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TITLE **LABOUR MARKET REFORM AND THE EVOLUTION OF THE RACIAL WAGE HIERARCHY IN POST-APARTHEID SOUTH AFRICA**

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ABSTRACT *The paper examines the evolution of the racial wage hierarchy in the South African labour market over the period 1993 to 1999. We find evidence that the transition to democratic rule in 1994 was accompanied by an improvement in the wage position of the majority African workforce relative to all other racial groups, but that these gains were not fully preserved through the latter half of the decade. We review the range of policy initiatives that have been taken by the new South African Government to reverse the legacy of apartheid in the light of our empirical findings.*

KEYWORDS Wage discrimination, South Africa, policy reforms

JEL CLASS J71, J31, J78

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1. Introduction

The South African apartheid system formally ended with the election of the African National Congress at the first all-race elections held in 1994. These elections concluded 46 years of official racial discrimination and inequality that had its roots in social structures, practices and attitudes dating back to the early nineteenth century. Despite the political transformation that has occurred and the elimination of overtly discriminatory laws and regulations, 'the overall consequences of the legacy of apartheid are deeply embedded in the polity, society and economy of the country' (Presidential Commission, 1996) potentially undermining the aspirations of the new South African democracy, at least within a reasonable time-frame.

Discrimination in the labour market was at the heart of the apartheid system, resulting in the use of non-productivity-related criteria in decisions concerning the allocation and utilisation of labour such as in recruitment, remuneration, firing and retrenchment (Presidential Commission, 1996). Apartheid policies adopted by the White-dominated National Party government such as colour barring and job reservation, for example through the *Industrial Conciliation Act 1956*, constituted statutory forms of racial discrimination and have now been repealed. Labour market outcomes were also conditioned by various institutional barriers to labour mobility and through the differential provision of and access to education, training and social welfare. These forms of extra-market discrimination[1] have also been subject to fundamental reform with, for example, the repeal of the *Bantu Urban Areas Act 1945* and the *Bantu Education Act 1955*.

However the replacement of apartheid legislation by policies designed to tackle the perceived causes of racial wage inequality has not as yet proved sufficient to eradicate the established racial wage hierarchy. Figure 1 provides *prima facie* evidence of the persistence of South Africa's well-known *hierarchical wage structure* over the period 1993 to 1999. It shows that amongst full-time, regular, civilian, non-primary sector, male employees of normal working age, Whites had the highest geometric mean wage, followed by Indians/Asians, Coloureds and finally Africans/Blacks who received the lowest geometric mean wage of any racial group throughout the period. Between 1993 and 1995 the overall African-White wage differential fell but then this gap stagnated or even rose slightly through the latter half of the 1990s. Thus substantial wage disparities persist five years after the transition to majority democratic rule.

[1] Extra-market discrimination refers to structural and systemic factors that exist prior to the labour market which condition the supply of and demand for labour (Presidential Commission, 1996).

Figure 1. Geometric mean wages by race as a percentage of the overall geometric mean wage, 1993-99

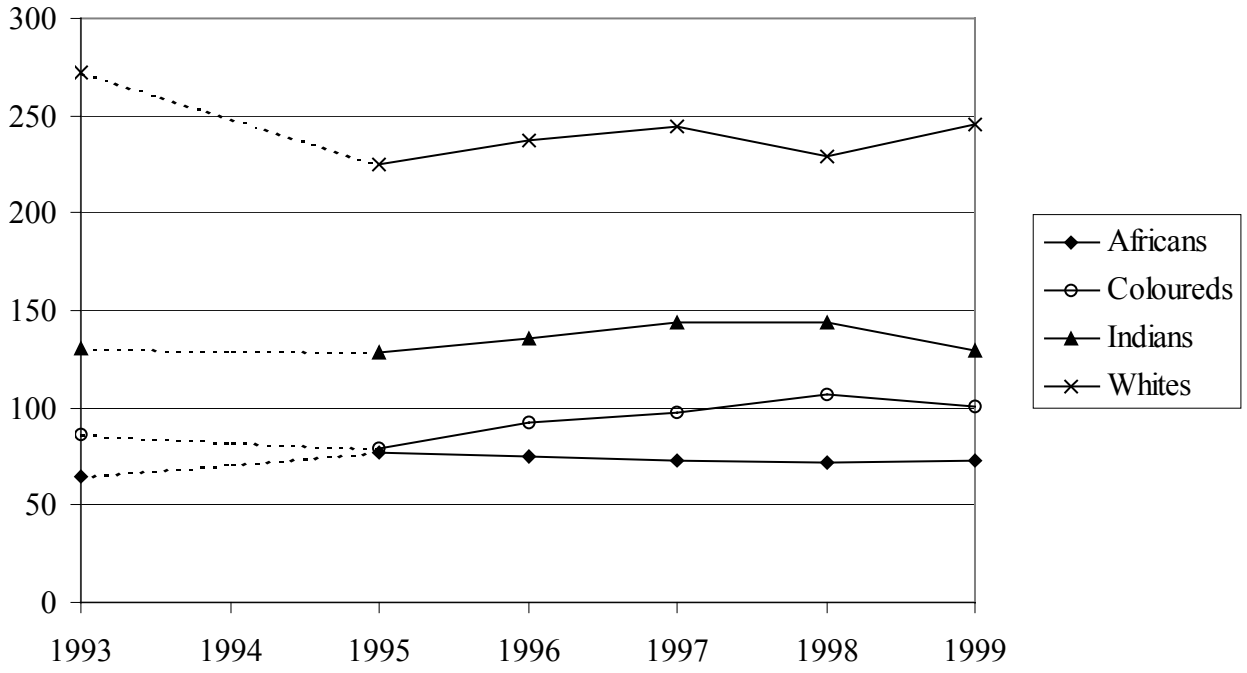
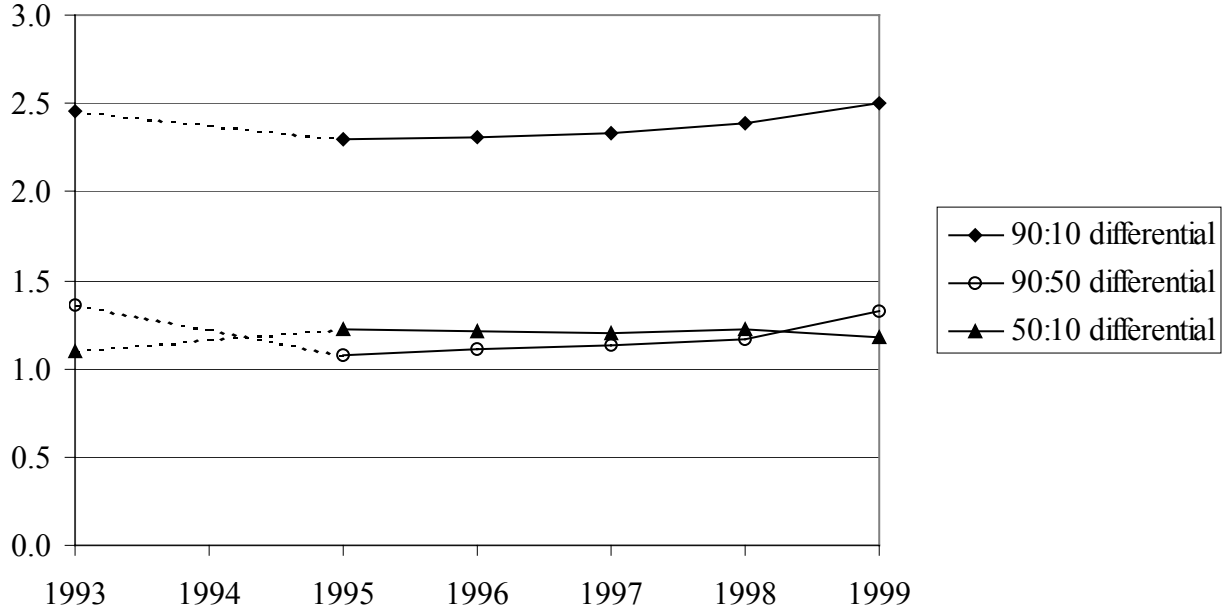


Figure 2. Overall log hourly wage differentials, 1993-99



A useful parallel may be drawn here with USA and other international experience even though this tends to concern discrimination against a minority, rather than the majority as is the case in South Africa. In particular, Darity and Mason (1998) and Altonji and Blank (1999) review a large literature on the USA labour market which provides evidence that the signal *Civil Rights Act* of 1964 led to a sustained and significant decline in Black/White earnings differentials over the following decade (Donahue and Heckman, 1991), but that substantial racial disparities remained which have proved remarkably persistent over time. One possible explanation is put forward by Arrow (1998) who stresses the potential importance both of 'statistical discrimination' and of social interactions and networks in influencing behaviour and perpetuating differential treatment. Thus the Apartheid policy of residential segregation might be expected to have a long-term detrimental impact on the operation of the labour market by inhibiting the formation of a genuinely multiracial society. A second reason may be that previous extra-market discrimination, particularly in the provision of education, can contribute markedly to continuing inequalities in the labour market since disadvantage tends to be self-reproducing and reinforcing. For example, Case and Deaton (1998) have found that in South Africa those with poor education are often unable to secure sufficient income to provide for the education of their children. Finally, Juhn et al. (1991, 1993) emphasise the importance of also taking changing returns to skills into account if the distribution of those skills is not uniform across racial groups due to either current discrimination or enduring patterns of disadvantage. Specifically, rising skill prices in combination with the fact that Africans are relatively concentrated in the lower half of the skills distribution may serve to explain the persistence of racial wage disparities.

The aim of this paper is to analyse the evolution of the racial wage hierarchy in South Africa over the period 1993 to 1999. In particular we examine the extent to which broader changes in the overall distribution of wages may serve to explain the lack of any sustained convergence in racial wage disparities in the post-apartheid era. Natrass (2000) argues that two forces appear to be acting on the wage distribution in South Africa's case: on the one hand, the demand for skilled labour is putting upward pressure on the top end of the wage distribution while trade union pressure on the other hand appears to be favouring lower paid jobs. Figure 2 shows that overall wage inequality amongst full-time, regular, civilian, non-primary sector, male employees of normal working age, as measured by the logarithm of the ratio of the hourly wage rate of the 90th percentile worker to that of the 10th percentile worker, fell between 1993 and 1995 but then grew steadily throughout the latter half of the decade. Between 1995 and 1999

there was a 9% increase in the 90-10 log wage differential as the net result of a 23% increase in the 90-50 differential and a 4% fall in the 50-10 differential.

The structure of the paper is as follows. The following section sets out the decomposition procedures that we employ to investigate the changing basis of the racial wage hierarchy. Section 3 describes the data from the 1993 Project for Statistics on Living Standards and Development survey and the 1995 to 1999 October Household Surveys that we employ in our analysis. Section 4 presents the empirical results on the nature and causes of the evolution of the racial wage hierarchy in the post-Apartheid era. In the final section we review the range of policy initiatives that have been taken by the South African Government to tackle the legacy of apartheid in the labour market.

2. Methodological Framework

This section presents a multilateral procedure that facilitates investigation of the changing basis of the racial wage hierarchy within South Africa by providing a joint decomposition of the logarithmic wage differentials between African, Coloured, Indian and White groups. Like other decomposition techniques our methodology measures discrimination indirectly as the residual component from an estimated wage function. Changes in this residual component over time should reflect any variation in the extent of wage discrimination but may also arise from changes in unmeasured or residual characteristics of the workforce and changes in the returns to such characteristics. We adapt an approach due to Juhn et al. (1991) to seek to identify the potential importance of changes in the returns to unobservable characteristics in the evolution of the residual wage gap.

Multilateral decomposition procedure

Following Oaxaca (1973) and Blinder (1973), the gross difference between the mean logarithm of wages of racial groups p and q $(p, q \in r = African, Coloured, Indian, White)$ in period t can be decomposed into an explained or predicted difference due to disparities in observable or measured characteristics between the two groups, and an unexplained or residual difference attributable to both wage discrimination and unmeasured disparities in characteristics. Neumark (1988) and Oaxaca and Ransom (1994) generalise this basic decomposition procedure by explicitly writing the residual difference in terms of the wage that each group receives relative to that which it would receive in the absence of discrimination. In Allanson et al. (2000), we

further partition both the gross and predicted differences in the mean logarithm of wages, to yield the following total decomposition of $ln(W_{pt} / W_{qt})$:

$$\left\{ln\left(\frac{W_{pt}}{W_t}\right) - ln\left(\frac{W_{qt}}{W_t}\right)\right\} = \left\{ln\left(\frac{W^*_{pt}}{W^*_t}\right) - ln\left(\frac{W^*_{qt}}{W^*_t}\right)\right\} + \left\{ln\left(\frac{W_{pt}}{W^*_{pt}}\right) - ln\left(\frac{W_{qt}}{W^*_{qt}}\right)\right\};\ p, q \in r;\ p \neq q \qquad (1)$$

which may be written as:

$$\{ln(\gamma_{pt} + 1) - ln(\gamma_{qt} + 1)\} = \{ln(\theta_{pt} + 1) - ln(\theta_{qt} + 1)\} + \{ln(\delta_{pt} + 1) - ln(\delta_{qt} + 1)\};\ p, q \in r;\ p \neq q \qquad (2)$$

On the left-hand side of (2), $\gamma_{rt} = ((W_{rt} / W_t) - 1)$ is defined as the gross wage differential of group *r,* where W_{rt} is the geometric mean wage of group *r* and W_t is the corresponding wage for the entire workforce under the (observed) discriminatory wage structure. On the right hand-side, $\theta_{rt} = ((W^*_{rt} / W^*_t) - 1)$ is the predicted wage differential of group *r* where W^*_{rt} is the geometric mean wage of group *r* and W^*_t is the corresponding wage for the entire workforce under the (hypothetical) non-discriminatory wage structure. Finally, $\delta_{rt} = ((W_{rt} / W^*_{rt}) - 1)$ represents the residual wage differential of group *r* which reflects the gap between the geometric mean wage of group *r* workers under the two wage structures. The main advantage of (2) over the standard Oaxaca-Blinder decomposition is that each component of the equation is expressed as the difference between two terms that is each defined independently of the particular binary comparison that is being made. The γ_{rt}, θ_{rt} and δ_{rt} coefficients thus constitute a set of sufficient statistics for the multilateral analysis of the racial wage hierarchy.

The implementation of (2) first requires the specification and estimation of a suitable model of wage determination under both the discriminatory and non-discriminatory regimes. Let the observed wage of an individual worker *h* in group *r* in year *t* be given by a standard Mincerian wage function:

$$ln\, w_{rht} = X'_{rht}\beta_{rt} + u_{rht};\quad h=1,\ldots n_{rt};\ \forall r \qquad (3)$$

where w_{rht} is the wage of the worker, X_{rht} is a vector of observable characteristics associated with the worker, β_{rt} is a conformable vector of group-specific returns to characteristics and u_{rht} is defined so that E($u_{rht} | X_{rht}$) = 0. If data on wages consist solely of point observations then estimation of (2) by ordinary least squares (OLS) using the sample of n_{rt} observations on group *r*

workers yields an estimate $\hat{\beta}_{rt}$ such that $lnW_{rt} = \overline{X}'_{rt}\hat{\beta}_{rt}$ where $\overline{X}_{rt}$ is the vector of mean values of the observed characteristics of group *r*. Additionally, OLS estimation of (3) over the pooled sample of size $n_t = \Sigma n_{rt}$ yields the pooled estimate $\hat{\beta}_t$ such that $lnW_t = \overline{X}'_t\hat{\beta}_t$ where $\overline{X}_t$ is the vector of mean values of the observed characteristics of the entire workforce.

The appropriate specification for the non-discriminatory wage structure is less well established in the literature.[2] We assume that neither the characteristics of individual workers nor the form of the wage function would change in the absence of discrimination, and specify the non-discriminatory wage function for an individual worker *i* of any race in year *t* as:

$$ln\, w^*_{it} = X'_{it}\beta^*_t + u^*_{it}; \quad i=1,\ldots n_t; \quad n_t = \Sigma n_{rt}; \tag{4}$$

where w^*_{it} is the hypothetical non-discriminatory wage of the worker, X_{it} is a vector of observable characteristics associated with the worker, β^*_t is a conformable vector of non-discriminatory returns to characteristics and u^*_{it} is defined so that $E(u^*_{it} | X_{it}) = 0$. Neumark (1988) provides a theoretical model to support the choice of $\hat{\beta}^*_t = \hat{\beta}_t$, that is the estimate of the non-discriminatory wage structure β^*_t in (4) is obtained by the estimation of (3) over the pooled sample of observations generated by the discriminatory wage regime. Oaxaca and Ransom (1994) show that $\hat{\beta}^*_t$ can be interpreted as a weighted combination of the $\hat{\beta}_{rt}$ estimates in (3), though individual elements of $\hat{\beta}^*_t$ need not be bracketed by the corresponding elements of $\hat{\beta}_{rt}$ from the separately estimated racial wage structures. The crucial point however for our multilateral decomposition procedure is simply that if $\hat{\beta}^*_t = \hat{\beta}_t$ then $ln\hat{W}^*_t = lnW_t = \overline{X}'_t\hat{\beta}_t$, that is our estimates of the overall geometric mean wage are identical under the two labour market regimes.

In practice, OLS estimation of (3) will be infeasible if all or some of the observations on wages take the form of interval data as will be the case if workers were not asked to report their exact wage but only within which of a set of pre-defined wage brackets the amount fell or if some workers were only prepared to respond in this manner. In general, the use of a generalised Tobit estimator (StataCorp, 1997, Volume 1, p. 145) will serve to deal with any censoring of the dependent variable while yielding identical results to the OLS estimator in the special case in which all observations on wages are reported as exact amounts. We define $ln\tilde{W}_{rt} = \overline{X}'_{rt}\tilde{\beta}_{rt}$,

$ln\tilde{W}_t = \overline{X}_t'\tilde{\beta}_t$ and $ln\tilde{W}_t^* = \overline{X}_t'\tilde{\beta}_t^* = \overline{X}_t'\tilde{\beta}_t$ where tildas refer to the generalised Tobit estimates, noting that $ln\tilde{W}_{rt}$ and $ln\tilde{W}_t$ are unbiased but not necessarily exact estimators of lnW_{rt} and lnW_t.

We proceed to obtain estimates of the various terms in the decomposition equation (2) as:

$$ln\{\tilde{\gamma}_{rt} + 1) = ln\tilde{W}_{rt} - ln\tilde{W}_t = \overline{X}_{rt}'\tilde{\beta}_{rt} - \overline{X}_t'\tilde{\beta}_t; \qquad \forall r \tag{5}$$

$$ln\{\tilde{\theta}_{rt} + 1) = ln\tilde{W}_{rt}^* - ln\tilde{W}_t^* = (\overline{X}_{rt} - \overline{X}_t)'\tilde{\beta}_t^*; \qquad \forall r \tag{6}$$

$$ln\{\tilde{\delta}_{rt} + 1) = ln\tilde{W}_{rt} - ln\tilde{W}_{rt}^* = \overline{X}_{rt}'(\tilde{\beta}_{rt} - \tilde{\beta}_t^*); \qquad \forall r \tag{7}$$

where $ln\{\tilde{\gamma}_{rt} + 1)$ will exactly equal the sum of $ln\{\tilde{\theta}_{rt} + 1)$ and $ln\{\tilde{\delta}_{rt} + 1)$ given that $ln\tilde{W}_t^*$ is equal to $ln\tilde{W}_t$ by construction. Hence, $\tilde{\gamma}_{rt}$ may be interpreted as the estimated wage differential between an average group *r* worker, with characteristics $\overline{X}_{rt}$, and the average worker overall, with characteristics $\overline{X}_t$, under the discriminatory wage structure in period *t*; $\tilde{\theta}_{rt}$ is the estimated wage differential between an average group *r* worker and the average worker overall under the non-discriminatory wage structure; and $\tilde{\delta}_{rt}$ is the estimated wage differential for an average group *r* worker between the two wage structures. Moreover, the sum of the predicted and residual wage gaps, if both are expressed relative to the (common) overall geometric wage, will be equal to the gross wage differential:

$$\left(\frac{\tilde{W}_{rt} - \tilde{W}_t}{\tilde{W}_t}\right) = \left(\frac{\tilde{W}_{rt}^* - \tilde{W}_t^*}{\tilde{W}_t^*}\right) + \left(\frac{\tilde{W}_{rt} - \tilde{W}_{rt}^*}{\tilde{W}_{rt}^*}\right)\left(\frac{\tilde{W}_{rt}^*}{\tilde{W}_t^*}\right) \quad \equiv \quad \tilde{\gamma}_{rt} = \tilde{\theta}_{rt} + \tilde{\delta}_{rt}(\tilde{\theta}_{rt} + 1); \quad \forall r \tag{8}$$

The interpretation of the results of the multilateral decomposition procedure is thus particularly clear and intuitive.

Analysis of changes over time in racial wage differentials

The investigation of changes over time in racial wage differentials is complicated by the possibility that changes in the residual wage differential can result either from variation in the

[2] Allanson et al. (2000) examine the sensitivity of the results of our multilateral decomposition procedure to the

extent of wage discrimination or from changes in the distribution of and returns to unmeasured or unobservable characteristics in the workforce or from some combination of the two. The standard approach (Altonji and Blank, 1999) decomposes both the predicted and residual differences in the mean logarithm of wages solely in terms of changes in observable characteristics and the returns to those characteristics, yielding in the case of our multilateral procedure the following decomposition of the change in the gross difference in the mean logarithm of wages between racial group *r* and the whole workforce between years *t* and *t′:*

$$\left(ln\{\tilde{\gamma}_{rt'}+1\}-ln\{\tilde{\gamma}_{rt}+1\}\right)=\left(ln\{\tilde{\theta}_{rt'}+1\}-ln\{\tilde{\theta}_{rt}+1\}\right)+\left(ln\{\tilde{\delta}_{rt'}+1\}-ln\{\tilde{\delta}_{rt}+1\}\right)$$

$$=\left((\Delta\overline{X}'_{rt'}-\Delta\overline{X}'_{rt})\tilde{\beta}^{*}_{t}+\Delta\overline{X}'_{rt'}(\tilde{\beta}^{*}_{t'}-\tilde{\beta}^{*}_{t})\right)+\left(\overline{X}'_{rt}(\Delta\tilde{\beta}_{rt'}-\Delta\tilde{\beta}_{rt})+(\overline{X}'_{rt'}-\overline{X}'_{rt})\Delta\tilde{\beta}_{rt'}\right);\quad \forall r \quad (9)$$

where $\Delta\overline{X}_{rs}=\overline{X}_{rs}-\overline{X}_{s}$ $(s\in t,\ t')$ is the difference in observable characteristics between the average group *r* and overall average worker and $\Delta\tilde{\beta}_{rs}=\tilde{\beta}_{rs}-\tilde{\beta}^{*}_{s}$ $(s\in t,\ t')$[3] is the difference between the discriminatory and non-discriminatory returns to observable characteristics faced by group *r* workers. Hence that part of the change in the gross difference explained by the model of wage determination is equal to the sum of the effects of the change in difference in observable characteristics given the non-discriminatory wage structure in year *t* and the change in the non-discriminatory returns to observable characteristics given the difference in observable characteristics in year t'. This leaves the residual or unexplained component of the change equal to the sum of the effects of the change in the difference in returns to observable characteristics given the average characteristics of group *r* workers in year *t* and the change in the observable characteristics of the average group *r* worker given the difference in returns to observable characteristics in year *t′*.

However, Juhn et al. (1991) argue that the standard approach may give a misleading impression of the change in discrimination over the period since part of the change in the residual difference may be due to changes either in the racial distribution of unobserved characteristics within the workforce or in the returns to those characteristics. In particular, if returns to unobserved characteristics increase then this will lead to apparent increases in discrimination against those groups over-represented in the lower end of the residual wage

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choice of estimator for the non-discriminatory wage structure.

distribution due to inferior unobservable characteristics and in favour of those groups with superior unobservable characteristics. To seek to isolate the potential size of any such effect we also construct an alternative decomposition of the change in the residual difference in (9) that provides a measure which may be interpreted as the change in returns to unobserved characteristics if residual wage differences are entirely due to disparities in unobserved characteristics and the overall distribution of such characteristics is constant over time. If these conditions were to hold then the model of wage determination would be given by (4) and, following Juhn et al. (1991), we can write $u_{it} = \varepsilon_{it}\sigma_t$ where ε_{it} is a 'standardised' disturbance term (with a mean of zero and a variance of one) that may be interpreted as a measure of unobserved characteristics and the residual standard deviation of wages σ_t is interpreted as the return to those characteristics in year *t*. Using this notation (5) may be re-written as:

$$ln\{\tilde{\gamma}_{rt} + 1) = ln\tilde{W}^*_{rt} - ln\tilde{W}^*_t = (\bar{X}'_{rt} - \bar{X}')_t\tilde{\beta}^*_t + (\tilde{\varepsilon}_{rt} - \tilde{\varepsilon}_t)\tilde{\sigma}_t = \Delta\bar{X}'_{rt}\tilde{\beta}^*_t + \Delta\tilde{\varepsilon}_{rt}\tilde{\sigma}_t\,; \quad \forall r \tag{10}$$

where the first equality holds by assumption, $\tilde{\varepsilon}_{rt}$ and $\tilde{\varepsilon}_t$ are respectively the group *r* and overall average standardised regression residuals, and $\Delta\tilde{\varepsilon}_{rt}$ ($= \tilde{\varepsilon}_{rt}$ since $\tilde{\varepsilon}_t = 0$ by construction) is the difference in unmeasured characteristics between the average group *r* and overall average worker. The change in the residual difference may then be re-written from (9) as:

$$ln\{\tilde{\delta}_{rt'} + 1\} - ln\{\tilde{\delta}_{rt} + 1\} = (\Delta\tilde{\varepsilon}_{rt'} - \Delta\tilde{\varepsilon}_{rt})\tilde{\sigma}_t + \Delta\tilde{\varepsilon}_{rt'}(\tilde{\sigma}_{t'} - \tilde{\sigma}_t) \tag{11}$$

where the decomposition parallels the decomposition of the change in the predicted difference in (9). Thus the change in the residual difference is equal to the sum of the effects of the change in difference in unobservable characteristics given the returns to those characteristics in year *t* and the change in returns to unobservable characteristics given the difference in unobservable characteristics in year t'. Implementation of (11) first requires the imputation of residuals for those observations with interval wage data: we calculate a point estimate of the residual as the expected value of the residual conditional on the predicted wage for that observation. Computation of $\Delta\tilde{\varepsilon}_{rt}\tilde{\sigma}_t$ and $\Delta\tilde{\varepsilon}_{rt'}\tilde{\sigma}_{t'}$ is then straightforward while $\Delta\tilde{\varepsilon}_{rt'}\tilde{\sigma}_t$ may be calculated as the average of the group *r* residuals that would have been observed in year t if group *r* workers had held the same positions in the year *t* residual wage distribution that they had held in the year

[3] If an element of $\Delta\tilde{\beta}_{rs}$ is defined in period t but not in t' then we assume that $\Delta\tilde{\beta}_{rt'} = \Delta\tilde{\beta}_{rt}$, i.e. the difference between the discriminatory and non-discriminatory returns to the characteristic is the same in the two periods. By construction, if an element of $\Delta\tilde{\beta}_{rs}$ is not defined then the value of the corresponding element of $\bar{X}_{rs}$ will be zero.

t' residual wage distribution. The latter procedure suggests the alternative interpretation of (11) as the sum of the effects of the movement of group r workers within the overall distribution of unobserved characteristics holding the returns to those characteristics constant and the change in the returns to unobservable characteristics holding the distribution of group r workers within the overall distribution of unobserved characteristics constant.

3. Data

The data for the study are principally drawn from the October Household Surveys (OHSs) that have been conducted annually by Statistics South Africa[4] (1995a, 1995b, 1999a, 2000a, 2000b, 2001a, 2001b) since 1993. The OHSs are based on probability samples of large numbers of households (ranging from 16000 to 30000) and cover a range of development indicators. One of the main purposes of the OHSs is to obtain indicators of the size of the economically active population in South Africa with special reference to the number of unemployed persons. Employees in all formal as well as informal business sectors are covered by the OHS since the survey is based on households, not businesses. Prior to the introduction of the Labour Force Survey in January 2000, the OHS was the only source of official data on the hours and earnings of individual workers in South Africa.

The OHSs form an ongoing series, but each OHS was conducted an independent survey and the resultant data sets are not completely comparable due to changes in target population, sample design and methodology, and questionnaire content and wording. In particular, the 1993 OHS neither covered the whole of South Africa due to the exclusion of the former bantustan states of Transkei, Bophuthatswana, Venda and Ciskei (TBVC states) nor collected sufficient information on employment to support the wage function analysis. Nor does the 1994 OHS provide suitable data for comparison due to both limitations in the sampling method and differences in the way in which the pay/salary questions were asked.[5] In place of these first two OHSs we use the Project for Statistics on Living Standards and Development (PSLSD) survey[6]

[4] Formerly the Central Statistical Service.

[5] The OHS has typically asked for information on total salary/pay before deductions. But the 1994 OHS asked respondents for their total pay and then followed this up with questions on whether the stated amount was before or after deductions and, if and only if total pay before deductions had been reported, the amount of any such deductions. As a result, gross pay data is only available for a sub-sample of workers which does not appear to be representative based on exploratory analysis of the data.

[6] To test the comparability of the data from the PSLSD survey with that from the 1993 OHS, we conducted a parallel decomposition analysis based on a common restricted sample definition and wage function specification. The two sets of results are broadly similar with the exception of Indians who appear to command a much lower geometric mean wage (and hence gross wage premium) from the PSLSD survey than from the 1993 OHS data.

which was undertaken during the nine months leading up to the country's first democratic elections at the end of April 1994 and provides data on the characteristics and employment conditions of individual workers drawn from a representative sample of nearly 9000 households[7] covering the whole of South Africa. The PSLSD was conducted by the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town with technical support from the World Bank (SALDRU, 1994).

For our analysis of racial wage rate differentials we initially restricted the sample to men between the ages of 15 and 65 who were in full-time, regular employment[8] in any economic activity other than agriculture forestry and fishing, mining and quarrying, and the armed services. We excluded female, part-time and casual workers on the grounds that these categories of workers might face discrimination on the basis of gender and employment status, which could bias our estimates of the extent of racial wage discrimination. The age restrictions limit the sample to adults not engaged in retirement occupations. Workers in the agricultural sector are excluded due to inconsistencies in the enumeration of agricultural workers caused by changes in OHS sampling methodology (Statistics South Africa, 2000c: iv), most notably in the identification procedure for non-urban areas between the 1995 and 1996 OHSs (Statistics South Africa, 1999b). Workers in the mining industry are excluded since the sampling frames of the various OHSs did not adequately cover mining hostels prior to 1998. Finally, South African Defence force members are excluded, as the 1995 OHS does not contain a detailed breakdown of military occupations.

We further restricted the sample to those workers for which we could calculate reliable estimates of gross hourly wages and for which no data were missing on the common set of independent variables specified in the wage functions. Information on pay or salary is reported only in exact terms in the PSLSD, only within pre-specified intervals in the (1993 and) 1996 OHS and as a mixture of point and interval observations in all other OHSs. Gross hourly wage rates were calculated from both the PSLSD and OHS data by converting all reported gross pay data to a weekly basis and dividing by hours worked in the past seven days. Nevertheless, neither survey is ideally suited for this purpose because the information on hours worked relate

[7] In the PSLSD, a household is defined as a single person or group of people who have lived together for at least 15 days out of the past year, who eat together and who share resources. To ensure compatibility with the OHS, we further require that individuals were present for more than 15 of the last 30 days.

[8] The PSLSD survey only distinguishes between regular wage employment (including self-employed professionals) and casual wage employment so full-time status is identified on the basis of hours worked in the past week. The 1995 and 1996 OHSs only distinguish between full-time and part-time employment whereas later OHSs also include casual employment as a separate category.

to the total hours worked by an individual in all economic activities whereas the information on pay relates to total salary/pay (including overtime and bonus[9] but before deductions) in main employment. To ensure the reliability of our hourly wage rate estimates we therefore excluded those employees who either had not worked at least 35 hours in the past seven days,[10] or could be identified as being engaged in economic activities other than their main job (either as employees[11] or on own account[12]), or had reported earnings on a daily basis. The surveys also provide comparable data on various worker and job attributes, including age, educational attainment, region of residence, occupation, industry and trade union membership, which are used to specify a common set of determinants of the wage function.

Finally, we seek to clean the data of any outliers which may give rise to grossly influential observations. Of particular concern are apparent clerical errors in the data for some observations on wages and hours worked. For example, in the 1999 OHS there are the cases of a African bricklayer and a White manager both in the construction industry who are respectively reported as earning R5 per month for a 45 hour week and R600035 per month for a 42 hour week. Errors may also be present in the data on worker and employment characteristics but since these variables are either categorical or naturally bounded then normal checks for data consistency may be expected to clean the sample of such cases. We use a method for the identification of multiple outliers due to Hadi and Simonoff (1993) which is relatively resistant to both masking and swamping effects and does not require the number of potential outliers to be arbitrarily set in advance. The first step is to establish a clean sub-set of size M by estimating the regression model using the full sample of size n, sorting the observations in ascending order of the internally studentised residuals and then selecting the first $M=s$ observations where s is the minimum number of observations in the ordered sequence necessary for the data matrix to have full rank. The next step increases the size of the clean sub-set by one: the regression model is re-estimated using the clean sub-set, the observations sorted in ascending order of the adjusted residuals (where the adjusted residual is equal to the internally studentised residual for observations within the clean sub-set and to the scaled prediction error for all other observations) and a new clean sub-set formed from the first $M+1$ observations in the ordered sequence where M is the size of the old clean sub-set. This step is repeated until either the

[9] The OHS questionnaires did not explicitly state that bonuses should be included in total pay prior to 1996. The 1999 OHS questionnaire further specifies that allowances should be included.

[10] The 1997 and subsequent OHSs further allow us to identify workers who worked a 'normal' week in the past seven days. Limiting the sample to these workers does not appear to appreciably affect the results of the decomposition analysis.

[11] The OHS does not enable workers holding multiple jobs to be identified prior to 1997.

absolute size of the *M+1'th* adjusted residual in the ordered sequence is greater than the appropriate Bonferoni critical value of the t-statistic or the clean sub-set is equal to the full sample. In the first case the *M+1'th* through *n'th* ordered observations are declared outliers and deleted from the sample; in the latter there are no outliers to delete.

For the purposes of outlier identification we treated each data set as a simple random sample and estimated the wage function (3) over the pooled set of observations to establish the initial clean sub-set. Ideally, we would have wished to use the generalised Tobit estimator for the next step of the procedure but encountered convergence problems with the estimator when M is small. So we restricted the estimation of the wage function with the clean sub-set to that sub-sample of the clean observations for which exact wage data were available, with some consequential loss of efficiency. However we did test for potential outliers in all observations by calculating a point estimate of the residual for those observations with interval wage data as the expected value of the residual conditional on the predicted wage for that observation. Choosing a 5% significance level we found up to 2.1% of outliers in the PSLSD data but no more than 0.4% in any OHS data set and none at all in the 1995 and 1997 OHSs. The 1996 OHS data set contains only interval observations on wages and therefore was not cleaned.

The final cleaned samples varied in size from 2200 observations in the PSLSD data to more than 9700 in the 1995 OHS data. The size of the workforce covered by our samples increased from 2.38 million workers in 1993 to 3.25 million workers in 1995 before declining gradually back to 2.30 million in 1999. The racial composition of this workforce was relatively stable over the years, with the African share of the workforce rising from 58% in 1993 to 63% in 1999, the White share falling from 25% to 20% and the proportion of Coloured and Indian workers roughly constant at 12% and 5% respectively . The average age of the workforce was 36 years throughout the period with comparatively little variation between racial groups. This racial uniformity is the result both of demographic factors and of labour participation rates with high levels of youth unemployment, particularly amongst Africans (Standing et al., 1996). The educational background of the racial groups differs markedly with over 80% of White workers and 60% of Indians having completed at least a secondary education in comparison to the 35% of Coloured workers and 25% of Africans with no more than a primary education in 1997. Such racial disparities are, in part, the outcome of past apartheid educational policies such as the Bantu Education Act 1955, which limited the provision of schooling to native Africans. Non-White educational standards were improved following the de Lange Commission 1979 and, more

[12] The PSLSD does not enable employees who also work on their own account to be identified.

recently, the passage of the National Education Policy Act 1996. But any resultant convergence in the educational attainment of workers is inevitably slow given both the low rate of turnover of the labour force and the perpetuation of disadvantage caused by household financial constraints to participation in education (Case and Deaton, 1998): more than 25% of the workers in 1995 who were in the age range 15 to 24 and had not obtained Standard 10 reported that they wished to continue with their education but did not have enough money to do so. Members of all racial groups participated in all occupations and sectors within the highly diversified economy. But the relatively low levels of education received by African and Coloured workers was reflected in a marked over-representation of African and Coloured workers in unskilled and semi-skilled occupational groups as compared to Indians and Whites who were more likely to work in white-collar occupations. However, the proportion of African and Coloured employment in white-collar jobs has more than doubled since the end of apartheid, particularly due to a greater presence in education and other public sector activities. More than 40% of the workforce were trade union members in 1995, with participation rates increasing among all groups in the post-apartheid period. Finally, the raised sample statistics reveal particular regional concentrations of Indians in Kwazulu/Natal and of Coloureds in Western Cape, surrounding Cape Town, with far more uniform distributions of Whites and Africans. These distributions strongly reflect historic settlement patterns and the influence of legislation, such as the Group Areas Act 1950.

4. Multilateral Decomposition of the Racial Wage Hierarchy

Table 1 presents basic summary statistics on the *hierarchical wage structure* based on our sample data. It shows that Whites had the highest geometric mean wage, followed by Indians, Coloureds and finally Africans who received the lowest geometric mean wage of any racial group throughout the period. Following the transition to democratic rule, geometric mean wages initially rose for all groups but then stagnated throughout much of the latter half of the 1990s. This finding might appear to contradict evidence of persistent wage growth from sources such as the Survey of Average Monthly Earnings, but it must be remembered that the figures reported in Table 1 are geometric not arithmetic mean wages and do not control for changes in workforce characteristics, including occupational and sectoral composition. This section provides an analysis of the evolving pattern of racial wage disparities.

Table 1 : Geometric Mean Hourly Wages by Racial Group, 1993-1999.

	Racial group				
	All races	African	Coloured	Indian	White
			Rand/hr		
1993	8.65	5.59	7.43	11.31	23.55
1995	10.01	7.68	7.93	12.89	22.54
1996	9.60	7.23	8.87	13.06	22.77
1997	9.47	6.94	9.24	13.62	23.14
1998	9.66	6.97	10.37	13.86	22.11
1999	10.97	8.03	11.05	14.19	26.93

Source: Authors' estimates from wage function regressions.

The practical implementation of the decomposition procedures requires the prior specification and estimation of the wage function for each racial group and for all groups together in each year.[13] To facilitate the subsequent analysis, the log of the hourly wage was specified in each wage regression as a function of an identical set of explanatory variables: age, age squared, years of primary, secondary, diploma and university education, occupational category, economic sector, trade union membership and region of residence. Estimation of these functions is based on samples of full-time, regular, civilian employees working outwith the primary sector and therefore may be subject to sample selection bias. This issue is of particular concern in the study because full-time labour absorption rates differ both between racial groups and over the period of comparison. And although there is no necessary connection between changes in labour absorption and selectivity bias (see Blau and Beller, 1988), the decomposition of the change in the residual term in terms of a common and invariant distribution of unmeasured skills is nevertheless more plausible if the estimation results may be taken to represent the unconditional wage (offer) functions rather than merely the (observed) wage functions conditional upon sample selection.

Mwabu and Schultz (2000), in their study of the South African labour market based on the PSLSD data set, have previously sought to identify the selection into full-time regular employment from a combination of land use rights and financial asset variables and found negligible sample selection bias. However, both the PSLSD and the OHS data contain a broader set of variables that the labour economics literature might suggest were of relevance in the determination of employment status. Thus the range of jobs for which individuals apply and their willingness to accept any such offers as are made, may be influenced by personal and

[13] Availability of space prevents the presentation of these wage functions. They can however be obtained from the authors on request.

household circumstances that affect their job search activities and reservation wage but not their subsequent performance in any employment that they may choose to undertake. Moreover, employers may also take some personal and household circumstances of individuals into account in making hiring and firing decisions but not in their determination of wage schedules.

We therefore sought to model sample selection not only as a function of individuals' age, education and region of residence, but also of their marital status, position within the household, health status, disability status, housing tenure and type, and access to farmland. In all cases, both the full set of explanatory variables and the sub-set of identifying variables were jointly significant in the individual probit equations. We also found the Heckman selection correction variables obtained from the probit equations to be significant in a number of the wage function regressions. But, the resultant coefficient estimates of the wage functions were not robust due to severe collinearity problems caused by the inclusion of the Heckman variable: condition numbers of the augmented data matrices were calculated and found to be greatly in excess of the recommended maximum of 20 (Leung and Yu, 1996). We were therefore forced to restrict estimation to the wage functions conditional on sample selection, thereby limiting the interpretation of the results.

For estimation, we used a generalised Tobit estimator (StataCorp, 1997) to deal with the mixture of point and interval data on the dependent variable in the wage functions. Observations were weighted to reflect projections of population size based on the 1991 Census in the case of the PSLSD and on the 1996 Census, as adjusted by a post-enumeration survey, in the case of all of the OHS data sets. Heteroscedastic-consistent standard errors were calculated that allow for the clustering of the samples, with the EA identified as the PSU. However we did not allow for the stratification of the samples as the data do not enable the explicit identification of stratum in all years. This failure to take the complex sample design fully into account may be expected to have given rise to needlessly large estimates of the standard errors. Nevertheless, many of the coefficients were individually significant at the 5% level or higher, with signs generally conforming to expectations. And the overall fit of the wage function regressions as measured by the χ^2 statistic was highly significantly different from zero in all regressions.

Tables 2 and 3 present the results from the multilateral decomposition analysis based on the estimated wage functions. The first part of Table 2 presents the crude estimates of the gross, predicted and residual differences between the mean logarithm of wages of each of the four

Table 2: Multilateral Decomposition of Hourly Wage Differentials by Racial Group

		Racial Group							
		African		Coloured		Indian		White	
		Coeff.	*Std. Error*	Coeff.	*Std. Error*	Coeff.	*Std. Error*	Coeff.	*Std. Error*
$ln(\tilde{\gamma}_i + 1)$	1993	-0.436#	0.023	-0.151#	0.054	0.268#	0.046	1.002#	0.043
	1995	-0.265#	0.008	-0.232#	0.021	0.253#	0.027	0.812#	0.014
	1996	-0.283#	0.014	-0.079*	0.039	0.308#	0.045	0.864#	0.028
	1997	-0.312#	0.010	-0.025	0.020	0.363#	0.033	0.893#	0.021
	1998	-0.327#	0.018	0.071	0.046	0.361#	0.054	0.828#	0.033
	1999	-0.313#	0.012	0.007	0.029	0.257#	0.049	0.898#	0.010
$ln(\tilde{\theta}_i + 1)$	1993	-0.303#	0.010	-0.141#	0.036	0.229#	0.036	0.703#	0.023
	1995	-0.142#	0.004	-0.220#	0.014	0.109#	0.016	0.497#	0.009
	1996	-0.178#	0.007	-0.083#	0.022	0.182#	0.032	0.570#	0.016
	1997	-0.183#	0.005	-0.058#	0.015	0.238#	0.018	0.545#	0.012
	1998	-0.213#	0.009	0.033#	0.028	0.219#	0.032	0.551#	0.018
	1999	-0.186#	0.006	-0.016	0.018	0.104#	0.028	0.555#	0.015
$ln(\tilde{\delta}_i + 1)$	1993	-0.133#	0.018	-0.010	0.046	0.040	0.051	0.299#	0.033
	1995	-0.122#	0.007	-0.013	0.018	0.144#	0.027	0.315#	0.015
	1996	-0.105#	0.010	0.005	0.029	0.126*	0.053	0.294#	0.026
	1997	-0.129#	0.008	0.033	0.018	0.125#	0.034	0.348#	0.020
	1998	-0.113#	0.014	0.038	0.035	0.142#	0.054	0.277#	0.030
	1999	-0.127#	0.010	0.022	0.025	0.153#	0.050	0.343#	0.028
		Percentages of overall geometric mean wage							
$\tilde{\gamma}_i$	1993	-35.3		-14.0		30.8		172.3	
	1995	-23.2		-20.7		28.8		125.2	
	1996	-24.6		-7.6		36.0		137.3	
	1997	-26.8		-2.5		43.8		144.3	
	1998	-27.9		7.3		43.4		128.8	
	1999	-26.9		0.7		29.3		145.4	
$\tilde{\theta}_i$	1993	-26.1		-13.2		25.7		101.9	
	1995	-13.3		-19.7		11.5		64.3	
	1996	-16.3		-8.0		20.0		76.8	
	1997	-16.7		-5.6		26.9		72.5	
	1998	-19.2		3.4		24.4		73.5	
	1999	-16.9		-1.5		11.0		74.2	
$\tilde{\delta}_i(\tilde{\theta}_i + 1)$	1993	-9.2		-0.9		5.1		70.4	
	1995	-10.0		-1.0		17.3		60.8	
	1996	-8.4		0.4		16.1		60.5	
	1997	-10.0		3.1		16.9		71.8	
	1998	-8.7		4.0		19.0		55.4	
	1999	-9.9		2.2		18.3		71.3	
		Percentage of group-specific geometric mean non-discriminatory wage							
$\tilde{\delta}_i$	1993	-12.4		-1.0		4.0		34.9	
	1995	-11.5		-1.3		15.5		37.0	
	1996	-10.0		0.5		13.4		34.2	
	1997	-12.1		3.3		13.4		41.6	
	1998	-10.7		3.8		15.2		31.9	
	1999	-11.9		2.2		16.5		40.9	

Notes: # Denotes significance at the 1% level. * Denotes significance at the 5% level.

Table 3: Decomposition of changes in gross, predicted and residual differences since 1993:
(A) in terms of changes in the levels of and returns to observed characteristics
(B) in terms of changes in the levels of and returns to unobserved characteristics

		Racial Group							
		African		Coloured		Indian		White	
Base year 1993		Coeff.	*Std. Error*	Coeff.	*Std. Error*	Coeff.	*Std. Error*	Coeff.	*Std. Error*
Gross change in $ln(\tilde{\gamma}_i+1)$ **by**:-	1995	0.171#	0.024	-0.081	0.058	-0.016	0.053	-0.190#	0.045
	1996	0.153#	0.027	0.073	0.067	0.039	0.064	-0.138#	0.051
	1997	0.124#	0.025	0.126*	0.058	0.095	0.057	-0.108*	0.048
	1998	0.109#	0.029	0.222#	0.071	0.092	0.071	-0.174#	0.054
	1999	0.123#	0.026	0.158*	0.061	-0.011	0.067	-0.104*	0.044
Gross change in $ln(\tilde{\theta}_i+1)$ **by**:-	1995	0.161#	0.011	-0.078*	0.039	-0.120#	0.039	-0.206#	0.025
	1996	0.126#	0.013	0.058	0.043	-0.047	0.048	-0.133#	0.028
	1997	0.120#	0.011	0.084*	0.040	0.009	0.040	-0.157#	0.026
	1998	0.090#	0.014	0.175#	0.046	-0.010	0.048	-0.152#	0.029
	1999	0.117#	0.012	0.126#	0.041	-0.124#	0.046	-0.148#	0.028
(A) due to changes in:-									
observable characteristics	1995	0.125#	0.014	-0.020	0.053	-0.106*	0.052	-0.142#	0.031
	1996	0.096#	0.014	0.077	0.052	0.007	0.052	-0.066*	0.031
	1997	0.097#	0.015	0.056	0.053	0.016	0.052	-0.070*	0.032
	1998	0.073#	0.015	0.091	0.052	0.030	0.053	-0.060	0.033
	1999	0.104#	0.014	0.053	0.052	-0.105*	0.054	-0.068*	0.032
returns to observable characteristics	1995	0.035#	0.011	-0.059	0.041	-0.014	0.041	-0.064#	0.022
	1996	0.030*	0.012	-0.019	0.044	-0.053	0.050	-0.067*	0.027
	1997	0.023*	0.011	0.028	0.041	-0.007	0.042	-0.087#	0.025
	1998	0.017	0.014	0.084	0.047	-0.040	0.050	-0.092#	0.029
	1999	0.013	0.011	0.073	0.041	-0.019	0.048	-0.080#	0.027
Gross change in $ln(\tilde{\delta}_i+1)$ **by**:-	1995	0.011	0.019	-0.003	0.049	0.104	0.058	0.016	0.036
	1996	0.028	0.021	0.015	0.054	0.086	0.073	-0.005	0.042
	1997	0.004	0.020	0.043	0.049	0.086	0.061	0.049	0.039
	1998	0.019	0.023	0.048	0.057	0.102	0.074	-0.022	0.045
	1999	0.006	0.021	0.032	0.052	0.113	0.071	0.044	0.043
(A) due to changes in:-									
returns to observable characteristics	1995	0.044*	0.019	0.020	0.050	0.087	0.067	-0.035	0.083
	1996	0.058#	0.021	0.032	0.058	0.141	0.077	0.008	0.047
	1997	0.023	0.020	0.082	0.051	0.026	0.068	0.041	0.044
	1998	0.053*	0.023	0.068	0.057	0.139	0.080	0.023	0.047
	1999	0.046*	0.021	0.075	0.054	0.303#	0.111	0.044	0.084
observable characteristics	1995	-0.033#	0.010	-0.023	0.027	0.018	0.051	0.051	0.077
	1996	-0.030*	0.014	-0.017	0.046	-0.055	0.079	-0.013	0.042
	1997	-0.019	0.011	-0.039	0.029	0.060	0.056	0.008	0.035
	1998	-0.034	0.020	-0.020	0.049	-0.037	0.082	-0.045	0.045
	1999	-0.040#	0.015	-0.043	0.038	-0.190	0.110	0.000	0.082
(B) due to changes in:-									
returns to unobservable characteristics	1995	0.014	~	-0.001	~	-0.024	~	-0.042	~
	1996	-0.001	~	0.002	~	0.007	~	0.010	~
	1997	-0.004	~	0.002	~	0.005	~	0.014	~
	1998	-0.005	~	0.002	~	0.012	~	0.014	~
	1999	-0.009	~	0.004	~	0.018	~	0.025	~
unobservable characteristics	1995	-0.004	~	-0.002	~	0.128	~	0.057	~
	1996	0.029	~	0.012	~	0.079	~	-0.014	~
	1997	0.009	~	0.041	~	0.081	~	0.035	~
	1998	0.024	~	0.045	~	0.090	~	-0.037	~
	1999	0.014	~	0.028	~	0.096	~	0.019	~

Notes: # Significant at the 1% level. * Significant at the 5% level. ~ Not computed.

racial groups and that of the entire population under the hypothetical, non-discriminatory wage structure. Table 3 presents the results from the analysis of changes in these differences: changes in the gross differences are the sum of the changes in the corresponding predicted and residual differences, which are in turn broken down in (A) on the basis of (9) in terms of changes in measured or observable characteristics and the returns to those characteristics and in (B) on the basis of (11) in terms of changes in the levels of and returns to residual or unobservable characteristics. Note that all of the changes are measured relative to a common base year t of 1993 and thus may be interpreted loosely as cumulative changes to date since the end of the Apartheid regime.

The second part of Table 2 restates the crude decomposition results in a more readily intelligible form by expressing the corresponding gross, predicted and residual wage gaps in terms of the percentage of the overall geometric mean wage in each year as in (8). Thus the typical African, Coloured, Indian and White worker of 1993 earned 35% less, 14% less, 31% more and 172% more respectively than the overall geometric wage rate of R8.65 per hour paid to the overall average worker in that year. These gross wage differences can largely be explained by quantifiable differences between the various racial groups, especially in educational and occupational attainment. Taking all observable characteristics into account, the typical African, Coloured, Indian and White worker of 1993 would have earned 26% less, 13% less, 26% more and 102% more respectively than the typical worker under the hypothetical, non-discriminatory wage structure in that year. The remainder of the gross wage differentials are then accounted for by the residual wage differentials which allow both for wage discrimination and for disparities in unobservable characteristics.

Changes over time in the pattern of the gross wage differentials point to two distinct sub-periods in the evolution of the wage hierarchy. The first sub-period between 1993 and 1995 is marked by significant compression of the overall wage hierarchy together with a slight degree of polarisation between the wage rates of Africans and Coloureds on the one hand and those of Indians and Whites on the other. The most noticeable result is a fall in the African-White wage gap from 208% to 160% of the overall geometric mean wage which is due to both the improvement in the relative position of Africans and the deterioration in that of Whites. In addition, the Coloured-Indian wage gap rose slightly from 45% to 50% of the overall geometric mean wage while both the African-Coloured and Indian-White wage gaps fell significantly. The subsequent sub-period from 1995 through 1999 shows some reversal in these trends. In particular, there is a partial reversal of the reduction in the African-White wage gap and the gross

wage gap of Coloureds falls to such an extent that the typical Coloured worker no longer receives less than the overall geometric mean wage by 1999. Thus the transition to democratic rule in 1994 was accompanied by an improvement in the wage position of the majority African workforce relative to all other racial groups, but these gains were not fully preserved through the latter half of the decade.

Table 3 shows that the changes in the wage hierarchy have been largely due to movements in predicted wage differences rather than in residual wage differences which show little change over the period. Moreover, the significant falls in both the African predicted wage deficit and the White predicted wage premium between 1993 and 1995, and the virtual elimination of the Coloured wage deficit by 1999 can be shown to be largely the outcome of two mutually reinforcing factors. The first is the absolute and relative improvement in the levels of educational and occupational attainment of Africans and Coloureds workers which can be shown to almost entirely account for the significant reductions in predicted wage differences due to the effects of changes in the distribution of observable characteristics with returns held at the levels that would have been observed in a non-discriminatory labour market in 1993. The second is changes in these non-discriminatory returns over time which have had the effect of further reducing the predicted wage differences given the racial distribution of observable characteristics.

None of the gross changes in the residual wage differences are significantly different from zero. Nevertheless, the results from the two decomposition procedures are of some interest. The standard approach (A) accounts for changes in the residual wage difference in terms of changes in the returns to and levels of observable characteristics, where racial differences in returns may reflect the effects either of discrimination or of unobserved disparities in the quality of observable characteristics. The results show a slight but statistically significant fall in the degree of underpayment faced by Africans in the post-apartheid era holding the observed characteristics of the workforce constant (together with an offsetting effect due to changes in the relative characteristics of the African workforce). But the observed (discriminatory) returns of all races rise relative to the hypothesised returns in a non-discriminatory labour market, so the degree of African underpayment has not in fact fallen relative to any other racial group. Thus evidence of any reduction in the extent of either wage discrimination or racial disparities in the quality of observable characteristics is at best negligible.

The alternative decomposition (B) permits an interpretation in terms of changes in the returns to and levels of unobservable characteristics if residual wage differences are entirely due

to disparities in unobserved characteristics and the overall distribution of such characteristics is constant over time. The results are consistent with the hypothesis that the persistence of residual wage differences in the post-Apartheid era is due in part to a general increase in the dispersion of wages. In particular, the relative wage position of Africans, who were concentrated at the bottom of the residual wage distribution, deteriorated between 1995 and 1999 due to an increase in returns to unobservable characteristics (though this effect is more than offset by an improvement in those characteristics). Nonetheless, the absolute sizes of the effects due to changing returns to unobservable characteristics are so small as to suggest that broader changes in the overall distribution of wages were not an important cause of the persistence of residual wage differences.

Overall, the changes in racial wage differences have the somewhat unexpected consequence that the extent to which the racial wage hierarchy can be explained on the basis of racial disparities in observable characteristics has fallen, not risen, following the end of the Apartheid regime. The final part of Table 2 reports the amount by which a racial group was underpaid/overpaid relative to the wage it would have received in the hypothesised non-discriminatory labour market. Thus in 1999 the wages of a typical African, Coloured, Indian and White worker were respectively 12% lower, 2% higher, 17% higher and 41% higher than they would have been in the absence of both unobserved racial disparities in characteristics and wage discrimination.

5. Discussion

The central theme of this paper is the way that the racial wage hierarchy evolved in South Africa over the period 1993 to 1999 amongst full-time regular employees of normal working age, but excluding those in the primary sector and the defence forces. We find that the transition to democratic rule in 1994 was accompanied by an improvement in the wage position of the majority African workforce relative to all other racial groups, but that these gains were not fully preserved through the latter half of the decade. The persistence of racial wage differences following the repeal of all overt discriminatory laws and regulations points to the need for concerted policy interventions to reverse the legacy of apartheid. However, it is important to identify the various sources of this labour market inequality in order to devise appropriate remedial programmes and to monitor their impact on labour market outcomes.

Our multilateral decomposition analysis indicates that the racial wage hierarchy at the end of the apartheid era can largely be explained by quantifiable differences between racial groups, especially in educational and occupational attainment. Since then, the entire education system has been systematically reformed through the passage of the *South African Schools Act 1996*, the *Further Education and Training Act 1998* and the *Higher Education Act 1997*. Schooling has been made compulsory for all children aged seven to fourteen and funding increased significantly with government expenditure on education rising from R31.8 billion in 1994 to R51.1 billion in 2000 (Department of Education, 2001). Our (unreported) wage regressions exhibit positive returns to post-primary education for all races (see also Moll, 1996; Allanson et al., 2000; Mwabu and Schultz, 2000), providing non-Whites with the incentives to take advantage of the new opportunities. Nevertheless, household finances may constrain participation in education, frustrating attempts to further narrow predicted wage differentials in the absence of significant income and wealth redistribution.

New employment legislation has also been introduced within the general framework established by the *Labour Relations Act 1995*. In particular, the *Employment Equity Act 1998* requires employers to implement affirmative action measures, including preferential treatment and racial employment targets, to ensure the equitable representation of suitably qualified non-Whites in all occupational categories and levels in the workforce. However the experience of the USA in a similar situation suggests that some forms of discrimination can be extremely persistent and difficult to counter by legislation. In particular, the racial segregation of housing in South Africa may maintain labour market segregation through recruitment via local networks and help to sustain employers' beliefs in racial differences (Arrow, 1998). Standing et al. (1996), and Case and Deaton (1998) provide evidence of informal screening devices adopted in the South African labour market.

The remainder of the racial wage differentials observed in 1993 is due to the combined effects of wage discrimination and unquantifiable differences between racial groups. Discrimination in remuneration was made illegal by, *inter alia*, the *Labour Relations Act 1995* which gave effect to the Constitutional right to fair labour practices. Employees were further given the right by the *Employment Equity Bill 1998* to institute proceedings through the Commission for Conciliation Mediation and Arbitration for alleged discrimination, with the burden of proof falling on the employer (Barker, 1999). These various labour market measures provide powerful instruments to counter the discriminatory practices that have sustained the overpayment of Whites and the underpayment of other races.

Residual wage differentials may also be reduced by the fundamental reform of the education system to the extent that this serves to decrease unquantifiable differences between racial groups. In particular, the more equitable distribution of educational funding has had the effect of reducing historical inequities in learning conditions though considerable variation still exists within the public schooling system (Department of Education, 2001). In addition, reform of the curriculum, which is envisaged in the *'Curriculum 2005'* initiative (Department of Education, 2001), has considerable potential to improve the productivity of non-Whites (Moll, 1998). However these changes will have only a gradual impact on the racial wage hierarchy as newly-qualified entrants are absorbed into the labour market.

The multilateral decomposition analysis provides some of the first, detailed evidence about the evolution of the wage hierarchy in the post-apartheid era. We find that the predicted wage differentials have fallen somewhat, due in part to a narrowing of the gaps in educational attainment and to the greater representation of African and Coloured workers in White-collar jobs in the public sector. But the relative improvement in the measured characteristics of the African workforce at the time of the transition to democratic rule has not been sustained in the post-apartheid era. The residual wage differentials have not declined and are virtually constant throughout the entire period. We show that the increasing inequality in the overall distribution of wages has had only a negligible effect on racial wage differentials.

These findings suggest that the policy reforms of the post-apartheid era have yet to have had a significant effect on the racial wage hierarchy in the secondary and tertiary sectors. However, it is too early to judge the effectiveness of these reforms given their timing and the endemic nature of the problems that they are designed to tackle. Only time will tell whether they are sufficient to eliminate the disadvantages and discrimination faced by non-Whites in the labour market as a legacy of apartheid or whether further policy interventions will be needed to achieve this goal.

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