

Klasen, Stephan; Minasyan, Anna

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Affirmative Action and Intersectionality at the Top: Evidence from South Africa*

Stephan Klasen^{‡†}

Anna Minasyan^{§‡}

[‡]University of Goettingen [§]University of Groningen

Abstract

Gender-based board quotas do not always lead to higher share of women in top management positions. We study the consequences of an affirmative action policy that stipulates gender- and race-based targets in top management positions, beyond boards. We focus on the representation of intersectional group identities, such as race and gender, at the top. We find sizable increase in the likelihood of Black women employment in top positions in the post-policy period relative to Black men, White women and White men in South Africa. We extend our analysis and estimate policy spillovers for years of schooling, earnings gaps and self-employment.

Keywords: affirmative action, top, employment, race, gender, South Africa

JEL Codes: H41; J18; J21; J71; K31

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[†]Postal address: Platz der Goettinger Sieben 3, 37073, Goettingen Germany, sklasen@gwdg.de.

[‡]Corresponding author. Postal address: Nettelbosje 2, 9747 AE, Groningen, The Netherlands. E-mail: a.minasyan@rug.nl. Tel.: +31 50 36 35995

1 Introduction

Affirmative action policies, such as group-based quotas and targets, first introduced in India and in the United States in the 1950s, have become one of the most controversial state policy interventions for increasing the representation of previously discriminated population groups in politics (Murray, 2010; Hughes, 2011; Obrien and Rickne, 2016; Besley et al., 2017), labor market (Kurtulus, 2012; Deshpande and Weisskopf, 2014; Peck, 2017; Miller, 2017) and educational institutions (Backes, 2012; Bagde et al., 2016; Francis-Tan and Tannuri-Pianto, 2018). There is a substantive body of interdisciplinary literature studying direct and indirect effects of group-based affirmative action policies (Leonard, 1990; Holzer and Neumark, 2000; Kirsch, 2018). Recent studies in economics explore spillovers of gender-based board quotas and find no causal evidence for trickle-down effects in the senior management positions in Norway (Bertrand et al., 2019) and Italy (Maida and Weber, 2019). Yet, non-quota studies report positive spillovers from higher representation of women on company boards to top managerial positions in the US and Norway (Matsa and Miller, 2013; Kunze and Miller, 2017). Thus, gender-based board quotas for publicly listed companies may not be a sufficient policy for increasing women’s representation in top management in the long-run. Given that the goal of gender-based quotas is to accelerate the process of achieving proportionate representation of women in the decision-making bodies, a more comprehensive approach may be needed. For example, besides board representation, targets for top management positions may also be necessary. Yet, there is lack of evidence from such full-fledged labor market policies as these are rare.

In this article we present a unique evidence from a South African affirmative action policy, which not only stipulates group-based targets for board representation but also for top management positions. Namely, we focus on the probability of employment in top position for Black women relative to Black men, White women and White men. We also compare pre- and post-policy outcomes for Black women for designated and non-designated employers. We find that Black women in South Africa have three percentage points more

likelihood to be employed in top management positions in the post-policy period relative to Black men and White women. Relative to White men their chances become slightly higher once we control for the over time changes in the observable factors (i.e., education).

Blacks are the majority population group in South Africa, who have been explicitly discriminated and geographically segregated by White people of European descent under the South African apartheid government. Due to the post-apartheid legacy, economic, educational and labor market opportunities continue to be limited for non-white South Africans. Consequently, asset ownership, board representation and top managerial positions, among others, are disproportionately dominated by Whites (mostly men), a minority but privileged population group.

In 2003 the post-apartheid South African government introduced a national level economic empowerment policy for Black people effective as of January 2004. The Broad-Based Black Economic Empowerment Act 53 of 2003 (BEE) stipulates equal (proportionate) representation of Blacks in all occupational categories. Specific targets in top management positions are set for Blacks, and also specifically for Black women, as a share of all Blacks, equal to 40 per cent.

In the BEE Act and also throughout this article, the word *Black(s)* is used as a generic term to denote non-white population groups in South Africa, that is African Blacks, Coloured, and Indian/Asians. Subsequently, we use the word *White* to denote white people of European descent in South Africa.

Designated enterprises of BEE 2003 are large employers while small employers are either exempted or automatically considered as an average level contributor (based on annual turnover). It is not mandatory for the firms in the private sector to comply with BEE but all designated enterprises are expected to report their contribution to the BEE commissioner on annual basis, if they expect to do any business with the local or national government (i.e., procurement, licensing, registration). Above-average contributors receive preferential treatment from the government when doing business with it. There are no monetary sanctions.

There is no national level complimentary policy for equal educational opportunities.

Identification of causal effects of BEE is challenging as there is lack of quality firm level data prior 2006 in South Africa. Instead, we follow Burger and Jafta (2012) and Burger et al. (2016) and use repeated cross-sectional and harmonized data from 1994 to 2015 based on labor force surveys, which include detailed information on occupations, employer size, sector, province and etc. Since the policy is not limited to publicly listed firms only, using labor force surveys allows us to conduct nationally representative analysis for all types of employers. We define senior management positions as the employment in the highest occupational category classified as Senior Managers, Legislators and Executives in the labor force surveys. This is in accordance with the classification of International labor Organization. In our sample there are only *Senior (Department) Managers* and *Executives*, and not Legislators. In the text we refer to this category as top or senior positions.

We use a linear probability model to estimate post-BEE change in the likelihood of employment in top positions for Black women relative to Black men, White women and White men. We control for other constant and time-varying linear effects by including individual-level control variables, province- and industry-level fixed effects and group-, province- and industry-specific time trends. In addition, we adapt a difference-in-difference type of approach and compare changes for women relative to men working for affected and non-affected employers. The findings show that the South African BEE policy increased the likelihood of Black women employment in top positions by three percentage points in the post-policy period. The marginal effect for highly educated Black women relative to Black men is much higher - nine percentage points.

We test for the possible idiosyncratic effects of other policy episodes and BEE amendments in South Africa. Particularly, we test for the effects of Employment Equity Act of 1998 (EEA), which also includes White women in the designated group, and for the year when BEE Codes of Good Conduct became official (i.e., 2007). We do not find any statistically significant changes for Black women that could be attributed to these policy episodes. In

addition, we run a placebo test for employment in top positions using the informal sector and find no statistically significant post-policy changes for this type of jobs.

We also extend our analysis and explore possible spillovers of BEE. Although BEE does not stipulate educational targets for Black people, it may have spillovers in increasing incentives for Blacks to invest more in own education. We find that in the post-BEE period both Whites and Blacks increased their years of education, the change for Blacks is 0.8 years more relative to Whites. We also find that Blacks in top positions have increased their schooling by 0.5 years more than Whites in the post-policy period. There is no gender difference in the changes in years of schooling within Blacks. Yet, the catching up process is very slow because the racial gap in schooling has been reduced from 4 years to 3 years in 21 years. This result suggest that educational inequalities between Blacks and Whites are persistent and BEE policy spillovers, if any, are very limited.

BEE policy stipulates equal opportunity employment but does not include any regulations about equal pay. In many countries around the world there is a large gender pay gap also within top occupational categories that is persistent over time (Blau and Kahn, 2017). Hence, we estimate post-policy change in earnings for Whites (women and men) and Blacks (women and men) employed in the top positions. We find that in the post-BEE period the earnings for White men increased by 30 per cent, while earnings of Black women, Black men and White women remained largely unchanged.

Our main analysis based on the employment in top managerial positions excludes the self-employed. Yet, given the preferential treatment of Black women and men by BEE and White women by EEA 1998, it is possible that some groups are more likely to be self-employed than others in the post-policy period. Hence, we estimate the probability of self-employment versus wage employment in the post-BEE period for all the groups. The results show that White men are more likely to be self-employed in the post-policy period while Black women, Black men and White women are more likely to be wage employed in the post-policy period.

In result, this article contributes to the affirmative action literature by exploiting the

unique policy design of South African BEE policy, which stipulates targets for senior management positions not only for Blacks in general but specifically also for Black women. By focusing on Black women we also contribute to the literature on intersectionality, where multiple forms of discrimination overlap for certain groups (i.e., gender, race, class).

Overall, our article shows that BEE contributed in modestly increasing the overall chances for Black women employment in top positions. However, the change for Blacks as a group is not yet large enough to ensure proportionate share of Blacks in top positions. Given this constraint, among the Black population group, the targets have been almost met as following the policy Black women comprise close to 40 per cent of all Blacks in top positions by 2015.

Hence, we conclude that the additional target for Black women has been somewhat effective in promoting their employment opportunities among Blacks, likely related to their initial double disadvantage, the desire of employers to show goodwill, and eroding stereotypes against female senior employment. Thus, targets over a period of time can be an effective tool to ensure equal opportunities and representation in the top management positions. Our findings are substantial given the persistence of educational inequalities in the post-apartheid South African society. Similar policies may contribute to a larger positive change in societies where educational inequalities are smaller.

The rest of this article is organized as follows. Section 2 describes the context and background of the policy in South Africa. Section 3 lays out the conceptual framework applied to the South African case. Section 4 presents data and descriptive statistics, while Section 5 describes the estimation strategy, and Section 6 reports the empirical findings. Section 8 concludes.

2 Background

Under the apartheid in South Africa (SA) women and men were discriminated primarily along the racial lines by the minority White population group of European descent. The

majority group, Black Africans, and other non-white minority groups (Indian/Asians and Coloured) were pushed to segregated territories. Many Black Africans were relocated to so-called *homelands*, where the administration was staffed predominantly by Black Africans.¹ Based on the apartheid law, all Black people had strictly restricted access to employment, education and housing and productive capital was in the hands of White men (Tangri and Southall, 2008). The formal restrictions existed until the 1980s, and were progressively lifted. In 1994 South Africa held its first democratic elections and Nelson Mandela came into power as the first Black head of state. Institutionalised racism was formally abolished. Yet, the majority of Blacks still face barriers in access to education, employment and asset ownership as the legacy of apartheid is not fully dismantled.

Discrimination and occupational segregation against White women in South Africa was not based on similar codified restrictions as was in the case of Black people. But, in practice, White women were excluded from most types of formal employment based on the patriarchal ideas of women's place in the society shared in the White community (Msimang, 2000). Consequently, White women were encouraged to learn nursing and teaching, and if employed, then mostly in the secretarial and clerical jobs. Thus, the apartheid curbed access to formal employment for all women and Blacks in South Africa; however Black women carried the double burden of discrimination based on their race and gender, and had few opportunities for top positions.

Broad-Based Black Economic Empowerment Act: On January 6, 2004 the Broad-Based Black Economic Empowerment Act 53 of 2003 (BEE) came into effect with an overarching goal to economically empower previously discriminated Black people in South Africa. The Act targets the non-white population groups in SA, which formally are the African Blacks, Coloureds and Indian/Asians, altogether defined as *Blacks* in the Act and accordingly also in this article.

BEE Act has three aims: (a) increase number of Black people who own, control and manage productive assets, (b) reach equity in employment and skill development, (c) achieve

equal representation of Black individuals in all occupations. The designated groups of this policy are Black people, Black women, Black workers, Black youth, Black people with disabilities and Black people living in rural areas (Balshaw and Goldberg, 2008; Gazette, 2003).

According to the BEE Act, designated employers are enterprises with annual turnover larger than R35 million (approx. USD 2,5 million), while firms with annual turnover from R5 million (approx. USD 350,000) to R35 million also need to comply but have less strict provisions (Qualifying Small Enterprises). Small firms and micro-enterprises with annual turnover less than R5 million (small firms) are exempted from the BEE compliance and are considered as average level (level four) contributor to the Act. The compliance is based on a score system. It is not mandatory for enterprises to comply as there are no sanctions. But designated enterprises with lower than average compliance score are denied government services, such as licensing, procurement, and etc. In contrast, designated enterprises with above average compliance score receive preferential treatment from the government (Balshaw and Goldberg, 2008). BEE Act has seven contribution elements, including Management Control, which has a set target of 50-60 per cent of Black representation.²

Additionally, the BEE Act has a gender component as it intends to promote Black women in owning and managing enterprises, having access to employment, infrastructure and skill development. Accordingly, designated employers are expected to achieve proportionate representation of Black women not only in all occupational categories but specifically also within *Management Control* (includes senior managerial positions) and *Ownership* elements (Balshaw and Goldberg, 2008). The focus on Management Control is the motivation for our analysis, which includes senior management and executive jobs.

The Codes of Good Practice set for the measurement of compliance of BEE became effective on February 7, 2007, however the drafts had been made available in previous years (Gazette, 2007).³ According to the policy, the compliance target for Black women in board participation is set to 50 per cent and in the top management it is set to 40 per cent as a share of all Black senior managers (Gazette, 2007). Since 2007, the calculation of the compliance

score includes Adjusted Recognition for Gender for the top management positions, giving twice more weight to Black women relative to Black men hires. Noteworthy is that there are no additional points for hiring White women in the top positions: however, their hiring could be motivated by an earlier Employment Equity Act of 1998 described below, which has an unofficial target of 50 per cent of female representation in all occupations (Burger et al., 2016).⁴

In terms of BEE compliance, all employers in South Africa are compelled to comply with the BEE to remain competitive in the market due to the well-crafted legislative codes. To give a sense on the level of compliance, the BEE commission report states that out of 4,034 companies, 60 per cent achieved a rating at the desired level 4 or higher (B-BEE (2007), p.6). In terms of progress in employing Black women and men in boards, the report shows that in the Johannesburg Stock Exchange (JSE)-listed company directorships, participation of Black women increased by 242 per cent over 2006-2016 period. In contrast, the participation of Black men in the directorship of JSE-listed companies increased only by 81 percent for the 2006-2016 period (B-BEE (2007), p.9).

Employment Equity Act 55 of 1998 (EEA) predates BEE 2003 in its efforts to tackle the legacy of apartheid discrimination in the labor market. It came into operation in 1999 with an aim to establish equity among all races in the workplace. Legally, the EEA Act (a) prohibits and eliminates unfair discrimination that can adversely affect the designated groups, and (b) designated employers should ensure equal (proportionate) representation of designated groups in all occupational categories and levels of employment (Balshaw and Goldberg, 2008).

While the designated group in the EEA Act includes African Blacks, Coloured and Indian/Asians (defined as *Blacks* in the Act), it also includes White women (see Table A2 in the Appendix). In the EEA Act designated employers are defined as those firms that have more than 50 employees or have an annual financial turnover higher than the specified amount for each productive sector (Balshaw and Goldberg, 2008). In contrast to BEE Act,

a non-compliant enterprise can face, on average, R1 million fine (approx. USD 70,000), according to the EEA legislation. Compared to BEE, besides including White women in the designated group, EEA does not address issues related to the ownership structure or management control. Nonetheless, we use this policy episode in the robustness section of our analysis to test for its idiosyncratic effect on the changes in the probability of employment in top positions for the beneficiary groups. Note that both policies EEA and BEE are in effect at the time of writing this article.

3 Conceptual framework

There are only a handful of formal models on the effectiveness of affirmative action policies in the labor market (Coate and Loury, 1993b; Moro and Norman, 2003; Fang and Moro, 2011). In this section we conceptually motivate our empirical study by discussing theoretical implications for South Africa based on these models.

According to Coate and Loury (1993b), an affirmative action, on the one hand, can help reduce discrimination and, on the other hand, can lead to persistence of negative stereotypes depending on the relative size of the discriminated group and type of the equilibrium. For example, the authors show that in the negative equilibrium, the stereotypes towards the disadvantaged group can become a self-fulfilling prophecy as it can lead to an ex-ante equally endowed but discriminated workers to invest less in own human capital and, thus, conform with employer beliefs, ex-post. In such a scenario, the discrimination persists for a long time. On the other hand, in the positive equilibrium, an affirmative action policy can reduce negative stereotypes permanently, if employers are willing to hire the disadvantaged group, and the state subsidizes the respective group in their human capital investment, which helps them to pass the employer standards (equal for all groups) in the high-skilled jobs. It can take less time to reach the positive equilibrium, if the relative size of the discriminated group is smaller than the size of the privileged group.

Coate and Loury (1993b) also show that affirmative action may lead to short term positive effects without reducing negative stereotypes in the so-called *patronizing* equilibrium. In this case, the size of the disadvantaged group should also be relatively small such that employers are willing to lower their standards and hire the members of the disadvantaged group proportionately at the same rate as the privileged ones for the sake of policy compliance. In such a scenario, the share of the privileged group is not reduced in the top positions and yet the proportionate representation of the disadvantaged group is achieved. However, once the policy is removed the discriminatory situation may revive. In addition, the patronizing equilibrium can also lead to low incentives to invest in own human capital, if the beneficiary group anticipates lowering of hiring standards for their benefit (Coate and Loury, 1993a). Yet, in the case of South Africa and in terms of gender-based policies, a patronizing equilibrium is less likely as the beneficiaries in this case are not a minority group, hence lowering the hiring standards for a relatively large group would be sub-rational for the employers.

Fang and Moro (2011) suggest that extreme segregation is not sustainable in South Africa in the long run. But the larger the disadvantaged group the bigger the incentive of the small group to keep the large discriminated group in the low-paid jobs. In this case, the marginal product of the complex jobs done by the few privileged becomes much higher. This implies that one should expect an occupational segregation in South Africa, where White people are predominantly in the high-paid jobs and Blacks in the low-paid jobs. Affirmative action policies, such as BEE, aim to hinder such a segregated equilibrium. But whether the policy effects apply uniformly to Black men and women is an open question.

In terms of employment in top positions, we hypothesize that Black women might benefit from the policy more than Black men for three reasons. First, employers might signal their intent to comply by trying to meet the target of 40 per cent women among Blacks, even if they miss the (arguably more difficult) target of 50 per cent for all Blacks. Second, the additional target for Black women, who previously were the most discriminated group, might enable them to benefit more, particularly if previous stereotypes against female senior employment

are also eroding over time. Lastly, Black men predominated in the administration of the former apartheid-era self-governed *homelands*, which were re-integrated into South Africa after 1994. As possibly more Black men but few Black women lost these jobs after 1994, Black women may have relatively more opportunities in the new South African labor market for executive positions given the gender- and race-based preferential appointments stipulated by BEE.

4 Data and Descriptive Statistics

We use the South African Post-Apartheid labor Market Series (PALMS) database (Kerr et al., 2016), which is an integrated and harmonized dataset of October Household Surveys from 1994 to 1999, bi-annual labor Force Surveys from 2000 to 2007 (LFS) and Quarterly labor Force Surveys from 2008 to 2015 (QLFS). This database provides individual-level, repeated cross-sectional data for 21 years from 1994 to 2015 that includes information on labor market characteristics, such as occupational and industry employment, formal and informal employment, size of the employer, and individual level demographics.⁵

In this article we define top positions as employment in the highest occupational category in the labor force surveys, which is classified as *Legislators, Senior Managers and Executives* (Stats, 2005) in accordance with the International Labor Organization categorization. Figure A1 in the Appendix shows that these top positions in our sample correspond to the middle to top managerial and executive jobs. The data on earnings confirm that in our sample senior managers have the highest earnings on average across all occupational categories (see Figure A2 in the Appendix).⁶ The next occupational category in the hierarchy classified as *Professionals* has the second highest average earnings. The lowest earnings are observed for elementary occupations and domestic workers, about 90 percent of the latter are Black women (see Table A3 in the Appendix). When it comes to employment in various sectors, we observe that before the BEE in 2003 Black women were represented in the top positions

in all industries, except the *mining and quarrying* (see Table A4 in the Appendix).

Among *Blacks* as defined in BEE and here, African Blacks are the largest population group in South Africa, comprising around 70 per cent of the whole population, while Indian/Asians have the smallest population shares, around 4 per cent. Coloured people are around 13 percent and White people around 12 percent of the population (see Figure A3 in the Appendix). Thus, Blacks, as the designated group, are the 88 per cent of the sample, which also matches the shares in the whole population in South Africa. The rest of our descriptive analysis refer to Blacks and Whites and gender as these are the basis of our analysis.

Table 1 presents summary statistics on the most relevant labor force characteristics in the sample for the whole sample period of 21 years. In this study we define the labor force as all individuals in the 15-65 age group, who are either working or looking for a job. On average, 21 per cent of the White men are employed in top positions. While only 3 per cent of all Black men and 2 per cent of all Black women hold top positions, albeit the number of Black men in the labor force is almost 8 times higher than that of White men. The large gap in the employment in top positions can be partly explained by the large gap in the years of schooling between Blacks and Whites. While the gender gap in schooling within Blacks or Whites is negligible, the racial gap is much larger, about three and half years. There are no differences in average age between Blacks and Whites or men and women. There is also large difference in marriage patterns. The majority of White people have (ever) been married, around 80 percent, while only slightly more than half of the Blacks in the sample have ever been married (including cohabitation). There are also far less Black women in the labor force than Black men, although Black women have slightly more years of education than Black men.

Given that we have 21 years of observation, it is important too see how some of these characteristics change over time. On the upper graph of Figure 1 we depict total labor force participation rates. Here we observe that Black women have the lowest rate of labor force

Table 1: Labor Force Characteristics. Sample Means.

	White men	White women	Black men	Black women
Employed in top position	0.21	0.10	0.03	0.02
Age	39.18	38.50	37.37	37.77
Years of education	12.31	12.46	8.59	9.25
Ever married/cohabit	0.80	0.81	0.64	0.56
Observations	29984	25524	211000	163159

Note. The sample includes individuals who are either employed or actively looking for a job, e.g., labor force.

participation: less than 40 percent before 1998 and less than 50 percent afterwards. White men have the highest rate of participation, constant around 75 percent and the participation rate of Black men and White women is at a comparable level between 50-60 percent, on average, during the whole period. The lower graph of Figure 1 shows that Black women have the highest unemployment rate (defined as the share of the labor force of 15-65 age group who are unemployed but looking for a job), while White men and women have the lowest rate.

In the upper graph of Figure 2 we plot the trends in years of schooling for the four groups. Here we observe that Blacks on average have four years less schooling in the pre-policy and three years less in the post-policy period compared to the Whites. Meanwhile, the gender gap in education has been closing over time within Blacks and Whites. The lower graph of Figure 2 depicts the trends in top positions by gender and race. While White men represent only around 6-7 percent of the whole South African population and in our sample, their share in top positions has been the highest until 2007, except the period from 1996 to 1999, around 30 per cent on average. The rise and fall of black male employment in senior positions is likely related to the incorporation of former *homeland* administrations into the new provinces.⁷ After 2007 the share of Black men passed the share of White men lasting till the end of the study period, suggesting that some White men are being 'replaced' by Black men. In terms of women, we also observe that the share of Black women became larger than the share of White women after 2004 and it increased further to about 18 per cent by the end

Figure 1: Upper: labor force participation, 15-65 yrs. Lower: Unemployment rate.

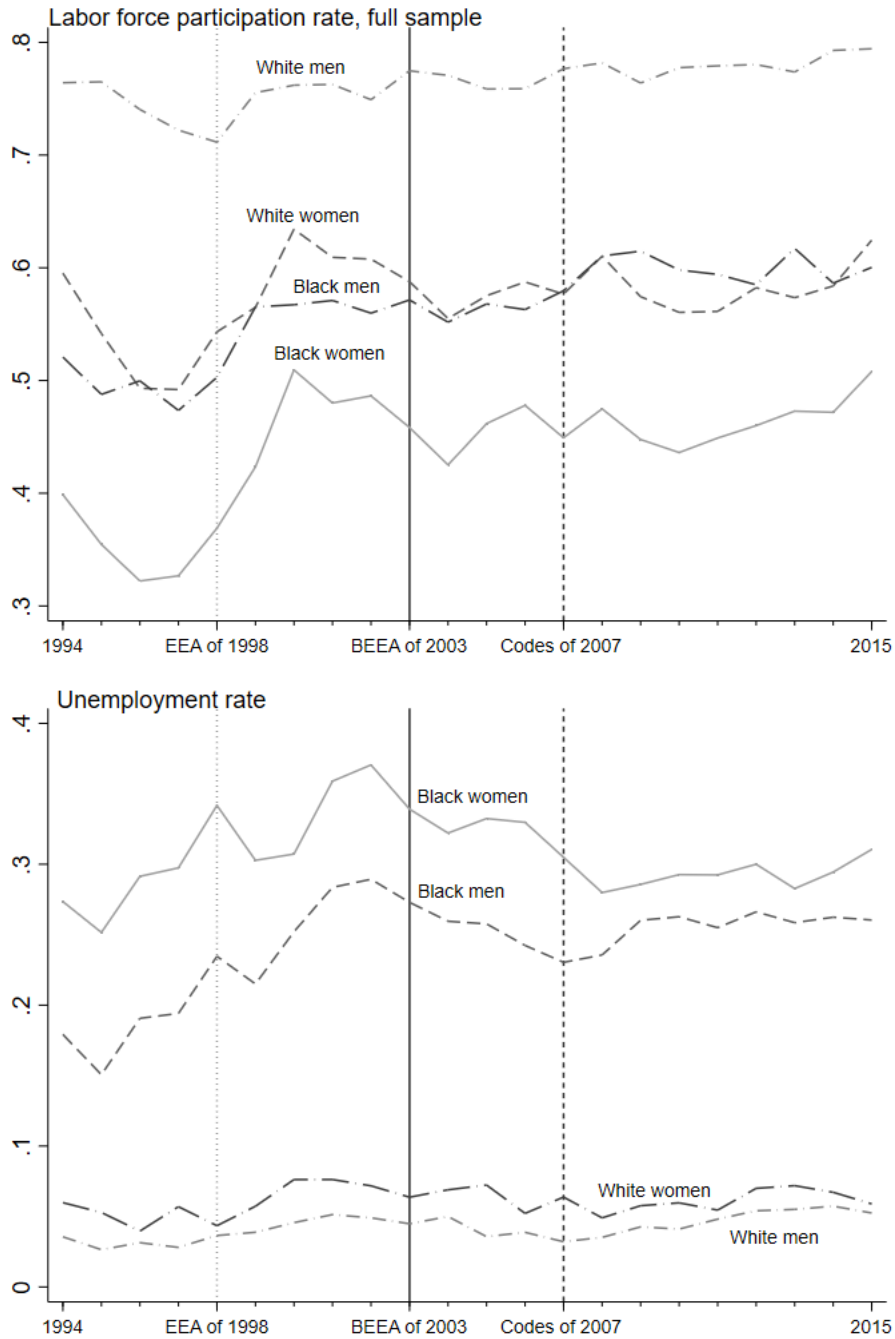


Figure 2: Upper: Trends in average years of schooling. Lower: Employment in top positions.

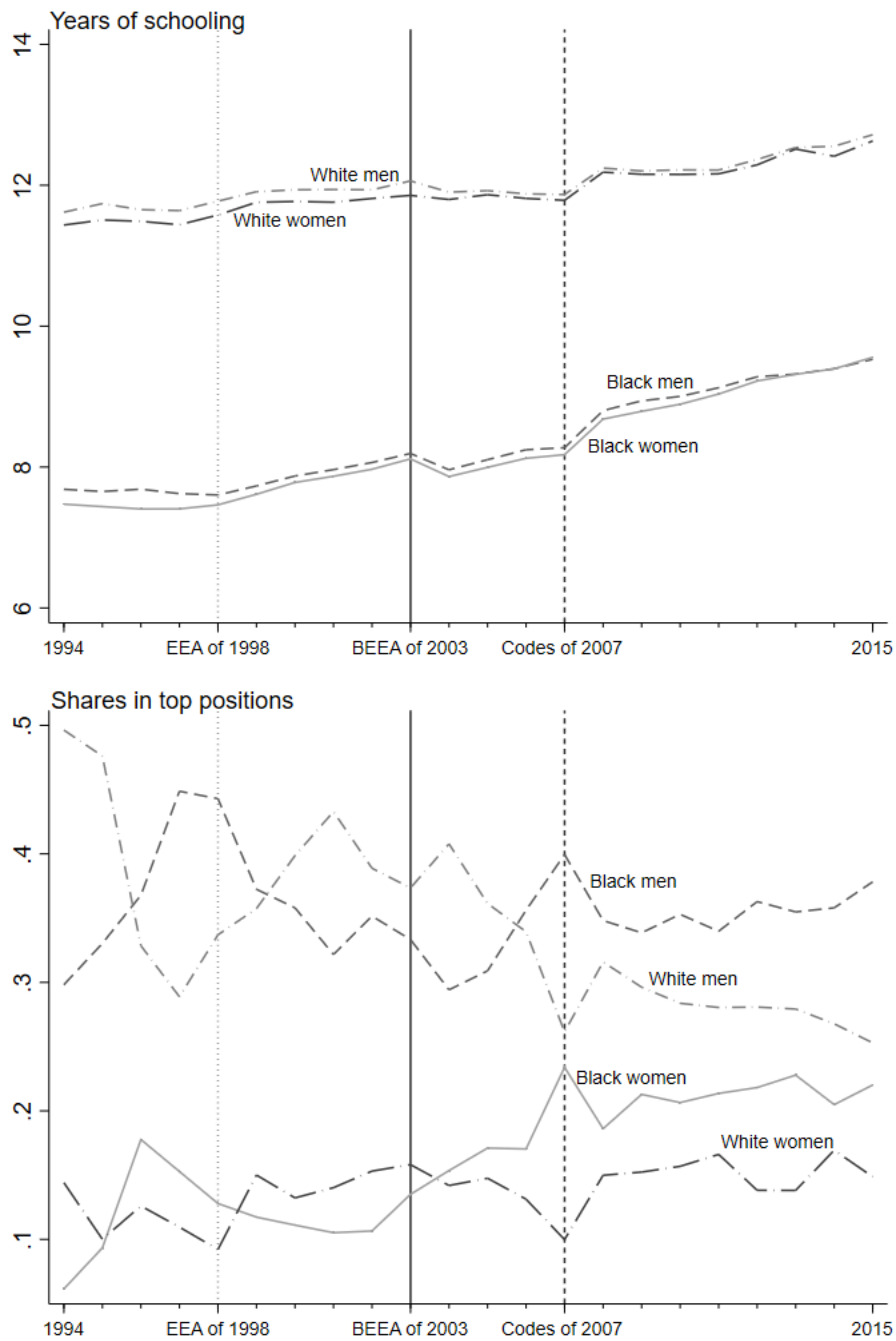
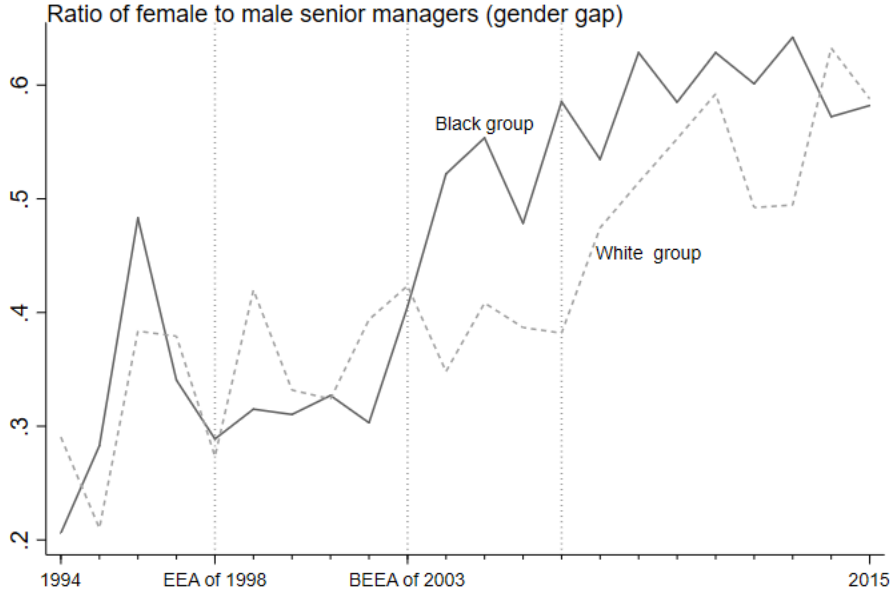


Figure 3: Trends in the gender gap (female/male) in top positions by population group.



of 2015, while the share of White women decreased after 2004, to an average of 13 percent. Based on these trends we also observe that White women are replaced by Black women as the third-largest group; in fact, by the end of 2015 they make up about 37 per cent of Black senior positions, thus close to reaching the target of 40 percent. But even in 2015, White people still make up more than 40 per cent of top positions, despite being only 13 per cent of the population; thus the aim of equal representation in top positions to reflect the racial make-up of South Africa is not yet reached, but the interim target of 50-60 per cent for all Blacks has been effective.

In Figure 3, we present the trends in gender gaps for the Black and White groups separately. As the figure shows, the gender gaps between two groups show similar trends before the Employment Equity Act in 1998, which also targets White women. Afterwards, the gender gap in the White population group started to decrease, and after the BEE in 2003, it reversed and the gender gap in the Black population group decreased more relative to the White group.

Information on the firm annual turnover is not included in the labor force surveys. There-

Figure 4: Trends in the share of employment in top positions by large and small employers, gender and population group.

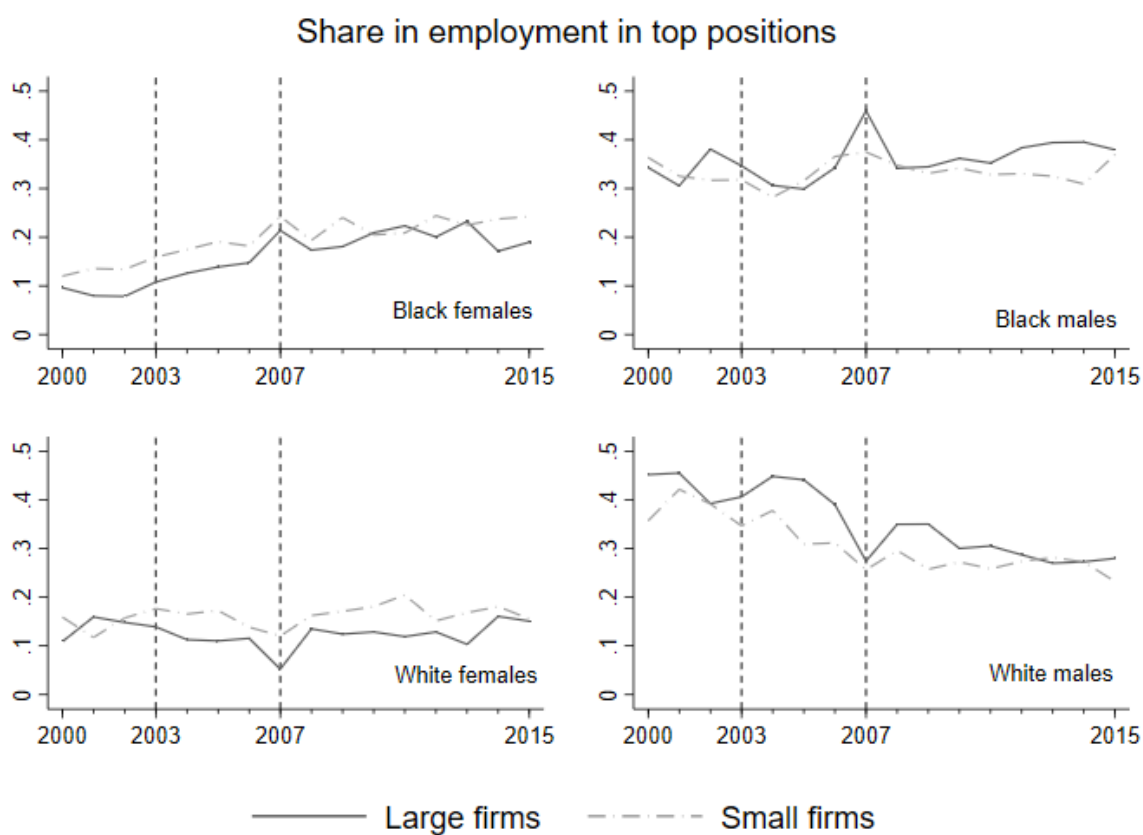
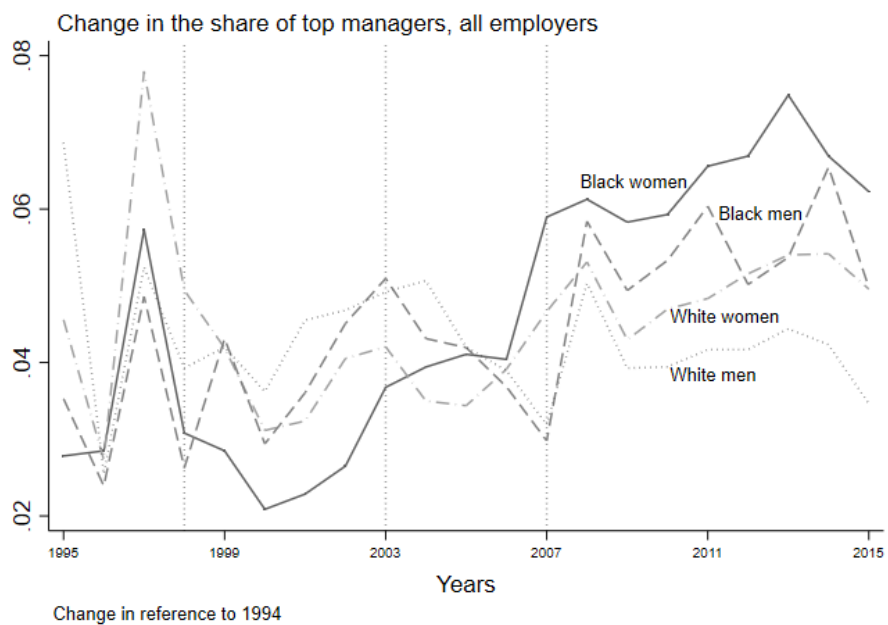


Figure 5: Yearly change in employment in the top positions. Upper: All employers. Lower: Large employers.



fore, we base our definition of large firms on the number of fellow employees estimated by the survey respondents. There is one category for more than 50 employees and three categories for less than 50 employees. To define large employers we use the cut-off point as more than 50 employees. This cutoff point is also used in the EEA legislation. Hence, it serves as a good proxy for defining designated firms for the purpose of this study. Additionally, this definition excludes the possibility that firms would intentionally reduce the number of their workers in order to be exempted from the BEE.⁸ One drawback is that the question on the size of the employers is available starting only from 2000.

We depict the trends by employer size on Figure 4. The data shows that the share of Black women employed in top positions had been higher in the pre-policy period in the small firms. After 2003 and 2007, the share of Black women in the large firms increased more relative to that of in the smaller firms (it decreased again after 2013). Black men also experienced increase in their share in employment for top positions in large firms relative to small firms. While White women exhibit higher shares of employment in top positions in small firms relative to the large ones both before and after 2003. The case of White men is interesting as they have larger share of employment in top positions in both types of firms, but between 2003 and 2007 it was much higher in larger firms, which started to decrease by 2015 and become comparable to their share in the small firms.

While in Figure 4 we depicted the shares in the absolute levels of employment in top positions, we are particularly interested in the rate of change over time. In Figure 5 we depict yearly change in the top positions for each of the group relative to the initial year. On the upper panel we observe the largest positive change for Black women after the Black Economic Empowerment Act. On the lower panel we observe a similar positive changes for Black women also in the large firms after 2007, when the Code of Good Practice for BEE Act of 2003 became effective. This tentatively suggests that Black women could have experienced the largest positive change in the probability of employment in top positions in the post-BEE period.

5 Estimation strategy

We use a linear probability model to estimate the likelihood of employment in top positions for Black women in the post-BEE period. First, we compare the post-policy outcomes for Black women with those of Black men as well as White women and men. Second, we compare the outcomes for Black women working for large (designated) employers relative to those working for small (non-designated) employers.

The identification of causal effects of BEE Act of 2003 is complicated by several factors. First, due to the persistent effects of apartheid policies, Blacks and Whites in South Africa, on average, are very different in other observable characteristics that determine the probability of employment in top positions. Such as years of education, residence, experience, industry of employment. This implies that each group is most likely on its own trend, which makes it less plausible that pre-policy trends are parallel, making the simple comparison of the four groups less informative. Therefore, we estimate the linear probability model with group interaction terms and post-policy time indicator variable and, in addition, include individual-level control variables with full set of fixed effects for residence, province and industry as well as the group-specific time trends. This allows us to compare individuals who are very similar in observable characteristics. Some of the deeper concerns such as changes in differences in the non-observable characteristics over time are partly captured by the group-specific time trends while individual-level, non-observable and time-varying factors are assumed to be random within the population groups.

In result, we estimate the following equation:

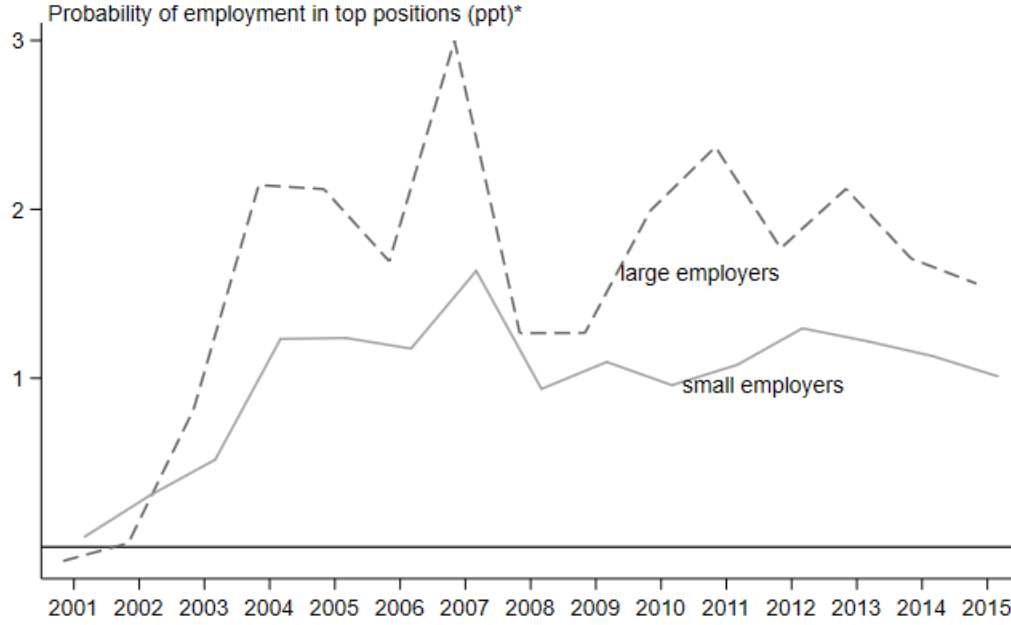
$$\begin{aligned}
 Top_{ijt} = & \alpha + \nu Black_j + \gamma Female_i + \theta Post_t + \eta Black_j Female_i + \mu Post_t Female_i + \\
 & + \tau Post_t Black_j + \beta Post_t Black_j Female_i + X'_i \Omega + \phi_R + \psi_P + \delta_S + \\
 & \sigma T_t + \chi T_P + \rho T_S + \pi T_{ij} + \epsilon_{ijt}.
 \end{aligned} \tag{1}$$

Where the unit of observation is the individual, observed once in the 21-year long repeated

cross-sectional data. β is the coefficient of interest, which estimates the average change in the probability of employment for Black women relative to Black men in the post-BEE period. The outcome variable, Top is the probability of employment in top positions, which equals 1 for employment in top positions and 0 otherwise. $Black$ is a binary variable equal 1 for the Black population group, and 0 for the Whites. It captures group-specific time-invariant differences between Black and White people. The binary variable $Female$ equals 1 for women and 0 for men and captures gender-specific, time-invariant differences between men and women. $Post$ is a binary variable equal to 0 for the years from 1994 to 2003 and 1 afterwards. A vector of relevant individual-level control variables such as years of schooling, marital status, age and squared term of age (as a proxy for experience) is denoted by X' . In the full specified model in (1) we include urban/rural- (ϕ_R), province- (ψ_P) and industry dummies (δ_S), which control for the residence, province and industry-specific unobserved factors that do not change over time. Next, we include general time trend (σT_t), which controls for national-level time trends in the outcome variable that is common for all groups but could be affected by unobserved factors, such as economic growth. In addition, we include province-, industry- and group-specific linear time trends to control for differential trends in the outcome variable for each province (χT_P), industry (ρT_S) and group (πT_{ij}).⁹ ϵ is the heteroscedasticity robust error term.¹⁰ As a result, we are able to estimate the post-policy average change for Black women (and for the other groups), which can be interpreted as the deviation from the average time-invariant effects and macro-, meso- and group-level linear time trends.

The second comparison point of our analysis is the estimation for the probability of employment in top position for Black women working for large employers versus small employers. As discussed above, we classify large employers as those with more than 50 employees, which is a relevant threshold for large employers in South Africa given that this is used in the EEA legislation. Additionally, this way of classification eliminates the concern related to direct impact of BEE on the changes of employer (firm) size. The strength of this estimation is that

Figure 6: Trends: Black women



Black women are not just compared to Black men but to other Black women employed at non-designated, small, enterprises. Yet, a possible concern here is that small employers may differ from large employers in other dimensions that can effect the demographic composition of top positions in those firms. Hence, in Figure 6 we depict trends in the probability of employment in top position for Black women by employer size. Here we observe that before BEE became effective in 2003, the chances for Black women to be employed in top positions were much lower in larger firms. After 2003, there is a reversal, where Black women are more likely to be employed in top positions in the case of large employers. This result continuous to persist. A slight difference in trends is observed after 2007 when BEE Codes of Good Conduct became officially effective but on average the trends appear to be parallel. This observation allows us to assume that it is close to random which individuals are employed in small firms and which individuals in large firms.¹¹

In result, we estimate the following equation for Black and White groups separately,

including all the control variables, fixed effects and time trends as in the equation 1:

$$\begin{aligned}
Top_{it} = & \alpha + \eta Female_i + \mu LargeEmpl_i + \xi Post_t + \lambda Female_i LargeEmpl_i + \kappa Post_t Female_i + \\
& + \iota Post_t LargeEmpl_i + \zeta Post_t Female_i LargeEmpl_i + X'_i \Omega + \phi_R + \psi_P + \\
& + \delta_S + \sigma T_t + \chi T_P + \rho T_S + \Upsilon T_i + \epsilon_{it}.
\end{aligned}
\tag{2}$$

where $LargeEmpl_i$ denotes a binary variable equal to 1 if the respondents employer has more than 50 employees and 0 otherwise. We are interested in the ζ parameter, which compares average probability of employment in top position for Black women in large relative to small firms before and after the policy. The rest of the variables are defined as in equation (1). We extend the analysis and estimate the heterogeneous effects of the BEE Act for the sample of highly educated individuals as they are most likely to be employed in top positions, and expect more precise and larger estimated coefficients in this case.

Furthermore, the descriptive analysis showed that the trends in gender gaps for each population group changed after the EEA Act of 1998 and the official introduction of Codes in 2007. Hence, we perform tests for robustness of our findings to investigate if our results are driven by these policy phases. Additionally, we perform a so-called *placebo* test using similar type of employment (top position) in the informal sector, where we do not expect to see any positive changes for Black women. Last but not least, we estimate possible policy spillovers for each group in terms of general schooling, skill level and earnings for top positions, and self-employment.

6 Results

Table 2 presents estimation results for Black women, Black men as well as White women and White men. The outcome is a binary variable for employment in the top positions. The coefficient on POST indicates change in the probability of employment in top positions for

White men after the BEE 2003. The coefficient on $\text{POST} \times \text{Black}$ indicates the change for Black men versus White men in the post-BEE period. The coefficient on $\text{POST} \times \text{Female}$ indicates the change for White women relative to White men in the post-BEE period. The coefficients on group variables (Black , Female , $\text{Black} \times \text{Female}$) indicate the probability of employment in top positions before the policy. The coefficient on *Constant* indicates the probability of employment in top positions for White men before BEE 2003.

The coefficient of our interest is the triple interaction term, $\text{POST} \times \text{Black} \times \text{Female}$, which indicates the change in the probability of employment in top positions for Black women relative to Black men in the post-policy period. The overall change for Black women in the post-policy period is the sum of the coefficients on POST , $\text{POST} \times \text{Black}$, $\text{POST} \times \text{Female}$ and $\text{POST} \times \text{Black} \times \text{Female}$.

Column 1 of Table 2 presents the simple group comparisons without any control variables. The results show that on average Black men in South Africa are less likely to be employed in top positions relative to White men (see coefficient on Black). The chances for average Black men become lower after 2003 ($\text{POST} \times \text{Black}$). Black women are less disadvantaged relative to Black men indicated by the positive sign of the coefficient on $\text{Black} \times \text{Female}$ and $\text{POST} \times \text{Black} \times \text{Female}$. The lower unconditional probabilities for Blacks relative to Whites are not surprising given that Blacks are more than 88 percent of the population sample but their share in the top positions is half of that. White men have disproportionately high representation in the top positions in South Africa, which can be partly explained by the persistence of inequalities in the observable characteristics, some of which are strongly associated with race and gender (i.e., education, marital status). We control for these variables in the following estimations.

In column 2 we account for individual-level observable differences and include control variables for years of schooling, age and age squared (as proxy for experience) and marital status. In addition, we include province- and industry-fixed effects and respective time trends. This leads to more precise estimation of the coefficients, whereas the sign remains

Table 2: BEE 2003 and employment at the top.

	(1)	(2)	(3)	(4)
POST	0.061*** (0.005)	0.051*** (0.005)	0.023*** (0.009)	-0.018 (0.011)
POST \times Black	-0.056*** (0.005)	-0.056*** (0.005)	-0.026*** (0.009)	-0.014 (0.009)
POST \times Female	-0.007 (0.006)	-0.012* (0.006)	-0.024** (0.011)	-0.024** (0.011)
POST \times Black \times Female	0.012* (0.006)	0.017*** (0.006)	0.033*** (0.011)	0.032*** (0.011)
Black	-0.153*** (0.003)	-0.119*** (0.003)	-0.113*** (0.003)	-0.118*** (0.003)
Female	-0.106*** (0.004)	-0.103*** (0.004)	-0.106*** (0.004)	-0.106*** (0.004)
Black \times Female	0.091*** (0.004)	0.085*** (0.004)	0.089*** (0.004)	0.091*** (0.004)
Constant	0.180*** (0.003)	0.020*** (0.004)	0.013*** (0.005)	0.027*** (0.006)
Mean Dep. Var.	0.042	0.042	0.042	0.042
R2-squared	0.061	0.087	0.087	0.088
Observations	433675	428856	428856	428856
Years	21	21	21	21
Controls	-	✓	✓	✓
Time trend	-	✓	✓	✓
UrbanRuralFE	-	✓	✓	✓
Province FE	-	✓	✓	✓
Industry FE	-	✓	✓	✓
Industry \times time trend	-	✓	✓	✓
Province \times time trend	-	✓	✓	✓
Group \times time trend	-	-	✓	✓
POST \times controls	-	-	-	✓

Note. The dependent variable is employment in *Top* positions (binary). Individual level controls include years of schooling, marital status, age and age squared. *POST* denotes period after Black Economic Empowerment Act of 2003, which equals 1 after 2003 and 0 otherwise. *Controls* denote individual level control variables such as number of years of schooling, age, age squared and dummy for ever married. Column 3 provides the results from equation 1, which also includes time trend, residence type, province and industry fixed effects as well as linear time trends for provinces, industries and four groups. Column 4 also includes interaction of *POST* variable with individual level controls. Standard errors calculated based on robust variance estimates. *Denotes statistical significance at 10 percent; **at 5 percent; ***at 1 percent levels.

the same. In column 3, we estimate equation 1 by additionally including group-specific time trends. In this case the coefficient of our interest also captures deviations from the group trends. The estimated coefficient on $\text{POST} \times \text{Female} \times \text{Black}$ doubles in size. This result suggests that in the post-policy period Black women relative to Black men have 3 percentage points higher likelihood of employment in a top positions, statistically significant at the one per cent level. Given the mean dependent variable of 4.2 per cent, the magnitude of change is quite large. Relative to White women, the chances for Black women are higher by one percentage point in the post-policy period. However, relative to White men, Black women have 2 percentage points lower likelihood of employment in top positions after 2003, possibly due to persistent post-apartheid legacies.

Our empirical model with time-invariant control variables, fixed effects and time trends does not fully capture the persistent advantage of White men. It is likely that over time White men respond to BEE policy by investing more in own human capital, while the opportunities for Blacks remain limited due to the lack of complimentary educational policies. Given the high inequality and unemployment trends in South Africa (Van der Walt, 2015) this is plausible explanation, which we can test as follows. In column 4 we include an interaction term between POST variable and individual-level controls. This captures changes in the return to education, experience and marital status over time. For example, we observe that over time White men also increase their education levels. This can lead to changes in the return to education premium or changes in the hiring standards. The regression results in column 4 confirm this conjecture as the coefficients on POST and $\text{POST} \times \text{Black}$ become smaller and statistically not significant at the conventional levels. This implies that Black women relative to White men are 0.6 percentage points more likely to be employed in a top positions once we account for over time changes in the returns to individual-level observable factors, i.e., years of education. Moreover, although previous regressions showed that Black men suffered in the post-policy period, controlling for the over time returns to education shows no statistically significant change for them in the post-policy period. Similarly, there

is no statistically significant difference in the likelihood of employment in top positions between Black men and White men in the post-BEE period. The difference in the statistical significance of estimates for $POST$ and $POST \times Black$ in column 3 and 4 suggests that BEE policy alone is not sufficient to proportionately increase labor market opportunities for Blacks because educational opportunities between Blacks and Whites remain unequal over time.¹² The negative change for White women could plausibly be attributed to the BEE policy as expected. Our main result that Black women have three percentage points higher likelihood to be employed in top positions after 2003, relative to Black men, remains.

In Table 3 we present estimation results for Black and White population groups based on equation 2. Note that these estimates are for 15 years only instead of 21 as the relevant survey questions had been included after 2000. This means we have three years of data before BEE Act became effective. The estimations include all the comprehensive controls as in Table 2, column 3. The group trend is implemented as interaction between time trend, Female and Large Employers. The triple interaction term, $POST \times Female \times Large\ Empl.$ compares the change in the probability of women employment in top position in large firms relative to small firms in the post-BEE period.

The results in column 1 of Table 3 show that the probability of Black women employment in top positions for large employers increased more in large firms relative to the small firm in the post-BEE period, statistically significant at the one per cent level. The estimated change using triple interaction term for the White group in column 2 is negative and statistically significant at the one per cent level, implying that White women had lower probability of being employed in top positions in large firms after the BEE 2003.

Furthermore, highly educated individuals have higher chances to be employed in top positions. Recall that the average years of schooling for Whites in South Africa is around 12 years, while for Blacks it is about 9 years (see Figure 1 in the *Appendix*). Moreover, only 13 per cent of Blacks in the sample have more than 12 years of education. Hence, equal educational opportunities could be one of the barriers for the achievement of larger post-

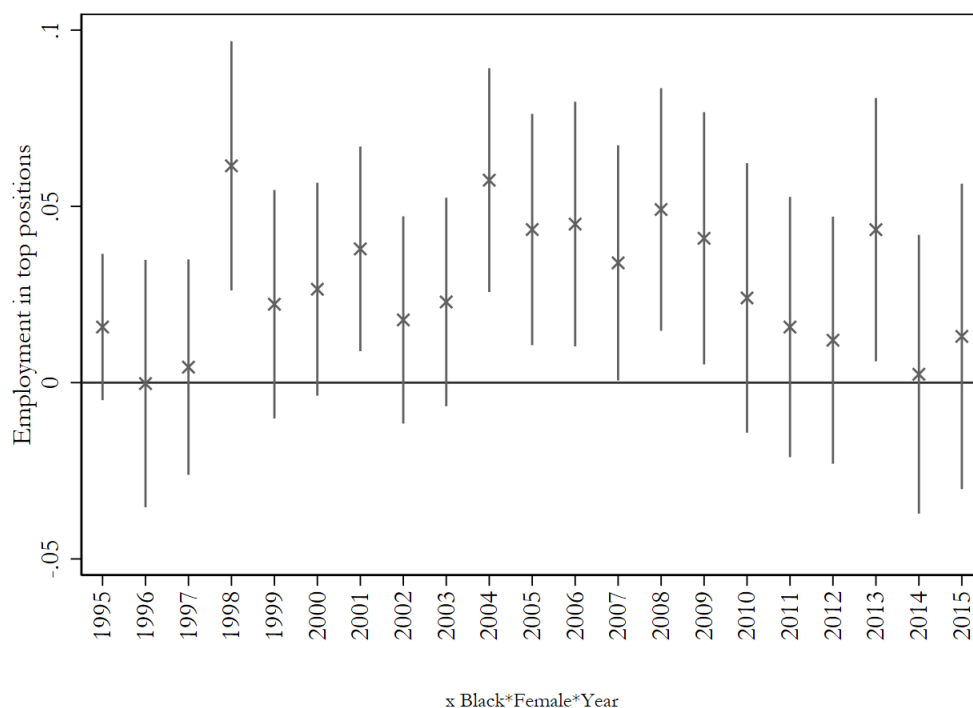
Table 3: Employer size and employee education level

	(1)	(2)	(3)	(4)
	Blacks	Whites	Blacks/ skilled	Whites/skilled
POST	0.007*** (0.001)	0.007 (0.014)	0.043*** (0.010)	0.047* (0.025)
POST \times Female	0.003 (0.002)	-0.001 (0.015)	-0.010 (0.010)	-0.039 (0.027)
POST \times Large firms	-0.008*** (0.003)	0.022 (0.018)	-0.064*** (0.018)	0.014 (0.033)
POST \times Female \times Large firms	0.011*** (0.004)	-0.062*** (0.024)	0.094*** (0.021)	-0.072* (0.043)
Female	-0.012*** (0.001)	-0.140*** (0.011)	-0.035*** (0.007)	-0.175*** (0.019)
Large firms	-0.001 (0.002)	-0.014 (0.013)	0.079*** (0.014)	0.050** (0.023)
Female \times Large firms	-0.002 (0.003)	0.026 (0.017)	-0.069*** (0.016)	0.014 (0.030)
Constant	-0.070*** (0.004)	-0.423*** (0.030)	-0.579*** (0.034)	-0.422*** (0.066)
Mean Dep.Var.	0.025	0.176	0.087	0.219
R2	0.036	0.095	0.075	0.116
Observations	263332	33699	35479	13369
Years	15	15	15	15
Controls	✓	✓	✓	✓
Time trend	✓	✓	✓	✓
UrbanRural FE	✓	✓	✓	✓
Province FE	✓	✓	✓	✓
Industry \times time trend	✓	✓	✓	✓
Province \times time trend	✓	✓	✓	✓
Group \times large firms \times time trend	✓	✓	✓	✓

Note. The dependent variable is employment in *Top* positions (binary). Individual controls include years of schooling, marital status, age and age squared. *POST* denotes period after Black Economic Empowerment Act of 2003, which equals 1 after 2003 and 0 otherwise. *Large Empl.* equals to 1 if the employer has more than 50 employees and 0 otherwise. Column (1) estimates the triple differences for the Blacks only and column (2) only for Whites. Column (3) estimates triple differences for the highly educated Blacks only and column (4) for the highly educated Whites. *Industry FE* is not included as large employers are predominantly from the mining industry. Number of years equals 15 as it is reported in surveys after 2000. Standard errors are calculated based on robust variance estimates. *Denotes statistical significance at 10 percent; **at 5 percent; ***at 1 percent levels.

BEE changes. Therefore, we estimate the policy effects for the sub-sample of above-average educated individuals, which we define as those who have more than 12 years of schooling (benchmarked to the White group). The estimated coefficient on the triple interaction term in column 3 shows that the positive change is larger for highly educated Black women relative to Black men, rounding up to nine percentage points ($\text{POST} \times \text{Female} \times \text{Large Empl.}$). In column 4, we present the estimation results for highly educated Whites and do not find any strong differences between White men and women in the post-BEE period. We therefore conclude that it is plausibly due to the BEE that the chances for employment in the top positions improved the most for Black women in the post-2003 period.

Figure 7: Annual changes in the probability of black women employment in top positions.



7 Robustness and Extension

One may argue that the estimated coefficients on our variables of interest possibly absorb the effects from other non-linear events before and after 2003. We know that BEE 2003

was preceded by EEA 1998. Also, in 2007 Codes of Good Conduct of BEE 2003 became officially effective. The last amendment to the Codes of Good Conduct was in 2013. We check for the possible effects for such events and estimate yearly changes in the probability of employment in top positions using a fully flexible specification where group-level variables are interacted with each year. We report point estimates and confidence intervals (95th per cent) in Figure 1. The statistically significant positive change in 1998 coincides with the timing of the Employment Equity Act of 1998, while the next significant positive change coincides with year 2004 when BEE 2003 became effective. In the following years the positive change persists albeit the size becomes smaller. The latest substantial positive change in 2013 coincides with the last amendments for BEE Codes of Good Practice. Thus, the spikes are as expected, but we also need to test whether our main findings are due to these events or BEE 2003 itself.

Therefore, in column 1 and 2 of Table 4 we report the estimated coefficients on the idiosyncratic changes in the probability of employment in top positions after EEA 1998 and Codes in 2007. The estimations include all the controls, fixed effects and trends as in Table 2, column 3. We restrict the period from 1994 to 2002 before BEE 2003 came into power. In column 1, POST equals 1 from 1999 to 2003 and 0 for years from 1994 to 1998, all other variables are defined as in the previous regressions. Based on the estimates on POST and the interaction terms, we do not find statistically significant associations between EEA 1998 and the probability of employment in top positions for Blacks or Black women. Thus, it is unlikely that our initial estimates on POST (BEE) have been absorbing the effects due to EEA. In column 2, we estimate the changes in the outcome variable after the Codes of Good Conduct of BEE became officially effective in 2007. In column 2 POST equals 1 for the years 2007-2015 and 0 for 2004-2006. Here, we restrict the period from 2004 to 2015 to keep the possible effects of BEE 2003 and EEA 1998 constant. In result, we do not find any evidence that the official introduction of Codes of Good Conduct for BEE led to statistically significant changes in the probability of Black women employment in top position after 2007. Given

Table 4: Other episodes and placebo tests

	(1)	(2)	(3)
	EEA 1998	Codes 2007	Informal employment
POST	-0.025*	-0.011	-0.063
	(0.015)	(0.012)	(0.039)
POST \times Black	0.005	0.013	0.058
	(0.015)	(0.012)	(0.039)
POST \times Female	0.020	0.002	0.022
	(0.019)	(0.015)	(0.049)
POST \times Black \times Female	-0.012	-0.004	-0.019
	(0.019)	(0.015)	(0.049)
Black	-0.097***	-0.153***	-0.110***
	(0.005)	(0.011)	(0.005)
Female	-0.092***	-0.142***	-0.098***
	(0.007)	(0.014)	(0.006)
Black \times Female	0.074***	0.135***	0.083***
	(0.007)	(0.014)	(0.006)
Constant	0.008	0.038***	0.060***
	(0.007)	(0.012)	(0.006)
Mean Dep. Var.	0.038	0.046	0.021
R-squared	0.076	0.097	0.071
Observations	184352	224581	142892
Years	8	11	21
Controls	✓	✓	✓
Time trend	✓	✓	✓
UrbanRural FE	✓	✓	✓
Province FE	✓	✓	✓
Industry FE	✓	✓	✓
Industry \times time trend	✓	✓	✓
Province \times time trend	✓	✓	✓
Group \times time trend	✓	✓	✓

Note. The dependent variable is employment in *Top* positions (binary). *POST* in column 1 denotes period after Employment Equity Act of 1998 and *POST* in column (2) denotes the period after Codes of Good Practice became effective in 2007. In column (3), the sample includes individuals who have reported to work in a top occupational category but either do not have a wage contract or their work is not formally regulated. All comprehensive controls, fixed effects and groups trends are same as in Table 2, column 3. See the text for the explanation for changes in the number of years. Standard errors are calculated based on robust variance estimates. *Denotes statistical significance at 10 percent; **at 5 percent; ***at 1 percent levels.

that the draft version of the Codes were circulated before it became official, it is possible that employers were already following the unofficial targets of BEE 2003.

BEE 2003 is a national level policy that applies to all formal sectors.¹³ Yet, South Africa has a large informal sector. In fact, the respondents in the labor force surveys report if their employment is formal (i.e., wage contract or formally regulated). We run a placebo test on the basis of this and expect to observe no changes for those individuals who report to have an employment in a top occupational category but informally. Column 3 reports the results. There are no statistically significant changes in the probability of informal employment in top positions for neither of the population groups in the post-BEE period.

We extend our analysis and assess spillovers in changes in schooling, skill level and earnings in the top positions as well as self-employment relative to wage employment. The results are presented in Table 5, where POST is defined as initially: it equals 1 in the period of 2004-2015 and 0 otherwise. In column 1, the dependent variable is years of schooling among the 25-35 age group. This age group is chosen as most people are finished with schooling by this time.¹⁴ The average years of schooling in this sample is 9.6 years. The estimated coefficient on POST shows that White men increased their schooling by four months, while White women increased their schooling by 3 months ($\text{POST} \times \text{Female}$) in the post-BEE period. Blacks increased their years of schooling the most in the post-policy period - 10 months. There is no difference in the changes in schooling between Black men and women ($\text{POST} \times \text{Black} \times \text{Female}$).

In column 2, we explore the changes in the skill level measured by years of schooling in all age groups for the sub-sample employed in the top positions. The average years of schooling for the top positions is 12 years. White men employed in top positions have 7 months of more schooling in the post-BEE period (POST), while there is no difference in changes in years of schooling between White women and men in top positions. Black men employed at the top have 6 months of additional increase in schooling relative to White men in the post-BEE period. Overall, Blacks increased their schooling by 13 months. There is

Table 5: Spillover effects.

	(1)	(2)	(3)	(4)
	Schooling	Schooling at top	earnings at the top	Self-employment
POST	0.328*** (0.041)	0.611*** (0.089)	0.294*** (0.070)	0.056*** (0.008)
POST \times Female	0.269*** (0.052)	-0.128 (0.137)	-0.149 (0.116)	-0.019* (0.010)
POST \times Black	0.800*** (0.041)	0.517*** (0.133)	0.021 (0.083)	-0.059*** (0.008)
POST \times Black \times Female	-0.049 (0.056)	0.014 (0.223)	0.007 (0.153)	0.022** (0.011)
Black	-3.041*** (0.026)	-2.106*** (0.071)	-0.478*** (0.035)	-0.107*** (0.004)
Female	-0.147*** (0.031)	-0.371*** (0.068)	-0.541*** (0.053)	-0.071*** (0.005)
Black \times Female	0.149*** (0.035)	0.743*** (0.130)	0.199*** (0.071)	0.073*** (0.005)
Constant	10.534*** (0.028)	9.640*** (0.280)	5.161*** (0.165)	0.038*** (0.006)
Mean Dep Var.	9.617	12.365	8.472	0.050
R-squared	0.154	0.229	0.290	0.117
Observations	345675	18127	8869	301731
Years	21	21	20	18
Controls	✓	✓	✓	✓
Time trend	✓	✓	✓	✓
UrbanRural FE	✓	✓	✓	✓
Province FE	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓
Industry \times time trend	✓	✓	✓	✓
Province \times time trend	✓	✓	✓	✓
Group \times time trend	✓	✓	✓	✓

Note. The dependent variable in column (1) is *Years of Schooling* for 25-35 age group. In column 2 the dependent variable is also years of schooling but for all the individuals in the sample employed in top positions. In column (3) the dependent variable is the natural logarithm of real monthly earnings for the sample in employed at the top (data for 2015 not available). In column (4) the dependent variable is binary, which equals 1 for self-employment and 0 for wage employment. *POST* denotes period after Black Economic Empowerment Act of 2003 and equal 1 after 2003 and 0 otherwise. In column (1) individual-specific controls as well as industry-specific fixed effects and time trends are excluded as these are less relevant. Standard errors are calculated based on robust variance estimates. *Denotes statistical significance at 10 percent; **at 5 percent; ***at 1 percent levels.

no difference in the changes in the outcome variable between Black women and men.

In column 3, the dependent variable is the natural logarithm of real earnings for the respondents employed in top positions. White men are the only group who have experienced 30 per cent increase in their real earnings in the post policy period. Neither Blacks nor White women experienced any statistically significant post-BEE changes in the earnings.

In column 4, the dependent variable is binary and equals 1 for self-employment and 0 for wage employment. The results show that in the post-policy period White men are around 6 percentage points more likely to become self-employed (POST), while Black men are 6 percentage point less likely to become self-employed (POST \times Black). Black women relative to Black men are 2 percentage point more likely to be self-employed in the post policy period. But, overall Black women are 4 percentage point less likely to be self-employed in the post-policy period. The change in the probability of self-employment for White women is negative but statistically not significant at the 5 per cent level. This serves as a suggestive evidence that BEE had a group-specific spillovers in the probability of self-employment. For Whites, self-employment may be a route to avoid employment in firms that are now mandated to favor Blacks.

8 Conclusion

Recent studies on the trickle-down effects of gender-based board quotas show that these had no causal effect on the share of women in top managerial positions in the affected firms. That is, the underlying aim of quotas in breaking down the group-based stereotypes are not fully realized in the affected firms. Hence, a comprehensive policy that stipulates group-specific targets at each level of under-representation could be a possible solution. In this article we study a unique case of such policy based on Broad-Based Black Economic Empowerment Act of 2003 (BEE) in South Africa. This allows us to investigate such policy effects directly as BEE not only stipulates race- and gender-based (intersectional) targets

for board participation in large firms but also for senior management positions. Blacks are the disadvantaged majority group in the post-apartheid South Africa, while Whites are the minority. They hold most of the productive capital in the country due to the apartheid legacy. BEE is a group-based preferential policy for equal opportunities. Increasing share of Blacks and Black women in top managerial positions is one of its pillars. In our study we focus on the effects for Black women employment in top positions for who the target is set to 40 per cent of all Blacks.

We use linear probability model and estimate the change in the probability of Black women employment in top positions for designated employers and, also, relative to the Black men, White women and White men. We control for individual level characteristics, province, residence and industry fixed effects as well as province-, industry- and group-specific time trends. Our findings based on 21 years of data from labor force surveys show that the probability of Black women employment in top positions increased by 3 percentage points in the post-BEE period. This is a sizable change given the average employment probability in top positions equals to four per cent. In the highly educated sample, the increase for Black women is nine percentage points relative to Black men.

We extend our analysis and explore possible spillovers of BEE policy. We find a positive association between BEE and decrease in the racial gap in years of schooling from four to three years of difference. We do not find any positive spillovers in the earnings for Blacks employed in the top positions in the post-policy period. We find negative association between probability of self-employment relative to wage employment for Blacks, but a positive association for White men, suggesting this could have become an alternative route for White men.

The enforcement of the policy and compliance is conceptually an important issue for the effectiveness of an affirmative action policy. Reports available from the BEE commissioner show that many firms comply but struggle to reach the ambitious targets set by the state (Gqubule and Brown, 2001; Reddy, 2008). South Africa also has a post-apartheid track

record of low employment growth and high unemployment particularly among previously discriminated groups and the youth (Klasen and Woolard, 2009), which creates additional challenges in reaching the targets.

Based on our analysis, we conclude that the policy contributed in increasing the share of Black women in top positions. However, its potential is hampered by educational inequalities between Whites and Blacks, which remain unaddressed. Once we control for changes in the educational premium over time, we find that Black women relative to White men have slightly higher likelihood to be employed in top positions in South Africa after the BEE policy.

The insight of this study can be extended to other settings where educational gender gaps have disappeared, however equal representation in top positions is lacking. Aiming to meet gender-specific targets in top positions can be an easier way for employers to show goodwill, especially in an environment of eroding stereotypes against women executives. Policy action can be helpful.

Notes

¹The homelands include four nominally independent counties and six self-governing territories. These homelands were re-integrated into South Africa and its new nine provinces after 1994. Three of the new provinces (Gauteng, Northern Cape, and Western Cape) contain no former homelands while the other six consist, in terms of population, mostly of former homelands although they also include parts of former ‘White’ South Africa.

²In the BEE Act of 2003, each designated employer is evaluated based on a scorecard consisted of seven elements. All elements should be addressed totalling to 100 points (see Table A1 in the Appendix).

³In 2013 the weights were amended, giving more weight to Ownership and less to Management Control.

⁴In terms of government subsidies for human capital, BEE Act relates only to equal representation of designated groups in all occupational categories (employment) but not to any educational subsidies at schools or universities.

⁵The QLFS has a rotating panel, which results in individual-level observations remaining in the sample for one year and half. We follow Burger et al. (2016), and use the last, September, wave for LFS and QLFS to ensure each individual is observed once in the dataset to be consistent with the October Household Surveys.

⁶We use senior managers and top positions interchangeably.

⁷We distinguish between provinces containing former homelands and the rest in Figure A5 in the Appendix. We observe that the share of Black men occupying top positions is initially much higher in the provinces containing former homelands than in the other provinces, confirming that Black men staffed senior positions in the these provinces. This is not true, however, for Black women, suggesting substantial gender discrimination in top positions in those provinces.

⁸For example, this has been shown in the case of the affirmative action policy in Saudi Arabia (Peck, 2017).

⁹Meer and West (2016) argue that group-specific time trends might lead to bias in certain cases, therefore, we also estimate the model without the group trends as shown in the next section.

¹⁰The error term is not clustered by industry or province due to two reasons: a) the policy is not differently applied neither by province nor by industry (Abadie et al., 2017) and b) the number of industries or provinces is less than 13. Also, clustering at a group level is not reasonable as number of clusters would be four.

¹¹We use firms and employers interchangeably in the article. Technically, these are the employers of the survey respondents.

¹²The poor progress in improving learning outcomes of primary and secondary schools predominantly attended by Blacks has ensured that learning outcomes remain poor for most Blacks, with South Africa

having worse average test scores, and a larger socioeconomic gradient in test scores, than many much poorer countries. Only the minority of wealthy Blacks attending previously segregated 'White' schools are performing as good as their White peers (Spaull, 2013a,b).

¹³Heterogeneity analysis show that most of the changes come from the Mining and Quarrying as well as Services industry. Results are available upon request.

¹⁴The main result is not affected if the age group boundaries are defined slightly different (i.e., 20-30).

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Appendix

Table A1: Balanced and Generic scorecards: Elements and weights.

Elements	Weights	Targets	
Ownership	20 points	25%	All seven elements
Management Control	10 points	40-50%	
Employment Equity	15 points	43-80%	
Skills Development	15 points	3%	
Preferential Procurement	20 points	70%	
Enterprise Development	15 points	3%	
Residual element/Socio-economic development	5 points	1%	

should be addressed summing up to 100 points. Source: Department of Trade and Industry of South Africa. URL: http://www.thedti.gov.za/economic_empowerment/bee.jsp

Table A2: Designated groups treated by an affirmative action policy in South Africa

	White male	White female	Black male	Black female
Pre-policy period	NO	NO	NO	NO
Employment Equity Act 1998	NO	YES	YES	YES
Broad-Based BEE Act 2003	NO	NO	YES	YES

Note. Both EEA and BEE are effective up to the day writing this article.

Table A3: Mean employment shares in all occupational categories by group before 2004

	Black men	Black women	White men	White women
Senior Managers	0.38	0.16	0.33	0.13
Professionals	0.30	0.33	0.21	0.16
Associates and Technicians	0.31	0.44	0.12	0.13
Clerks	0.27	0.46	0.05	0.22
Service workers	0.46	0.43	0.05	0.05
Agricultural workers	0.50	0.33	0.14	0.02
Craft and trade workers	0.72	0.15	0.12	0.01
Plant and machine operators	0.81	0.14	0.04	0.00
Elementary occupation	0.56	0.42	0.01	0.00
Domestic workers	0.07	0.93	0.00	0.00

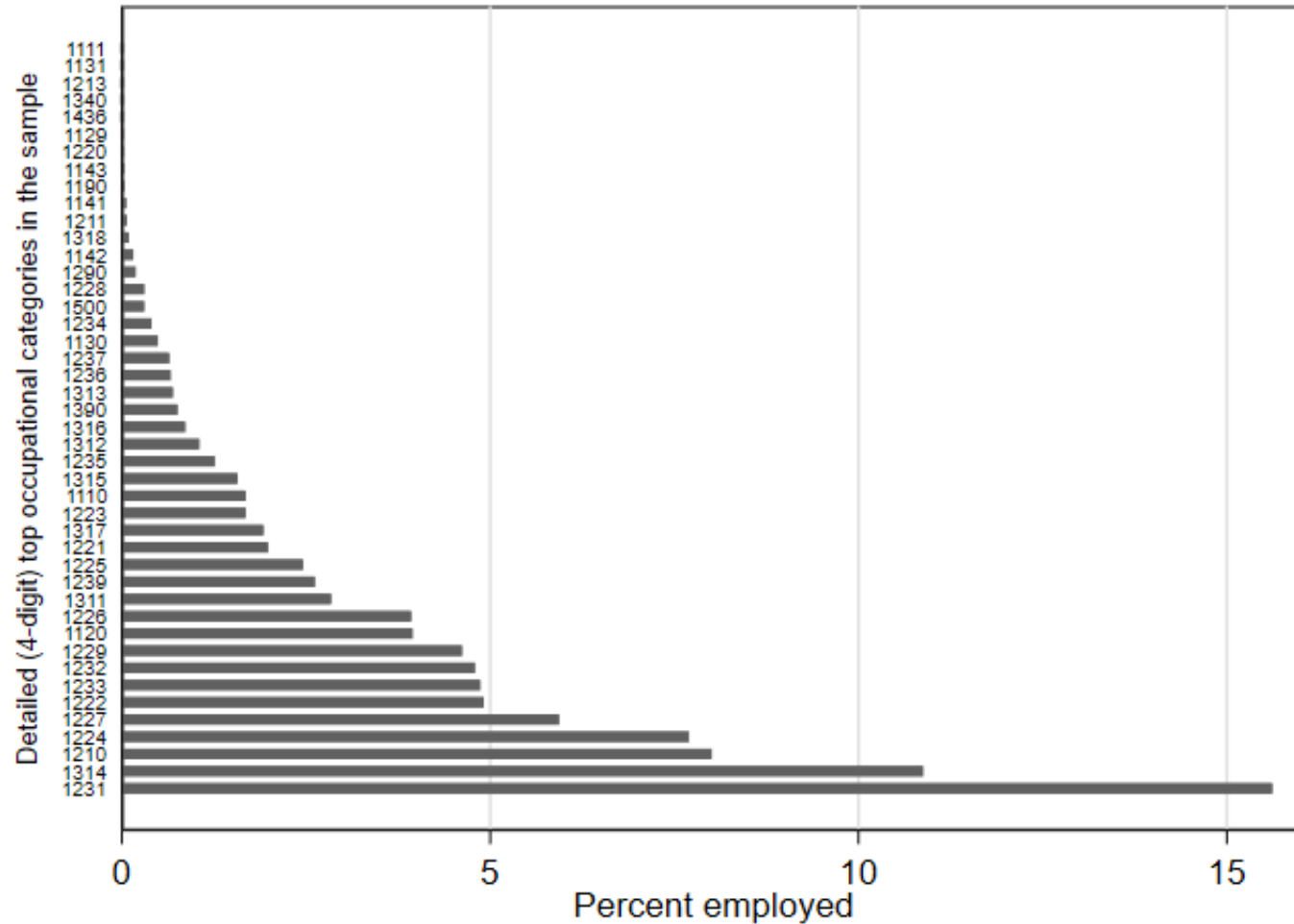
Note. Shares in each occupational category add up to 1.

Table A4: Mean employment shares in **top positions** by industry and group before 2004

	Black men	Black women	White men	White women	Count
Agriculture	0.38	0.08	0.47	0.07	422
Mining and quarrying	0.50	0.00	0.46	0.04	360
Manufacturing	0.37	0.08	0.48	0.08	1626
Utilities	0.31	0.05	0.54	0.09	127
Construction	0.42	0.02	0.49	0.08	221
Trade	0.32	0.17	0.33	0.17	2026
Transport	0.41	0.07	0.42	0.11	559
Finance	0.22	0.09	0.47	0.21	1086
Services	0.45	0.18	0.25	0.12	1499
Domestic Services	0.44	0.11	0.33	0.11	9

Note. Shares in each industry add up to 1. Count is the total number of people at the top per industry.

Figure A1: Detailed (4-digit) occupational codes for the top occupations in the sample.



Note: According to South African Standard Classification of Occupations, occupations are classified into nine major groups (1-9). We have used the 1-digit code for occupations classified as belonging to the major group coded as 1: Legislators, senior officials and managers. While in the analysis we cannot use the sub-major groups, this graph depicts the 4-digit sub-major groups that belong the group 1. Occupations in sub-major group starting with code 11** denote Legislators and Senior Officials. 12** denote Corporate Managers. 4-digit codes starting with 131* denote General Managers, and 139* denote General Managers not elsewhere classified. The highest share of occupations analyzed in our study are General Managers and Corporate Managers. Most frequent occupations in our sample are Administrative Department Managers (1231), General Managers in Wholesale and Retail Trade (1314), Directors and Chief Executive (1210) and Managers in Production and Operations (1224, 1227) (SASCO 2003, 2012).

Figure A2: Average real earnings by occupation.

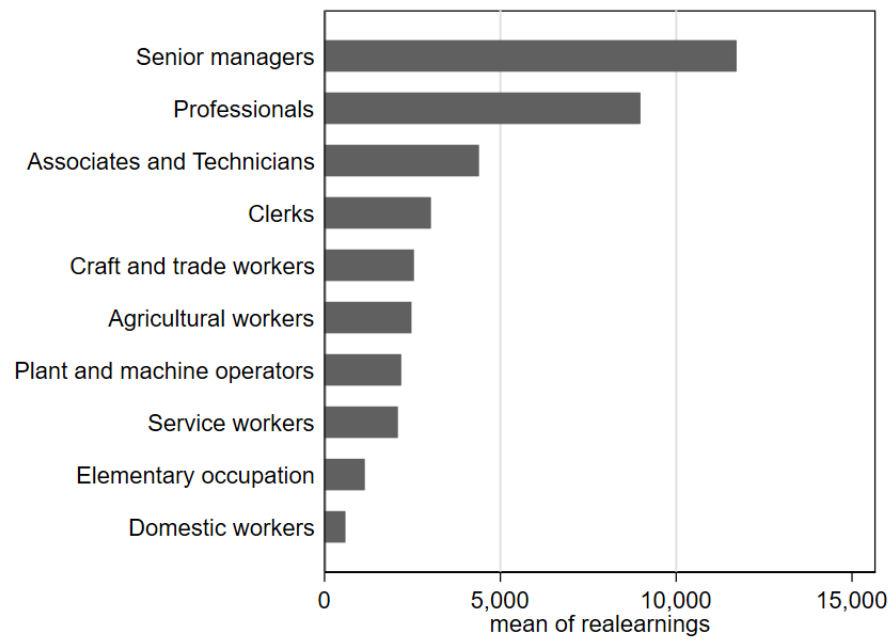


Figure A3: Trends in population shares.

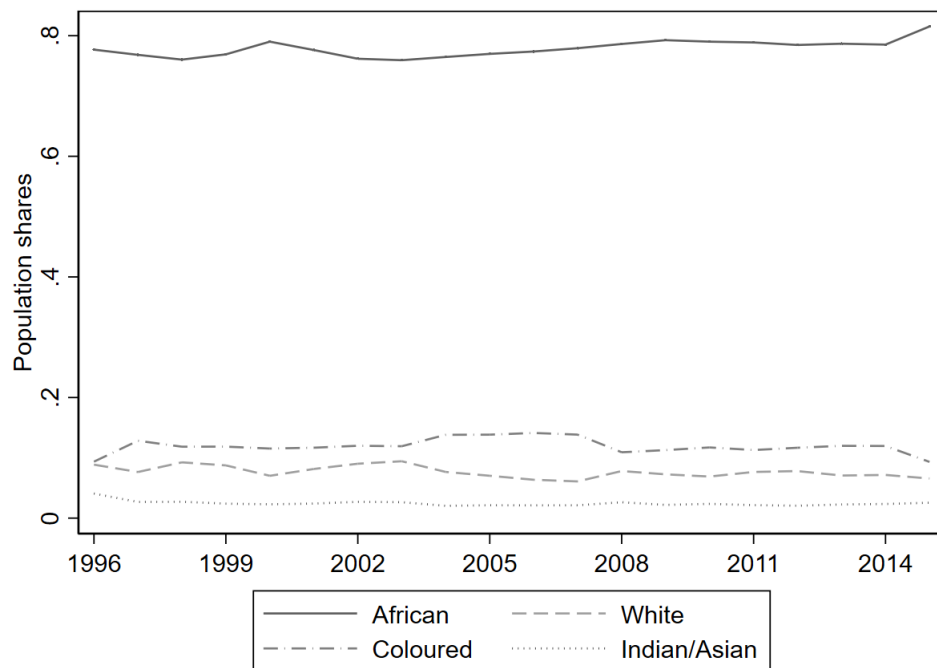


Figure A4: Average share of large employers in each industry.

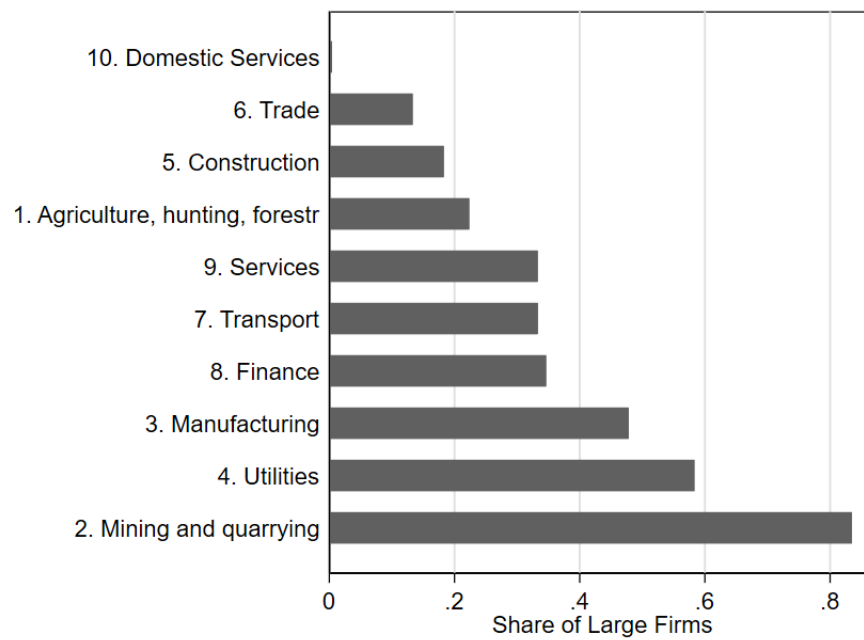


Figure A5: Trends in top positions by 'homeland.'

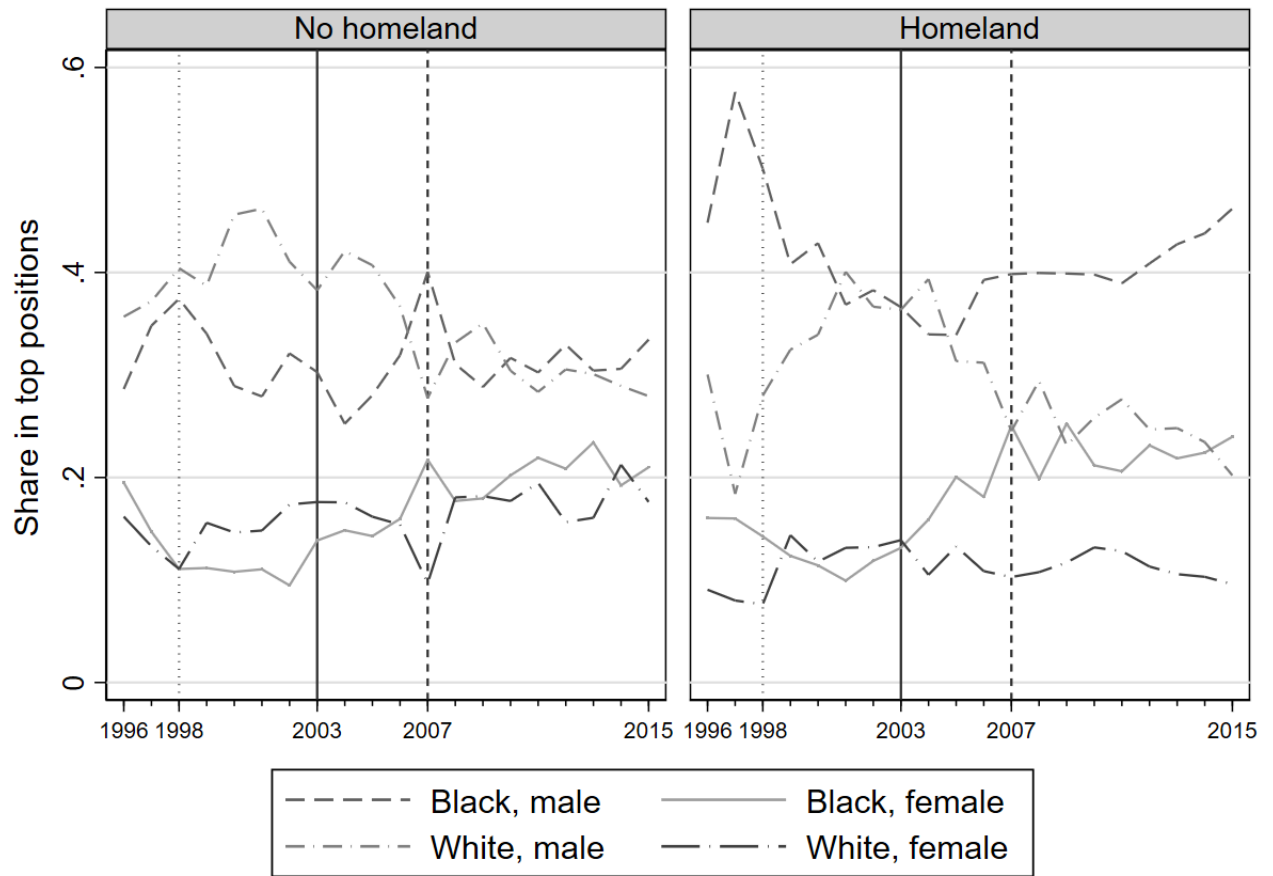


Figure A6: Trends in the share of self-employment by population group and gender.

