Affirmative action policies and the evolution of post-apartheid South Africa's racial wage gap

Rulof Burger,[1,2] Rachel Jafta,[1] and Dieter von Fintel[1,3]

May 2016

United Nations University World Institute for Development Economics Research

wider.unu.edu

Abstract: Racial wage inequality and discrimination have pervaded South African society for centuries. Apartheid legislation cemented these disparities by institutionalizing white job reservation and many other unfair practices. While racial wage gaps started to decline towards the end of apartheid, they increased (against all expectations) in the immediate post-transition period. Affirmative action legislation was enacted with a lag, first targeting employment equity and skills development in 1998 and then more extensive 'black economic empowerment' in 2003. However, the rise in the racial wage gap only started to reverse in 2005. Existing studies therefore report limited effects of affirmative action policies, with highly skilled occupations still dominated by white men, and racial wage gaps remaining higher than in 1997. This paper develops an updated decomposition methodology that tracks changes in the discrimination component of the wage gap over time. It accounts for biases attributable to changing generational composition of labour market entrants and retirees: this variation is typically incorrectly measured as time evolution, and by implication attributes demographic movements to the effect of policy changes. New evidence shows that 2003 was a turning point, when black–white discrimination started to decline continuously thereafter. The continuing trend suggests that this is a permanent legislative effect rather than a business cycle dividend. However, generational changes (separate from policy effects) have not yet reached a turning point. Results also indicate that the legislation has alleviated previous barriers—by which black wages did not benefit from economic growth before affirmative action legislation was implemented. Notably, the time decline in discrimination can be attributed to the large and growing returns to tertiary education, especially for black men after successive waves of reforms were enacted.

Keywords: affirmative action, discrimination, decomposition techniques, South Africa
JEL classification: J31, J71

[1] Department of Economics, Stellenbosch University, South Africa; corresponding author Rulof Burger: rulof@sun.ac.za; [2] Centre for the Study of African Economies, Oxford University; UK; [3] Institute for the Study of Labour (IZA), Bonn, Germany.

1   Introduction

Inequality between groups (horizontal inequality) and concomitant efforts to reduce such inequalities remain firmly on the agenda in South Africa, as they do elsewhere. The context, root causes and methods of redress differ across countries, and various terms such as positive discrimination, positive action measures and others have been used, but affirmative action seems to have gained the most traction in international discourse. Affirmative action in general ' … encompasses any measure that allocates goods – such as admission into universities, jobs, promotions, public contracts, business loans, and rights to buy and sell land – on the basis of membership in a designated group, for the purpose of increasing the proportion of members of that group in the relevant labour force, entrepreneurial class, or university student population, where they are currently underrepresented as a result of past or present discrimination' (Sabbagh 2004: 1).

South Africa has embarked on its own affirmative action programme in the wake of apartheid policies that institutionalized discrimination in all facets of life. A peculiar feature of this institutional setting is that a former minority white government imposed discriminatory legislation on a large black majority, which in turn entrenched high poverty and inequality. In contrast, discriminatory behaviour in most cases occurs when a majority marginalizes a minority. Examples of discrimination against majorities are scarce, with the case of Malaysia providing the closest comparison to South Africa. Gary Becker (1993) suggests that the costs to minorities are substantial when they act against majorities, and claimed in his Nobel lecture that this was a central reason for the demise of the apartheid regime and its discriminatory policies. According to this line of argument, discrimination should have declined speedily after the transition to democracy. Following the example of many other countries, South Africa's interim constitution adopted explicit provisions to implement a programme of affirmative action. By all expectations, this legislation (targeted at majority redress) should also have shown large effects. Yet, by existing indications, this has not occurred.

The 1998 Employment Equity Act and the 2003 Broad-Based Black Economic Empowerment Act are dominant pieces of legislation passed by the democratic parliament to enact equity in the South African work-place. While the former focuses only on employment equity (EE), the latter is more comprehensive and includes ownership and management targets for black individuals. Existing empirical evidence suggests that the effects of especially the first policy have been small to negligible on, amongst others, the average racial wage gap, perceived business costs, and a disincentive for investment and labour productivity (Acemoglu, Gelb and Robinson 2007; Burger and Jafta 2010; Kruger 2011). However, very little empirical work has considered the impacts beyond that period.

Additionally, perceptions abound that suggest that the dividends of Black Economic Empowerment (BEE) only accrued to an emerging black elite (Ponte, Roberts and van Sittert 2007), which is also corroborated by empirical evidence that the racial wage gap only narrowed among top earners (Burger and

Jafta 2010). James Robinson (2014) cites examples of politically prominent black individuals who have been co-opted onto multiple boards of traditionally white-dominated companies to raise firms' 'BEE credibility'. The composition of management appears to have transformed marginally – allegedly without widespread influence – but old patterns of economic power persist. While some authors suggest that it may simply be too early to discern any significant positive effects of BEE (Acemoglu, Gelb and Robinson 2007), this contrasts with the expectation that apartheid-era discrimination was too costly to maintain very far into democracy (Becker 1993). It is therefore of distinct policy relevance to understand whether a large-scale redress programme had the desired effect, using newer data and methods. The goal of this paper is therefore to account for a potential policy lag, but also discrimination outside the labour market.

This paper briefly reviews the existing literature on monitoring discrimination in South Africa, focusing on white-African wage gaps from the 1970s to the 1990s. We then propose a refined methodology that critiques existing contributions and updates our understanding of the evolution of discriminatory behaviour in South Africa. In particular, we address the concern that time variation in labour market outcomes is often confounded with the replacement of older generation retirees by new entrants: should wage gaps change because of, for example, large generational differences in access to quality schools, the time variation in wage gaps may be distinctly generational. The potential convergence of outcomes can therefore not be entirely attributed to modern anti-discriminatory legislation, but due to demographic change that is affected by policies from many years before. We develop a decomposition that uses repeated cross section data to account for this potential discrepancy and to account for some of the bias inherent in analyses that rely on Oaxaca–Blinder (1973) methods. Results are analysed in light of legislative reforms enacted in the first post-apartheid decade, and placed within the context of international experiences.

2   Discrimination in South Africa

2.1   Legislative and economic background

South Africa's political history has resulted in large racial income disparities that have become a defining feature of the country's characteristically high income inequality. While these differences are commonly attributed to the separate development policies of the apartheid regime (which was in power from 1948 until 1994), race-based inequality has historical beginnings that pre-date this era. For instance, the so-called Colour Bar Act institutionalized job reservation based on race as early as 1911, shortly after the unification of various territories to create the modern geographic boundaries of South Africa. However, the racial roots of inequality reach as far back as the slave trade: it simultaneously promoted pre-industrial economic growth and high wealth disparities (Fourie and von Fintel 2010).

By the 1970s occupational segregation by race had been firmly established, with white workers filling highly skilled vacancies and black workers typically limited to unskilled jobs. After this time, black workers progressively attained to higher education levels, and the unbanning of black unions meant that unskilled

wages started to improve. However, the same period also represented a time of skill-biased technological change, with a de-emphasis of traditional mining and agricultural jobs, and a structural shift in labour demand towards highly skilled secondary and tertiary sector jobs. As a result, structural unemployment arose, with a surplus of unskilled and a shortage of skilled workers (Bhorat and Hodge 1999). Despite the increase in education levels of the black population, this (relatively unskilled) group bore the brunt of the rise in unemployment over this period. In the context of structural economic change, the Bantu Education system (a separate schooling system of inferior quality) did not equip black individuals to transition into better skilled jobs, adding another layer to racial discrimination. This polarization within the education system and the labour market exists to this day, embodied by large racial school quality differentials (Van der Berg 2007) and high levels of convexity in the schooling-earnings profiles, with zero returns to primary schooling and high returns to post-secondary schooling (Keswell and Poswell 2004). Hence, legislative, economic and social circumstances contributed to racial disparities over a long time horizon.

While the sources of racial discrimination are important to study in and of themselves, this paper does not primarily embark on this task; instead, it monitors whether affirmative action has had any remedial influence on racial disparities in the labour market. The next section continues by reviewing existing evidence on racial wage gaps, but with a particular focus on the ability of post-apartheid legislative efforts to address long-run racial inequalities.

2.2   Tracking discrimination over time

One of the first empirical analyses of the black-white wage gap (Knight and McGrath 1977) studied a period during which apartheid laws regulated labour market activity. White males earned approximately 5.7 times[4] more than their black counterparts in 1970. This large difference was partly attributable to the skewed cross-racial distribution of education. Even so, white workers could expect to have earned between 3.6 and 5 times more than equally educated black counterparts. Knight and McGrath (1977) speculated that this racial gap was mainly driven by white workers' desire to protect their wages from market forces. They also found that most of the wage gaps occurred due to occupational segregation that resulted from enacted job reservation, as opposed to within-occupational wage gaps.

Moll (2000) studied the evolution of the racial wage gap between 1980 and 1993. He looked specifically at the wage gap between black and white men who worked in the same occupation, and found a substantial narrowing during the 1980s. This was partly (but not completely) driven by the gradual increase in the educational attainment of black workers. Within-race group inequality increased notably over the same period.

Since the end of apartheid in 1994 a large number of studies have investigated the level and trend in racial

---

[4] This figure is obtained by calculating weighted averages for black and white wages from the reported racial distribution of incomes and the average wages by race-education categories.

labour market discrimination. This interest has been facilitated by the increased availability of South African household survey data. Most studies use some variant of the Oaxaca–Blinder (1973) decomposition to gauge the extent of discrimination. Section 3.2.1 briefly reviews the mechanics of this methodology. However, the broad motivation of this approach is to distinguish between parts of the wage gap that can be attributed to differences in productive characteristics across groups and those that arise due to different labour market rewards to these personal attributes. The latter component is regularly interpreted as the extent of labour market discrimination.

Kingdon and Knight (2004) investigate racial discrimination in employment between whites and each of the other race groups (black, coloured and Asian) in 1993 and 1994, at the beginning of the democratic era. About one-quarter of the black-white employment gap remained unexplained after controlling for observable employment determinants. Mlatsheni and Rospabé (2002) look at racial discrimination in both wage- and self-employment amongst black and white youths (aged 15 and 30) in 1999. Just less than half of the wage-employed wage gap can be attributed to racial differences in characteristics, whereas almost all of the self-employment racial gap can be accounted for by these productive endowments. Mwabu and Schultz (2000) use 1993 data to decompose the racial wage gap. Their results show that more than half of the black-white wage difference is attributable to the difference in educational attainment. More recently, Szelewicki and Tyrowics (2009) estimate a racial wage gap of between 30 per cent and 55 per cent for 2006, of which almost half is unexplained by observable variables.

Sherer (2000) estimates the extent of wage discrimination in 1995 and finds a larger unexplained component than Moll's (2000) estimate for 1993. This is interpreted as evidence that the previous trend of decreasing discrimination (observed between 1980 and 1993) was subsequently reversed in the immediate post-apartheid period. Erichsen and Wakeford (2001) compare wage discrimination in 1993 and 1995 and also conclude that discrimination against black men increased during these two years. Allanson, Atkins and Hinks (2002) compare wage discrimination between 1995 and 1997, confirming a continued (but slight) widening of the racial wage gap. Rospabé (2002) studies the evolution of racial discrimination in employment, occupational attainment and wages between 1993 and 1999. She finds that racial employment discrimination decreased slightly, whereas racial occupational and wage discrimination increased marginally. Brookes and Hinks (2004) study the evolution of employment discrimination using a longer time period and several surveys. They find a widening of the racial employment gap between 1995 and 2002.

Overall, the studies reviewed find widening discrimination in the immediate post-apartheid period. However, in all cases, the periods analysed are shortly after the introduction of affirmative action legislation, or long before. Hence, very little can be concluded about the efficacy of these policies based on existing evidence.

2.3   Limitations of previous studies

The cross section attempts to measure discrimination suffer from a number of shortcomings. First, and

most importantly, the omission of unobservable determinants of labour market outcomes (which may be correlated with race) typically produce an upward bias in the estimate of discrimination. Many studies explicitly acknowledge this limitation. The most commonly cited unobservable variables are the quality of schooling, social networks, parental background, neighbourhood effects, ability, attitude and trust (Rospabé 2002; Brookes and Hinks 2004; Kingdon and Knight 2004). The same issue appears in the international literature; it is commonly believed that these omitted variables are unequally distributed across groups. They typically embody disadvantage experienced by 'minorities', but not because of discriminatory practices that arise *within* the labour market (Holzer and Neumark 2000: 495). These omissions therefore result in an overestimation of labour market discrimination (in particular), though many of these differences could signify discrimination that manifests itself before individuals enter the work-place.

In response to these omitted factors, D'Amico (1987: 312) regards the size of the unexplained share of the wage gap as 'an index of the virility of labour market discrimination'. Oaxaca (1973), on the other hand, refers to it as the 'upper limit to discrimination', which assumes that the misspecification problems will necessarily have an upward bias on the estimate. The unexplained component only captures discrimination that occurs within the labour market. On the other hand, models of discrimination which endogenize the human capital investment decision – such as those of Coate and Loury (1993) or Lundberg and Startz (1983) – suggest that a feedback mechanism exists from discrimination to human capital formation. The existence of discrimination entails that disadvantaged groups are likely to under-invest in their education. In this case some part of the explained component of the race gap should actually be attributed to labour market discrimination, so that the empirical estimate of discrimination could also be downwardly biased. This study, however, will be restricted to the analysis of the discrimination that takes place *after* individuals enter the labour market. We note, at this stage, that the Oaxaca–Blinder estimate of discrimination could be a noisy approximation of *levels* of discrimination. However, as argued below, *trends* in discrimination may be credibly obtained with the aid of the methodological developments we propose.

The second shortcoming is that comparisons across race groups are often made in areas of the covariate space where there is no common support. Few white men, for example, enter the South African labour market with less than secondary education. The Oaxaca–Blinder decomposition uses a strong linearity assumption to create a counterfactual white wage for black workers with low levels of schooling; it implicitly extrapolates white wages beyond the range of observed schooling values. This provides a very tenuous basis for identifying wage discrimination. Modern decomposition studies now restrict comparisons to covariate combinations with common support (Fortin, Lemieux and Firpo 2011).

A third complication is the choice of conditioning variables. The results from the multiple studies discussed above are not directly comparable (both within and across periods), because authors included different covariates in their decomposition analyses. In particular, no uniform approach exists in dealing with controls for industry and occupation of employment. This choice can fundamentally affect the interpretation of the extent of discrimination: if these indicators are included as controls, then wage

discrimination is essentially defined as the difference in the expected earnings of black and white workers who work in the same industry and occupation. Such a strategy disregards discrimination that arises from occupational segregation. We therefore omit these variables to ensure that 'comprehensive' discrimination is measured.

Studies that, instead of focusing on the *extent* of discrimination, quantify how it has evolved over time face additional difficulties. Numerous studies demonstrate comparability issues across Statistics South Africa survey data, especially during the late 1990s (Burger and Yu 2006; Branson and Wittenberg 2014). Any attempt to compare the outcomes of different surveys is hence likely to partly reflect survey differences, especially when these periods are too close together for hiring practices to have changed considerably in response to legislative reforms. Most studies cited above rely on changes over short intervals, and cannot adequately address this deficiency.

The most important confounder in monitoring the evolution of discrimination is the changing generational composition of the labour force over time. New labour market entrants continuously replace retirees. Should these groups possess different unobservable productive attributes, the racial wage gap will continuously change. This will be true, even in the absence of changes in the wage structure. Without appropriately accounting for racial unobservable differences across generations, wage decompositions across time may over- or under-state changes in discrimination.

Before considering these analytical issues further, we turn to the role of affirmative action policies in alleviating discriminatory practices to contextualize and describe the South African case.

3 Affirmative action policies

3.1 International experiences

The oldest attempts at redress and positive action to reduce inequity are generally accepted to have occurred in India[5], where affirmative action policies were introduced with the adoption of the new constitution shortly after independence in 1947. More recent measures were introduced in Brazil in 2012 (Brown, Langer and Stewart 2012: 24). These and other case studies offer a varied and rich history to draw lessons from. Bearing in mind the purpose of this paper, however, we will confine ourselves to a concise overview of the affirmative action experience in a select number of countries, focusing specifically[6] on

---

[5] Bacchi (1996: 32) contends that the term 'Affirmative Action' first appeared in the Wagner Act of 1935, Section 160(c) in the United States of America, where it obliged employers to take positive measures to undo the effects of unfair discrimination in the past and to prevent future recurrences. Affirmative action in the civil rights context, however, came about in the 1960s when the Civil Rights Legislation was newly adopted (Brown, Langer and Stewart 2012: 24).

[6] This categorization partially follows the approach by Daniel Sabbagh (2004) in the background paper for the 2004

i) the rationale for the measures, ii) the targeted beneficiaries, iii) the scope or reach of the policies (e.g. labour market only or various other sectors of the economy) and iv) the measures implemented (for example, quotas or numerical targets).

At India's independence from colonial rule in 1947, the country faced stark divisions along socio-economic and class[7] lines. The Constitution (1950) made specific provision for positive measures in the form of access quotas for 'Scheduled Castes' and 'Scheduled Tribes'. In 1990, a provision was made to add 'other backward classes' (Brown, Langer and Stewart 2012: 54–5). The scope of the positive discrimination measures (the term used for affirmative action in India) covers only the public sector, focusing mostly on education and employment. The main 'tools' are quotas for admission into colleges, medical and engineering schools, and preferential employment in government and public enterprises. In addition, secondary education is free for targeted groups and financial assistance is offered to enable access to tertiary education (Heyer and Gopal Jayal 2012: 54–62). Places in parliament and state legislatures are reserved for scheduled castes and scheduled tribes. Studies on progress with India's positive discrimination policies find that the results are mixed, with education being a particularly interesting case. An empirical study by Cassan (2011) compares the educational attainment of the targeted beneficiaries of preferential educational policies that were on the lists of Scheduled Castes and Tribes from 1936, to those added to the lists in a harmonization of the lists in 1976. Overall, the study finds that the effect has been negligible. However, the results are more nuanced when a rural-urban dimension is added and the presence of feeder primary schools is taken into account. The authors conclude that providing access is not enough when the facilities are insufficient (such as feeder schools that should generate a sufficient supply of candidates to take up the opportunities in secondary and tertiary education). This view is also voiced by Heyer and Gopal Jayal (2012: 62). They add that, although the gap in tertiary education scores between scheduled caste and scheduled tribe students has narrowed and more of them complete their degrees in the required time, designated groups find it hard to obtain suitable employment and upward mobility remains a challenge.

Affirmative action policies in the United States of America have been a source of controversy since their inception. Title IV of the Civil Rights Act of 1964 institutes affirmative action for black minorities in the United States of America. Currently, affirmative action measures include education (university admissions

Human Development Report, entitled 'Affirmative Action Policies: an International Perspective'.

[7] In the Indian context, coinciding with the hierarchy of castes, a centuries old system of social stratification which entails a hereditary division of the population into priests (Brahmins), warriors and rulers (Kshatriya), farmers and merchants (Vaisya) and labourers, domestic workers, and artisans (Sudra). [www.thefreedictionary.com/caste+system; accessed: 29 September 2015]. These four categories are called the Varnas, with each category containing layers of sub-castes. In addition to this, there is a fifth category of people who are literally doing the dirty work such as sanitation. Names for this category vary from previously being called 'untouchables' to a more recent name, 'Dalits'.

and financial aid) and employment via federal contractors. The specific beneficiaries are minorities and women. Several prominent court cases over the years have reversed affirmative action practices in higher education and led universities to pursue other policies, such as a diversity rationale for admissions policies to increase the number of minorities (African Americans and Hispanics, broadly). Empirical work here has focused on what the probabilities of access to more select universities and colleges for the minority groups would have been in the absence of affirmative action. The results are generally positive since it is argued – in the manner of a virtuous circle – that access to higher quality education improves the performance of minority students relative to their peers (non-minority students); graduating from such institutions signals a better quality of educational attainment and they are then likely to earn higher wages and achieve more mobility. In addition, it is argued that such minority graduates are more likely to be actively involved in their community, thus acting as positive role models (Long 2012: 37).

Whereas India and the United States of America have the longest experiences of affirmative action, Malaysia arguably offers one of the most comprehensive affirmative action architectures. It is also, like South Africa, a country where the measures are aimed at advancing the majority of the population – the Bumiputera in Malaysia.

At independence from colonialism in the 1950s, Malaysia's employment and wealth distribution patterns reflected the impact of colonial division of labour along racial lines. In preparing the 1957 Constitution, the new government offered citizenship to Chinese and Indian members of the population in return for special treatment for the Malays. This offer was accepted, but progress in the ensuing years was too slow and widespread discontent led to economic and social instability in the 1960s. In 1971, the government introduced the New Economic Policy, heavily slanted in favour of indigenous Malays. The manifold purpose of the policy was to reduce and progressively eradicate poverty, and to restructure the society to eliminate the association of race with economic standing. The long-term aim was the promotion of national unity and social integration. The programme covered the areas of education, employment, management and business ownership. This was to be achieved through quotas for Malays at universities, government and parastatal organizations, ownership of enterprises and new businesses. The Malaysian affirmative action programme was closely tied in with its economic development policies and years of significant economic growth enabled accelerated progress on achieving the numerical targets set. Whereas significant progress was made in reducing poverty generally and improving access of the targeted groups to the mainstream economy through business ownership and management, Yusof (2012: 146–47) observes that impediments still remain in the form of an insufficient supply of well-educated Bumiputera to fill vacancies, as well as an underdeveloped capacity to function successfully in the modern corporate environment.

Brazil presents an interesting case, since the country has a rich racial diversity and income inequality similar to that of South Africa. In addition, these aspects are intriguing:

- Despite its colonial history and relatively late abolishment of slavery, the country only introduced what is recognized as affirmative action measures almost a decade after the return to democratic rule in 1985;

- Brazilian affirmative action, especially in education, combines class and race in the selection of beneficiaries; and

- The affirmative action legislation for higher education introduced in 2012, has an expiry date.

Brazilian affirmative action measures span all levels of government, using mostly access to higher education and government procurement as levers. The beneficiaries are extensive, covering students from public high schools, blacks and brown people (the latter being of mixed race), descendants of indigenous peoples, women and people with disabilities. It began in 1999 when the municipality of Porto Alegre, in Brazil adopted a regulation requiring that 5 per cent of the work force being employed by contractors to the state should be black (Hernandez 2013).

While the preceding measures were still fragmented across local, state and federal agencies, affirmative action became a national priority in 2002 when the National Affirmative Action Programme was introduced by a presidential decree. The purpose of the programme was to increase the participation of Afro-descendants in federal agencies as well as the firms they contract with. It entailed setting percentage goals for participation (Hernandez 2013).

The Brazilian government took the boldest step to date by introducing the Law of Social Quotas, which institutionalizes affirmative action in all public federal universities in 2012. This law requires that half of all new spaces for admissions at federal public universities be reserved for students graduating from public high schools. Half of these places are allocated on the basis of household income where such income is less than 1.5 times the minimum wage per person in the household. The law further specifies that descendants of indigenous peoples as well as Afro-descendants have access to reserved places to the extent of their proportional representation in the population of each state (Hernandez 2013). This legislation will be in place for ten years, and higher education institutions are already expected to show significant progress by 2016. So far, the results are promising in that the academic performance of targeted beneficiaries closely approximates that of their white counterparts and in some instances consistently exceeds it. It is in part attributed to an observed stronger drive on the part of 'quota' students to succeed.

We now turn to the South African experience.

3.2 South African affirmative action legislation

The legacies of South Africa's colonial past and the discriminatory practices during apartheid underlie the affirmative action architecture in South Africa. While there were attempts at rectifying some of the inequalities resulting from these practices before the democratic election in 1994, it was the interim constitution of 1993 (itself the result of a negotiation process) that laid the foundation for the ensuing legislation and institutional structure to support affirmative action.

3.2.1 Affirmative action in the Employment Equity Act (Act 55 of 1998)

After a long consultative process, the South African government introduced the Employment Equity (EE) Act (Act 55 of 1998) with a twofold purpose: firstly, it looks back (to implement measures to mitigate the results of past discrimination) and secondly, it looks forward (to enact positive action to be taken to reduce inequality between groups that are identified in the act). Specifically, the purpose of the ct was to

(i) eliminate unfair discrimination[8] (i.e. in current employment and remuneration practices) and (ii) take positive or affirmative measures to attract, develop and retain individuals from previously disadvantaged groups. These groups are designated in the act as 'Blacks (including African, Coloured (mixed race) and Indians), women and people with disabilities'.[9]

Chapter 3 of the act sets out the duties of designated employers[10] (those who employ 50 or more workers). Designated employers are required to conduct EE audits to identify gaps, compile EE plans with targets (not quotas) and timelines, file these plans with the Department of Labour and report against these plans to the same organization.[11] The duty of monitoring compliance falls on inspectors from the Department of Labour and the Employment Equity Commission.

During the same period, a further set of labour market interventions was introduced, namely the Skills Development Act of 1998, and the Skills Development Levies Act (1999). The purpose of this legislation was to oblige all employers to commit to the training and education of employees and to contribute 1 per cent of their payroll to the relevant Sectoral Education and Training Authority. The latter provides sector-specific training opportunities for workers. These measures are meant to build the human capital amongst

---

[8] To further strengthen the legislative framework in pursuit of this objective, government promulgated the Promotion of Equality and the Prevention of Unfair Discrimination Act (Act 4 of 2000).

[9] 'African, Coloured and Indian persons who are natural persons and: are citizens of the Republic of South Africa by birth or descent; or are citizens of the Republic of South Africa by naturalisation before the commencement date of the Constitution of the Republic of South Africa Act of 1993; or became citizens of the Republic of South Africa after the commencement date of the Constitution of the Republic of South Africa Act of 1993, but who, had it not been for the Apartheid policy, would have qualified for naturalisation before then. The definition of "Black people" now includes South African Chinese people as per the Pretoria High court ruling on 18 June 2008' (Department of Trade and Industry 2013).

[10] The South African National Defence Force, National Intelligence Agency, and South African Secret Services are excluded from this Act and are covered under separate legislation.

[11] Designated employers are divided into two categories for reporting purposes: smaller firms with less than 150 employees are only obliged to file employment equity reports with the Department of Labour every two years, while larger firms employing more than 150 workers must do so annually (Bezuidenhoud et al. (2008: 22).

designated groups to generate a supply of candidates to achieve the aspirations of the employment equity policies.

If discrimination inherent in legacy employment and remuneration practices were removed and positive actions taken to enhance access, retention and development of beneficiaries of affirmative action following from the legislation, the expectation is that this will show up in a narrowing in the racial wage gap as well as improved upward mobility of the designated beneficiaries. These beneficiaries, however, are not a homogenous group and it is conceivable that some of them may be better placed to gain from the legislation in the short to medium term.

3.2.2 Widening the scope: from affirmative action to Broad-Based Black Economic Empowerment

In the wake of institutionalized discrimination rooted in apartheid legislation, the South African government embarked on a programme of legislation to counteract long-run discrimination. The first comprehensive piece of legislation aiming to broaden the scope of redress beyond the labour market was the Broad-Based Black Economic Empowerment (BEE) Act of 2003. The express purpose of the act is the 'economic empowerment of all black people, including women, workers, youth, people with disabilities and people living in rural areas'. In terms of the act the Minister of Trade and Industry was tasked with the development of so-called 'Codes of Good Practice'.[12] These codes created the broad framework for BEE implementation in the economy as a whole. Contemporaneously, sectoral charters were developed to address industry-specific circumstances in implementing the policy. Many sectors have progressively implemented charters, including mining, finance, agriculture, tourism and information and communications technology. Any person or institution who wants to do business with the government or who needs the government's approval – such as obtaining licences – must comply with the provisions of the act. The 'balanced scorecard', designed by the Department of Trade and Industry, serves as a compliance measurement tool and provides the basis for firms' so-called 'BEE accreditation'. The scorecard is composed of three broad metrics against which firms are to measure compliance with the affirmative action legislation. These are direct empowerment (which measures the extent to which designated groups own and control businesses and assets), human resource development (which measures the extent to which designated groups are actively trained by firms) and indirect empowerment (through preferential procurement from other black enterprises, enterprise development, profit and contract sharing by black enterprises, and local content requirements) (Tucker 2003:1).

Direct empowerment, in turn, is comprised of the following sub-components: (i) ownership (i.e. equity holdings among previously disadvantaged groups, including black women and disabled persons), carries a

---

[12] Revised codes that contain more stringent requirements have been developed since 2013, but since these codes became effective only in April 2015, they fall outside the scope of our research. (Department of Trade and Industry, Gazette 36928 11 October 2013 and Gazette 37453 of 18 March 2014).

weight of 20 per cent on the scorecard and (ii) management (the proportion of black persons in executive management, on the board of directors and in board committees) contributing 10 per cent to the BEE score (Mason and Watson 2005: 2).

Preferential procurement, with a weight of 20 per cent on the scorecard, is the foremost element of indirect empowerment. The aim of this provision is to enable black enterprises to grow as suppliers and service providers. The enterprise development component, on the other hand, entails equity investment in black-owned or black-empowered enterprises. It also encourages firms to embark on joint ventures with black-owned or black-empowered enterprises. This final category contributes 10 per cent to the balanced score (Mason and Watson 2005: 3). A residual component, determined by the sector being assessed, carries a further 10 per cent.

It is important to note that the Broad-Based BEE Act, while broadening the scope to a wider coverage of the economy through the sectoral approach, also effectively narrows the intended beneficiaries to black South Africans only. Hence, while the EE Act included white women on the basis that they have suffered past discrimination, the elements of the scorecard award no points for the advancement of white women. The dti's Code of Good Practice (2007) furthermore introduces a Gender Recognition Adjustment. This provision acts as a further incentive for the advancement of *black women* in particular. Firms that perform poorly with respect to the empowerment of black women may be penalized in other categories. In the same vein, firms that score highly in promoting black women in the work-place, may earn additional credits (Bravura Consulting, 2007: 2).

Increasing the mechanisms of preferential treatment beyond EE and skills development and expanding the reach to cover the economy in a sectoral approach, implies that a much broader impact should be evident following the introduction of these measures. In addition, preferential procurement and enterprise development, although indirectly, also draw more beneficiaries into the net.

In summary, South Africa's affirmative action is arguably the broadest in scope in as far as it covers the majority of the population in the country, the private and public sector, all sectors of the economy, education, sport and cultural activities. The implementation of Broad-Based BEE, however, has only been in process for a short period of time. The thread of continuity in the legislative framework, is the elements that focus on the labour market, namely employment equity and skills development. Our empirical work therefore concentrates on these aspects.

4   Data and methodology

4.1   Data

The object of the empirical analysis is to monitor changes in discrimination beyond the implementation of the EE and BEE Acts, but to also address methodological concerns with this type of study. We use a series of repeated cross section labour market surveys that have been enumerated by Statistics South

Africa over a long period, spanning various policy regimes. The datasets have been harmonized as the Post-Apartheid Labour Market Series (PALMS) by Kerr and Lam (2013). Cross-entropy weights, calibrated to actuarial demographic models, have been developed to account for differential surveying patterns across time (Branson and Wittenberg 2014). Nationally representative household data prior to the political transition in 1994 is scarce; however, the first period of data we use was collected before the promulgation of major labour market reforms. The study period includes the passing of the 1998 Employment Equity Act (which became effective in August 1999), a subsequent period that led up to the implementation of the 2003 Black Economic Empowerment Act (which came into effect in January 2004), and a final phase during which all affirmative action legislation had already been enacted. From 1997 to 1999, we use the October Household Surveys, while we study the September rounds of the 2000 to 2007 Labour Force Surveys, and third quarter Quarterly Labour Force Surveys in 2010 and 2011.[13] We primarily analyse wage gaps between black African men and white men, though other demographic differences are briefly investigated where appropriate. We limit ourselves to formal sector workers who are not self-employed: we do so to ensure that we study those workers who are bound *de facto* by affirmative action legislation, but also due to inconsistent measurement of these sectors over time (Burger and Yu 2006). Furthermore, we only focus on workers aged 20 to 65, as well as birth cohorts born between 1940 and 1990, to ensure sufficient sample sizes and to avoid including groups that may not have transitioned out of education. Only workers with at least some secondary education are included to ensure overlap in the skills profiles across race groups. A large number of wage outliers have also been removed (Wittenberg 2014).

4.2 Methodology

4.2.1 The Oaxaca–Blinder decomposition

Traditionally wage discrimination is measured using the Oaxaca (1973) and Blinder (1973) decomposition. We briefly outline the mechanism here, before adapting this approach to account for remaining weaknesses.

The log of wages for individual i in period t can be represented as

$$w_{it} = x_{it}\boldsymbol{\beta}_{r(i),t} + \eta_i + u_{it} \tag{1}$$

where $\boldsymbol{x}_{it}$ is the vector observable productive covariates for individual i in period t (including a constant), $\boldsymbol{\beta}_{r(i),t}$ is the vector of wage rewards to productive endowments for members of race $r \in \{W, B\}$ in period t; $\eta_i + u_{it}$ captures all time invariant and time varying unobservable determinants of productivity. Assume, without loss of generality, that $E(u_{it}) = 0$.

---

[13] Earnings data for 2008 and 2009 have not been released to the public. We omit the 1994 to 1996 October Household Surveys, due to the inconsistent classification of informal sector employment.

Oaxaca's method entails decomposing the difference in mean wages between two race groups (denoted by W and B) into explained and unexplained components for a cross section of individuals at period t. The expected wage of either race group can be expressed as

$$E(w_{it}|r(i) = j) = E(\boldsymbol{x}_{it}|r(i) = j)\boldsymbol{\beta}_{jt} + E(\eta_i + u_{it}|r(i) = j)$$

Hence, the racial wage gap can be expressed as

$$
\begin{aligned}
E(w_{it}|r(i) = W) &- E(w_{it}|r(i) = B) \\
&= [E(\boldsymbol{x}_{it}|r(i) = W) - E(\boldsymbol{x}_{it}|r(i) = B)]\boldsymbol{\beta}_{Bt} + E(\boldsymbol{x}_{it}|r(i) = W)[\boldsymbol{\beta}_{Wt} - \boldsymbol{\beta}_{Bt}] \\
&\quad + E(\eta_i + u_{it}|r(i) = W) - E(\eta_i + u_{it}|r(i) = B)
\end{aligned}
$$

[2]

Under the assumption that $E(\eta_i + u_{it}|r(i), \boldsymbol{x}_{it}) = 0$ for $r(i) \in \{W, B\}$ it follows that there are only two reasons why average black and white workers earn different wages: differences in the average level of observable productivity determinants, $E(\boldsymbol{x}_{it}|r(i) = W) - E(\boldsymbol{x}_{it}|r(i) = B)$, and racial differences in the way in which these determinants are remunerated, $\boldsymbol{\beta}_{Wt} - \boldsymbol{\beta}_{Bt}$. The same assumption allows us to consistently estimate $\boldsymbol{\beta}_{Wt}$ and $\boldsymbol{\beta}_{Bt}$ by OLS, $\widehat{\boldsymbol{\beta}}_{rt} = (\boldsymbol{X}'_{rt}\boldsymbol{X}_{rt})^{-1}\boldsymbol{X}'_{rt}\boldsymbol{w}_{rt}$:

$$E\big(\widehat{\boldsymbol{\beta}}_{rt}|\boldsymbol{X}_{rt}\big) = E(\boldsymbol{X}'_{rt}\boldsymbol{X}_{rt})^{-1}\boldsymbol{X}'_{rt}E(\boldsymbol{w}_{rt}|\boldsymbol{X}_{rt}) = \boldsymbol{\beta}_{rt} + (\boldsymbol{X}'_{rt}\boldsymbol{X}_{rt})^{-1}\boldsymbol{X}'_{r,t}E(\boldsymbol{\eta}_r + \boldsymbol{u}_{rt}|\boldsymbol{X}_{rt}) = \boldsymbol{\beta}_{rt}$$

where $\boldsymbol{X}_{rt}, \boldsymbol{w}_{rt}, \boldsymbol{\eta}_r$ and $\boldsymbol{u}_{rt}$ are the horizontally stacked variants of $\boldsymbol{x}_{it}, w_{it}, \eta_i$ and u_{it} for members of race group r. Under this assumption the first two terms on the right-hand side of equation [2] can be consistently estimated with sample data. The former captures the part of difference that can be ascribed to differences in the means of observable productive characteristics, such as education and geographical location, and the latter reflects the size of the differences that is left unexplained by these controls. Many subsequent studies have used this technique and interpreted the unexplained component as the extent of labour market discrimination.[14]

However, the exogeneity assumption $E(\eta_i + u_{it}|\boldsymbol{x}_{it}) = 0$ is very strong, and invalid in most empirical settings. Various unobservable determinants of wages, such as natural abilities, the quality of schools attended and family background, are likely to be correlated with various productivity determinants such as schooling. Furthermore, members of race or ethnic groups that experience labour market discrimination tend to also grow up in poor neighbourhoods and households, and to attend lower quality schools. In this case the assumption that $E\big(u_{it}|r(i)\big) = 0$ may be valid, but $E\big(\eta_i|r(i)\big) = 0$ would be false. Hence the OLS estimates would be biased. Furthermore, the basis of the Oaxaca decomposition (that productivity

---

[14] However, pre-labour market discrimination will be assigned to the differences in the characteristics, and hence excluded from the 'discrimination' component.

differences between race groups only exist because of differences in the distribution of observable covariates), would also be violated. In such a case, it is not clear what exactly $\widehat{\boldsymbol{\beta}}_{Wt} - \widehat{\boldsymbol{\beta}}_{Bt}$ estimates. Even if η_i were to be uncorrelated with all of the covariates (with OLS estimates producing unbiased estimates of the slope coefficients as a consequence), the real possibility that the expected value of η_i varies across race groups makes it impossible to distinguish between unobservable productivity differences and discrimination.

Recent empirical work has been careful in interpreting the unexplained component as an accurate measure of the level of discrimination, due to the omission of certain unobservable wage determinants that may be unequally divided between two groups. Some studies have attempted to circumvent the issue by referring to this component as 'an upper bound' for discrimination, but clearly this is not necessarily the case.[15] The following sub-sections introduce remedies that go towards addressing these concerns.

4.2.2 Cohort fixed effects

The problem with the Oaxaca decomposition is that certain unobservable productivity determinants are likely to be correlated with race. In this case any decomposition based on OLS estimates will fail to accurately identify the part of the racial wage gap that is due to discrimination. However, for certain research questions, this is not the only object of interest. For example, when evaluating the effect of affirmative action legislation aimed at reducing the effect of discrimination, we are primarily interested in the *change* in the level of discrimination and not in the level itself. In such cases cohort panel techniques may allow us to identify the object of interest.

Consider the expected value of wages for a member of cohort c and race r in period t

$$E(w_{it}|c(i), r(i), t) = E(\boldsymbol{x}_{it}|c(i), r(i), t)\boldsymbol{\beta}_{r(i),t} + E(\eta_i|c(i), r(i)) + E(u_{it}|c(i), r(i), t)$$

The coefficient vector $\boldsymbol{\beta}_{r(i),t}$ can be consistently estimated using an OLS regression with cohort fixed effects as long as $E(u_{it}|c(i), r(i), t, \boldsymbol{x}_{it}) = 0$ even if $E(\eta_i|c(i), r(i), \boldsymbol{x}_{it}) \neq 0$. Given the likely existence of unobservable productivity determinants that are specific to race-cohort groups – but quite possibly time invariant – this is a useful relaxation of the strong exogeneity assumption required in the Oaxaca decomposition. Unfortunately we cannot know how much of $E(\eta_i|c(i), r(i) = W) - E(\eta_i|c(i), r(i) = B)$ – which is estimated by the difference in cohort fixed effects across races – is the result of discrimination experienced by (rather than unobservable productivity differences possessed by) members

---

[15] If apartheid era legislation had the effect of allowing most whites the opportunity to finish school and obtain a tertiary qualification, regardless of individual ability or family background, while only black learners with exceptionally high ability or well-connected families were allowed to do so, then the black schooling coefficient may be upwardly biased more than the white schooling coefficient. All other things being equal, this would tend to understate the extent of labour market discrimination.

of cohort *c*. However, by comparing the wage gap for a specific cohort over time, we are able to estimate the *change* in discrimination (under the assumption that the difference in productivity remains fixed over time).

Explicitly distinguishing between cohort effects and discrimination demonstrates that simply comparing wage gaps over time may be confounded by the changing composition of cohorts with different productivity differentials. For example, if an increasing share of black workers attended high quality schools that were previously reserved for white learners, then this will reduce the wage gap over time in a way that is not reflected by a change in the mean values of observable covariates. Such a change will be identified as a reduction in labour market discrimination in a comparison of Oaxaca decompositions over time, whereas it actually reflects a reduction in unobservable productivity differentials. A more reliable decomposition is achieved by doing the analysis with groups in a region of common support over races and time periods: in our sample that entails dropping workers with less than incomplete secondary education (as there are very few white workers with fewer years of schooling) and restricting the sample to those born between 1945 and 1990.

4.2.3 Decomposing the change in labour market discrimination

Having obtained consistent estimates of $\boldsymbol{\beta}_{r(i),t}$ and $\eta_{rc} = E(\eta_i | c(i), r(i))$, the question is how to decompose the change in the wage gap into meaningful components. We are particularly interested in knowing how much of the change in the wage gap is due to changes in the skills gap, and how much is due to changes in difference in how the same skills are rewarded differently between members of different races. This is achieved by the decomposition of the change in the wage gap into:

$$
\begin{aligned}
(\bar{w}_{Wct} - \bar{w}_{Bct}) &- (\bar{w}_{Wc,t-1} - \bar{w}_{Bc,t-1}) \\
&= \bar{x}_{Wc,t}(\boldsymbol{\beta}_{Wct} - \boldsymbol{\beta}_{Bct} - \boldsymbol{\beta}_{Wc,t-1} + \boldsymbol{\beta}_{Bc,t-1}) \\
&+ (\tau_{W,t} - \tau_{B,.t} - \tau_{W,t-1} + \tau_{B,t-1}) \\
&+ (\bar{x}_{Wct} - \bar{x}_{Bct} - \bar{x}_{Wc,t-1} + \bar{x}_{Bc,t-1})\boldsymbol{\beta}_{Bc,t-1} \\
&+ \{(\bar{x}_{Wct} - \bar{x}_{Wc,t-1})(\boldsymbol{\beta}_{Wc,t-1} - \boldsymbol{\beta}_{Bc,t-1}) \\
&+ (\bar{x}_{Wct} - \bar{x}_{Bct})(\boldsymbol{\beta}_{Bct} - \boldsymbol{\beta}_{Bc,t-1})\}
\end{aligned}
$$

[3]

According to equation [3], the change in the racial wage gap between periods $t-1$ and t can be attributed to five terms. The first two terms correspond to changes in the wage structure: $\bar{x}_{Wc,t}(\boldsymbol{\beta}_{Wct} - \boldsymbol{\beta}_{Bct} - \boldsymbol{\beta}_{Wc,t-1} + \boldsymbol{\beta}_{Bc,t-1})$ represents the change in the way in which attributes are rewarded between the race groups (evaluated at the mean attributes for group W in period t) and $\tau_{W,t} - \tau_{B,.t} - \tau_{W,t-1} + \tau_{B,t-1}$ represents the change in the 'pure' race gap over time. The third term, $(\bar{x}_{Wct} - \bar{x}_{Bct} - \bar{x}_{Wc,t-1} + \bar{x}_{Bc,t-1})\boldsymbol{\beta}_{Bc,t-1}$, represents the change in the wage gap due to a change in the skills gap. The last two terms are interactive terms that are needed to equate the left- and right-hand sides of equation [3].

The same decomposition can be applied to understand changes in the racial wage gap across cohorts.

$$\begin{aligned}
(\bar{w}_{Wc,t} - \bar{w}_{Bc,t}) - (\bar{w}_{Wc-1,t} - \bar{w}_{Bc-1,t}) &= \bar{x}_{Wct}(\boldsymbol{\beta}_{Wct} - \boldsymbol{\beta}_{Bct} - \boldsymbol{\beta}_{Wc-1,t} + \boldsymbol{\beta}_{Bc-1,t}) + \\
&\quad (\eta_{Wc} - \eta_{Bc} - \eta_{W,c-1} + \eta_{B,c-1}) + (\bar{x}_{Wct} - \bar{x}_{Bct} - \bar{x}_{Wc-1,t} + \bar{x}_{Bc-1,t})\boldsymbol{\beta}_{Bc-1,t} + \\
&\quad \{(\bar{x}_{Wct} - \bar{x}_{Wc-1,t})(\boldsymbol{\beta}_{Wc-1,t} - \boldsymbol{\beta}_{Bc-1,t}) + \\
&\quad (\bar{x}_{Wct} - \bar{x}_{Bct})(\boldsymbol{\beta}_{Bct} - \\
&\quad \boldsymbol{\beta}_{Bc-1,t})\}
\end{aligned}$$
[4]

These techniques will be implemented alongside traditional approaches to monitor the effects of affirmative action policies on labour market discrimination in South Africa.

5 Results

5.1 Descriptive analysis

The descriptive analysis commences by tracking labour market conditions of different demographic groups during various phases in the post-apartheid period. The objective is to illustrate how labour market opportunities were altered by anti-discriminatory legal reforms. The time trajectories in Figure 1 highlight that the real wages of black males declined by almost 20 per cent between 1997 and 2003, while the wages for white males continued to grow by almost 10 per cent. This trend may seem surprising, given the abolition of discriminatory legislation in the early 1990s, the imposition of 'positive discrimination' employment equity legislation later in the decade and the co-incidence with the start of a business cycle upswing at the end of 1999. In fact, the time trends in Figure 1 and in Table 1 reveal that for many disadvantaged groups the racial wage gap only began to reverse around 2004.

Figure 1: Mean log monthly earnings over time
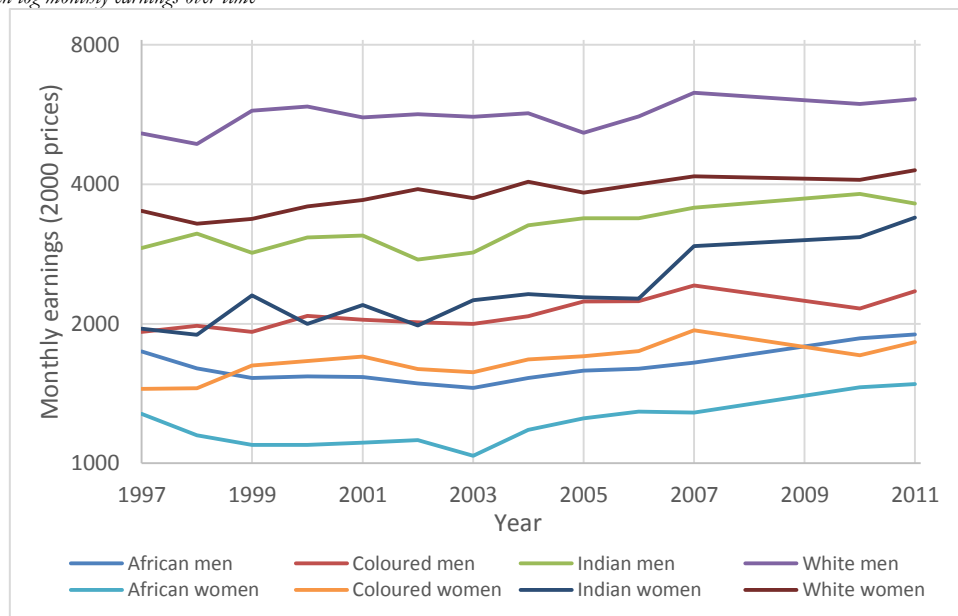
Source: Authors' own calculations from PALMS dataset (Kerr and Lam 2013)

Table 1 reports the mean logarithm of monthly earnings (expressed in 2000 rand values rather than log-points) and the share of highly skilled workers by demographic group.[16] It also shows the evolution of the mean earnings gap[17] (expressed relative to the most advantaged group: white males), the earnings gap at the 90th percentile and the gap in occupational representation between the beginning of the sample, the implementation of the Employment Equity Act, the implementation of Broad-Based Black Economic Empowerment and the end of the sample.

We start by looking at the era between the end of apartheid and the implementation of the Employment Equity Act. During this period there were many changes in the way in which Stats SA sampled and surveyed households, so we should be cautious of drawing unjustifiably strong inferences about trends from this period. Having said that, Table 1 shows no evidence of a narrowing of the wage gap (at the mean or at the 90th percentile) or improvement in occupational representation in highly skilled occupations relative to white males for any of the 'previously' disadvantaged groups. If anything, the data suggests that white men were able to improve their already favourable position during this period. After the implementation of the Employment Equity Act, we do start to observe a reversal of this trend, at least for certain groups. White women, Indian men and Indian women all experienced a large reduction in their wage gap relative to white males (at the mean and – particularly for white women – at the 90th percentile) as well as an improved representation in highly skilled occupations. Black women also experienced a reduction in their mean wage gap and the occupational gap, but no commensurate improvement in the gap at the 90th percentile. Black men, coloured men and coloured women – arguably three of the four most disadvantaged groups in terms of labour market outcomes – experienced no significant reduction in their mean wage gap vis-à-vis white males during this period, and only negligible improvements in their representation in highly skilled occupations.

Subsequent legislation in the form of the Black Economic Empowerment Act of 2003 placed a concerted emphasis on the black sub-population, with less emphasis on women from other race groups. The figures in Table 1 suggest that this legislation indeed shifted the benefits of affirmative action towards the more disadvantaged groups. Since 2004 there has been no additional (significant) reduction in the wage gap for white women and Indian males, and their improvement in occupational representation has slowed down.

---

[16] Occupational representation is measured by the share of total highly skilled workers that belongs to each demographic group, rather than that share of the demographic group employed in highly skilled occupations. South Africa has a very high unemployment rate, and we would not want cyclical movements of workers between unemployment and unskilled employment for any demographic group to be reflected as a decrease in representation in highly skilled occupations.

[17] The earnings gap refers to the proportional difference in monthly earnings, which is calculated as the mean log earnings for white males minus the mean log earnings for members of the other demographic group.

Black men and women, on the other hand, experienced substantial reductions in their wage gap relative to white males (at the mean and particularly at the 90th percentile) as well as in their representation in highly skilled occupations.

Table 1: Labour market outcomes by demographic group and year

	Men				Women			
	Black	Coloured	Indian	White	Black	Coloured	Indian	White
Mean log monthly earnings (expressed in rands)								
1997	1742	1920	2913	5152	1278	1448	1952	3505
2000	1540	2081	3072	5884	1095	1662	2000	3585
2004	1528	2075	3262	5690	1181	1676	2317	4051
2011	1896	2350	3635	6106	1482	1824	3388	4291
Reduction in wage gap relative to white males								
1997-2000	-26%***	-5%	-8%		-29%***	0%	-11%	-11%*
2000-2004	3%	3%	9%*		11%**	4%	18%**	16%***
2004-2011	15%***	5%	4%		16%***	1%	31%***	-1%
Reduction in 90th percentile wage gap relative to white males								
1997-2000	-54%***	-30%***	-31%***		-44%***	-13%	-5%	-19%*
2000-2004	10%	17%*	22%*		4%	-14%	13%	27%***
2004-2011	23%***	27%***	11%		45%***	52%***	38%***	-20%***
Share of highly skilled occupations								
1997	20.1%	5.7%	6.7%	42.4%	5.0%	3.0%	1.5%	15.6%
2000	15.9%	5.7%	6.1%	47.7%	3.7%	2.9%	0.9%	17.1%
2004	15.7%	5.7%	8.1%	40.8%	6.3%	3.2%	1.8%	18.4%
2011	16.1%	6.3%	5.4%	34.8%	11.1%	4.6%	3.1%	18.6%
Reduction in occupational representation gap relative to white males								
1997-2000	-9.5%***	-5.3%**	-5.9%***		-6.5%***	-5.4%***	-5.9%***	-3.7%*
2000-2004	6.6%***	6.8%***	8.9%***		9.4%***	7.2%***	7.7%***	8.1%***
2004-2011	6.5%***	6.7%***	3.4%**		10.9%***	7.5%***	7.4%***	6.3%***

Source: Authors' own calculations from PALMS dataset (Kerr and Lam 2013)

The results from this descriptive analysis allow us to draw a few preliminary conclusions, before proceeding to a more rigorous analysis of the way in which affirmative action affected the wage gap between black and white men in section 5.2. Firstly, it seems that the main beneficiaries of the first phase of affirmative action legislation were the groups that were the least disadvantaged during apartheid. It was only after the implementation of Broad-Based Black Economic Empowerment that we start to see an improvement in the labour market position of the average black male, for example. Secondly, the effect of affirmative action appears to have been more pronounced at the top of the earnings distribution. This has implications for the use of affirmative action as a means of reducing overall inequality or alleviating poverty. Finally, the total effect of affirmative action on the mean racial earnings gap has been very small. In fact, the only group who experienced a significant narrowing of the mean gap relative to white males between 1997 and 2014 is Indian females. This is not to say that this policy has not had an impact on the

labour market outcomes of specific workers. Rather, it suggests that the largest effect appears to be concentrated amongst a relatively small group of workers at the top of the earnings distribution, and this effect appears to be too small to have substantial changes at the mean of the distribution.

5.2 Regression model

Table 2: Log (wage) regression – OLS

	Variables	Specification 1		Specification 2	
		Coefficients	Interactions with Black	Coefficients	Interactions with Black
Education Splines	Secondary	0.128***	-0.013	0.129***	-0.014
	Tertiary	0.201***	0.134***	0.199***	0.136***
	Business cycle growth			1.406***	-1.528***
Time Dummies	2000-2011	-0.175*	0.068	-0.225**	0.128
	2004-2011	-0.154	0.324**	0.013	0.290
	2010-2011	0.073	-0.050	0.025	-0.039
	Age	0.130***	-0.042***	0.124***	-0.041***
	Age Squared	-0.001***	0.000***	-0.001***	0.000***
Time Interactions	Secondary Educ x (2000-2011)	0.036*	-0.022	0.035*	-0.022
	Secondary Educ x (2004-2011)	0.026	-0.054*	0.025	-0.054*
	Secondary Educ x (2010-2011)	-0.025	0.048	-0.025	0.048
	Tertiary Educ x (2000-2011)	0.032	0.082**	0.034*	0.079*
	Tertiary Educ x (2004-2011)	0.025	0.076**	0.024	0.076**
	Tertiary Educ x (2010-2011)	-0.066***	-0.016	-0.065***	-0.017
	BC Growth x (2000-2011)			-0.969	1.454*
	BC Growth x (2004-2011)			-1.864	0.323
	BC Growth x (2010-2011)			0.557	-0.181
Cohort Splines	1941-1945	0.017	-0.021	0.011	-0.020
	1946-1950	-0.003	-0.045***	-0.009	-0.043**
	1951-1955	-0.022**	0.020	-0.028**	0.021
	1956-1960	0.027**	-0.055***	0.021*	-0.053***
	1961-1965	0.005	-0.028**	-0.001	-0.026**
	1966-1970	0.003	-0.0219*	-0.003	-0.021*
	1971-1975	0.025**	-0.036***	0.018*	-0.034***
	1976-1980	-0.005	0.011	-0.011	0.012
	1981-1985	0.034***	-0.032**	0.027**	-0.030**
	1986-1990	0.059***	-0.040**	0.053***	-0.039*
	Black	0.823*		0.678	
	Constant	4.878***		5.286***	
	Observations	97664		97664	
	R-squared	0.469		0.469	

Source: Authors' own calculations from PALMS dataset (Kerr and Lam 2013)

Table 2 presents regression output from which the decomposition analysis is conducted. The analysis only considers the white-black male wage differential. As noted in section 3.2.2, it is desirable to account for

cohort-specific unobservables. However, we wish to simultaneously account for life cycle variation in wages, while identifying the time variation in wages that is central to the hypothesis of this paper. The age, period and cohort effects are collinear by definition, and pose the famous identification problem experienced in multiple social science contexts, but introduced to economists by Angus Deaton (Deaton and Paxson 1994; Deaton 1997). Applying Deaton's zero restriction on time effects would not be sensible here, since we hope to detect differences in wages that are not driven by business cycle variation, but by discrete policy events. Instead, we include time dummies that match periods in which various pieces of legislation were operative: the base category is 1997–99, the period before the 1998 Employment Equity Act was enforced; a dummy for 2000–11 indicates the additional effect for the entire period that the EE Act was in force; a further dummy for 2004–11 captures the additional effect for the complete era in which the BEE Act was legally binding, and finally a dummy for the post-financial crisis period (2010–11) is included.

In addition, we control for life cycle effects, relying on a quadratic in age. The models include splines for education (distinguishing the marginal returns to an additional year of secondary and tertiary education). Splines for birth years (showing the wage growth within cohorts, distinguished by race) strip out the role of generational unobservables, as discussed extensively above. Each of these effects is interacted with a black dummy variable, and is displayed in the second column. Coefficients are used to predict wage gaps for various periods and cohorts in later decomposition analysis.

A potential confounding factor in our approach is that the time specification may discern pure business cycle variation in discrimination, instead of the impacts of legislation. Biddle and Hamermesh (2013) study cyclical discrimination in the United States, and find that racial wage gaps grow in times of economic upswing – this is, however, the result of a changing composition in the work force, with unskilled African Americans finding jobs more readily in better economic conditions. While our study accounts for such potential compositional changes to measure pure cyclical discrimination, the co-incidence of business cycle phases with the implementation of labour legislation could be problematic. The year 1999, which co-incides closely with the promulgation of the EE Act, marks the beginning of one of South Africa's longest recorded business cycle upswings. Furthermore, economic growth became more robust in the year 2003, in the very year that the BEE Act was legislated. To distinguish between policy and business cycle variation, we introduce a macro-level control, the growth in the co-incident business cycle indicator, issued by the South African Reserve Bank (SARB 2016). Additionally, this approach also allows us to distinguish between wage response differentials by race across the business cycle.

We briefly discuss the results from Specification 1 in Table 2 to understand how wages evolved for black and white men. Marginal returns to an additional year of secondary education (12.8 per cent) are larger than marginal returns on tertiary education (20.1 per cent) for white workers in the base period. These effects largely persist over time for white men, except for a small increase in the returns to secondary education from the year 2000, and a reduction in the returns to tertiary education in the post-financial crisis period. Black individuals have rather different experiences to whites, illustrating the changes in

labour market rewards in the evolving policy environment. Returns to secondary education do not differ by race in the base period; from 2004, however, the returns to black secondary education start to decline marginally. In contrast, black men earn a significant premium of 13.4 per cent compared to white men for an additional year of tertiary education. This premium grows over time; in the period during which the EE Act was enforced, the premium to black tertiary education grew by an additional 8 percentage points; the period associated with the BEE Act adds another similar premium of 7.6 percentage points on top of the prior gains. In contrast to white men, the financial crisis did not reduce this tertiary premium. Highly educated black men have, therefore, experienced marked benefits in the labour market during the period in which equitable labour market reforms were enacted. The same cannot be said for black men with less than tertiary education, so that the apparent benefits of reforms have not been equally spread across the skills distribution.

A concave age profile emerges for white men. The black interaction effects indicate that the concavity is weaker for this population group: the life cycle progression of wages is therefore not as sharp for black as for white men.

Time dummies show that, on average, wages declined from 2000 for white individuals. For black individuals, however, relative wages rose by 32.4 per cent on average from 2004. The combined effect is a narrowing of the racial wage gap for the average individual (over and above the improvements in the returns to education among the best skilled workers). This effect may not necessarily be the direct result of affirmative action legislation, but also co-incides with the introduction of a number of sectoral minimum wages, which affected the pay levels of unskilled workers (Bhorat, Mayet and Kanbur 2013). Given that we have limited ourselves to individuals with secondary and tertiary education, this effect may, however, be minimized.

While few cohort differences arise: individuals born between 1981 and 1990 are distinct, with substantial growth in white wages but not for black men. As a result, the generational racial wage gap – apart from life cycle and time effects – has widened.

Specification 2 repeats the analysis, but also controls for business cycle growth. The results discussed above remain robust. We can therefore be confident that our analysis is not driven by economic fluctuations, but rather by changes in legislation at discrete times. Interestingly, however, white wages are strongly procyclical in the base period, while they are acyclical for black men. Economic growth tended to initially benefit white individuals and widen the wage gap, similar to the results of Biddle and Hamermesh (2013) in the USA. This is true despite accounting for the changes in skills composition of workers. However, from the year 2000, when the EE Act became effective, this disadvantage is reversed; black workers started to benefit as much from economic growth as their white counterparts. It therefore appears that the affirmative action legislation played a role in mediating more equitable benefits from economic growth.

5.3 Decomposition

5.3.1 Decomposing the time variation in discrimination

Figure 2 depicts a series of *standard* Oaxaca–Blinder decompositions of the black-white wage gap among men. Level comparisons over time have been typically implemented to track whether discrimination has grown or abated. The results are based on a series of regressions that control for education splines and a quadratic in age. Note, however, that these analyses cannot account for cohort-specific variation, as separate decompositions rely on one cross section at a time. This is the major weakness of such an approach. As noted before, the wage structure component is therefore likely to be overstated. Importantly, if labour market entrants and leavers differ substantially in each year, the bias in the 'unexplained' component may also be time variant. Nevertheless, the method illustrates the growth in the racial wage gap, but also the high contribution of the unexplained component to this figure. Any discernable reversals in the unexplained (wage structure) component only occurred after the 2004 implementation of the 2003 BEE Act. The standard Oaxaca–Blinder approach suggests that the first real dividends of affirmative action policy occurred with a lag, with real reversals only arising from 2006.

Figure 2: Oaxaca–Blinder decomposition over time
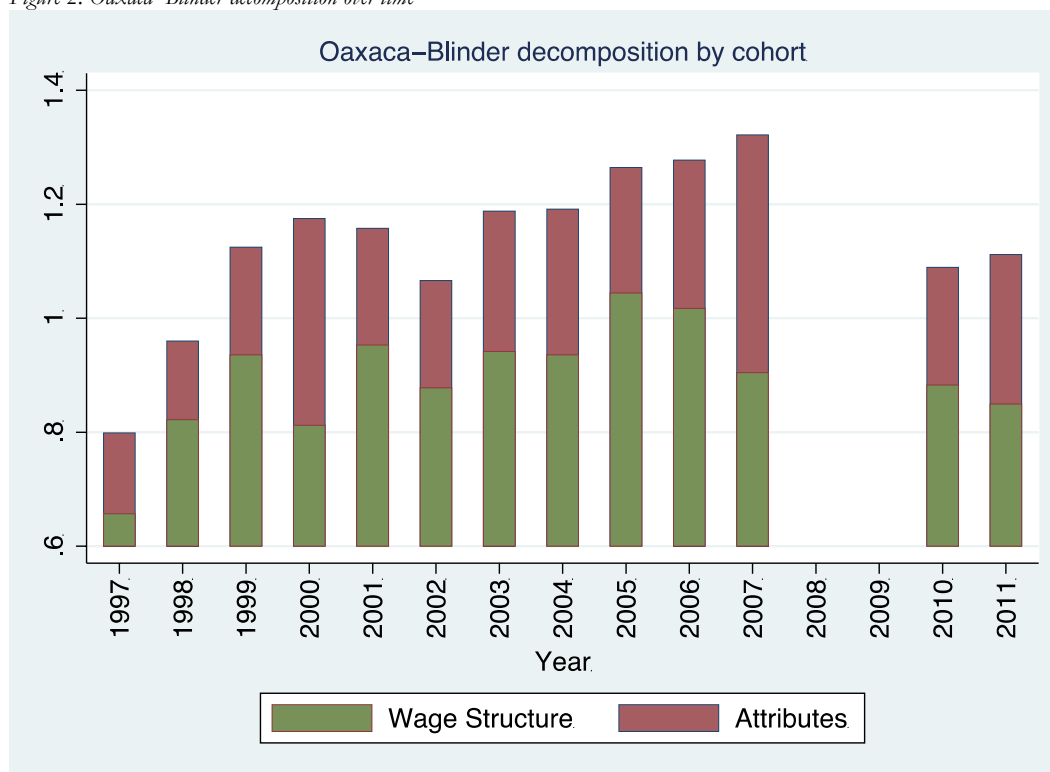
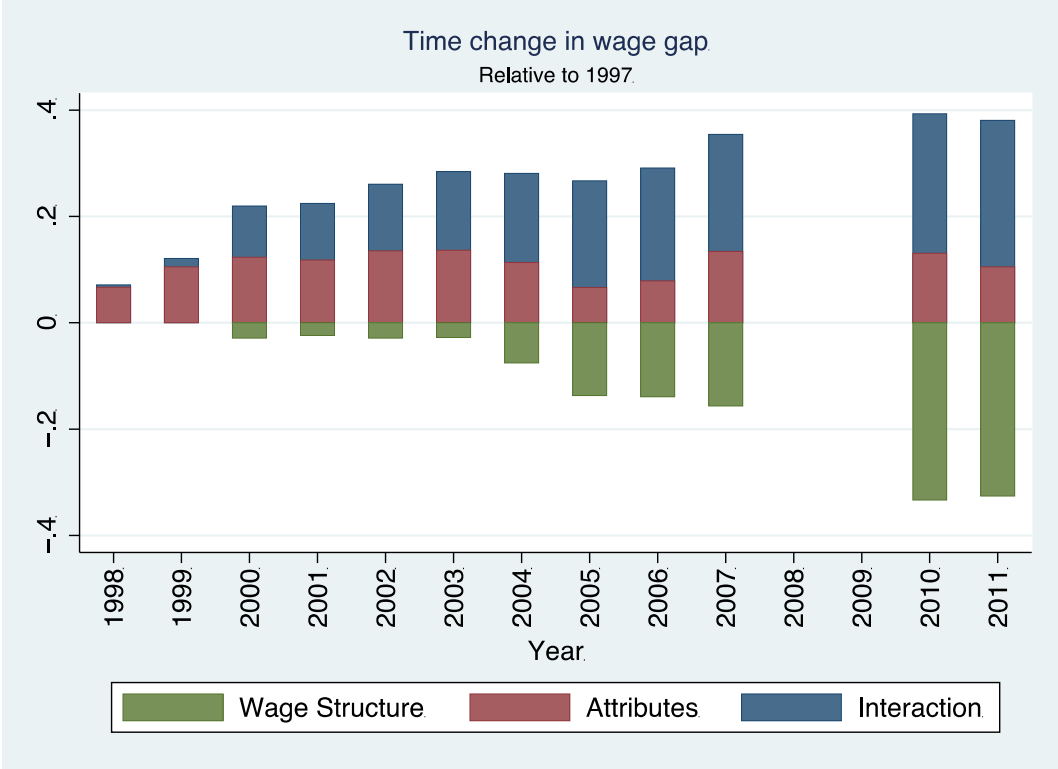*Source: Authors' own calculations from PALMS dataset (Kerr and Lam 2013)*

Section 4.2.3 demonstrated that *changes* in the racial wage gap over time can be similarly decomposed, but now they can also incorporate explicit controls for changes in generational composition. The sum of the first two components represents the change in discrimination that occurs due to changes in the race-specific wage structures over time. This can be due to either a change in the race-specific intercepts (which represents the expected earnings of workers with eight years of completed schooling in this case) or a

change in the differential reward of attributes, when possessed by members of different races. If affirmative action policies affected the way in which workers were remunerated, and in a way that reduced inter-racial wage inequality, then we would expect to see positive and growing values for this component (representing a shrinking of the gap) over time.

The second component represents the change in the racial wage gap due to changes in the average values of observable attributes for the different race groups. These changes are evaluated using the black pre-affirmative action wage structure, and hence represents the change in the wage gap that would have occurred in the absence of any changes in the wage structure.

The third component (which represents the fourth and fifth terms from equation [5]) denotes the changes in the wage structure due to simultaneous changes in wages and observable attributes. For example, if black workers are experiencing shifts in educational attainment into schooling year for which the racial wage gap is widening, then the negative effect on racial equality will be larger than the sum of the first two components. The third component represents exactly this difference.

Figure 3: Decomposition of time changes in racial wage gap between white and black men, relative to 1997

Source: Authors' own calculations from PALMS dataset (Kerr and Lam 2013)

Figure 3 shows an implementation of this approach, based on Specification 1 in Table 2. Each bar represents the *change* in the log (wage) gap from 1997, between white and black men. Up until 2007, the total wage gap continued to widen. Most of the increase occurred between 1998 and 2003, during the implementation phase of the Employment Equity Act. However, this does not imply that discrimination also increased. Changes in all components played a contributing role to the rise in the total wage gap. As

discussed in the analysis of Figure 2, the trend in the wage gap reversed shortly thereafter, with the change in the unexplained component having the greatest influence: while standard methods lead us to conclude that the turning point only came in 2006, this refined analysis more clearly illustrates that legislation did have immediate influences. The effects of the EE Act were, however, initially small. The wage structure component (the unexplained component) was marginally lower than in 1997 for the period 2000–03. This declining discrimination component intensified co-incidentally with the 2004 promulgation of the 2003 Black Economic Empowerment Act and the intensification of economic growth in 2003. The decline in the discrimination component did not reverse after this point in time, even after the financial crisis. After stripping out generational unobservables, and accounting for compositional changes, affirmative action legislation appears to have been effective.

However, distinguishing between the business cycle and legislative explanations for the decline in discrimination remains tenuous. It is plausible that the continued reversal up until 2011 (throughout the financial crisis) indicates that the decline in the wage gap results from a more permanent legislative, rather than a temporary cyclical impact. To affirm this assertion, we run the same decomposition, but also control for business cycle variation, as in Specification 2 of Table 2. Recall that the specification did not change many of the coefficient findings. Figure A1 in the appendix shows that, if anything, the discrimination component declined earlier and more intensively in the era of the EE Act, once removing business cycle effects. This concurs with our earlier observation that wages of black men were less responsive to economic growth than those of white men in earlier periods. It is therefore more appropriate to measure the initial black wage-growth inelasticity as discrimination (as in Figure 3). Regardless of our approach, it is evident that what we measure is a change in discrimination resulting from legislative progress, rather than changes in the economic climate.

We conduct additional robustness checks to test the sensitivity of our results to our chosen specification. Age-period-cohort regressions of this kind are notoriously sensitive to the particular manner in which any of the components are specified (Glenn 1976; Fienberg 2013). As a result, our chosen specification – informed mainly by policy changes – may not uncover the true data-generating process. Instead, it may pick up large policy effects by design, while they may simply be attributed to generational compositional changes in the labour market. Alternative specifications 'rotate' the age, period and cohort profiles, resulting in a trade-off between generational and time shifts in explaining the evoluation of wages (Yang et al. 2008). This feature of the empirical framework has a potentially critical bearing on the decomposition analysis, by which we would like to distinguish pure time evolution in discrimination – associated with the relevant policies – from the experiences of various generations. For the sake of robustness, therefore, we also implement a data-driven specification, by detecting statistical structural breaks in each of the age, period and cohort profiles (McKenzie 2006). Based on the fact that the acceleration in each of these profiles can be uniquely estimated, statistical tests are developed to detect when the inflection points of the estimates arise. This assumption-agnostic technique additionally allows the researcher to determine

whether linear or quadratic restrictions are credibly applied to each of the sections in the profile specifications. We do not report the regression results,[18] but show the time decomposition in Figure A2 in the appendix. The results show that after an initial intensification of the discrimination component in 1999, the trough of the business cycle, this started to reverse after the implementation of the EE Act. Again, the decline intensified after the BEE Act was implemented, leading up to much lower discrimination by 2011. Results are therefore robust to the specification we apply, and show that legislation has contributed to a declining discrimination component.

### 5.3.2 Decomposing the cohort variation in discrimination

The primary purpose of controlling for cohort fixed effects is to obtain more robust estimates of the wage effects of affirmative action legislation. However, these effects are of considerable interest in their own right, even if we are ignorant of what exactly they represent. Equation [5] in section 3.2.3 can be used to decompose the change in these effects across birth years into the parts that are attributable to i) pure cohort effects, ii) differences in the average observable attributes of the cohorts, and iii) the interaction between these two changes. This approach abstracts from time changes due to legislation, and instead focuses on whether younger generations have entered a less discriminatory labour market.

The Specification 1 in Table 2 is again used to construct the decompositions in Figure 4, but this time holding time variation constant.[19] Changes in the wage gap of cohorts relative to those born in the first half of the 1940s are shown. Successive cohorts experienced a widening racial wage gap, until it started to narrow for generations born after the mid-1970s. The initial and relatively moderate widening of the racial wage gap are the outcome of two countervailing forces: a narrowing of the wage gap attributable to the difference in observable determinants of wages (chiefly due to improvements in educational attainment amongst more recently born black generations) and an even stronger increase in the difference of the pure cohort race effects for black and white men. The quickest successive generational growth in the cohort wage structure gap occurs for generations that entered the labour market during the height of apartheid rule (in the 1960s and the 1970s). While the cohort discrimination component continued to rise (apart from the time effects analysed above), its growth slowed down for those born post-1970.

---

[18] The approach yields a fairly exhaustive specification, including many dummy variables. Few coefficients remain statistically significant due to high levels of collinearity, and are also difficult to interpret economically. Nevertheless, they still add value to the decomposition analysis.

[19] Results are robust to other approaches and we therefore only show the decomposition associated with Specification 1 in Table 2.

Figure 4 Cohort change in racial wage gap
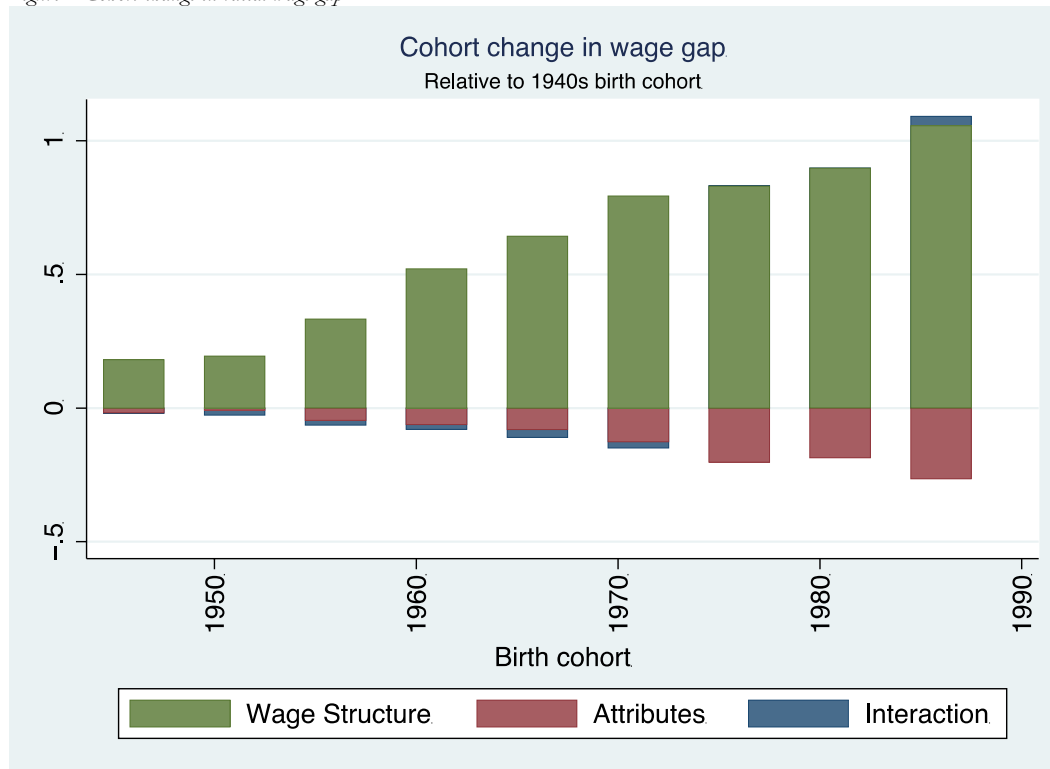
Source: *Authors' own calculations from PALMS dataset (Kerr and Lam 2013)*

6   Conclusions

South Africa has a long history of institutionalized racial discrimination. Post-apartheid affirmative action legislation has been the central vehicle to address racial and gender disparities within the labour market and broader economic life. However, despite the removal of discriminatory apartheid-era acts, wage gaps *widened* in the immediate post-transition period. This pattern continued even after the promulgation of the 1998 Employment Equity Act, which laid the basis for positive discrimination measures. Only from 2005, two years after the enactment of the Black Economic Empowerment Act, did the gap start to narrow again. What proportion of these changes can be attributed to changes in discrimination? Neoclassical theory suggests that discrimination should subside in the long run, and prominent scholars predicted that the high costs associated with unfair treatment would lead to rapid declines in discrimination in South Africa (Becker 1993). Yet, the experience of Malaysia shows that the application of affirmative action policies did not bear immediate fruits. This paper distinguished between these two possibilities, explicitly measuring changes in wage discrimination between black and white South African men over time.

This paper has addressed methodological concerns in gauging the time evolution of discrimination; by controlling for cohort fixed effects, the bias in standard wage gap decompositions is reduced, and compositional differences between entrants and retirees are largely accounted for. This updated approach suggests that discrimination did start to decline – though modestly – soon after the implementation of employment equity legislation. However, the implementation of Black Economic Empowerment

legislation represented a more visible turning point, when (despite a simultaneously growing generational gap) the time path of discrimination started to decline substantially. We show that this time path is not the product of business cycle variations, and attribute it to the effects of employment equity legislation.

Are the effects likely to be long-lasting? Abstracting from time effects, we show that generations that entered the labour market at the height of apartheid experienced successively higher discrimination. The generational component of discrimination has not yet undergone a turning point, though its growth has slowed down. This portion of the total wage gap explains why raw figures measure growth in the wage gap: new entrants are facing higher discrimination than retirees. The exact reasons for this pattern are difficult to pinpoint, though one potential channel might be the persistent racial gap in education quality that continues to drive a wedge in labour market opportunities between the various groups.

To whom have the benefits from affirmative action accrued? Our regression analysis shows that, among men, black wages became as responsive to economic growth as white wages after the imposition of affirmative action legislation. Reforms therefore appear to have removed some obstacles that prevented black men as a whole from enjoying the benefits of economic expansion. However, the way education was rewarded plays a dominant role in the evolution of the wage gap. Returns to tertiary education have grown for all groups, but especially among black men; the trend for black men intensified even more after employment equity laws were enacted. It therefore appears that the legislation has been effective at drawing highly qualified black men into well-remunerated positions, and that this drives much of the average effects that we observe.

7 Bibliography

Acemoglu, D., S. Gelb, and J. Robinson (2007). *Black Economic Empowerment and Economic Performance in South Africa*. Report of the Harvard Advisory Panel. Pretoria: National Treasury.

Allanson, P., J.P. Atkins, and T. Hinks (2002). 'No End to the Racial Wage Hierarchy in South Africa?'. *Review of Development Economics,* 6(3): 442–59.

Bacchi, C. (1996). *The Politics of Affirmative Action: 'Women', Equality and Category Politics*. London and Thousand Oaks, CA: SAGE.

Becker, G. (1993). 'Nobel Lecture: The Economic Way of Looking at Behavior'. *Journal of Political Economy*, 101(3): 385–409.

Bezuidenhoud, A., C. Bischoff, S. Buhlungu, and K. Lewins (2008). 'Tracking Progress on the Implementation and Impact of the Employment Equity Act since its Inception'. Research Commissioned by the Department of Labour, South Africa.

Bhorat, H., and J. Hodge (1999). 'Decomposing Shifts in Labour Demand in South Africa'. *The South African Journal of Economics*, 67(3): 349–80.

Bhorat, H., N. Mayet, and R. Kanbur (2013). 'The Impact of Sectoral Minimum Wage Laws on Employment, Wages, and Hours of Work in South Africa'. *IZA Journal of Labor and Development*, 2(1): 1–27.

Biddle, J.E., and D.S. Hamermesh (2013). 'Wage Discrimination over the Business Cycle'. *IZA Journal of Labor Policy*, 2(7): 1–19.

Blinder, A.S. (1973). 'Wage Discrimination: Reduced Form and Structural Estimates'. *Journal of Human Resources*, 8(4): 436–55.

Branson, N., and M. Wittenberg (2014). 'Reweighting South African National Household Survey Data to Create a Consistent Series over Time: A Cross-Entropy Estimation Approach'. *South African Journal of Economics*, 82(1): 19–38.

Bravura Consulting (2007). '7 out of 10 for Final Codes'. Available at: www.bravuraempowerment.com/Articles/final_codes_of_good_practice.pdf.

Brookes, M., and T. Hinks (2004). 'The Racial Employment Gap in South Africa'. *South African Journal of Economics,* 72(3): 573–80.

Brown, G.K., A. Langer, and F. Stewart (eds) (2012). *Affirmative Action in Plural Societies, International Perspective*. London: Palgrave Macmillan.

Burger, R., and R. Jafta (2010). 'Affirmative Action in South Africa: An Empirical Assessment of the Impact on Labour Market Outcomes'. Crise Working Paper 76. Oxford: CRISE, Oxford University.

Burger, R.P., and D. Yu (2006). 'Wage Trends in Post-Apartheid South Africa: Constructing an Earnings Series for South Africa from Household Survey Data'. *Labour Market Frontiers*, 8: 1–8.

Cassan, G. (2011). 'The Impact of Positive Discrimination in Education in India: Evidence from a Natural Experiment'. Paris School of Economics Working Paper. Available at: www.parisschoolofeconomics.eu/IMG/pdf/JobMarket-2paper-CASSAN-PSE.pdf.

Coate, S., and G.C. Loury (1993). 'Will Affirmative-Action Policies Eliminate Negative Stereotypes?'. *The American Economic Review*, 83 (5): 1220–40.

D'Amico, T.F., (1987). 'The Conceit of Labor Market Discrimination'. *The American Economic Review*, 77(2): 310–15.

Daflon, V.T., ,J.J. Feres, and L.A. Campos (2013). 'Race-Based Affirmative Actions in Brazilian Public Higher Education: An Analytical Overview'. *Cadernos de Pesquisa*, 43(148): 302–27. Available at: dx.doi.org/10.1590/S0100-15742013000100015.

Deaton, A., and C. Paxson (1994). 'Saving, Growth and Aging in Taiwan'. In D.A. Wise (ed.), *Studies in the Economics of Aging*. Chicago: University of Chicago Press, pp.331–62.

Deaton, A. (1997). *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*. Baltimore: Johns Hopkins University Press.

Department of Trade and Industry (2007). 'The BEE Codes of Good Practice'. Pretoria: Department of Trade and Industry. Available at: www.dti.gov.za/bee/beecodes.htm.

Department of Trade and Industry (2013). 'The National Broad-Based Economic Empowerment Summit, Summit Report'. Pretoria, Department of Trade and Industry. Available at: http://www.thedti.gov.za/economic_empowerment/docs/National_Summit_Report.pdf.

Erichsen, G., and J. Wakeford (2001). 'Racial Wage Discrimination in SA before and after the First Democratic Election'. DPRU Working Paper, 001/49. Cape Town: DPRU, University of Cape Town.

Fienberg, S.E. (2013). 'Cohort Analysis' Unholy Quest: A Discussion'. *Demography*, 50: 1981–4.

Fortin, N., T. Lemieux, and S. Firpo (2011). 'Decomposition Methods in Economics.' In D. Card and O. Ashenfelter (eds), *Handbook of Labor Economics*. 4th edition. Amsterdam: Elsevier North Holland, pp.1–102.

Fourie, J., and D.P. von Fintel (2010). 'The Dynamics of Inequality in a Newly Settled, Pre-Industrial Society: The Case of the Cape Colony'. *Cliometrica*, 4: 229–67.

Glenn, N.D. (1976). 'Cohort Analysis' Futile Quest: Statistical Attempts to Separate Age, Period, and Cohort Effects'. *American Sociological Review*, 41(5): 900–04.

Hernandez, T.K. (2013). 'Affirmative Action in the Americas'. *Americas Quarterly*, August 1. Available at: www.americasquarterly.org/affirmative-action-in-the-americas.

Heyer, J., and N.G. Jayal (2012). 'The Challenge of Positive Discrimination in India'. In G.K. Brown, A. Langer, and F. Stewart (eds), *Affirmative Action in Plural Societies, International Perspective*. London: Palgrave Macmillan.

Holzer, H., and D. Neumark (2000). 'Assessing Affirmative Action'. *Journal of Economic Literature* 38(3): 483–568.

Kerr, A., and D. Lam (2013). 'Post-Apartheid Labour Market Series 1994–2012'. [dataset]. Version 2.1. of the Harmonised Dataset Based on Statistics SA's OHS and LFS Surveys, 1994–2012. Cape Town: DataFirst [data producer and distributor], 2013.

Keswell, M., and L. Poswell (2004). 'Returns to Education in South Africa: A Retrospective Sensitivity Analysis of the Available Evidence'. *South African Journal of Economics*, 72(4): 834–60.

Kingdon, G.G., and J. Knight (2004). 'Race and the Incidence of Unemployment in South Africa'. *Review of Development Economics,* 8(2): 198–222.

Knight, J., and M.D. McGrath (1977). 'An Analysis of Racial Wage Discrimination in South Africa'. *Oxford Bulletin of Economics and Statistics*, 39(4): 245–71.

Kruger, L.P. (2011). 'The Impact of Black Economic Empowerment (BEE) on South African Businesses: Focusing on Ten Dimensions of Business Performance'. *South African Business Review*, 15(3): 207–33.

Labour Market Commission (1996). 'Restructuring the South African Labour Market. Report of the Presidential Commission to Investigate Labour Market Policy'. Pretoria: Government Printer.

Lempert, R. (2014). 'Affirmative Action in the United States: A Brief Summary of the Law and Social Science'. University of Michigan Public Law and Legal Theory Research Paper Series, 430. Ann Arbour: University of Michigan.

Long, M.C. (2012). 'Affirmative Action and its Alternatives in Public Universities: What Do We Know?'. In G.K. Brown, A. Langer, and F. Stewart, (eds), *Affirmative Action in Plural Societies, International Perspective*. London: Palgrave Macmillan.

Lundberg, S.J., and R. Startz (1983). 'Private Discrimination and Social Intervention in Competitive Labor Market'. *The American Economic Review*, 73(3): 340–47.

Mason, G., and G. Watson, (2005). 'The Role of HR in Facilitating Black Economic Empowerment'.

[online]. Available at: http://www.workinfo.com/free/downloads/194.htm.

McKenzie, D. (2006). 'Disentangling Age, Cohort and Time Effects in the Additive Model'. *Oxford Bulletin of Economics and Statistics*, 68(4): 473–95.

Mlatsheni, C., and S. Rospabé (2002). 'Why is Youth Unemployment so High and Unequally Spread in South Africa?'. DPRU Working Paper, 02/06. Cape Town: DPRU, University of Cape Town.

Moll, P. (2000). 'Discrimination is Declining in South Africa but Inequality is not'. *Journal for Studies in Economics and Econometrics*, 24(3): 91–108.

Mwabu, G., and T.P. Schultz (2000). 'Wage Premiums for Education and Location of South Africa Workers, by Gender and Race'. *Economic Development and Cultural Change,* 48(2): 307–34.

Oaxaca, R. (1973). 'Male-Female Wage Differentials in Urban Labor Markets'. *International Economic Review*, 14(3): 693–709.

Ponte, S., S. Roberts, and L. van Sittert (2007). 'Black Economic Empowerment. Business and the State in South Africa'. *Development and Change*, 38(5): 933–55.

Robinson, J.A. (2014). 'Elites and Institutional Persistence'. In A.H. Amsden, A. DiCaprio and J.A. Robinson (eds), *The Role of Elites in Economic Development*. Oxford: Oxford University Press, pp.29–49.

Rospabé, S. (2002). 'How Did Labour Market Racial Discrimination Evolve after the End of Apartheid? An Analysis of the Evolution of Employment, Occupational and Wage Discrimination in South Africa between 1993 and 1999'. *The South African Journal of Economics,* 70(1): 185–217.

Sabbagh, D., (2004). 'Affirmative Action Policies: An International Perspective'. Human Development Report Office, Background Paper for Human Development Report 2004.

SARB (South African Reserve Bank) (2016). 'Composite Business Cycle Indicators'. Available at: www.resbank.co.za/Research/Statistics/Pages/CompositeBusinessCycleIndicators.aspx.

Sherer, G. (2000). 'Intergroup Economic Inequality in South Africa: The Post-Apartheid Era'. *The American Economic Review,* 90(2): 317–21.

Szelewicki, M., and J. Tyrowics (2009). 'Labour Market Racial Discrimination in South Africa Revisited'. Faculty of Economics Working Paper, 08/2009. Warsaw: University of Warsaw.

Tucker, C., (2003). 'Summary of BEE in South Africa'. [online]. Available at: http://www.bowman.co.za/Pressroom/Publications/Pub_BEE.

Van der Berg, S. (2007). 'Apartheid's Enduring Legacy: Inequalities in Education'. *Journal of African Economies,* 60(5): 849–80.

Wittenberg (2014). 'Wages and Wage Inequality in South Africa 1994–2011: The Evidence from Household Survey Data'. A Southern Africa Labour and Development Research Unit Working Paper Number 135 and DataFirst Technical Paper 26. Cape Town: SALDRU, University of Cape Town.

Yang, Y., S. Schulhofer-Wohl, W.J. Fu, and K.C. Land (2008). 'The Intrinsic Estimator for Age-Period-Cohort Analysis: What it is and how to use it'. *American Journal of Sociology*, 113(6): 1697–936

Yusof, Z.A., (2012). 'Affirmative Action in Malaysia: An Overview of Progress and Limitations'. In G.K. Brown, A. Langer, and F. Stewart (eds), *Affirmative Action in Plural Societies, International Perspective*. London: Palgrave Macmillan.
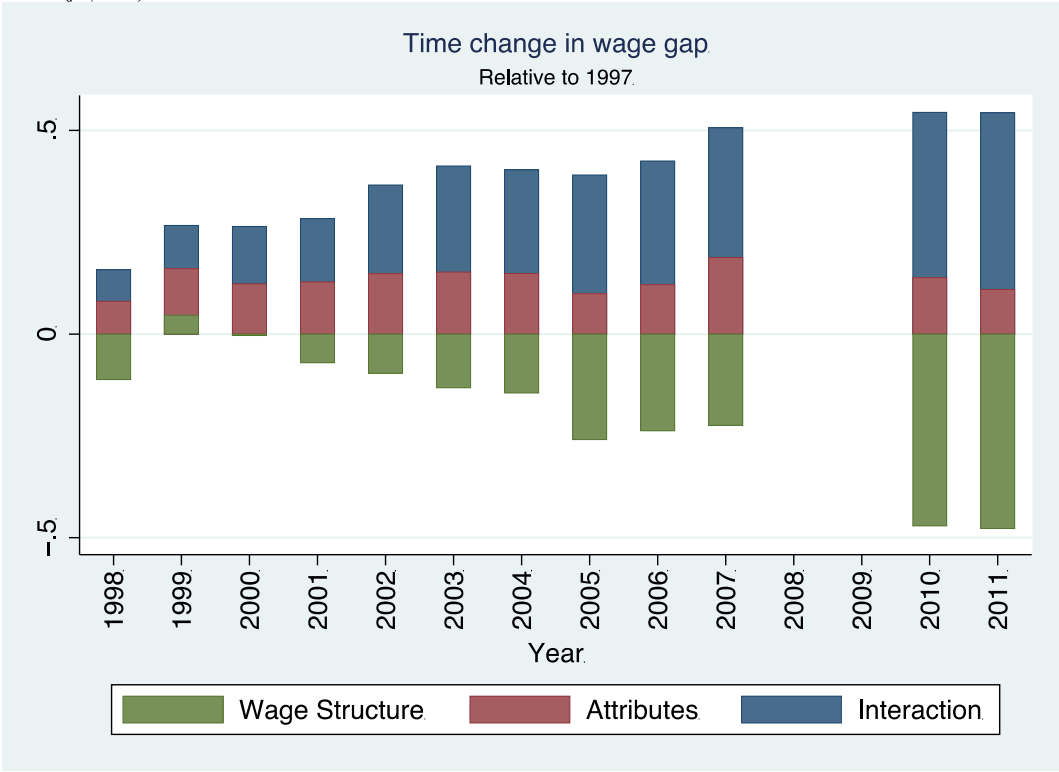
8   APPENDIX

Figure A1: Decomposition of time changes in racial wage gap between white and black men, relative to 1997. Includes controls for business cycle growth.
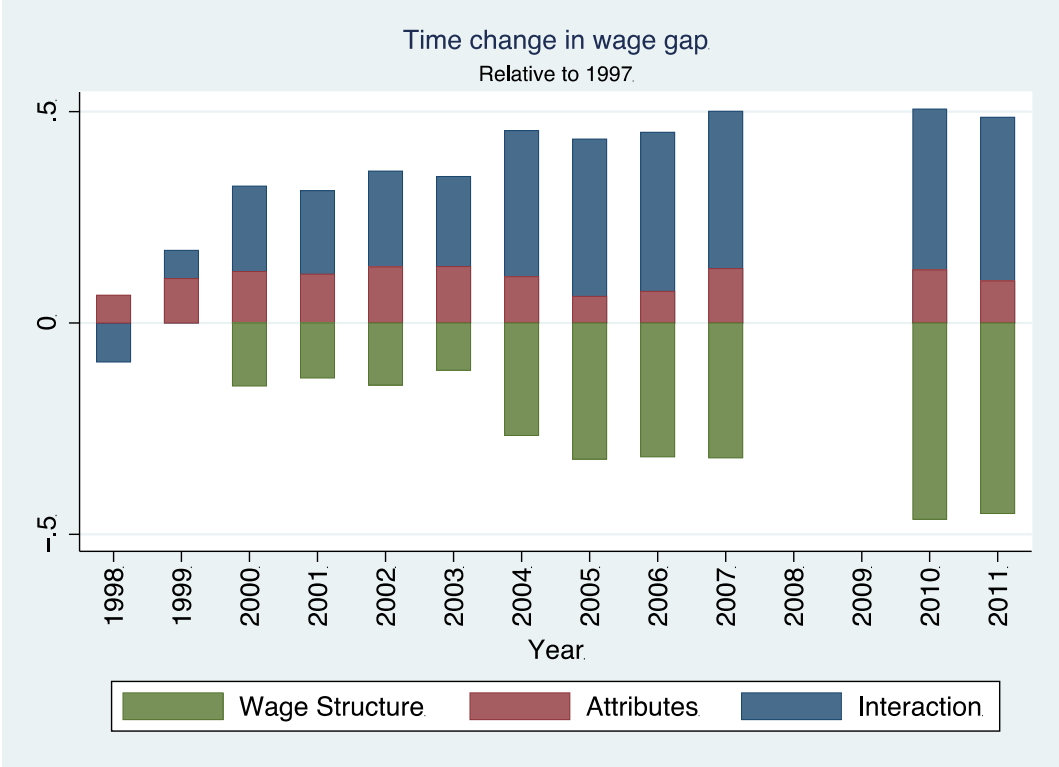
Source: Authors' own calculations from PALMS dataset (Kerr and Lam 2013)

Figure A2: Decomposition of time changes in racial wage gap between white and black men, relative to 1997. Imposing structural breaks as per McKenzie (2006).

Source: Authors' own calculations from PALMS dataset (Kerr and Lam 2013)