746952**	**0.806346**	**0.879639**	**0.688183**	**0.7474**	**0.548393**	**0.66522**	**0.39568**	**0.329163**	**0.333765**
	(17.52)	(10.29)	(13.71)	(10.77)	(10.22)	(12.73)	(13)	(17.05)	(10.07)	(8.46)	(8.45)
indus7	**0.784021**	**0.767953**	**0.845179**	**0.963262**	**0.71944**	**0.827674**	**0.582733**	**0.688544**	**0.53422**	**0.371462**	**0.325896**
	(15.99)	(8.71)	(11.7)	(10.55)	(8.41)	(11.45)	(10.04)	(11.37)	(9.63)	(6.33)	(5.5)
indus8	**0.874746**	**0.85883**	**0.830134**	**0.892948**	**0.916715**	**0.804953**	**0.71641**	**0.806406**	**0.595**	**0.475306**	**0.40912**
	(15.22)	(9.53)	(11.08)	(9.49)	(10.17)	(10.51)	(13.56)	(15.73)	(11.95)	(10.01)	(8.12)
indus9	**0.740271**	**0.649769**	**0.606634**	**0.85289**	**1.06555**	**0.87106**	**0.677679**	**0.771708**	**0.61114**	**0.418319**	**0.359845**
	(10.39)	(4.8)	(5.42)	(5.75)	(7.35)	(11.22)	(11.04)	(12.87)	(8.96)	(8.95)	(6.23)
indus10	**0.26184**	**0.38649**	**0.515946**	**0.254618**	**0.19882**	**0.251059**	**-0.08318**	**-0.27121**	**0.00428**	**0.053317**	**-0.06583**
	(4.25)	(3.22)	(3.11)	(1.49)	(1.3)	(1.6)	(0.61)	(2.22)	(0.03)	(0.7)	(0.72)
Public	**0.247891**	**0.356516**	**0.532778**	**0.310319**	**0.031532**	**0.216822**	**0.311082**	**0.258171**	**0.29074**	**0.37439**	**0.412625**
	(3.44)	(2.85)	(5.05)	(2.18)	(0.22)	(3.46)	(5.54)	(4.35)	(4.43)	(8.03)	(7.98)
Rural	**-0.13508**	**-0.23816**	**-0.27966**	**-0.36072**	**-0.26523**	**-0.2679**	**-0.28337**	**-0.28039**	**-0.27721**	**-0.28129**	**-0.29338**
	(6)	(5.84)	(8.66)	(7.7)	(5.85)	(6.81)	(10.23)	(10.91)	(10.73)	(11.35)	(11.54)
Head	**0.106022**	**0.121835**	**0.055685**	**-0.02162**	**0.085672**	**0.064092**	**0.041322**	**0.069412**	**0.10067**	**0.0831**	**0.04977**
	(3.85)	(2.78)	(1.47)	(0.37)	(1.77)	(1.74)	(1.36)	(2.56)	(3.64)	(2.79)	(1.7)
Married	**0.046084**	**0.103989**	**0.054791**	**0.046239**	**0.111487**	**0.113814**	**0.070423**	**0.038924**	**0.07091**	**0.009492**	**0.075198**
	(1.78)	(2.4)	(1.45)	(0.83)	(2.45)	(3.28)	(2.56)	(1.52)	(2.84)	(0.37)	(2.79)
Children	**-0.00875**	**-0.01667**	**0.009985**	**-0.0168**	**-0.00872**	**-0.00892**	**-0.01972**	**-0.02811**	**-0.01687**	**-0.01819**	**-0.02419**
	(1.5)	(1.56)	(1.29)	(1.47)	(0.77)	(0.95)	(2.58)	(3.91)	(2.44)	(2.19)	(3.04)
_cons	**0.595343**	**0.27551**	**0.313518**	**0.27783**	**0.181079**	**0.217846**	**0.00373**	**0.066129**	**0.28063**	**0.411811**	**0.702589**

	(10.56)	(2.79)	(3.54)	(2.41)	(1.7)	(2.22)	(0.06)	(1.03)	(4.53)	(6.38)	(11.21)
Observations	6079	2595	3537	2155	3236	5103	7361	7392	6961	7339	7410
Rsquared	0.5269	0.4539	0.3988	0.4505	0.3884	0.4333	0.4439	0.5061	0.4733	0.453	0.3953

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

Quantile Regression Results

Absolute t-values indicated in parentheses, significance at 5% level.

1995	20th Percentile	50th Percentile	80th Percentile	1996	20th Percentile	50th Percentile	80th Percentile	1997	20th Percentile	50th Percentile	80th Percentile	1998	20th Percentile	50th Percentile	80th Percentile
Education	-0.015	-0.038	-0.058		0.005	-0.005	0.025		-0.065	-0.032	-0.012		-0.034	-0.051	0.09
	(-1.02)	(-3.92)	(-5.94)		(0.18)	(-0.24)	(1.35)		(-3.39)	(-2.52)	(-0.98)		(-1.67)	(-2.68)	(-3.36)
Education 2	0.006	0.007	0.008		0.006	0.007	0.004		0.01	0.007	0.006		0.006	0.007	0.01
	(5.95)	(10.11)	(10.51)		(3.33)	(4.87)	(3.02)		(8.25)	(9.14)	(7.24)		(4.47)	(5.71)	(5.95)
Experience	0.019	0.014	0.015		0.021	0.01	0.001		0.001	0.01	0.007		0.025	0.015	0.013
	(3.15)	(3.83)	(3.71)		(2.19)	(1.29)	(0.17)		(-0.22)	(2.19)	(1.36)		(3.2)	(2)	(1.36)
Experience2 ($x10^2$)	-0.033	-0.019	-0.022		-0.029	-0.013	0.006		0.013	-0.014	-0.008		-0.041	-0.021	-0.013
	(-3.1)	(-2.83)	(-3.1)		(-1.61)	(-0.91)	(0.44)		(1.05)	(-1.54)	(-0.83)		(-3.02)	(-1.54)	(-0.77)
Tenure	0.013	0.012	0.011		0.018	0.014	0.016		0.014	0.012	0.011		0.016	0.012	0.013
	(4.98)	(7.67)	(7.18)		(3.99)	(4.07)	(4.94)		(4.43)	(6.14)	(5.52)		(4.33)	(3.78)	(3.42)
occ2	-0.004	-0.103	-0.102		0.526	0.121	0.276		0.383	0.129	0.062		0.289	0.388	0.292
	(-0.02)	(-0.84)	(-0.71)		(2.45)	(0.73)	(1.73)		(3.15)	(1.51)	(0.73)		(1.86)	(2.5)	(1.5)
occ3	0.086	0.012	-0.097		0.404	0.047	0.214		0.206	-0.007	-0.09		0.174	0.263	0.282
	(0.52)	(0.11)	(-0.75)		(2.15)	(0.32)	(1.54)		(1.71)	(-0.08)	(-1.06)		(1.27)	(1.9)	(1.66)
occ4	-0.209	-0.258	-0.376		0.276	-0.123	-0.072		0.213	-0.07	-0.144		-0.11	-0.064	0.003
	(-1.25)	(-2.31)	(-2.85)		(1.42)	(-0.83)	(-0.52)		(1.82)	(-0.85)	(-1.74)		(-0.8)	(-0.46)	(0.02)
occ5	-0.47	-0.486	-0.56		-0.074	-0.256	-0.163		-0.026	-0.308	-0.361		-0.202	-0.166	-0.265
	(-2.8)	(-4.34)	(-4.25)		(-0.37)	(-1.71)	(-1.19)		(-0.22)	(-3.62)	(-4.27)		(-1.48)	(-1.2)	(-1.55)
occ6	-0.4	-1.008	-0.829		0.124	-0.092	-0.026		-0.189	-0.615	-0.586		-0.25	-0.221	0.744
	(-1.43)	(-4.66)	(-3.73)		(0.47)	(-0.44)	(-0.13)		(-1.14)	(-5.43)	(-5.13)		(-1.13)	(-1.04)	(2.87)
occ7	-0.659	-0.602	-0.645		-0.138	-0.258	-0.283		-0.117	-0.387	-0.351		-0.207	-0.339	-0.409
	(-3.53)	(-4.82)	(-4.43)		(-0.67)	(-1.61)	(-1.93)		(-0.95)	(-4.31)	(-3.95)		(-1.34)	(-2.14)	(-2.02)
occ8	-0.562	-0.547	-0.625		-0.085	-0.341	-0.122		0.126	-0.249	-0.382		-0.173	-0.102	-0.371
	(-3.1)	(-4.53)	(-4.43)		(-0.37)	(-1.89)	(-0.71)		(0.92)	(-2.56)	(-3.81)		(-1.04)	(-0.61)	(-1.8)
occ9	-0.521	-0.622	-0.703		-0.019	-0.337	-0.375		-0.066	-0.375	-0.471		-0.336	-0.269	-0.349
	(-3.06)	(-5.55)	(-5.34)		(-0.1)	(-2.28)	(-2.8)		(-0.56)	(-4.5)	(-5.72)		(-2.46)	(-1.96)	(-2.07)

indus2	0.503	0.48	0.455		0.907	0.849	0.605		0.673	0.83	0.506		0.774	0.693	0.291
	(2.57)	(4.38)	(3.81)		(3.21)	(3.62)	(2.35)		(3.93)	(6.31)	(3.68)		(2.31)	(2.62)	(1.03)
indus3	0.792	0.638	0.501		0.63	0.398	0.423		0.656	0.706	0.42		0.269	0.759	0.646
	(11.1)	(13.64)	(10.18)		(5.11)	(3.79)	(4.19)		(7.26)	(11.73)	(6.29)		(2.75)	(7.74)	(5)
indus4	0.777	0.936	0.456		0.891	0.828	0.709		0.442	0.719	0.489	**indus4**	0.852	1.744	1.384
	(2.84)	(5.86)	(2.82)		(2.45)	(2.91)	(4.55)		(1.43)	(4.08)	(2.83)		(3.62)	(7.52)	(4.54)
indus5	0.922	0.807	0.852		0.303	0.203	0.579		0.441	0.577	0.613	**indus5**	1.227	1.228	1.868
	(5.14)	(6.41)	(7.16)		(1.18)	(1.01)	(3.45)		(2.7)	(4.86)	(4.79)		(5.91)	(5.31)	(7.91)
indus6	0.696	0.534	0.401		0.346	0.279	0.243		0.557	0.598	0.258	**indus6**	0.443	0.732	0.663
	(10.71)	(13.21)	(9.44)		(2.77)	(2.73)	(2.6)		(6.23)	(9.9)	(3.86)		(4.59)	(7.96)	(5.61)
indus7	1.194	0.836	0.647		0.855	0.704	0.7		0.616	0.926	0.717	**indus7**	0.909	1.243	0.887
	9.21	9.12	7.56		(3.26)	(3.64)	(4.32)		(4.4)	(9.37)	(6.72)		(5.19)	(7.53)	(4.29)
indus8	(0.996)	(0.752)	(0.692)		0.813	0.628	0.563		0.72	0.804	0.454	**indus8**	0.9	1.049	0.809
	10.16	11.61	10.53		(5.45)	(5.18)	(4.94)		(6.35)	(10.43)	(5.42)		(7.62)	(8.98)	(5.58)
indus9	(0.778)	(0.594)	(0.453)		0.319	0.489	0.361		0.375	0.478	0.34	**indus9**	0.404	0.727	0.73
	7.19	8.36	6.85		(2.34)	(4.14)	(3.31)		(3.15)	(5.94)	(3.85)		(3.27)	(6.37)	(5.32)
indus10	(0.051)	(0.065)	(0.2)		-0.284	0.056	0.181		-0.178	0.063	-0.224	**indus10**	0.023	0.309	1.11
	0.46	0.89	2.65		(-1.41)	(0.34)	(1.15)		(-1.06)	(0.54)	(-2.1)		(0.08)	(1.01)	(3.73)
Public	(0.145)	(0.117)	(0.13)		0.507	0.27	0.22		0.44	0.363	0.189	**Public**	0.422	0.32	0.047
	1.43	1.75	2.08		(4.61)	(2.89)	(2.32)		(4.44)	(5.5)	(2.67)		(3.86)	(3.44)	(0.43)
Rural	(-0.173)	(-0.166)	(-0.079)		-0.411	-0.316	-0.271		-0.292	-0.213	-0.191	**Rural**	-0.288	-0.264	-0.279
	-5.13	-7.87	-3.64		(-6.94)	(-6.84)	(-6.11)		(-7.26)	(-7.89)	(-6.62)		(-6.22)	(-5.88)	(-4.81)
Head	(0.112)	(0.094)	(0.116)		0.035	0.055	0.005		0.029	0.049	0.021	**Head**	-0.013	0.029	0.051
	2.96	3.97	4.64		(0.54)	(1.13)	(0.11)		(0.69)	(1.68)	(0.7)		(-0.27)	(0.62)	(0.86)
Married	(0.095)	(0.012)	(0.019)		0.06	0.077	0.066		0.002	-0.03	-0.042	**Married**	-0.046	-0.007	0.087
	2.85	0.56	0.83		(1.03)	(1.74)	(1.58)		(0.06)	(-1.15)	(-1.52)		(-0.94)	(-0.15)	(1.64)
Children	(-0.029)	(-0.023)	(-0.005)		0.011	0	-0.007		-0.023	-0.015	-0.011	**Children**	-0.043	-0.005	0.015
	-3.15	-3.94	-0.93		(0.68)	(-0.02)	(-0.62)		(-2.46)	(-2.2)	(-1.58)		(-3.76)	(-0.45)	(0.98)
Union	(0.144)	(0.183)	(0.079)		0.233	0.229	0.149		0.319	0.222	0.123	**Union**	0.434	0.275	0.249
	4.38	6.26	3.48		(3.91)	(5.11)	(3.55)		(8.58)	(8.51)	(4.43)		(9.07)	(6.2)	(4.41)
_cons	(0.459)	(1.385)	(2.096)		-0.348	0.858	0.473		0.203	0.88	1.746	**_cons**	0.169	0.628	1.428

	2.31	10.68	13.82		(-1.13)	(4.19)	(7.7)		(1.23)	(7.48)	(14.66)		(0.87)	(3.23)	(5.77)
Observations	4584	4584	4584		1892	1892	1892		3170	3170	3170	**Observations**	1982	1982	1982
Rsquared	0.3862	0.3625	0.3326		0.3428	0.3514	0.3277		0.3406	0.3267	0.2697	**Rsquared**	0.3396	0.3268	0.2660

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

1999	**20th Percentile**	**50th Percentile**	**80th Percentile**	**2000**	**20th Percentile**	**50th Percentile**	**80th Percentile**	**2001**	**20th Percentile**	**50th Percentile**	**80th Percentile**
Education	-0.017	-0.014	-0.016		-0.017	0.022	0.018		-0.052	-0.038	-0.032
	(-1.09)	(-1.14)	(-1.05)		(-1.13)	(2.53)	(1.26)		(-3.18)	(-3.13)	(-2.06)
Education2	0.007	0.006	0.006		0.006	0.003	0.003		0.008	0.007	0.007
	(6061)	(8.26)	(6.31)		(5.55)	(5.93)	(3.32)		(7.08)	(8.28)	(5.89)
Experience	0.018	0.013	0.014		0.019	0.003	-0.002		0.019	0.012	0.001
	(3.21)	(3.06)	(2.78)		(3.4)	(0.97)	(-0.38)		(3.64)	(3.23)	(0.3)
Experience2 ($x10^2$)	-0.03	-0.02	-0.019		-0.026	0.006	0.021		-0.037	-0.016	0.007
	(-2.97)	(-2.57)	(-2.06)		(-2.58)	(1.16)	(2.24)		(-3.77)	(*2.32)	(0.95)
Tenure	0.009	0.012	0.007		0.014	0.014	0.012		0.016	0.014	0.011
	(3.39)	(60.9)	(2.77)		(5.28)	(10.82)	(5.02)		(6.56)	(8.41)	(6.56)
occ2	-0.077	-0.303	-0.125		0.166	-0.122	-0.551		-0.272	-0.499	-0.699
	(-0.48)	(-2.58)	(-0.82)		(1.02)	(-1.56)	(-3.73)		(-1.99)	(-4.37)	(-6.66)
occ3	-0.032	-0.259	-0.112		0.068	-0.26	-0.573		-0.222	-0.413	-0.599
	(-0.21)	(-2.37)	(-0.8)		(0.48)	(-3.74)	(*4.19)		(-1.78)	(-3.96)	(-6.39)
occ4	-0.236	-0.34	-0.345		-0.14	-0.539	*0.853		-0.373	-0.608	-0.771
	(-1.55)	(-3.12)	(-2.5)		(-0.97)	(-7.6)	(*6.18)		(-3)	(-5.79)	(-8.18)
occ5	-0.545	-0.648	-0.534		-0.616	-0.889	-1.133		-0.765	-0.976	-1.048
	(-3.52)	(-5.9)	(-3.87)		(-4.17)	(-12.31)	(-7.94)		(-5.97)	(-9.08)	(-9.93)
occ6	-0.232	-0.574	-0.623		-0.34	-0.841	-1.276		-1.008	-1.099	-0.902
	(-1.19)	(-4.11)	(-3.62)		(-1.98)	(-8.78)	(-6.92)		(-4.29)	(-6.67)	(-5.63)
occ7	-0.46	-0.554	-0.605		-0.6	-0.998	-1.286		-0.72	-0.894	-1.132
	(-2.81)	(-4.67)	(-4.07)		(-3.87)	(-12.88)	(-8.7)		(-5.22)	(-7.91)	(-10.45)
occ8	-0.282	-0.571	-0.469		-0.502	-0.888	-1.158		-0.673	-0.925	-1.162
	(-1.67)	(-4.67)	(-2.99)		(-2.31)	(-11.41)	(-7.61)		(-4.89)	(-8.11)	(-10.68)
occ9	-0.408	-0.669	-0.613		-0.531	-0.948	-1.351		-0.693	-0.945	-1.104
	(-2.67)	(-6.14)	(-4.45)		(-3.65)	(-13.35)	(-9.58)		(-5.46)	(-8.88)	(-10.86)
indus2	0.428	0.561	0.662		0.777	0.672	0.504		0.848	0.77	0.772
	(2.26)	(4.26)	(3.8)		(3.96)	(6.97)	(3.18)		(5.33)	(6.58)	(7.45)

indus3	0.354	0.441	0.605		0.328	0.428	0.329		0.388	0.529	0.626
	(4.87)	(7.88)	(8.31)		(4.75)	(11.22)	(4.51)		(6.07)	(11.1)	(12.37)
indus4	1.402	1.18	0.916		0.957	0.995	0.694		0.498	0.751	0.78
	(6.22)	(6.96)	(3.91)		(6.18)	(11.3)	(5.22)		(2.76)	(6.18)	(6.47)
indus5	0.626	0.699	0.883		0.66	0.468	0.359		0.696	0.784	0.739
	(4.82)	(6.53)	(7.16)		(5.17)	(6)	(3.08)		(5.99)	(9.11)	(7.83)
indus6	0.34	0.317	0.375		0.407	0.407	0.256		0.288	0.465	0.461
	(5)	(6.03)	(5.63)		(6.17)	(11.13)	(3.69)		(4.46)	(10.03)	(9.78)
indus7	0.6	0.597	0.921		0.589	0.735	0.879		0.703	0.875	0.828
	(4.51)	(5.89)	(7.48)		(4.25)	(10.95)	(7.26)		(5.97)	(10.73)	(10.7)
indus8	0.787	0.747	0.865		0.656	0.718	0.666		0.724	0.798	0.779
	(9.83)	(11.67)	(10.96)		(8.03)	(16.53)	(8.09)		(9.88)	(14.29)	(14.51)
indus9	0.355	0.29	0.59		0.366	0.437	0.427		0.537	0.611	0.609
	(4.08)	(4.09)	(6.98)		(5.22)	(11.13)	(5.57)		(7.74)	(12.12)	(11.18)
indus10	0.232	-0.07	1.175		-0.126	0.729	0.355		-0.278	-0.171	-0.498
	(1.31)	(-0.45)	(5.94)		(-0.71)	(5.98)	(1.66)		(-0.88)	(-0.76)	(-2.37)
Public	0.447	0.588	0.322		0.353	0.357	0.269		0.367	0.341	0.299
	(5.65)	(9.77)	(4.48)		(6.96)	(12.99)	(5.34)		(7.22)	(9.57)	(7.4)
Rural	-0.25	-0.208	-0.153		0.279	-0.244	-0.176		-0.316	-0.278	-0.263
	(-6.83)	(-7.58)	(-4.65)		(-7.62)	(-12.83)	(-5.21)		(-9.66)	(-11.66)	(-10.99)
Head	0.054	0.114	0.036		0.015	0.076	0.088		0.08	0.07	0.048
	(1.49)	(4.17)	(1.04)		(0.38)	(3.9)	(2.53)		(2.38)	(2.91)	(2.07)
Married	0.067	0.102	0.065		0.039	0.12	0.125		0.119	0.072	0.083
	(1.95)	(3.9)	(1.95)		(1.09)	(6.5)	(3.71)		(3.81)	(2.95)	(3.13)
Children	-0.003	-0.007	-0.003		-0.029	-0.017	0.017		-0.003	0.003	-0.001
	(-0.3)	(-0.98)	(-0.4)		(-3.17)	(-3.59)	(-2.05)		(-0.37)	(0.44)	(-0.17)
Union	0.313	0.236	0.169		0.346	0.204	0.193		0.324	0.298	0.194
	(8.57)	(8.81)	(5.05)		(9.26)	(10.71)	(5.8)		(9.93)	(10.08)	(7.65)
_cons	0.26	0.99	1.504		0.402	1.286	2.239		0.656	0.272	2.033
	(1.4)	(7.45)	(9.18)		(2.27)	(14.27)	(12.93)		(4.14)	(10.08)	(17.33)
Observations	3249	3249	3249		4647	4647	4647		6954	6954	6954
Rsquared	0.3064	0.3541	0.3570		0.3570	0.4054	0.3942		0.3826	0.4181	0.3839

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

2002	20th Percentile	50th Percentile	80th Percentile	2003	20th Percentile	50th Percentile	80th Perncetile	2004	20th Percentile	50th Percentile	80th Percentile
Education	-0.053	-0.02	-0.026		-0.021	-0.031	-0.019		-0.009	-0.03	-0.034
	(-4.62)	(-1.98)	(-2.32)		(-1.41)	(-2.63)	(-1.93)		(-0.5)	(-2.62)	(-3.12)
Education2	0.008	0.006	0.006		0.005	0.006	0.006		0.005	0.006	0.006
	(10.26)	(8.94)	(7.88)		(5.55)	(7.9)	(8.2)		(4.93)	(8.95)	(7.85)
Experience	0.008	0.013	0.007		0.009	0.009	0.004		0.006	0.012	0.006
	(2.05)	(3.73)	(1.87)		(2.11)	(2.13)	(1.08)		(1.43)	(3.68)	(1.79)
Experience2 ($x10^2$)	-0.01	-0.01	0..048		-0.015	-0.005	0.006		0.028	-0.008	0.004
	(-1.52)	(-1.54)	(0.07)		(-1.72)	(-0.68)	(0.9)		(0.03)	(-1.26)	(0.54)
Tenure	0.019	0.013	0.009		0.015	0.013	0.012		0.01	0.011	0.008
	(10.37)	(8.06)	(5.03)		(7.11)	(7.75)	(7.89)		(2.16)	(5.35)	(5.29)
occ2	-0.385	-0.535	-0.755		-0.284	-0.46	-0.777		-0.28	-0.417	-0.563
	(-3.97)	(-4.66)	(-6.05)		(-2.78)	(-4.8)	(-8.56)		(-2.75)	(-4.11)	(-6.89)
occ3	-0.228	-0.331	-0.586		-0.275	-0.409	-0.671		-0.401	-0.496	-0.651
	(-2.67)	(-3.13)	(-5.17)		(-2.88)	(-4.95)	(-8.42)		(-4.27)	(-5.64)	(-10.5)
occ4	-0.559	-0.662	-0.885		-0.581	-0.63	-0.945		-0.543	-0.621	-0.848
	(-6.49)	(-6.34)	(-7.79)		(-5.97)	(-7.48)	(-11.99)		(-5.78)	(-6.99)	(-13.22)
occ5	-0.918	-0.957	-1.129		-0.883	-0.948	-1.16		-0.871	-0.971	-1.088
	(-10.08)	(-9.07)	(-9.91)		(-8.83)	(-10.96)	(-13.83)		(-8.99)	(-10.92)	(-16.65)
occ6	-0.749	-0.965	-1.137		-0.824	-0.839	-1.25		-0.975	-1.3	-1.327
	(-5.71)	(-7.25)	(-7.5)		(-4.9)	(-5.84)	(-9.72)		(-5.19)	(-8.75)	(-11.95)
occ7	-0.809	-1.108	-1.304		-0.803	-1.051	-1.291		-0.927	-1.063	-1.402
	(*7.93)	(-9.98)	(-10.85)		(-7.24)	(-10.87)	(-14.41)		(-8.53)	(-10.7)	(-18.21)
occ8	-0.831	-1.008	-1.22		-0.926	-1.047	-1.259		-1.067	-1.182	-1.294
	(-8.31)	(-9.14)	(-10.22)		(-8.46)	(-10.86)	(-13.65)		(-8.62)	(-12.07)	(-16.45)
occ9	-0.845	-1.036	-1.295		-0.9	-1.046	-1.345		-0.926	-1.121	-1.352
	(-9.21)	(-9.94)	(-11.69)		(-9.01)	(-12.3)	(-16.99)		(-9.45)	(-12.68)	(-21.13)
indus2	0.911	0.727	0.892		0.798	0.7	0.768		0.62	0.655	1.312
	(8.05)	(6.79)	(7.48)		(6.51)	(5.45)	(7.29)		(4.59)	(5.95)	(10.48)
indus3	0.351	0.485	0.622		0.249	0.43	0.58		0.187	0.311	0.556
	(6.67)	(11.03)	(12.37)		(4.11)	(8.45)	(7.29)		(3.12)	(6.81)	(11.12)
indus4	0.879	0.907	0.87		0.808	1.181	1.197		0.901	0.758	1.311
	(8.19)	(9.34)	(8.6)		(4.62)	(7.97)	(12.15)		(6.67)	(7.58)	(11.89)
indus5	0.55	0.553	0.639		0.25	0.241	0.369		0.158	0.26	0.518
	(6.37)	(7.64)	(7.74)		(2.52)	(2.71)	(5.12)		(1.6)	(3.7)	(8.22)
indus6	0.304	0.343	0.373		0.159	0.237	0.383		0.029	0.095	0.273
	(6.06)	(8.23)	(8.07)		(2.83)	(4.94)	(9.02)		(0.44)	(2.2)	(6)
indus7	0.818	0.878	1.047		0.901	0.907	0.924		0.561	0.687	1.173
	(9.26)	(12.19)	(10.75)		(9.59)	(10.46)	(15.05)		(5.85)	(8.97)	(18.85)
indus8	0.729	0.733	0.901		0.592	0.631	0.855		0.434	0.532	0.728

	(13.14)	(14.78)	(16.24)		(9.3)	(11.16)	(16.14)		(6.03)	(10.54)	(13.17)
indus9	0.454	0.445	0.616		0.47	0.621	0.772		0.214	0.328	0.583
	(8.01)	(9.32)	(11.57)		(7.05)	(11.37)	(15.1)		(3.2)	(6.8)	(11.92)
indus10	-0.195	-0.169	0.066		0.35	-0.121	-0.587		0.383	-0.025	-0.357
	(-0.87)	(-0.85)	(0.28)		(6.79)	(-2.87)	(-16.8)		(4.92)	(-0.31)	(-2.49)
Public	0.331	0.457	0.359		0.372	0.307	0.178		0.424	0.357	0.237
	(7.3)	(13)	(8.59)		(7.64)	(7.58)	(4.82)		(9.43)	(9.98)	(6.27)
Rural	-0.357	-0.291	-0.243		-0.341	-0.298	-0.25		-0.332	-0.257	-0.206
	(-13.36)	(-13.37)	(-9.84)		(-11.84)	(-11.96)	(-11.35)		(-12.28)	(-12.54)	(-10.1)
Head	0.075	0.025	0.029		0.003	0.023	0.081		0.055	0.006	0.035
	(2.78)	(1.09)	(1.18)		(0.11)	(0.92)	(3.77)		(1.99)	(0.28)	(1.47)
Married	0.161	0.099	0.077		0.083	0.058	0.076		0.135	0.088	0.069
	(6.35)	(4.56)	(3.16)		(3.03)	(2.32)	(3.38)		(4.97)	(4.07)	(2.79)
Children	-0.025	-0.019	-0.015		-0.039	-0.024	-0.024		-0.022	-0.029	-0.012
	(-3.66)	(-3.35)	(-2.23)		(-4.55)	(-3.49)	(-3.78)		(-2.9)	(-4.77)	(-1.9)
Union	0.314	0.226	0.145		0.34	0.187	0.099		0.463	0.339	0.255
	(11.25)	(9.72)	(5.21)		(11.57)	(7.06)	(4.2)		(14.03)	(14.41)	(9.74)
_cons	0.891	1.328	2.145		1.096	1.643	2.244		1.141	0.709	2.351
	(7.97)	(10.77)	(16.03)		(8.33)	(14.77)	(22.45)		(8.55)	(15.64)	(25.78)
Observations	6959	6959	6959		6614	6614	6614		6925	6925	6925
Rsquared	0.4060	0.4520	0.4251		0.3849	0.4524	0.4186		0.3839	0.4433	0.4283

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

2005	**20th Percentile**	**50th Percentile**	**80th Percentile**
Education	-0.066	-0.042	-0.051
	(-4.77)	(-3.34)	(-2.9)
Education2	0.008	0.008	0.009
	(9.44)	(9091)	(7.2)
Experience	0.01	0.007	0.003
	(2.46)	(1.73)	(0.61)
Experience2 (x10^{2})	-0.018	-0.004	0.013
	(-2.24)	(-0.53)	(1.19)
Tenure	0.016	0.016	0.01
	(7.11)	(8.82)	(3.75)
occ2	-0.154	-0.354	-0.564
	(-1.65)	(-4)	(-3.66)
occ3	-0.228	-0.31	-0.448

	(-2.63)	(-3.83)	(-3.43)
occ4	-0.505	-0.601	-0.772
	(-5.77)	(-7.5)	(-6.26)
occ5	-0.785	-0.948	-1.017
	(-8.63)	(-11.5)	(-8.06)
occ6	-0.646	-0.955	-1.112
	(-4.17)	(-6.58)	(-5.19)
occ7	-0.883	-1.013	-1.167
	(-8.42)	(-10.89)	(-8.18)
occ8	-0.985	-0.997	-1.099
	(-9.51)	(-10.55)	(-7.21)
occ9	-0.756	-0.972	-1.177
	(-8.18)	(-11.84)	(-9.46)
indus2	0.44	0.615	0.882
	(7.11)	(5.48)	(4.89)
indus3	0.256	0.271	0.488
	(3.52)	(5.3)	(6.41)
indus4	0.595	0.584	0.903
	(4.35)	(4.42)	(6.5)
indus5	0.225	0.168	0.216
	(2.68)	(2.15)	(2.1)
indus6	0.059	0.091	0.2
	(1.1)	(2.01)	(3.16)
indus7	0.33	0.694	0.682
	(3.04)	(8.12)	(6.19)
indus8	0.363	0.395	0.599
	(5.79)	(7.33)	(7.6)
indus9	0.126	0.227	0.411
	(2.04)	(7.33)	(5.35)
indus10	0.647	0.292	0.718
	(4.59)	(0.99)	(3.5)
Public	0.439	0.362	0.306
	(9.46)	(9.03)	(4.46)
Rural	-0.266	-0.228	-0.196
	(-9.91)	(-9.96)	(-5.91)
Head	0.022	0.012	-0.003

	(0.76)	(0.5)	(-0.08)
Married	0.09	0.063	0.052
	(3.18)	(2.58)	(1.44)
Children	-0.023	-0.023	-0.02
	(-2.86)	(-3.26)	(-1.99)
Union	0.378	0.269	0.154
	(11.83)	(10.35)	(3.87)
_cons	1.212	1.737	2.272
	(10.32)	(15.91)	(14.04)
Observations	6989	6989	6989
Rsquared	0.3049	0.3953	0.4102

Source: Own calculations from OHS 1995-1999 and LFS 2000-2005

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