EXPLORING THE STATUS OF AFRICAN WOMEN IN THE SOUTH AFRICAN LABOUR MARKET, 1995-2004

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Declaration

I, Miracle Ntuli, do hereby declare that the work presented in this thesis, is my own, except where acknowledged and that this thesis or any part of it, has not been previously submitted for the award of a degree at any university.

Dedication

This thesis is dedicated to my sweetheart Clive, the fruit of our love Clive Junior, my future kids and my late parents, Harry and Idah, who did not live to see the fruits of their efforts.

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Abstract

For so long, black South African women have suffered from cultural and legalised discrimination. This gradually marginalised them from mainstream economic activities. Since the demise of Apartheid in 1994, the new government introduced corrective measures to improve the status of women in the labour market. For example, new legal provisions were enacted while international laws were also embraced. This demonstrated the government's commitment to achieve equality between men and women in the labour market and society at large. Given that more than ten years have passed since the inception of such enabling policies, it is reasonable to assume that remarkable strides were made in improving the status of African women in the job market. Therefore, this thesis aims to investigate whether the position of African women in the labour market has improved or not over the period 1995-2004. This audit is important for poverty eradication initiatives. Enhancing the status of women in the labour market is one vehicle through which poverty can be eradicated in the economy. The research focuses on three central areas.

Firstly, the study explores the determinants of African women's labour force participation in 1995, 1999 and 2004. It uses logit models and the Even and Macpherson (1990 1993) decomposition. On the basis of this methodology, the study finds that for each of the three cross sections, education was the major correlate followed by non-labour income, marital status, geographical location and fertility. Furthermore, the increase in female labour force participation between 1995 and 2004 was mainly due to differences in coefficients/behavioural response than to a change in characteristics. The latter was especially due to behavioural response to education and age. However, these changes did not go far enough to make an improvement on the status of African women in the labour market. Specifically, the increase in female labour force participation was weighed down by some labour market inequalities associated with the trend like gender pay gaps.

Secondly, gender wage differentials are scrutinized across the entire wage distribution in 1995, 1999 and 2004. The analysis utilises quantile regression estimation and counterfactual decomposition methods. This framework provides different estimates of the "discrimination" coefficient across the wage distribution. In particular, it reveals that the gender gaps are wider at the bottom than at the top of the wage distributions. To add on, the research finds that the unexplained components of the gender pay gaps "discrimination" did not substantially decline across the wage distributions between 1995 and 2004. Instead, the unexplained gaps slightly declined in the lower quantiles while increasing at the top end of the distributions. This probably indicates the persistence of substantial discrimination in the South African labour market, and that the incidence is more severe at the bottom than at the top of the wage distributions. However, rather than being a causal factor, this discrimination could be a symptom of the underlying problems. One of the possible causes is the low membership and hence representation of women in

decision making bodies such as trade unions. This invited a consideration of the gender differences in union membership.

Finally, the research seeks to establish the nature and extent of the gender differences in trade union membership. It hypothesises that the gaps are either due to family loyalty, differences in union related characteristics or to discrimination. The analysis makes recourse to the Even and Macpherson (1990 1993) decomposition. The study finds that the gender gaps for 1995 and 2004 were mostly due to the unexplained components of the gender gaps/behavioural response, especially, differences in responses to family attachment related variables: marriage, occupations and industries. These outcomes sometimes show that most women spend most of their time carrying out domestic chores when compared to men. This suggests the persistence of patriarchal attitudes in society.

Overall, our findings suggest that the changes in the status of African women in the post-Apartheid labour market were mainly due to responses to the constitution induced transformation rather than to a change in labour market characteristics. Nonetheless, this raises a question as to why, on the one hand, there were considerable shifts in labour force participation and on the other, there were negligible changes in unionism and pay gaps, yet all are explained by differences in coefficients. Therefore, we have suggested that the paradox resulted from massive changes in women's expectations about their involvement in paid work which are in concurrence with slowly changing social expectations about the role and place of women in the home and in the greater society. Clearly, women suffer from the work-family conflicts which compromise their advancement in the labour market. Also, it seems employers have not yet changed their discriminatory perceptions about women despite the presence of anti-discrimination legislation. The negative effect of this is to some extent an artefact of the persistence of patriarchal attitudes which continue to give women less voice in the labour market and in the society at large. Thus, we conclude that African women's *de facto* situation at the bottom of the hierarchy in the South African labour market is not mitigated by their *de jure* equality status. From these findings we speculate that the retention of patriarchy underlies the virtual restriction of an improvement in African women's labour market status. Therefore, we suggest that there is an urgent need for reforming gender roles at the societal level so that they exist on a more equal foundation and provide the basis for free and fair development of African women in the labour market.

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Chapter One

1. Background and Motivation of the Study

1.1. Introduction

For a long time, African[1] women were subjected to both legalised and informal social discrimination which has hampered their full integration into the South African labour market. Hence, the post-Apartheid regime has since 1994, implemented fundamental constitutional changes to ensure fair access and treatment of women in the labour market. For example, there is the Employment Equity Act (1998) which abolishes discrimination in the work place (Maziya, 2001). With these enabling policies one would expect to see a decline in labour market inequalities matched with progressive changes in the place of African women in the job market. Indeed, analyses of micro-data collected from the mid-1990s onwards attest to an improved assimilation of women in the labour market. However, this is associated with continued inequity among the workforce. Because of this paradox, this thesis aims to comprehend the status of African women in the post-Apartheid labour market by concentrating on three fundamental areas. These areas are labour force participation, wages and trade union membership.

Concerning the issue of labour force participation, statistical analyses demonstrate that there has been an increase in both men and women's labour force participation rates[2] from 1995 onwards (see Table 1). The increase was higher for women than men which reduced the gender gap in participation (see also Casale, 2003 and van der Westhuizen *et al*, 2007). However, the rise was saddled by the persistence of racial and gender hierarchies in the labour market. For instance, women's participation rates were still low in comparison to their male counterparts (see Table 1). Further interrogation of these low participation rates of South African women by race shows that the rates for historically disadvantaged groups such as African women were still low in comparison to their white counterparts (see Table 1).

[1] Apartheid policies defined four main racial groups in South Africa: Africans, Indians, Coloureds and Whites. Africans constitute 75 percent of the South African populace (47 million), Coloureds and Indians form 11 percent and the remainder comprises of Whites. These racial classifications are also utilised in this study. Africans, Indians, Coloureds are collectively referred to here as blacks.

[2]The definition for the labour force participation rate in South Africa is twofold (broad and narrow definitions). This stems from the debate about the appropriate definition of unemployment. One strand of the literature carries the narrow definition of unemployment which excludes the non-searching and is in line with the International Labour Organisation definition. In this case, labour force participation rate is simply defined as the ratio of the sum of total employed plus the searching unemployed divided by the working age population (ILO, 1999). On the other hand, the broad definition includes the non-searching unemployed (Kingdon and Knight, 2000). The latter measure is often accused of exaggerating the level of unemployment, as it may include people who are out of the labour force (ILO, 1996). As a result, we will apply the narrow definition in our empirical analysis, for international comparison. However, we will check the robustness of our results using the broad definition.

Table 1: Labour Force Participation Rates for South Africans (15-65 years)

Participation rates		Male			Female		
		1995	1999	2004	1995	1999	2004
Aggregate	Strict participation rate	58.6	59.4	62.0	38.4	45.5	45.6
	Broad participation rate	65.9	70.7	72.7	50.0	60.3	63.8
Whites	Strict participation rate	77.8	76.3	78.7	52.9	59.3	58.9
	Broad participation rate	78.3	79.0	80.7	54.5	63.7	62.6
Africans	Strict participation rate	59.6	55.3	56.6	33.9	41.8	42.6
	Broad participation rate	63.8	67.3	70.8	49	59.2	64.2

Source Casale, 2004 and own calculations: based on OHS 1995, 1999 and LFS 2004_2.

Surprisingly, this low participation of South African women in the labour market does not synchronize with other stylised facts on ground, especially, the trends of important covariates for the female labour force participation decision like marriage, fertility and education. For instance, evidence shows that between 1995 and 2004 marriage rates for women in South Africa were on the decline. For example, the proportion of married females was 38.75 percent in 1995, 34.5 percent in 1999, and 31.4 percent in 2004 (Casale and Posel, 2002; own calculation). Moreover, there has been a general increase in the proportion of educated women in South Africa (see Table A.1 in appendix a). Related to this, is the observation that fertility rates for South Africa have generally been on the decline. According to the International Labour Organisation (2001, 2005) the total fertility rate[3] during the period 1980-1985 averaged 4.6 and in the 1995-2000 period, the rate averaged 3.1, and in 2003 it further declined to 2.6.

Given that the above-mentioned facts favour higher labour force participation rates for South African women, it is therefore surprising that their participation rates are still low. This begs a number of questions which demand incisive answers. For instance, why are participation rates for women so low and especially those for African women? What are the determinants of such low participation rates? What constrains African women and all South African women to participate fully and meaningfully in the labour market? What accounts for the observed changes in labour force participation?

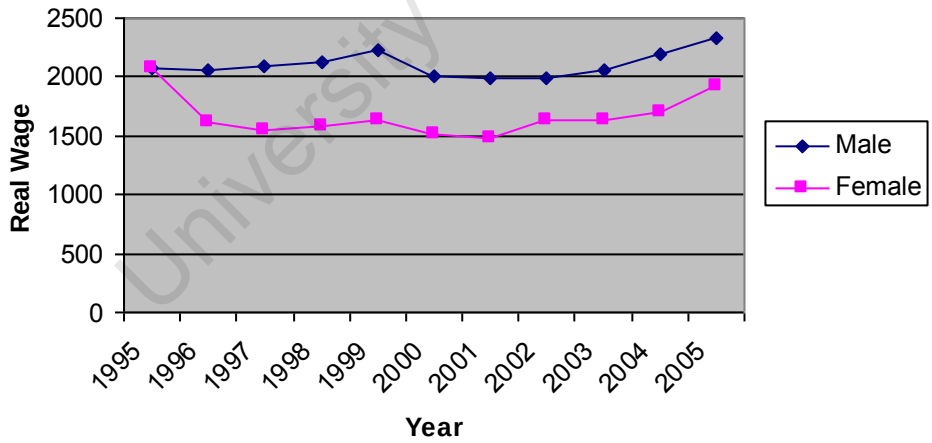
Although attempts have been made to investigate labour force participation of women in South Africa, answers to the afore-mentioned questions have remained sketchy. Specifically, the findings on the constraints to women's participation are inconclusive, at best. For instance, earlier studies on determinants of women's labour force participation by Winter (1999), Mlatsheni and Leibbrandt (2001), Bhorat and Leibbrandt (2001a), McCord and Bhorat (2003), Serumaga-Zake and Naude (2003), Serumaga-Zake and Kotze (2004) and van der Westhuizen *et al* (2007) failed to address the questions posed above in a comprehensive manner. This has been exacerbated by the fact that most of them exclusively focused on very limited time periods. Consequently, they are not wide ranging enough to explicitly evaluate and pin-point the principal factors accountable for the long-term and

[3] The Total Fertility Rate is defined as the average number of babies born to women during their reproductive years.

current extent of South African women's labour force participation. In addition, some of the studies had limited coverage of the labour market, for instance, Serumaga-Zake and Naude (2003) and Serumaga-Zake and Kotze (2004) focused on residents of the North West province and on married women respectively. This leaves a huge gap which must be addressed; to provide an overview of the whole country. Moreover, Bhorat and Leibbrandt (2001a), McCord and Bhorat (2003) and van der Westhuizen *et al* (2007) employed a descriptive approach which did not show the relative impacts of the determinants on labour force participation. In view of the limitations of these studies, we try to resolve some of the above-mentioned questions in this thesis.

Leaving the issue of participation aside, another important observation is that women in the South African labour market still earn significantly less than men, see Figure 1.1. Although the gaps are quite substantial, a careful look at the figure shows that they were generally higher in the 1990s as compared to the 2000s. Despite the abolition of legalised discrimination and the introduction of Affirmative Action legislation, there is still wide acknowledgement that a significant portion of these wage differentials is due to gender "discrimination"[4]. Quite worryingly, the latter has received less attention in the literature than it deserves as it has always stood on the shadow of institutionalised racism (Isemonger and Roberts, 1999).

Figure 1.1: Real Wages for Africans by Gender (1995-2005)



Source: Burger and Yu (2006). The statistics are for formal sector workers including domestic workers

To be explicit, the few studies which were devoted to gender "discrimination" and especially its wage aspect include Casale (1998), Isemonger and Roberts (1999), Winter (1999), Hinks (2002), Rospabe (2001a) and Gruen (2004) *inter alia*. These studies have exclusively investigated the gender pay gaps at the conditional mean of the wage distributions. As a result, they have neglected the distributional implications of standardising the size of the wage gaps across the entire wage distribution. This

[4] Discrimination here is in quotes because it is difficult to get its exact measure.

caveat creates a huge potential for studies which seek to understand the South African gender wage gap conundrum by carrying out distributional analyses.

Also, to this point, there is still a dearth of information on whether the incidence of gender wage "discrimination" increased or decreased over time. This is because existing works have utilised different analytical methods making comparative analyses of their results fraught with difficulties (although their scope spreads over the period 1994 to 2004). Even so, most of these studies have suggested the presence of "discrimination" in one particular year. Hence, they have not provided us with any systematic analysis of whether "discrimination" is increasing or decreasing. Obviously, this limited focus fails to reveal long term trends of the gender wage gaps. Generally, such trends are important in assessing the effectiveness of counter legislation such as the Employment Equity Act (1998).

One potential reason why gender "discrimination" exists in the labour market is that women lack adequate representation in decision making structures in the labour market such as trade unions. A cursory look at the structures of South African trade unions shows that they are male dominated. For instance, women constitute about 37 percent of COSATU[5] membership (COSATU, 2000). Furthermore, women's union densities are usually lower than men's. For example, in 1995 men's union density[6] at 39 percent was 13 percent higher than women's and the differential declined to 6 percent in 2004. Besides, the recruitment patterns of the trade unions tend to replicate the traditional ideology that superior roles in society should be apportioned to men. Thus, most of high-ranking positions in the unions are filled by men, whereas the opposite applies to women (see Table 2). This is also corroborated by the word of COSATU (2000), "the most influential positions in COSATU, such as educators, organisers and regional/general secretaries are overwhelmingly male-dominated, while the majority of women employed in unions are in administrative positions".

Table 2: COSATU Leadership by Gender (1997)

Position	Male	Female
Administration	6%	94%
Organisers	78%	12%
Branch and Regional Secretaries	89%	11%
General Secretary	100%	0%
Research/legal/media officers	75%	25%
Education officers	90%	10%

Source: Buhlungu, 1997, cited in COSATU (2000)

[5]South Africa has 4 union federations Congress of South African Trade Unions (COSATU), Federation of unions of South Africa (FEDUSA), National Council of Trade Unions (NACTU) and the Confederation of South African Workers' Unions (CONSAWU). COSATU is by far the largest umbrella Federation.
[6]Union density is defined as the proportion of union members among all employees.

Clearly, the available data show that women are underrepresented in trade union decision making positions[7]. Therefore, men play the leading role in the struggle for achieving gender equality and women's demands in the workplace. Given this status quo, it is hardly surprising that the needs of women workers are not addressed as shown by the persistence of wage "discrimination". What therefore causes gender differences in trade union membership? Because this topic has not been systematically analysed in the local context, answers to this question are still elusive. Yet answering the question is critical not only in improving women's power base and decision making in the trade unions but also in enhancing their participation in the labour market by lobbying for their rights and demanding equal pay for work of equal value (Finnemore and Cunningham, 1994; Standing *et al*, 1996:414).

1.2. Objectives and Rationale for the Study

In view of the above discussion, this thesis aims to contribute to the debate on the status of African women in the post-Apartheid labour market by pursuing the following objectives:

- To investigate the determinants of, and changes in, South African women's labour force participation over the period 1995-2004.
- To explore the evolution of the incidence of gender wage "discrimination" across the entire wage distribution from 1995-2004.
- To investigate the determinants of the observed gender differences in trade union membership using individual data for 1995 and 2004.

Addressing these objectives is fundamental for poverty eradication because African women occupy the bottom of the country's income distribution. Essentially, the working of the labour market made a significant contribution to the entrenchment of poverty and inequality in South Africa. Hence, by assessing whether the position of African women in the labour market has improved or not, this study contributes to the initiatives to empower women in the labour market, which is an important route for poverty eradication. We hereafter provide a review of the labour market developments that inform the contemporary picture and thereby spell the necessity of achieving the given objectives. The review starts with the advent of political Apartheid in 1948[8], a policy which institutionalised racial segregation in the country.

1.2.1. Origins of Poverty and Inequality in South Africa: the Apartheid Labour Market

The policy of political Apartheid operated at three levels: macro 'grand apartheid', meso 'own community life' and micro 'petty apartheid' (Leibbrandt *et al*, 2001a:3; van der Berg and Bhorat,

[7] This conclusion holds despite the fact that some women vote for men to be in leadership positions, instead of their fellow women.
[8] For a review of the developments prior to the Apartheid legislature see van der Berg and Bhorat (1999)

1999:6). Macro level Apartheid entailed the creation of black-nation states. This was enforced by the development of homelands coupled with the policy of industrial decentralisation (Lipton, 1986:27)[9]. The meso/intermediate echelon accentuated separation between racial groups through urban settlement patterns, population removals and separate schools. Finally, the micro/petty level insisted on separation between individuals of different race groups. Among these echelons, meso level Apartheid measures had a more harmful economic impact as they authorized discrimination in the labour market (Leibbrandt *et al*, 2001a:3). With this policy, the government managed to forcefully advance the employment of whites in public relief programmes, and in parastatals, thus economically empowering only one race (van der Berg and Bhorat, 1999:6).

In contrast to these supportive conditions for whites, African workers faced a series of laws that thwarted their ability to accumulate human capital and to bargain for decent wages and working conditions. After the introduction of Apartheid, policies encouraging the urbanisation of blacks such as the Fagan report (1946) were reversed (van der Berg and Bhorat, 1999:6). These were replaced by laws which controlled the movement of black labour. Such laws included the Stallard principle which specified that blacks had to reside in rural areas and only work in the urban areas when required by whites (Leibbrandt *et al*, 2001a:4; van der Berg and Bhorat, 1999:7). According to Leibbrandt *et al* (2001a:4), these prejudicial measures were bolstered by the construction of Labour Bureaus which controlled the movement of black labour through the Bantu Labour Regulations Act (1968). Hence, places of work and permissible permanent residence for the African population were separated by long distances. Many rural dwellers were thus barred from employment (Klasen, 2000; Dieden, 2005). Consequently, unemployment in South Africa was and is still high in rural areas as compared to urban areas (Kingdon and Knight, 1999).

The aforesaid is especially true for African women as they are overrepresented in rural areas as compared to males of the working age. This is because men often migrated to work places as the 'ideal form' of the migrant labour system meant that husbands had to earn an income outside of the homelands which they remitted to their families back home (Aliber, 2001). Nonetheless, that the remittances from migrant labour were insufficient for the upkeep of rural households meant that "women's productive activity continued to be critical for rural survival", Baden *et al* (1999). The disparity was also due to employment discrimination. In particular, the mining industry employed lots of male migrant workers yet their jobs were not open to women (Finnemore, 2002:43). When coupled to this outcome, the traditional perception that women's place is in the home resulted in many African women remaining in the rural/homeland areas doing unpaid labour, with less access to education and training facilities. This accepted position of women as primarily the providers of unpaid labour in the home, had the result of placing black women below black men in the hierarchy of jobs. All the same, the situation of the unemployed was aggravated as Apartheid barred blacks from

[9] "Black townships must be an adequate distance from white townships, preferably separated by an industrial area", van der Berg and Bhorat, 1999.

opportunities to raise non-wage income from land, capital, and entrepreneurship. This was worsened by the fact that the homeland areas contained about 13 percent of the land and yet they were legislated to accommodate about 75 percent of the population. Consequently, peasant agriculture was lacking among the rural non-white population (Wilson and Ramphele, 1989; Dieden, 2005)[10].

In addition, the Bantu Labour Act (1953) denied African workers the opportunities to form or join registered trade unions (van der Berg and Bhorat, 1999:7). The act further alienated the Africans by presenting them with their own system of industrial relations (works and liaison committees). Thus, African workers and management were supposed to negotiate their employment conditions through that system (van der Berg and Bhorat, 1999:7). This restriction left white unions with the power to set wages for all workers in the various sectors of the economy which had industrial councils. In this way, white workers could ensure that their wages remain high compared to the wages of black workers.

Further pieces of repressive policies were enacted as a way of continually thwarting the progression of black workers. Such legislation included the Industrial Conciliation Act of 1956. This policy followed a divide and rule approach; it defined and safeguarded the superiority of white workers over their black counterparts. Especially, the policy extended the scope of the 'civilised labour policy' to all industries. This worked to protect white labour against black competition through the provision of more job opportunities and higher wages to white employees (Bendix, 2000:81). According to van der Berg and Bhorat (1999:7), this was exemplified when "white workers were considered as first choice in the public sector and in several instances black labour was substituted by white labour (Lipton, 1986:24)".

In support of job reservation, an education race barrier was raised by the Bantu Education Act (1953) and the 1956 Extension of University Education Act. Through the former, education facilities available to Africans were pegged to the population group's contribution to tax income and through the latter the same population group was banned from white universities (Leibbrandt *et al*, 2001a:4; Bromberger, 1982; Lundhal and Moritz, 1996; Dieden, 2005). As a result of these policies, Africans received an education of inferior quality as compared to whites; especially as their tax base was almost inexistent.

As if the pre-employment discrimination was not burden enough for African school-leavers, they also faced employment discrimination. The latter occurred at two levels of the employment ladder. The first occurrence was at the recruitment phase, and it was embodied in the so-called 'civilised labour policy'. This policy stifled the employment of Africans as it prioritised the employment of whites (Leibbrandt *et al*, 2001a:5; van der Berg and Bhorat, 1999:7). However, if by any chance, Africans

[10] The legal restrictions on the movement of women into the cities, and the exclusion of Africans from a range of jobs resulted in a high proportion of women working as domestic workers or located in the informal sector in activities such as hawking and beer brewing (Baden *et al*, 1998).

managed to obtain a job, their progress on the job was compromised by the second hurdle; limited job mobility and lack of voice or representation in the labour market. Generally, this battery of anti-progressive legislations choked Africans' prospects for economic advancement.

These processes of economic exploitation of blacks resulted in political organisation by both black men and women (both independently of, and alongside men) from the early 1950s. Thus, African women participated actively in campaigns carried out during that period, such as the transport and education boycotts. Nevertheless, the activities of these liberation movements were barred in the 1960s as the extent of oppression worsened (Baden *et al*, 1999).

Juxtaposed to these dramatic events in the labour market, was a remarkably booming South African economy; economic growth exceeded 5 percent between 1961 and 1970 (Leibbrandt *et al*, 2001a:5; van der Berg and Bhorat, 1999:7). Because of the boom, the economy experienced a scarcity of skilled labour. Hence, the state resorted to luring women and foreigners in the labour market and also updated the skills of the white workers (Leibbrandt *et al*, 2001a:5; Lipton, 1986:33-34, van der Berg and Bhorat, 1999:7). The skills shortage also engendered a reversion by the state from the colour bar[11] to a *de facto*, 'floating bar', (van der Berg and Bhorat, 1999:7). This entailed a redefinition of jobs in order to absorb blacks into the lower echelons of the previously 'white only' jobs. However the floating bar was not an unqualified good as the labour market continued with its hierarchical structure e.g. a black worker could not compete with or supervise a white worker, especially in skilled jobs (Lipton, 1986:33; Leibbrandt *et al*, 2001a:5; van der Berg and Bhorat, 1999:7).

After that, the period 1973-1990 marked the origins of the post-Apartheid labour market. This period was distinguished by tension between repression and resistance (van der Berg and Bhorat, 1999:8). The key labour market instances of such conflict include the 1973 widespread strikes by Africans which were prompted by rapidly declining wages in the face of rising inflation (Finnemore, 2002:24; Bendix, 2000:72; Leibbrandt *et al*, 2001a:6; van der Berg and Bhorat, 1999:8). These strikes spearheaded a reclassification of the economy's industrial relations culminating in the commissioning of the Wiehahn and Riekert Commissions of 1979. The Wiehahn Commission advocated for the Industrial Conciliation Amendment Act of 1979 to embrace black employees. Thus, African trade unions became authorised while job reservations were eliminated (van der Berg and Bhorat, 1999:8; SALDRU, 1991; Leibbrandt *et al*, 2001a:6; Finnemore, 2002:25; Bendix, 2000:75). The Riekert Commission campaigned for the repealing of all forms of influx control. These controls were eventually abolished in 1986. Consequently, African labour gained increased mobility to, and chances of residing in urban areas.

[11] The Colour Bar Act/ the Mines and Works Act originated in 1911 and it was popular for reserving 32 categories of the mining jobs for whites. Hence, it was meant to exclude Africans from fruitful participation in the economy.

According to Finnemore (2002:26), although by the 1980s Africans had gained a say in the industrial relations system they still had no vote in the political system. As a result, African trade unions joined political parties to fight for effective democracy in the economy. According to Baden *et al* (1999), African women were very influential during this period as they organised alongside, and within, the male-dominated union and public organisations. The female activists began to champion for the improvement of the conditions of women workers, and called for women's participation in union leadership. However, the influence of women's organisations was waned through the assimilation of their leaders into national structures (Baden *et al*, 1999). Eventually, Apartheid was officially repealed in 1994, but it left a legacy of vast income inequalities and also inequalities in access to resources essential for human capital development across the racial groups (e.g., health care, education, clean water, electricity and infrastructure). Accordingly, the Gini coefficient for South Africa amounted to almost 60 percent, showing that the country belongs to the most unequal societies in the world (May *et al*, 1998). Concomitantly, poverty varied across the racial groups. It was highest among Africans (61 percent)[12] and coloureds (38 percent) and significantly lower among Indians (5 percent) and whites (1 percent) (May *et al*, 1998).

1.2.2. The post-Apartheid Labour Market Constitution

As rightly stated by Gruen (2004), since 1994 the need to redress inequalities in skill development, wages, employment and occupations became clear. Hence, it has been unambiguously addressed by the new South African legislation. In particular, four major pieces of labour market legislation have been put in place. These are the Labour Relations Act (1995), which provides a framework for collective bargaining[13]. The Basic Conditions of Employment Act (1997), which establishes minimum conditions of work and particularly aims at protecting workers who fall out of collective bargaining. The Employment Equity Act (1998), which abolishes discrimination in the work place and provides a platform for the implementation of Affirmative Action by firms and for the monitoring and reduction of wage differentials. Finally, the Skills Development Act (1998) was enacted to provide for the setting up of mechanisms to finance and promote skills development in the work place (Maziya, 2001). Most of all, the constitution of South Africa (1996) requires the government to redress the injustices of the past while adhering to the principle of good governance. The ultimate ideal envisaged in the constitution is a non-racial, non-sexist democracy in South Africa. Having justified the study, we move on to give an overview of our data sources.

[12] African women constituted 95 percent of the poor.

[13] Labour Relations Act (1995) establishes the relations between employers, employees and trade unions. As such, organised workers in South Africa are represented by three major federations that are the Congress of South African Trade Unions (COSATU), the National Council of Trade Unions (NACTU) and the Federation of Unions of South Africa (FEDUSA) (Bhorat *et al*, 2002).

1.3. Data and Methodology

It is emphasised that our empirical analyses are quantitative in nature. The data utilised for the analyses were obtained from the nationally representative and detailed (1995, 1999) October Household Surveys (OHS) and the September (2004) Labour Force Survey (LFS) carried out by Statistics South Africa (Stats SA). The OHS are annual cross sectional surveys carried out from 1994-1999[14] (the OHS were replaced by the LFSs in 2000). These OHS surveys are autonomous as each of them is based on a different sample. However, the samples cover several but assorted households across all provinces of South Africa which enables us to have a full picture of labour market opportunities and outcomes. For the years 1995 and 1999 in particular, similar sample designs have been applied. 3 000 Enumeration Areas (EAs) were sampled and 10 households within each of them have been interviewed, resulting in a sample size of 30 000 households. On the other hand, the LFS is a bi-annual rotating panel household survey. The rotating panel methodology is specifically designed to measure the dynamics of employment and unemployment in the country. The LFS was conducted such that detailed information about the labour market situation of approximately 68 000 adults of working age (15-65 years) living in 30 000 households across the country was collected. The survey provides more reliable measures of labour market status than the OHSs as it has a more detailed module on informal sector activities.

Nevertheless, that Stats SA upgraded the questionnaires with each successive survey implies that caution has to be exercised when using these national household surveys to study changes over time. In particular, it has been documented that the modifications somewhat altered the definitions and derivations of some labour market indicators over time, (see Casale 2003:79). For example, respondents were given a more detailed categorisation of education levels in 1999 and 2004 as compared to 1995. Therefore, "to arrive at comparable levels of schooling, it is necessary to aggregate the detailed information to match the 1995 classification", Gruen (2004). Besides, for the years 1999 and 2004, there was a change in the way the wage information was captured. For instance, in 1995 the questions elicited the actual amounts of income while in the later years an appropriate income class was also given (Gruen, 2004). As a result, in 1999 and 2004 workers sometimes preferred to report their earnings by indicating their income category only. This compromises our analyses as it necessitates employing an indirect method to obtain a wage series compatible with distributional analyses. Hence, for the empirical analyses in this study, some variables of interest like employment, unemployment, wages and education for the three years had to be recreated using relevant questions that were available in the surveys. This process is essential as it creates "comparable"[15] data series which enables us to separate actual from taxonomic changes in

[14] Prior, in 1993 an OHS survey was collected but it excluded the TBVC states. Also the 1993 and 1994 surveys used different sample designs compared to the latter years. In the former, a sample of 30 000 households was drawn from 1000 EAs. From 1995 onwards a sample of 30 000 households was drawn from 3000 EAs.

[15] Comparable is in quotes as it is impossible to create data series' which are 100 % comparable using the available surveys.

the variables over time (Casale 2003:79). See section section 2.4 for details on some of the derivations.

Despite efforts made to ensure comparability over the years, the cross sectional nature of the data leaves some questions unanswered. For instance, it is difficult to make far-reaching conclusions on shifts in female labour force participation because we cannot trace individual movements in and out of the labour force. Also, we cannot infer on what has been happening to particular age cohorts over time. Although these limitations do not negate the validity of this study, the reader should keep them in mind.

In order to make sense out of this data, this research utilises distinct but complementary estimation methods. For instance, maximum likelihood estimation methods and a decomposition method for a binary choice model based on Even and Macpherson (1990 1993) will be utilised to explore the issue of female labour force participation. The Even and Macpherson method decomposes the observed differences in the probabilities of female labour force participation between two periods into a part explained by differences in the average individual characteristics, and a part explained by differences in coefficients (behavioural response or "discrimination") (Yun, 2000). Furthermore, the study will adapt and exploit the Even and Macpherson (1990 1993) procedure to investigate the gender differences in trade union membership.

Finally, the thesis will employ the quantile regression estimation method and the Machado Mata (2005) decomposition technique to address the question of gender wage "discrimination". This framework provides different coefficients of gender wage "discrimination" for the distinct percentiles of the conditional wage distribution. Thus, it brings a richer description of the coefficient of discrimination than the mean-based approach which only provides the overall magnitude (earlier South African studies have exclusively used the mean based approach). The next section gives an outline of the thesis.

1.4. Structure of the Thesis

This thesis comprises of five chapters. Chapter Two investigates the correlates of female labour force participation in 1995, 1999 and 2004. The chapter commences with a debate on the appropriate theory to model female labour force participation. The relevance of the different theories to the South African case is also discussed. This debate informs the theoretical base on which this chapter is built. Subsequently, econometric techniques are used to investigate the correlates of female labour force participation. It will be shown that the prospects of female labour force participation were positively correlated to personal characteristics. Inversely, financial variables, geographical and household related characteristics persistently reduced the chances of labour force participation throughout the study period. Furthermore, we will show that the increase in African women's labour force

participation between 1995 and 2004 was almost exclusively due to disparities in coefficients/behavioural change as compared to differences in labour market characteristics.

Chapter Three explores the incidence of gender wage "discrimination" across the entire wage distribution over the period 1995-2004. After outlining the methodological developments in the gender pay gap debate, the chapter presents a survey of the relevant empirical literature. The review forms the basis of the analytic approach adopted by our study. It will be shown that the gender wage gap is wider at the bottom tails of the distribution (i.e. individuals with low levels of schooling and work in the least paid occupations) as compared to the top. Automatically, this identifies the affected segment of the labour market which necessitates research into the underlying mechanisms for the disparity. Hopefully, this will help in the formulation of target oriented labour market policy and intervention mechanisms (Gunawardena, 2005).

On the same case, given that it is almost ten years after the abolition of legalised discrimination and the introduction of Affirmative Action legislation, one would have expected that gender "discrimination" might have decreased. Surprisingly, we will show that the gaps increased in the upper tails of the wage distribution from 1995 to 2004. Such information helps in taking stock of the achievements made in gender mainstreaming after 10 years of South Africa's democratic independence[16]. In carrying out such an audit, it is critical that all decisions are underpinned by sound research that systematically explores the prevalence of labour market "discrimination". This is crucial because the existence of labour market discrimination inevitably negates any endeavours to close gender disparities regarding participation in economic activities.

Chapter Four considers the sources of the gender gaps in trade union membership for 1995 and 2004. The chapter starts by reviewing both empirical and theoretical literature on the subject. On the basis of these reviews it develops a theoretical framework for analysing the gender gaps. Afterwards, the gender gaps are empirically scrutinised. It will be shown that the under-representation of women in trade unions was more likely to be due to gender differences in behavioural response to family related variables (marriage, occupations and industries). Such insights into the sources of gender gaps in unionism are timely as South African trade unions are reviewing their organisational mechanisms to promote gender equity in the unions and at the workplace (COSATU, 2000).

Finally, Chapter Five synthesises the findings from Chapters Two, Three and Four and draws the main conclusions of the thesis, as well as potential avenues for future research. As such, our findings are consistent with a story in which changing attitudes and Affirmative Action policies have improved women's labour market opportunities over time, but not their outcomes. Once on the labour market, African women continue to be vulnerable to lower hiring rate, lower wages and lower unionisation

[16] See speech by Lulu Xingwana, M.P on the achievements of South African women in the first decade of democracy the Presidents Debate (2004)

rates than their male counterparts. In light of the analyses in this thesis, it is suggested that part of the lower wages could be due to discrimination. Alternatively, the lower wages and lower unionisation rates could be due to other social processes which we could not capture, but have kept women in elementary jobs which are both poorly remunerated and lowly unionised. These findings make sense if we believe that there are barriers which are entrenched in patriarchy-based socialization, where men are regarded as higher-ranking than women — a constructed marginalisation that has deprived women of adequate representation in the collective-bargaining structures, leading to the underplaying of their interests from the policy agenda.

All the same, it should be clear from the above discussions that although the study succeeds in highlighting the underlying mechanisms for the changes in the position of African women in the post-Apartheid labour market, it is nonetheless limited in that the methodologies do not allow us to identify the sources of the mechanisms. For example, we can only identify gender wage "discrimination" but not its exact causes. However, these weaknesses do not compromise the significance of this research. For instance, we have shown that there is a sticky floor in the labour market (gender wage gaps are wider at the bottom than at the top of the wage distribution).

1.5. Summary

In synopsis, this thesis explores the shifts in the status of African women in the post-Apartheid labour using individual data from the 1995 and 1999 October Household surveys, and the September 2004 Labour Force survey. The study achieves this by quantitatively analysing changes in three indicators of the position of women in the labour market across the data sets. These indicators are labour force participation, trade union membership and wages. Each indicator is addressed in a separate chapter. As a result, the thesis has three empirical chapters based on the above indicators. Chapter Two concentrates on the issue of female labour force participation, Chapter Three deals with wages and finally, Chapter Four focuses on trade union membership. The findings from the empirical analyses are synthesised in chapter Five which concludes the thesis and suggests the way forward. It is hoped that the study will contribute towards the empowering of women in the labour market which is an important vehicle for economic development.

Chapter Two

2. Determinants of South African Women's Labour Force Participation, 1995-2004

2.1. Introduction

In this chapter we will analyse labour force participation by black African women in 1995, 1999 and 2004. We will show that the significant correlates of the participation decision were education, non-labour income, marital status, fertility and geographical location. Also, the increase in labour force participation between 1995 and 2004 was mainly due to behavioural response rather than to a change in labour market characteristics. The rest of the chapter is structured as follows. Section 2.2 outlines the female labour force participation debate. Section 2.3 gives an overview of labour supply theories. Section 2.4 reviews some empirical literature on female labour force participation in post-Apartheid South Africa. Thereafter, section 2.5 presents our theoretical framework; the standard participation model derived from the conventional neo-classical labour supply theory, based on the utility–maximising framework of consumer theory and time allocation. Section 2.6 builds our empirical model, whereby the labour force participation decision is explained by financial, personal, geographical and household characteristics. Section 2.7 expounds on the methodology and data analyses. Section 2.8 carries the results of the study. The conclusions are drawn in section 2.9.

2.2. The Female Labour Force Participation Debate: an Overview

Female labour force participation signals the extent of women's willingness and ability to be involved in economic activities. Ever since the pioneering works of Mincer (1962), female labour force participation has been discussed in a number of studies in both developed and developing countries (Killingsworth, 1983; Smith, 1980; Bowen and Finegan, 1969; Boserup, 1970). Significantly, for developing countries Boserup (1970) documented women's participation in the labour market and their involvement in economic development (Maglad, 1998). According to these early works, most women participated, either as employees or job-seekers, in the informal sector[17] of the labour market. Equally important is the fact that the pronounced increase in the involvement of women in modern sector activities has been recent (Amsden, 1980:11; Maglad, 1998). This is opined to have improved because of the progress made in females' educational attainment and the development of the market system (Maglad, 1998; Moghadam, 1998:15).

According to Blundell and MaCurdy (1999), the increasing attention given to women's labour force participation stems from the interest in assessing the consequences of a wide array of public policies.

[17] Some industries like textiles have historically employed women but it does not change the aggregate result.

Such policies include taxes, welfare programs and the alteration of institutional features of the labour market. Incidentally, these policies are based on the belief that most of the participants will be in employment and hence, pose the challenge of employment creation to high unemployment regions like South Africa. Besides, Tansel (2001) maintains that gender mainstreaming[18] and increased participation of women in economic activities either as employees or entrepreneurs are desirable goals on equity and efficiency considerations. Again, this shows the importance of reducing the unemployed component of the participants. Within this argument, the equity goal implies that increased labour force participation of women, mainly as employees, will improve their relative economic position. As such, labour force participation decisions have important implications for the distribution of income. This is critical because those who do not participate in the labour market lack direct access to wage income (Dixon, 1996). On the word of Basu (2001), such lack of direct income is problematic, especially in non-Beckerian[19] household models since those who have direct access to economic resources have more bargaining power as compared to those who do not contribute directly to the household's total income. Consequently, financial resources, consumption vectors and well-being will be distributed in the former's favour (Blundell *et al*, 2005). Hence, if women do not contribute substantially to household income, the distribution of resources is likely to be skewed against them, which reduces their welfare which may spill over to their children[20].

Furthermore, a crucial stylised fact on labour supply from developed countries is that labour force participation has steadily, but noticeably, declined for men in general, whereas that for women has risen considerably over time (Maglad, 1998; Joseph, 1983:6; Berndt, 1991:594; Killingsworth 193). As such, there has been a change in the composition of the labour force - a *feminisation*[21] of the workforce. Incidentally, the trend observed in men's participation rates has been attributed to the dominance of the negative income effect that came with advancement in men's wages and earnings over time (Maglad, 1998). On the contrary, the increase in female labour force participation is explained by a positive and sizeable substitution effect of women's wages that dominates the somewhat small income effect (Mincer, 1962; Maglad, 1998). Similarly, in less developed countries an increasing trend in women's participation rates has also been observed (Standing, 1999; ILO, 2005). For example, in cases like South Africa and Brazil this is attributed to the added-worker

[18]Gender mainstreaming entails incorporating gender dimensions in all aspects of policy making.

[19] In Beckerian household models men are presupposed to be altruistic and they specialise in labour market activities and earn higher wages which they use to acquire optimal consumption vectors for their families.

[20] The World Bank (1994) argues that a growing number of studies on household allocations, show that women more than men use their economic resources to improve health, nutritional and educational status of household members particularly children, as a result in cases where women earn their own money the status of children is often better. This is an issue of concern to economists since it results in the production and reproduction of a healthy and productive workforce which is vital for economic growth.

[21] Defined here as an increase in the percentage of women among the labour force.

effect[22],increase in education, and declining marriage and fertility rates (Casale and Posel, 2002; Fernandes and De Felicio, 2005). Nonetheless, international evidence shows that overall participation rates for women are still low as compared to those of men despite the general feminisation of labour markets (ILO, 2005; Fallon and Verry, 1988).

2.3. Review of Theoretical Literature

2.3.1. Overview of the labour supply theories

Developments in labour supply theories have been summarised in surveys by Bowen and Finegan (1969), Pencavel (1986), Killingsworth and Heckman (1986) and Blundell and MaCurdy (1999). These works mainly show that the initial intellectual impulses on female labour supply literature were the works of Mincer (1962)[23], followed by, among others, Becker (1965 1973), Cain (1966), Kosters (1966) Bowen and Finegan (1969) and Gronau (1977) who contributed considerably towards the household production and time allocation domain.

Following the works of the above-mentioned scholars, several substantive contributions have been made to-date. These include the extension of single utility family models, which were postulated by Mincer (1962), Becker (1965 1973), Cain (1966), Kosters (1966), Bowen and Finegan (1969) and Gronau (1977) to include, *inter alia* game theoretic paradigms by Leuthold (1968), Manser and Brown (1980), McElroy and Horney (1981), Wooley (1988) and Lundberg and Pollak (1993). Moreover, dynamic labour supply models have attracted increased attention (Killingsworth, 1983; Blundell and MaCurdy, 1999).

Generally, this branch of theories maintains that female labour supply decisions are most appropriately modelled within the household domain (Killingsworth and Heckman, 1986). In this vein, the discussion of labour supply based on the individual unit is opined to be unrealistic since most people participate in the labour market as members of the household and family membership has significant effects on motivation of market work (Cain, 1966; Bowen and Finegan, 1969; Mincer, 1962b; Becker, 1965 1991; Heckman, 1979).

However, the issue of the appropriate theoretical paradigm to explain household behaviour from which labour supply of household members can be inferred has been controversial ever since the last two decades and the debate has mainly focussed on the unitary and collective models (Alderman *et al*, 1995). Both types of models belong to the framework of neo-classical economics, based on basic consumer choice theory. Thus, labour supply decisions are viewed as being the result of utility maximisation subject to constraints (Killingsworth, 1983).

[22] When household income falls, e.g. due to a husband's unemployment/ a decline in real wages of the employed members of the household, women, considered secondary workers of the household, temporarily take up employment to cushion the falling household income. But, if there is structural unemployment, the increase in female labour supply will be permanent.

[23] Mincer (1962) contributed a powerfully simple explanation of discrepancies between time series and cross sectional market work patterns for married White women using the standard decomposition of income and price effects of traditional price theory (Smith 1980)

The orthodox view is represented by the unitary model. Incidentally, the unitary model is implicit in Samuelson's (1956) paper and has become the most popular model on family behaviour. This perspective presupposes that households consisting of either single or multiple persons act as single decision making units. Hence, labour supply is seen as the observable result of the maximization of a unique well behaved household utility function (whose objects of choice are consumption goods and leisure) subject to a unique budgetary constraint pooling the income of every family member (Killingsworth and Heckman, 1986; Killingsworth, 1983; Blundell and MaCurdy, 1999).

Nonetheless, since the unitary model assumes away conflicts, it makes it difficult to analyse intra-household inequalities or the effect of government transfers on the allocation of intra-household resources (Chiappori, 1992; Fortin and Lacroix, 1997). As a result, the need to understand intra-household resource allocation from which labour supply decisions of members of the household can be inferred has seen the popularisation of the collective approach (Haddad *et al*, 1997). The latter approach subscribes to the individuality of household members by relocating the centre of decision making within a household to the individual, which is in accordance with the basic microeconomic requirements of methodological individualism (Chiappori, 1988 1992; Fortin and Lacroix, 1997). This group of models maintain that, since the household consists of different individuals, its decisions should be analysed within a formal framework which would model the interaction between individually rational people who may have different preferences (for instance, through cooperative or non cooperative bargaining) (Alderman *et al*, 1995; Fortin and Lacroix, 1997).

These two household models (unitary and collective) emerged as the extensions of the simple static neoclassical model of labour supply (Smith, 1980; Pencavel, 1986; Blundell and MaCurdy, 1999). The assumptions of the simple static neo-classical model are that the individual's labour supply function satisfies homogeneity[24] and the Slutsky condition[25]. The unitary model adds on the supposition of symmetry,[26] to the above-mentioned presumptions. However, the unitary model has been highly criticised from methodological, empirical and economic welfare perspectives (see Chiappori, 1988

[24] *Homogeneity* entails that an equi-proportionate change in prices, wages and non labour income leaves the optimal supply of labour market hours unchanged, hence no impact on the labour force participation decision. Thus, the labour supply decisions depend on real variables only and there is no money illusion.

[25] The slutsky condition implies the following;
i) *Negativity of the income compensated own wage substitution effect*.
An increase in the wage rate leads to a reduction in demand for leisure. Thus, an increase in the wage rate leads to an increase in the price of an hour of non-market time and at the same level of utility this induces less consumption of non-market time and more time is allocated to market work.The implication for labour force participation is that an increase in own wage rate potentially has a positive impact.
ii) *Negative income elasticity*
An increase in an individual's income as a result of a wage increase leads to demand for more leisure and consequently to a reduction in labour supply than before the increase in the wage rate. This effect is negative provided non-market time is a normal good.

[26] According to Ashenfelter and Heckman (1974) symmetry means that an income compensated change in the husband's income wage rate has the same effect on the wife's work effort as an income compensated change in the wife's wage rate on the husband's work effort. Also the income compensated cross substitution effect of one spouse's wage offer on the other spouse's labour supply may be positive or negative. This depends on whether leisure time of one spouse is a substitute or a complement for leisure time of the other spouse in the household (Pencavel, 1986).

1992; Bourguignon and Chiappori, 1992; Ashworth and Ulph, 1981; Browning and Meghir, 1991; Schultz, 1990; Thomas 1990; Fortin and Lacroix, 1997; Browning and Chiappori, 1998; Phipps and Burton, 1992; Hoddinot and Haddad, 1995; and Duflo, 2000). For example, some of these works demonstrate that at the empirical level some of the predictions of the unitary model such as symmetry and negative semi-definiteness of the Slutsky matrix were repeatedly rejected when confronted with data sets.

However, other theorists have extended the basic unitary model by including alternative uses of time apart from leisure (Becker, 1965). Proponents of the time allocation approach have argued that women have more alternative uses for their time than men (market-work, home-work and leisure) (Mincer, 1962b). This proposition stems from numerous empirical studies which show that women's uncompensated wage elasticity of labour supply is relatively high as compared to men's (see Killingsworth, 1983). In regards to this, the range of estimates for women was between 0.200 and 0.900 as compared to between 0.00 and -0.40 for men (Killingsworth, 1983).

Becker's (1973) household production theory shows how women make alternative use of their non labour time apart from leisure. A crucial aspect of the theory is its recognition of the fact that the labour supply of household members, especially, the wife is associated with a host of non-market decisions including fertility and human capital. The theory maintains that each household has a production function that relates its total output to different inputs, which include various market goods and services as well as the time input of a different member of the household. The household maximises a utility function subject to a budget constraint that equalises the sum of income earned from the market sector, property income and the amount spent on goods and services. In addition to the goods constraint, the household also has a time constraint. The equilibrium exists when the ratio of marginal productivity of inputs (i.e. time) is equal to the ratio of their prices (i.e. the wage rate). Thus, each household member will allocate his/her time between the market and non-market activities in an appropriate proportion. From this model, we will borrow the fact that women have other opportunity costs for their time apart from leisure. However, we will not implement the model in full as the available time use data sets do not span over the entire period under investigation (1995-2004).

Some theories have also examined the substitution of labour or leisure between the members of a household, e.g. Joll *et al.* (1993). They likened married women to secondary workers of the household, [27]and their decision to participate in market production is a function of the expectation of the wage rate, the income received by their husbands and their share of income not related to work. They also distinguished the decision of time allocation by women from that of men. Accordingly, they hypothesised that the woman is traditionally the main producer of domestic services such as the

[27] However, the perception of women as secondary workers is increasingly coming under fire, as they demand for equal rights.

minding and education of children, hence, if she wants to be a mother she has minimum choice concerning remunerated employment. She must choose between remuneration work, domestic work and leisure, for an optimum and balanced allocation of her time using the market wage rate to assess the real cost of the marginal hour of domestic work. It is therefore, the trade-off between these two rates that result in the woman's decision to participate in the labour market.

All the same, the theoretical debate on the household decision making process is still inconclusive as empirical studies have concentrated on debunking the unitary model rather than on the development of a common framework for collective models (Lundberg and Pollak, 1996). Therefore, no new theoretical paradigm has gained overall acceptance as a viable alternative to the unitary model which they criticise. While we are aware of the above debate, the unitary model is not a bad description of the South African situation. This is because patriarchal forms of authority in some South African households are still deeply embedded in social and cultural life, despite concerted efforts by the government to uproot them (especially with reference to the bulk of African women who are rural based). Thus, to a large extent men remain the prime decision makers in society while most women remain secondary subjects. Consequently, South African social anthropologists have shown that upholding human/women's rights in practice is a major challenge facing the country (see Baden *et al*, 1999; Bentley, 2004). This observation, coupled with the fact that almost a third of South African households are *de facto* female headed (Pirouz, 2004) raises support for the dictatorial decision making process embedded in the unitary models as the female leaders could also be dictators in their homes[28].

In light of the above discussion, this research will utilise aspects of the unitary model. In particular, we will not implement the unitary model in full because of the repeated rejection of some of its predictions (e.g. symmetry). This is augmented by the simple static neo-classical labour supply model[29]. Thus, the individual is the main agent while the household is in the background. This approach allows us to only maintain the desirable aspects of the unitary model, especially the time allocation variant since women have more uses for their non-labour time apart from leisure. Section 2.5 expounds on this.

2.4 Review of Previous Empirical Research

In order to contextualize our study, in this section, we will discuss some of the existing literature on female labour force participation in post-Apartheid South Africa. This includes Winter (1999), Mlatsheni and Leibbrandt (2001), Bhorat and Leibbrandt (2001), Casale and Posel (2002), Casale (2003), McCord and Bhorat (2003), Serumaga-Zake and Naude (2003), and Serumaga-Zake and

[28] However, whether most South African men are benevolent dictators as suggested by the unitary model or not, or whether they make decisions in the best interest of their families is an empirical question which warrantees its own thesis.

[29] Recall that the unitary model emerged as an extension of the simple model, on which it imposes its strong assumptions (e.g. symmetry of cross wage effects) which have been seriously debunked in the literature. Hence, we will not utilise the assumptions of the unitary model in our study. Instead we revert to the simple static model.

Kotze (2004). However, we reiterate that most of these studies focused on limited time periods such as one year; an exception is Casale (2003). This limited scope led the studies to identify the correlates of participating in a given year, but not of the widely acknowledged feminization of the labour market.

Regarding the specific studies, Winter (1999) studied the determinants of female 'labour force participation' in the South African formal labour market. The term labour force participation is in quotes as the study exclusively focused on employed individuals, thus the study left out the unemployed category of the labour force. Consequently, it does not address why women enter the labour market. Instead, it delves into the category of women who will be more likely to find a job in the formal sector once they enter the labour market. Nevertheless, her title "Women workers in South Africa: Participation, Pay and Prejudice in the Formal labour market" and the focus of the study show that there are definitional problems in the South African labour force participation literature, as labour force participation is not synonymous to employment. Apart from this classification issue, another shortfall of the paper pertains to its focus on the formal sector; it excludes the informal sector which is also a significant portion of the South African labour market.

Nonetheless, the definitional shortfall in Winter's study was addressed by subsequent studies which defined labour market participants to include unemployed job seekers, those in full time and part time employment and those temporarily absent from work due to illness (official labour force). Such studies include Serumaga-Zake and Naude (2003) who utilized 1995 OHS data to study the determinants of labour force participation in the North West province of South Africa. They estimated separate probit models for African men and women and observed that age, region, marital status, and relationship to the household head were significant determinants of labour force participation for both genders. Moreover, the effect of marriage differed by gender; it increased men's chances while reducing those for women.

While Serumaga-Zake and Naude (2003) enhance our comprehension of the determinants of participating in the North West province's labour market, their study is limited as it excludes other provinces. In view of the different histories and labour market characteristics of South Africa's provinces, such work presents an incomplete picture. Certainly, this demands an extended coverage of the labour force in order to get a full understanding of the determinants of female labour force participation in the whole country. This critique also applies to the study by Serumaga-Zake and Kotze (2004) which solely focused on married women. Another drawback of Serumage-Zake and Naude (2003) is that it exclusively focuses on the official labour force. The latter includes workers and active job-seekers and excludes discouraged workers, yet the latter are an important part of the South African labour force. Essentially, the discouraged workers' state of unemployment differs from that of active job seekers (Kingdon and Knight, 2000; Dinkelman and Pirouz; 2002). Above all, if discouraged workers are combined with the official labour force, the labour force will be said to be

broadly defined. This observation invites a comparison of the determinants between the official and broad definitions of the labour force, in order to establish their robustness. Hence, by omitting discouraged workers from the analysis it's not clear whether the reported findings are robust across the two definitions of the workforce.

Furthermore, some studies concentrated on selected determinants of female labour force participation e.g. Mlatsheni and Leibbrandt (2001). The authors used 1995 OHS data to investigate the inter linkages between education, fertility, labour market participation, and employment of African women aged between 16 and 54 years. Among others, logit models of labour market participation were used to assess these relationships (the dependent variable took a value of 1 if an individual was employed or an active job-seeker). However, the study had two theoretically unexpected findings. Firstly, in contrary to the negative income effect, the presence of other income earners in the household encouraged the chances of participation. Secondly, while the number of children under the age of five that a woman has is generally anticipated to reduce the prospects of participating, this study established that the variable was statistically insignificant. Apart from diverging from theory, this conclusion is also contrary to what has been found elsewhere using the same data, see Bhorat and Leibbrandt (2001).

In addition, and apart from rigorous econometrics, some studies performed a descriptive analysis of the correlates of participation for example, Bhorat and Leibbrandt (2001), Casale and Posel (2002) and McCord and Bhorat (2003). The descriptive approach is however limited by an inability to comprehensively determine the relative importance of the covariates in explaining labour force participation. Somehow, this was compensated by the provision of preliminary information on the correlates of participation. For instance, Bhorat and Leibbrandt (2001) showed that a larger portion of adult females in rural areas were out of the labour force when compared to those in urban areas. Furthermore, education, potential experience and age were positively correlated with participation. The implication of these findings is that government policies designed to promote women's labour force participation should take the spatial variations into account. Nonetheless, Bhorat and Leibbrandt (2001) later conducted a multivariate analysis of the determinants in their three phase model which captured employment, participation and earnings. Importantly, some of their findings corroborated the descriptive analysis.

So far, our review has concentrated on studies which focused on limited time periods, now we turn to studies which explored the determinants over time. Such studies include Casale (2003) who investigated the feminization of the labour market over the period 1995-2001. The study utilized 1995 OHS and 2001 LFS data for African women aged from 15 to 59 years. It was conceived within the framework of decomposition analysis. This method allows an identification of the correlates which were mostly responsible for the increase in labour force participation. Furthermore, it establishes whether the effect of these correlates was through changes in coefficients (behavioural

response) or through changes in the characteristics of the samples used for 1995 and 2001. The main finding was that changing attitudes and policies (coefficients) were mostly responsible for the increase in female labour force participation between 1995 and 2001. This was mainly due to the effect of the coefficients for age and education.

Apart from the above finding, the study is also crucial as it partly resolved the incomparability problem of the national household surveys over time. In particular, the study created comparable series of employment and unemployment (strict and broad) data for the years 1995, 1997, 1999 and 2001 using the Labour Force and the October Household surveys. A detailed analysis of the derivations is given in Casale (2003:217-223). Nonetheless, here we give a brief summary of the derivation method. This is essential as the procedure has promoted the genesis of a detailed discussion of labour force participation over the years. More importantly, our study will adapt this procedure in creating comparable data series for our analysis of the feminization of the South African labour market from 1995-2004.

To be specific, Casale (2003) defined employed individuals as those aged between 15 and 65 who had a part-time, full time, or casual job in the past week. Individuals who satisfied these categories but had failed to report for work as a result of the following factors: illness, strike, bad weather, problems with transport, vacation, study or training leave, maternity/paternity leave, unrest and 'other' also fitted into the employed category. However, those who failed to work in the past week as a result of off-season activity or a temporary reduction in economic activity were classified as unemployed. This was regardless of whether such individuals had jobs to return to because this constituted frictional/seasonal unemployment. Quite significantly, this definition is at variance with that of Stats SA which categorized persons who failed to report for work in the past week as a result of problems such as unrest, lack of transport and 'other' as unemployed. According to Casale (2003), there is a lack of clarity with regards to why Stats SA relegated those individuals to the pool of unemployment[30].

Furthermore, she generally categorised the unemployed as individuals who did not have a job but would accept if an apt one was presented to them[31]. Thereafter, she differentiated strict and broad unemployment on the basis of individuals' job searching behaviour. The strictly unemployed were distinguished as those who wanted to work and had taken active steps to look for jobs in the preceding month, while the broadly unemployed were those who indicated their desire to work, but had not looked for work in a similar period of time. Although a number of job search strategies were included in the questionnaire (seeking the services of employment agencies; registering at trade unions; making enquiries at places of work (farms, factories etc), and waiting at the street side

[30] Furthermore, those who indicated that their main activity was begging in the LFS 2001 were reclassified from employment to inactive.

[31] Notably, she disregarded the criterion of *availability for work within a week* as it was missing from the OHS 1995.

among others), those who indicated that their job search strategy was waiting at the street side were classified under broad unemployment as the option was absent in the 1995 OHS, while it was included in the latter years. This ensured consistency as it was likely that there were some individuals in the 1995 OHS who were classified as broadly unemployed when in actual fact they were strictly unemployed. Finally, she reclassified from Stats SA's unemployment category to economically inactive, individuals who stated in the OHSs that their reason for not working was because they were either a scholar/student, or a housewife, or retired and prefers not to work, or illness, or invalid, or disabled and unable to work, if they explicitly stated that they preferred, or were not able to work. The same nomenclature will be utilised in the derivations of employment and unemployment for the purpose of our study.

Although Casale (2003) made a significant contribution to the South African female labour force participation debate by utilizing the decomposition analysis, her work left some methodological gaps. For example, she did not correct for the identification problem in the decomposition of coefficients. Apparently, the failure to control for this problem yields results that are conditional on the reference categories, and thus making it difficult to infer whether such results should be generalised or not (Oaxaca and Ransom, 1999). Consequently, this calls for studies which address the invariance problem in order to confirm the robustness of Casale's (2003) findings and their implications for the South African female labour force participation debate. Furthermore, the observation that the female labour force continued to increase from the 2001 levels not only necessitates an investigation into whether similar factors were responsible for the increase in later years, but it also allows us to go one step further by correcting for the invariance problem to achieve robust results which are critical in providing solid and relevant policy review and formulation recommendations.

The review also shows that most of the research on female labour force participation in post-Apartheid South Africa concentrated on short time intervals such as one year. Admittedly such works focussed on different years, yet their research thrusts and methodologies varied thereby making it difficult to compare results over time. Within the confines of a single methodology, this invites further research into the long term changes in female labour force participation. Such investigations will help to assess whether the position of African women in the post-Apartheid labour market has improved or not.

On the whole, this chapter will investigate the changes that occurred in female labour force participation over the period 1995-2004. This is important as South Africa is in the process of taking stock of the achievements made in the first decade of democracy. Incidentally, the economic empowerment of women which includes the progress made in integrating women into the labour force is one of the areas under the lime-light.

2.5. Theoretical Framework

As mentioned earlier on, the study uses a standard participation model developed from the conventional neoclassical labour supply theory. The specification of the model follows ideas from Sprague (1994) and Blundell and MaCurdy (1999). It is notable that this simple static neo-classical model of labour supply originated from Hicks (1946).

In accordance with Hicks formulation, labour supply is derived from a general model of consumer demand in which a fixed endowment of a commodity is divided into one part for sale on the labour market and another part for direct consumption. Incidentally, the endowment consists of a fixed block of time (T) that in the simplest of cases is to be divided between hours worked (H) and leisure (L). Thus; T = H+L.

Besides, the model also presupposes that an individual possesses a well behaved (real valued, continuous, quasi-concave) utility function (U) that is defined over his consumption of commodities, X (we assume throughout the analysis that the relative price of X is constant, hence X represents a Hicksian composite commodity) and his hours of work, H. This can be expressed formally as,

$$U(X, H, A, \varepsilon) \tag{2.1}$$

where: A = individual characteristics (e.g. race, age and marital status)

ε = an individual's tastes

The individual is also assumed to face a budget constraint (2.2), whereby the amount of money spent on the market must be equal to the sum of that received from labour and non-labour incomes (sum of asset and unearned income). The budget constraint is in turn presupposed to be linear and homogenous of degree zero in prices, wages and income;

$$PX = WH + Y \tag{2.2}$$

where: W = wage rate (assumed fixed)

Y = non labour income

P = fixed per unit price of the bundle of commodities (numeraire).

Consumption and labour supply decisions can be thought of as complementary behaviours whereby the individual selects X > 0 and $H \geq 0$ that maximises utility (2.1) subject to the budget constraint (2.2). The resulting first order conditions take the familiar form

$$U_x(X, H, A, \varepsilon) = \lambda \text{ and } U_H(X, H, A, \varepsilon) \geq \lambda W \tag{2.3}$$

where λ is the marginal utility of income. If the inequality in equation (2.3) holds strictly then the individual is not working (H=0) and L=T. The wage W_r such that $U_H(Y,T,A,\varepsilon) = \lambda W_r$ is the reservation wage below which an individual will not work (that is the value of time in non-market activities). Thus, the decision rule is that the individual participates if and only if, the expected market wage offer (W_i) is greater than the reservation wage;

$$W_i > W_r \tag{2.4}$$

The first wage in (2.4) pertains to the market demand function while the second refers to the individual's labour supply function (Killingsworth and Heckman, 1986).

According to Sprague (1994) the reservation wage (W_r) depends on non-labour income and personal characteristics, such as race, age, marital status, ages and number of children and tastes. On the other hand, the expected market wage offer (W_i) depends on personal and human capital characteristics which include, schooling, age, experience and unobserved parameters reflecting innate ability. This formulation abstracts from institutional factors such as union membership which also influence wages since the individuals may not know whether they will join the union before they make their participation decision. Notionally, if we combine the aforementioned explanatory variables we obtain a labour force participation model whereby, an individual participates if any of these variables impact on the market demand and individuals' labour supply functions according to rule (2.4).

Following Sprague's (1994) derivation which is not rigorously done here, the theory allows us to specify the following model;

Labour force participation decision = f (expected wage, education, non-labour income, age, age-squared, race, marital status, ages and number of children, region of residence and unobserved parameters reflecting innate ability and personal tastes).

The theoretical predictions are;

i) Expected wage

Notionally, a positive relationship is postulated between the decision to participate and the expected wage (Mincer, 1962b; Cain, 1966). According to Joll *et al* (1993) this is explainable by the concept of income and substitution effects. The income effect implies that an increase in the own expected wage rate increases an individual's income for every hour that is worked than before. As a result, the individual will demand more leisure which reduces labour supply than prior to the increase in the wage rate. This effect is negative provided non-market time is a normal good. The substitution effect works in the opposite direction; an increase in the wage rate leads to a reduction in demand for

leisure, which implies more labour force participation. Thus, an increase in the wage rate leads to an increase in the price of an hour of non-market time and at the same level of utility. This induces less consumption of non-market time and more time is allocated to market work. However, the overall effect is ambiguous as it depends on the relative strengths of the income and substitution effects. Even so, in this case we assume that the substitution effect outweighs the income effect.

ii) Education

Lam and Duryea (1999) argue that education can either have a positive or a negative effect on labour force participation. The theoretical explanation for the former is that educational attainment increases an individual's earning capacity which increases the opportunity cost of non-market time (Mincer, 1974). Conversely, the negative impact is an outcome of the inter-linkage between education, fertility and labour force participation of women. This is based on the assumption that an increase in schooling leads to an increase in home production (Lam and Duryea, 1999). The consequential effect of schooling on home productivity will be an adjustment in child quality and quantity. For instance, schooling may lead to a reduction in the quantity of children, which may be accompanied by an increase in the desire for high quality investment in the children. In this case, a reduction in the number of children will not be accompanied by an increase in the opportunity cost of non-market time, implying that the reservation wage will be equal to or higher than the expected market wage offer. Hence, it is not clear whether education should increase or reduce the time that will be devoted to labour market activities.

iii) **Non-labour income**

A negative relationship is hypothesised between non-labour income and labour force participation. This can be explained on the basis of the income effect. Specifically, an increase in non-labour income (e.g. the husband's wage) enables a woman to afford a higher demand for goods including unpaid time/leisure (provided leisure is a normal good). Thus, she will value her non-labour time more than the market valuation of her time which will negatively influence her labour force participation (Killingsworth and Heckman, 1986). However, theory also suggests that non-labour income is endogenous to women's labour supply behaviour. In particular, Becker's household specialisation model maintains that a spouse will devote all his/her time to an activity where they are more productive. Typically, the wife will specialise in domestic activities meanwhile the husband spends all his time in the labour market. Consequently, the husband will be more productive and get a higher wage because of the wife's choice to be a non-participant (Becker, 1991). In any case, this study treats non-labour income as exogenous to the wife's choice due to data limitations. Apart from the measures used in the study, our data sets do not have other instruments for non-labour income like property income or assets at marriage.

iv) Fertility

Theoretically fertility (quantity and ages of children) can either have a positive or a negative effect on women's labour force participation (Glick and Sahn, 1997). This stems from the fact that childcare is costly in terms of both time and money. Since childcare is a time intensive non-market activity, it leads to a higher reservation wage as compared to the market wage, which reduces formal employment outside the home. On the other hand, as the children grow the reservation wage will be reduced since the elder children's demands require some finances to satisfy them, which has a positive effect on labour force participation (Joll *et al*, 1993). Nonetheless, in some instances the negative effect is mitigated by the presence of other elderly women in the household who will assume the child caring duties while the mothers go to work, (Wong and Levine, 1992). In addition, the presence of day care activities also enables some mothers of young children to participate in the labour market.

v) Age and Age squared

As indicated by Joll *et al* (1993), theory postulates an inverted U profile between age and labour force participation. The relation between age and women's labour force participation is complicated by the fact that the participation decision is also related to changes in requirements and responsibilities over the female life cycles which are themselves age dependent. The requirements and responsibilities include school attendance, marriage, both child bearing and rearing and perhaps, changes in the value attached to leisure with age. In turn, these will introduce changes in demand for and marginal costs of homework and leisure. For instance, when one is young she goes to school and thus place a higher value on non-labour time, which reduces participation in economic activities and the converse holds after completing school. Also, child bearing and rearing will shift labour supply earlier in the life cycle.

vi) Marital Status

Marital status either has a positive or a negative effect on labour force participation. This can be explained in terms of the income effect. In the case of a married woman, if there is an increase in her husband's income, assuming an intra-household transfer of income to the wife, her non-labour income also increases. If the increase in non-labour income is significant, the woman's reservation wage will be higher than the expected market wage. Consequently, the wife will respond by being a non-participant (McConnell *et al*, 2006:65)[32]. Within this line of argument, wives in lower income families are likely to participate in the labour market due to economic necessity (McConnell *et al*, 2006). This possibility extends to widows and divorcees as they have less access to non-labour income especially, spousal income. In particular, chances are high that most widows and divorcees' reservation wage will be lower than their expected income because of economic need, increasing their probability of participating in the labour market.

[32] However, this line of argument is increasingly being contested as there has been a general increase in the labour force participation of married women.

2.6. Empirical Model Specification

The interplay between our objectives, theory and data allows us to specify the following labour force participation model.

$$lfp = f(Y, NLY, ED, AGE, AGE2, MSTAT, PROV, RACE, URB, PRES) \quad (2.5)$$

Or specifically,

$$\Pr(lfp = 1 \mid \mathbf{X}) = F(\beta + \beta_0 Y + \beta_1 NLY + \sum_{j=1}^{6} \beta_{2j} ED_j + \beta_3 AGE + \beta_4 AGE2 + \sum_{j=1}^{5} \beta_{5j} MSTAT_j + \sum_{j=1}^{9} \beta_{6j} PROV_j + B_7 URB + \sum_{j=1}^{2} \beta_{8j} PRES_j + \sum_{j=1}^{4} \beta_{9j} RACE)$$

where

i = individual, **j** = number of dummies

X = is a vector of explanatory variables

lfp = is a dichotomous dependent variable =1 if the respondent participates in the labour force and 0 otherwise[33].

The explanatory variables are as follows;

Y = respondent's expected wage.

NLY = dummy variable =1 if a household or household member receives non-labour income which includes; disability grants, childcare grants, pension and remittances, or 0 otherwise[34].

ED = dummy variables for educational categories; Elementary, Primary, Secondary, College, Diploma and Degree (Elementary is the omitted category)[35].

[33] In this study labour force participants are unemployed job seekers (non-searchers are also included when checking the robustness of our findings), those in full time and part time employment (including self employed) and those temporarily absent from work due to illness, strike, bad weather, problems with transport, vacation, study or training leave, maternity/paternity leave, unrest, 'other' and discouraged workers. Non-participants include those in full time education, those in domestic activities, and retired people.

[34] *Non Labour income* is created as a household level variable =1 if a household or household member receives any of the following funds: disability grants, childcare grants, pension and remittances, and 0 otherwise.

[35] In the questionnaires the highest level of education attained by an individual was coded in levels of education. However, Stats SA was not consistent in their capturing of the education levels across the periods. OHS 1995 had fewer categories as compared to the subsequent periods. Hence, we combined some of the categories captured in the subsequent surveys so

AGE = Age in completed years[36]

AGE2 = Age-squared.

MSTAT = dummy variables for Marital Status =1 if one falls within the following categories; Married, Co-habiting, Widow, Divorcee and 0 otherwise[37].

PROV = dummy variables for provinces =1 if one resides in a given province and 0 otherwise[38].

PRES = dummy variables representing the presence of young children in the household (aged 0-5 years=1 and 0-14 years=1) and 0 otherwise[39].

URB= dummy variable =1 if one resides in an urban area and 0 otherwise[40].

RACE = dummy variables for race = 1 if one belongs to a particular race: African, Coloured, Indian and White, and otherwise[41]

2.7. Estimation Issues and Techniques

This section outlines the estimation issues and methodologies which were dealt with in this research. The procedures involved estimating labour force participation functions using survey logit techniques in STATA (9.2). This estimation approach was chosen due to data constraints which impaired instrumentation and estimation of a system of simultaneous equations (identification problems) as necessitated by the inclusion of some notionally endogenous covariates in our model. Consequently, we augmented our logit estimates with bivariate probit estimates to check robustness. Furthermore, the decomposition technique adopted from Even and Macpherson (1990 1993) and Yun (2002 2005)

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that the levels could be as consistent as possible. Thereafter, we created dummy variables for individuals who have attained the different levels of education.

[36] Stats SA coded the age variable as the number of years that an individual had completed during the time of the Survey. Hence, they rounded off the ages to the nearest number of years completed by an individual.

[37] Single is the omitted category.

[38] *Provinc*e, a set of dummy variables representing the 9 provinces in the country: Eastern Cape, Northern Cape, Free state, KwaZulu/Natal Mpumalanga, North West, Gauteng and Limpopo/ Northern Province , Western Cape is the omitted category.

[39] In the LFS (2004) children are not attributable to a specific parent due to co-habitation of working age women. Furthermore, in OHS 1995 the number of children that a precise woman has was only asked for individuals aged between 16 and 54, yet our sample covers individuals aged between 15 and 59. Due to these peculiarities we generated 2 dummy variables which represented the presence of children aged 5 and below and those aged 14 and below in the household.

[40] For the years 1995 and 1999, these variables were derived from the Enumeration area types which specified whether a specific area is urban or otherwise. However, the LFS 2004 does not supply the same information. As a result, the variable is derived by linking PSUs to an area type variable containing values: 1(urban formal), 2 (rural formal), 3 (urban informal) and 4 (tribal area). See appendix b for more details on the derivation of this variable.

[41]Apartheid defined 4 main racial groups in South Africa; African Coloured Indian and White. Stats SA also uses the same categorisation and it is maintained in this study. In the pooled regressions whites form the base category.

was used to decompose the gaps in predicted labour force participation rates for African women across time periods basing on estimates from the logit models.

Turning to the issue of lack of instruments, it is noteworthy that the inclusion of the wage variable in the model potentially leads to biased results owing to incidental truncation. This occurs because the wage offer is missing for non-working women as a result of the labour force participation decision (Wooldridge, 2002). To counter this problem, the literature suggests that the market wage function estimated for the sample of workers can be used as the basis for imputing wage rates to those with and without observed wages (Maglad, 1998). Despite this, there are some drawbacks associated with predicted wages. For instance, MaCurdy *et al* (1990) noted that the replacement of observed wages for all individuals implies a mis-specified budget set for everyone in the sample.

Another issue of concern is that the wage model is often explained using human capital characteristics like education and experience following Mincer (1974) and Mincer and Polachek (1974). These variables also influence the labour force participation decision. However, our data set does not contain other independent variables (abstaining from institutional variables) which explain wages only without influencing the participation decision. Therefore, including predicted wages modelled on the basis of the present variables would bring in the problem of multicollinearity in our participation model. Consequently, the expected wage was dropped from the analysis.

Now clarifying on the question of the estimation procedures, it is apparent that the inclusion of the presence of children, non-labour income and marital status variables among the covariates gave rise to simultaneity problems. This is because labour force participation and the highlighted variables are thought to be endogenous household decisions (Nakamura and Nakamura, 1992; Hersch and Stratton, 2000). As a result, this necessitates proper instrumentation and the estimation of a system of simultaneous equations (Assaad and Zouari, 2003; Greene, 2003). However, the data used here does not contain enough information on appropriate instruments to control for the signalled endogeneity and simultaneity biases hence, the reader should be aware of this omission. All the same, we shall assess the seriousness of these problems in our data and in the process check the robustness of our results.

An additional problem which could have arisen from use of complex survey data is that our disturbances might possibly not be independently distributed. In this regard, clustering might have allowed correlation of the disturbances within a cluster. Consequently, our empirical estimation involved controlling for clustering in order to obtain robust estimates of the variances.

2.7.1. Statistical Models

A. Logit model

The decision whether or not to participate was estimated using a binary logit model, in which an underlying response variable Y_i^* (for the yes or no decision for each individual *i*) can be defined for an (*1xk*) vector of observable explanatory variables $\mathbf{x}_i$ by the statistical model

$$y_i^* = \mathbf{x}_i\boldsymbol{\beta} + e_i, \qquad y_i = 1 \text{ if } y_i^* > 0; \qquad y_i = 0 \text{ if } y_i^* \le 0 \tag{2.6}$$

The maximum likelihood estimator of β which is ($\hat{\beta}$) is obtained by solving the logistic likelihood equations (derivatives of logistic likelihood functions equated to 0), that is,

$$\frac{\partial \ln L(\beta; y)}{\partial \beta} = \sum_{i=1}^{n} (y_i - \Lambda_i)\, x_i = 0 \tag{2.7}$$

where y_i is an observable random choice variable, Λ represents the logistic cumulative distribution function.

B. Bivariate probit model

The bivariate probit model is used if you have two binary dependent variables, Y_1 and Y_2 and wish to model them jointly (Ashford and Sowden, 1970; Greene, 2003: 710-711). The model assumes that Y_1 and Y_2 have underlying response variables Y_1^* and Y_2^* whose error terms are distributed as standard bivariate normal. Also, the degree of correlation of these error terms (correlation coefficient) shows the extent to which the dependent variables are related. Each pair of these dependent variables (Y_1, Y_2) has four conditional outcomes, $(Y_1 = 1, Y_2 = 1)$; $(Y_1 = 1, Y_2 = 0)$; $(Y_1 = 0, Y_2 = 1)$ and $(Y_1 = 0, Y_2 = 0)$.

C. Decomposition Technique

A decomposition technique devised by Even and Macpherson (1990 1993) (E.M) was used to decompose the shifts in African women's labour force participation rates between 1995 and 2004. The procedure is similar to the well-known Blinder (1973) and Oaxaca (1973) decomposition procedure for wages disparities. The similarity is that they both decompose the respective gaps (in wages/unionism) into two components which are: differences in recognisable characteristics and disparities in response/returns to these characteristics. Nonetheless, the two approaches have been utilized in different contexts. Typically, the Blinder (1973) and Oaxaca (1973) decomposition technique applies to linear models, whilst the latter is associated with non linear (binary probability)

models which are the focus of this study. E.M's technique does not enable the analysis of specific factor contributions to the unexplained portion of the gap. This omission, however, is covered by an extension made by Yun (2000). Although, EM's procedure was initially applied to probit models, this study applies it to logit models because of the similarity between the models. The estimation procedure is explained as follows.

We estimate a logit model of labour force participation y_{ij} (2.8)

where ***i*** represents the i[th] woman; ***j***; *j* = (*b, s*) represents the year, *b* stands for 2004 and *s* represents 1995.

The estimated probability that a female *i* in year *j* participates in the labour market is

$$\hat{p}_{ij} = \Lambda\left(x_{ij}\,\hat{\beta}_j \right); \quad (j=b, s) \tag{2.9}$$

where $\hat{\boldsymbol{\beta}}_j$ is the logit estimate of the parameter vector $\boldsymbol{\beta}_j$ and Λ is the standard logistic cumulative distribution function.

The average estimated probability of female labour force participation for year *j is* given by

$$\bar{\hat{p}} = \frac{1}{N_j} \cdot \sum_{i=1}^{N_j} \Lambda\left(x_{ij}\,\hat{\beta}_j \right), \text{ (j=b, s)} \tag{2.10}$$

where N_j is the number of women in the year *j* sample.

The average estimated probability if there are no differences in response to characteristics across the

1995 and 2004 samples is $\bar{\hat{p}}_0 = \frac{1}{N_s} \cdot \sum_{i=1}^{N_s} \Lambda\left(x_{is}\,\hat{\beta}_b \right)$ (2.11)

The b - s (2004 – 1995) gap in women's labour force participation can be apportioned into two parts

that is $\bar{\hat{p}}_b - \bar{\hat{p}}_s = \bar{\hat{p}}_b - \bar{\hat{p}}_0 + \bar{\hat{p}}_0 - \bar{\hat{p}}_s$ (2.12)

where $\bar{P}_b - \bar{\hat{P}}_0$ denotes the part of the gap ascribed to disparities in observed characteristics, which is the explained portion of the gap, and $\bar{P}_0 - \bar{\hat{P}}_s$ is associated with differences in response/returns to these characteristics (the unexplained component of the gap)[42].

Following Yun (2000), the contributions that each explanatory variable *k* makes to the explained (EXP) and unexplained (UNEXP) portions of the total gap is given by

$$EXP_k = [\bar{\hat{P}}_b - \bar{\hat{P}}_0] \begin{bmatrix} (\bar{x}_b^k - \bar{x}_s^k)\hat{\beta}_b^k \\ (\bar{x}_b - \bar{x}_s)\hat{\beta}_b \end{bmatrix} \text{ and } UNEXP_k = [\bar{\hat{P}}_0 - \bar{\hat{P}}_s] \begin{bmatrix} (\hat{\beta}_b^k - \hat{\beta}_s^k)\bar{x}_s^k \\ (\hat{\beta}_b - \hat{\beta}_s)\bar{x}_s \end{bmatrix} \text{ respectively}[43].$$

Since the detailed decomposition of the coefficients is destined to suffer from an identification problem (the effect attributable to dummy variables is not invariant to the choice of the reference categories (Oaxaca and Ransom, 1999), the study used Yun's (2005) remedy for this problem. According to Yun (2005), it turns out that the identification problem in the decomposition equation is a disguised identification problem of constant and dummy variables in the regression equation. Hence, the problem is solved by using normalised regressions which enable identifying the constant and estimates of each dummy variable. See Yun (2005) for the derivation of the normalised coefficients.

2.7.2. Data

The data utilised for the empirical analyses came from the September 2004 Labour Force Survey and the 1995, 1999 October Household Surveys (OHS) which have been described in the introduction. The total sample of labour force participants comprises of individuals aged between 15 and 59 and either reported to be employed or were categorised as unemployed using the broad definition[44]. The data have sample weights that enable scaling up of the sample to reflect the full population and correct for over and under representation of certain households. Accordingly, adjustments for over and under sampling were used in this study. However, the data sets also have some weaknesses pertaining to the measurement of some variables of concern. For instance, we cannot obtain an individual level measure of non-labour income. This limits us to household level non-labour income only which has been severely criticised by the Collective models (although both measures have been predicted to reduce labour force participation).

[42] We may interpret the difference in coefficients between 2 groups as differences in the behavioural response to the individual's characteristics if the choice is made by her own will, or as discrimination if the choice is made by others.

[43] This procedure allocates shares according to the relative size of the explanatory variables impact on labour force participation.

[44] Includes people who although not actively looking for a job would nevertheless like to work.

2.7.3. Data Analysis

In this section, we describe both our samples and the specific determinants of labour force participation. In regards to this, the empirical analyses are entirely based on South African females aged between 15 and 59 years, who availed information about their economic status. The samples were further restricted to individuals who had data for the variables used in the analyses; a prerequisite of decomposition analysis. As mentioned earlier on, the study uses the strict definition of unemployment, and therefore the strict definition of the labour force. However, we will utilise the broad definition of unemployment (differs from the latter by including the non-searching unemployed) and hence, of the labour force to check the robustness of our results. The selected working age populations, their strict and broad labour forces, and their respective participation rates are presented in Table 3 below.

Table 3: Delineation of the Samples used for Empirical Analyses

		Unweighted Statistics			***Weighted Statistics (000s)***		
		1995	1999	2004	1995	1999	2004
All South African Women	Working Age population	40 448	32 344	33 111	12 000	12 606	13 620
	Broad Labour Force	20 857	21 499	22 164	6 309	8 472	9 490
	Strict Labour Force	15 762	15 692	15 894	4 787	6 167	6 872
	Repartition by economic activity						
	Employed	12 620	10 847	10 945	3 797	4 253	4 733
	Broadly Unemployed	8 242	10 652	11 246	2 445	4 218	4 765
	Strictly Unemployed	3 142	4 845	4 949	945	1 913	2 139
	Participation Rates						
	Strict participation Rate				39.9	48.2	50.4
	Broad Participation Rate				52.5	67.2	69.9
African Women	Working Age population	28 543	25 030	25 544	8 664	9.625	10 526
	Broad Labour Force	14 323	16 466	17 148	4 405	6 370	7 377
	Strict Labour Force	9 789	11 365	11 607	3 035	4 624	4 990
	Repartition by economic activity						
	Employed	7 363	7 912	7 466	2 262	2 667	3 142
	Broadly Unemployed	6 969	9 274	9 701	2 145	3 693	4 241
	Strictly Unemployed	2 430	4 173	4 141	772	1 647	1 847
	Participation Rates						
	Broad participation Rate				50.9	66.1	70.1
	Strict participation Rate				35.0	44.9	47.4

Source: own calculations using OHSs 1995 and 1999 and LFS 2004_2

It should be noted in Table 3, that we can only identify overall changes in the labour force across the years i.e. we cannot identify individuals who quitted or entered the labour market. As such, the South African female population aged between 15 and 59 years, which indicated its economic status increased by almost 1.6 million between 1995 and 2004. Similarly, the labour force participation rates for these women increased over the same period. Accordingly, 39.9 percent of the sample was economically active in 1995, while nearly 50 percent was active in 2004. In line with the general trend, African women's labour force participation rates also increased from 35 percent in 1995 to 47 in 2004. In addition, the figures show that the increase in the economically active population in South Africa from 1995 to 2004 was associated more with an increase in the number of unemployed individuals than employed.

Subsequently, we provide a summary of both the dependent and independent variables used by year. Tables 4, pg:45 (for all South African women) and 5, pg:46 (for African women) provide the descriptive statistics (Means/Proportions and Standard Deviations). In particular, linearised[45] standard errors are reported for proportions.

An inspection of the descriptive statistics shows that at most the distribution of participants by provinces and education levels did not shift much from 1995-2004, except for the marked increase in the recipients of secondary education. To add on, the proportion of women who lived in households which received non-labour income increased between 1995 and 2004. Consequently, we anticipate the presence of a strong income effect. The data also reveals that the proportion of women who lived in households with children aged below 15 years did not shift much between 1995 and 2004. This could be a signal of the variable's robust and persistent influence on participation (supposedly negative). The figures also illustrate that the ratio of women who lived in urban households increased between 1995 and 1999. This pattern is expected due to increased urbanisation.

Also, in line with the stylised facts, the ratio of married women persistently and perceptibly declined throughout the period. It is notable that this variable dropped by an outstandingly large magnitude from 1995-2004 as compared to the shifts in other marital states (increase in single and cohabiting and widowed women). In conclusion, this section consists of elementary ideas which are to be rigorously analysed in the following section.

2.8. Estimation Results

Tables 6/7, pg:47-8 and 8/9, pg: 49-50 show the coefficients and marginal effects estimated from the binary logit regressions for African women only and for all South African women for 1995, 1999 and 2004. In order to accomplish our main objectives, the marginal effects from the different data sets will be compared across the three data sets. These marginal effects are computed at the mean of the continuous covariates and they show how the baseline probability of participation shifts due to a unit change in the j^{th} covariate holding other covariates constant. For the dummy variables the marginal effect is a change in the probability of labour force participation due to a discrete change of a dummy variable from 0 to 1 i.e. Prob [LFP^{*} =1|d=1] - Prob [LFP^{*} =1|d=0] d is the dummy variable of interest.

The results show that most of the parameter estimates are statistically significant at the 5 percent level and have the theoretically anticipated signs (see section 2.5). They also support and bring in a long-term perspective to previous findings reported in other research initiatives (see Iwayemi and Olusoji (2005), Maglad (1998), Kabubo–Mariara (2002), Evans and Kelly (2004), Winter (1999),

[45] Linearization (or Taylor series) methods are widely used to estimate standard errors for the coefficients of linear regression models fit to multi-stage samples. When the number of primary sampling units (PSUs) is large, linearization can produce accurate standard errors.

Mlatsheni and Leibbrandt (2001) and Serumaga-Zake and Kotze (2004)). The long-term view is obtained from the observed shifts in the magnitudes of the parameters as the economy progressed from 1995-2004. In turn, these help to account for the perceptible changes in prospects to participate in the labour market.

Discussion and implications of the results

Given the fairly long time span that this study has covered, we can have an insight into key correlates of female labour force participation in the first decade of democracy in South Africa. This period was marked by increasing pressures on the government to redress traditional imbalances with respect to gender and race. One of the democratically elected regime's major challenges was the need to increase women's participation in the labour market, with the hope that all the participants will end up into employment. It is imperative, therefore to understand how the impacts of the strategic correlates of female labour force participation have evolved since the end of Apartheid. Accordingly, the discussion will be divided into three segments, the first one concentrates on findings which are common across the years (logit models). The analysis mainly focuses on the strict participation regressions and where applicable any differences with the broad participation models will be highlighted. In the second section, we discuss the linkages between participation and marriage and in the process we will check the robustness of our results. Ultimately, we will explore the findings from the decompositions of the gaps in labour force participation rates.

Firstly, it is noteworthy that the evolution of the determinants is similar for the equations which pool all South African women and those for African women only. Probably, this is due to the fact that Africans comprise the larger percentage of the South African female populace hence, their characteristics drive the mean of the variables in the equations which encompass all South African women. In this vein, we will only interpret results from the equations for African women as the discussion has similar implications for the other equations. All the same, we could have contrasted the findings for Africans with those of other subgroups but, running regressions separately for women of other races, in some cases results in degrees of freedom problems, as the unweighted samples are substantially smaller.

2.8.1. Logistic Participation Models

In this section, we analyse the logit models estimated for 1995, 1999 and 2004. To begin with, the estimates show that across the years, education had a positive effect which increased at advanced levels (relative to the base category, Elementary). For instance, in 1995, having secondary education and having a degree increased the prospects of participating by 5 percent and 45 percent respectively (relative to the base category). These results are consistent with previous studies which covered limited time periods such as one year (see Mlatsheni and Leibbrandt, 2001; McCord and Bhorat, 2003). The established outcome also holds for other developing countries such as Nigeria and

Kenya as well as for developed countries like Australia (Kabubo-Mariara, 2002; Iwayemi and Olusoji, 2005; Evans and Kelly, 2004). These findings point to the important role of education in determining whether or not a woman is employed, or is unemployed but available for suitable work in the South African labour market.

It is also notable that the prospects of African women to participate in the South African labour market differed according to the rural/urban spatial dimension[46]. Specifically, the chances of women who lived in urban areas to participate in the labour market were on average 10 percent higher than those of their rural counterparts. The implication of this finding is that the government still has a challenge in creating opportunities for rural women to participate in the labour market.

In the case of marital status, the outcomes display that apart from being married or a divorcee other states were not always significantly different from the referent category. Nonetheless, this study tallies with earlier analyses pertaining to marriage, as it ascertained that marriage considerably reduced the probability of a South African woman to participate in the labour market during the period 1995-2004. For instance, the status reduced the chances of participating by 6 percent in 1995 and the effect increased to 12 percent in 2004. Incidentally, marital status (marriage) has emerged as one of the essential factors accountable for the enduring low level and extent of African women's participation in the labour market. This finding is startling, given that most African households live in poverty hence, we did not expect the negative impact of marital status to be substantial, particularly due to *inter alia* the added worker effect. Besides, being a divorcee increased prospects of participating in the labour market (i.e. by 15 percent in 1995 and the effect declined to 5 percent in 2004). Logically, the chances of wanting a job or, of actively searching for one are higher for such group of women as they lack prospects for economic dependence on a spouse.

As expected, our findings with respect to the presence of children aged below 15 years in the household (fertility) harmonise with the theoretical assertion that fertility tends to increase the housewife's value of time at home, thus negatively affecting the prospects of participating in the labour market in times in which the need for childcare or housework is high. Particularly, fertility reduced the propensity to participate by 5 percent in 1995 and the effect was somewhat similar in 2004. In this dimension, our results warrant further investigation into the issue of the time requirements for childcare in the household, since high levels of female labour force participation and employment in particular, are a prerequisite for economic development.

[46] The African population was denied rights of land ownership outside the reserves through the 1913 Natives land act. In conjunction with this act, a series of apartheid era regulations reinforced spatially uneven economic development and led to institutionalised labour migration in the African population (van der berg and Bhorat, 1999) (most migrants were working age men leaving women overrepresented in the rural areas, Baden et al, 1999). Hence, places of work and permissible permanent residence were separated by long distances. Consequently, many rural residents were barred from labour force participation.

Moreover, our results for non-labour income revealed the existence of a substantial income effect (negative) over the entire decade. As such, this variable reduced the propensity to participate by 7 percent, 16 percent and 11 percent for the 1995, 1999 and 2004 samples respectively. Further scrutiny of this outcome indicates that on average non-labour income accounts more for the low participation rates of South African women than marriage and fertility (although the effect of marriage is higher when we refer to the broad labour force).

Equally important is the observation that residing in any other province apart from the Western Cape reduced the probability of labour force participation for African women during the period under investigation (when significant). This could be due to the persistence of different levels of economic development across the provinces which are in juxtaposition with legalised opportunities to migrate. Accordingly, ambitious and skilled individuals migrated to provinces with better employment and self advancement opportunities. Consequently, disadvantaged provinces were predominantly left with inferior human capital/non-participants resulting in limited chances for improvement. Therefore, failure to migrate due to e.g. cultural or other reasons and continuing to reside in relatively underdeveloped provinces limited the chances of South African women to be willing to, or to actively participate in economic activities. Subsequently, we go on to check the robustness of these findings.

2.8.2. Robustness of the Results

This section assesses whether there is any correlation between labour force participation and the marriage decision for African women and also checks the robustness of the findings from the logistic participation models[47]. This entails interpreting the estimates of the bivariate probit models. Tables 10 and 11 pg:51-2 show the results of the estimated models for the years 1995, 1999 and 2004.

Concerning the issue of correlation, the outcomes reveal that the estimates of the correlation coefficients between the error terms of the marriage and the labour force participation models ($\hat{\rho}$) are all negative and significant at the 5 percent level. This implies that labour force participation and marriage are jointly determined which leads to a linkage of these decisions. However, the absolute values of the correlation coefficients are very small across the board (less than 15 percent). This suggests that the endogeneity problem is not very strong in our samples or it could be that our specification is not very good at picking it up.

As for the robustness checks, these are based on comparative analyses of the marginal effects for the labour force participation decisions from the bivariate probits (PM1) (from Table 10) with those from the univariate logit models (see Table 6, pg:47). The investigations reveal that most of the covariates'

[47] Ideally, we should have included bivariate probit models of fertility and labour force participation. However, this was going to yield inaccurate findings as our fertility variable is defined as a binary variable =1 if there is a child below 15 in the household and 0 otherwise. Consequently, there are two types of women in the 0 category; young women without children and old women with children aged above 15. Also, the women (80 percent) in the sample who have a child are treated the same whether they have one child or seven. On the basis of these observations, we conclude that the variation in the variable has been compromised which would probably bring some biases in the bivariate probit models.

effects do not significantly differ from one model to the other. Thus, the estimated marginal effects are not considerably affected by ignoring the interdependences of the aforesaid decisions. This conclusion corroborates the robustness of the results.

As for the other findings from the bivariate probit models, the marginal effects for marriage (PM2, from Table 10) show that the impacts of the educational levels are generally not robust. For instance, in 1995 secondary education reduced the prospects of getting married by 4 percent, whereas all the other categories were insignificant. Additionally, provincial variables did not commonly influence the marriage decision over the entire period. It is also noteworthy that residing in an urban zone reduced the prospects of getting married by about 7 percent as compared to being a rural resident. Lastly, non-labour income diminished the likelihood of getting married over the given period although the effect was fading with time (12 percent in 1995 and 5 percent in 2004).

In addition, the other joint probabilities for marriage and labour force participation (Table 11) show that education has a positive effect on the probability of being an unmarried participant. On the contrary to this outcome, education reduced the prospects of being a married non-participant and the effect intensified with the educational levels. Intuitively, this result could be in support of the viewpoint that marriage stifles participation as most married women have prospects of economic dependence on their spouses. Taken together, these outcomes could be reinforcing the importance of education in determining who is a participant and who is not. The results also exhibit that urban residence increased the joint probability of participating while being unmarried by 9 percent, whilst it reduces the remaining probabilities. Turning to non-labour income, it robustly decreased the chances of a woman to participate if she is unmarried while it increased the chances of an individual to be inactive in either state. In the case of provincial variables, being in any other province apart from the Western Cape mostly increased the probability of being married and not participating.

Also to note, are the overall low joint probabilities (p11) (i.e. probability (lfp=1, marriage=1)) as compared to the corresponding marginal probabilities for participation. This is caused by the low marginal probabilities on the marriage decision. For instance, the case of marriage and participation shows that, in instances where the joint probabilities for education are clearly non-zero they range between 1 and 18 percent, whilst the corresponding range for the marginal effects for labour force participation is between 3 and 45 percent and those for marriage lie between -4 and 9 percent. The intuition is that, although education significantly affects the chances of being a participant, it also has a small effect on marriage which spills over and hence diminishes the joint probability of participation and marriage. The portrayed outcome also applies to urban residence and non-labour income variables.

2.8.3. Decomposition Analysis

In the previous section, we analysed the correlates of the levels of female labour force participation in South Africa. Now, we discuss the changes in African women's prospects to participate in the labour force between 1995 and 2004. While a simple comparison of the coefficients of the regressions for 1995 and 2004 is informative when trying to identify any changes between the two years, it is not immediately clear from such an analysis if it is mainly changing coefficients in the regressions or the changing characteristics of the sample driving the change in female labour force participation (Casale, 2003). However, using decomposition methods it is possible not only to separate the effects of the changing coefficients from the changing characteristics on the rise in female labour force participation, but also to identify the explanatory variables that were mostly responsible for the rise. Also, it is feasible to discern whether the effect of the latter will be due to their changing relationship to the dependent variable (coefficients) or to changing values (characteristics). Consequently the results presented in the section are based on decomposition analysis.

Table 12, pg:52 shows the results from the decomposition of the observed gaps in African women's average predicted labour force participation rates between 1995 and 2004. The reference year is 1995 and the comparison year is 2004[48]. Using the strict definition, the average estimated probabilities of labour force participation are 0.341 and 0.458 for 1995 and 2004 respectively. The total predicted labour force participation gap (differences in expected probabilities of participation) is therefore 0.1167, of this gap -0.0123, or (-11 percent) is due to variations in observed characteristics and 0.129 or (111 percent) is ascribed to different responses to characteristics across the years. As for the broad definition, the average predicted probabilities of participation for the two periods are 0.5011 and 0.676. The total predicted gap is therefore 0.1749, of this gap -0.0075 (-4 percent) is attributable to a change in characteristics and 0.1824 (104 percent) is due to differences in coefficients. *Thus, the increase in female labour force participation over this period is almost exclusively explained by differences in coefficients/behavioural response*, regardless of the definition being used. This suggests that women with the same objective characteristics in 2004 as in 1995 participated more in the labour market. Such outcomes imply that the increase in female labour force participation between 1995 and 2004 was mainly due to a change in the functional relationship between labour force participation and the covariates rather than to a change in the value of the characteristics of the sampled individuals. Essentially, this outcome tallies with Casale (2003).

Turning to the specific factor contributions, the results from all the decompositions show that the changing coefficients for the age variables significantly contributed positively to the overall change in labour force participation. In other words, women of the same age in 2004 as in 1995 were more likely to be working/looking for work or not searching for work but willing to work in 2004. We can infer that if both samples had similar age labour force participation profiles, the differences in the

[48] The decomposition using 2004 as the reference year and 1995 as the comparison year produced similar results and are not shown here.

participation rates will decrease by at least 13.52 percent (or by 16.42 percent using the broad definition).

To add on, the coefficients for the set of education dummies are also found to be responsible for the increase in labour force participation. This implies that women in 2004 are more likely to enter the labour market as either employees or as active/inactive job-seekers than equally educated women in 1995. This discussion implies that the increase in labour participation rates from 1995-2004 was due to the enthusiasm of women with higher levels of education. In line with this, we conclude that*, the sets of education and age variables had the primary effect on the observed increase in female labour force participation.*

Regarding the fertility variables, the analysis reveals that having children aged below 15 years in the household has a negligible effect on the decomposition of characteristics[49]. This is expected as the descriptive statistics for this variable did not shift much between 1995 and 2004. Nevertheless, the outcomes for decomposition of the coefficients vary across the samples, negative in the strict regressions and vice versa for the broad regressions. The outcome for the broadly defined sample shows that women who dwell in households with children aged below 15 years are more likely to participate in 2004 as compared to 1995. This could be due to the need for financial resources to look after the children, especially against the backdrop of worsening economic conditions.

As for non-labour income, the fact that its levels were higher in 2004 tends to reduce the difference in participation rates irrespective of the definition of participation used. In contrast, the positive effect of the differences in the coefficients of non-labour income implies that its acquisition is likely to increase participation by 0.32 percent. Thus, the rolling out of social grants increased women's chances of participating in the labour market as employees or as active job seekers. However, the impact changes as we move from the strict to the broad definition. This implies that some individuals who received the same level of non-labour income in 2004 as in 1995 were less likely to participate and especially, to be discouraged work seekers. This could be due to the dire unemployment conditions in the economy which saw some discouraged workers withdrawing from the labour force.

The urban dummy is consistently found to be responsible for the increase in labour force participation through the effects of characteristics. This effect is expected due to urbanisation. As such, the proportion of people living in the urban areas increased considerably over the period, and urban residence is associated with higher labour force participation. Nonetheless, the effect changes as we move from characteristics to coefficients. Perhaps, this reflects the prevalence of higher unemployment conditions in the urban areas in 2004 as compared to 1995 such that some unemployed participants including discouraged job-seekers lost hope of finding a job and dropped out of the labour force.

[49] We focus on children aged less than 15 as the presence of children below 6 was insignificant in our models.

Provincial location also accounts for the increase in female labour force participation through the effects of both coefficients and characteristics, although the effects of the coefficients vary across samples. Probably, the changes in the coefficients imply that the effect of residing in certain provinces on female labour force participation has shifted over the period. Also, the relatively low effect of provinces on the decomposition of characteristics could be due to negligible changes in the distribution of the female population across the provinces, during the sample period. However, further analysis is precluded by the fact that we cannot identify movements within and across the provinces.

Furthermore, the decomposition of the characteristics show that the change in marital status from 1995-2004, has a substantial positive effect on the overall increase in labour force participation in all the decompositions. This is expected from the descriptive statistics which show that there had been a decline in marriage and a slight increase in the proportion of widows and divorcees, all of which promote participation. *In fact marital status contributes significantly to the overall change due to characteristics.*

On the other hand, the results for the decomposition of the coefficients indicate that the effect of marital status dummies over time is not consistent across definitions of samples. For the strictly defined sample, the changing coefficients on marital status dummies have a negative effect while they have a positive effect on the broadly defined one. The positive effect is because widows and divorcees are more likely to work, to actively search for work, or to be discouraged job-seekers in 2004 than in 1995. This is expected as they are more likely to enter the labour market in response to their lack of prospects for economic dependence.

In summary, the differences in African women's labour force participation across the years are mainly due to disparities in coefficients. However, the unexplained portion of the gap is more difficult to interpret and it could be partly due to factors omitted from our analysis. Despite this, our results are similar to those obtained by Casale (2003). The implications of the findings are that the increase in African women's labour force participation is due to behavioural response to individual characteristics especially the set of age and education variables which harmonises with Casale (2003). Also we conclude that marital status, non labour-income, provinces and urban residence also contributed to the observed shifts in participation rates. On the whole, that our findings tally with those for the period 1995-2001 confirms the robustness of the covariates of the feminisation of the post-Apartheid South African labour market.

2.9. Concluding Remarks

This research investigated the human capital, economic, demographic and geographical factors which influenced African women's decision to participate in the labour market over the period 1995-2004.

The variables were found to influence labour force participation in line with the underlying theoretical framework of utility maximisation and labour-leisure choice.

The results unveiled that female participation in the South African labour market is positively associated with education and urban residence. Importantly, education was a very crucial correlate during the first decade of democracy. In contrast, non-labour income, marriage, fertility and geographical variations in economic development persistently reduced the prospects of participation over the entire period.

The study also practically established that there is negative correlation between labour force participation and marriage although the magnitudes of the associations are somewhat small (less than 15 percent from 1995-2004). Also, our results pertaining to labour force participation are robust, i.e. they do not significantly differ whether we take account of endogeneity issues (estimate bivariate probit models) or not (estimate univariate logit models).

Finally, we also discovered that the shifts in participation rates across time were mainly due to changes in coefficients or behavioural responses (*mainly, the effects of the differences in the coefficients of the age and education variables*) as compared to changes in individual characteristics. This conclusion implies that there is potential for future researchers to explore the contributory mechanisms for the impact (positive) of behavioural response to age on African females' labour force participation. To add on, the perceived shifts in the probability to participate were also aroused by policy engendered changes in endowments such an extension of social grants to all racial groups, and also to changes that occurred in the marriage market over the years.

In light of the above discussion, it appears as if government intervention is still needed in order to accomplish the desired but elusive goal of ensuring maximum participation by women. To accomplish this one would suggest the following tentative policies.

1. Continue investing in education especially, up to higher levels.
2. Augment income redistribution policies with strategies that encourage some of today's beneficiaries to develop their human capital. Arguably, this will increase their prospects of participating in the labour market.

In conclusion this essay is not a final statement on this topic. Instead, the investigation of an increase in labour force participation was constrained by the poor quality of the available data, which has however showed signs of improvement as of late. For instance, the existing data did not permit us to identify movements within and across provinces. Clearly, this has limited the utility of such variables. Because of recent improvements in data quality, it is hoped that the recently introduced labour force survey panel data will take future studies beyond this limitation by making it possible to track individual women's movements into and out of the labour market (but not from one province to

another). Such data will provide more information than is possible from the existing one and hence, enable controlling for the endogeneity of non-labour income, fertility and marital status. This is critical because accommodating the linkages between these decisions improves on the precision of their estimates. Furthermore, such info will enable the inclusion of variables such as predicted wages in the analysis. In this thesis, their exclusion owes to the unavailability of data on theoretically postulated regressors for wages which are independent from those which also influence labour force participation.

Having investigated female labour force participation, the next step is to explore the issue of gender wage "discrimination" which is the focus of the following chapter.

Table 4: Descriptive Statistics for South African Women (1995, 1999 and 2004)

	1995		1999		2004			
Variable	Mean/Prop	S.Dev	Mean/Prop	S.Dev	Mean/Prop	S.Dev	Min	Max
Broad labour force participation rate	0.53	0.004	0.67	0.004	0.69	0.003	0	1
Strict labour force participation rate	0.398	0.048	0.48	0.004	0.5	0.005	0	1
Age	31.93	0.1	31.52	0.092	32.33	0.14	15	59
Age-Squared	1166	7.35	1135	4.91	1192	6.25	225	3481
15-19 years	0.178	0.001	0.176	0.001	0.162	0.002	0	1
20-24 years	0.161	0.003	0.175	0.003	0.166	0.003	0	1
25-34 years	0.27	0.004	0.279	0.004	0.28	0.004	0	1
34-44 years	0.22	0.004	0.199	0.004	0.193	0.003	0	1
45-54 years	0.136	0.003	0.121	0.002	0.145	0.003	0	1
55-59 years	0.051	0.001	0.049	0.002	0.051	0.002	0	1
Non-labour income	0.161	0.005	0.333	0.006	0.501	0.007	0	1
Children <15 years	0.747	0.005	0.74	0.006	0.748	0.006	0	1
Children < 6 years	0.458	0.006	0.482	0.006	0.497	0.007	0	1
Provincial variables								
Western Cape	0.097	0.008	0.101	0.007	0.106	0.002	0	1
Eastern Cape	0.156	0.006	0.147	0.006	0.139	0.004	0	1
Northern Cape	0.017	0.001	0.021	0.001	0.018	0.001	0	1
Free State	0.066	0.004	0.067	0.001	0.064	0.002	0	1
KwaZulu/Natal	0.211	0.009	0.202	0.012	0.211	0.007	0	1
North West	0.077	0.007	0.081	0.003	0.081	0.004	0	1
Gauteng	0.181	0.011	0.192	0.009	0.195	0.008	0	1
Mpumalanga	0.068	0.004	0.068	0.004	0.067	0.003	0	1
Northern Province	0.123	0.005	0.112	0.005	0.114	0.004	0	1
rural	0.469	0.01	0.42	0.007	0.382	0.008	0	1
urban	0.514	0.01	0.579	0.007	0.617	0.008	0	1
Marital Status								
Married	0.399	0.006	0.344	0.005	0.313	0.004	0	1
Co-habiting	0.038	0.002	0.058	0.002	0.09	0.003	0	1
Widow	0.042	0.001	0.037	0.002	0.048	0.002	0	1
Divorcee	0.033	0.002	0.036	0.002	0.037	0.001	0	1
Single	0.487	0.003	0.523	0.005	0.511	0.004	0	1
Education levels								
Elementary	0.03	0.001	0.018	0.001	0.012	0.001	0	1
Primary	0.21	0.004	0.243	0.004	0.201	0.004	0	1
Secondary	0.573	0.006	0.575	0.005	0.632	0.004	0	1
College	-	-	0.003	0.001	0.013	0.001	0	1
Diploma	0.059	0.004	0.052	0.003	0.051	0.003	0	1
Degree	0.019	0.001	0.028	0.002	0.028	0.003	0	1
Population Groups								
African	0.739	0.011	0.764	0.007	0.779	0.008	0	1
Coloured	0.095	0.007	0.093	0.005	0.095	0.006	0	1
Indian	0.028	0.003	0.028	0.003	0.027	0.004	0	1
White	0.137	0.009	0.112	0.006	0.097	0.006	0	1
N	40448		31772		32907			

Education levels do not show the none category.

Table 5: Descriptive Statistics for African Women (1995, 1999 and 2004)

	1995		1999		2004			
Variable	Mean/Prop	S.Dev	Mean/Prop	S.Dev	Mean/Prop	S.Dev	Min	Max
Broad labour force participation rate	0.51	0.005	0.66	0.004	0.7	0.004	0	1
Strict labour force participation rate	0.35	0.059	0.45	0.005	0.47	0.005	0	1
Age	31.25	0.06	30.85	0.07	31.27	0.088	15	59
Age-Squared	1120	4.81	1089	4.96	1114	6.28	225	3481
15-19 years	0.196	0.002	0.189	0.002	0.175	0.003	0	1
20-24 years	0.167	0.003	0.185	0.003	0.180	0.005	0	1
25-34 years	0.269	0.006	0.282	0.005	0.289	0.006	0	1
34-44 years	0.195	0.004	0.192	0.005	0.188	0.006	0	1
45-54 years	0.125	0.002	0.108	0.003	0.129	0.005	0	1
55-59 years	0.047	0.002	0.045	0.002	0.038	0.002	0	1
Non-labour income	0.177	0.006	0.373	0.007	0.574	0.007	0	1
Children <15 years	0.795	0.007	0.785	0.007	0.789	0.006	0	1
Children < 6 years	0.505	0.008	0.53	0.007	0.535	0.006	0	1
Provincial variables								
Western Cape	0.022	0.005	0.029	0.005	0.034	0.004	0	1
Eastern Cape	0.185	0.009	0.165	0.009	0.153	0.005	0	1
Northern Cape	0.006	0.002	0.009	0.001	0.009	0.001	0	1
Free State	0.075	0.006	0.073	0.005	0.068	0.003	0	1
KwaZulu/Natal	0.231	0.012	0.226	0.012	0.223	0.008	0	1
North West	0.095	0.008	0.096	0.005	0.092	0.005	0	1
Gauteng	0.147	0.011	0.177	0.009	0.195	0.008	0	1
Mpumalanga	0.082	0.006	0.078	0.006	0.079	0.004	0	1
Northern Province	0.082	0.001	0.143	0.009	0.144	0.005	0	1
rural	0.598	0.014	0.516	0.008	0.468	0.01	0	1
urban	0.382	0.014	0.483	0.008	0.531	0.01	0	1
Marital Status								
Married	0.342	0.007	0.293	0.006	0.251	0.006	0	1
Cohabit	0.041	0.003	0.062	0.003	0.099	0.004	0	1
Widow	0.045	0.002	0.039	0.002	0.049	0.002	0	1
Divorcee	0.031	0.003	0.033	0.002	0.033	0.003	0	1
Single	0.541	0.007	0.571	0.006	0.567	0.007	0	1
Education levels								
Elementary	0.037	0.002	0.021	0.001	0.014	0.005	0	1
Primary	0.246	0.006	0.279	0.006	0.222	0.006	0	1
Secondary	0.541	0.008	0.549	0.006	0.632	0.007	0	1
College	-	-	0.003	0.001	0.011	0.001	0	1
Diploma	0.04	0.001	0.038	0.001	0.04	0.003	0	1
Degree	0.009	0.002	0.013	0.001	0.014	0.003	0	1
N	28543		24611		25432			

Education levels do not show the none category

Table 6: Strict Participation Regressions for African women (1995, 1999 and 2004)

	1995		1999		2004	
Variable	Coefficients	Marginal Effect	Coefficients	Marginal Effect	Coefficients	Marginal Effect
Age	0.446 (0.010)**	0.09	0.479 (0.010)**	0.11	0.401 (0.010)**	0.1
Age-squared	-0.005 (0.0001)**	-0.001	-0.005 (0.0001)**	-0.001	-0.005 (0.0001)**	-0.001
urban	0.41 (0.052)**	0.09	0.391 (0.054)**	0.1	0.456 (0.059)**	0.11
Eastern Cape	-0.694 (0.117)**	-0.13	-0.661 (0.13)**	-0.15	-0.661 (0.137)**	-0.16
Northern Cape	-0.279 (0.170)	-0.06	-0.363 (0.217)*	-0.09	-0.866 (0.182)**	-0.2
Free State	-0.162 (0.125)	-0.03	-0.255 (0.128)**	-0.06	-0.485 (0.143)**	-0.12
KwaZulu/Natal	-0.354 (0.117)**	-0.07	-0.257 (0.123)**	-0.05	-0.496 (0.135)**	-0.12
North West	-0.46 (0.129)**	-0.09	-0.518 (0.128)**	-0.12	-0.866 (0.143)**	-0.2
Gauteng	0.054 (0.120)	0.01	-0.36 (0.121)**	-0.09	-0.506 (0.140)**	-0.12
Mpumalanga	-0.575 (0.125)**	-0.11	-0.061 (0.129)	-0.02	-0.391 (0.137)**	-0.1
Northern Province	-0.88 (0.132)**	-0.16	-0.326 (0.134)**	-0.08	-0.744 (0.143)**	-0.18
Co-habiting	-0.074 (0.095)	-0.01	-0.165 (0.077)**	-0.04	-0.236 (0.08)**	-0.06
Widow	0.282 (0.088)**	0.06	0.106 (0.091)	-0.03	-0.061 (0.095)	-0.02
Divorcee	0.667 (0.097)***	0.15	0.526 (0.104)**	0.13	0.203 (0.120)*	0.05
Married	-0.303 (0.049)**	-0.06	-0.398 (0.049)**	-0.09	-0.481 (0.062)**	-0.12
Primary	0.23 (0.056)***	0.05	0.358 (0.058)**	0.08	0.278 (0.073)**	0.07
Secondary	0.351 (0.061)**	0.07	0.672 (0.060)**	0.16	0.672 (0.069)**	0.16
Diploma	1.66 (0.105)***	0.39	2.21 (0.124)**	0.45	2.09 (0.161)**	0.42
Degree	1.961 (0.211)***	0.45	2.27 (0.211)**	0.46	2.445 (0.339)**	0.45
Children<6	0.051 (0.040)	0.01	0.019 -0.044	0	-0.022 -0.053	-0.01
Children<15	-0.248 (0.050)**	-0.05	-0.411 (0.055)**	-0.1	-0.24 (0.061)**	-0.06
Non-labour income	-0.339 (0.052)**	-0.07	-0.67 (0.042)**	-0.16	-0.438 (0.049)**	-0.11
Constant	-8.374 (0.223)**		-8.37 (0.220)**	-	-7.069 (0.235)**	
Predicted probability	0.35		0.449		0.474	
Observations	28543		24611		25432	
F	1467.2**		165.49**		101.82**	

i) Robust standard errors in parentheses: *** Significant at 1%, ** significant at 5%;
* significant at 10%.
ii) The referent variables are: rural for the rural urban spatial dimension, Western Cape for the Provinces, Elementary education level (grades R-2) for the education levels and Single for Marital Status.

Table 7: Broad Participation Regressions for African women (1995, 1999 and 2004)

	1995		1999		2004	
Variable	Coefficients	Marginal Effect	Coefficients	Marginal Effect	Coefficients	Marginal Effect
Age	0.545 (0.009) **	0.13	0.659 (0.010)**	0.14	0.64 (0.012)**	0.12
Age-Squared	-0.007 (0.0001) **	-0.001	-0.008 (0.0001)**	-0.001	-0.008 (0.0001)**	-0.001
urban	0.348 (0.047)**	0.09	0.220 (0.052)**	0.04	0.095 (0.055)*	0.02
Eastern Cape	-0.57 (0.117)**	-0.14	-0.082 (0.155)	-0.02	-0.613 (0.130)**	-0.12
Northern Cape	-0.3143 (0.177)*	-0.08	0.139 (0.220)	0.03	-0.629 (0.185)**	-0.13
Free State	-0.007 (0.123)	-0.001	0.096 (0.158)	0.02	-0.306 (0.131)**	-0.06
KwaZulu/Natal	-0.295 (0.118)**	-0.07	0.234 (0.157)	0.05	-0.434 (0.131)**	-0.08
North West	-0.389 (0.128)**	-0.1	0.144 (0.160)	0.03	-0.335 (0.131)**	-0.06
Gauteng	0.174 (0.124)	0.04	0.442 (0.156)**	0.08	-0.043 (0.130)	-0.01
Mpumalanga	-0.319 (0.124)**	-0.08	0.28 (0.16)*	0.05	-0.089 (0.134)	-0.02
Northern Province	-0.659 (0.129)**	-0.16	0.118 (0.157)	0.02	-0.091 (0.134)	-0.02
Co-habiting	-0.406 (0.104)**	-0.1	0.312 (0.102)**	0.06	0.016 (0.116)	0.03
Widow	0.152 (0.089)*	0.04	0.239 (0.113)**	0.05	-0.305 (0.118)**	-0.06
Divorcee	0.746 (0.121)**	0.18	0.734 (0.150)**	0.13	-0.106 (0.156)	-0.02
Married	-0.557 (0.051)**	-0.14	-0.211 (0.058)**	-0.04	-0.609 (0.072)**	-0.12
Primary	0.185 (0.058)**	0.05	0.641 (0.072)**	0.12	0.648 (0.088)**	0.11
Secondary	0.024 (0.06)	0.01	0.795 (0.072)**	0.16	0.916 (0.087)**	0.17
Diploma	0.788 (0.107)***	0.19	1.99 (0.168)**	0.24	2.388 (0.225)**	0.22
Degree	1.02 (0.213)***	0.24	1.62 (0.240)**	0.21	2.31 (0.628)**	0.21
Children<6	0.211 (0.038)***	0.05	0.323 (0.047)**	0.07	0.294 (0.051)**	0.05
Children<15	-0.308 (0.048)**	-0.08	-0.449 (0.057)**	-0.09	-0.216 (0.065)**	-0.04
Non-labour income	-0.189 (0.048)**	-0.05	-0.393 (0.043)**	-0.08	-0.351 (0.050)**	-0.06
Constant	-8.725 (0.26)**	-	-10.69 (0.2403)**	-	-9.98 (0.254)**	-
Predicted probability	0.50		0.661		0.70	
Observations	28543		24611		25432	
F	174.37**		202.58**		149.85**	

i) Robust standard errors in parentheses: ** significant at 5%; *** significant at 1%.
ii) The referent variables are: rural for the rural urban spatial dimension, Western Cape for the provinces, Elementary education level (grades R-2) for the education levels and Single for marital Status.

Table 8: Strict Participation Regressions for South African women (1995, 1999 and 2004)

	1995		1999		2004	
Variable	Coefficients	Marginal Effect	Coefficients	Marginal Effect	Coefficients	Marginal Effect
Age	0.426 (0.008)**	0.1	0.474 (0.009)**	0.11	0.41 (0.010)**	0.1
Age-Squared	-0.005 (0.000)**	-0.001	-0.006 (0.000)**	-0.001	-0.005 (0.001)**	-0.001
urban	0.424 (0.044)**	0.1	0.336 (0.047)**	0.08	0.449 (0.053)**	0.11
Eastern Cape	-0.409 (0.073)**	-0.09	-0.504 (0.089)**	-0.12	-0.371 (0.097)**	-0.09
Northern Cape	-0.42 (0.091)**	-0.09	-0.392 (0.107)**	-0.1	-0.639 (0.097)**	-0.15
Free State	-0.015 (0.083)	-0.04	-0.154 (0.092)*	-0.04	-0.234 (0.103)*	-0.06
KwaZulu/Natal	-0.141 (0.074)*	-0.03	-0.139 (0.087)	-0.03	-0.254 (0.097)**	-0.06
North West	-0.286 (0.089)**	-0.06	-0.4204 (0.090)**	-0.10	-0.615 (0.106)**	-0.15
Gauteng	0.208 (0.073)**	0.05	-0.195 (0.081)**	-0.04	-0.231 (0.101)**	-0.06
Mpumalanga	-0.382 (0.086)**	-0.08	0.003 (0.091)	-0.001	-0.190 (0.103)**	-0.05
Northern Province	-0.61 (0.097)**	-0.13	-0.23 (0.097)**	-0.06	-0.472 (0.109)**	-0.11
Co-habiting	0.002 (0.080)	0.00	-0.117 (0.069)*	-0.03	-0.193 (0.071)**	-0.05
Widow	0.315 (0.074)**	0.08	0.191 (0.083)**	0.05	-0.038 (0.090)	-0.01
Divorcee	0.739 (0.084)**	0.18	0.546 (0.092)**	0.14	0.238 (0.111)*	0.06
Married	-0.312 (0.042)**	-0.07	-0.451 (0.044)**	-0.11	-0.525 (0.055)**	-0.13
Primary	0.129 (0.052)**	0.03	0.241 (0.055)**	0.06	0.191 (0.069)**	0.05
Secondary	0.247 (0.054)**	0.06	0.525 (0.056)**	0.13	0.560 (0.066)**	0.14
Diploma	1.420 (0.082)**	0.34	1.930 (0.103)**	0.4	1.948 (0.132)**	0.39
Degree	1.558 (0.127)**	0.37	1.586 (0.139)**	0.34	1.568 (0.214)**	0.33
Children <15 years	-0.289 (0.039)**	-0.07	-0.388 (0.046)**	-0.1	-0.161 (0.053)**	-0.04
Children<6 years	0.085 (0.034)**	0.02	0.029 (0.039)	0.00	-0.003 (0.047)	0.00
Non-labour income	-0.345 (0.044)**	-0.08	-0.675 (0.037)**	-0.16	-0.486 (0.042)**	-0.12
African	-0.129 (0.058)**	-0.03	-0.089 (0.069)	-0.02	0.160 (0.088)***	0.04
Coloured	0.437 (0.073)**	0.11	0.355 (0.089)**	0.09	0.308 (0.107)**	0.08
Indian	-0.40 (0.090)**	-0.09	-0.309 (0.129)**	-0.08	-0.636 (0.151)**	-0.15
Constant	-7.69 (0.175)**		-7.93 (0.181)**		-7.40 (0.207)**	
F	180.04**		173.59		107.52**	
Observations	40448		31772		32907	

i) Robust standard errors in parentheses: *** Significant at 1%, * *significant at 5%; * significant at 10%.

ii) The referent variables are: rural, Western Cape for the provinces, Elementary education level (grades R-2), Single for marital Status and white for racial groups.

Table 9: Broad Participation Regressions for South African women (1995, 1999 and 2004)

	1995		1999		2004	
Variable	Coefficients	Marginal Effect	Coefficients	Marginal Effect	Coefficients	Marginal Effect
Age	0.511 (0.008)**	0.13	0.62 (0.009)**	0.12	0.595 (0.011)**	0.11
Age-Squared	-0.006 (0.000)**	-0.001	-0.008 (0.000)**	-0.001	-0.007 (0.000)**	-0.001
urban	0.368 (0.041)**	0.09	0.2018 (0.046)**	0.04	0.128 (0.049)*	0.02
Eastern Cape	-0.334 (0.068)**	-0.08	-0.111 (0.091)	-0.02	-0.515 (0.104)**	-0.11
Northern Cape	-0.342 (0.09)**	-0.09	-0.106 (0.120)	-0.03	-0.409 (0.110)**	-0.08
Free State	0.094 (0.078)	0.02	0.054 (0.099)	0.01	-0.254 (0.110)**	-0.05
KwaZulu/Natal	-0.117 (0.071)*	-0.03	0.163 (0.096)	0.03	-0.376 (0.109)**	-0.07
North West	-0.255 (0.084)**	-0.06	0.063 (0.101)	0.01	-0.303 (0.113)**	-0.06
Gauteng	0.262 (0.073)**	0.05	0.334 (0.094)**	0.06	-0.021 (0.115)	-0.01
Mpumalanga	-0.191 (0.081)**	-0.05	0.184 (0.103)*	0.04	-0.089 (0.119)	-0.01
Northern Province	-0.455 (0.088)**	-0.11	0.06 (0.10)	0.01	-0.037 (0.115)	-0.01
Co-habiting	-0.293 (0.088)**	-0.07	0.282 (0.090)**	0.05	0.053 (0.106)	-0.01
Widow	0.119 (0.078)*	0.03	0.266 (0.097)**	0.05	-0.291 (0.106)**	-0.06
Divorcee	0.733 (0.097)**	0.17	0.717 (0.123)**	0.12	0.019 0.135	0.003
Married	-0.564 (0.044)**	-0.14	-0.377 (0.049)**	-0.08	-0.70 (0.062)**	-0.14
Primary	0.093 (0.053)*	0.02	0.466 (0.066)**	0.09	0.514 (0.081)**	0.09
Secondary	-0.032 0.053	-0.001	0.621 (0.066)**	0.13	0.783 (0.081)**	0.15
Diploma	0.832 (0.085)**	0.19	1.77 (0.134)**	0.23	2.15 (0.172)**	0.23
Degree	1.004 (0.127)**	0.23	1.447 (0.170)**	0.2	1.453 (0.272)**	0.18
Children <15 years	-0.362 (0.038)**	-0.09	-0.456 (0.049)**	-0.09	-0.223 (0.055)**	-0.04
Children<6 years	0.228 (0.032)**	0.06	0.306 (0.041)**	0.06	0.302 (0.046)	0.06
Non-labour income	-0.22 (0.041)**	-0.06	-0.415 (0.037)**	-0.09	-0.356 (0.043)**	-0.07
African	0.296 (0.058)**	0.07	0.474 (0.076)***	0.1	0.789 (0.102)***	0.16
Coloured	0.501 (0.071)**	0.12	0.75 (0.102)**	0.13	0.533 (0.124)**	0.09
Indian	-0.398 (0.091)**	-0.1	-0.268 (0.156)*	-0.06	-0.444 (0.168)**	-0.09
Constant	-8.37 (0.165)**		-10.12 (0.196)**		-9.89 (0.242)**	
F	197.47**		193.18**		131.76**	
Observations	40448		31772		32907	

i) Robust standard errors in parentheses: *** Significant at 1%, ** significant at 5%;
* significant at 10%.
ii) The referent variables are: rural for the rural urban spatial dimension, Western Cape for the provinces, Elementary education level (grades R-2) for the education levels and Single for marital Status.

Table 10: Coefficients, Marginal and Joint probabilities from Bivariate Probit models of Marriage and Labour Force Participation of African Women

	1995					1999					2004				
Variable	lfp	Married	PM1	PM2	P11	lfp	Married	PM1	PM2	P11	Lfp	Married	PM1	PM2	p11
Age	0.249 (0.005)**	0.266 (0.005)**	0.09	0.09	0.05	0.271 (0.005)**	0.245 (0.006)**	0.10	0.07	0.05	0.224 (0.006)**	0.255 (0.008)**	0.09	0.07	0.04
Age-Squared	-0.003 (0.000)**	-0.002 (0.000)**	-0.001	-0.001	-0.001	-0.003 (0.000)**	-0.002 (0.000)**	-0.001	-0.001	-0.001	-0.003 (0.000)**	-0.003 (0.000)**	-0.001	-0.001	-0.000
Primary	0.143 (0.033)**	0.002 (0.03)	0.05	***0.001***	0.01	0.208 (0.035)**	0.094 (0.034)**	0.08	0.03	0.03	0.165 (0.044)**	0.115 (0.408)**	0.07	0.03	0.03
Secondary	0.204 (0.037)**	-0.106 (0.032)**	0.07	-0.04	0.01	0.390 (0.036)**	0.032 (0.036)	0.15	***-0.01***	0.04	0.471 (0.041)**	0.082 (0.041)	0.16	0.02	0.04
Diploma	1.001 (0.063)**	0.028 (0.053)	0.38	***-0.01***	0.01	1.275 (0.068)**	0.248 (0.060)**	0.45	0.08	0.17	1.224 (0.093)**	0.316 (0.073)**	0.42	0.09	0.16
Degree	1. 163 (0.120)**	0.021 (0.106)	0. 44	***-0.01***	0. 11	1.302 (0.112)**	0.285 (0.094)**	0.45	0.09	0.18	1.364 (0.170)**	0.254 (0.117)***	0.44	0.07	0.15
Eastern Cape	-0.419 (0.068)**	0.048 (0.092)	-0.14	***0.02***	-0.03	-0.388 (0.077)**	-0.076 (0.076)	-0.15	***-0.02***	-0.04	-0.396 (0.080)**	0.072 (0.115)	-0.15	***0.02***	-0.02
Northern Cape	-0.160 (0.102)	-0.130 (0.139)	-0.05	***-0.04***	-0.02	-0.193 (0.126)	-0.404 (0.109)**	-0.07	-0.10	-0.05	-0.525 (0.104)**	-0.090 (0.142)	-0.20	***-0.02***	-0.04
Free State	-0.096 (0.071)	0.219 (0.095)**	***-0.03***	0.08	***-0.01***	-0.154 (0.077)*	0.014 (0.077)	-0.06	***0.04***	-0.01	-0.298 (0.082)**	0.037 (0.116)	-0.11	***0.01***	-0.02
KwaZulu/Natal	-0.214 (0.068)**	-0. 125 (0.092)	-0.07	***-0.04***	-0.03	-0.113 (0.075)	-0.475 (0.076)**	-0.04	-0.13	-0.05	-0.284 (0.078)**	-0.278 (0.114)	-0.11	-0.07	-0.04
North West	-0.286 (0.075)**	-0.067 (0. 098)	-0.09	***-0.02***	-0.03	-0.295 (0.076)**	-0.253 (0.077)**	-0.11	-0.07	-0.04	-0.519 (0.085)**	-0.85 (0.120)*	-0.20	-0.05	-0.04
Gauteng	0.032 (0.070)	0.229 (0.097)**	***0.01***	0.08	0.02	-0.195 (0.073)**	-0.106 (0.073)	-0.07	***-0.03***	-0.03	-0.323 (0.081)**	0.101 (0.114)	-0.13	***0.03***	-0.01
Mpumalanga	-0. 351 (0.073)**	-0.028 (0.098)	-0.11	***-0.01***	-0.03	-0.027 (0.076)	-0.251 (0.078)**	***-0.01***	-0.07	-0.03	-0.247 (0.081)**	-0.107 (0.117)	-0.10	***-0.03***	-0.03
Northern Province	-0.550 (0.077)**	0. 159 (0.098)*	-0.17	***0.05***	-0.03	-0.210 (0.079)**	0.060 (0.076)	-0.08	***0.02***	***-0.01***	-0.458 (0.084)**	0.223 (0.118)***	-0.18	0.06	-0.01
Urban	0.269 (0.030)**	-0. 203 (0.029)**	0.09	-0.07	***0.003***	0.277 (0.032)**	-0.352 (0.031)**	0.11	-0.10	-0.02	0.299 (0.035)**	0.259 (0.036)***	0.12	-0.07	-0.04
Non labour income	-0.1872 (0.030)**	-0.394 (0.029)**	-0.06	-0.12	-0.04	-0.385 (0.024)**	-0.256 (0.025)**	-0.15	-0.07	-0.06	-0.283 (0.027)**	-0.208 (0.029)**	-0.11	-0.05	-0.01
Constant	-4.84 (0.121)**	-5.51 (0.143)**	-	-	-	-5.005 (0.122)**	-5.060 (0.148)**	-	-	-	-4.137 (0.133)**	-5.566 (0.186)**	-	-	-
rho	-0.120 (0.015)**	-	-	-	-	-0.138 (0.015)**	-	-	-	-	-0.133 (0.018)**	-	-	-	-
Chi^2 Statistic for the model	8080**					7177**					4868**				
N	28227	-	-	-	-	25274	-	-	-	-	26677	-	-	-	-

Robust standard errors in parentheses * significant at 5%; ** significant at 1%, *** significant at 10%.(ii) PMI and PM2 are marginal success probabilities for Labour force participation and Marriage respectively. P11 represents Joint probability of success for both marriage and labour force participation; **italicised/boldened marginal or joint probabilities are insignificant**.

Table 11: Other Joint Probabilities for marriage and Labour Force Participation

	1995			1999			2004		
Variable	P10	p01	p00	p10	p01	p00	p10	p01	p00
Age	0.04	0.04	-0.12	0.05	-0.02	-0.13	0.05	0.02	-0.11
Age-Squared	-0.001	0.00	0.001	-0.001	-0.002	0.001	-0.001	-0.00	0.001
Primary	0.04	***-0.01***	-0.04	***0.05***	***-0.001***	-0.08	0.04	***0.01***	-0.07
Secondary	0.06	-0.04	-0.03	0.12	-0.03	-0.13	0.12	-0.01	-0.15
Diploma	0.29	-0.11	-0.28	0.28	-0.09	-0.36	0.26	-0.06	-0.35
Degree	0.32	-0.12	-0.32	0.26	-0.09	-0.36	0.29	-0.08	-0.36
Eastern Cape	-0.11	0.05	0.09	-0.11	***0.01***	0.13	-0.13	0.04	0.11
Northern Cape	***-0.03***	***0.02***	0.07	***-0.03***	-0.06	0.13	-0.16	***0.01***	0.18
Free State	-0.04	0.06	***-0.03***	-0.05	***0.02***	0.04	-0.10	***0.02***	0.09
KwaZulu/Natal	-0.05	***-0.01***	0.09	***-0.01***	0.07	0.12	-0.07	***-0.02***	0.14
North West	-0.07	***0.01***	0.09	-0.07	-0.03	0.14	-0.15	***-0.001***	0.20
Gauteng	***-0.01***	0.05	-0.06	-0.05	***-0.01***	0.08	-0.11	0.04	0.07
Mpumalanga	-0.08	***0.02***	0.09	***-0.02***	-0.04	0.05	-0.07	***-0.001***	0.10
Northern Province	-0.14	0.09	0.09	-0.07	***0.03***	0.05	-0.16	0.07	0.10
urban	0.09	-0.07	-0.03	0.13	-0.09	-0.02	0.13	-0.06	-0.06
Non labour income	-0.02	-0.07	0.14	-0.09	0.02	0.17	-0.07	***-0.01***	0.12

P10 = pr(lfp=1, marriage=0); P01 = pr(lfp=0, marriage=1); P00 = pr(lfp=0, marriage=0)
Italicised/boldened marginal or joint probabilities are insignificant.

Table 12: Decomposition of the change in African women's labour force Participation between 1995 and 2004 (% point change shown)

Definition of the Economically Active	**Strict**	**Broad**
Total change in labour force participation	***11.67***	**17.49**
Change due to Characteristics:		
Total	***-1.23***	***-0.75***
	(-11 %)	***(-4 %)***
Factor Shares		
Age	0.93	10.63
Education	-0.42	-0.11
Provinces	0.18	3.70
Marital Status	0.66	5.11
Non- Labour income	-4.27	-24.37
Children<15	0.04	0.26
Children<6	-0.02	1.56
Urban dummy	1.67	2.48
Change due to coefficients		
Total	***12.9***	***18.24***
	(111%)	***(104 %)***
Factor Shares		
Age	13.12	16.42
Education	0.06	1.87
Provinces	-0.48	0.30
Marital Status	-0.09	0.26
Non- Labour income	0.16	-0.25
Children <15years	-0.06	0.65
Children<6 years	0.34	0.37
Urban dummy	-0.16	-0.86

Chapter Three

3. Exploring Gender Wage "Discrimination" In South Africa, 1995-2004: A Quantile Regression Approach

3.1. Introduction

The preceding chapter found that the increase in African female labour force participation between 1995 and 2004 was mainly due to behavioural response rather than to a change in labour market characteristics. However, this evidence does not accommodate the fact that the feminisation of the South African labour market is not an unqualified good. This follows from the argument, in chapter one, that the feminisation is related to persistent inequalities in the labour market. Hence, an understanding of the changes in the status of African women in the post-Apartheid labour market requires an investigation of some of the inequalities associated with the trend. To that end, this chapter will delve into one of the inequities. Specifically, we will investigate the gender pay gaps observed among Africans in 1995, 1999 and 2004. We will demonstrate that the magnitude and sources of the gender wage gaps are not uniform across the quantiles of the wage distributions. Especially, the unexplained component of the wage gap "discrimination" is larger at the bottom of the wage distribution than at the top. Furthermore, the latter did not generally show a declining tendency across the wage distribution from 1995 to 2004.

The chapter is organised as follows. Section 3.2 gives an outline of the debate on gender pay gaps. Section 3.3 presents the theoretical basis for post entry gender wage discrimination. Section 3.4 reviews some empirical literature which employed the quantile regression approach and also considers earlier South African studies. Thereafter, section 3.5 poses the human capital earnings functions and the specification of the empirical wage and employment models. Section 3.6 expounds on the methodology and data analyses. Section 3.7 discusses the findings while the conclusions are drawn in section 3.8.

3.2. The Gender Pay Gap Debate: an Overview

The question of equality between the sexes, particularly in relation to their earnings capacity in the labour market, dates back to as early as the 19th century (Amsden, 1980:11; Goldin, 1990: 59). Specifically, women's earnings in practically all advanced countries have historically hovered around 60 percent of men's earnings (Sapsford and Tzannatos, 1993:210; Amsden, 1980). This gender disparity, however, is not unique to developed countries as it is also a feature of developing countries. This phenomenon has been unveiled in the World Bank (2001) report which showed that in virtually every country in the world, women earn less on average

as compared to men with the exception of Chile in 1996. To comprehend the origin of these disparities in developing economies, this chapter explores the extent to which "discrimination"[50] is responsible for the South African case.

Considering the issue of definition, sex wage discrimination is a situation whereby persons who are equally productive in a physical or material sense, receive different wages solely because of their gender[51] (Altonji and Blank, 1999:3168; Cahuc and Zylberberg, 2004:261). Typically, discrimination renders a labour market inefficient, as it fails to speedily allocate labour inputs and skills to areas where they are mostly and urgently needed. Consequently, this compromises the role of the labour market as an important vehicle for economic growth. Incidentally, probing into the incidence of wage discrimination portrays economists' concern with both the equity and efficiency goals of an economic system (Sloane, 1985; Bendix, 2001). As such, evaluating this problem is essential in the formulation of policies to equalize opportunities for men and women in the labour market, which is a prerequisite for economic development.

Because of the importance of understanding the incidence and nature of discrimination as the cause of gender pay gaps substantive methodological contributions have been made over the years (Beblo *et al*, 2003). These follow the popularization of the classical works of Oaxaca (1973) and Blinder (1973). Accordingly, two methodological issues have to be addressed. Firstly, male and female wage equations have to be estimated consistently after controlling for technical problems such as sample selection bias, heterogeneity and endogeneity (Beblo *et al*, 2003). The second procedural consideration regards to the appropriate decomposition of the gender pay gap which allows meaningful interpretation of its components (Beblo *et al*, 2003). Such components may include rewards to different levels of human capital endowments and the unexplained element which is usually described as discrimination (Altonji and Blank, 1999:3153-4; Cahuc and Zylberberg, 2004:281).

Following the above framework, earlier studies employed wage estimation methodologies and decomposition techniques which focused exclusively on the conditional mean. This prompted researchers to assume that the sizes of the wage gaps and their possible causes were constant along the whole wage distribution (Kee, 2005) (see Andersson, 1995; Appleton *et al*, 1996; Knight and Sabot, 1982; Chu Ng, 1991 and Siphambe *et al*, 2001 *among others*). For that reason, little attention has been paid to the disparate size of the wage gaps experienced by females whose incomes lie at the top or at the bottom ends of the wage distributions (Kuhn,

[50] Discrimination here is in quotes because it is difficult to get its exact measure due to difficulties faced in disentangling the effects of omitted variables like intrinsic characteristics from the unexplained component of the wage gap which is attributable to discrimination. Moreover, we do not consider premarket discrimination and feedback effects. Hence, our results should be interpreted with caution as they are just indicators of the extent of "post entry" gender wage discrimination.

[51] However, it is difficult to distinguish between the effects of past vs. current discrimination on productivity based characteristics (Altonji and Blank, 1999).

1987; Kee, 2005). This omission is cause for concern because individuals whose incomes fall into distinct quantiles of the wage distribution potentially experience different degrees of discrimination.

Recent lines of research have however managed to overcome the above limitation by including distributional aspects in the study of wage disparities (Buchinsky, 1994 1995, 1998; Albrecht *et al*, 2003 2004; de la Rica *et al*, 2005). The bulk of the literature which follows this route mainly employs the Koenker and Basset (1978) quantile regression technique in estimating wages. This facilitates analyses of the gender wage gaps at different points of the wage distribution. In synopsis, the researchers demonstrated that the size of the wage gap is not constant along the whole wage distribution.

In consideration of these methodological developments, this research aims to contribute to the South African debate on gender pay gaps by applying quantile regression estimation and counterfactual decomposition methods. It is reiterated that the study seeks to explore whether the incidence of gender wage "discrimination" has been increasing or decreasing across the entire wage distribution from 1995-2004. In the process we shall ascertain whether a 'glass ceiling'[52] exists or if instead a "sticky floor"[53] is more prevalent among the African populace in the South African labour market.

3.3. Theoretical Explanations

This section gives the theoretical underpinnings for the incidence of post entry gender wage discrimination. Although there are many discrimination theories, this work exclusively focuses on competitive (broadly divided into taste based and statistical models) and institutionalist models (For a thorough discussion of discrimination theories, see for instance, Amsden (1980) and Altonji and Blank (1999)). These theories were selected because they are more relevant to the South African setting.

3.3.1. Taste-Based Discrimination Theory

The taste-based theory originated from Becker (1957, 1971) who argued that discrimination results from mere taste by members of a particular group, which could be employers, customers or fellow employees against other employees who could be women or a particular race or ethnic group. In this vein, the disadvantaged group (women) would be employable on condition they accept lower wages (Altonji and Blank, 1999; Autor, 2003; Ehrenberg and Smith, 2006). The following formalisation brings about the basics of the model:

- Let M denote males (favoured group) and F females (segregated group)

[52] Glass ceiling is a situation where the gender gaps are typically wider at the top of the wage distribution.
[53] A Sticky floor is a situation whereby the gender gaps are wider at the bottom of the wage distribution.

- Also, suppose men and women are equally productive, that is, they have the same marginal revenue products: $MRP_m = MRP_f = MRP$

- Furthermore, let the strength of an employers' prejudice be captured by Becker's discrimination coefficient d. This prejudice manifests in devaluing women's productivity. As such, the employer's subjective productivity for women is equal to $MRP - d$.

- Additionally, assume that the optimal number of workers hired at each firm is determined by the w = MRP condition. Thus, firms will hire men until their wages equal their marginal revenue product: w_m = MRP, whilst, because of prejudice, the corresponding condition for women is $w_f = MRP - d$. This situation implies that $w_m = MRP > w_f$.

- If we re-arrange the hiring condition for women: $w_f = MRP - d$ to $w_f + d = MRP$

  we get the key implication of the model; that prejudiced employers (d>0) will act as if the wage of group F members is $w_f + d$. Hence, they will only hire group F members if $w_m - w_f \geq d$.

The model implies that if there are enough non-discriminating employers, discrimination will be competed away. The less prejudiced profit-maximizing employers (in a capitalist society) would hire more people from the group discriminated against so as to decrease their costs. This would force prejudiced employers to do the same in order to maintain their profits. In principle, this theoretical consideration does not tally with persistent gender wage discrimination in South Africa (Amsden, 1980; Altonji and Blank, 1999). However, in practice, the fact that South African industries are not very competitive (in terms of industrial structure) means that there are lesser chances that discrimination may be competed away (Fallon and Lucas, 1998). Thus, the theory is potentially useful in explaining the persistence of gender wage discrimination in South Africa.

The key testable implications of the model are: (i) wage disparities: female workers earn less than equally productive male workers, (ii) Employment prejudice: firms are less likely to employ female workers of equal productivity with men (Autor, 2003).

Besides employers, workers and customers may also have a taste for discrimination. For instance, some members of the M group may have distaste for working with F workers and demand some compensation to work alongside them. This scenario has similar consequences to F workers as employer discrimination (receipt of lower wages than M workers) and leads to

segregation. Ideally, a profit maximising firm will employ an all F workforce since $W_f < W_m$, (presuming the workers are perfect substitutes). This means the two groups will only be employed together if there is an insufficient supply of F workers at the going wage.

As discussed above, customers may also discriminate against F workers. Thus, they wish to be served by M workers in some situations e.g. a motor mechanic. However, for F workers to be employed in such jobs, they must accept lower wages than equally qualified M workers as their worth to the firm is devalued by customers' prejudice (Autor, 2003; Ehrenberg and Smith, 2000:411). This situation promotes the use of segregated workforces, since firms that cater for discriminatory customers will only hire M workers, pay higher wages and charge higher prices than firms that employ F workers.

While it is clear that employer discrimination can be competed away by the market, the same cannot be said for customer discrimination as there is not a defined channel for one consumer to arbitrage the discrimination of another (Autor, 2003). Of course, that discriminatory customers may be willing to pay higher prices for services, may be true in equilibrium. This supposition implies that customer prejudice may be an lasting cause of labour market discrimination than employer prejudice (Autor, 2003).

3.3.2. Statistical Discrimination Theory

Alternatively, employers may discriminate against women due to imperfect information in the labour market, as explained by the concept of statistical discrimination. This view was popularised by *inter alia* Phelps (1972) and Arrow (1973), Aigner and Cain (1977) and Lundberg and Startz (1983). Its premise is that firms have limited information on labour force participation and productivity about each prospective employee. As a result, "employers use the average characteristics of the group to which an individual belongs to infer the expected productivity of applicants (if these factors are correlated with productivity)", Autor, 2003. Thus, some female workers will get lower wage rates when compared to men due to their low expected productivity and not because their actual productivity would be lower[54]. The theory implies that, unless the average productivity of women changes, there is no compelling reason why gender discrimination should diminish over time (Berndt, 1991:182). Hence, discrimination is a solution to the signal extraction problem which explains the persistence of earnings differentials (Altonji and Blank, 1999; Cahuc and Zylberberg, 2004).

In the case of South Africa, the data sets show that this model can only account for earnings disparities between the sexes if education does not predict productivity very well. Specifically, within each race, there is no substantial difference in educational attainment between men and

[54] Although, this will not be true on average within each group since expected productivity equals true productivity on average.

women as well as in the distribution of employees across the education levels (Winter, 1999; Casale, 2003). Therefore, the potential conduits for women's relatively lower levels of human capital when compared to men are experience and on the job training which could be a result of interruptions from childbirth.[55]

However, the main limitation of this hypothesis is that it is difficult to test. Hence, it may be impracticable to detect how employers form expectations. Consequently, the tests are mainly indirect. For example, de la Rica *et al* (2005) tested it by tracing the interaction between gender and job tenure in occupations where women could have been discriminated against due to historically low participation. They found indications of discrimination, "especially, as job tenure increased women became more reliable in employers' eyes and their wages converged to men's", de la Rica *et al* (2005. Accordingly, any perceptible gender pay gap can be ascribed to statistical discrimination.

3.3.3. Segmented Labour Market Theory

Other relevant explanations are posed by the institutionalists or segmented labour market theorists. These scholars maintain that job discrimination (whereby equally qualified groups of workers are not on average awarded equally remunerative jobs) is crucial in explaining persistent gender wage differentials (Amsden, 1980:19). Notably, there are a number of segmented labour market models, all differing in terms of the quantity of sectors believed to characterise the labour market, the attributes of the workers confined to each segment and the causes of segmentation (Isemonger and Roberts, 1999). The most popular ones are the dual labour market theories by Doeringer and Piore (1971) and Dickens and Lang (1985). These paradigms distinguish between a 'primary' and a 'secondary' sector of the labour market. According to Anker (1997), jobs in the primary sector are relatively good in terms of pay, security, opportunities for advancement and working conditions. On the contrary, jobs in the secondary sector are fairly poor in view to the aforesaid conditions. It is also hypothesised that barriers to mobility (economic and non-economic) make it extremely difficult for workers to pass from the secondary to the primary sector. Moreover, that the majority of women are found in the secondary sector workforce is offered as an explanation for their lower wages on average (Dex, 1985:132).

Although these theories lack clarity on what initially caused women to be restricted to secondary jobs, they partially explain the persistence of gender wage discrimination in post-Apartheid South Africa. For instance, Winter (1999) reveals that South African women are concentrated in low paying jobs consequential on job segregation. Additionally, Casale (2003) opines that the feminisation of the South African labour market has been driven more by supply side factors than demand side factors hence it has pushed most African women into elementary

[55] Unfortunately, there is not much information in the surveys to test this possibility.

occupations (i.e. domestic and service/sales occupations). In this vein, job differentials partly account for gender earnings disparities in the economy. In conclusion, the afore-cited potential causes of wage disparities are not necessarily mutually exclusive and hence, may occur in conjunction with each other.

3.4. Review of Previous Empirical Research

Initially, the discussion focuses on studies which pursued the quantile regression approach in general before concentrating on the South African case.

3.4.1. Quantile Regression Based Studies

It is reiterated that the quantile regression technique originated from Koenker and Basset (1978). Generally, Buchinsky (1994 1996 and 1998) instigated its application in the milieu of earnings functions. In particular, he explored women's wage differentials at various percentiles of the conditional wage distributions in the United States. To address the issue of female selection bias, he approximated the inverse Mill's ratio from a non-parametric single-index selection model into power series expansions[56] (Kee, 2005). However, this method has the potential pitfall that the wage regression intercept term is not identified given its conflation with the constant term associated with the higher order series. The results showed that the wage inequality in the U.S decreased for the high school graduates, and individuals with higher levels of education experienced an increase in their wages throughout the wage distribution (Kee, 2005). Although, Buchinsky's focus was on wage disparities among women, his work has been influential to studies on gender wage disparities, especially the sample selection correction procedure.

Following Buchinsky's seminal work, a reasonable number of studies has adopted this methodology. However, the approach has been almost exclusively utilised in the developed countries. For example, Albrecht *et al* (2004) used quantile regression decomposition methods based on Machado and Mata (2001 2005) (MM) to analyse the gender pay gap for men and women who work full time in the Netherlands. Incidentally, the MM bootstrap procedure entails constructing a counterfactual male distribution, namely what women would have been paid if they were paid like men given their characteristics. The generated/hypothetical wage distribution will be used together with the actual female wage distribution, to construct the counterfactual wage gap (differences in the corresponding quantiles of the two distributions) which yields part of the raw wage gap explained by different returns/coefficients.

[56] The method entails estimating a labour force participation model and uses the estimates to compute an index of labour force participation. The index is transformed into several power series expansions. The power series expansions are then included in the wage equation as controls for selection bias. This formulation is adopted since the form of selection bias over the different percentiles of the wage distribution is unknown. However, there is currently little consensus regarding the most appropriate correction procedure for selectivity bias in quantile regression models.

The Albrecht *et al* (2004) study controlled for sample selection bias using Buchinksy's (1998) technique, since the fraction of women who worked full time was quite low in their sample. They explained the log of hourly wage using the basic human capital variables; years of work experience and education, as well as marital status and whether the individual lived in a city. The findings showed that work experience had a positive effect which increased across the quantiles. Also, education had a strong positive effect while the remaining variables were insignificant. The outcomes from the decompositions revealed that the majority of the gender wage gap was due to differences between returns to labour market attributes rather than to disparities in characteristics. This result mainly occurred in the top half of the distribution (strong "glass ceiling" effect). Nevertheless, there were no controls for the endogeneity of education which limits this study.

In contrast to the above study which pooled individuals with different levels of education, other studies stratified their samples by education groups. For example, de la Rica *et al* (2005) maintains that pooling individuals with different levels of education masks some disparities in the pattern of gender wage differentials experienced by these groups of individuals. The study used the same methodology as in Albrecht *et al* (2004) and applied it to a 1999 Spanish data set. They discovered an expanding gender wage gap over the wage distribution for the group with college/tertiary education. Inversely, for less educated groups, the gender wage gap was wider at the bottom than at the top. Thus, in Spain for the more educated there is a "glass ceiling" while for the less educated there is a "sticky floor".

Other studies investigated the impact of occupational segregation on the gender wage differentials. Specifically, Kee (2005) conducted a sectoral analysis of the gender pay gap in both the public and private sectors of the Australian labour market, in which she distinguished the effect of treating occupation and industry dummies as endogenous (excluded from the regression) or exogenous, on the gender wage disparities. The study also used the MM decomposition technique and Buchinsky's procedure to control for selection bias in the wage equations. Controls for sectoral selection bias were also undertaken. They were based on correction terms obtained from logit models of the sectoral participation decision. In terms of findings, the study detected a strong glass ceiling effect in the private sector. Furthermore, the gender wage gap tended to accelerate across the distribution, suggesting that the observed pay gap was a result of differences in returns to gender (Kee, 2005). Remarkably, the inclusion or exclusion of the occupation and industry dummies did not change the overall result, implying that occupational segregation was not responsible for the wage gaps.

As for the developing countries, most studies which pursued the quantile regression approach did not decompose the gender pay gap along the wage distribution. Instead, they estimated pooled quantile regressions and assessed the evolution of a gender dummy along the wage

distribution. Typical studies include Hyder and Reilly (2005) and Ajward and Kurukulasuriya (2002) who investigated the Pakistan and Sri Lankan cases respectively. While this approach may lead such studies to detect the gender wage premium, it under identifies the source of the premium. For instance, Ajward and Kurukulasuriya (2002) investigated ethnic and gender wage disparities in Sri Lanka's formal sector using the Sri Lanka Integrated Survey (1999-2000). Their wage equations were explained by a gender dummy and controls for human capital, sector of employment, geographic location, industry type and number of hours worked. The subsequent quantile regression estimates indicated that the premium paid to male workers in the labour force was more pronounced at the top of the wage distribution. This finding is however, inverse to what Hyder and Reilly (2005) discovered for Pakistan. Nonetheless, the above-mentioned limitation was addressed by Gunawardena (2006) who applied quantile regression and the MM decomposition method to the Sri Lankan gender pay gap. More importantly, the study's findings contradict those reported in Ajward and Kurukulasuriya (2002). In particular, a sticky floor was detected in both the public and private sectors.

In the African context, Nielsen and Rosholm (2001) used quantile regression estimation techniques to investigate sectoral wage gaps in Zambia. In so doing, the study scrutinised the raw gender pay gap and concluded that between 1991 and 1993 the gender pay gap in the private sector was lower at the bottom of the distribution, but in 1996 it was similar across all quantiles. As in the Sri Lankan (2002) and Pakistan cases, the Zambian study did not conduct a decomposition analysis of the wage gap. As a result, the factors that drove the gender pay gaps in the three studies remained unknown. When compared to studies carried out in the developed countries, the Sri Lankan (2002), Pakistani and Zambian case studies did not fully exploit the utility of the quantile regression technique. Therefore, the ability to analyse both the size and components of the gender pay gaps in Gunawardena's (2006) study highlights the benefits of full implementation of the quantile regression technique. Overall, we conclude that the application of quantile regression in the context of gender wage gaps in developing countries is still in its infancy. Nonetheless, its potential is live.

3.4.2. South African Studies on Gender wage gaps

Unlike the Sri Lankan, Pakistani and Zambian cases discussed above, none of the South African studies carried out on this topic has made recourse to quantile regression techniques. In fact, they exclusively concentrated on the conditional mean. For instance, Casale (1998) used the 1995 October Household Survey (OHS) data to investigate the incidence of gender wage discrimination. She estimated a classic Mincerian earnings function, whereby log wages were explained by years of experience, job duration, job duration squared, education, race, occupation sector, residential area, union status, potential experience and its square and a gender dummy. She found that females earn on average 15 percent less than males.

However, the failure to expose the sources of the raw wage gap has limited this study and its potential in suggesting appropriate corrective measures.

Another similar study was carried out by Isemonger and Roberts (1999) who used the 1994 OHS data to investigate post entry gender discrimination. They applied the Chow test to separate earnings functions for males and females presuming that the two earnings functions were equivalent. They discovered that the Chow test was significant at the 1 percent level. This outcome indicated that there was gender stratification in the pay structure. The Blinder (1973) and Oaxaca (1973) decomposition procedure was subsequently employed in their research. Also, both males and females were used interchangeably as the non-discriminatory component[57]. The overall finding was that discrimination accounted for between 35.6 and 66.5 percent of the wage differentials in the South African labour market. Clearly, the maximum utility of these studies (Casale, 1998 and Isemonger and Roberts, 1999) has been diminished by the inability to situate specific gender disparities by race. This is essential given that South Africa is a multi-racial society. Accordingly, these studies do not present a comprehensive description of the sources of the South African gender pay gaps.

After realising the drawbacks ingrained in the above studies, Winter (1999) investigated gender wage differentials in the formal labour market along racial lines. The independent variables incorporated in the study's earnings functions were limited to years of education, experience, experience-squared, log hours and regional variables. The study used Oaxaca-Blinder decompositions and concluded that in all races, women broadly receive low wages for the same human capital as compared to men. Thus, over 70 percent of the wage differentials observed for Africans and Asians was attributable to discrimination. The wage discrimination appeared to be the lowest for Coloureds (41 percent) and highest for Whites (100 percent). As it is, this study can be criticised for truncated coverage of the labour market. However, its domain is justifiable as most labour market institutions, including anti-discrimination laws are mainly followed in the formal sector than the informal sector.

Additionally, Hinks (2002) used the 1995 OHS data and a decomposition technique based on Hinks *et al* (2000) which augmented the standard Oaxaca decomposition approach by assuming that the total sample size wage structure is competitive (however, it is not clear whether their assumption is plausible or not). The study's major finding was that for all racial groups males were overpaid relative to the hypothetical competitive wage while females were underpaid. The largest overpayment was to the White and Indian males at 9 percent and 8 percent respectively with Black males being overpaid by a lowly 4 percent. On the other hand, White and Indian females were the worst underpaid at 13 percent and 16 percent

[57] Male / female wage structure will be used as the wage structure that will prevail in the absence of discrimination, and hence a benchmark for assessing the prevalence of discrimination.

respectively, followed by Black and Coloured women at approximately 11 percent. This finding is consistent with employer discrimination against females.

Gruen (2004) adopted a different approach from the aforementioned studies as she explored both direct and indirect aspects of gender discrimination (for Blacks and Whites only). The study also uniquely investigated the dynamics of the gender wage gap from 1995-1999. It applied a decomposition criterion suggested by Mavromaras (2003) and Neumann and Oaxaca (1998). The main finding was that African women "increasingly suffered from discrimination at the hiring stage whereas White women were more affected by direct discrimination", Gruen (2004). Also, the extent of gender discrimination decreased between 1995 and 1997 for Whites but overall it was growing between 1995 and 1999.

Finally, Rospabe (2001) used 1999 OHS data and extended the analysis of gender discrimination to include wage, employment and occupational discrimination. She used the interval regression technique to estimate the wage models (selectivity corrected) since the income data was in point and intervals. In order to preserve the robustness of the results a non-discriminatory set of coefficients from the pooled structure was used in the decompositions following Neumark (1998). Her findings were that overall women faced a discrimination of 56 percent. Specifically, African women experienced an unexplained earnings differential of 54 percent, while Coloureds, Indians and Whites faced 92 percent, 34 percent and 68 percent respectively.

In summary, quantile regressions have mainly been utilised to analyse gender pay gaps in the first world and there are limited applications in the third world. However, these new and innovative quantile regression approaches are yet to be used in South Africa as shown by the prevalence of studies which focussed on the conditional mean. By utilising these new approaches, this study will not only make a significant methodological contribution but will also investigate the gender premia with respect to strategic explanatory variables such as education along the quantiles of the wage distribution.

3.5. Earnings Functions

This section explores the theoretical framework underpinning wage determination. This framework is crucial as it facilitates the specification and analysis of wage models along gender dimensions. Specifically, we take a closer look at the human capital earnings function developed by Becker and Chiswick (1966)[58] and Mincer (1974). This earnings paradigm dominates research on wages due to its desirable characteristics. For example, it has its basis in a very simplistic competitive theory inaugurated by Schultz (1961), Becker (1964) and Ben-

[58] They developed the simple schooling version while Mincer (1974) added experience to it.

Porath (1967). Willis (1986) provides a survey of the theory and empirical literature on the development of the human capital earnings function.

A detailed derivation of the 'standard' Mincerian income function is given in appendix b. Based on this derivation a wage model of the following form results:

$$\ln y_i = \rho_0 + \rho_1 s_i + \rho_2 x_i - \rho_3 x_i^{\ 2} + u_i \qquad (3.1)$$

Equation (3.1) expresses an individual's log hourly income (lny_i) as a function of his/her measured human capital stock which depends on years of education (s), years of experience (x) and its square (X^2). Notionally, earnings should increase with the accrual of human capital as it enhances productivity, that is, ρ_1 and ρ_2 are > 0 (Mincer, 1974:9; Fallon and Verry, 1988:149 and Cahuc and Zylberberg, 2004:69-87). The square of the years of experience captures the non-linear effect of experience, as it often follows a parabolic shape which peaks somewhere in midlife, thus ρ_3 is < 0. The standard function can be expanded to control for other factors such as tenure, race, gender and location depending on the purpose of the study (Chamberlain and van der Berg, 2002). Similarly, this study extends the Mincerian wage model to include other controls often included in analyses of gender pay gaps in South Africa.

3.5.1. Statistical Earnings function

There is no universally accepted set of conditioning variables that should be included in wage models, especially when describing the causes of gender pay gaps. Nevertheless, this study employs some explanatory variables that can be easily compared with prior studies of wage disparities in South Africa. The variables are defined according to data availability and they can be categorised into controls for human capital (education, experience and hours worked), individual characteristics (marital status, having young children), geographical location (provinces) sector of employment, trade union membership, occupation and industry of employment. The resulting statistical earnings function and a description of the variables are presented below.

$$\ln w_i = \beta + \beta_0 H_i + \beta_1 Age_i - \beta_2 Age_i^{\ 2} + \sum_{j=1}^{5} \beta_{3j} Ed_{ij} + \beta_4 Tu_i + \sum_{j=1}^{8} \beta_{5j} Ind_{ij} + \sum_{j=1}^{8} \beta_{6j} Occ_{ij}$$
$$+ \sum_{j=1}^{8} \beta_{7j} \Pr ov_{ij} + \beta_8 Mstat_i + \beta_9 Chn_i + \varepsilon_i + \lambda_i$$

where **i**= individual, **j**=dummies

H= log weekly hours worked

ln w_i = Log of Employee i's Real Monthly Wage (*dependent variable*)

Edn = Worker i's Educational Level

Age = Worker i's Age [59]

Age^2 = Worker i's Age (squared)

Mstat = Worker i's Marital status

Prov = Employee i's Province of work

Chn = Dummy variable for the presence of young children in worker i's household

Ind = Worker i's Industry of Employment

Occ = Worker i's Occupation

Tu = Employee i's Trade Union membership status

λ = Sample Selection bias correction terms

ε_i = Error term which captures employee heterogeneity

Variable Description

Turning to the description of the variables, while the Mincerian wage model was originally derived in terms of logged hourly wages, logged real gross monthly wages are used in this study. These real wage series' were obtained from deflating nominal monthly wages for the years 1995, 1999 and 2004 to the 1995 base (expressed in 2000 prices) using the South African Reserve Bank's Consumer Price Index (CPI) series (KBP7031J). See appendix b for more details surrounding the derivation of the real wage series.

Education

A series of indicator variables that represent the level of education attained by a worker are utilised in the analyses (see appendix c for the definition of the education levels). However, educational attainment is a noisy measure of a worker's skills since it only measures an input and not output. Moreover, education is potentially endogenous although, lack of appropriate instruments precludes us from carrying out the correction.

Experience

Because the actual measure of experience is not available, in this research age is used as a proxy[60]. Nevertheless, proxy measures of women's professional experience (age or a measure

[59] Stats SA coded the age variable as the number of years that an individual had completed during the time of the Survey. Hence, they rounded off the ages to the nearest number of years completed by an individual.

[60] A proxy variable is one used as a "stand-in" or approximation for a variable that is harder to measure or collect. For example, age and potential experience are often used to proxy work experience.

of potential experience) are particularly prone to errors given discontinuity in their labour force attachment (related to parenting) (Altonji and Blank, 1999:3213). The measures often overstate women's actual experience and this can result in serious biases in the calculation of the discrimination component resulting from Mincerian wage equations. Even so, this caveat does not negate the utility of these variables. Therefore, they were incorporated into this research.

Marital Status and Having Young Children

Being married and having young children are included as proxies for factors such as stability, motivation and discipline (Rospabe, 2001b). Potentially, these factors might stimulate high productivity among workers and thus may have a positive effect on wages. However, having young children may be an indicator of lesser productivity in the case of women due to divided efforts between child care and the labour market, which may reduce their wages. Being married is denoted by a dummy variable =1 if married and 0 if otherwise. The other category (0) stands for co-habiting, widow/er, divorcees and single individuals. Moreover, having young children is captured by two indicator variables which represent the presence of children aged below six and also between 0 and 14 years in the household[61].

Geographical Variations

In order to capture the potential impact of geography on pay structures, we use indicator variables based on provincial information to identify the geographical location of a worker. The geographical coverage extends to all the 9 provinces of the country; Western Cape, Eastern Cape, Northern Cape, Free state, KwaZulu/Natal, Mpumalanga, North West, Northern Cape, Gauteng and Limpopo/ Northern Province.

Trade Unionism

This variable is captured by a dummy variable equal to 1 if one is a trade union member and 0 otherwise. Trade union members can earn significantly more than non-union members, due to the strong bargaining power of the unions. Literature shows that this has been the case in South Africa (Mwabu and Schultz, 1998; Rospabe and Azam, 2005). Typically, selection bias may emerge because not every worker is a member of the union. As such, members and non members could be having different characteristics. Despite the importance of correcting for the bias, methodological challenges make this difficult to achieve. To the best of our knowledge, the issue of selection into unionism has not yet been explicitly addressed within the context of

[61] In the LFS there is no specific marker for the parent of a child. If there is more than one adult woman in the house we cannot conclude which one of this is the mother of the child. Furthermore, in OHS 1995 the number of children that a precise woman has was only asked for individuals aged between 16 and 54, yet our sample covers women aged between 15 and 59. Due to these peculiarities we generated 2 dummy variables which represented the presence of children aged 5 and below and those aged 14 and below in the household.

quantile regression. Hence, we are not sure of the appropriate way to correct for the selection bias over the different percentiles of the wage distribution. Even so, the subject of trade unionism will be given further attention in chapter four.

Occupations and Industry of Employment

Wages often vary from one occupation/industry to another. This is explicable by the theory of compensating wage differentials (see Cahuc and Zylberberg, 2004:250-1). Thus, some occupations/industries pay more to compensate for the difficult working conditions. However, it is debatable whether occupation and industry should be included among the covariates. This is because employers may differentiate between men and women through their tendency to hire into certain occupations. In this case, occupational assignment would be an outcome of employer practices rather than a product of individual choice or productivity differentials (Altonji and Blank, 1999)[62]. In addition, the issue of selection bias also arises in such a scenario, since individuals who work in distinct industries or sectors may be having different attributes. Consideration of the fact that the sample selection corrections are not currently doable further complicates this discussion. This is because correcting for the selectivity entails estimating multinomial logit models which capture all the occupational and industrial categories, yet some categories have very small sample sizes, which preclude an estimation of the required models. Despite the above debate, we included these variables to control for the impact of job heterogeneity on wages, and they are captured through the use of indicator variables. The industrial categories include the following; agriculture, mining, manufacturing, elementary, construction, wholesale, transport, finance and social service[63]. Coming to the issue of occupation, the following categories are coded in the data; manager, professional, technician, clerk, skilled, skilled agriculture worker, trader, operator and elementary worker[64].

λ (Controls for Sample Selection)

Irrespective of the fact that we only observe wages for employed women, it would result in biased outcomes if earnings were simply modelled on the selected sample of wage earners, as they may not be representative of all women (Chamberlain and van der Berg, 2002). The bias arises when some determinants of the work decision also influence the wage (Vella, 1998). This indicates that controlling for the observables only in wages equations is insufficient as some additional process which determines employment may also affect the wage. According to Vella (1998)," if these unobservable characteristics are correlated with the observables then failure to

[62] Unfortunately, our data does not provide information on parents' education or occupation which could provide appropriate instruments to correct for endogeneity.
[63] Include private households, and foreign sector.
[64] Domestic workers are included in this job category. The occupational categories used here are based on the one-digit International Standard Classification of Occupations (ISCO 88). In both the OHSs and the LFSs individuals were asked to provide a brief discussion of their work. These responses were post-coded by Stats SA in accordance with the four-digit ISCO codes. From these the one-digit occupational classifications were derived.

include an estimate of the unobservables will lead to incorrect inference regarding the impact of the observables on wages". Heckman (1979) opined that this exclusion reduces to the omitted variable problem (Chamberlain and van der Berg, 2002). Therefore, the bias is controlled by including appropriate conditioning variables which determine the probability of being employed in the wage equation. Incidentally, this procedure is known as the Heckman sample selection correction procedure/Heckit[65] (Heckman, 1979; Vella, 1998; Chamberlain and van der Berg, 2002)[66].

Nonetheless, there is hardly any consensus regarding the most appropriate correction procedure for selectivity bias in quantile regression models[67]. Despite this, we follow the bulk of the researchers who employed the technique by Buchinsky (1998). This entails approximating the selection term by a higher order series expansion based on the selection index and the inverse Mill's ratio (λ).

3.5.2. Modelling Employment

According to Chamberlain and van der Berg (2002), "the process of selection into employment is often modelled as a binary choice model where individuals are confronted with the 'choice' of being employed or remaining unemployed". This specification is based on the supposition that all unemployment is voluntary, which does not apply to South Africa (Bhorat and Leibbrandt, 2001b:113; Kingdon and Knight, 2000; Chamberlain and van der Berg, 2002). As a result, it is incorrect to similarly model selection into employment (Bhorat and Leibbrandt, 2001b). Instead, an individual's choice to participate in the South African labour market does not guarantee employment. In other words, there is selection into employment. On the word of Chamberlain and van der Berg (2002), "the selection into employment may be influenced by the same factors as the choice to participate such as the individual's preferences, location, level of education and household characteristics and also by other factors such as demand for labour and the characteristics of competing participants", (also see Sprague (1994)).

[65] However, to date there are many variants of the Heckman sample selection procedure, especially those that follow the recently developed semi-parametric estimation techniques.

[66] The implication is that sample selection bias is corrected by including an estimate of the missing variables (determinants of the employment decision) in the specification of the wage equation.

[67] While the two stage procedure addresses selection from labour force participation into all employment, the selectivity problem in this study is more complicated than can be solved by this procedure. Particularly, the study restricts the sample for the wage employed to those employed in the formal sector, informal sector and domestic workers only (see page 72). Thus, it excludes the self employed which complicates the selection process from labour force participation into employment. Ideally, the exclusion calls for a sample selection correction procedure which accounts for unobservable differences between the wage employed and the self employed. However, due to methodological considerations we could not fully control for the selection bias. Hence, the reader should be aware of the omission. It is thus reiterated that, the selection procedure utilised in the study is from labour force participation into all employment and then included in the wage equations for those employed in the formal sector, the informal sector, and domestic work.

In light of the above discussion, the process of controlling for sample selection bias in wage equations involves estimating the earnings functions in two stages. The first stage consists of estimating employment models, accounting for sample selection bias. Controlling for selectivity into employment requires estimating a labour force participation model. The outcomes from the participation model are used to compute an inverse Mill's ratio, sample selection bias correction term, which is included as an additional regressor in the employment models. Afterwards, the estimates from the selectivity corrected employment models are used to compute another sample selection bias correction term which is encompassed in the second stage of the estimation process. In the second stage, earnings functions of those employed are estimated separately by gender. The earnings functions incorporate the inverse Mill's ratios computed from the employment probits hence they are corrected for selectivity into employment.

The work adopts the modelling of the participation process discussed in chapter 2. *In contrast to the labour force participation models, household formation variables, to be exact, dummies for the presence of children aged below 15 years in the household are excluded as these should not have much influence in finding a job*[68]*.* Therefore, we explain the prospects of working using age, age-squared, education, provinces, non-labour income, marital status, the proportion of working age females in the household, urban residence and the sample selection bias correction term. The expectations from the model are that urban residence (relative to rural), the proportion of working age females in the household and higher education levels should increase the probability of being employed. The probability of getting a job is also expected to increase with age, but at a diminishing rate, and the probability will decrease beyond a particular age. In contrast, age-squared is expected to reduce the chances of getting a job. Meanwhile, non-labour income and marital status are anticipated to either increase or reduce the prospects of being employed. In addition to these, we expect systematic differences in employment due to variations in prospects from one province to another (relative to the Western Cape). Having discussed the models, the next section focuses on the estimation framework.

3.6. Methodology

This section presents the study's estimation framework which consists of two main stages. The first stage involves estimating separate human capital earnings functions for men and women (accounting for female sample selection bias) at various percentiles of the wage distributions, using quantile regression. The process of controlling for selectivity entails fitting Heckprobit models of employment on the broadly defined sample of female participants. The Heckprobit method is similar to the Heckit/Heckman sample selection bias correction procedure often applied in mincerian earnings functions (see Heckman, 1979). Because the Heckit model has

[68] These variables serve as the exclusion restrictions in order to identify the employment decision (see section 3.6).

already been discussed, we shall not repeat the exercise (see pg 67-8). However, the difference between a Heckit and a Heckprobit model is that in the Heckprobit, the dependent variable of the main equation is not a continuous, but a dummy variable, which in this study takes a value of one if the individual is employed and zero otherwise (if the individual is either unemployed according to the broad definition or inactive). To control for the possible selectivity[69] implied in excluding the unemployed, the estimates are corrected by a term simultaneously estimated by maximum likelihood using a selection equation (labour force participation model). The dependent variable of the selection equation takes a value of one if the individual is participating in the labour market and of zero otherwise (see STATA, 2001:31-47). This process provides consistent estimates for all parameters of the employment model. Such outcomes will be utilised to compute sample selection correction terms (λs) and these are eventually included in the wage models. The second stage involves using quantile regression decomposition methods to analyse the size and components of the gender wage gaps over the entire conditional wage distribution. The aforesaid estimation techniques are described below.

3.6.1. Estimation Techniques

A. Heckprobit model

According to Stata (2005:469) the Heckprobit model can be summarised as follows.

Assume that there exists an underlying relationship

$$y_j^* = x_j\beta + u_{1j} \quad \text{(latent equation)} \tag{3.2}$$

Such that we observe only the binary outcome

$$y_j^{probit} = \begin{cases} 1 & \text{if } y_j^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad \text{(probit equation)} \tag{3.3}$$

The dependent variable, however, is not always observed. Rather, the dependent variable for the observation j is observed if

$$y_j^{selectt} = \begin{cases} 1 & \text{if } z_j\gamma + u_{2j} > 0 \\ 0 & \text{otherwise} \end{cases} \quad \text{(selection equation)} \tag{3.4}$$

where $u_1 \sim N(0,1);\ u_2 \sim N(0,1)$ and $corr(u_1, u_2) = \rho$

$\rho \neq 0$, that is there is correlation between the error terms of the main and selection equations. For the model to be well-defined, the selection equation should have at least one

[69] If the sample of employees is different from unemployed participants, coefficients of the determinants of employment might be biased.

variable that is not in the probit equation (fertility variables in this case). Otherwise the model is identified only by the functional form and the coefficients have no structural interpretation.

C. Counterfactual Wage Decomposition

The well-known Oaxaca (1973) and Blinder (1973) decomposition criterion can be viewed as a way of comparing actual observations with counterfactual ones (de la Rica *et al*, 2005) Specifically, if we represent women and men's pay structures by β_f and β_m and their labour market characteristics by x_f and x_m, respectively, one is concerned with the fictitious wage that a woman would receive if she was paid according to men's pay structure (β_m) but maintained her own observed characteristics (x_f)[70] (counterfactual wage). In a labour market without discrimination ($\beta_f = \beta_m$), women's actual and fictitious wage distributions would be identical as long as both distributions are based on the same productive characteristics. Thus, any observed differences between women's actual and counterfactual wage distributions suggest the prevalence of gender disparities in pay structures ($\beta_f \neq \beta_m$), which may be due to discrimination.

Nonetheless, we emphasize that, while the Oaxaca-Blinder decomposition criterion is directly applicable to the mean of the wage distributions, it cannot be generalized to other percentiles of the distributions (Beblo *et al*, 2003; de la Rica *et al*, 2005). In particular, the decomposition of the mean wage gap is perceived to be exact (since the inclusion of a constant term in the equation ensures that the O.L.S residuals have zero mean). This property is however lost when applied to the gender wage gap at quantile θ (de la Rica *et al*, 2005). To be precise, in the case of the mean,

$$E(w_i \mid x_i) = x_i'\beta \tag{3.5}$$

implying that the Oaxaca- Blinder decomposition yields:

$$E(w_m) - E(w_f) = (E(x_m) - E(x_f))'\beta_m + E(x_f)'(\beta_m - \beta_f). \tag{3.6}$$

The first term on the right hand side of *3.6* captures the portion of the mean wage gap ascribed to differences in observed characteristics, whilst the second term measures the portion of the gap that is attributable to different pay structures/coefficients to these characteristics.

Nevertheless, as per de la Rica *et al* (2005), in QR, taking *expectations* of the logged wage: $\ln w_i = x_i'\beta_\theta + u_{\theta i}$ at its unconditional quantile of order θ that is $\ln w_i = \ln w_{\theta i}$

[70] Alternatively, we can also generate the density that would arise if women were paid according to women's returns but had men's labour market characteristics.

yields: $\ln w_\theta = E(x \mid w = w_\theta)'\beta_\theta + E(u_\theta \mid w = w_\theta)$ (3.7)

namely, the θ quantile of the (log) wage distribution is equal to its θ conditional quantile evaluated at the vector of mean characteristics of the individuals at that quantile, plus the mean value of the error term for this group of individuals. Thus, in contrast to the O.L.S decomposition at the mean, evaluation of the conditional quantile wage function at

$$E(x \mid w = w_\theta) \quad (3.8)$$

does not yield the desired decomposition. Consequently, we follow Albrecht *et al's* (2003) adoption of the Machado and Mata (MM)'s (2001 2005) bootstrap method which generalizes the Oaxaca-Blinder (1973) criterion to implement the decomposition directly at each quantile[71] (see Kee, 2005; de la Rica *et al*, 2005; Albrecht *et al*, 2004). Following Kee (2005), de la Rica *et al* (2005) and Albrecht *et al* (2004) *among others*, the steps in (MM)'s procedure can be summarized as follows.

1. Using a standard uniform distribution, sample a quantile say the θ^{th} quantile.
2. With the male database, estimate the coefficient vectors β_θ^m at the θ^{th} quantile.
3. From the female database take a draw from women's data (x_f), and construct a predicted wage by multiplying the chosen x_f by the estimate of β_θ^m. Repeat steps 1, 2 and 3 N times (e.g. N=5000) and construct a counterfactual female distribution, namely what women would have earned if they were "paid like men".
4. Then use the generated wage distribution to construct the counterfactual gap[72] $(x_f'\beta_\theta^m - x_f'\beta_\theta^f)$ which yields that part of the raw gap explained by different rewards, that is $x_f'(\beta_\theta^m - \beta_\theta^f)$.

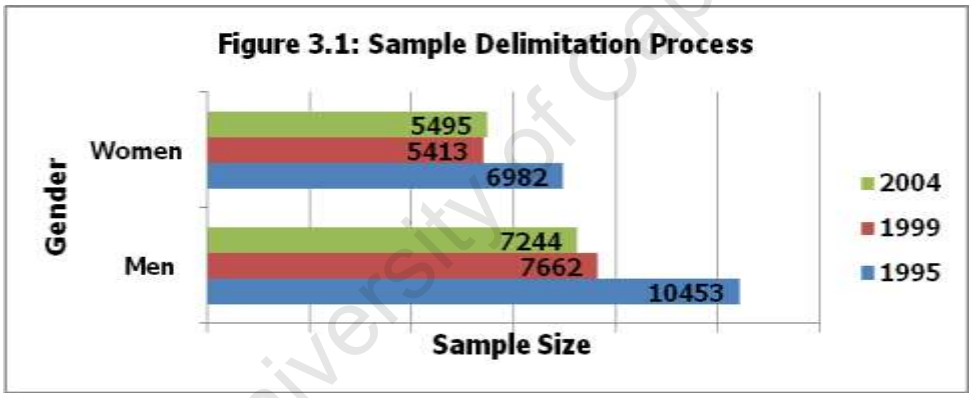
3.6.2 Data Analysis

Before presenting the various estimation results, it is necessary to have a closer look at the data used in the analyses. As mentioned earlier, the research utilised data from the 1995 and 1999 OHSs and the September 2004 Labour Force Survey. Since the data sets have already been discussed (see page 9), in this section we dwell on the sample delineation process. In addition, the summary statistics of the variables used in this chapter will be considered in detail.

[71] There are similar techniques e.g Dinardo Fortin and Lemieux (1996).

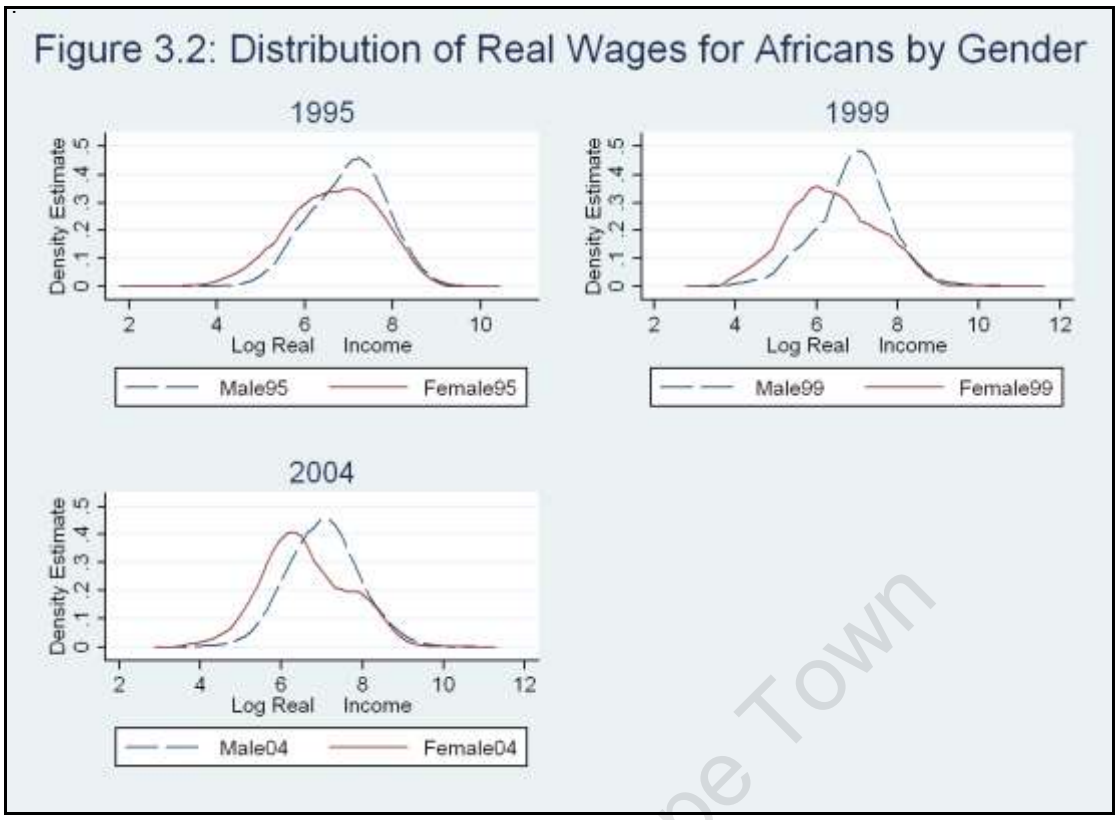
[72] Difference between the female log wage density at various percentiles and the counterfactual density.In line with most of the literature, we chose to evaluate differences in observed characteristics at the men´s returns, under the assumption that their market rewards wages are not distorted by discrimination. A positive sign on the gap implies that returns to men's characteristics are higher than the returns to women's characteristics.

Concerning the samples, it is reiterated that our primary intention was to exclusively focus on the wages of African formal sector employees as they are deemed to be more comparable than wages earned in the informal sector (Gruen, 2004). Regrettably, the available data could not suffice for the proposed analyses. Especially, the 1995 OHS data did not distinguish between formal and informal sector wage workers, while the later surveys did. Due to the inseparability of the formal and informal sector wage workers in the 1995 OHS, the exercise of comparing the wages earned in the formal sector using the 1995 data as the starting point became difficult. Because of this concern, we adopted the second best approach of including working age Africans (15-65 years) employed in the formal, informal, and domestic sectors, who provided their wage information in the questionnaires. The domestic sector was considered as it is the main employer of African women. However, for some, this sample delineation process remains contentious. To that end, we will check the robustness of our results using different sample specifications. Ultimately, the data cleaning exercise engendered the unweighted sample statistics presented in Figure 3.1. The information given in Figure 3.1 tallies with the economy's labour force participation rates since the numbers of employed males constantly outnumber those of women from 1995-2004 (See Table 1, pg2).



The figure also shows that the "total" samples of African employees decreased between 1995 and 2004. The smaller sample sizes for 1999 and 2004 could be due to a sample composition shift or it could be that odd things that we cannot explain happened over time. Even so, our analyses are based on observed wages although it is not clear as to how this will affect our results.

Secondly, analyses of empirical wage density functions for the years 1995, 1999 and 2004 were carried out by gender. The density functions were estimated using an Epanechnikov kernel estimator (see Johnston and DiNardo, 1997:370-375; StataCorp, 2003). Figure 3.2 shows the resulting density plots for Africans.



The three panels in Figure 3.2 indicate that male and female wage distributions are clearly distinct. In regards to this, the female wage distributions mainly lie to the left of the male wage distributions, especially at the lower percentiles of the distributions. Also, the latter are characterised by a relatively lower dispersion around the mode. It is also apparent that the advantage that the males enjoy over females at the lower quantiles of the distributions is significantly reduced at the upper quantiles. Thus, if one considers only the raw wage distributions, it appears there is a "sticky floor" and no "glass ceiling" for African women. Thereafter, a summary of both the dependent and independent variables used by year and gender is provided. The descriptive statistics i.e. means/proportions and standard deviations/linearised standard errors for the proportions are presented in Table 13, pg:86.

Considering the dependent variable, the statistics demonstrate that men's earnings are on average higher than women's[73]. The relatively inferior position of women is however compensated by a 2 percent increase in their real wages between 1995 and 2004, while those of men concurrently decreased by the same proportion. Despite these differences, the data shows that there were no significant changes in the wages over time.

Turning to the covariates, it is notable that the displayed information conveys some traits of patriarchy in trade union membership. Probably, this is due to the relatively higher concentration of women in non-unionised sectors such as the social services (includes domestic

[73] We are reporting average statistics which regrettably conceal the changes that occurred in the distinct percentiles of the wage distribution.

workers). Consequently men's relatively higher wages are partly attributable to the union wage premia. However, as mentioned earlier, chapter four will address this issue in more detail.

Furthermore, the data reveal that the distribution of participants among the provinces (by gender) does not significantly differ across the data sets. Perhaps this is attributable to the similarity of the sample designs.

In the case of education, the statistics exhibit a slightly higher proportion of male participants who attained primary level and below than women. Interestingly, both sexes have a higher proportion of participants who attained secondary school than the other levels. In this vein, for both sexes, the ratio of secondary school graduates increased by around 9 percent from 1995-2004. The data also show that there are slightly more women with diplomas and degrees than males.

The statistics also portray some aspects of industrial concentration. In particular, they show that both genders are concentrated in social services, trade, manufacturing and agriculture. Despite these obvious similarities there are gender disparities in the proportions of participants across these industries. For instance, there is a relatively higher percentage of women in the social services for example, in 1995 the industry accommodated 60 percent of the female participants and the corresponding proportion of men was 23 percent. On the other hand, men appear to dominate women in sectors such as agriculture, mining and construction.

Furthermore, the figures expose that there is a higher ratio of participants in elementary and skilled occupational categories irrespective of sex. It is also evident that there is gender based occupational concentration. In this case, there are more male artisans and operators than women. Inversely, women outnumber men in occupations like technicians and clerks.

Lastly, the information given for marriage and fertility harmonises with the stylised facts as both variables are generally declining with time. Subsequent to this data description process, we proceed to analyse the study's estimation results.

3.7. Estimation Results

Analyses of the results reported in this section follow the estimation framework developed in section 3.5. The discussion of participation models has been omitted in this chapter (the reader is referred to the previous chapter). The outcomes of the employment models presented in Table 15, pg:88 form the starting point for discussion in this section.

3.7.1. Heckprobit Employment Models

The employment models were fit on the broadly defined sample of participants using the Heckprobit estimation procedure. It is reiterated that the procedure applies if there is

correlation between the error terms of the main (employment) and the selection (labour force participation) equations. Incidentally, the correlation coefficients (rho) are significant across the models which show that there is a linkage between the two models. Such outcomes confirm the appropriateness of the Heckprobit model in this case.

In addition, age is shown to significantly increase the chances of getting a job. Diminishing returns are also observed, although the marginal effects are negligible. This means employment rates are lowest among the young age cohorts, rise and then decline as workers approach retirement age. According to Kingdon and Knight (2000) the low employment among youngsters is attributable to their high degree of mobility. To add on, younger people are more likely to enter into voluntary unemployment. Nonetheless, it seems their reservation wages decline with age or with time spent in unemployment (Rospabe, 2001b). In contrast, the decreasing rate of employment as workers become older is consistent with diminishing productivity in the work place. This occurs as formal training/skills decline in relevance against the backdrop of a low likelihood of being trained in new skills due to proximity to retirement age. Besides, we do not rule out the adverse effect of health problems on productivity.

Furthermore, the attainment of secondary and lower levels of education did not always feature significantly as we would have expected in the 3 cross sections (relative to Elementary education). However, positive relationships are displayed between higher levels of education (diploma and degree) and the employment prospects. Arguably, formal education plays a more important role in the attainment of a job at levels beyond secondary school education.

In terms of demographic variables, the results demonstrate that being married is negatively correlated with employment (the employment prospects of married women were about 3 percent lower than those of the base category)[74]. This partly reflects that greater family responsibilities increase the reservation wage which reduces the prospects of being employed rather than unemployed (apart from the 1995 sample where the effect is statistically).

More importantly, non-labour income sizeably reduces an individual's possibility of being employed, by about 10 percent, relative to the base category. This is explainable by the view that the availability of social welfare grants may raise beneficiaries' reservation wages and thus prolong their unemployment durations.

In contrast to Bhorat and Leibbrandt (2001), Kingdon and Knight (2000) and Rospabe (2001b) this study established that residing in an urban area increases the chances of finding employment by 3 percent, relative to living in a rural area. The difference could be due to the fact that they use the broad definition of the labour force while we use the narrow definition.

[74] despite the debate on whether marital status should be included in an employment function due to its possible endogeneity

However, our outcome is expected since urban areas offer more employment opportunities than rural areas.

Another revelation is that the proportion of working age females in a household significantly increases the probability of employment (by 24 percent). This may arise as individuals' job search strategy is often conditioned by household structure (searchers often live together and the same holds with non-searchers) (Dinkelman and Pirouz, 2002). As such, individuals who dwell in households with high proportions of fellow job-seekers have higher chances of getting a job[75]. Perhaps, this occurs as these women form a network and share information on available employment opportunities.

3.7.2. Quantile Regressions

Here, we discuss the quantile regression equations reported at the 10th, 25th, 50th, 75th and 90th percentiles of the wage distributions. The results are presented in Tables 16, pg:89 (for 1995), 17, pg:91 (for 1999) and 18, pg:93 (for 2004). For these regressions, the omitted (base) variables correspond to an unmarried, non-unionised worker with elementary education, residing in Gauteng province, employed as an operator in the manufacturing industry. The distinct wage models are analysed together and their coefficients provide an indication of whether or not the returns to observable characteristics differ by gender and how these differences change as we move across the wage distributions.

The following findings stand out. The coefficients on age/experience for men are always significant. This means that having more experience increases wages up to a certain point of the life cycle but after this peak, an additional year of experience decreases earnings (Rospabe 2001b). Notably, this effect slightly declined as we move up the quantiles of the wage distributions. In contrast to the male equations, these variables do not always feature significantly and as theoretically expected in the female regressions. Importantly, these gender differences in coefficients are statistically significant at the 5 percent level[76], across both the wage distributions and time. Probably, this irregularity shown by women's returns to the variable in question is due to family related career interruptions.

We also discover that earnings increase with the number of hours worked (if significant). The returns are higher at the bottom than at the top of the wage distributions. This can be exemplified by the case for men in 2004, whose coefficients were 0.268 and 0.117 in the 10th and 75th percentiles, respectively. Furthermore, the coefficients tended to both increase with time, and to be skewed in favour of women. For instance, that for women in the 10th percentile

[75] The decision rule used by the worker usually takes the form of comparison of a wage offer to some reservation wage, which depends on both the characteristics and the preferences of the individual. If the wage offer exceeds the reservation wage, the worker accepts the job; otherwise search is continued

[76] The confidence interval approach (95 percent confidence level) was used to test the equality of coefficients. If the confidence intervals overlap, it implies that the coefficients are statistically the same and otherwise.

increased from 0.18 in 1995 to 0.356 in 2004, while the corresponding coefficient for men was 0.137 in 1995 and it improved to 0.268 in 2004. Probably, this outcome is linked to the feminisation of the labour market which saw the entry of most women into lowly-paid casual jobs, where wages are heavily dependent on the number of hours worked. In contrast, a sizeable amount of men still works in full-time jobs, where the number of hours worked is one among many determinants of wages. All the same, statistical tests exhibit that only the gender differences in the coefficients for the 50th and 75th quantiles of the 1999 distributions, and the 10th, 25th and 75th quantiles of the 2004 distributions were statistically significant at the 5 percent level.

Besides, being married (proxy for factors such as stability, discipline and motivation) confer relatively higher chances of having higher returns to men than women. The advantages conferred to workers by this status indicate that it acts as a motivational/productivity signal to employers (Rospabe 2001b). Incidentally, the outcomes for 1995 and 1999 portray that the returns are lower at the upper tails of the male wage distributions, while they are mostly insignificant in female distributions. For instance, in 1995, the 10th percentile coefficient for men was 0.205 and it declined to 0.143 in the 90th percentile. Thus, being married conferred wage premia of 22 percent ((exp. (0.205)-1)*100) and 15.3 percent to men at the bottom and top deciles, respectively. In contrast, the coefficients for 2004 exhibited an irregular pattern across the percentiles of both sexes' wage distributions. Despite these differences, the magnitudes of men's coefficients did not shift significantly between 1995 and 2004. Specifically, the coefficient for the 10th percentile declined by about 5 percent while that for the 90th percentile increased by a similar magnitude. Furthermore, that in 2004 the wage premia for married women in the 10th and 90th percentiles were 13 percent and 9.7 percent, respectively, shows that the advantage presented to women by this variable was lower than that of men. Probably, women's inferior position arises because some employers perceive marriage with its incidences of maternity leave, as a proxy of potential career interruptions. Essentially, these gender differences in coefficients are statistically significant at the 5 percent level.

Quite fundamentally, the regression results show that educational attainment yields higher returns as compared to the base level (elementary). The returns tend to increase with the education levels. According to Rospabe (2001b), this upshot contradicts the law of diminishing returns to the formation of human capital. Nonetheless, this result is consistent with the findings of Lam (1999), Mwabu and Schultz (2000), Hofmeyr (2001) and Rospabe (2003). Probably, it is an artefact of apartheid policies which rationed Africans' acquisition of human capital and thus allowed them to have 'excess' returns (Mwabu and Schultz, 2000; Rospabe, 2001b). Another observation is that there are gender gaps in these returns. The gender gaps are defined as the differences between the respective coefficients. However, not all of these gaps are statistically significant. While the gaps for diplomas and degrees are statistically

significant, at the 5 percent level, those for the lower echelons are mostly insignificant, across the wage distributions. Consequently, our analysis will put much emphasis on degrees and diplomas.

As an example, the case for degrees shows returns that are higher for men than women in 1995 and 2004, while the opposite applies in 1999. Generally, the returns are higher at the bottom than the top of the wage distributions. For instance, in 1995, men at the bottom and top deciles had coefficients of 1.169 and 0.846 respectively. Notably, these coefficients are comparable to those of Hofmeyr (2001). In other words, these men earned 222 percent and 178 percent higher than those with elementary education, respectively. The corresponding premia for women were 72 percent and 77 percent, which corroborates their relatively disadvantaged position than men. At most, the sizes of these gender gaps fluctuated along the wage distributions. As well, the returns for men exhibited an increasing trend between 1995 and 2004. For instance, the wage premia for men at the 10^{th} and 90^{th} percentiles increased by 29 percent and 33 percent, correspondingly, in the given period. On the contrary, women at the bottom quantiles experienced a decline in the wage premia, while the opposite applied at the top quantiles. Taken together, these findings show that the dividends to having a degree are generally higher for men than women and especially, those at the lower percentiles of the wage distributions. Thus, the returns to education play a significant role in explaining gender wage differentials.

In likeness with *inter alia* Butcher and Rouse (2001) and Mwabu and Schultz (1998) union members are found to earn significantly more than non-union members. Actually, the coefficients for unionism tend to decline monotonically across both sexes' wage distributions. For instance, those for men in 1995 declined from 0.337 in the 10^{th} percentile to 0.12 in the 90^{th} percentile. Thus, male union members in the 10^{th} and 90^{th} percentiles earned 40 percent and 12 percent more than their non-union counterparts, respectively. Moreover, the union wage premia for both sexes increased over time. For example, the premia for men at the 10^{th} and 90^{th} percentiles increased by 32 percent and 24 percent respectively, between 1995 and 2004. However, men's premia happen to be lower than women's, and these differences are statistically significant at the 5 percent level. As an example, in 1995, the wage premia for women at the bottom and top deciles were 2 percent and 10 percent higher than those of their male counterparts. Essentially, these premia are similar to those found in Mwabu and Schultz (1998). Overall, these outcomes highlight the strong bargaining power of South African unions. In this regard, the lower returns in the upper quantiles are explainable by the consideration that most wages in the upper market are set by direct contracts as compared to collective bargaining (Bhorat *et al*, 2002). The findings also suggest that women tend to benefit more from unionism than men, which brings their lower levels of unionism into question.

Lastly, the female selection bias correction terms were found to be insignificant in most cases[77]. Nevertheless, this finding is not unique as it tallies with that of Winter (1999). Probably, it indicates that selection bias does not generally bind in the labour market especially, when the formal sector is encompassed in the sphere of analysis.

In sum, the evidence presented so far points out that returns to observable characteristics differ by gender and that these differences change as we move throughout the distribution. Therefore, the next step is to investigate the sources of the gender pay gaps.

3.7.3. Decomposition Analysis

Table 25, pg:107 presents the raw/observed and the counterfactual gender wage gaps for 1995, 1999 and 2004. The raw wage gaps are defined as the difference between male and female unconditional log wages at the different quantiles of the wage distributions (Albrecht *et al*, 2004). The counterfactual gap shows the disparities between the quantiles of women's log wage distributions and the corresponding quantiles of a counterfactual distribution that arises if women maintained their characteristics but were paid like men.[78]

Firstly, we explore the raw gender wage gaps. Table 25 exhibits a declining gap as we move towards the upper quantiles of the 1995 wage distribution, i.e. the gap declines from 0.51 in the bottom decile to 0.09 in the top decile. However, this pattern is not robust across the time periods. For instance, the 1999 gap increases dramatically from the 10^{th} to the 25^{th} percentile, remains flat and then declines after the 50^{th} percentile. Specifically, the gap increased from 0.41 in the 10^{th} percentile to 0.54 in the 25^{th} and 50^{th} percentiles and then declined to 0.11 in the 90^{th} percentile. Typically, the evolution of the 1999 gap identifies females whose wages lie in the 25^{th} and 50^{th} percentiles as the most disadvantaged[79]. Besides, Table 28 displays a gender gap that is decreasing as we move towards the upper tails of the 2004 wage distribution although the evolution of the gap from the 10^{th} to the 50^{th} percentiles is uneven. This tendency for a deceleration of the gap as we move up the quantiles of the wage distributions possibly indicates a "sticky floor". Hence, by focussing only on the mean raw gender wage gap, substantial variations of the gap will be hidden.

Secondly, we investigate the counterfactual wage gaps. A striking feature of these gaps is that they are positive across the data sets. This positive gap implies that men's coefficients are

[77] Surprisingly, joint tests for these selection correction terms show that the variables are jointly significant.

[78] We are unable to compute standard errors for the decomposition due to low computational power as we are using a large sample size, we also confirmed with James Albrecht (pioneered the adoption of the MM procedure to the study of gender wage gaps).

[79] Probably, the sharp increase from the 10^{th} to the 25^{th} percentiles of the 1999 wage distribution is due to a selection effect as the 1999 sample suggested a decline in employment which does not tally with the actual employment statistics. Regrettably the reasons for this are largely unknown.

greater than women's. Thus, even if women had the same distribution of characteristics as men, they would still receive lower pay across the wage distribution. The percentage contribution of the counterfactual wage gaps to the raw wage gaps are also presented in Table 25. A percentage value greater than 100 potentially means that women have characteristics that compensate them for any unobservables which may include "discrimination"[80]. In other words, it implies that women have better characteristics than men. In our case, this is exemplified by education (higher levels), provinces (e.g. Eastern Cape, Free State, KwaZulu/Natal and Northern Province), and elementary, technical and clerical occupations *among others*[81]. However, the very large percentage values found for instance, in the upper quantiles of the 1999 and 2004 wage distributions merit comment. Possibly, they emerged because the raw wage gap is relatively small.

Also, that the gender differences in characteristics do not explain much of the raw wage gaps is somewhat surprising. This is because on the one hand, men have better number of hours worked, unionism, marriage and occupation (i.e. artisans and operators) related characteristics than women. On the other hand, there are relatively higher proportions of women in education, provinces, and elementary, technical and clerical occupations than men (see Table 13, pg:86). Ideally, these differences in observed characteristics should have had a significant impact in the decompositions. Presumably, this outcome was precipitated by some offsetting effects deriving from the variations in the dominance of the endowment levels across the genders. This rather perplexing situation demands further research into the issue if we are to generate insights for sound policy formulation.

Even so, Table 25 shows that the counterfactual wage gap for 1995 declines monotonically across the wage distribution, from 0.63 in the 10th percentile to 0.15 in the 90th percentile. In addition, the table exhibits that the 1999 gap increases from the 10th to the 25th percentile and declines thereafter. In particular, the coefficient for the 10th percentile is 0.42 and it increases to 0.49 in the 25th percentile and then declines to 0.26 in the 90th percentile. Lastly, Table 25 reveals that the 2004 gap increases from the bottom to the middle of the distribution and then declines. This evidence unequivocally supports the existence of a "sticky floor" in the South African labour market. Because of such outcomes, we suggest that low income females are more likely to be disadvantaged, although it is not clear whether the disadvantage is mainly due to "discrimination" or to other factors that the model does not control for. For instance, the gender gap could have been driven by changes in labour supply. As such, many women responded to their household's economic need by entering into marginal jobs which are lowly-paid and poorly unionised (Casale, 2003). This could have resulted in a drop in women's real

[80] The component of the raw gap attributed to different characteristics is given as $\beta_m \bar{X}_m - \beta_m \bar{X}_f$.

[81] As discussed earlier, although women have better endowments of these characteristics than men, they get relatively lower returns to these characteristics.

wages, while men's real wages were stagnant. Consequently, the gaps could be spill over effects from the stronger unionisation among low income men.

Finally, we probe into the issue of whether the component of the raw gender wage gap attributable to different returns "discrimination" has been increasing or decreasing along the wage distribution from 1995-2004. In this case, it is perceptible that the portion of the wage distribution that ranges from the 10^{th} to the 25^{th} percentiles experienced a decline in the component between 1995 and 2004. The decrease observed at the bottom tails of the wage distributions could be due to the strengthening of minimum wage policies with time. All the same, the effect of different pay structures on gender wage differentials is still substantial despite the observed decline. On the other hand, the 50^{th} and 75^{th} percentiles saw a 10 point increase in the component during the same period (from 0.37 to 0.47 in the 50^{th} percentile and from 0.20 to 0.31 in the 75^{th} percentile). Such findings suggest that highly paid women are facing more and more gender based wage inequalities with time. Thereafter, we are going to discuss the sensitivity of our results to different sample specifications.

3.7.4 Sensitivity analysis

In this section, we discuss the robustness of our results by drawing on different sample specifications. These specifications include: full sample (domestic workers, the self-employed, and formal and informal sector wage workers), and formal and informal sector wage workers excluding domestic workers. [82]Incidentally, the outcomes for the quantile regressions are somewhat similar across the different samples, see Tables 19-24, pgs:95-105. Consequently, we shall not repeat the interpretations here. In this vein, our main focus will be on the findings for the decompositions. The analysis starts by delving into the outcomes for the full sample that are reported in Table 26, pg:107.

According to Table 26, both the raw and counterfactual wage gaps, for the full sample, show a declining tendency across the 1995 and 1999 wage distributions. Nonetheless, this pattern changes when we consider the data for 2004. In 2004, both gaps accelerate from the bottom to the middle of the distribution and then decline. For instance, the counterfactual wage gaps for the bottom, middle and top quantiles were 0.24, 0.35 and 0.02, respectively. Overall, these results do not refute the earlier mentioned idea of a "sticky floor". To add on, another important result from Table 26 is that the "discrimination" component of the raw gender wage

[82] Other samples that could have been considered include the self employed, and formal sector wage workers only, and 'formal 'sector wage workers including domestic workers. Formal is in quotes because for 1995 we include formal and informal sector wage workers while formal sector wage workers only are included for 1999 and 2004. However, we do not put much emphasis on the self employed as it was difficult to compute some of the quantiles for this sample due to the small sample sizes. As for the other samples, any sample which includes formal sector wage workers but excludes informal sector wage workers has been debunked due to the inseparability of formal and informal sector wage workers in the data for 1995.

decreased in all percentiles of the wage distribution bar the 75th quantile, in the period under study. To a great extent, this outcome harmonises with that discussed in section (3.7.3).

As mentioned earlier, we also specified a sample for formal and informal sector wage workers only (excluding domestic workers). The results for this sample are displayed in Table 27 pg:108. Generally, these findings show that both the raw and counterfactual wage gaps are larger at the bottom when compared to the top end of the distributions. Nonetheless, the findings for the 75th and 90th percentiles of the observed wage gaps merit comment. Mostly, these gaps are negative which suggests that women earn more than men, in these quantiles. Although it is an empirical question, these findings probably imply that these women have better endowments of characteristics than their male counterparts. This outcome could be implying that including domestic workers in the analysis pulls down women's distribution of wages relative to that of men. Further, Table 27 shows that the counterfactual wage gap declined in the 10th, 25th and 75th percentiles while it increased in the 50th and 90th percentiles, from 1995 to 2004. For instance, it increased from 0.14 to 0.20 in 50th quantile, and from 0.11 to 0.14 in the 90th percentile. Intuitively, this analysis indicates that the counterfactual wage gap increased in the upper quantiles of the wage distribution, while it declined in the bottom percentiles. Essentially, these findings have similar implications for the shifts in the counterfactual wage gap when compared to those of the sample whose results are under an assessment for robustness.

Last but not least, the main discoveries of the decomposition analysis; a "sticky floor" and an increase of the counterfactual wage gap in the upper quantiles of the wage distribution, remain intact even if the contentious sample for domestic workers and 'formal' sector wage workers only is considered. This is surprising given that the sample has been debunked due to the inability to separate formal and informal sector wage workers in the data for 1995. (See Table 28, pg:108 for detailed findings for that sample). Within this argument, we conclude that our key findings are robust across different sample specifications.

3.8. Concluding Remarks

This paper explored gender wage gaps throughout the wage distribution for African wage workers in South Africa over the period 1995-2004. The analyses utilised individual data from the 1995 and 1999 October Household Surveys and the 2004 September Labour Force Survey. Quantile regression techniques were used to control for various characteristics at different points of the wage distributions. In addition, the Machado Mata (2005) decomposition method was utilised to estimate the component of the wage gaps not explained by different characteristics (counterfactual gap/"discrimination").

Basing on this methodology, our findings on unconditional wage gaps indicate that the mean gender wage gap hides large variation in the gap across the wage distribution. In fact, the magnitudes of these gaps slide as we move towards the upper tails of the wage distributions. Analogously, the absolute sizes of the counterfactual wage gaps generally decline as we proceed from the bottom to the upper tails of the wage distributions. As it is, both the raw and counterfactual gaps align us towards an existence of a "sticky floor" in the South African labour market. Importantly, this finding is similar to that of Gunawardena (2006), for Sri Lanka. However, it is reiterated that the "sticky floor" probably indicates a form of discrimination, or it could be due to other social processes which have influenced the observed trends in labour supply (concentration of women in elementary occupations).

Additionally, the study reveals that the counterfactual wage gaps did not generally show a declining tendency along the whole wage distribution between 1995 and 2004. Instead, a slight decline was generally evident only in the 10^{th} and 25^{th} percentiles of the wage distribution. This finding is somewhat similar to that of Gruen (2004). If discrimination is the main factor that drove these pay gaps, then female workers in the upper quantiles became more disadvantaged with time, even under the existence of equal opportunity legislation.

Equally important, the findings in this chapter suggest that the first decade of democracy was marked by a labour market with substantial gender wage disparities. This calls for more inquiry into the issue as it could be a problem associated with "discrimination". Quite worryingly, the new labour legislation has all sorts of provisions to curb discrimination but the incidence seems to persist. Nonetheless, it is suggested that mitigatory measures should focus more on women at the bottom end of the wage distribution because they are probably the most vulnerable. Furthermore, because discrimination and the subordinate role of women seem to be entrenched at various stages it is essential to get an understanding of the barriers that exist in the labour market and also in the greater society and how they affect African women.

Last but not least, we recommend that future research can benefit from exploring issues that remain unresolved in the current work. For example, the results presented in this chapter can be improved by utilising better data sets. Should a panel of matched employer-employee data be available, we suggest that future research should tap into the resource. Such data will enable the analysis of the same men and women over time, presumably with similar objective characteristics, in similar occupations and if possible within the same firms and industries, this is crucial as it reduces the effects of uncontrolled employer-employee heterogeneity on the unexplained gap which improves its precision. The data will also enable controlling for the potential endogeneity of variables like education, occupation and industry of employment, which is omitted in this study due to data limitations. Such controls are important because they

yield consistent estimates of the wage models, which also improve on the decomposition exercise.

Given that this chapter only gives a description of the gender pay gaps among the African populace, the need to study women from other races becomes obvious. More importantly, such work can benefit from the utility of methods adopted in this study. Such a wholesale description of the South African gender pay gaps will no doubt inform policy makers of the areas that require corrective action if the position of South African women is to be improved. Another fruitful line of investigation for future research is the issue of establishing whether the gender pay gaps identified in this study are causal or not and in the process explore the causal mechanisms. This will enable the creation of appropriate interventions and in the long term help in transforming the economy and society at large.

Overall, the existence of these gender pay gaps invites a further consideration of their causes. Could it be that women lack an important voice in decision making bodies such as trade unions? Therefore, the chapter next looks at the gender differences in trade union membership.

Table 13: Descriptive Statistics for Africans by Gender (1995, 1999 and 2004)

	1995				1999				2004			
	Females		Males		Females		Males		Females		Males	
Variable	Mean/ Prop	S.dev	Mean/ Prop	S.dev	Mean/ Prop	S.dev	Mean/ Prop	S.dev	Mean/ Prop	S.dev	Mean/ Prop	S.dev
Real Monthly income	1193	27.18	1483	28.39	1175	51.04	1487	50.02	1222	48.2	1455	39.9
Demographic Variables												
Children <15years	0.742	0.009	0.619	0.012	0.66	0.009	0.50	0.008	0.65	0.01	0.467	0.011
Children < 6years	0.445	0.008	0.384	0.01	0.406	0.009	0.34	0.007	0.395	0.01	0.324	0.009
Married	0.449	0.008	0.594	0.007	0.367	0.008	0.52	0.009	0.32	0.009	0.414	0.011
Human Capital												
Age	36.94	0.135	37.52	0.16	36.5	0.16	36.7	0.144	37.5	0.20	36.64	0.21
Age-Squared	1457	10.32	1516	10.5	1426	12.20	1447	11.2	1510	15.9	1454	15.81
Log hours	3.68	0.006	3.76	0.005	3.73	0.007	3.83	0.005	3.7	0.08	3.81	0.007
None	0.12	0.005	0.118	0.005	0.06	0.004	0.09	0.005	0.074	0.004	0.065	0.004
Elementary	0.04	0.018	0.047	0.003	0.025	0.002	0.28	0.003	0.015	0.002	0.021	0.003
Primary	0.24	0.007	0.263	0.007	0.27	0.008	0.31	0.007	0.2	0.008	0.246	0.007
Secondary	0.45	0.009	0.473	0.009	0.46	0.009	0.47	0.008	0.54	0.002	0.550	0.009
Diploma	0.12	0.006	0.068	0.005	0.099	0.057	0.05	0.003	0.114	0.006	0.058	0.004
Degree	0.027	0.003	0.022	0.003	0.037	0.003	0.03	0.003	0.050	0.006	0.032	0.004
Occupations												
Manager	0.006	0.001	0.019	0.002	0.009	0.002	0.02	0.003	0.011	0.002	0.017	0.004
Professional	0.026	0.003	0.018	0.002	0.040	0.005	0.029	0.002	0.039	0.005	0.023	0.003
Technician	0.16	0.007	0.066	0.004	0.123	0.008	0.06	0.003	0.12	0.006	0.055	0.004
Clerk	0.10	0.005	0.071	0.004	0.101	0.005	0.06	0.004	0.123	0.007	0.052	0.004
Skilled	0.12	0.005	0.117	0.005	0.104	0.005	0.13	0.006	0.112	0.006	0.141	0.007
Agriculturalist	0.002	0.005	0.007	0.001	0.014	0.002	0.06	0.003	0.003	0.001	0.004	0.001
Artisan	0.025	0.023	0.135	0.005	0.041	0.005	0.19	0.006	0.039	0.004	0.191	0.008
Operator	0.05	0.005	0.209	0.005	0.037	0.003	0.22	0.007	0.042	0.004	0.203	0.007
Elementary	0.52	0.010	0.358	0.01	0.528	0.010	0.23	0.007	0.511	0.011	0.309	0.009
Industries												
Agriculture	0.083	0.006	0.208	0.011	0.099	0.084	0.14	0.008	0.060	0.005	0.103	0.006
Mining	0.005	0.002	0.094	0.009	0.004	0.001	0.12	0.011	0.002	0.007	0.092	0.012
Manufacturing	0.103	0.006	0.163	0.009	0.098	0.006	0.16	0.007	0.111	0.006	0.157	0.007
Electricity	0.016	0.001	0.012	0.001	0.003	0.001	0.02	0.002	0.004	0.001	0.011	0.002
Construction	0.005	0.001	0.063	0.004	0.008	0.002	0.08	0.005	0.018	0.002	0.121	0.007
Trade	0.16	0.008	0.124	0.005	0.16	0.007	0.13	0.006	0.16	0.008	0.137	0.007
Transport	0.01	0.013	0.062	0.004	0.01	0.001	0.06	0.004	0.02	0.003	0.062	0.004
Finance	0.03	0.003	0.038	0.003	0.049	0.006	0.07	0.004	0.05	0.004	0.097	0.006
Social Services	0.60	0.009	0.232	0.012	0.567	0.01	0.21	0.008	0.58	0.01	0.216	0.008
Provinces												
Western Cape	0.03	0.005	0.045	0.006	0.050	0.006	0.06	0.006	0.053	0.005	0.055	0.005
Eastern Cape	0.144	0.009	0.098	0.004	0.120	0.009	0.08	0.006	0.12	0.006	0.094	0.006
Northern Cape	0.008	0.001	0.012	0.002	0.012	0.002	0.01	0.002	0.01	0.009	0.016	0.002
Free State	0.103	0.005	0.099	0.004	0.093	0.006	0.11	0.008	0.078	0.003	0.085	0.008
Kwazulu/Natal	0.216	0.012	0.183	0.008	0.209	0.012	0.16	0.01	0.225	0.01	0.179	0.013
North West	0.092	0.008	0.111	0.006	0.094	0.006	0.12	0.008	0.086	0.005	0.100	0.008
Gauteng	0.242	0.016	0.282	0.012	0.242	0.010	0.29	0.005	0.25	0.009	0.292	0.011
Mpumalanga	0.067	0.006	0.091	0.004	0.082	0.006	0.10	0.007	0.076	0.004	0.085	0.006
Northern Province	0.097	0.008	0.077	0.004	0.102	0.007	0.08	0.005	0.098	0.001	0.090	0.009
Trade Unionism	0.26	0.011	0.39	0.012	0.31	0.009	0.42	0.01	0.26	0.01	0.322	0.012
N	6982			10 453	5 413			7662	5495			7224

Table 14: Heckprob Broad Participation Models for African Women

	1995		1999		2004	
Variable	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Age	0.332 (0.005)**	0.13	0.393 (0.006)**	0.13	0.330 (0.006)**	0.11
Age-squared	-0.004 (0.000)**	-0.001	-0.005 (0.000)**	-0.001	-0.004 (0.000)**	-0.001
Children<15yrs	-0.094 (0.030)**	-0.04	-0.1519 (0.033)**	-0.06	-0.100 (0.038)**	-0.03
Children<6yrs	0.146 (0.023)**	0.06	0.145 (0.024)**	0.06	0.163 (0.026)**	0.05
Non-labour income	-0.093 (0.028)**	-0.04	-0.198 (0.034)**	-0.08	-0.204 (0.029)**	-0.07
Married	-0.317 (0.029)**	-0.12	-0.179 (0.029)**	-0.06	-0.309 (0.037)**	-0.10
propf	0.440 (0.065)**	0.18	0.195 (0.070)**	0.07	0.044 (0.079)	0.01
Provinces						
Eastern Cape	-0.329 (0.067)**	-0.13	-0.029 (0.088)	-0.01	-0.349 (0.072)**	-0.12
Northern Cape	-0.201 (0.100)**	-0.08	0.066 (0.115)	0.02	-0.379 (0.103)**	-0.14
Free State	-0.002 (0.079)	-0.001	0.081 (0.090)	0.03	-0.218 (0.073)**	-0.07
Kwazulu/Natal	-0.170 (0.068)**	-0.07	0. 132 (0.088)	0.04	-0.272 (0.073)**	-0.09
North West	-0.237 (0.074)**	-0.09	0.097 (0.091)	0.03	-0.229 (0.074)**	-0.08
Gauteng	0.109 (0.071)	0.04	0.273 (0.088)**	0.09	-0.038 (0.074)	-0.01
Mpumalanga	-0.183 (0.071)**	-0.07	0.186 (0.091)**	0.06	-0.051 (0.075)	-0.02
Northern Province	-0.375 (0.074)**	-0.15	0.100 (0.089)	0.03	-0.093 (0.076)	-0.03
Urban	0.205 (0.028)**	0.08	0.126 (0.030)**	0.04	0.054 (0.031)*	0.02
Education Levels						
Primary	0.103 (0.033)**	0.04	0.342 (0.039)**	0.11	0.285 (0.046)**	0.09
Secondary	0.015 (0.034)	0.01	0.452 (0.039)**	0.16	0.482 (0.047)**	0.16
Diploma	0.471 (0.063)**	0.18	1.124 (0.085)**	0.26	1.195 (0.101)**	0.24
Degree	0.576 (0.121)**	0.22	0.935 (0.129)**	0.23	1.099 (0.273)**	0.22
Constant	-5.621 (0.126)**		-6511 (0.141)**		-5.171 (0.145)**	
rho	0.716 (0.237)**		0.822 (0.058)**		0.795 (0.066)**	
Observations	28543		24611		28196	

Standard errors in parentheses*** Significant at 1%, ** significant at 5%; * significant at 10%
ii) The referent variables are: rural for the rural -urban special dimension, Western Cape for the Provinces, Elementary education level (grades R- 2) for the education levels and Single for Marital Status.

Table 15: Heckprob Employment Models for African Women

	1995		1999		2004	
Variable	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Age	0.243	0.07	0.258	0.07	0.202	0.06
	(0.035)**		(0.010)**		(0.014)**	
Age2	-0.027	-0.001	-0.002	-0.001	-0.002	-0.001
	(0.001)**		(0.001)**		(0.001)**	
Propf	0.781	0.24	0.817	0.23	0.788	0.25
	(0.078)**		(0.064)**		(0.071)**	
Non-labour income	-0.306	-0.09	-0.690	-0.18	-0.341	-0.11
	(0.041)**		(0.031)**		(0.031)**	
Married	-0.027	-0.01	-0.145	-0.04	-0.084	-0.03
	(0.062)		(0.003)**		(0.032)**	
Provinces						
Eastern Cape	-0.401	-0.11	-0.363	-0.09	-0.176	-0.05
	(0.092)***		(0.077)**		(0.091)*	
Northern Cape	-0.025	-0.01	0.035	-0.01	-0.294	-0.08
	(0.142)		(0.120)		(0.109)**	
Free State	0.065	0.02	-0.138	-0.04	-0.168	-0.05
	(0.096)		(0.079)*		(0.097)*	
Kwazulu/Natal	-0.124	-0.04	-0.913	-0.03	-0.085	0.03
	(0.092)		(0.075)		(0.091)	
North West	-0.167	-0.05	-0.294	-0.08	-0.324	-0.09
	(0.100)*		(0.078)**		(0.093)**	
Gauteng	0.013	0.004	-0.242	-0.06	-0.159	-0.05
	(0.095)		(0.074)*		(0.091)*	
Mpumalanga	-0.233	-0.07	-0.103	-0.03	-0.036	0.01
	(0.095)**		(0.079)		(0.094)	
Northern Province	-0.502	-0.13	-0.403	-0.10	-0.258	-0.08
	(0.102)***		(0.079)**		(0.097)**	
urban	0.125	0.04	0.023	0.01	0.082	0.03
	(0.044)***		(0.033)		(0.035)**	
Education Levels						
Primary	-0.068	0.02	0.188	0.06	-0.093	-0.03
	(0.040)**		(0.040)**		(0.050)*	
Secondary	0.086	0.03	0.199	0.06	0.228	0.07
	(0.038)**		(0.041)		(0.045)***	
Diploma	1.307	0.48	1.192	0.43	1.134	0.43
	(0.114)***		(0.063)***		(0.077)***	
Degree	1.661	0.59	1.344	0.49	1.608	0.58
	(0.208)**		(0.109)**		(0.122)**	
rho	0.716		0.822		0.795	
	(0.237)**		(0.058)**		(0.066)**	
Constant	-5.481		-5.619		-4.983	
	(0.645)**		(0.212)**		(0.218)**	
Observations	28543		24611		28196	

Standard errors in parentheses*** Significant at 1%, ** significant at 5%; * significant at 10% .propf= proportion of working age females in the household.

ii) The referent variables are: rural for the rural -urban special dimension, Western Cape for the Provinces, Elementary education level (grade1 and 2) for the education levels and Single for Marital Status.

Table 16: Quantile regressions for African wage employees including DWs by Gender (1995) (Table continues on next page)

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Age	0.056***	0.040***	0.037***	0.024***	0.029***	-0.056**	-0.055**	-0.036**	-0.015	-0.005
	(0.007)	(0.006)	(0.004)	(0.004)	(0.006)	(0.016)	(0.016)	(0.013)	(0.013)	(0.016)
Age-Squared	-0.001***	-0.0004***	-0.0003***	-0.0002***	-0.0003***	0.001**	0.001**	0.001**	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.137**	0.064**	0.017	0.021	0.009	0.180***	0.114**	0.067*	0.034	-0.015
	(0.038)	(0.028)	(0.019)	(0.019)	(0.024)	(0.033)	(0.031)	(0.024)	(0.024)	(0.027)
Married	0.205***	0.167***	0.128***	0.125***	0.143***	-0.029	-0.049	-0.017	-0.017	0.008
	(0.024)	(0.019)	(0.015)	(0.015)	(0.022)	(0.025)	(0.025)	(0.019)	(0.019)	(0.023)
Education Levels										
Primary	0.137***	0.118***	0.074***	0.079***	0.028	0.098**	0.184**	0.100**	0.065**	0.064*
	(0.030)	(0.024)	(0.018)	(0.018)	(0.026)	(0.036)	(0.036)	(0.028)	(0.029)	(0.032)
Secondary	0.356***	0.314***	0.263***	0.276***	0.239***	0.486***	0.528***	0.382***	0.323***	0.302***
	(0.031)	(0.025)	(0.018)	(0.018)	(0.027)	(0.037)	(0.037)	(0.029)	(0.030)	(0.033)
Diploma	0.712***	0.578***	0.507***	0.532***	0.511***	0.396***	0.456**	0.349**	0.266*	0.319**
	(0.061)	(0.047)	(0.037)	(0.039)	(0.056)	(0.097)	(0.098)	(0.078)	(0.076)	(0.087)
Degree	1.169***	1.025***	0.949***	0.954***	0.846***	0.546**	0.635**	0.563**	0.428**	0.572**
	(0.084)	(0.098)	(0.075)	(0.079)	(0.096)	(0.149)	(0.170)	(0.126)	(0.126)	(0.143)
Occupations										
Manager	0.367***	0.417***	0.563***	0.654***	0.725***	0.605***	0.671***	0.825***	1.140***	0.852***
	(0.088)	(0.072)	(0.052)	(0.053)	(0.064)	(0.169)	(0.173)	(0.138)	(0.132)	(0.127)
Professional	0.262***	0.310***	0.357***	0.450***	0.514***	0.708***	0.827***	0.827***	0.868***	0.600***
	(0.095)	(0.105)	(0.080)	(0.087)	(0.103)	(0.130)	(0.142)	(0.108)	(0.113)	(0.127)
Technician	0.473***	0.453***	0.484**	0.461***	0.408***	0.890**	0.919***	0.930***	0.919***	0.719***
	(0.065)	(0.049)	(0.037)	(0.040)	(0.059)	(0.086)	(0.085)	(0.067)	(0.069)	(0.079)
Clerk	0.118**	0.200***	0.225***	0.257***	0.242***	0.339**	0.436***	0.453***	0.515***	0.373***
	(0.055)	(0.043)	(0.031)	(0.031)	(0.042)	(0.083)	(0.083)	(0.064)	(0.064)	(0.072)
Skilled	0.005	0.019	0.139***	0.178***	0.219***	-0.023	0.113*	0.254**	0.315***	0.236***
	(0.044)	(0.035)	(0.026)	(0.027)	(0.038)	(0.083)	(0.082)	(0.064)	(0.065)	(0.074)
Agric worker	-0.390**	-0.379**	0.031	0.246**	0.160*	-0.192	-0.172	-0.161	0.100	-0.250
	(0.134)	(0.110)	(0.074)	(0.071)	(0.089)	(0.129)	(0.278)	(0.211)	(0.199)	(0.226)
Artisan	-0.028	-0.023	0.041*	0.107***	0.147**	-0.338**	-0.133**	-0.015	-0.055	0.047
	(0.038)	(0.032)	(0.024)	(0.025)	(0.036)	(0.093)	(0.094)	(0.074)	(0.073)	(0.075)
Elementary Job	-0.260***	-0.282***	-0.185***	-0.198***	-0.257***	-0.357**	-0.297**	-0.230**	-0.186**	-0.250***
	(0.030)	(0.025)	(0.019)	(0.019)	(0.027)	(0.073)	(0.073)	(0.058)	(0.060)	(0.226)
Industries										
Agriculture	-0.520***	-0.579***	-0.724***	-0.709***	-0.702****	-0.273**	-0.336***	-0.396**	-0.437***	-0.312***
	(0.039)	(0.032)	(0.024)	(0.025)	(0.035)	(0.064)	(0.066)	(0.051)	(0.052)	(0.064)
Mining	-0.127***	-0.110**	-0.075***	-0.068**	-0.095**	-0.035	-0.151	-0.081	0.123	0.217**
	(0.050)	(0.040)	(0.028)	(0.028)	(0.038)	(0.144)	(0.169)	(0.127)	(0.133)	(0.084)
Electricity	0.373***	0.260***	0.227***	0.166**	0.185**	0. 745**	0.702**	0.266	-0.009	0.112
	(0.098)	(0.077)	(0.057)	(0.057)	(0.089)	(0.103)	(0.265)	(0.191)	(0.194)	(0.251)

Table 16: Continued

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Construction	-0.169***	-0.132***	-0.205***	-0.208***	-0.213***	0.110	0.007	0.069	0.075	0.134
	(0.052)	(0.042)	(0.032)	(0.033)	(0.047)	(0.162)	(0.174)	(0.140)	(0.135)	(0.151)
Trade	-0.165**	-0.182***	-0.236***	-0.212***	-0.176*	-0.065	-0.137**	-0.163**	-0.251**	-0.090
	(0.042)	(0.035)	(0.027)	(0.029)	(0.042)	(0.061)	(0.062)	(0.048)	(0.049)	(0.059)
Transport	0.135**	0.085**	0.014	-0.017	0.033	-0.025	0.018	0.043	0.086	0.312**
	(0.050)	(0.041)	(0.031)	(0.033)	(0.048)	(0.145)	(0.143)	(0.100)	(0.094)	(0.110)
Finance	0.071	0.034	-0.062	-0.034	-0.072	0.080*	0.105	0.051	-0.021	0.087
	(0.064)	(0.055)	(0.042)	(0.043)	(0.058)	(0.092)	(0.095)	(0.073)	(0.067)	(0.083)
Social Service	-0.079**	-0.008	-0.025	-0.032	-0.046	-0.161**	-0.166**	-0.152**	-0.192**	-0.072
	(0.040)	(0.032)	(0.024)	(0.025)	(0.035)	(0.054)	(0.056)	(0.043)	(0.045)	(0.054)
Unionism	0.337***	0.295***	0.199***	0.170***	0.122***	0.353***	0.309***	0.299***	0.251***	0.205***
	(0.022)	(0.019)	(0.015)	(0.016)	(0.022)	(0.029)	(0.029)	(0.024)	(0.025)	(0.030)
Provinces										
Western Cape	-0.017	-0.036	-0.084	-0.130**	-0.074	0.015	-0.101	-0.185**	-0.132**	-0.076
	(0.057	(0.046)	(0.035)	(0.036)	(0.050)	(0.069)	(0.071)	(0.055)	(0.055)	(0.062)
Eastern Cape	-0.381***	-0.271***	-0.233***	-0.167***	-0.077***	-0.311***	-0.251**	-0.291***	-0.186**	-0.089**
	(0.037)	(0.030)	(0.023)	(0.023)	(0.032)	(0.050)	(0.050)	(0.038)	(0.038)	(0.044)
Northern Cape	-0.182**	-0.163**	-0.163**	-0.215*	-0.251**	-0.449***	-0.371**	-0.391**	-0.297***	-0.346***
	(0.064)	(0.052)	(0.039)	(0.039)	(0.054)	(0.089)	(0.090)	(0.070)	(0.071)	(0.081)
Free State	-0.434***	-0.385***	-0.363***	-0.383***	-0.362***	-1.105***	-0.917***	-0.812***	-0.643***	-0.477***
	(0.037)	(0.030)	(0.022)	(0.023)	(0.033)	(0.042)	(0.042)	(0.033)	(0.034)	(0.039)
Kwazulu/Natal	-0.146**	-0.099**	-0.065***	-0.030	0.015	-0.156**	-0.138**	-0.157**	-0.100**	-0.033
	(0.033)	(0.027)	(0.020)	(0.021)	(0.030)	(0.049))	(0.041)	(0.031)	(0.032)	(0.037)
North West	-0.143**	-0.111**	-0.148***	-0.139***	-0.066*	-0.456***	-0.216***	-0.279***	-0.178***	-0.115**
	(0.039)	(0.031)	(0.024)	(0.024)	(0.035)	(0.049)	(0.052)	(0.038)	(0.038)	(0.044)
Mpumalanga	-0.285*	-0.277*	-0.189***	-0.099**	0.003	-0.203**	-0.012***	-0.176**	-0.081*	0.046
	(0.037)	(0.030)	(0.023)	(0.023)	(0.032)	(0.052)	(0.052)	(0.040)	(0.040)	(0.046)
Northern Provnc	-0.237***	-0.106**	-0.069*	0.043*	0.104**	0.022	-0.012	0.037	0.116**	0.135***
	(0.041)	(0.033)	(0.025)	(0.025)	(0.035)	(0.062)	(0.061)	(0.047)	(0.046)	(0.054)
Sample Selection Correction Terms										
Lambda1						-3.430**	-2.580**	-1.702**	-1.880	-0.203
						(0.823)	(0.809)	(0.771)	(0.699)	(0.742)
Lambda2	-	-	-	-	-	3.764**	2.888**	1.949**	0.812	0.142
	-	-	-	-	-	(1.209)	(1.195)	(1.115)	(1.015)	(1.074)
Lambda3	-	-	-	-	-	0.208**	0.138**	0.076**	0.019	-0.048
	-	-	-	-	-	(0.053)	(0.052)	(0.054)	(0.049)	(0.052)
Lambda4	-	-	-	-	-	0.016	0.039	0.043	0.058**	0.087**
	-	-	-	-	-	(0.041)	(0.037)	(0.029)	(0.027)	(0.028)
Constant	4.424***	5.411***	6.065***	6.570***	6.858***	7.068***	7.280***	7.342***	7.336***	7.369***
	(0.214)	(0.157)	(0.113)	(0.114)	(0.151)	(0.417)	(0.419)	(0.336)	(0.336)	(0.395)
Observations	10219	10219	10219	10219	10219	6853	6853	6853	6853	6853

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 17: Quantile regressions for African wage employees including DWs by Gender (1999) (Table continues on next page)

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Age	0.078***	0.057***	0.047***	0.046***	0.059***	0.038*	0.027*	0.011	0.029*	0.046**
	(0.011)	(0.007)	(0.005)	(0.005)	(0.010)	(0.021)	(0.013)	(0.011)	(0.011)	(0.015)
Age-Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001*	-0.0001*	0.000	-0.000**	-0.0001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.341**	0.232**	0.135**	0.103**	0.172**	0.383***	0.309**	0.268**	0.253**	0.244**
	(0.052)	(0.037)	(0.022)	(0.021)	(0.041)	(0.057)	(0.034)	(0.027)	(0.022)	(0.034)
Married	0.226***	0.191***	0.145***	0.137***	0.143***	0.028	0.018	0.020	0.071**	0.109**
	(0.042)	(0.027)	(0.018)	(0.018)	(0.037)	(0.044)	(0.028)	(0.024)	(0.023)	(0.034)
Education Levels										
Primary	0.176***	0.111***	0.114***	0.096***	0.090*	0.110*	0.176**	0.152**	0.118**	0.186**
	(0.052)	(0.035)	(0.025)	(0.024)	(0.047)	(0.063)	(0.042)	(0.037)	(0.035)	(0.052)
Secondary	0.387***	0.309***	0.305***	0.344***	0.367***	0.379***	0.373***	0.426***	0.433***	0.500***
	(0.055)	(0.037)	(0.026)	(0.025)	(0.051)	(0.065)	(0.044)	(0.039)	(0.037)	(0.057)
Diploma	0.895***	0.850***	0.822***	0.867***	0.941***	1.000***	0.972**	0.899**	0.888*	0.902**
	(0.107)	(0.071)	(0.050)	(0.049)	(0.104)	(0.129)	(0.084)	(0.073)	(0.070)	(0.112)
Degree	1.027***	0.969***	0.997***	1.091***	0.892***	1.106**	1.096**	1.100**	1.014**	0.999**
	(0.138)	(0.099)	(0.068)	(0.067)	(0.142)	(0.178)	(0.120)	(0.103)	(0.101)	(0.153)
Occupations										
Manager	0.463***	0.474***	0.492***	0.648***	0.871***	-0.140	0.636***	0.698***	0.432***	0.290*
	(0.123)	(0.081)	(0.056)	(0.052)	(0.112)	(0.193)	(0.162)	(0.149)	(0.124)	(0.178)
Professional	0.500***	0.352***	0.404***	0.335***	0.554***	0.287*	0.637***	0.742***	0.767***	0.691***
	(0.134)	(0.096)	(0.067)	(0.065)	(0.135)	(0.170)	(0.117)	(0.103)	(0.103)	(0.178)
Technician	0.373***	0.362***	0.403**	0.321***	0.442***	0.236*	0.531***	0.742***	0.680***	0.557***
	(0.091)	(0.064)	(0.044)	(0.042)	(0.084)	(0.141)	(0.091)	(0.080)	(0.078)	(0.134)
Clerk	0.180**	0.182***	0.266***	0.212***	0.360***	-0.038	0.152*	0.306***	0.335***	0.361***
	(0.079)	(0.057)	(0.039)	(0.037)	(0.076)	(0.128)	(0.086)	(0.078)	(0.076)	(0.131)
Skilled	-0.002	0.0001	0.047	0.102***	0.241***	-0.214	-0.166*	-0.005	0.047	0.088
	(0.064)	(0.047)	(0.033)	(0.032)	(0.067)	(0.132)	(0.086)	(0.078)	(0.075)	(0.127)
Agric worker	-0.514**	-0.548**	-0.552**	-0.376**	-0.159**	-0.657**	-0373**	0.007	-0.176*	-0.233
	(0.074)	(0.054)	(0.040)	(0.040)	(0.081)	(0.207)	(0.122)	(0.110)	(0.098)	(0.157)
Artisan	0.027	0.034	-0.007	0.027	0.062	-0.239*	-0.079	0.048	-0.001	-0.108
	(0.053)	(0.036)	(0.026)	(0.025)	(0.053)	(0.132)	(0.088)	(0.079)	(0.076)	(0.111)
Elementary Job	-0.153***	-0.189***	-0.193***	-0.167***	-0.119***	-0.526**	-0.362**	-0.251**	-0.305**	-0.331***
	(0.051)	(0.036)	(0.025)	(0.024)	(0.050)	(0.117)	(0.077)	(0.070)	(0.068)	(0.117)
Industries										
Agriculture	-0.551***	-0.684***	-0.753***	-0.739***	-0.719****	-0.056	-0.232***	-0.310**	-0.361***	-0.382***
	(0.068)	(0.046)	(0.032)	(0.032)	(0.065)	(0.106)	(0.065)	(0.058)	(0.057)	(0.091)
Mining	0.229*	0.023	-0.069**	-0.140**	-0.133**	0.153	0.298*	0.257*	0.120	0.617**
	(0.069)	(0.047)	(0.031)	(0.029)	(0.061)	(0.217)	(0.155)	(0.149)	(0.157)	(0.198)
Electricity	0.276***	0.249***	0.303***	0.235**	0.365**	0.816**	0.899**	0.615**	0.586**	1.227**
	(0.150)	(0.104)	(0.074)	(0.070)	(0.150)	(0.152)	(0.235)	(0.186)	(0.197)	(0.120)

Table17: Continued

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Construction	-0.175***	-0.238***	-0.224***	-0.180***	-0.184***	0.082	0.127	0.208	0.234*	-0.052
	(0.076)	(0.052)	(0.037)	(0.035)	(0.073)	(0.198)	(0.125)	(0.128)	(0.133)	(0.152)
Trade	-0.127**	-0.163***	-0.259***	-0.236***	-0.297**	-0.145	-0.130**	-0.108*	-0.211**	-0.164*
	(0.062)	(0.044)	(0.032)	(0.031)	(0.065)	(0.098)	(0.061)	(0.055)	(0.054)	(0.091)
Transport	-0.052	-0.013	0.003	0.035	-0.026	0.267	0.189	-0.007	0.063	0.168
	(0.082)	(0.055)	(0.038)	(0.036)	(0.075)	(0.189)	(0.122)	(0.115)	(0.111)	(0.203)
Finance	0.084	0.010	-0.109**	-0.150**	-0.163**	0.364**	0.219**	0.211**	0.141**	0.252**
	(0.085)	(0.061)	(0.043)	(0.042)	(0.082)	(0.122)	(0.080)	(0.070)	(0.065)	(0.104)
Social Service	-0.025	-0.015	-0.012	-0.006	-0.021	0.023	-0.151**	-0.161**	-0.218**	-0.145**
	(0.064)	(0.045)	(0.031)	(0.030)	(0.060)	(0.091)	(0.055)	(0.048)	(0.048)	(0.079)
Unionism	0.483***	0.434***	0.318***	0.276***	0.204***	0.568***	0.485***	0.515***	0.511***	0.501***
	(0.038)	(0.027)	(0.018)	(0.018)	(0.039)	(0.052)	(0.031)	(0.027)	(0.026)	(0.042)
Provinces										
Western Cape	0.200**	0.136	0.073**	0.025	-0.011	0.237**	0.182**	0.046	0.012	-0.028
	(0.077)	(0.055)	(0.037)	(0.036)	(0.072)	(0.096)	(0.063)	(0.054)	(0.050)	(0.075)
Eastern Cape	-0.503***	-0.516***	-0.391***	-0.278***	-0.337***	-0.752***	-0.577**	-0.648***	-0.559**	-0.422**
	(0.067)	(0.048)	(0.033)	(0.032)	(0.063)	(0.076)	(0.047)	(0.041)	(0.038)	(0.055)
Northern Cape	-0.141	-0.137**	-0.096**	-0.001	0.084	-0.368***	-0.362**	-0.422**	-0.329***	-0.411***
	(0.091)	(0.067)	(0.048)	(0.046)	(0.097)	(0.118)	(0.076)	(0.071)	(0.069)	(0.085)
Free State	-0.431***	-0.424***	-0.389***	-0.359***	-0.373***	-0.910***	-0.845***	-0.692***	-0.559***	-0.446***
	(0.060)	(0.042)	(0.028)	(0.027)	(0.054)	(0.070)	(0.045)	(0.040)	(0.037)	(0.058)
Kwazulu/Natal	-0.082	-0.146**	-0.153***	-0.125**	-0.116**	-0.370**	-0.371**	-0.350**	-0.279**	-0.142**
	(0.059)	(0.040)	(0.028)	(0.027)	(0.055)	(0.065))	(0.043)	(0.037)	(0.034)	(0.049)
North West	-0.236**	-0.171**	-0.212***	-0.119***	-0.132**	-0.341***	-0.301***	-0.283***	-0.213***	-0.187**
	(0.057)	(0.038)	(0.027)	(0.025)	(0.051)	(0.070)	(0.045)	(0.039)	(0.036)	(0.053)
Mpumalanga	-0.176**	-0.152*	-0.160***	-0.117**	-0.132**	-0.358**	-0.332***	-0.386**	-0.286**	-0.189**
	(0.059)	(0.040)	(0.027)	(0.026)	(0.051)	(0.070)	(0.046)	(0.040)	(0.038)	(0.056)
Northern Provnc	-0.202***	-0.281**	-0.282**	-0.258**	-0.227**	-0.323**	-0.389**	-0.399**	0.392**	-0.229***
	(0.065)	(0.046)	(0.031)	(0.029)	(0.056)	(0.079)	(0.049)	(0.042)	(0.038)	(0.057)
Sample Selection Correction Terms										
Lambda1						1.629	0.248	0.673	0.191	1.323
						(1.241)	(0.903)	(0.850)	(0.664)	(0.934)
Lambda2	-	-	-	-	-	-2.860	-0.682	-1.422	-0.539	-1.888
	-	-	-	-	-	(1.904)	(1.347)	(1.257)	(1.002)	(1.142)
Lambda3	-	-	-	-	-	-0.124*	-0.033	-0.034	-0.008	-0.104*
	-	-	-	-	-	(0.073)	(0.059)	(0.057)	(0.040)	(0.054)
Lambda4	-	-	-	-	-	-0.024	0.001	-0.058	-0.047	0.001
	-	-	-	-	-	(0.074)	(0.049)	(0.044)	(0.040)	(0.058)
Constant	2.508***	4.040***	5.142***	5.548***	5.324***	3.578***	4.396***	5.118***	5.212***	4.894***
	(0.314)	(0.210)	(0.139)	(0.130)	(0.263)	(0.536)	(0.341)	(0.297)	(0.274)	(0.410)
Observations	7268	7268	7268	7268	7268	5172	5172	5172	5172	5172

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 18: **Quantile regressions for African wage employees including DWs by Gender (2004)**(Table continues on next page)

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Age	0.058***	0.043***	0.037***	0.033***	0.038***	-0.019	0.021	0.010	-0.000	0.019**
	(0.009)	(0.008)	(0.005)	(0.005)	(0.006)	(0.018)	(0.010)	(0.008)	(0.009)	(0.009)
Age-Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	0.001	-0.0001	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.268**	0.292**	0.280**	0.117**	0.022	0.356***	0.338**	0.330**	0.227**	0.189**
	(0.056)	(0.041)	(0.021)	(0.022)	(0.028)	(0.069)	(0.027)	(0.017)	(0.018)	(0.019)
Married	0.154***	0.132***	0.144***	0.151***	0.200***	0.131**	0.077**	0.102**	0.123**	0.093**
	(0.034)	(0.029)	(0.019)	(0.022)	(0.025)	(0.041)	(0.022)	(0.018)	(0.020)	(0.024)
Education Levels										
Primary	0.026	0.054	0.040	-0.036	-0.098**	0.070	0.141**	0.068**	-0.017	0.026
	(0.043)	(0.041)	(0.028)	(0.032)	(0.036)	(0.061)	(0.033)	(0.028)	(0.033)	(0.034)
Secondary	0.244***	0.289***	0.277***	0.214***	0.229***	0.216***	0.360***	0.246***	0.125***	0.253***
	(0.041)	(0.040)	(0.028)	(0.032)	(0.038)	(0.065)	(0.034)	(0.028)	(0.034)	(0.035)
Diploma	0.883***	0.920***	0.874***	0.694***	0.731***	0.505***	0. 677**	0.638**	0.371**	0.398**
	(0.079)	(0.071)	(0.046)	(0.054)	(0.063)	(0.136)	(0.065)	(0.054)	(0.063)	(0.066)
Degree	1.257***	1.126***	1.338***	1.280***	1.137***	0.419**	0.542**	0.551**	0.433**	0.687**
	(0.141)	(0.114	(0.084)	(0.114)	(0.111)	(0.207)	(0.106)	(0.090)	(0.104)	(0.135)
Occupations										
Manager	0.509***	0.726***	0.809***	0.867***	1.051***	0.940**	0.975***	1.315***	1.453***	1.519***
	(0.134)	(0.106)	(0.070)	(0.072)	(0.071)	(0.177)	(0.107)	(0.092)	(0.093)	(0.126)
Professional	0.505***	0.567***	0.318***	0.212*	0.631***	1.039***	1.243***	1.179***	1.085***	0.970***
	(0.162)	(0.125)	(0.089)	(0.118)	(0.114)	(0.157)	(0.102)	(0.094)	(0.102)	(0.149)
Technician	0.386*	0.392***	0.344**	0.406***	0.544***	0.730**	0.859***	0.900***	0.935***	0.832***
	(0.071)	(0.075)	(0.047)	(0.055)	(0.060)	(0.120)	(0.064)	(0.054)	(0.063)	(0.069)
Clerk	0.163**	0.274***	0.243***	0.415***	0.544***	0.406**	0.472***	0.595***	0.617***	0.643***
	(0.072)	(0.066)	(0.043)	(0.049)	(0.055)	(0.105)	(0.057)	(0.051)	(0.062)	(0.071)
Skilled	-0.069	-0.013	0.030	0.051	0.227***	0.085	-0.087	0.217**	0.274***	0.342***
	(0.055)	(0.049)	(0.035)	(0.040)	(0.044)	(0.104)	(0.057)	(0.052)	(0.062)	(0.070)
Agric worker	-0.355**	-0.133	-0.267**	-0.275**	-0.185	-0.411**	0.093	0.010	-0.009	-0.293*
	(0.131)	(0.123)	(0.081)	(0.081)	(0.091)	(0.198)	(0.160)	(0.137)	(0.098)	(0.143)
Artisan	-0.043	-0.011	-0.004	0.036	0.092**	-0.011	-0.023	0.049	0.000	-0.119
	(0.049)	(0.041)	(0.028)	(0.032)	(0.034)	(0.111)	(0.064)	(0.056)	(0.066)	(0.077)
Elementary Job	-0.282***	-0.225***	-0.262***	-0.253***	-0.181***	-0.009**	-0.089*	-0.122**	-0.166**	-0.224***
	(0.045)	(0.038)	(0.026)	(0.029)	(0.032)	(0.089)	(0.050)	(0.046)	(0.054)	(0.063)
Industries										
Agriculture	-0.379***	-0.388***	-0.466***	-0.549***	-0.574****	-0.114	-0.112**	-0.185**	-0.308***	-0.352***
	(0.052)	(0.049)	(0.032)	(0.037)	(0.042)	(0.093)	(0.049)	(0.043)	(0.050)	(0.056)
Mining	0.333***	0.214**	0.174	-0.117**	0.164**	0.182	0.062	0.055	0.157	1.130**
	(0.056)	(0.051)	(0.035)	(0.037)	(0.040)	(0.288)	(0.131)	(0.118)	(0.143)	(0.059)
Electricity	0.129	0.108	0.152*	0.037	-0.070	0. 580**	0.405**	0.632**	0.523**	0.469**
	(0.086)	(0.165)	(0.087)	(0.078)	(0.082)	(0.250)	(0.116)	(0.113)	(0.119)	(0.073)

Table 18: Continued

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Construction	-0.214**	-0.240***	-0.232***	-0.175***	-0.153**	0.104	-0.232**	-0.112*	-0.027	0.193**
	(0.055)	(0.049)	(0.034)	(0.038)	(0.043)	(0.131)	(0.068)	(0.059)	(0.063)	(0.062)
Trade	-0.288**	-0.265***	-0.262***	-0.210***	-0.232**	-0.3192**	-0.226**	-0.286**	-0.242**	-0.212**
	(0.054)	(0.048)	(0.033)	(0.037)	(0.041)	(0.075)	(0.042)	(0.040)	(0.051)	(0.053)
Transport	0.034	-0.078	-0.050	0.003	0.073*	0.023	0.168**	0.268**	0.408	0.667**
	(0.069)	(0.060)	(0.039)	(0.044)	(0.049)	(0.142)	(0.079)	(0.068)	(0.081)	(0.064)
Finance	-0.132**	-0.063	-0.157**	-0.109*	-0.145**	0.162	0.074	0.052	0.134**	0.086
	(0.065)	(0.058)	(0.042)	(0.050)	(0.052)	(0.099)	(0.056)	(0.050)	(0.058)	(0.065)
Social Service	-0.281**	-0.192**	-0.128**	-0.005	-0.004	-0.161**	-0.189**	-0.202**	-0.187**	-0.153**
	(0.049)	(0.045)	(0.031)	(0.036)	(0.040)	(0.065)	(0.037)	(0.035)	(0.044)	(0.046)
Unionism	0.545***	0.533***	0.470***	0.414***	0.309***	0.814***	0.701***	0.608***	0.591**	0.599***
	(0.037)	(0.031)	(0.020)	(0.023)	(0.024)	(0.048)	(0.024)	(0.022)	(0.025)	(0.029)
Provinces										
Western Cape	0.035	-0.036	0.062*	0.111**	-0.199**	0.094	0.025	-0.038	0.010	0.009
	(0.074)	(0.064)	(0.051)	(0.047)	(0.049)	(0.103)	(0.051)	(0.049)	(0.061)	(0.047)
Eastern Cape	-0.556***	-0.473***	-0.349**	-0.257***	-0.190***	-0.608***	-0.618**	-0.535***	-0.351**	-0.351**
	(0.049)	(0.044)	(0.030)	(0.033)	(0.035)	(0.066)	(0.034)	(0.027)	(0.029)	(0.035)
Northern Cape	-0.318**	-0.249**	-0.207**	-0.076	-0.003	-0.252**	-0.278**	-0.226**	-0.126***	-0.190***
	(0.071)	(0.067)	(0.040)	(0.042)	(0.044)	(0.099)	(0.086)	(0.045)	(0.050)	(0.059)
Free State	-0.408***	-0.381***	-0.418***	-0.363***	-0.332***	-0.709***	-0.600***	-0.514***	-0.434***	-0.468***
	(0.051)	(0.044)	(0.029)	(0.030)	(0.034)	(0.068)	(0.035)	(0.028)	(0.032)	(0.037)
Kwazulu/Natal	-0.131**	-0.149**	-0.093***	-0.027*	-0.023	-0.327**	-0.343**	-0.286**	-0.248**	-0.237**
	(0.042)	(0.038)	(0.026)	(0.029)	(0.032)	(0.052))	(0.029)	(0.024)	(0.027)	(0.032)
North West	-0.162**	-0.205**	-0.261***	-0.240***	-0.237**	-0.330***	-0.336***	-0.278***	-0.195***	-0.226**
	(0.046)	(0.045)	(0.030)	(0.031)	(0.034)	(0.069)	(0.037)	(0.031)	(0.032)	(0.039)
Mpumalanga	-0.292*	-0.299**	-0.283***	-0.217**	-0.083**	-0.642**	-0.514***	-0.414**	-0.313**	-0.267**
	(0.051)	(0.042)	(0.027)	(0.030)	(0.034)	(0.072)	(0.035)	(0.028)	(0.032)	(0.040)
Northern Provnc	-0.411***	-0.317**	-0.275**	-0.210**	-0.214**	-0.462**	-0.559**	-0.399**	-0.282**	-0.290***
	(0.050)	(0.044)	(0.029)	(0.032)	(0.035)	(0.073)	(0.039)	(0.031)	(0.036)	(0.038)
Sample Selection Correction Terms										
Lambda1						0.699	2.912**	0.982	0.183	-0.288
						(1.767)	(0.931)	(0.853)	(0.877)	(0.897)
Lambda2	-	-	-	-	-	-1.635	-4.182**	-1.562	-0.202	0.025
	-	-	-	-	-	(2.523)	(1.320)	(1.196)	(1.246)	(1.279)
Lambda3	-	-	-	-	-	-0.113	-0.265**	-0.096	0.028	0.051
	-	-	-	-	-	(0.131)	(0.069)	(0.066)	(0.065)	(0.064)
Lambda4	-	-	-	-	-	0.111**	0.111**	0.036	-0.011	0.003
	-	-	-	-	-	(0.055)	(0.027)	(0.023)	(0.027)	(0.025)
Constant	3.783***	4.272***	4.817***	5.820***	6.321***	4.875***	4.008***	4.832***	6.039***	5.932***
	(0.314)	(0.242')	(0.140)	(0.144)	(0.167)	(0.585)	(0.297)	(0.237)	(0.254)	(0.245)
Observations	7064	7064	7064	7064	7064	5469	5469	5469	5469	5469

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 19: Quantile regressions for full sample of African Employees by Gender (1995) (Table continues on next page)

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Age	0.064***	0.048***	0.038***	0.027***	0.035***	-0.054**	-0.054**	-0.033**	-0.024	-0.005
	(0.007)	(0.006)	(0.004)	(0.003)	(0.007)	(0.016)	(0.015)	(0.011)	(0.012)	(0.016)
Age-Squared	-0.001***	-0.0005***	-0.0003***	-0.0003***	-0.0003***	0.001**	0.001**	0.001**	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.179**	0.097**	0.043**	0.050**	-0.002	0.179***	0.103**	0.071*	0.049**	-0.019
	(0.036)	(0.025)	(0.019)	(0.017)	(0.031)	(0.032)	(0.027)	(0.019)	(0.021)	(0.029)
Married	0.214***	0.174***	0.127***	0.132***	0.142***	-0.029	-0.031	-0.011	-0.001	0.036
	(0.023)	(0.019)	(0.015)	(0.013)	(0.024)	(0.024)	(0.023)	(0.017)	(0.018)	(0.024)
Education Levels										
Primary	0.141***	0.118***	0.075***	0.078***	0.038	0.106**	0.200**	0.083	0.059**	0.041
	(0.029)	(0.024)	(0.018)	(0.016)	(0.029)	(0.036)	(0.033)	(0.024)	(0.026)	(0.033)
Secondary	0.368***	0.340***	0.274***	0.279***	0.255***	0.479***	0.525***	0.374***	0.311***	0.262***
	(0.030)	(0.024)	(0.019)	(0.016)	(0.030)	(0.037)	(0.034)	(0.025)	(0.027)	(0.034)
Diploma	0.777***	0.614***	0.531***	0.524***	0.523***	0.400***	0.487**	0.375**	0.312*	0.330**
	(0.059)	(0.045)	(0.037)	(0.034)	(0.065)	(0.098)	(0.091)	(0.068)	(0.071)	(0.090)
Degree	1.203***	1.039***	0.843***	0.753***	0.735***	0.573**	0.749**	0.610**	0508**	0.539**
	(0.085)	(0.098)	(0.077)	(0.063)	(0.094)	(0.151)	(0.157)	(0.111)	(0.116)	(0.147)
Occupations										
Manager	0.314***	0.461***	0.721***	0.988***	1.589***	0.273***	0.553***	0.726***	1.050***	1.313***
	(0.058)	(0.049)	(0.039)	(0.033)	(0.062)	(0.114)	(0.101)	(0.075)	(0.083)	(0.109)
Professional	0.255***	0.331***	0.471****	0.608***	0.601***	0.690***	0.701***	0.789***	0.858***	0.661***
	(0.098)	(0.104)	(0.083)	(0.068)	(0.107)	(0.131)	(0.131)	(0.096)	(0.104)	(0.133)
Technician	0.408***	0.438***	0.472**	0.488***	0.413***	0.887**	0.889***	0.910***	0.939***	0.756***
	(0.064)	(0.047)	(0.038)	(0.034)	(0.064)	(0.086)	(0.079)	(0.059)	(0.065)	(0.087)
Clerk	0.106	0.202***	0.218***	0.261***	0.238***	0.347**	0.417***	0.424***	0.472***	0.402***
	(0.055)	(0.042)	(0.033)	(0.028)	(0.049)	(0.085)	(0.078)	(0.057)	(0.061)	(0.077)
Skilled	0.002	0.025	0.135***	0.177***	0.185***	-0.021	0.101*	0.212**	0.300***	0.294***
	(0.043)	(0.035)	(0.028)	(0.023)	(0.043)	(0.084)	(0.076)	(0.057)	(0.063)	(0.078)
Agric worker	-0.330**	-0.238**	0.156	0.314**	0.614**	-0.159	-0.110	-0.179	0.453**	2.346**
	(0.116)	(0.095)	(0.068)	(0.057)	(0.095)	(0.169)	(0.177)	(0.127)	(0.132)	(0.154)
Artisan	-0.041	-0.021	0.043*	0.120***	0.213**	-0.257**	-0.085	-0.027	-0.006	0.052
	(0.047)	(0.030)	(0.025)	(0.021)	(0.039)	(0.083)	(0.077)	(0.057)	(0.061)	(0.075)
Elementary Job	-0.254***	-0.269***	-0.181***	-0.189***	-0.272***	-0.342**	-0.293**	-0.228**	-0.158**	-0.207***
	(0.039)	(0.025)	(0.024)	(0.017)	(0.031)	(0.075)	(0.068)	(0.052)	(0.058)	(0.073)
Industries										
Agriculture	-0.515***	-0.574***	-0.721***	-0.726***	-0.701****	-0.277**	-0.343***	-0.408**	-0.406***	-0.363***
	(0.039)	(0.032)	(0.025)	(0.022)	(0.040)	(0.065)	(0.061)	(0.045)	(0.050)	(0.066)
Mining	-0.125***	-0.118**	-0.071***	-0.080**	-0.124**	-0.056	-0.159	-0.066	0.115	0.223
	(0.050)	(0.039)	(0.030)	(0.024)	(0.045)	(0.148)	(0.160)	(0.113)	(0.127)	(0.175)
Electricity	0.373***	0.269***	0.221***	0.144**	0.144	0. 724**	0.681**	0.282*	0.069	0.060
	(0.098)	(0.076)	(0.060)	(0.051)	(0.104)	(0.105)	(0.242)	(0.165)	(0.187)	(0.267)

Table 19: Continued

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Construction	-0.150***	-0.138***	-0.182***	-0.193***	-0.202***	0.051	0.025	0.047	0.046	-0.056
	(0.051)	(0.039)	(0.032)	(0.028)	(0.052)	(0.147)	(0.215)	(0.117)	(0.121)	(0.153)
Trade	-0.165**	-0.187***	-0.211***	-0.190***	-0.073*	-0.049	-0.106**	-0.107	-0.149**	-0.038
	(0.040)	(0.033)	(0.027)	(0.024)	(0.044)	(0.059)	(0.055)	(0.040)*	(0.045)	(0.058)
Transport	0.162**	0.096**	0.024	-0.006	0.034	-0.018	0.045	0.033	0.084	0.381**
	(0.048)	(0.039)	(0.032)	(0.028)	(0.054)	(0.145)	(0.130)	(0.088)	(0.090)	(0.124)
Finance	0.072	0.027	-0.046	-0.050	-0.081	0.155*	0.111	0.069	0.004	0.066
	(0.062)	(0.054)	(0.043)	(0.058)	(0.068)	(0.093)	(0.088)	(0.064)	(0.067)	(0.086)
Social Service	-0.077**	-0.021	-0.025	-0.046	-0.050	-0.167**	-0.160**	-0.153**	-0.211**	-0.097
	(0.039)	(0.032)	(0.025)	(0.022)	(0.040)	(0.054)	(0.051)	(0.038)	(0.042)	(0.056)
Unionism	0.339***	0.290***	0.193***	0.155***	0.092***	0.371***	0.320***	0.287***	0.230***	0.182***
	(0.022)	(0.018)	(0.015)	(0.014)	(0.026)	(0.029)	(0.027)	(0.021)	(0.024)	(0.032)
Provinces										
Western Cape	-0.048	-0.040	-0.100	-0.138**	-0.090	0.003	-0.110	-0.176**	-0.168**	-0.115*
	(0.056)	(0.045)	(0.036)	(0.031)	(0.057)	(0.070)	(0.064)	(0.048)	(0.051)	(0.061)
Eastern Cape	-0.362***	-0.259***	-0.231***	-0.155***	-0.087***	-0.310***	-0.263**	-0.289***	-0.192**	-0.111**
	(0.035)	(0.029)	(0.023)	(0.020)	(0.036)	(0.049)	(0.045)	(0.033)	(0.035)	(0.049)
Northern Cape	-0.185**	-0.176**	-0.157**	-0.209*	-0.262**	-0.437***	-0.368**	-0.336**	-0.304***	-0.326***
	(0.062)	(0.050)	(0.041)	(0.035)	(0.062)	(0.093)	(0.084)	(0.062)	(0.067)	(0.086)
Free State	-0.452***	-0.403***	-0.369***	-0.382***	-0.371***	-0.999***	-0.918***	-0.799***	-0.651***	-0.477***
	(0.036)	(0.029)	(0.023)	(0.020)	(0.038)	(0.042)	(0.039)	(0.029)	(0.032)	(0.042)
Kwazulu/Natal	-0.152**	-0.100**	-0.071***	-0.035	0.007	-0.156**	-0.143**	-0.273**	-0.119**	0.048
	(0.031)	(0.026)	(0.021)	(0.018)	(0.034)	(0.041))	(0.037)	(0.033)	(0.029)	(0.038)
North West	-0.142**	-0.118**	-0.148***	-0.130***	-0.068*	-0.446***	-0.335***	-0.273***	-0.195***	-0.133
	(0.037)	(0.030)	(0.024)	(0.021)	(0.039)	(0.049)	(0.045)	(0.058)	(0.035)	(0.045)
Mpumalanga	-0.297*	-0.268*	-0.189***	-0.093**	0.002	-0.198**	-0.211***	-0.153**	-0.098*	0.033
	(0.036)	(0.029)	(0.023)	(0.020)	(0.064)	(0.051)	(0.047)	(0.034)	(0.037)	(0.048)
Northern Provnc	-0.231***	-0.132**	-0.045*	0.062**	0.099**	-0.027	-0.031	0.045	0.081*	0.124***
	(0.039)	(0.032)	(0.025)	(0.021)	(0.040)	(0.061)	(0.056)	(0.041)	(0.043)	(0.056)
Sample Selection Correction Terms										
Lambda1						-3.565**	-2.530**	-2.067**	-1.408**	-0.363
						(0.822)	(0.746)	(0.647)	(0.634)	(0.771)
Lambda2	-	-	-	-	-	3.982**	2.852**	2.463**	1.701*	0.489
	-	-	-	-	-	(1.211)	(1.103)	(0.941)	(0.924)	(1.111)
Lambda3	-	-	-	-	-	0.215**	0.133**	0.110**	0.061	-0.037
	-	-	-	-	-	(0.052)	(0.048)	(0.045)	(0.043)	(0.053)
Lambda4	-	-	-	-	-	0.016	0.044	0.031	0.061**	0.095**
	-	-	-	-	-	(0.042)	(0.034)	(0.029)	(0.025)	(0.029)
Constant	4.117***	5.133***	5.929***	6.402***	6679***	7.019***	7.280***	7.286***	6.991***	6.978***
	(0.208)	(0.148)	(0.160)	(0.098)	(0.183)	(0.423)	(0.380)	(0.289)	(0.312)	(0.415)
Observations	10781	10781	10781	10781	10781	7375	7375	7375	7375	7375

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 20: Quantile regressions for full sample of African Employees by Gender (1999) (Table continues on next page

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Age	0.072***	0.062***	0.050***	0.051***	0.061***	0.037**	0.009	0.004	0.029**	0.033**
	(0.012)	(0.008)	(0.006)	(0.006)	(0.009)	(0.018)	(0.013)	(0.012)	(0.012)	(0.014)
Age-Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001**	-0.0001	0.000	-0.000**	-0.0002*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.381**	0.315**	0.189**	0.181**	0.172**	0.385***	0.352**	0.313*	0.274**	0.227**
	(0.051)	(0.032)	(0.233)	(0.023)	(0.034)	(0.037)	(0.028)	(0.024)	(0.024)	(0.028)
Married	0.234***	0.195***	0.148***	0.135***	0.141***	-0.027	0.036	0.040	0.081**	0.133**
	(0.046)	(0.027)	(0.021)	(0.022)	(0.033)	(0.037)	(0.028)	(0.026)	(0.026)	(0.030)
Education Levels										
Primary	0.150***	0.113***	0.127***	0.117***	0.097**	0.194**	0.181**	0.179**	0.157**	0.224**
	(0.056)	(0.024)	(0.029)	(0.030)	(0.044)	(0.053)	(0.042)	(0.038)	(0.039)	(0.044)
Secondary	0.405***	0.336***	0.328***	0.368***	0.393***	0.432***	0.391***	0.466***	0.475***	0.526***
	(0.058)	(0.037)	(0.030)	(0.031)	(0.046)	(0.055)	(0.043)	(0.039)	(0.041)	(0.047)
Diploma	0.912***	0.871***	0.863***	0.869***	0.934***	0.890***	0. 871**	0.895**	0.922*	0.795**
	(0.116)	(0.074)	(0.056)	(0.059)	(0.091)	(0.119)	(0.088)	(0.077)	(0.079)	(0.097)
Degree	0.847***	0.981***	1.012***	1.052***	1.063***	1.024**	0.930**	1.084**	1.060**	0.928**
	(0.182)	(0.099)	(0.079)	(0.079)	(0.131)	(0.165)	(0.127)	(0.114)	(0.121)	(0.138)
Occupations										
Manager	0.422***	0.489***	0.669***	0.843***	1319***	-0.012	0.581***	0.658***	0.457***	0.860***
	(0.104)	(0.065)	(0.052)	(0.055)	(0.085)	(0.167)	(0.134)	(0.129)	(0.129)	(0.158)
Professional	0.530***	0.379***	0.418***	0.422***	0.471***	0.347***	0.553***	0.686***	0.755***	0.805***
	(0.154)	(0.098)	(0.083)	(0.079)	(0.126)	(0.153)	(0.126)	(0.116)	(0.127)	(0.161)
Technician	0.275***	0.4277***	0.385**	0.357***	0.502***	0.374**	0.442***	0.687***	0.668***	0.716***
	(0.101)	(0.065)	(0.050)	(0.051)	(0.075)	(0.123)	(0.097)	(0.088)	(0.094)	(0.118)
Clerk	0.222**	0.226***	0.277***	0.236***	0.404***	0.160	0.199***	0.296***	0.304***	0.449***
	(0.094)	(0.059)	(0.047)	(0.049)	(0.074)	(0.114)	(0.093)	(0.169)	(0.093)	(0.114)
Skilled	0.078	-0.004	0.048	0.141***	0.313***	-0.056	-0.128*	-0.017	0.078	0.285***
	(0.074)	(0.048)	(0.038)	(0.040)	(0.060)	(0.110)	(0.090)	(0.084)	(0.090)	(0.109)
Agric worker	-0.544**	-0.518**	-0.510**	-0.352**	0.072	-1.032**	-0.944**	-0.379**	-0.250**	-0.058
	(0.084)	(0.055)	(0.046)	(0.057)	(0.072)	(0.144)	(0.117)	(0.107)	(0.113)	(0.129)
Artisan	0.009	0.006	-0.007	0.025	0.106**	-0.332**	-0.163*	-0.034	-0.041	-0.022
	(0.0458)	(0.037)	(0.031)	(0.032)	(0.048)	(0.106)	(0.088)	(0.081)	(0.085)	(0.095)
Elementary Job	-0.143***	-0.168***	-0.191***	-0.169***	-0.104***	-0.479**	-0.400**	-0.285**	-0.295**	-0.234***
	(0.059)	(0.036)	(0.030)	(0.032)	(0.046)	(0.101)	(0.082)	(0.077)	(0.083)	(0.102)
Industries										
Agriculture	-0.460***	-0.655***	-0.717***	-0.726***	-0.728****	-0.072	-0.207***	-0.296**	-0.346***	-0.381***
	(0.077)	(0.047)	(0.038)	(0.041)	(0.060)	(0.089)	(0.068)	(0.065)	(0.069)	(0.081)
Mining	0.250***	0.027	-0.054	-0.127**	-0.109**	0.292	0.389**	0.261	0.103	0.551
	(0.077)	(0.048)	(0.037)	(0.038)	(0.058)	(0.189)	(0.171)	(0.169)	(0.195)	(0.191)
Electricity	0.352***	0.263***	0.322***	0.194**	0.286**	0. 753**	0.985**	0.641**	0.638**	1.262
	(0.165)	(0.111)	(0.089)	(0.092)	(0.144)	(0.134)	(0.266)	(0.213)	(0.250)	(0.115)

Table 20: Continued

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Construction	-0.155***	-0.196***	-0.183***	-0.124***	-0.138***	0.003	0.108	0.212	0.186	-0.078
	(0.083)	(0.51)	(0.041)	(0.042)	(0.061)	(0.174)	(0.130)	(0.135)	(0.153)	(0.149)
Trade	-0.266	-0.242***	-0.273***	-0.257***	-0.293**	-0.305**	-0.192**	-0.125**	-0.149**	-0.081
	(0.067)	(0.043)	(0.035)	(0.037)	(0.054)	(0.076)	(0.057)	(0.057)	(0.153)	(0.073)
Transport	0.078	-0.008	0.039	-0.035	0.082	0.245*	0.252*	0.152	0.128	0.486**
	(0.086)	(0.054)	(0.043)	(0.045)	(0.069)	(0.141)	(0.133)	(0.126)	(0.136)	(0.184)
Finance	0.108	0.024	-0.072	-0.132**	-0.144*	0.368**	0.295	0.229**	-0.167**	0.270**
	(0.095)	(0.061)	(0.050)	(0.053)	(0.078)	(0.107)	(0.087)	(0.078)	(0.081)	(0.095)
Social Service	-0.074	-0.016	-0.007	-0.024	-0.072	-0.041	-0.054	-0.126**	-0.187**	-0.162**
	(0.073)	(0.046)	(0.037)	(0.038)	(0.056)	(0.077)	(0.057)	(0.054)	(0.059)	(0.070)
Unionism	0.607***	0.490***	0.343***	0.274***	0.183***	0.614***	0.555***	0.523***	0.506***	0.480***
	(0.043	(0.027)	(0.022)	(0.023)	(0.036)	(0.047)	(0.034)	(0.030)	(0.032)	(0.040)
Provinces										
Western Cape	0.246**	0.154	0.059	0.039	-0.048	0.231**	0.149**	0.058	-0.108	-0.048
	(0.089)	(0.055)	(0.043)	(0.045)	(0.068)	(0.086)	(0.066)	(0.059)	(0.060)	(0.075)
Eastern Cape	-0.567***	-0.511***	-0.417***	-0.283***	-0.339***	-0.649***	-0.588**	-0.620***	-0.550**	-0.389**
	(0.076	(0.047)	(0.037)	(0.039)	(0.057)	(0.064)	(0.049)	(0.043)	(0.044)	(0.051)
Northern Cape	-0.151	-0.119*	-0.099*	-0.011	-0.013	-0.316***	-0.355**	-0.368**	-0.359***	-0.414***
	(0.101)	(0.068)	(0.056)	(0.059)	(0.090)	(0.101)	(0.084)	(0.079)	(0.085)	(0.096)
Free State	-0.428***	-0.427***	-0.410***	-0.377***	-0.421***	-0.835***	-0.815***	-0.677***	-0.558***	-0.456***
	(0.067)	(0.041)	(0.033)	(0.034)	(0.050)	(0.060)	(0.047)	(0.043)	(0.045)	(0.054)
Kwazulu/Natal	-0.192**	-0.203**	-0.195***	-0.157**	-0.121**	-0.296**	-0.373**	-0.355**	-0.258**	-0.132**
	(0.064)	(0.040)	(0.032)	(0.033)	(0.049)	(0.056))	(0.043)	(0.039)	(0.040)	(0.045)
North West	-0.218**	-0.145**	-0.217***	-0.142***	-0.133**	-0.228***	-0.276***	-0.228***	-0.186***	-0.129**
	(0.062)	(0.038)	(0.031)	(0.032)	(0.047)	(0.061)	(0.047)	(0.043)	(0.043)	(0.050)
Mpumalanga	-0.161*	-0.152*	-0.167***	-0.132**	-0.173**	-0.291**	-0.297***	-0.352**	-0.296**	-0.170**
	(0.065)	(0.039)	(0.031)	(0.032)	(0.047)	(0.060)	(0.046)	(0.041)	(0.043)	(0.050)
Northern Provnc	-0.247***	-0.301**	-0.281	-0.227**	-0.205**	-0.371**	-0.392**	-0.404**	0.385**	-0.247***
	(0.071)	(0.045)	(0.0235)	(0.036)	(0.052)	(0.065)	(0.049)	(0.044)	(0.044)	(0.050)
Sample Selection Correction Terms										
Lambda1						1.248	-1.305	-0.890	-0.482	-0.108
						(1.075)	(0.914)	(0.906)	(0.845)	(0.905)
Lambda2	-	-	-	-	-	-2.412	1.388	0.856	0.460	0.074
	-	-	-	-	-	(1.657)	(1.372)	(1.345)	(1.259)	(1.356)
Lambda3	-	-	-	-	-	-0.106*	0.057	0.056	0.032	-0.013
	-	-	-	-	-	(0.062)	(0.057)	(0.059)	(0.054)	(0.056)
Lambda4	-	-	-	-	-	-0.001	0.037	0.033	-0.035	0.025
	-	-	-	-	-	(0.068)	(0.053)	(0.050)	(0.049)	(0.055)
Constant	2.508***	3.583***	4.848***	5.145***	5.271***	3.527***	4.718***	5.138***	5.103***	5.225***
	(0.314)	(0.198)	(0.150)	(0.154)	(0.232)	(0.440)	(0.343)	(0.305)	(0.315)	(0.367)
Observations	8271	8271	8271	8271	8271	6160	6160	6160	6160	6160

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 21: Quantile regressions for full sample of African Employees by Gender (2004) (Table continues on next page

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Age	0.057***	0.050***	0.039***	0.044***	0.043***	-0.032**	0.011	0.008	0.062	0.014
	(0.008)	(0.007)	(0.006)	(0.005)	(0.006)	(0.014)	(0.012)	(0.012)	(0.010)	(0.008)
Age-Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	0.001*	-0.0001	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.381**	0.366**	0.355**	0.255**	0.139**	0.337***	0.325**	0.295**	0.255**	0.217**
	(0.041)	(0.038)	(0.020)	(0.014)	(0.018)	(0.038)	(0.024)	(0.016)	(0.017)	(0.015)
Married	0.182***	0.140***	0.154***	0.158***	0.183***	0.114**	0.111**	0.108**	0.129**	0.110**
	(0.034)	(0.026)	(0.022)	(0.019)	(0.033)	(0.033)	(0.026)	(0.021)	(0.023)	(0.020)
Education Levels										
Primary	0.062	0.076***	0.039	-0.046	-0.100**	0.136**	0.105**	0.063**	-0.010	0.051*
	(0.043)	(0.038)	(0.033)	(0.028)	(0.037)	(0.047)	(0.038)	(0.032)	(0.036)	(0.029)
Secondary	0.283***	0.316***	0.279***	0.214***	0.213***	0.319***	0.337***	0.277***	0.174***	0.314***
	(0.041)	(0.038)	(0.033)	(0.028)	(0.038)	(0.047)	(0.041)	(0.033)	(0.037)	(0.030)
Diploma	0.927***	1.021***	0.869***	0.709***	0.752***	0.527***	0. 637**	0.647**	0.455**	0.559**
	(0.080)	(0.064)	(0.052)	(0.045)	(0.065)	(0.096)	(0.079)	(0.064)	(0.074)	(0.057)
Degree	1.150***	1.206***	1.293***	1.283***	1.147***	0.378**	0.396**	0.518**	0.458**	0.797**
	(0.147)	(0.102)	(0.094)	(0.091)	(0.107)	(0.171)	(0.132)	(0.115)	(0.128)	(0.119)
Occupations										
Manager	0.440***	0.690***	0.836***	1.060***	1320***	0.593**	0.928***	1.161***	1.233***	1.486***
	(0.071)	(0.062)	(0.055)	(0.045)	(0.064)	(0.135)	(0.112)	(0.097)	(0.107)	(0.088)
Professional	0.398***	0.486***	0.391***	0.174*	0.613***	0.850***	1.114***	1.158***	1.092***	0.904***
	(0.166)	(0.114)	(0.101)	(0.094)	(0.115)	(0.174)	(0.129)	(0.123)	(0.131)	(0.134)
Technician	0.142*	0.213***	0.279**	0.404***	0.543***	0.381**	0.694***	0.798***	0.916***	0.731***
	(0.075)	(0.068)	(0.055)	(0.047)	(0.062)	(0.094)	(0.077)	(0.070)	(0.080)	(0.062)
Clerk	0.293**	0.242***	0.247***	0.433***	0.608***	0.409**	0.588***	0.597***	0.600***	0.599***
	(0.071)	(0.064)	(0.053)	(0.045)	(0.058)	(0.088)	(0.071)	(0.067)	(0.078)	(0.062)
Skilled	-0.104**	-0.009	0.044	0.073***	0.265***	-0.036	-0.100*	0.168**	0.264***	0.325***
	(0.051)	(0.046)	(0.041)	(0.035)	(0.046)	(0.082)	(0.069)	(0.065)	(0.074)	(0.060)
Agric worker	-1.213**	-0.705**	-0.497**	-0.259**	-0.019	-1.150**	-1.306**	-0.626**	-0.214*	-0.082
	(0.111)	(0.082)	(0.072)	(0.056)	(0.072)	(0.114)	(0.212)	(0.128)	(0.126)	(0.084)
Artisan	-0.161	0.055	-0.033	0.050*	0.102**	-0.349**	-0.142*	-0.033	0.000	-0.078
	(0.046)	(0.038)	(0.033)	(0.029)	(0.037)	(0.080)	(0.071)	(0.063)	(0.071)	(0.060)
Elementary Job	-0.433***	-0.287***	-0.287***	-0.260***	-0.175***	-0.286**	-0.132**	-0.145**	-0.149**	-0.233***
	(0.037)	(0.035)	(0.031)	(0.027)	(0.035)	(0.074)	(0.063)	(0.061)	(0.070)	(0.056)
Industries										
Agriculture	-0.136***	-0.284***	-0.416***	-0.454***	-0.532****	0.258**	-0.004	-0.056	-0.245***	-0.276***
	(0.054)	(0.045)	(0.038)	(0.034)	(0.045)	(0.080)	(0.059)	(0.054)	(0.065)	(0.047)
Mining	0.379***	0.235**	0.200	-0.162**	0.212**	0.146	0.113	0.202	0.199	1.180**
	(0.060)	(0.049)	(0.048)	(0.035)	(0.045)	(0.126)	(0.171)	(0.150)	(0.189)	(0.053)
Electricity	0.373***	0.133*	0.104	0.052	0.023	0. 831**	0.382**	0.699**	0.516**	0.413**
	(0.116)	(0.160)	(0.109)	(0.068)	(0.090)	(0.220)	(0.151)	(0.149)	(0.154)	(0.115)

Table 21: Continued

	Males					Females				
Variable	θ =10	θ =25	θ =50	θ =75	θ =90	θ =10	θ =25	θ =50	θ =75	θ =90
Construction	-0.034	-0.139***	-0.194***	-0.084***	-0.050)	0.118	0.101	-0.009	-0.061	0.126**
	(0.056)	(0.044)	(0.038)	(0.032)	(0.044)	(0.108)	(0.080)	(0.071)	(0.076)	(0.062)
Trade	-0.312**	-0.349***	-0.293***	-0.167***	-0.146**	-0.319**	-0.412**	-0.293**	-0.227**	-0.156**
	(0.049)	(0.042)	(0.037)	(0.031)	(0.043)	(0.056)	(0.044)	(0.045)	(0.056)	(0.047)
Transport	0.113**	-0.057	-0.026	0.069*	0.100*	-0.199*	0.110	0.407**	0.475	0.658**
	(0.053)	(0.052)	(0.045)	(0.038)	(0.051)	(0.099)	(0.095)	(0.085)	(0.097)	(0.070)
Finance	0.028	-0.017	-0.135**	-0.082*	-0.147**	0.250**	0.082	0.174**	0.150**	0.067
	(0.067)	(0.053)	(0.049)	(0.044)	(0.055)	(0.086)	(0.069)	(0.064)	(0.073)	(0.056)
Social Service	-0.016	-0.123**	-0.095**	-0.026	-0.010	0.161**	-0.072*	-0.081*	-0.163**	-0.129**
	(0.049)	(0.042	(0.037)	(0.032)	(0.043)	(0.054)	(0.043)	(0.043)	(0.054)	(0.039)
Unionism	0.687***	0.612***	0.506***	0.440***	0.310***	0.934***	0.792***	0.685***	0.608**	0.607***
	(0.038	(0.029)	(0.025)	(0.021)	(0.026)	(0.039)	(0.031)	(0.027)	(0.032)	(0.026)
Provinces										
Western Cape	0.111	0.018	0.062	0.141**	-0.273**	0.244**	0.060	-0.012	-0.045	-0.018
	(0.078)	(0.060)	(0.051)	(0.041)	(0.052)	(0.079)	(0.063)	(0.062)	(0.074)	(0.043)
Eastern Cape	-0.590***	-0.474***	-0.384	-0.292***	-0.277***	-0.546***	-0.609**	-0.599***	-0.420**	-0.413**
	(0.049)	(0.039)	(0.034)	(0.028)	(0.036)	(0.054)	(0.040)	(0.033)	(0.037)	(0.030)
Northern Cape	-0.281**	-0.195**	-0.221**	-0.122**	-0.039	-0.061	-0.253**	-0.268**	-0.170***	-0.250***
	(0.084)	(0.058)	(0.048)	(0.038)	(0.048)	(0.085)	(0.086)	(0.061)	(0.064)	(0.051)
Free State	-0.389***	-0.393***	-0.437***	-0.422***	-0.387***	-0.588***	-0.584***	-0.520***	-0.459***	-0.443***
	(0.053)	(0.040)	(0.033)	(0.027)	(0.034)	(0.057)	(0.042)	(0.035)	(0.039)	(0.033)
Kwazulu/Natal	-0.113**	-0.148**	-0.101***	-0.047*	-0.005	-0.264**	-0.310**	-0.324**	-0.272**	-0.265**
	(0.042)	(0.035)	(0.034)	(0.025)	(0.035)	(0.043))	(0.036)	(0.030)	(0.034)	(0.028)
North West	-0.160**	-0.222**	-0.280***	-0.287***	-0.291**	-0.173***	-0.297***	-0.274***	-0.235***	-0.255**
	(0.046)	(0.040)	(0.034)	(0.027)	(0.036)	(0.057)	(0.048)	(0.038)	(0.040)	(0.034)
Mpumalanga	-0.325*	-0.321**	-0.311***	-0.297**	-0.173**	-0.545**	-0.530***	-0.466**	-0.351**	-0.291**
	(0.045)	(0.039)	(0.031)	(0.026)	(0.035)	(0.055)	(0.044)	(0.035)	(0.038)	(0.032)
Northern Provnc	-0.509***	-0.402**	-0.337**	-0.309**	-0.272**	-0.593**	-0.598**	-0.522**	0.400**	-0.346***
	(0.049)	(0.039)	(0.033)	(0.027)	(0.035)	(0.059)	(0.047)	(0.037)	(0.040)	(0.033)
Sample Selection Correction Terms										
Lambda1						2.370**	2.832**	3.266**	0.373	-0.781
						(1.396)	(1.132)	(0.989)	(1.161)	(0.862)
Lambda2	-	-	-	-	-	-3.912*	-4.191**	-4.719**	-0.886	0.803
	-	-	-	-	-	(2.003)	(1.602)	(1.393)	(1.633)	(1.219)
Lambda3	-	-	-	-	-	-0.247**	-0.274**	-0.295**	-0.032	0.064
	-	-	-	-	-	(0.099)	(0.083)	(0.075)	(0.089)	(0.065)
Lambda4	-	-	-	-	-	0.122**	0.125**	0.070**	0.004	0.025
	-	-	-	-	-	(0.046)	(0.034)	(0.028)	(0.032)	(0.023)
Constant	3.196***	3.770***	4. 485***	5.055***	5.782***	5.031***	4.363***	4.814***	5.720***	5.932***
	(0.222)	(0.184')	(0.146)	(0.116)	(0.152)	(0.422)	(0.353)	(0.3281)	(0.302)	(0.245)
Observations	8249	8249	8249	8249	8249	6857	6857	6857	6857	6857

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 22: Quantile Regressions for African employees excluding DWs by Gender (1995) (Table continues on next page)

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Age	0.056***	0.041***	0.036***	0.026***	0.032***	-0.043*	-0.026	-0.018	-0.002	0.010
	(0.008)	(0.005)	(0.004)	(0.004)	(0.006)	(0.022)	(0.017)	(0.013)	(0.016)	(0.015)
Age-Squared	-0.001***	-0.001***	-0.0003***	-0.0002***	-0.0003***	0.001**	0.0003*	0.001*	0.000	-0.000
	0.056***	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.187**	0.046*	0.021	0.025	0.007	0.074	0.046	0.012	-0.007	-0.034
	(0.042)	(0.028)	(0.018)	(0.019)	(0.024)	(0.046)	(0.036)	(0.025)	(0.030)	(0.031)
Married	0.205***	0.163***	0.129***	0.126***	0.143***	-0.012	0.014	0.005	0.012	0.002
	(0.026)	(0.019)	(0.014)	(0.015)	(0.022)	(0.034)	(0.028)	(0.019)	(0.024)	(0.022)
Education Levels										
Primary	0.151***	0.108***	0.070***	0.075***	0.024	0.228**	0.100**	0.048	-0.005	0.023
	(0.033)	(0.024)	(0.017)	(0.018)	(0.026)	(0.059)	(0.047)	(0.034)	(0.042)	(0.037)
Secondary	0.356***	0.304***	0.255***	0.273***	0.231***	0.543***	0.378***	0.248***	0.152***	0.212***
	(0.034)	(0.025)	(0.017)	(0.017)	(0.026)	(0.059)	(0.047)	(0.033)	(0.040)	(0.036)
Diploma	0.728***	0.570***	0.502***	0.524***	0.503***	0.611***	0.463**	0.305**	0.229**	0.224**
	(0.068)	(0.047)	(0.033)	(0.037)	(0.058)	(0.133)	(0.106)	(0.076)	(0.092)	(0.084)
Degree	1.178***	1.003***	0.967***	0.952***	0.847***	0.884**	0.707**	0.595**	0.413**	0.470**
	(0.092)	(0.097)	(0.067)	(0.074)	(0.095)	(0.208)	(0.156)	(0.115)	(0.140)	(0.129)
Occupations										
Manager	0.346***	0.397***	0.546***	0.647***	0.743***	0.428***	0.611***	0.667***	0.937***	0.788***
	(0.095)	(0.072)	(0.048)	(0.050)	(0.065)	(0.193)	(0.150)	(0.112)	(0.142)	(0.128)
Professional	0.221***	0.283***	0.331***	0.445***	0.5491***	0.532***	0.463***	0.579***	0.604***	0.448***
	(0.105)	(0.104)	(0.073)	(0.082)	(0.104)	(0.156)	(0.122)	(0.092)	(0.120)	(0.107)
Technician	0.426***	0.438***	0.465**	0.449***	0.384***	0.836**	0.622***	0.743***	0.669***	0.558***
	(0.072)	(0.049)	(0.034)	(0.037)	(0.059)	(0.098)	(0.077)	(0.057)	(0.072)	(0.065)
Clerk	0.111*	0.201**	0.222***	0.252***	0.234***	0.383**	0.289***	0.432***	0.354***	0.238***
	(0.061)	(0.043)	(0.028)	(0.029)	(0.042)	(0.095)	(0.076)	(0.054)	(0.067)	(0.058)
Skilled	0.002	0.022	0.139***	0.180***	0.206***	-0.008	-0.047	0.172**	0.144***	0.138***
	(0.048)	(0.035)	(0.024)	(0.026)	(0.038)	(0.094)	(0.075)	(0.054)	(0.068)	(0.060)
Agric worker	-0.466**	-0.382**	-0.016	0.259**	0.142	-0.277**	-0.389	-0.118	0.087	-0.193
	(0.150)	(0.113)	(0.068)	(0.068)	(0.094)	(0.126)	(0.237)	(0.175)	(0.200)	(0.184)
Artisan	-0.032	-0.023	0.039*	0.105***	0.138**	-0.334**	-0.176**	-0.004	-0.068	-0.019
	(0.042)	(0.032)	(0.022)	(0.023)	(0.035)	(0.104)	(0.086)	(0.062)	(0.076)	(0.067)
Elementary Job	-0.265***	-0.268***	-0.179***	-0.195***	-0.255***	-0.052	-0.198**	-0.088*	-0.094	-0.192***
	(0.033)	(0.025)	(0.018)	(0.018)	(0.027)	(0.082)	(0.066)	(0.049)	(0.063)	(0.055)
Industries										
Agriculture	-0.522***	-0.596***	-0.736***	-0.719***	-0.710****	-0.619**	-0.525***	-0.597**	-0.679***	-0.460***
	(0.043)	(0.032)	(0.022)	(0.023)	(0.035)	(0.075)	(0.061)	(0.044)	(0.056)	(0.052)
Mining	-0.119***	-0.112***	-0.078***	-0.073**	-0.092**	-0.183	-0.173	0.004	0.003	0.269**
	(0.055)	(0.040)	(0.027)	(0.026)	(0.038)	(0.177)	(0.144)	(0.109)	(0.135)	(0.100)
Electricity	0.320***	0.244***	0.243***	0.173**	0.198**	0.208*	0.464**	0.172	0.063	-0.027
	(0.110)	(0.078)	(0.052)	(0.054)	(0.091)	(0.117)	(0.238)	(0.159)	(0.190)	(0.204)

Table 22: Continued

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Construction	-0.176***	-0.143***	-0.206***	-0.218***	-0.214***	0.192	0.073	0.096	0.071	0.142
	(0.058)	(0.042)	(0.029)	(0.032)	(0.047)	(0.184)	(0.158	(0.111)	(0.132)	(0.122)
Trade	-0.152**	-0.185**	-0.229***	-0.213***	-0.184**	-0.162	-0.066	-0.153**	-0.169**	-0.078*
	(0.046)	(0.034)	(0.025)	(0.027)	(0.042)	(0.068)	(0.056)	(0.040)	(0.052)	(0.047)
Transport	0.133**	0.078**	0.014	-0.017	0.032	0.041	0.012	0.029	0.134	0.286**
	(0.056)	(0.041)	(0.029)	(0.031)	(0.048)	(0.162)	(0.121)	(0.085)	(0.099)	(0.089)
Finance	0.087	0.025	-0.057	-0.032	-0.071	0.092	0.193**	0.103*	0.063	0.169**
	(0.073)	(0.055)	(0.038)	(0.040)	(0.058)	(0.105)	(0.084)	(0.062)	(0.075)	(0.066)
Social Service	-0.047	0.005	-0.009	-0.022	-0.026	-0.052**	-0.149**	0.072*	0.047	0.095**
	(0.044)	(0.033)	(0.022)	(0.023)	(0.035)	(0.066)	(0.054)	(0.039)	(0.049)	(0.044)
Unionism	0.332***	0.281***	0.196***	0.168***	0.129***	0.300***	0.269***	0.200***	0.156***	0.123***
	(0.025)	(0.019)	(0.013)	(0.015)	(0.022)	(0.035)	(0.028)	(0.020)	(0.026)	(0.023)
Provinces										
Western Cape	-0.042	-0.061	-0.082	-0.135**	-0.064	0.018	-0.137*	-0.150**	-0.130**	-0.017
	(0.064)	(0.047)	(0.032)	(0.034)	(0.050)	(0.089)	(0.073)	(0.053)	(0.064)	(0.054)
Eastern Cape	-0.383***	-0.281***	-0.230***	-0.164***	-0.080***	-0.339***	-0.303**	-0.233***	-0.106**	-0.048
	(0.041)	(0.030)	(0.021)	(0.022)	(0.032)	(0.065)	(0.052)	(0.037)	(0.045)	(0.040)
Northern Cape	-0.192**	-0.167**	-0.154**	-0.215*	-0.252**	-0.402***	-0.280**	-0.259**	-0.222***	-0.380***
	(0.069)	(0.052)	(0.035)	(0.037)	(0.054)	(0.127)	(0.105)	(0.076)	(0.095)	(0.090)
Free State	-0.438***	-0.388***	-0.358***	-0.379***	-0.355***	-0.721***	-0.622***	-0.548***	-0.360***	-0.319***
	(0.040)	(0.030)	(0.020)	(0.022)	(0.033)	(0.063)	(0.050)	(0.035)	(0.043)	(0.039)
Kwazulu/Natal	-0.154**	-0.106**	-0.059***	-0.033	0.029	-0.172**	-0.175**	-0.143**	-0.098**	-0.065
	(0.036)	(0.027)	(0.019)	(0.020)	(0.030)	(0.052))	(0.042)	(0.030)	(0.037)	(0.033)
North West	-0.159**	-0.123**	-0.142***	-0.139***	-0.054	-0.344***	-0.193***	-0.164***	-0.110***	-0.069**
	(0.043)	(0.032)	(0.022)	(0.024)	(0.035)	(0.064)	(0.052)	(0.036)	(0.045)	(0.040)
Mpumalanga	-0.286*	-0.274*	-0.177***	-0.097**	0.013	-0.145**	-0.239***	-0.182**	-0.092*	0.007
	(0.040)	(0.030)	(0.021)	(0.022)	(0.032)	(0.072)	(0.057)	(0.040)	(0.049)	(0.045)
Northern Provnc	-0.244***	-0.101***	-0.053**	0.038	0.086**	0.010	-0.119*	0.008	0.050	0.097**
	(0.046)	(0.034)	(0.023)	(0.024)	(0.036)	(0.080)	(0.064)	(0.045)	(0.054)	(0.049)
Sample Selection Correction Terms										
Lambda1						-2.305**	-2.403**	-2.715**	-0.918	-0.119
						(1.039)	(0.811)	(0.691)	(0.708)	(0.617)
Lambda2	-	-	-	-	-	2.584 **	2.808**	3.558**	1.177	0.025
	-	-	-	-	-	(1.540)	(1.211)	(1.009)	(1.050)	(0.923)
Lambda3	-	-	-	-	-	0.109**	0.146**	0.144**	0.012	-0.042
	-	-	-	-	-	(0.065)	(0.051)	(0.048)	(0.047)	(0.041)
Lambda4	-	-	-	-	-	0.020	0.017	0.028	0.069**	0.093**
	-	-	-	-	-	(0.048)	(0.036)	(0.025)	(0.029)	(0.024)
Constant	4.527***	5.049***	6.078***	6.541***	6.823***	6.789***	6.993***	7.269***	7.236***	7.246***
	(0.239)	(0.158)	(0.105)	(0.107)	(0.153)	(0.586)	(0.455)	(0.330)	(0.406)	(0.384)
Observations	10018	10018	10018	10018	10018	4755	4755	4755	4755	4755

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 23: Quantile Regressions for African employees excluding DWs by Gender (1999) (Table continues on next page)

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Age	0.071***	0.054***	0.047***	0.045***	0.060***	0.036*	0.004	0.003	0.029**	0.040
	(0.010)	(0.007)	(0.005)	(0.005)	(0.010)	(0.019)	(0.018)	(0.014)	(0.012)	(0.019)
Age-Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001	-0.0001	0.000	-0.000*	-0.0001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.353**	0.214**	0.142**	0.115**	0.174**	0.347***	0.211**	0.171**	0.127**	0.141**
	(0.049)	(0.034)	(0.022)	(0.023)	(0.041)	(0.073)	(0.062)	(0.040)	(0.031)	(0.038)
Married	0.222***	0.185***	0.141***	0.139***	0.142***	-0.022	-0.016	0.022	0.066**	0.092**
	(0.037)	(0.025)	(0.017)	(0.020)	(0.037)	(0.042)	(0.040)	(0.031)	(0.028)	(0.044)
Education Levels										
Primary	0.141***	0.093***	0.099***	0.092***	0.080*	0.081	0.157**	0.119**	0.137**	0.137**
	(0.046)	(0.032)	(0.024)	(0.027)	(0.047)	(0.069)	(0.073)	(0.056)	(0.051)	(0.076)
Secondary	0.362***	0.300***	0.296***	0.344***	0.367***	0.406***	0.350***	0.361***	0.393***	0.428***
	(0.049)	(0.034)	(0.025)	(0.028)	(0.050)	(0.068)	(0.074)	(0.057)	(0.052)	(0.082)
Diploma	0.872***	0.813***	0.798***	0.860***	0.944***	1.001***	0.861**	0.743**	0.743*	0.739**
	(0.094)	(0.064)	(0.047)	(0.054)	(0.104)	(0.117)	(0.119)	(0.090)	(0.082)	(0.138)
Degree	0.956***	0.978***	0.963***	1.081***	0.894***	1.222**	0.920**	0.920**	0.895**	0.841
	(0.121)	(0.089)	(0.064)	(0.074)	(0.139)	(0.163)	(0.156)	(0.119)	(0.106)	(0.177)
Occupations										
Manager	0.448***	0.460***	0.496***	0.651***	0.867***	-0.247	0.344*	0.586***	0.383***	0.282
	(0.097)	(0.073)	(0.052)	(0.058)	(0.110)	(0.157)	(0.186)	(0.156)	(0.122)	(0.191)
Professional	0.462***	0.300***	0.415***	0.343***	0.546***	0.143	0.441***	0.502***	0.466***	0.396***
	(0.113)	(0.087)	(0.062)	(0.071)	(0.133)	(0.142)	(0.142)	(0.110)	(0.100)	(0.189)
Technician	0.309***	0.331***	0.407**	0.326***	0.434***	0.154	0.332***	0.495***	0.336***	0.289***
	(0.079)	(0.058)	(0.042)	(0.045)	(0.083)	(0.117)	(0.112)	(0.086)	(0.076)	(0.145)
Clerk	0.146**	0.187***	0.255***	0.215***	0.364***	0.008	0.156	0.266***	0.195***	0.153
	(0.072)	(0.052)	(0.037)	(0.042)	(0.074)	(0.109)	(0.106)	(0.082)	(0.073)	(0.136)
Skilled	-0.024	-0.003	0.042	0.104***	0.243***	-0.312**	-0.185*	-0.075	0.157	0.045
	(0.057)	(0.043)	(0.032)	(0.035)	(0.065)	(0.110)	(0.106)	(0.082)	(0.072)	(0.132)
Agric worker	-0.647**	-0.611**	-0.577**	-0.373**	-0.159**	-0.508**	-0.231	-0.136	-0.144	-0.239
	(0.064)	(0.049)	(0.038)	(0.044)	(0.081)	(0.154)	(0.156)	(0.116)	(0.102)	(0.162)
Artisan	0.029	0.026	-0.004	0.028	0.066	-0.235*	-0.059	0.035	-0.019	-0.089
	(0.046)	(0.033)	(0.025)	(0.028)	(0.053)	(0.109)	(0.104)	(0.083)	(0.074)	(0.117)
Elementary Job	-0.082*	-0.154***	-0.181***	-0.159***	-0.113***	-0.311**	-0.118	-0.114	-0.118*	-0.117***
	(0.045)	(0.032)	(0.024)	(0.027)	(0.050)	(0.099)	(0.095)	(0.074)	(0.066)	(0.122)
Industries										
Agriculture	-0.606***	-0.721***	-0.763***	-0.744***	-0.719****	-0.261**	-0.391***	-0.422**	-0.585***	-0.522***
	(0.061)	(0.042)	(0.030)	(0.036)	(0.065)	(0.086)	(0.081)	(0.064)	(0.057)	(0.100)
Mining	0.227*	0.027	-0.058*	-0.132**	-0.132**	-0.021	0.398*	0.232	0.126	0.484**
	(0.061)	(0.042)	(0.029)	(0.032)	(0.060)	(0.168)	(0.197)	(0.154)	(0.144)	(0.128)
Electricity	0.294***	0.245***	0.301***	0.244**	0.373**	0.921**	0.762**	0.800**	0.643**	1.080**
	(0.128)	(0.093)	(0.069)	(0.078)	(0.141)	(0.117)	(0.271)	(0.195)	(0.172)	(0.129)

Table 23: Continued

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Construction	-0.169***	-0.249***	-0.225***	-0.175***	-0.179***	0.060	0.185	0.203	0.039	-0.088
	(0.067)	(0.047)	(0.035)	(0.039)	(0.071)	(0.155)	(0.156)	(0.129)	(0.133)	(0.175)
Trade	-0.124**	-0.179***	-0.259***	-0.240***	-0.299**	-0.142*	-0.046	-0.108*	-0.116**	-0.161*
	(0.055)	(0.040)	(0.030)	(0.035)	(0.063)	(0.077)	(0.074)	(0.058)	(0.052)	(0.091)
Transport	-0.029	-0.025	0.006	0.037	-0.026	-0.020	0.056	-0.100	-0.199	0.346
	(0.071)	(0.049)	(0.036)	(0.040)	(0.074)	(0.144)	(0.151)	(0.121)	(0.110)	(0.217)
Finance	0.121	0.011	-0.108**	-0.150**	-0.159**	0.383**	0.283**	0.281**	0.255**	0.422**
	(0.075)	(0.054)	(0.040)	(0.046)	(0.082)	(0.103)	(0.097)	(0.073)	(0.063)	(0.113)
Social Service	-0.088	0.032	0.016	0.008	-0.017	0.187**	-0.221**	0.215**	-0.297**	0.301**
	(0.056)	(0.041)	(0.030)	(0.033)	(0.061)	(0.078)	(0.074)	(0.056)	(0.050)	(0.092)
Unionism	0.474***	0.408***	0.308***	0.267***	0.199***	0.591***	0.508***	0.419***	0.295***	0.253***
	(0.034)	(0.024)	(0.018)	(0.020)	(0.039)	(0.045)	(0.042)	(0.031)	(0.028)	(0.045)
Provinces										
Western Cape	0.208**	0.125**	0.067*	0.031	-0.006	0.125	0.116	-0.065	-0.052	-0.183
	(0.070)	(0.049)	(0.035)	(0.039)	(0.071)	(0.095)	(0.093)	(0.070)	(0.061)	(0.102)
Eastern Cape	-0.478***	-0.488***	-0.393***	-0.281***	-0.342***	-0.694***	-0.522**	-0.505***	-0.415**	-0.302**
	(0.061)	(0.043)	(0.032)	(0.035)	(0.063)	(0.072)	(0.070)	(0.053)	(0.046)	(0.072)
Northern Cape	-0.199	-0.168**	-0.098**	0.006	0.088	-0.085	-0.162	-0.257**	-0.333***	-0.434***
	(0.079)	(0.061)	(0.045)	(0.052)	(0.096)	(0.108)	(0.121)	(0.095)	(0.084)	(0.121)
Free State	-0.446***	-0.413***	-0.391***	-0.361***	-0.366***	-0.741***	-0.654***	-0.613***	-0.463***	-0.439***
	(0.054)	(0.038)	(0.027)	(0.030)	(0.053)	(0.069)	(0.067)	(0.051)	(0.046)	(0.077)
Kwazulu/Natal	-0.099*	-0.151**	-0.156***	-0.125**	-0.112**	-0.282**	-0.297**	-0.259**	-0.221**	-0.209**
	(0.052)	(0.036)	(0.026)	(0.030)	(0.055)	(0.062))	(0.061)	(0.046)	(0.040)	(0.063)
North West	-0.206**	-0.169**	-0.206***	-0.120***	-0.124**	-0.220***	-0.240***	-0.199***	-0.154***	-0.082
	(0.050)	(0.035)	(0.025)	(0.028)	(0.051)	(0.066)	(0.064)	(0.049)	(0.042)	(0.066)
Mpumalanga	-0.178**	-0.147*	-0.169***	-0.122**	-0.136**	-0.274**	-0.318***	-0.299**	-0.248**	-0.225**
	(0.052)	(0.036)	(0.026)	(0.029)	(0.051)	(0.068)	(0.067)	(0.052)	(0.046)	(0.073)
Northern Provnc	-0.198***	-0.296**	-0.297**	-0.258**	-0.225**	-0.307**	-0.412**	-0.349**	0.336**	-0.259***
	(0.057)	(0.042)	(0.031)	(0.032)	(0.055)	(0.070)	(0.067)	(0.050)	(0.044)	(0.068)
Sample Selection Correction Terms										
Lambda1						0.523	-0.878	0.868	1.040	-0.560
						(1.097)	(1.195)	(0.988)	(0.719)	(1.032)
Lambda2	-	-	-	-	-	-1.116	0.800	-1.818	-1.807	-0.778
	-	-	-	-	-	(1.709)	(1.805)	(1.468)	(1.097)	(1.581)
Lambda3	-	-	-	-	-	-0.063	0.039	-0.044	-0.064	-0.067
	-	-	-	-	-	(0.063)	(0.076)	(0.066)	(0.042)	(0.059)
Lambda4	-	-	-	-	-	-0.024	-0.001	-0.069	-0.030	0.030
	-	-	-	-	-	(0.064)	(0.067)	(0.050)	(0.041)	(0.062)
Constant	2.809***	4.205***	5.125***	5.530***	5.294***	3.610***	5.243***	5.746***	5.722***	5.562***
	(0.271)	(0.191)	(0.132)	(0.146)	(0.264)	(0.498)	(0.491)	(0.377)	(0.328)	(0.487)
Observations	7193	7193	7193	7193	7193	3561	3561	3561	3561	5172

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 24: Quantile Regressions for African wage employees excluding DWs by Gender (2004) (Table continues on next page)

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Age	0.058***	0.042***	0.037***	0.032***	0.041***	-0.014	-0.005	-0.007	-0.021*	-0.032**
	(0.010)	(0.008)	(0.006)	(0.005)	(0.005)	(0.020)	(0.009)	(0.013)	(0.011)	(0.010)
Age-Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	0.001	-0.0001	-0.000	-0.000**	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Log hours	0.262**	0.288**	0.259**	0.101**	0.021	0.286***	0.201**	0.106**	0.137**	0.100
	(0.068)	(0.042)	(0.024)	(0.023)	(0.024)	(0.069)	(0.027)	(0.034)	(0.025)	(0.027)
Married	0.146***	0.121***	0.143***	0.148***	0.188***	0.097**	0.099**	0.091**	0.136**	0.091**
	(0.041)	(0.029)	(0.021)	(0.023)	(0.022)	(0.042)	(0.021)	(0.030)	(0.025)	(0.025)
Education Levels										
Primary	0.047	0.056	0.034	-0.028	-0.104**	0.062	0.004	-0.089	-0.133	-0.127
	(0.054)	(0.040)	(0.032)	(0.034)	(0.031)	(0.075)	(0.036)	(0.056)	(0.046)	(0.048)
Secondary	0.273***	0.296***	0.272***	0.226***	0.215***	0.209***	0.236***	0.064	0.057	0.064
	(0.051)	(0.039)	(0.031)	(0.035)	(0.034)	(0.075)	(0.036)	(0.056)	(0.048)	(0.047)
Diploma	0.898***	0.921***	0.864***	0.700***	0.721***	0.512***	0.404 **	0.308**	0.237**	0.084
	(0.099)	(0.071)	(0.051)	(0.058)	(0.057)	(0.133)	(0.061)	(0.089)	(0.076)	(0.074)
Degree	1.226***	1.093***	1.346***	1.276***	1.114***	0.533**	0.361**	0.228*	0.267**	0.282**
	(0.172)	(0.111)	(0.094)	(0.122)	(0.096)	(0.182)	(0.096)	(0.135)	(0.110)	(0.115)
Occupations										
Manager	0.553***	0.720***	0.814***	0.828***	1.054***	0.798**	0.926***	1.088***	1.392***	1.204***
	(0.164)	(0.106)	(0.078)	(0.076)	(0.062)	(0.143)	(0.087)	(0.133)	(0.108)	(0.111)
Professional	0.531***	0.557***	0.265***	0.185	0.629***	0.824***	0.865***	0.954***	0.852***	0.903***
	(0.198)	(0.123)	(0.100)	(0.125)	(0.098)	(0.131)	(0.083)	(0.131)	(0.106)	(0.104)
Technician	0.396**	0.372***	0.340**	0.394***	0.533***	0.532**	0.607***	0.651***	0.680***	0.637***
	(0.089)	(0.075)	(0.053)	(0.059)	(0.055)	(0.104)	(0.052)	(0.077)	(0.065)	(0.066)
Clerk	0.153*	0.277***	0.230***	0.411***	0.548***	0.277**	0.342***	0.452***	0.549***	0.491***
	(0.088)	(0.066)	(0.048)	(0.052)	(0.048)	(0.089)	(0.046)	(0.072)	(0.065)	(0.063)
Skilled	0.052	0.011	0.036	0.021	0.212***	-0.111	-0.077	0.068	0.200***	0.166***
	(0.068)	(0.049)	(0.039)	(0.042)	(0.039)	(0.091)	(0.047)	(0.073)	(0.064)	(0.064)
Agric worker	-0.362**	-0.153	-0.252**	-0.291**	-0.178**	-0.147	0.202*	0.125	0.014	-0.250
	(0.159)	(0.121)	(0.090)	(0.081)	(0.079)	(0.166)	(0.110)	(0.195)	(0.117)	(0.143)
Artisan	-0.056	-0.014	-0.004	0.034	0.094**	-0.131	-0.069	0.044	0.021	-0.163
	(0.060)	(0.041)	(0.032)	(0.034)	(0.030)	(0.093)	(0.052)	(0.078)	(0.067)	(0.066)
Elementary Job	-0.274***	-0.217***	-0.248***	-0.244***	-0.165***	0.058	0.015	-0.007	-0.021	-0.100***
	(0.055)	(0.038)	(0.026)	(0.030)	(0.028)	(0.075)	(0.041)	(0.064)	(0.055)	(0.054)
Industries										
Agriculture	-0.378***	-0.388***	-0.477***	-0.549***	-0.576****	-0.182**	-0.226**	-0.302**	-0.444***	-0.554 ***
	(0.064)	(0.049)	(0.036)	(0.039)	(0.037)	(0.080)	(0.039)	(0.062)	(0.050)	(0.048)
Mining	0.325***	0.222**	0.178**	-0.122**	0.167**	-0.054	-0.082	-0.075	0.084	1.413**
	(0.069)	(0.051)	(0.038)	(0.039)	(0.035)	(0.242)	(0.095)	(0.158)	(0.146)	(0.055)
Electricity	0.109	0.113	0.142	0.047	-0.054	0.576**	0.472**	0.751**	0.639**	0.472**
	(0.095)	(0.164)	(0.098)	(0.083)	(0.072)	(0.209)	(0.107)	(0.157)	(0.119)	(0.069)

Table 24: continued

	Males					Females				
Variable	θ=10	θ=25	θ=50	θ=75	θ=90	θ=10	θ=25	θ=50	θ=75	θ=90
Construction	-0.210**	-0.235***	-0.229***	-0.174***	-0.156**	-0.200*	-0.359**	-0.185*	-0.135	0.038
	(0.068)	(0.049)	(0.038)	(0.040)	(0.038)	(0.105)	(0.054)	(0.083)	(0.067)	(0.071)
Trade	-0.272**	-0.262***	-0.269***	-0.206***	-0.224**	-0.092	-0.105**	-0.167**	-0.225**	-0.246**
	(0.067)	(0.048)	(0.037)	(0.039)	(0.036)	(0.064)	(0.033)	(0.056)	(0.052)	(0.048)
Transport	0.045	-0.092	-0.041	0.003	0.071	0.062	0.237**	0.232**	0.524	0.762**
	(0.084)	(0.058)	(0.044)	(0.046)	(0.043)	(0.112)	(0.062)	(0.094)	(0.075)	(0.070)
Finance	-0.133*	-0.067	-0.163**	-0.110**	-0.144**	0.122	0.156	0.232	0.184**	0.172**
	(0.080)	(0.058)	(0.046)	(0.053)	(0.045)	(0.085)	(0.045)	(0.070)	(0.062)	(0.060)
Social Service	-0.274**	-0.152**	-0.086**	0.044	0.034	0.092	0.142**	0.199**	0.197**	0.141**
	(0.058)	(0.045)	(0.035)	(0.038)	(0.036)	(0.067)	(0.033)	(0.054)	(0.049)	(0.050)
Unionism	0.536***	0.524***	0.460***	0.404***	0.297***	0.777***	0.625***	0.504***	0.406**	0.357***
	(0.046)	(0.031)	(0.023)	(0.024)	(0.022)	(0.043)	(0.021)	(0.032)	(0.026)	(0.027)
Provinces										
Western Cape	0.010	-0.054	-0.095	0.113**	-0.212**	0.080	-0.044	-0.108	-0.166	-0.217**
	(0.090)	(0.064)	(0.048)	(0.049)	(0.043)	(0.103)	(0.049)	(0.082)	(0.063)	(0.056)
Eastern Cape	-0.576***	-0.488***	-0.354**	-0.274***	-0.222***	-0.464***	-0.421**	-0.454***	-0.269**	-0.234**
	(0.059)	(0.044)	(0.035)	(0.035)	(0.030)	(0.068)	(0.033)	(0.046)	(0.036)	(0.038)
Northern Cape	-0.326**	-0.262**	-0.195**	-0.057	-0.021	-0.232**	-0.176**	-0.193**	-0.142***	-0.175***
	(0.088)	(0.067)	(0.046)	(0.044)	(0.039)	(0.105)	(0.049)	(0.072)	(0.056)	(0.055)
Free State	-0.445***	-0.391***	-0.419***	-0.368***	-0.360***	-0.570***	-0.496***	-0.460***	-0.335***	-0.351***
	(0.062)	(0.044)	(0.032)	(0.032)	(0.029)	(0.069)	(0.035)	(0.047)	(0.038)	(0.039)
Kwazulu/Natal	-0.140**	-0.165**	-0.093***	-0.027	-0.041	-0.297**	-0.241**	-0.279**	-0.183**	-0.214**
	(0.051)	(0.038)	(0.029)	(0.030)	(0.029)	(0.053))	(0.029)	(0.042)	(0.034)	(0.032)
North West	-0.183**	-0.215**	-0.266***	-0.237***	-0.260**	-0.268***	-0.210***	-0.212***	-0.103***	-0.082**
	(0.056)	(0.045)	(0.034)	(0.033)	(0.030)	(0.073)	(0.036)	(0.050)	(0.044)	(0.041)
Mpumalanga	-0.303**	-0.317**	-0.279***	-0.223**	-0.097**	-0.661**	-0.472***	-0.449**	-0.268**	-0.300**
	(0.063)	(0.042)	(0.030)	(0.031)	(0.030)	(0.072)	(0.035)	(0.048)	(0.041)	(0.044)
Northern Provnc	-0.420***	-0.328**	-0.282**	-0.209**	-0.234**	-0.514**	-0.399**	-0.318**	-0.255**	-0.228***
	(0.061)	(0.044)	(0.033)	(0.034)	(0.030)	(0.076)	(0.035)	(0.050)	(0.038)	(0.039)
Sample Selection Correction Terms										
Lambda1						1.567	3.198**	0.962	-0.352	0.128
						(1.501)	(0.792)	(1.270)	(0.976)	(1.042)
Lambda2	-	-	-	-	-	-2.536	-4.734**	-1.635	-0.056	-0.807
	-	-	-	-	-	(2.192)	(1.143)	(1.802)	(1.399)	(1.467)
Lambda3	-	-	-	-	-	-0.193*	-0.309**	-0.103	0.033	-0.006
	-	-	-	-	-	(0.106)	(0.057)	(0.096)	(0.072)	(0.081)
Lambda4	-	-	-	-	-	0.121**	0.140**	0.044	-0.018	-0.010
	-	-	-	-	-	(0.048)	(0.022)	(0.032)	(0.027)	(0.028)
Constant	3.787***	4.302***	4.899***	5.891***	6.304***	4.910***	5.255***	6.306***	6.935***	8.027***
	(0.385)	(0.243')	(0.158)	(0.154)	(0.148)	(0.588)	(0.279)	(0.393)	(0.306)	(0.298)
Observations	6985	6985	6985	6985	6985	3789	3789	3789	3789	3789

Bootstrapped Standard errors (200, replications accounting for clustering) in parentheses* **significant at 1%; ** significant at 5%;*significant at 10%

Table 25: Gender gaps: African Wage Employees including DWs (1995, 1999 and 2004)

		θ = 10	θ = 25	θ = 50	θ = 75	θ = 90
	Observed	0.51	0.34	0.34	0.14	0.09
	Counterfactual	0.63	0.50	0.37	0.20	0.15
1995	Percent of raw gap explained by different coefficients	125	148	110	146	175
	Observed	0.41	0.54	0.54	0.29	0.11
	Counterfactual	0.42	0.49	0.43	0.30	0.26
1999	Percent of raw gap explained by different coefficients	105	91	79	104	228
	Observed	0.47	0.40	0.48	0.38	-0.05
	Counterfactual	0.37	0.39	0.47	0.31	0.11
2004	Percent of raw gap explained by different coefficients	79	95	98	82	-221

Table 26: Gender gaps: Full sample of African employees (1995, 1999 and 2004)

		θ = 10	θ = 25	θ = 50	θ = 75	θ = 90
	Observed	0.55	0.41	0.41	0.21	0.16
	Counterfactual	0.63	0.47	0.36	0.21	0.17
1995	Percent of raw gap explained by different coefficients	114	116	89	100	105
	Observed	0.62	0.62	0.55	0.36	0.23
	Counterfactual	0.53	0.50	0.39	0.32	0.21
1999	Percent of raw gap explained by different coefficients	85	82	71	89	93
	Observed	0.36	0.47	0.53	0.41	0.05
	Counterfactual	0.24	0.28	0.35	0.23	0.02
2004	Percent of raw gap explained by different coefficients	69	60	66	56	46

Table 27: Gender gaps: African Wage Employees excluding DWs (1995, 1999 and 2004)

		θ = 10	θ = 25	θ = 50	θ = 75	θ = 90
	Observed	0.15	0.08	0.002	-0.05	-0.06
	Counterfactual	0.32	0.28	0.14	0.14	0.11
1995	Percent of raw gap explained by different coefficients	210	351	5575	-256	-195
	Observed	0.26	0.35	0.22	0	-0.11
	Counterfactual	0.26	0.33	0.21	0.17	0.11
1999	Percent of raw gap explained by different coefficients	100	95	92	-	-100
	Observed	0	0.06	0.06	-0.21	-0.15
	Counterfactual	0.09	0.16	0.20	-0.05	0.14
2004	Percent of raw gap explained by different coefficients	-	263	318	23	-91

Table 28: Gender gaps: African 'Formal' sector employees and DWs (1995, 1999 and 2004)

		θ = 10	θ = 25	θ = 50	θ = 75	θ = 90
	Observed	0.56	0.41	0.36	0.16	0.11
	Counterfactual	0.60	0.46	0.29	0.14	0.17
1995	Percent of raw gap explained by different coefficients	107	112	81	88	154
	Observed	0.56	0.76	0.55	0.11	0.13
	Counterfactual	0.59	0.69	0.51	0.18	0.15
1999	Percent of raw gap explained by different coefficients	105	91	93	164	115
	Observed	0.66	0.61	0.60	0.15	0.05
	Counterfactual	0.52	0.44	0.44	0.15	0.13
2004	Percent of raw gap explained by different coefficients	79	72	73	100	260

Chapter Four

4. Determinants of the Gender Gap in Trade Union Membership: The Case of South Africa, 1995 & 2004

4.1. Introduction

The evidence presented in chapter 3 suggests the persistence of gender "discrimination" in the post-Apartheid South African labour market; the incidence is more severe at the bottom tails than at the top of the wage distributions. Furthermore, the chapter does not negate the potential of other social processes in fostering the larger unexplained gaps at the bottom of the wage distributions. The latter include the nature of the feminisation of the labour market; most African women entered into lowly-paid occupations which could have reduced their real wages. However, rather than being causal factors, discrimination and the high concentration of women in lowly-paid jobs could be symptoms of the underlying problems. One of the possible causes, as argued in chapter one, could be women's low voice or representation in the labour market's decision-making bodies such as trade unions. This situation naturally calls for more research. As a result, this chapter will explore why African women are less likely to join trade unions than their male counterparts.

The chapter is organised as follows. Section 4.2 outlines the role and challenges faced by trade unions. Section 4.3 gives theoretical explanations for the gender gap in unionism. The section also presents an overview of the theoretical debate about an individual's choice to join or not to join a trade union. Section 4.4 reviews existing empirical literature on the subject. Section 4.5 poses the methodological framework adopted by the study, (we employ the standard cost-benefit analysis) and presents our empirical model (whereby union membership is explained by personal, geographical and workplace characteristics). Section 4.6 expounds on the methodology and data analyses. Section 4.7 presents the results of the study. The conclusions are dealt with in section 4.8.

4.2. The Role and Challenges of Trade Unions

"*Gender equality is a fundamental human right and an essential condition for achieving effective democracy. The democratic structures of trade unions and their mandate to promote and protect workers' rights make unions important vanguards in the fight against discrimination at workplace, community, national, regional and international levels", ILO, (2001).*

"Trade unions are the agents of change in society and should be in the forefront of the struggle for gender equality", COSATU (2000)[83].

The importance of trade unions as agents of transformation dates back to the industrial revolution[84] (Finnemore, 2002:61; Bendix, 2001:150-1). Since then, unions have been actively seeking ways to improve the position of their members within the economy and wider society (Bendix, 2001:149; Finnemore, 2002:61). Gradually, trade union efforts precipitated the adoption of various operational strategies for pursuing *inter alia* economic, job security, social welfare, job regulation, socio-political and individual developmental objectives (Bendix, 2001:155-59)[85]. Nowadays, one of the core objectives of unions is the desire to improve the economic status of their members within a perceived framework of equity (Bendix, 2001:156; Finnemore, 2002:61).

By way of definition, a trade union refers to any organization whose membership comprises of the workforce (Bendix, 2001:150). In most cases, unions attempt to organise and represent the interests of their members at two levels: at the workplace and in society at large. "They also seek to regulate the employment relation by means of collective bargaining with management", Bendix (2001:150).[86] Typically, after their establishment by interested workers, one of the challenges facing trade unions is the need to continue recruiting new members to strengthen their support and power base. As it is, high levels of union membership are essential for unions to have an impact on society (Riley, 1997; Bendix, 2001:159).

Although the rationale for unionism appears sound, in practice unions are faced with the continual challenge to fortify their membership base. This is particularly relevant in light of the general decline in union membership since the last two decades (Riley, 1997). For instance, in the European Union, union density (defined as the proportion of union members among all employees) declined by 8 percent between 1985 and 1997. Also, an ILO survey of 92 countries (both developed and developing) showed that union membership levels declined

[83]South Africa has 4 union federations Congress of South African Trade Unions (COSATU), Federation of unions of South Africa (FEDUSA), National Council of Trade Unions (NACTU) and the Confederation of South African Workers' Unions (CONSAWU). COSATU is by far the largest umbrella federation.

[84] "The term Industrial Revolution originally referred to the developments that transformed Great Britain, between 1750 and 1830, from a largely rural population making a living almost entirely from agriculture to a town-centered society engaged increasingly in factory manufacture. Ordinary workers faced massive dire employment conditions during that period. Hence, they formed unions in order to have more power to raise their interests to employers", http://indialife.com/History/ind_rev.htm.

[85] E.g. some unions face some institutional challenges, which means they have to deal with the institutional environment first before pursuing their objectives.

[86] There are 2 types of unions: industrial unions: represent most or all workers within a union; and craft unions: represent workers in a single occupational group.

in all but 20 countries[87] (ILO, 1997[88]; Schnabel and Wagner, 2005). This negative trend is attributable to a number of factors which include "a shift in the age structure of the workforce, education, reduced public-sector employment, heightened economic competition, and a falling share of manufacturing industries in total employment", ILO (1997). Besides, substantive changes in governance at both country and regional levels are also cited among the latter (Riley, 1997; Mashin, 2002; ILO, 1997). That the drop in union density has not translated into a corresponding decline in union power is somewhat surprising (ILO, 1997). However, according to ILO (1997), this is because trade unions have been able to regain their potency in the traditional sectors, penetrate the upcoming sectors, and revitalize their collective bargaining tactics. All the same, the declining membership is cause for concern for the unions as the scope of action they enjoy is to a great extent determined by the size of their membership bases. Hence, the study of the covariates of workers' decisions to join or not to join unions lies at the core of the labour relations system (Riley, 1997).

Furthermore, another finding which has attracted attention in international research is that women have a lower demand for unionism than men (see *inter alia* Windolf and Haas, 1989; Even and Macpherson, 1993; Schnabel and Wagner, 2005). This situation indicates the existence of the so-called gender gap in unionism[89]. However, it is rather ironic to say unions lead the struggle for gender equality in society yet, their internal structures do not live to such terms. Nonetheless, this result is critical because barring a few exceptions, unionised workers are paid more than their non-unionised counterparts (Hansen, 1997; Fallon and Lucas, 1998; Schultz and Mwabu, 1998; Butcher and Rouse, 2001; Manda *et al*, 2001; Hirsch and Macpherson, 2002). It is no wonder that Even and Macpherson (1993) report that the gender gap in unionism explains between 6 and 14 percent of gender earnings differences in developed countries (see also Antos *et al* (1980) and Doiron and Ridell (1994). Despite scant evidence, these findings have a deep resonance in developing countries (see Fallon and Lucas (1998:3,17))[90].

Notwithstanding the potential importance of gender gaps in unionism to the gender pay gaps, very few attempts have been made to investigate the causes of the gender gap in unionism in developing countries, especially in sub-Saharan Africa. Yet, both from an academic and policy point of view it is crucial to understand the mechanisms leading to these outcomes.

[87]"In contrast, the largest single increase in trade union membership came in South Africa, which saw unionization rates leap by 130.8 per cent, with most of the increase coming in the post-apartheid era. Some of the other countries which saw unionization rates increase were: Bangladesh (58 per cent), Canada (10.7 per cent), Chile (89 per cent), Republic of Korea (61 per cent), the Philippines (69 per cent), Spain (92 per cent), Thailand (77 per cent) and Zimbabwe (54 per cent)", ILO (1997).

[88] http://www.ilo.org/public/english/bureau/inf/pr/1997/28.htm.

[89] It should be clear that in cases like South Africa women are less unionised than men and the few who are unionised are also underrepresented in union decision making structures.

[90]Fallon and Lucas (1998) discovered that unionism reduces the South African gender wage gap by about 21%.

Therefore, this study seeks to explore the sources of the gender gap in unionism using the South African labour market as case study.

The running hypothesis of this study is that the observed gender differences in unionism are either explained by: family loyalty[91] which inhibits women's commitments to jobs and unions, different labour market characteristics (women tend to work in occupations and sectors that are resistant to unionism), discrimination, or gender differences in demand for unionism that are not related to labour market characteristics. The hypothesis will be tested quantitatively.

4.3. Review of Theoretical Literature

Two sets of theories are reviewed in this section; the first set rationalises the observed gender gaps in trade union membership. The second one gives an overview of the theoretical underpinnings for an individual's decision to be unionised. The latter is crucial as it leads to the study's methodological framework.

4.3.1. Theories about Gender and Union Membership

Here, we discuss the theoretical explanations for the gender differences in trade union membership, and draw several implications to be tested. Incidentally, the gender gaps are rationalized by well known theories: human capital, and discrimination and segmented labour markets based approaches. While, it is clear that these theories have already been dealt with in chapter three, it is important to note that the theories can be adapted to explain different kinds of labour market inequalities. The theories were chosen because, apart from accommodating the view that the gender gaps in unionism are attributable to women's low levels of labour market attachment, they also encompass the stylised fact that the disparities are mainly due to differences in occupations and industries, which we believe to also hold in the case of South Africa. This is because the South African labour market is fraught with occupational gender segregation (Standing *et al*, 1996:407; Winter, 1999; Rospabe, 2001a). Hence, the variations in the propensities to unionise could be a function of these job differentials. The discussion starts with the human capital model, followed by the segmented labour market theory and finally, the taste based approach.

4.3.1.1. Human Capital Theory

The human capital/neoclassical theory is based on the idea that sexual disparities in aptitudes and preferences induce workers to self-select into various occupations (Polachek, 1981). Within this argument, gender inequalities in unionism arise as women self-select into poorly unionised occupations while the converse holds for men. The rationale is that, even though

[91] Family loyalty may be explained as women's commitment to and highly prioritising household activities above any other activities which may require their time or attention.

both genders are to be presented with the same distribution of abilities, the realisation that women may face career breaks (e.g. due to parenthood or the need to look after the elderly) hampers their access to full time jobs. Because of the anticipation of these career interruptions, women may choose to work in marginal/part-time jobs rather than full-time jobs (better paying) as the penalty of career breaks is not hefty (Jacobsen, 1994:268).

On the contrary, the absence of perceptible career interruptions in the case of men implies that they will self-select into full-time jobs. In such a situation, there are fewer expectations for women to be unionised than men as they have a higher tendency to enter into marginal jobs. Generally, the latter are associated with high turnover which mitigates solidarity and hence, are difficult to organise and therefore tend to be lowly unionised. Inversely, the low turnover associated with full-time jobs makes them easier to unionise when compared to part-time jobs. Ultimately, women will have fewer chances of being unionised or in unionised jobs than men. Regrettably, this scenario is amenable to a poverty trap as the occupational differences reflect optimal career choices and thus are difficult to reverse. Even so, we draw the following testable hypothesis: family attachment (e.g. married women's commitment to household activities which may include cooking and looking after young children) reduces women's unionism.

4.3.1.2. Segmented Labour Market Theory

Alternatively, the gender gap in unionism is explainable by the dual/segmented labour market theory, *a la* Doeringer and Piore (1971) and Dickens and Lang (1985). These scholars opine that the labour market has two segments: "primary sector" and "secondary sector" and it is difficult for workers to move between the segments (Anker, 1997). Essentially, this approach gives a detailed map of labour market conditions that workers face, correlating union membership to the extent of stability in each labour market segment (Edwards, 1979:167-170; Osterman, 1975:516). Secondary labour market jobs are characterised by instability and minimal security and the inverse holds for the primary labour market. Because of the instability and high turnover rates which reduce team-spirit, jobs in the secondary sector are difficult and costly for unions to organise.

On the other hand, primary labour market jobs offer stable work relationships crucial to collective organization. Consequently, employment in the secondary sector reduces the prospects of being unionised and the opposite is true for the primary sector. In this vein, the gender gap in unionism is attributable to the observation that females tend to be stuck in the secondary sector while men dominate women in the primary sector. This observation is potentially relevant to South Africa. On the word of Casale (2003), one characteristic of the feminisation of the South African labour market was a high entry of women in marginal/survivalist jobs (typically, such jobs are difficult to unionise). This theory however

suffers from its inability to explain the rationale for women's concentration in the secondary sector. Presumably, we have to look at other theories such as statistical theory or the taste-based theory for an explanation (see Altonji and Blank, 1999). Irrespective of this caveat, the segmented labour market theory propagates the following testable hypothesis: job characteristics in particular, small plant size and insecure jobs reduce the probability of unionism and *vice versa*.

4.3.1.3. Taste-Based Discrimination Theory

As mentioned above, the other viewpoint relates to the Beckerian (1971) taste for discrimination in the workplace. In this theory, employers, customers or fellow male employees are prejudiced against women. Notionally, there are different pay structures for men and women of equal productivity, as long as the job market is not perfectly competitive (Altonji and Blank, 1999; Autor, 2003). In this case, the gender gap in unionism is perceived as a consequence of the resistance given to female colleagues by male workers in unionised sectors. In other words, men's utility is inversely related to the number of female co-workers in the unionised jobs hence, they have to be compensated by higher wages.

Given such a situation, profit maximising employers in unionised jobs will respond by hiring less women, if the services provided by men and women are substitutes. In some cases, the latter will be an outcome of customer discrimination[92]. As a result, more women will be relegated to non-unionised jobs which are presumably low paying and insecure, while on average more men enjoy organised jobs. Therefore, the key testable implication of the model is preferential hiring: employers in unionised jobs are less likely to hire women of identical productivity with men. This implies that there will be more and more employment segregation by gender. Having described the underlying mechanisms of the gender gap in unionism, we proceed to discuss the theoretical debate on the determinants of an individual's decision to join a trade union. This is crucial as it sets the basis for our empirical analysis.

4.3.2. Theories about an Individual's Decision to join a Union: an Overview

According to Schnabel and Wagner (2005), union membership and its determinants have been studied from various perspectives by economists, sociologists, psychologists and political scientists but, it has proved difficult or even impossible to identify a standard model of unionisation. As such, theoretical analyses of unionisation range from traditional economic supply and demand analyses through social custom models to various psychological and socio-political theories. However, this work emphasises the economic explanations[93]. This is

[92] Firms that cater for discriminatory customers will only hire men, pay higher wages and charge higher prices.

[93] We do not underplay contributions from other social scientists as they provide other explanations of unionism than economists like class consciousness, values, and modes of production, the composition of the workforce, the

because apart from being more relevant to our discipline, these theories are given more value by data availability. For a thorough survey of the literature see Schnabel (2003). The theoretical debate develops from an initial discussion of the orthodox demand and supply (cost-benefit) model of unionisation.

4.3.2.1 Cost-Benefit Theory

The conventional demand and supply framework was linked to union determination by Berkowitz (1954), Pencavel (1971), Ashenfelter and Johnson (1972), and Ashenfelter and Pencavel (1969) (see Hirsch and Addison, 1986:29; Schnabel, 2003; Ehrenberg and Smith, 2000:486). These scholars viewed unionism as an asset that provides a flow of services (private and/or collective goods) to utility maximising workers (Hirsch and Addison, 1986:29; Schnabel, 2003). Given that many services that unions provide are realised over time (e.g. seniority systems and grievance procedures), the decision to join a union or a unionised job can be treated as both an investment and consumption good. The model postulates that the greater the sum of the union wage premium and the value of union induced non-monetary benefits in the work place in comparison to the costs, the more likely an individual is to prefer a union or union job (Schnabel, 2003).

However, the above-mentioned view is contested as it treats union membership determination as a choice variable yet, in practice we also observe free riders. On the word of Schnabel (2003), this inadequacy problem was highlighted by Olson (1965) who maintained that unions provide both private and collective goods. On the one hand, collective goods include the level of wages, which apply to all workers irrespective of union membership status (Booth, 1986). For instance, wage setting in South Africa allows for sectoral collective bargaining coverage (Nattrass, 2000; Bendix, 2001)[94]. On the other hand, private goods cannot be consumed without joining the union. They include grievance procedures, promotion rules, job security and pension schemes. In principle, an individual may free ride on the collective goods, because he can receive the benefits without incurring the costs of union membership (Booth, 1986; Schnabel, 2003). Hence, the model lacks clarity on why individuals would join a union when dues are costly and when the benefits apply to all workers regardless of their union status.

More importantly, the above caveat does not negate the applicability of the cost-benefit theory to South Africa. This is because the Labour Relations Act (1998) has provisions for employers in covered sectors to deduct fees from non-union workers, and the fees may amount to the union subscription fees (Finnemore, 2002:79; http://www.labour.gov.za/).

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political climate, the role of government incomes policies, and the centralisation or cohesiveness of the labour movement. Some of these potential determinants have been incorporated in economic models of unionisation.

[94]Under section 32 of the Labour Relations Act (1997) the Minister of labour is obliged to extend the Bargaining Councils' agreements on wages to non-party firms (Nattrass, 2000).

Therefore, the law reduces incentives to free ride. When considered from a different position, the supply and demand approach is flawed as it ignores general equilibrium aspects. In tandem with this, some of the benefits of union membership such as the union wage premium cannot be divorced from the extent of unionisation (Hirsch and Addison, 1986; Schnabel, 2003).

4.3.2.2. Social Custom View

It is also noteworthy that some of the limitations ingrained in the cost-benefit theory led to the genesis of alternative perspectives such as the social custom view. According to this notion, workers obtain satisfaction from the "reputation effect" of belonging to a union (Schnabel, 2003). Hence, a union can thrive regardless of the free rider problem; provided it attains a minimum critical density see Booth (1985) and Naylor (1990), (Schnabel, 2003). In this theory, an individual's decision to "join a union is interdependent, and contrary to the free rider paradox, workers may be more prepared to join a union if others are joining", Schnabel (2003:7). However, one setback of the social choice theory is that it does not explain the construction of the social custom. Even so, the theory is difficult to operationalise in this context as we lack data to estimate interdependent union membership models. We only have information on whether an individual is unionised or not, hence we cannot decipher any linkages in their choices.

4.3.2.3. Excludable Private Goods

Nonetheless, the drawback of the social choice theory is evaded by standpoints which hypothesise that unions supply pure private goods to their members instead of "reputation" (Schnabel, 2003). Specifically, Booth and Chatterji (1995) originated a theoretical model of simultaneous determination of union wages and membership. The model posits that the presence of excludable private goods is instrumental in inspiring workers to join unions in the absence of coercive "closed shop" rules (Schnabel, 2003). Potentially, the absence of legalised coercive closed shop agreements in South Africa makes this theory relevant to our study[95] (http://www.labour.gov.za/). Importantly, it was established that unions provided goods such as grievance procedures which linked positively with union density (Schnabel, 2003). Although, the testable implications of this model are straightforward (unionism is positively related to excludable services provided by unions to their members), we are unable to operationalise it. In particular, we suffer from unavailability of data on the "private goods" such as grievance procedures, promotion rules and pension schemes.

[95] Conscientious objectors (workers who refuse to belong to a union on the grounds of conscience) may not be dismissed for refusing to join the union (http://www.labour.gov.za/).

While we are aware of the above theoretical developments and their relevance to the South African context, our data preclude us from exploiting the full utility of private goods and social custom related paradigms. Consequently, our empirical analysis will be based on the conventional cost-benefit analysis, despite its limitations. All the same, focussing on this theory does not interfere with the importance of our work as we are purely interested in modelling whether an individual is a member of a union or not and not their affiliation to other union members. The following section presents the empirical debate on the cause of concern.

4.4. Review of Previous Empirical Research

Initially, the discussion focuses on studies which analysed the sources of the gender differences in union membership in general before concentrating on the South African case. In particular, we dwell on studies which utilised the union membership dummy as the dependent variable as our data dictates the utility of such measure in this study.

4.4.1. Studies on Gender Differences in Unionism

Generally, there is limited empirical research on the sources of the gender gap in union membership, despite the existence of a substantial literature on the determinants of unionism (see *inter alia* surveys by Riley (1997) and Schnabel (2003)). Even so, the existing evidence can be grouped into two depending on the methodology. On the one hand, lie earlier studies (dating to pre-1990) which employed stepwise regression techniques and on the other, are the more recent studies (post-1990) which utilised decomposition analysis.

The methodology employed by most pre-1990 studies revolved around estimating a single logit/probit equation (pooled men and women) for the union membership decision of which, a gender dummy was included among the covariates. The gender dummy presumably captured gender related effects. Hypothetically, its effect was supposed to decline as some variables were added to the equation in stepwise form (the variables were added sequentially and the model was estimated at each stage). The decline indicated the extent to which the newly added variables accounted for the male-female gap in unionisation (Doiron and Ridell, 1994). However, "there is a potential bias in using a stepwise estimation procedure to the extent that the variables included in a given specification are correlated with those that are excluded", Antos *et al* (1980:164). See Riley (1997) for a comprehensive survey of the literature which fall in this category.

As an example of the above method, Antos *et al* (1980) utilised a 1976 data set to investigate the determinants of the male-female unionisation differential in the United States. Their study estimated logistic union membership models in 3 steps. Firstly, they included standard human capital measures, location, race and sex as explanatory variables and then sequentially added

occupation and industry status. The study discovered that gender gaps in occupation and industrial status accounted for over half of the male-female unionisation differential (Antos *et al*, 1980). The implication of these findings on the issue of sex discrimination in union membership is however, not clear. Supposedly, a substantial part of the unexplained unionisation gap reflects discrimination or simply unmeasured differences affecting unionisation. Additionally, "the interpretation of sex differences in occupational and industrial status is inherently ambiguous. Some of the envisaged differences undoubtedly reflect optimal career choices. On the other hand, many researchers have emphasised the importance of occupational and industrial segregation as a major factor accounting for the inferior economic status of female workers", Antos *et al* (1980:169). Hence, the large impact of occupational and industrial status on net sex differences in union membership status may represent an important indirect form of discrimination.

However, the lack of clarity inherent in the stepwise estimation procedure was to some extent addressed by the subsequent development of decomposition methods like the Even and Macpherson (1990) procedure. The latter entails firstly estimating separate probit models of the union membership decision for each gender. Then, the differences in the average predicted probabilities of unionism between the two models are decomposed into two components. The components include: differences in labour market characteristics (explained portion) and disparities in response/returns to these characteristics (unexplained part). As said by Even and Macpherson (1993),the latter portion is attributable to hiring discrimination and also to a lower demand for unionism that arises if women are more inclined to withdraw from the labour force and miss the rewards that unions generate for long term employees (e.g. seniority rules on layoffs and pensions).

Following the above technique, Even and Macpherson (1993) investigated the sources of the gender differences in unionism in the United States from 1973-1988 and also, the effect of the latter on the gender pay gap. Their study explained union membership using full time work, years of potential experience and its square, and a set of dummies for education, marital status, occupations, and industries. They discovered that labour market characteristics especially, occupations, industries and full time work status accounted for approximately 50 percent to 67 percent of the gender gap in unionism. Secondly, the declining demand for unionism in male-dominated sectors was also found to be mainly accountable for the reduction in the gender gap. The study is however limited as it is truncated to the private sector and more importantly fails to control for sectoral selection bias.

In similarity with Even and Macpherson (1993), Doiron and Ridell (1994) used Canadian data for the period 1981-1988 to explore the effect of unionism on the gender pay gap, as well as an investigation into the correlates of the decline in the gender gap in unionism. They

controlled for province, age, education, marital status, public sector, job tenure, working part time, industry and occupation in their union membership equations. Apart from utilizing the Even and Macpherson (1990) decomposition, Doiron and Ridell (1994) also devised an alternative approach. Their approach substituted Taylor series approximations in place of the first moments utilized in Even and Macpherson (1990) (see section 4.6 for a thorough exposition of the Even and Macpherson (1990) approach). In so doing, they accommodated the curvature of the unionization function largely ignored by Even and Macpherson (1990). Interestingly, the two methods yielded different estimates but similar qualitative results.

In terms of the findings, the Doiron and Ridell (1994) study encountered both similarities and differences in factors which affect male and female unionization, e.g. age had a positive effect on male unionization, while tenure had a strong positive effect for females. However, for both genders the principal correlate of unionism was having a job in the public sector which increased the propensity to unionize. Potentially, this result is biased as employment in the public sector is sometimes endogenous. As such, individuals with a higher affinity to unionism may self select into the public sector as it is generally associated with high opportunities for unionism. In summary, the decompositions showed that across the period, a significant proportion of the gender gap was due to differences in characteristics between men and women particularly occupation, industry and job tenure. On the word of Doiron and Ridell (1994), this implied that females would have higher unionization rates if they had male endowments of union related characteristics.

4.4.2 South African Studies on Unionism

So far, the review has exclusively focused on developed countries. Regrettably, to the best of our knowledge not much has been done in developing countries to quantitatively investigate the causes of the gender gap in unionism. This invites a consideration of the South African situation. As pointed out earlier in this paper, there is a dearth of information on the sources of the gender gap in trade union membership in South Africa (here membership is not the same as leadership). However, in more general analyses of the South African labour market (for example, Standing *et al* (1996:414) Fallon and Lucas (1998) and COSATU (2000)) and also in some studies of gender wage disparities (for example, Casale (1998) and Winter (1999)), the statistics generated suggested that women are less likely to be unionised than men. Despite these cursory observations, no rigorous and comprehensive analyses were done to identify the sources of the inferred gender gap.

The lack of comprehensive analyses is demonstrated by the existence of a few but related studies, which have explored the lower representation of women in union leadership structures using qualitative information e.g. Tshoaedi (1999) and COSATU (2000). The information was drawn from a few individuals' self-reports on union-related experiences.

Although such studies enrich our understanding on the gender dimensions of trade unions, they have to be treated with caution when making conclusions at the national level as it is not clear whether the data on which they are based is nationally representative or not.

Nonetheless, basing on the above method, COSATU (2000) maintained that South African trade unions are patriarchal[96] in nature. As such, the gender inequality in union leadership is due to the sexual division of labour in the home. This status negates female leadership because "shop steward and union meetings are often held after working hours, making it difficult for women to participate", COSATU (2000). Additionally, the traditionalist ideology of "a woman's place" enhances the dissuasion and intolerance of women in unions. For instance, some women encounter hostility and abuse from their spouses who feel endangered by their wives' activism and that their wives are becoming more forceful. Instead, the spouses would rather have their wives linger at home COSATU (2000). Furthermore, the study did not discount the role of sexual harassment in discouraging female participation.

Despite the lack of comprehensive analyses, there are few but relevant studies in which the determinants of union membership (in general) have been analysed within a multivariate context. Because of their utility, such studies have informed our specification of the union membership models. Even so, the purpose of estimating the union membership equations was motivated by the need to obtain the inverse Mills ratio to correct for sample selection bias when estimating wage equations. Clearly, this was not inspired by the desire to understand the determinants of union membership itself (for example, Rospabe and Azam (2005), Moll (1993), Hofmeyr and Lucas (2000) and Michaud and Vencatachellum (2001)). Hence, so far no study has undertaken an analysis where the determinants of union membership were at least part of the main focus. Notably, such studies have treated Moll's (1993) work as the reference point; hence it shall be the centre of our discussion. However, it is regrettable that other potentially useful studies incorporated but failed to report their findings from the union membership models (e.g. Rospabe and Azam (2005)).

Specifically, Moll (1993) utilised data from the 1985 Bureau of Market Research (for blacks, i.e. Africans, Indians and Coloureds) and combined it with that from the Central Statistical Services survey (for whites), to compare the impact of emergent unions on wages at local and international levels. Additionally, he explored the effect of emergent unions on skill differentials. The study accommodated the endogeneity of union membership in the wage equations. As such, "a probit model of union status was estimated first and the inverse Mill's ratio calculated from the probit coefficients was entered as an extra variable into the union

[96] Patriarchy refers to the system of male domination and control at all level of society. Thus, women participate less in unions and are also underrepresented in leadership than men.

wage equations", Moll (1993:251). The following covariates were also included in the union membership model: education, experience and its square, tenure, industry, city dummies, marital status, dummy variable for other employed people in the household, dummy variable for medical aid or pension benefits (proxy for firm size; bigger firms are more likely to provide these benefits than smaller firms), and the ratio of persons in the household to the number of earners (proxy for financial commitment).

The study found that women's demand for unionism was not significantly different from that of men once their sector, experience and tenure are controlled for. Furthermore, the coefficients for experience were significant. This means having experience increases the probability of being unionised up to a certain point of the life cycle but after the peak, an additional year of experience reduces the prospects of unionism. This outcome reflects the "tendency of experienced workers to use union voice rather than to quit", Moll (1993). Also, industry dummies had large negative effects. In contrast, proxies for firm size, other union members in the household, and ratio of persons in the household to the number of earners had a positive effect on the propensity to join a union. Finally, education and marriage were discovered to be insignificant. While this study enhances our understanding of the determinants of black people's tendency to be unionised, the efficacy of these findings for policy purposes is strongly diminished as it obscures the race specific effects which are crucial in the South African context. Besides, Moll's study is also constrained by its emphasis on blue-collar workers (skilled, semi- skilled and unskilled workers) which excluded white collar workers.

Similarly, Michaud and Vecatachellum (2001) also incorporated the endogeneity of union membership in their wage equations. They made recourse to Moll's (1993) specification of the union membership model. Notably, their study had similar outcomes with those of Moll. The only exception was that Michaud and Vecatachellum's gender dummy was statistically significant while Molls' was not. This point of divergence on the gender dummy was attributed to the use of a richer data set in the study by Michaud and Vecatachellum. Therefore, this implies that men and women have different propensities to unionise.

In synopsis, the sources of the gender gap in trade union membership have been systematically investigated in the developed world. In contrast, there is a dearth of corresponding information from the third world. Hence, this study aims to fill this research "vacuum" in the developing world by using the South African labour market as case study. The next section discusses the methodological framework adopted by the study.

4.5. Methodological framework

It is reiterated that our empirical analysis is based on the conventional demand and supply (cost-benefit) analysis**.** The exposition of the framework follows ideas from Hirsch and Addison (1986) and Schnabel (2003). Incidentally, "the demand function expresses the demand of workers for union representation and services, while the supply reflects the supply of union services", Schnabel (2003:4).

Demand for union services

Following Hirsch and Addison (1986), the demand for union services (**U^d**) can be stated as

$$U^d = f(p, y, diff, s, z, t) \quad (4.1)$$

where $U_p^{'} < 0$ and $U_y^{'}, U_{diff}^{'}, U_s^{'}, U_z^{'} > 0$;

p is the price of union services relative to the price of other commodities, and it is has a negative effect on demand;

y is permanent income, it is expected to have a positive impact on demand should union services be a normal good[97];

diff is the union wage premium, it is hypothesized to have a positive relationship with the demand for union services. However, **diff** cannot be directly quantified. Hence, it is often proxied by variables like skills and industry concentration as they serve as anticipated gains of unionism;

s is the price of substitute resources (such as social welfare benefits), it has a positive relationship with the demand for union membership.

z is any net non-monetary benefits from a unionised job, and it affects demand positively;

t captures any preferences for unionism[98]. In regression analysis, variables representing geographical location and the presence of right to work laws are often used as proxies for **t.**

Supply of union services

Since unions are rational agents, they also carry out cost-benefit analyses in their operations. In this regard, Hirsch and Addison (1986), specified the supply of union services (**U^s**) as

[97] According to Schnabel (2003:4), the normal good assumption is an empirical question, such a relationship should be estimated using simultaneous equations methods because unions affect wages and wages affect unionism. For some the union services are an inferior good- as your income increases you demand less representation.

[98] This variable represents workers attitudes and preferences, ideological motives, social pressure and custom and related non-economic variables stressed by other disciplines of social science, Schnabel (2003).

$$U^s = g(p, co, cs, g) \quad (4.2)$$

where $U_p^{'} > 0$ and $U_{co}^{'}, U_{cs}^{'} < 0$

p is the revenue from union services. Notionally, there is a positive correlation between **p** and the supply of amenities;

co are costs of establishing a union, they are inversely related to industry concentration and firm size.

cs are costs of offering amenities to existing members. Hypothetically, both **co** and **cs** "have a fixed cost component so that collective bargaining exhibits decreasing unit costs with respect to membership, and unionism is therefore less likely in small firms. Both costs affect supply negatively, and are likely to be affected by employers' attitudes towards unions and collective bargaining and they can be influenced substantially by the legal structure within which unions may operate", Hirsch and Addison (1986:15) and Schnabel (2003:4-5).

g represents union goals (e.g. extending coverage to "female jobs") which may influence their supply of services in many ways.

The equilibrium level of unionism

Other things being equal, the optimal level of unionism (**U**) occurs when

$$U = U^d = U^s \quad (4.3)$$

4.3 can be expressed in a reduced form where **U** and **p** are explained by all the other variables in the system i.e.

$$U = f(y, diff, z, s, t, co, cs, g) \quad (4.4)$$

The variables in (4.4) are defined as in (4.1) and (4.2). The sign of each variable in the reduced-form equation is unambiguous as none enters both the structural demand and supply equations (Hirsch and Addison, 1986:15; Schnabel, 2003:5). However, this property is sometimes reduced by the use of proxies which may affect unionism through several channels. Nonetheless, as stated by Hirsch and Addison (1986:15) and Schnabel (2003:5), the convenience of this model is that the price variable **p** (for which data is lacking) drops off so that empirical studies often estimate a variant of the reduced form equation depending on data availability (and so shall be the case here).

Following Booth's (1986) derivation which is not rigorously followed here, the theory allows us to specify the following model;

Union membership = f(expected wage, age, education, occupation, sector/industry, size of plant, region of residence, ages and number of children, marital status and personal tastes)

The theoretical predictions are

i) Expected wage

In theory, there is a positive relationship between the propensity to unionise and the expected wage. This is explainable in terms of the *income effect* since union services are perceived as a normal good. Hence, their demand increases with the level of earnings.

ii) Age

According to Hirsch and Addison (1986:58) age can either have a positive or a negative effect on union membership. The theoretical explanation for the pro unionism decision is that older workers are likely to exhibit less mobility and greater firm attachment and to value relatively more the union generated health and pension benefits and structured pay scales emphasizing seniority. Alternatively, unions tend to flatten earnings-experience profiles and provide largest wage advantages to the youngest workers, older workers may be less likely to accept this.

iii) Education

Notionally, education can either increase or reduce the prospects of union membership. Accordingly, the level of education attained by a worker affects his or her perception of what a union has to offer. For instance, highly educated workers may expect personal rather than bureaucratic rules to work in their favour. They may anticipate achieving more from individual action than through the workings of trade unions. Hence, it may be costly for them to unionise. Alternatively, they may be more willing to accept the value of collective action. As such, they are more likely to be articulate and therefore able to influence the union's actions. On the same note, lowly educated individuals may be more union friendly, but it may be costly for them to unionise as they often experience higher employment instability (Booth, 1986; Moll, 1993; Schnabel and Wagner, 2005).

iv) Occupation

Hypothetically, some occupations provide a higher opportunity to be unionised than others. In regards to this, the monopoly position of an individual's occupation may play a significant role in the individual's decision to unionise. For example, skilled workers' unions have a strategic position for extracting concessions from firms and are therefore capable of offering greater benefits to their members than unskilled workers unions (Booth, 1986). Therefore, individuals with access to the former type of occupations and unions are more likely to unionise than the latter as there are higher chances that benefits will exceed the costs.

v) Industry and size of the plant

In principle, these variables affect unionism via their impact on organisation costs, thus they can either increase or reduce unionism depending on the cost structure (costs are inversely related to unionism). Typically, these costs are greater where an industry consists of small dispersed plants with less permanent labour force attachment or where more flexible work schedules are present[99]. It is also expected that individuals in public (including production or blue collar workers) and nationalised industries have a higher probability of being unionists. Such workers are likely to have less identification with management, and may feel a greater need for protection. In addition, they tend to have relatively more homogeneous preferences and working conditions. For these reasons, organising costs are likely to be lower and unions can devise an agenda that satisfy a majority of workers (Booth, 1986; Hirsch and Addison, 1986; Schnabel and Wagner, 2005)[100].

vi) Family commitments - Marital status and Number of children

Family commitments are predicted to increase men's prospects of unionism and to either increase or reduce women's. It can be argued that individuals with family commitments may seek higher wages and job security through unionism (especially in high unemployment environments like South Africa), therefore variables such as marital status and the number of dependent children may increase the unionisation probability[101]. Alternatively, family commitments may reduce an individual's demand for jobs and unionisation at large. This prediction tallies with a traditional explanation for the gender gap in unionism which states that women are less committed to working due to family related obligations and regard their participation as temporary. Therefore, they wish to avoid union membership and its associated costs (Hirsch and Addison, 1986; Rees, 1990). However, this effect may be mitigated by the presence of elderly women in the household who can assume the child care responsibilities (Wong and Levine, 1992).

vii) Region

Regional differences in the location of a company are hypothesised to either increase or reduce the probability of being a union member (Moll, 1993; Riley, 1997). Such an ambiguous relationship is expected because these variables are believed to reflect both differences in personal characteristics and job structure not accounted for elsewhere by other

[99] The costs may decline with government recognition, but it does not change the overall conclusion.

[100] Another argument is that in sectors such as the public sector and manufacturing, which are traditional union strongholds, there may exist higher peer pressure to conform to a social custom of union membership, so that the probability of union membership should be higher in both sectors, while the converse hold in small sectors.

[101] According to Moll (1993), this argument may not be valid as some individuals are married and do not have children and some people are not married but have dependents. Hence, a marriage dummy may not capture these differences, so it may be included for comparative purposes.

variables. Consequently, the effects of the variables vary due to systematic differences in attitudes to unionism held by employers and employees.

viii) Other union members in the household

A positive relationship is anticipated between the presence of existing union members in a given household and the propensity for a new wage earner to join a union (Moll, 1993). This result may arise because co-residence with other union members may either encourage someone to find employment in a company where most workers are unionized, or persuade a worker to gather enough information on the net benefits of joining a union. Subsequently, we present our estimation model.

4.5.1. Empirical Model Specification

This section specifies the union membership model to be estimated. As such, we operationalise the theoretical model by: dummy variables for trade union membership (dependent variable), the respondents' expected wage, dummy variables for occupational categories, industrial categories, educational levels, age, marital status, province, dummy variables representing the presence of children below 15 in the household, dummy variable for the presence of other union members in the household, and a dummy variable for the presence of other women aged 15 years and above in the household. See data appendix for a description of these variables. This specification is followed by a discussion of the estimation framework.

4.6. Methodology and Data Analyses

This section outlines the estimation issues and techniques which were considered in this work. Firstly, our model is difficult to estimate owing to the simultaneity between unionism and the expected wage rate. In principle, we should estimate a system of equations, as not only do higher earnings result in a higher propensity to join a union, but being a union member can result in higher earnings (Booth and Chatterji, 1995; Riley, 1997). Typically, estimating the simultaneous equation model relies on exclusion restrictions, whereby variables assumed to affect earnings have no direct effect on union membership status. While we are aware of this methodological aspect, our data lack plausible independent instruments for the wage model which precludes us from estimating a system of equations. Consequently, the earnings variable is excluded from the union membership model. Even so, the reader should keep in mind that some simultaneity bias might be present in our results, potentially leading to an overestimation of the union membership equations.

Despite the caveat, the work proceeds by utilising the Even and Macpherson (1990 1993) decomposition technique, which has also been applied in chapter 2. The technique enables us

to investigate whether the South African gender gaps in unionism for 1995 and 2004 are explained by gender differences in union related characteristics or by differences in coefficients/response to the characteristics. The latter is in turn attributable to gender disparities in the demand for unionism or to hiring discrimination by unions and employers. The method is described below.

4.6.1. Statistical Model

Here, we give an outline of the Even and Macpherson (1990) procedure as it applies to unionism. It is reiterated that the notation utilised in this section is directly quoted from Even and Macpherson (1993). Having said that, the method is as follows

Initially, a probit model of the following form is estimated:

$$\Pr(U_{ijt} = 1 \mid X_{ijt}) = \Phi(\mathbf{x}_{ijt}\gamma_{jt}) \tag{4.5}$$

where $\mathbf{x}_{ijt}$ is a vector of observed characteristics defining individual i of sex *j* (*j=m, f*) in period t, U_{ijt} is a dummy variable that takes a value of one if an individual is a union member and zero otherwise, and Φ is the standard normal cumulative density function.

The next step concerns utilising the estimated probit coefficients to predict the percentage of sex *j* workers unionised in period *t*. The computation of the predicted probability is as follows:

$$P(\mathbf{x}_{jt}\hat{\gamma}_{jt}) = (1/n_{jt}) \sum_{i=1}^{n_{jt}} \Phi(\mathbf{x}_{ijt}\hat{\gamma}_{jt}) \tag{4.6}$$

Thereafter, the difference between men and women's predicted probabilities of unionism in period t ($UGAP_t$) is obtained as shown in 4.7.

$$UGAP_t = P(\mathbf{x}_{mt}, \hat{\gamma}_{mt}) - P(\mathbf{x}_{ft}, \hat{\gamma}_{ft}) \tag{4.7}$$

$UGAP_t$ is then decomposed into two portions. The first portion is associated with gender differences in observed characteristics, and it is known as the explained component - EXP_t; Algebraically, EXP_t is computed as the difference between men's coverage rate and the coverage rate that they would have if they had female sample characteristics:

$$EXP_t = P(\mathbf{x}_{mt}, \hat{\gamma}_{mt}) - P\left(X_{ft}, \hat{\gamma}_{mt}\right) \tag{4.8}$$

The second component of $UGAP_t$ is the unexplained gap $UNEXP_t$; it follows from the differences in the estimated coefficients. $UNEXP_t$ is calculated as the disparity between

women's coverage rate and the coverage rate that would arise "if the probability of female unionism is determined by the male probit coefficients", Even and Macpherson (1993):

$$UNEXP_t = P(\bar{X}_{ft}, \hat{\gamma}_{mt}) - P(\bar{X}_{ft}, \hat{\gamma}_{ft})^{102}. \quad (4.9)$$

On the word of Even and Macpherson (1993), "$UNEXP_t$ captures gender differences in the demand for unionism due to unobservables, gender differences in the demand for unionism, or hiring discrimination by unions and their employers".

Finally, the portions of EXP_t and $UNEXP_t$ that are explained by disparities in the r^{th} explanatory variable are computed as:

$$EXP_{rt} = EXP_t \left[\frac{\left(\bar{x}_{mrt} - \bar{x}_{frt} \right) \hat{\gamma}_{mrt}}{\left(\bar{x}_{mt} - \bar{x}_{ft} \right) \hat{\gamma}_{mt}} \right] \quad and \quad UNEXP_{rt} = UNEXP_t \left[\frac{\left(\hat{\gamma}_{mrt} - \hat{\gamma}_{frt} \right) \bar{x}_{frt}}{\left(\hat{\gamma}_{mt} - \hat{\gamma}_{ft} \right) \bar{x}_{ft}} \right] \quad (4.10)^{103}.$$

respectively. Notably, the detailed decomposition uses normalised regression coefficients following Yun (2005). As explained in chapter two, this is done in order to avoid the identification problem associated with dummy variables – i.e. a change in the reference categories leads to changes in the contributions of the dummy variables to the unexplained component of the gap, see Oaxaca and Ransom (1999) and Yun (2005)[104]. The next section addresses data issues.

4.6.2. Data Issues and Analyses

The chapter uses individual data from the 1995 October Household Survey and the September 2004 Labour Force survey. Because the data sources have already been discussed, a description of our samples and variables utilised in the analyses form the core for discussion in this section.

Regarding the samples, our main focus is on a sub-sample of African employees aged between 15 and 65 years provided they are eligible for union membership. This includes wage workers from the formal sector, the informal sector and the domestic sector, and

[102] According to Even and Macpherson (1993), applying logic symmetric to the above provides an alternative decomposition with a female reference group.

[103] The specific variable contribution to the unexplained gap follows Yun (2000).

[104] This method applies to both linear and non-linear models.

excludes the self-employed as employers are ineligible to union membership. The sample delimitation process is illustrated in Table 29 below.

Table 29: Sample Delimitation Process

	Number of Individuals	
Sample	1995	2004
Total sample	18 234	16 822
Ineligibles	1 095	3 368
Final Sample	17 139	13 454
Repartition of the Final sample by Gender		
Number of Males	10228	7 577
Number of Females	6 911	5 877

Source: OHS: 95 and LFS: 2004_2, own computation (unweighted figures)

Following the above, we describe our dependent variable and the covariates. Table 30, pg:138 shows the descriptive statistics for the variables used by gender and period. These statistics and the remainder of the analyses are weighted figures based on the above-mentioned-samples.

Concerning the dependent variable, Table 30 shows that in 1995 men's union density was 39 percent while the one for women was 26 percent. However, men's union density declined by 6 percent between 1995 and 2004, concomitantly women's density remained constant. As a result, the gender gap in unionism declined from 13 percent in 1995 to 6 percent in 2004 (these gaps are statistically significant at the 5 percent level of significance[105]). Significantly, these figures show that women are still less likely to be unionised when compared to men. Naturally, this invites an in-depth investigation into the factors behind this situation.

With respect to the covariates, the statistics for the age related variables indicate that a higher proportion of the individuals are aged between 25 and 44 years irrespective of gender and period. Thus, we expect an individual's probability of joining a trade union to increase with age, but only up to a certain point beyond which it starts to decrease.

Also, considerable similarities exist between the proportions of each sample found in the different education levels. For instance, a larger fraction of the samples has secondary education followed by primary, diploma and then those with degrees. However, the proportion of men with secondary education is slightly higher than that of women and *vice versa* for degrees.

As for the household related variables, the data highlights that in 1995 approximately 45 percent of the females were married while the proportion of men was about 15 percent

[105] The 95% binomial wald confidence interval (CI) for the proportion of unionised males is [0.3643815 0.4102365] and the one for females is [0.2457855 0.2804584], clearly these CIs do not overlap, implying that the proportions are different. This conclusion also applies to the 2004 sample as the corresponding CIs for men and women are [0.3044509 0.350518] and [0.2464159 0.2850579].

higher. However, for both genders, the proportions fell by about 14 percent between 1995 and 2004. These findings accord well with the stylised fact of a general decline in marriage.

Another useful observation is that a higher ratio of women belongs to households with children aged below 15 years in comparison with their male counterparts. Therefore, we anticipate the presence of dependent children to reduce women's probability of joining a union more than it does for men, especially due to the notion of the household division of labour. Nonetheless, the observation that a higher proportion of females cohabit with other elder women than men could mitigate the negative effect of dependent children on women's propensity to unionise. Accordingly, other women in the household could for example, assume child caring duties while mothers attend to unions.

The data also show that a slightly higher fraction of the females cohabit with other union members as compared to men (2-4 percent higher). This information leads us to expect this variable to have a larger impact on females than men. Moreover, the figures demonstrate that the allocation of the genders across the provinces did not shift much between 1995 and 2004.

In addition, while both genders are exhibited to be concentrated in elementary jobs and skilled occupations, women dominate men in clerical and technical occupations and *vice versa* for occupations such as operators and artisans.

Finally, the statistics for the industries reveal that overall, social services, manufacturing, and trade (and agriculture for men) employ a higher ratio of the individuals as compared to the remaining sectors. This statement concludes our data description exercise. Subsequently, we analyse our results.

4.7. Empirical Analyses

Initially, we discuss findings from the union membership probits and then proceed to the decompositions. The results are contained in Tables 31, pg:139 and 32, pg:141. Table 31 shows the coefficients and marginal effects of the covariates on the probability of joining a trade union by gender and period. Table 32 presents results for both the aggregate decompositions of the average predicted gender gap in the propensity to unionise into components due to different characteristics and different coefficients and the specific variable contributions to these components. Similar outcomes are presented in Section 2.8.

4.7.1. Probit Models

At the outset, Table 31 shows that having dependent children does not significantly influence an individual's propensity to be unionised. Although this outcome is contrary to our theoretical expectations, it is not an exception, see the survey by Riley (1997:288).

The evidence also shows differences in the effects of marriage on men and women's decisions to join trade unions (relative to not being married). While being married reduces women's chances of joining a union, the opposite applies to men. For instance, in 1995 women's prospects were reduced by 4 percent, while those for men were increased by 8.5 percent (relative to baseline probabilities). It is also surprising that the impact of marriage on the cause of concern increased, by about 4 percent (absolute value), for both genders between 1995 and 2004, despite the decline in marriage rates. Essentially, confidence interval tests attest that these marriage coefficients are statistically different, for men and women, at the 5 percent level. Potentially, these disparities signal the dominance of patriarchy, whereby men are supposed to be leaders and activists both in the household and society while women are expected to be subservient caregivers who carry out domestic chores and follow the dictates of men (COSATU, 2000).

It also reveals that the relative effects of the age dummies on the probability of joining a union are similar for men and women. This is also supported by statistical tests for gender differences in these coefficients; for each year, the coefficients for men and women are not statistically different at the 5 percent level. Even so, the outcomes show that being aged between 15 and 24 years reduced the prospects of being unionised relative to the referent category (25-34 years)). Inversely, the higher age levels (35 to 64 years) increased the propensity to be unionised. For instance, on average, men's propensities of being unionised were increased by 6 percent in 1995 whilst the impact was almost double for women (relative to the baseline probabilities). Thus, the elderly workers prefer to use voice rather than the quit strategy which could be common among the more mobile young workers. Also, the effect of the age dummies on the cause of concern increased from 1995 to 2004 (e.g. on average, the effect of the dummies for those aged from 35 to 64 increased from 6 to 12 percent for men, while those for women increased from 12 to 20 percent).

In addition, while the presence of other females aged 15 years and above in the household reduces the probability of trade union membership for both genders in 1995, it is insignificant in 2004. Moreover, there is a statistically significant gender gap in the effects for 1995 (7 percent), which favours women. In the case of women, this outcome is puzzling as we anticipated the female housemates to substitute for mothers/wives' time spent on domestic chores so that the mothers/housewives could attend to unions. Arguably, the co-habitation was expected to increase mothers/wives' prospects of union membership.

It is also apparent that the presence of other union members in the household strongly increased the prospects of being unionised[106]. These effects tend to be stronger for women (70 percent in 1995) than men (65 percent in 1995) and they increased over the given period (by 10 and 6 percent respectively). Essentially, these gender gaps are statistically significant at the 5 percent level of significance. Thus "the variables appear to act as indicators of household "tastes" for unionisation, probably reflecting political and social awareness, but may also reflect firm recruiting strategies", Moll (1993).

Additionally, the outcomes for the education levels are similar for both genders and time periods. As expected, these coefficients for men and women are not statistically different at the 5 percent level of significance. Specifically, having secondary education or a diploma significantly increased the prospects of being unionised relative to elementary education (secondary education was insignificant for men in 2004). For example, having a diploma increased women's prospects of unionism by 11 percent in 1995 while it simultaneously increased men's prospects by 15 percent. As well, the shifts in these effects did not follow an obvious trend across gender and time. For instance, the impact of having a diploma on unionism increased from 11 percent to 25 percent for women, while that for men declined from 15 percent to 9 percent during the period under study. In contrast, dummies for having a degree and primary education were insignificant. These outcomes are however, expected as both groups of lowly and highly educated employees were anticipated to have a low probability of unionism than for medium educated individuals. This is because the latter group of workers (skilled) is traditionally represented by trade unions (Booth, 1986; Moll, 1993; Schnabel and Wagner, 2005).

Besides, most occupational dummies did not have a robust influence on the prospects of being unionised. For instance, being an artisan reduced the chances of unionism for both genders in 2004, but not in 1995 (relative to the base category (operator)). The chances for men and women were reduced by 7 percent and 16 percent, respectively. Furthermore, being a technician increased women's propensity to join a union while the effect was insignificant for men. Even so, doing elementary jobs reduced the probability of being unionised for both genders (e.g. in 2004 women's chances were reduced by about 20 percent while those for men were reduced by 10 percent). This is understandable as the latter encompasses some poorly unionised jobs such as domestic work. Further, most of the gender gaps in the coefficients for the occupations were statistically significant.

More importantly, the findings for the industrial variables show that being in agriculture, construction, trade, transport, finance and social services offered less opportunities for

[106] However, this result could be amenable to simultaneity bias as the characteristics of individuals who dwell in the same household could be interdependent.

unionisation across time and gender relative to being in the manufacturing sector. On average, being in these industries reduced men and women's probabilities of joining unions by 22 percent and 15 percent, in that order. Inversely, being in the mining sector presented men with relatively more chances of being unionised (25 percent in 1995 and the effect increased by 14 percent in 2004) while it was insignificant for women. Accordingly, statistical tests for gender differences in the coefficients did not yield robust results. While the coefficients for most industries were statistically similar in 2004, those for agriculture, mining, trade and finance were statistically different across the genders in 1995. Following Moll (1993), these dummies were potentially picking up firm size differences that may have varied systematically across industries.

Having discovered both differences and similarities in the effects of the covariates on men and women's probabilities of joining a union, we move on to explore the driving mechanisms for such outcomes. That is whether the gender differences in the probability of unionism are due to different characteristics or different coefficients.

4.7.2. Decomposition Analysis

At this point, we discuss the outcomes from the decompositions of the gaps in African men and women's average predicted probabilities of being unionised in 1995 and 2004 which are shown in Table 32 pg:141. The decompositions use women as the base category and men as the reference category. With regard to the aggregate decompositions, the findings show that the average estimated probabilities of union membership for 1995 are 0.3899 and 0.2627 for men and women respectively. Therefore, the total predicted gender gap in unionism is 0.1265, of this gap 0.0026 (or 17.87 percent) is due to variations in observed characteristics and 0.1039 (or 82.13 percent) is ascribed to different responses to characteristics between the genders. However, the total predicted gender gap in unionism declined to 0.054 in 2004. Of which, -0.007 is attributable to differences in characteristics and 0.061 is due to disparities in coefficients. Clearly, these findings show that the gender gaps are largely explained by differences in coefficients/behavioural response as compared to variations in union related characteristics. The findings for 2004 in particular imply that, even if men and women had the same endowments of unionisation related characteristics women would still have lower unionisation rates than men. Ideally, this poses a number of questions, for instance: could the lower propensity of women to join unions be due to family commitments, self selection, or to hiring discrimination?

Answers to the above-mentioned questions require us to investigate the factor specific contributions to the unexplained gaps. However, we before-hand, acknowledge the difficulty associated with such a task (see Doiron and Ridell, 1994). Often, the main challenge has been associated with untangling the effects of self selection from those of "discrimination".

Given such a situation, we dwell on intuitive judgements, where possible. In this vein, our statistical tests for the differences between the coefficients for men and women for both 1995 and 2004 reveal some statistical differences in the coefficients of marriage, occupation, industry, and other_fem (*most* of the coefficients for age, children[107], education, province, and other_un were not statistically different, hence we shall not put much emphasis on them). These variations accentuate the gender gap for a given male-female difference in the respective variable.

Fundamentally, we infer from the differences in the coefficients of the marriage variables that married men and women respond differently to unionisation. These differences could be rationalised by the notion of the household division of labour. Hence, they could be in support of the hypothesis that family commitments reduce women's participation in unions.

Furthermore, the variations in the coefficients of occupations and industries explain a significantly large portion of the decomposition of coefficients. We opine that these differences could be due to self selection. This argument follows from the assumption that the family commitment hypothesis applies. According to this viewpoint, family commitments could lead some women to self select into occupations and industries which spare them time for participating in household activities, most of which tend to be non-unionised. Alternatively, although it is not very clear, we do not negate the possibility that the differences in the coefficients for occupations and industries might be picking up the effect of some factors usually captured by the unobservables. For instance, the latter may include discrimination and other factors which could have been omitted from the analyses such as unaccounted employer or employee heterogeneity.

While we are aware of the contributions made by some of the age dummies, education dummies, provinces, the presence of other union members and other females in the household to the decomposition, the ambiguity inherent in interpreting the specific variable contributions to the unexplained component of the unionism gap makes it difficult to rationalise the mechanisms through which they drive the gender differences in unionism. Certainly, this limits the usefulness of these variables. In light of this, it is hoped that future research will devise methodological frameworks which disentangle the effects of e.g. behavioural response, discrimination and individual heterogeneity from the unexplained gap.

In summary, the findings show that the differences in unionism are mainly due to differences in coefficients as compared to variations in characteristics. This is especially due to the coefficients for marriage, most occupations, and most industries. Thus, women with the same union related characteristics as men are less likely to join unions. However, the unexplained

[107] The fertility variables were insignificant in the probit models hence, we shall not put much emphasis on them.

portion of the gap is more difficult to interpret and it could be partly due to factors omitted from our analyses. Despite this, the implication of our findings is that self selection, family commitment and other unobservables are likely to be the main drivers of the gender gaps.

4.8. Concluding Remarks

Differences in the propensities of South African men and women to unionise were examined by analysing individual data from the 1995 and 2004 surveys. Firstly, we estimated the demographic, workplace and geographical determinants of unionism by gender, and these were specified in line with the cost-benefit theory. Thereafter, we applied the Even and Macpherson (1990 1993) decomposition. The decomposition was meant to assist us in testing whether the gender gaps were due to differences in characteristics or variations in coefficients (the latter presumably captured "discrimination", self selection or unaccounted employee or employer heterogeneity).

Generally, the results showed that the prospects of unionism in the South African labour market are positively associated with having secondary education and a diploma, being aged above 25 years, and co-habiting with other union members. In contrast, occupations, industries and provinces, *where significant*, mainly reduced the opportunities to participate in unions (relative to the base categories). Besides, some variables like marriage had different effects on men and women's probability of unionism. In particular, marriage reduced women's unionism, while it increased men's chances. Perhaps, this outcome is attributable to patriarchy. Even so, it is difficult to comprehend why patriarchy persists in unions and in our society at large when its disadvantages seem obvious.

In addition, the Even and Macpherson (1990 1993) decompositions revealed that 17.87 percent of the total predicted gender gap in unionism for 1995 is due to variations in observed characteristics and 82.13 percent is ascribed to different coefficients. As for 2004, -13 percent of the gap is due to disparities in characteristics, while 113 percent is due to different coefficients. Thus, we find that the gender gaps are mainly due to different coefficients/behavioural response as compared to variations in characteristics. Furthermore, the outcomes from the specific variable contributions to the unexplained gaps suggest that the gender gaps are mainly explicable by the human capital theory (marriage, differences in occupations and industries).

Notably, these findings differ from those of Moll (1993). In synopsis, Moll discovered that women had similar tendencies of joining unions with men once their sector, experience and tenure were controlled for. This divergence could be attributed to differences in the investigated sub-populations, estimated equations, and estimation methods between the two studies. While we focussed on Africans, Moll's study embraces Africans, Indians and coloureds. Importantly, these racial groups have different cultural values which could have

neutralised the effect of marriage on the propensities of unionism. Furthermore, Moll included the following variables in his regressions while we did not: tenure, potential experience, potential experience squared (we used age dummies as a proxy for experience), dummy variable for other employed people in the household, dummy variable indicating deductions for medical or pension benefits, and the ratio of persons in the household to the number of earners. Therefore, it is possible that the effect of the omitted variables could be captured by the coefficient effect in our decomposition analysis.

All the same, we suggest that our findings are consistent with a story in which social expectations about the role of women in society are changing slowly. In other words, it is suggested that many women are still docile and devote more time to domestic chores than men, which is an epitome of patriarchy. Perhaps, these expectations are partly responsible for sorting men and women into different jobs.

From the above story we infer that the observed gender pay gaps are an artefact of the slow change in social expectations about women's role in society which have kept male dominance in trade unions. Furthermore, differences in choices of occupations and industries between men and women are also instrumental in explaining the gender pay gaps.

Given the above stories, we speculate that the following measures may help to increase female unionism. Firstly, the government should educate both male and female employees and the society at large about the socio-economic implications of patriarchy and its negation of female unionism. For instance, efforts should be invested in removing the social stigma or radicalism associated with being a female unionist or of letting your wife/partner join the unions. Secondly, unions should introduce educational programmes designed to educate female employees and build their confidence not only to join male dominated jobs but also to participate fully in union activities. Hopefully, these measures will eventually allow those women who can spare some time for unions to join without fear of being victimised or assaulted. Thirdly, the unions should consider moving beyond their long announced plans to organise in marginal/female jobs towards implementation, in order to accommodate women. Generally, these speculations suggest that the gender discourse goes beyond unions and activists; instead it requires a collective effort.

Finally, the ability to draw far-reaching conclusions on the major causes of the gender gaps require the use of better theoretical models which enable unambiguous interpretation of the variable specific contributions to the unexplained component of the gap. Furthermore, if available, the use of richer data sets will improve on our findings as it will enable the inclusion of firm level characteristics which were omitted in this case due to data constraints. Such data will also make it possible to estimate a simultaneous equation system of unionism and wage

determination as the two are notionally interdependent, that will improve the precision of the of the union membership models.

Table 30: Descriptive Statistics for Africans by Gender (1995, 2004)

	1995				2004			
Variable	Females Mean/Prop	s.dev	Males Mean/Prop	s.dev	Females Mean/Prop	s.dev	Males Mean/Prop	s.dev
Union density	0.26	0.01	0.39	0.01	0.26	0.01	0.32	0.012
15-19 Years	0.010	0.001	0.014	0.001	0.008	0.001	0.012	0.002
20-24 Years	0.073	0.004	0.076	0.003	0.085	0.005	0.098	0.005
25-34 Years	0.342	0.007	0.345	0.007	0.335	0.001	0.384	0.009
35-44 Years	0.328	0.007	0.309	0.007	0.29	0.008	0.259	0.008
45-54 Years	0.183	0.011	0.179	0.005	0.21	0.008	0.171	0.007
55-64 Years	0.052	0.005	0.077	0.003	0.057	0.004	0.046	0.003
Household variables								
Married	0.455	0.008	0.596	0.008	0.32	0.009	0.416	0.011
Other_Un	0.141	0.008	0.123	0.011	0.092	0.007	0.054	0.004
Other_fem	0.608	0.009	0.348	0.010	0.469	0.011	0.198	0.008
Children<15 years	0.738	0.008	0.616	0.012	0.659	0.01	0.47	0.011
Children<6 years	0.438	0.009	0.382	0.009	0.402	0.01	0.333	0.009
Provincial variables								
Western Cape	0.030	0.005	0.045	0.006	0.051	0.01	0.053	0.01
Eastern Cape	0.144	0.009	0.097	0.006	0.125	0.01	0.094	0.005
Northern Cape	0.007	0.001	0.011	0.002	0.01	0.001	0.015	0.002
Free State	0.107	0.008	0.102	0.007	0.074	0.004	0.082	0.007
Kwazulu/Natal	0.214	0.013	0.184	0.011	0.215	0.009	0.173	0.008
North West	0.093	0.008	0.112	0.009	0.083	0.005	0.098	0.008
Gauteng	0.244	0.017	0.285	0.018	0.265	0.017	0.305	0.011
Mpumalanga	0.068	0.006	0.091	0.007	0.075	0.004	0.085	0.005
Northern Province	0.093	0.008	0.074	0.006	0.102	0.006	0.092	0.007
Education Levels								
Elementary	0.040	0.003	0.048	0.003	0.015	0.002	0.021	0.002
Primary	0.246	0.008	0.264	0.007	0.2	0.008	0.243	0.007
Secondary	0.451	0.010	0.477	0.009	0.539	0.011	0.553	0.009
College	-	-	-	-	0.015	0.002	0.013	0.002
Diploma	0.109	0.006	0.062	0.004	0.111	0.006	0.06	0.004
Degree	0.028	0.003	0.023	0.002	0.052	0.005	0.034	0.004
Occupations								
Manager	0.006	0.001	0.019	0.002	0.013	0.003	0.02	0.003
Professional	0.027	0.003	0.019	0.002	0.038	0.004	0.025	0.003
Technician	0.156	0.007	0.065	0.004	0.116	0.006	0.061	0.005
Clerk	0.104	0.005	0.070	0.004	0.125	0.007	0.055	0.004
Skilled	0.119	0.005	0.118	0.005	0.12	0.006	0.143	0.006
Agriculture jobs	0.002	0.001	0.003	0.001	0.002	0.001	0.005	0.001
Artisan	0.025	0.002	0.134	0.005	0.013	0.003	0.186	0.008
Operator	0.043	0.004	0.210	0.006	0.040	0.004	0.203	0.008
Elementary Jobs	0.519	0.010	0.359	0.009	0.505	0.01	0.302	0.01
Industries								
Agriculture	0.084	0.007	0.211	0.011	0.057	0.005	0.1	0.007
Mining	0.005	0.002	0.094	0.009	0.002	0.001	0.089	0.01
Manufacturing	0.103	0.007	0.164	0.009	0.109	0.006	0.157	0.007
Electricity	0.002	0.001	0.012	0.001	0.005	0.001	0.012	0.003
Construction	0.004	0.001	0.062	0.004	0.018	0.002	0.12	0.007
Trade	0.160	0.006	0.124	0.003	0.17	0.008	0.142	0.006
Transport	0.010	0.001	0.063	0.006	0.02	0.003	0.064	0.005
Finance	0.028	0.003	0.038	0.003	0.052	0.004	0.097	0.006
Social services	0.604	0.010	0.231	0.011	0.567	0.01	0.217	0.008
N	6706		9913		5819		7468	

othr_un = other union members in the household, other_fem =other females aged 15 years and above in the household.

Table 31: Coefficients and Marginal Effects from Union Membership Probits (1995, 2004)

	1995				2004			
	Females		Males		Females		Males	
Variable	Coefficien	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Household Variables								
Children<15years	0.081 (0.063)	0.022	0.005 (0.054)	0.002	0.092 (0.075)	0.027	-0.167 (0.067)**	-0.055
Children<6 years	0.041 (0.057)	0.012	-0.010 (0.043)	-0.004	-0.091 (0.072)	-0.026	0.119 (0.072)	0.040
Married	-0.141 (0.053)**	-0.040	0.228 (0.047)**	0.085	-0.275 (0.062)**	-0.077	0.304 (0.052)**	0.115
Other_fem	-0.118 (0.052)*	-0.034	-0.287 (0.041)**	-0.106	-0.054 (0.066)	-0.016	-0.077 (0.065)	-0.025
Othr_un	2.175 (0.094)**	0.723	2.059 (0.098)**	0.653	2.931 (0.170)**	0.824	2.407 (0.147)**	0.720
Age Variables								
15-19 Years	-0.151 (0.265)	-0.040	-0.830 (0.229)**	-0.248	-0.664 (0.295)**	-0.143	-1.991 (0.435)**	-0.278
20-24 Years	-0.377 (0.109)**	-0.092	-0.313 (0.079)**	-0.111	-0.442 (0.156)**	-0.110	-0.362 (0.108)**	-0.109
35-44 Years	0.325 (0.058)**	0.096	0.123 (0.045)**	0.047	0.500 (0.079)**	0.158	0.285 (0.058)**	0.098
45-54 Years	0.371 (0.074)**	0.115	0.181 (0.057)**	0.069	0.650 (0.092)**	0.215	0.387 (0.073)	0.134
55-64 Years	0.375 (0.098)**	0.120	0.176 (0.079)*	0.068	0.877 (0.135)**	0.315	0.406 (0.135)**	0.148
Education Levels								
Primary	0.127 (0.082)	0.037	0.045 (0.055)	0.017	0.050 (0.112)	0.015	-0.078 (0.107)	-0.025
Secondary	0.333 (0.079)**	0.095	0.126 (0.056)*	0.047	0.280 (0.105)**	0.082	0.023 (0.107)	0.077
Diploma	0.361 (0.103)**	0.113	0.392 (0.097)**	0.153	0.743 (0.146)**	0.258	0.260 (0.136)*	0.092
Degree	0.030 (0.229)	0.009	0.096 (0.203)	0.037	1.022 (0.217)**	0.372	0.016 (0.244)	0.005
Occupations								
Manager	-0.042 (0.300)	-0.012	-0.462 (0.135)**	-0.156	-0.095 (0.292)	-0.027	0.113 (0.214)	0.038
Professional	0.944 (0.241)**	0.339	-0.280 (0.209)	-0.099	0.333 (0.276)	0.109	0.610 (0.264)**	0.229
Technician	0.665 (0.155)**	0.219	0.039 (0.096)	0.015	0.566 (0.191)**	0.191	0.106 (0.108)	0.036
Clerk	0.033 (0.149)	0.009	-0.005 (0.084)	-0.002	-0.053 (0.185)	-0.016	0.283 (0.126)**	0.100
Skilled	-0.113 (0.150)	-0.031	0.021 (0.075)	0.008	-0.413 (0.193)**	-0.106	0.325 (0.103)**	0.115
Artisan	-0.231 (0.178)	-0.059	-0.032 (0.065)	-0.012	-0.771 (0.185)**	-0.162	-0.205 (0.091)**	-0.065
Elementary Job	-0.576 (0.136)**	-0.164	-0.110 (0.058)	-0.041	-0.751 (0.229)**	-0.219	-0.307 (0.079)**	-0.098

Standard errors in parentheses * significant at 5%; ** significant at 1%

Referent variables: Gauteng province, Operator for occupations, Elementary education level, manufacturing industry, 25-34 years for age categories.

othr_un = other union members in the household, other_fem =other females aged 15 years and above in the household.

The occupation agriculture was missing for females in 2004 hence, we did not include it in the decompositions.

(*Table continues on next page*).

Table 31: Continued

	1995				2004			
	Females		Males		Females		Males	
Variable	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect	Coefficient	Marginal Effect
Industries								
Agriculture	-0.625 (0.148)**	-0.138	-1.396 (0.105)**	-0.407	-0.715 (0.229)**	-0.156	-1.12 (0.123)**	-0.261
Mining	-0.306 (0.365)	-0.076	0.641 (0.104)**	0.251	0.558 (0.455)	0.194	1.043 (0.114)**	0.392
Electricity	-0.066 (0.491)	-0.018	-0.243 (0.159)	-0.087	0.360 (0.438)	0.119	0.393 (0.260)	0.143
Construction	-0.441 (0.266)	-0.102	-0.846 (0.114)**	-0.258	-0.602 (0.294)**	-0.135	-0.930 (0.124)**	-0.235
Trade	-0.448 (0.116)**	-0.110	-0.657 (0.075)**	-0.218	-0.396 (0.163)**	-0.103	-0.734 (0.100)**	-0.201
Transport	-0.587 (0.270)*	-0.126	-0.237 (0.086)**	-0.085	-0.352 (0.229)	-0.089	-0.399 (0.104)**	-0.118
Finance	-0.921 (0.189)**	-0.169	-0.817 (0.116)**	-0.248	-0.467 (0.228)**	-0.113	-0.628 (0.134)**	-0.173
Social service	-0.668 (0.106)**	-0.198	-0.345 (0.077)**	-0.125	-0.345 (0.147)**	-0.102	-0.148 (0.134)	-0.048
Provinces								
Western Cape	-0.237 (0.181)	-0.061	0.117 (0.163)	0.045	0.007 (0.252)	0.002	-0.073 (0.111)	-0.023
Eastern Cape	0.150 (0.084)	0.044	0.042 (0.081)	0.016	0.206 (0.109)*	0.064	0.137 (0.090)	0.047
Northern Cape	-0.167 (0.170)	-0.044	-0.231 (0.132	-0.083	0.131 (0.162)	0.040	0.129 (0.137)	0.044
Free State	-0.450 (0.093)**	-0.108	-0.089 (0.083)	-0.033	0.283 (0.122)**	0.090	0.321 (0.090)**	0.114
KwaZulu/Natal	-0.361 (0.084)**	-0.093	-0.149 (0.078)	-0.055	0.126 (0.099)	0.038	0.078 (0.097)	0.26
North West	-0.158 (0.094)	-0.042	-0.245 (0.085)**	-0.089	0.191 (0.105)*	0.059	0.206 (0.099)**	0.072
Mpumalanga	-0.214 (0.103)*	-0.056	-0.209 (0.088)*	-0.076	0.181 (0.103)*	0.056	0.043 (0.098)	0.014
Northern Province	-0.110 (0.110)	-0.030	-0.246 (0.114)*	-0.089	0.048 (0.107)	0.014	0.192 (0.093)**	0.066
Constant	-0.566 (0.149)**		-0.132 (0.102)		-0.927 (0.173)**		0.612 (0.132)**	
F	30.81**		33.35**		23.33**		27.68**	
Observations	6706		9913		5800		7468	

Table 32: Decomposing the Male-Female Unionization Gap

	1995		2004	
Unionization Rates				
	Actual	*Predicted*	*Actual*	*Predicted*
Male	0.3899	0.3892	0.318	0.312
Female	0.2638	0.2627	0.257	0.258
Gap	0.1261	0.1265	0.061	0.054
A. Decomposing into Characteristics and Returns				
Characteristics	0.0026		-0.007	
percent	17.87		-13	
Returns	0.1039		0.061	
percent	82.13		113	
B. Contribution of Individual Characteristics to the Unionisation gap				
Characteristic	*Explained Gap (1995)*	*Unexplained Gap (1995)*	*Explained Gap (2004)*	*Unexplained Gap (2004)*
Age	0.001	0.049	-0.004	0.014
Children	0.000	-0.240	0.001	-0.014
Married	-0.012	-0.347	0.002	0.031
Other_fem	-0.041	-0.315	0.002	-0.002
Other _Un	0.020	-0.05	-0.007	-0.008
Education	0.008	-0.234	-0.001	0.011
Occupation	0.008	0.924	0.002	0.018
Industry	0.037	0.276	-0.003	0.011
Province	0.003	0.039	0.00	-0.001

Other_fem refers to other females of the working age in the household.
Other _Un refers to other union members in the household.

Chapter Five

5. Conclusion

This thesis has investigated three areas of central importance to understanding the shifts in the status of African women in the labour market over the period 1995-2004. These topics are: determinants of African women's labour force participation, sources of gender pay gaps and determinants of the gender gaps in trade union membership. The highlighted issues were explored quantitatively and the main methodologies utilised in the thesis are decomposition analysis and maximum likelihood estimation techniques. The decompositions partitioned the changes in a labour market indicator into two main components. These are differences in objective characteristics and disparities in coefficients/behavioural response/discrimination.

Several insights emerged from the analyses. Firstly, we have suggested that the shifts in the place of African women in the labour market between 1995 and 2004 were mainly explained by responses to changing conditions rather than to changes in labour market characteristics. However, this raises a question as to why on the one hand, there were big shifts in labour force participation and on the other, there were negligible shifts in unionism and pay gaps, yet all are explained by differences in coefficients. To that end, we have suggested that the differences are due to considerable changes in women's perceptions about involvement in paid works which are in juxtaposition with slowly changing social expectations about the role and place of women in the household and the society at large. Hence, it is likely that African women's advancement in the labour market is compromised by the work-family conflict[108] which they experience.

Secondly, we have suggested that the work-family conflict may mean that some women self-select into women's jobs which are usually low paying and poorly unionised, hence this phenomenon could be partly implicated in the slow convergence in pay.

Thirdly, we have suggested that the persisting gender pay differentials are explicable by the persistence of segmented labour markets, taste-based, and statistical discrimination in the economy. In other words, employers have not yet changed their perceptions about women, despite the anti-discrimination legislation. Thus, even though the South African constitution is viewed as being among the most progressive in the world as it advocates for women's rights in all sectors of society, this has not changed the perception towards women (Tshoaedi and Hlela (2006).

[108] Work-family conflict occurs when participation in the work role and the family role is incompatible in some respect. As a result, participation in one role is made more difficult by virtue of participation in the other.

On the basis of the above speculations, it seems that even though the South African government has effected progressive constitutional changes to empower African women in the labour market, some challenges still exist. This suggests that the constitutional reforms are yet to transform the overall position of African women in the labour market. Therefore, there is need to translate the constitutional guarantees into action. More importantly, the policy changes were primarily concerned with the paid labour market (that is they were not framed within the socio-cultural context), yet responses to the policies were underpinned, albeit invisibly by social institutions. Perhaps it is because of the failure of the labour market reforms to integrate the social institutions that the society has not changed its perceptions about women. In light of this supposition, we propose that if the policies are to be fruitful, they should encompass measures which accommodate the socio-cultural context in which they are supposed to act. Above-all, an integrated policy framework between labour markets and socio-cultural policies is needed in order to redress the inequality associated with African women's labour market opportunities and outcomes.

When placed in a global context, the above situation is not unique to South Africa. This is a major challenge so far, on a global scale, no country has managed to attain equality between men and women in the labour market, but less patriarchal societies like the Nordic countries have registered the most significant progress in reducing the gender gap (Claros and Zahidi, 2005).

In terms of directions for future research, the findings in this thesis suggest that a further understanding of the status of African women in the post-Apartheid labour market requires an analysis of gender rather than primarily focussing on women as a category. Therefore, future research can benefit by addressing the following issues.

1. How and to what extent do gender roles and relations compromise women's response to post-Apartheid labour market policies?
2. How can gender relations be reformed so that they exist on a more equitable foundation and provide the basis for the full and free development of African women in the labour market?
3. How can gender as a social construct not as women's concerns be integrated into labour market policies?

References

Aigner, D and Cain C. (1977). "Statistical Theories of Discrimination in Labour Markets", *Industrial and Labour Relations Review,* 30(2): 175-87.

Ajwad, M.I and Kurukulasuriya, P. (2002). "Ethnic and Gender Wage Disparities in Sri Lanka" World Bank Research Working paper, 2859.

Allanson, P., Atkins, J and Hinks, T. (2001). "Did the End of Apartheid Spell the Beginning of the end for Racial Wage Discrimination in South Africa? A Multilateral Analysis of Racial Wage Differentials in the Early post Apartheid Period", Paper presented at the 6th Annual conference of the African Econometrics society, Pretoria.

Albrecht, J., Bjorkland, A and Vroman, S. (2003). "Is there a Glass Ceiling in Sweden?" Journal of *Labour Economics,* 21(1): 145-77.

Albrecht, J., Vuuren, A. and Vroman, S. (2004)."Decomposing the Gender Wage Gap in the Netherlands with Sample Selection Adjustments", IZA Discussion Paper: 1440.

Albrecht, J., Vureen, A and Vroman, S. (2004). "Decomposing the Gender wage gap in the Netherlands with Sample selection adjustments", IZA Discussion Paper, 1400.

Alderman, H., Chiappori, P-A, Haddard, L Hoddinott, J and Kanbur, R. (1995). "Unitary vs. Collective models of the Household: Time to shift the burden of proof?" *World Bank Research Observer*, 10(95):1-19.

Alexis, M. (1973). "A Theory of Labour Market Discrimination with Independent Utilities", *American Economic Review* Papers and Proceedings.

Aliber, M. (2001). "Study of the Incidence and Nature of Chronic Poverty and Development policy in South Africa: An Overview, Programme for Land and Agrarian Studies", School of Government, University of Western Cape.

Altonji, J.G and Blank, R.M. (1999). "Race and Gender in the Labour Market", In O. Ashenfelter and D. Card (eds), *Handbook of Labour Economics*. Vol. 3, chapter 48, pp 3143-3259, Amsterdam: North Holland.

Amsden, A. (1980). *The Economics of Women and Work*. England: Penguin.

Andersson, P. (1995). "Two Essays in Labour Economics; on Labour Market Discrimination and on the Quality of Data", Gothenburg University, Sweden.

Angrist, J. (2001). "How do Sex Ratios affect Marriage and Labour Markets? Evidence from America's 2nd Generation", revised version of NBER working paper, 8042.

Anker, R. (1997). "Theories of Occupational Segregation by Sex: an Overview", *International Labour Review,* 136(3):315-339.

Antos, J.R, Chandler, M and Mellow, W. (1980). "Sex Differences in Union Membership", *Industrial and Labour Relations Review*, 33(2):162-169.

Appleton, S., Hodinott, J and Krishnan, P. (1996). "The Gender Wage Gap in 3 African Countries", CSAE paper series 1996-7, University of Oxford.

Apps, P.F and Rees, R. (1997). "Collective Labour Supply and Household Production", *Journal of Political Economy*, 105(1): 178-190.

Arrow, K. (1973). "The Theory of Gender Discrimination", in O.A Ashenfelter and A. Rees (eds). *Discrimination in the Labour Market*. Princeton University Press: Princeton, pp3-33.

Asaad, R and Zouari, S. (2003). "Estimating the Impact of Marriage and Fertility on the Female Labour Force Participation when Decisions are Interrelated: Evidence from Urban Morocco", Topics in Middle Eastern and North African Economies, *Electronic journal*, 5, Middle East Economic Association and Loyola University Chicago.

Ashenfelter, O and Pencavel, J.H. (1969). "American Trade Union Growth," *Quarterly Journal of Economics*, 83(3): 434-48.

Ashenfelter, O and Johnston, G.E. (1972). "Unionism, Relative Wages and Labour Quality in US Manufacturing Industries", International Economic Review, 13(3): 488-508.

Ashford, J.R and Sowden, R.R. (1970). "Multivariate Probit Analysis," *Biometrics*, 26(3): 535-546.

Ashworth, J and Ulph, D. (1981). "Household Models", in C.V.Brown, (ed)., Taxation and Labour Supply, Allen and Unwin: London.

Autor, D.H. (2003). *Lecture Notes: The Economics of Discrimination*- Theory, MIT 14.661 (Fall).

Azam, J-P., Rospabé, S. (2005). "Trade Unions vs. Statistical Discrimination: Theory and Application to Post-Apartheid South Africa", University of Toulouse (ARQADE, IDEI) and Institut Universitaire de France., CREM, University of Rennes 1.

Baden, S Hassim, S and Meintjes, S. (1999). "Country Gender Profile: South Africa", (Prepared for the Swedish International Development Co-operation Agency (Sida) Pretoria, Republic of South Africa), http://womensnet.org.za/links/genderpr.htm

Barker, F. (1999). *The South African Labour Market: Critical Issues for Renaissance*. Pretoria: J.L. Van Schaik Publishers.

Baskin, J. (2000). *Labour in South Africa's Transition to Democracy: Concentration in a Third World Setting* in Adler, G. and Webster, E. (Eds.) Trade Unions and Democratisation in South Africa, 1985-1997. Witwatersrand University Press: Johannesburg.

Basu, K. (2001) "Gender and say: A Model of Household Behaviour with Endogenously Determined Balance of Power", Cornell University, Unpublished Manuscript.

Beblo, M., Beninger, D., Heinze, A and François, L. (2003). "Methodological Issues Related to the Analysis of Gender gaps in Employment, Earnings and Career Progression", Project Carried out for the European commission Employment and Social Affairs.

Becker, G.S. (1957). *The Economics of Discrimination*. Chicago: University of Chicago Press.

Becker, G.S. (1962). "Investment in Human Capital a Theoretical Analysis", *Journal of Political Economy*, supplement: 70 (5) part2: s9-s49.

Becker, G.S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with special reference to Education*. New York, National Bureau of Economic Research.

Becker, G.S. (1965). "The Theory of the Allocation of Time", *Economic Journal*, 75 (September) 79: 502-5.

Becker, G.S. (1971). *Economics of Discrimination* (Second Edition). Chicago: University of Chicago Press.

Becker, G.S. (1973). "A Theory of Marriage Part 1", *Journal of Political Economy*, 81(4):813-846.

Becker, G.S. (1974). "On the Relevance of the New Economics of the Family", *American Economic Review*: 62(4): 317-19

Becker, G.S. (1991). *A Treatise on the Family*. Cambridge, Massachusetts: Harvard University Press, 1981. Enlarged Edition, 1991.

Becker, G.S. and Chiswick, B.R. (1966). "Education and the Distribution of earnings', *American Economic Review*, 56 (1/2): 358-69.

Bendix, S. (1998). *Industrial Relations in South Africa*. Juta and Co. Ltd: Cape Town South Africa.

Bendix, S. (2001). *Industrial Relations in South Africa*, 4th (eds.) Juta and Co. Ltd, Cape Town South Africa.

Berkowitz, M. (1954). "The Economics of Trade Union Organisation and Administration", *Industrial and Labour Relations Review*, 7(4): 537-549.

Ben-Porath, Y. (1967). "The Production of Human Capital and the Life Cycle of Earnings", *Journal of Political Economy* 75 (4, Part 1): 352.365.

Bentley, K. (2004) "Women's Human Rights and the Feminisation of poverty in South Africa", *Review of African Political Economy,* 31(100):247-61.

Bergstrom, T.C. (1997) "A Survey of the Theories of the Family", in Handbook of Population and Family Economics, Rosenzweig, M.R and O Stark (eds).

Berndt, E.R. (1991). *The Practice of Econometrics: Classic and Contemporary*. Massachusetts: Addison-Wesley Publishing Company.

Bhorat, H and Hodge, J. (1999). "Decomposing Shifts in Labour Demand in South Africa", *South African Journal of Economics*, 67(3): 348-380.

Bhorat, H. (2000). *Wage Premia and Wage differentials in the South African Labour Market.* Paper Presented at Tips Annual Conference, Johannesburg, South Africa.

Bhorat, H. and Leibbrandt, M. (2001a.). "Correlates of Vulnerability in the South African Labour Market", Chapter 2, in: Bhorat, H; Leibbrandt, M; Maziya, M; Van der Berg, S; and Woolard, Ingrid (Eds.). 2001. *Fighting poverty: Labour Markets and Inequality in South Africa*. UCT Press: Lansdowne: 171-106.

Bhorat, H. and Leibbrandt, M. (2001b). "Modelling Vulnerability and Low Earnings in the South African Labour Market", Chapter 3, in Bhorat, H; Leibbrandt, M; Maziya, M, Van der Berg, S; and Woolard, I (Eds.). 2001. *Fighting poverty: Labour Markets and Inequality in South Africa*. UCT Press: Lansdowne: 107-129.

Bhorat, H and McCord, A. (2003). *Employment and Labour Market Trends*, Chapter 5, HRD Review.

Bhorat, H., Lundall, P and Rospabe, S. (2002). "The South African Labour market in a Globalising World: Economic and Legislative considerations". ILO Publication: Employment Paper, 2002/32.

Bignebat, C. (2003). "From Individual Labour Supply to Household Labour Supply: The Evidence of Female Bargaining Power in Couple Relationship as a Challenge to Economic Theory" TEAM, University of Paris I-Panthéon Sorbonne & CNRS.

Blinder, S. (1973). "Wage Discrimination; Reduced Form and Structural Estimate", *Journal of Human Resources,* 8 (4): 436-455.

Blundell, R and McCurdy, T. (1999). *"Labour Supply a Review of Alternative approaches":* The Institute for Fiscal Studies. Working Paper series Number W98/18.

Blundell, R; Chiappori, P-A and Meghir, C. (2005). "Collective Labour Supply with Children', *Journal of Political Economy*, 113 (61): 1277-1306.

Booth, A.L. (1985). "A Reconsideration of Trade Union Growth in the United Kingdom", *British Journal of Industrial Relations*, 21 (3): 377-391.

Booth, A.L. (1986). "Estimating the Probability of Trade Union Membership: A Study of Men and Women in Britain" *Economica*, 53 (209): 41-61.

Booth, A. L and Chatterji, M. (1995). "Union Membership and Wage Bargaining when Membership is not Compulsory", *Economic Journal*, 105 (429):345-360.

Booth, A.L and Bryan, M.L. (2004). "The Trade Union Membership Wage-Premium Puzzle: Is there a free rider Problem?" *Industrial and Labour Relations Review*, 57 (3): 401-421.

Boserup, E. (1970). *The Role of Women in Economic Development*. New York: St Martin's; London; Earth scan.

Bourguignon, F and Chiappori, P-A. (1992). "Collective Models of Household Behaviour", *European Economic Review*, 36 (23): 355-64.

Bowen, W.G and Finegan, T.A. (1969). *The Economics of Labour force Participation*. Princeton, N.J, Princeton University Press.

Bromberger, N. (1982). "Government Policies Affecting the Distribution of Income", in Schrire, R. (Eds),*South Africa - Public Policy Perspectives*, Cape Town, Juta.

Browning, M and Chiappori, P-A. (1998). "Efficient Intra Household Allocations: A General Characterisation and Empirical Tests", *Econometrica*, 66(6): 1241-1278.

Browning, M and Meghir, C. (1991). "The Effects of Male and Female Labour Supply on Commodity Demands", *Econometrica*, 59(4): 925-51.

Budlender, D. (1998). *Country Gender Profile South Africa* (short version). Swedish International Development Co-operation Agency.

Budlender, D. (1998). *African Gender and Development Index*. Centre for Applied Legal Studies, University of Witwatersrand.

Buchinsky, M. (1995). "Quantile regression Box Cox Transformation Model and Changes in the Returns to Schooling and Experience", *Journal of Econometrics*, 65:109-54

Buchinsky, M. (1994). "Changes in the US Wage Structure 1963-1987: An application of Quantile Regression", *Econometrica*, 62(2):405-58.

Buchinsky, M. (1998). "Recent Advances in Quantile Regression Models: A Practical Guideline for Empirical Research", *Journal of Human Resources*, 33(1):88-126

Buchinsky, M. (1998). "The Dynamics of Changes in the Female Wage Distribution in the USA: A Quantile Regression Approach", *Journal of Applied Econometrics*, 13:1-30.

Buchinsky, M. (2001). "Quantile Regression with Sample Selection: Estimating Women's Return to Education in the US", *Empirical Economics*, 26(1): 87-113.

Buhlungu, S. (2005). *The State of Trade Unionism in Post-Apartheid South Africa,* in Daniel, J., Lutchman, J. (eds.) State of the nation: South Africa, 2004-2005. Human Sciences Research Council: Pretoria.

Burger, R and Yu, D. (2006). "Wage Trends in Post-Apartheid South Africa: Constructing an Earnings Series from Household Survey Data," Working Papers 10/2006, Stellenbosch University, and Department of Economics.

Butcher, K-F and Rouse, C.E. (2001). "Wage Effects of Unions and Industrial councils in South Africa", World Bank Policy Research Working Paper, 2520.

Cahuc, P and Zylberberg, A. (2004). *Labour Economics.* Massachusetts Institute of technology Press, Cambridge, Massachusetts, London England.

Cain G.G. (1966). *Married Women in the Labour force*. Chicago: University of Chicago Press.

Casale, D. (1998). "Gender Discrimination and the Determination of Wages in the South African Labour Market", Honours Thesis, University of Natal, Durban.

Casale, D. (2003). "The Rise in Female Labour Force Participation in South Africa: An analysis of Household Survey Data, 1995-2001". PhD Thesis, University of Natal.

Casale, D. (2004). "What Has the Feminization of the Labour Market 'Bought' Women in South Africa? Trends in Labour force Participation, Employment and Earnings, 1995-2001", *Journal of Interdisciplinary Economics* 15(3-4) (Special Issue):251-275.

Casale, D and Posel, D. (2002). "The Continued Feminisation of the Labour force in South Africa: An analysis of Recent Data and Trends", *South African Journal of Economics*: 70 (1) pp 156-184.

Chamberlain, D and van der Berg, S. (2002*).* "Earning Functions labour Market Discrimination and Quality of Education in South Africa," Stellenbosch University Economic Working Papers, 2/2002.

Chiappori, P-A. (1997). "Introducing Household Production in Collective models of Labour Supply", *Journal of Political Economy*, 105(1):191–209.

Chiappori, P-A. (1992). "Collective Labour Supply and Welfare', *Journal of Political Economy*, 100(3): 437-67.

Chiappori, P-A. (1988). "Rational Household Labour Supply", *Econometrica*, 56(1): 63-89.

Chiappori, P-A; Fortin, B and Lacroix, G. (1998). "Household Labour Supply, Sharing Rule and the Marriage Market", Université de Laval Cahiers de recherché.

Chiappori, P-A; Fortin, B and Lacroix, G. (2002). "Marriage Market, Divorce Legislation and Household Labour supply', *Journal of Political Economy*, 110(1): 36-72.

Chu Ng, Y. (1991). "Female Labour force Participation and Gender Earnings Differentials in Agentina," in Psacharopoulos and Tzannatos, World Bank, Religious Studies Report Number 10.

Claros, L and Zahidi, S. (2005). "Women's empowerment: Measuring the Global Gender gap"' World Economic Forum, Switzerland

COSATU (2000). Draft COSATU Gender Policy: debated and adopted at the National Gender Conference (held on 5-7 July 2000).

Deaton, A. (1997). *The Analysis of Household Surveys: A Micro econometric Approach to Development Policy*. Johns Hopkins Press (pub): Baltimore London.

Deaton, M and Muellbauer, J. (1980). *Economics and Consumer Behaviour*. Cambridge, University Press.

de la Rica, S., Dolado J.J and Llorens, V. (2005). "Ceilings and floors, Gender Wage Gaps by Education in Spain", IZA Discussion Paper: 1483.

Dickens, W and Lang, K. (1985). "A Test of Dual Labour Markets Theory", *American Economic Review*, 75(4): 792-8.

Dieden, S. (2005). "Income Generation in the African and Coloured Population- Three Essays on the Origins of Household Incomes in South Africa", PhD Thesis, Gothenburg University.

Dixon, S. (1996). "Labour force Participation over the last 10 years", Department of Labour, *New Zealand Labour Market Bulletin*, 1996(2):71-88.

Dinkelman, T., Pirouz, F. (2002). 'Individual, Household and Regional Determinants of Labour Force Attachment in South Africa: Evidence from the 1997 October household survey' *South African Journal of Economics*, 70 (5):865-891.

Doeringer, P.B and Piore, M.J. (1971). *Internal Labour Markets and Manpower Analysis*. Lexington: M.A: Health Lexington Books.

Doiron, D.J and Riddell, C. (1994). "The Impact of Unionization on Male-Female Earnings Differences in Canada", *The Journal of Human Resources*, 29 (2) Special Issue: Women's Work, Wages, and Well-Being. (Spring): 504-534.

Dolado J.J and Llorens, V. (2004). "Gender Wage Gaps by Education in Spain: Glass Floor vs Glass Ceiling". CEPR Discussion Paper, 4203.

Duflo, E. (2000). "Grandmothers and Grand Daughters: Old Age Pension and Intra-household Allocation in South Africa". Manuscript, Cambridge: Massachusetts Institute of Technology.

Edwards, R. (1979). *Contested Terrain*, New York: Basic Books.

Efron, B. (1979). "Bootstrap Methods: Another look at the Jacknife", *The Annals of Statistics*, 7: 1-26.

Ehrenberg, R.G and Smith R.S. (2000). *Modern Labour Economics*, 7th edition, Massachusetts: Addison-Wesley Longman Inc.

Erichsen, G and Wakeford, J. (2001). "Racial Wage Discrimination in South Africa Before and After the First Democratic Election". DPRU working paper, 1/49, University of Cape Town.

Evans M.D.R and Kelly J. (2004). "Trends in Women's Labour Force Participation in Australia: 1984-2002". Melbourne Institute Working Paper: 23/04.

Even, W and Macpherson, D.A. (1990). "Plant Size and the Decline of Unionism", *Letters,* 32(4): 393-98.

Even, W and Macpherson, D.A. (1993). "The Decline of Private Sector Unionism and Gender Wage Gap", *Journal of Human Resources*, 28 (2): 279-96.

Fallon, P. and Lucas, R. (1998). "South African Labor Markets Adjustment and Inequalities. Informal Discussion Papers on Aspects of the Economy of South Africa", World Bank: Washington D.C.

Fallon, P and Verry, D. (1988). *The Economics of Labour Markets*. London: Philip Alan Publishers, Oxford and New Jersey.

Fernandes, R and De Felicio, F. (2005). "Entry of the Wife into the Labour Force in Response to the Husband's Unemployment: A study of the Added Worker effect in Brazilian Metropolitan Areas", *Economic Development and Cultural Change*, 53(4):887-911.

Finnemore, M and van der Merwe, R. (1987). *Introduction to Labour Relations in South Africa*. Lexicon Publishers: Johannesburg South Africa.

Finnemore, M. (1998). *Introduction to Labour Relations in South Africa.* 6th ed. Butterworth Publishers Pvt. Ltd, Durban South Africa.

Finnemore, M. (2002). *Introduction to Labour Relations in South Africa*, 8th ed. Butterworth Publishers Pvt. Ltd, Durban, South Africa

Finnemore, M and Cunningham, P. (1994). *Women and the Work Place,* in Van der Merwe A (ed) *Industrial Sociology- A South African Perspective* Johannesburg Lexicon.

Fortin, B and Lacroix, G. (1997). "A Test of the Unitary and Collective Models of Household Labour Supply", *Economic Journal*, 107(443): 935-955.

Gabler, S., Laisney, F and Lechner, M. (1993). "Semi Non-Parametric Maximum Likelihood Estimation of Binary Choice Models with an Application to Labour force Participation", *Journal of Business and Economic Statistics*, 11: 61-80.

Garcia, J, Hernandez, P.J and Nicholas, A.L. (2001). "How wide is the gap? An Investigation of Gender Differences Using Quantile Regression", *Empirical Economics*, 26:149-7.

Gerfin, M. (1996). "Parametric and Semi Parametric Estimation of the Binary response model of Labour Market Participation", *Journal of Applied Econometrics*: 11(3): 321-339.

Glick, P and Sahn, D., (1997). "Gender and Education Impacts on Employment and Earnings from Conakry, Guinea", *Economic Development and Cultural Change*, 45(4): 793-824.

Greene, W.H. (2003). *Econometric Analysis* (5th Ed.).Pearson Education LTD: New Jersey, USA.

Greenberger, S. (1980). *Race and State in Capitalist Development*. Johannesburg, Ravan Press.

Griffiths H and Jones, R. (1980). *Discrimination in the labour market, South African Labour Economics*, McGraw Hill book Company, Johannesburg

Goldin, C. (1990). *Understanding the Gender Gap: An Economic History of American Women*. New York: Oxford University Press.

Gronau, R. (1974). "Wage Comparisons: A Selectivity Bias," *Journal of Political Economy*, 82(6): 1119-1143.

Gronau, R. (1977). "Leisure, Home Production, and Work--The Theory of the Allocation of Time Revisited", *Journal of Political Economy*, 85(6): 1099-1124.

Gronau, R. (1988). "Sex Related Wage Differentials and Women's Interrupted Labour Careers the Chicken/ the Egg", *Journal of Labour Economics*, 6(3): 277-302.

Grossbard-Shechtman, A. (1984). "A Theory of Allocation of Time in Markets for Labour and Marriage", *Economic Journal*, 94(376): 863-882.

Gruen, C. (2004). "Direct and Indirect Gender wage discrimination in the South Africa labour market", *International Journal of Manpower*, 25(3-4): 321-342.

Gunawardena, D. (2005). "The Gender Wage Gap in Sri Lanka", Paper presented at the 4th PEP Research Network General meeting June 13-17 2005, Colombo Sri Lanka

Gunawardena, D. (2006). "Exploring Gender Wage Gaps in Sri Lanka: A Quantile Regression Approach", Paper presented during the 5th PEP Research Network General Meeting, June 18-22, Addis Ababa, Ethiopia.

Haddad, L and Kanbur, R. (1992). "Intra-household Inequality and the Theory of Targeting' European *Economic Review*, 36(2): 372-8.

Haddad, L., Hoddinott, J and Alderman, H. (1997). *Intra Household Resource Allocation in Developing Countries: Models, Methods and Policy*. The Johns Hopkins Press, Baltimore.

Haddad, L and Hoddinot, J. (1994). "Women's Income and Boy-Girl Anthropometric Status in Côte d'Ivoire", *World Development* , 22(4): 543-53.

Hamilton, L.C. (2004). *Statistics with Stata*. Brooks/Cole-Thompson Learning, Belmont, USA

Hansen, J. (1997). *Essays on Earnings and Labour Supply*, PhD Thesis, University of Gothenburg.

Heckman, J.J. (1979). "Sample Selection Bias as a Specification Error", *Econometrica*, 47(1): 153 – 161.

Heckman, J.J. (1974). "Shadow Prices Market Wages and Labour Supply", *Econometrica*, 42(4): 679-694.

Hersch, J. and Stratton, S., (2000) "Household Specialization and the Male Marriage Wage Premium", *Industrial and Labour Relations Review* 54 (1):78-94.

Hicks, J.R. (1946). *Income*. Chapter XIV of Value and Capital (2nd Edition: Clarendon Press, 1946), reprinted in Parker, R.H., Harcourt, G.C., and Whittington, G., Readings in the Concept and Measurement of Income (2nd Edition: Philip Allan, 1986).

Hinks, T. (2002). "Gender Wage Differentials and Discrimination in the New South Africa", *Applied Economics*, 34(16): 2043-205.

Hinks, T., Allanson, P and Atkins, J. (2000). "A Multilateral Decomposition of Racial Wage Differentials in the 1994 South Africa Labour Market", *Journal of Development Studies*, 37(1): 93-120.

Hirsch, B.T and Addison J.T. (1986). *The Economic Analysis of Unions: New Approaches and Evidence.* Boston: Allen & Unwin.

Hirsch, B.T and Macpherson, D.A. (2002) *Union Membership and Earnings Data Book: Compilations from the Current Population Survey* (2002 Edition). Washington, D.C.: Bureau of National Affairs.

Hoddinot, J and Haddad, L. (1995). "Does Female Income share Influence Household Expenditure? Evidence from the Côte d'Ivoire", *Oxford Bulletin of Economics and Statistics*, 57(1): 77-96.

Hofmeyr, J.F and Lucas, R. (2001). "The Rise in Union Wage Premiums in South Africa", *Labour*, 15 (4): 685-719.

Hofmeyr, J.F (2001) "The importance of Segmentation in the South African Labour market" DPRU/FES Conference on Labour Markets and Poverty in South Africa, Misty hills Johannesburg.

Hutt, W.H. (1964). *The Economics of Colour Bar*. London Institute for Economic Affairs.

Hyder, A and Reilly, B. (2005). The Public Sector Pay Gap in Pakistan: A Quantile Regression Analysis. PRUS Working Paper, 33.

http://www.ilo.org/public/english/bureau/inf/pr/1997/28.htm

Ichimura, H. (1993). "Semi Parametric Least squares (SLS) and Weighted SLS Estimation of Single Index Models", *Journal of Econometrics*, 58(1): 71-120.

International Labour Office (2001). *Promoting Gender Equality - A Resource Kit for Trade Unions*. Geneva: ILO Gender Promotion Programme.

ILO (1999, 2001, 2005). *Key indicators of the Labour market*, International Labour Office, Geneva.

Isemonger, A.G and Roberts N.J. (1999). "Post Entry Gender Discrimination in the South African Labor Market", *Journal of Studies in Economics and Econometrics*, 23(2): 1-25.

Iwayemi, A and Olusoji, M.O. (2005). "Women Labour Supply in Nigeria: An Econometric Analysis". African Econometrics Society Research Paper.

Jacobsen, J.P. (1994). *The Economics of Gender*, Cambridge, M.A: Blackwell Publishers.

Joll, C., McKenna, C., McNabb, R and Shorey, J. (1993). *Developments in Labour Market Analysis*. London: George Allen and Unwin.

Jones, F.L. (1983). "On Decomposing the Wage Gap: A Critical Comment on Blinder's Method", *Journal of Human Resources*, 18(1):126-130.

Johnston, J and Dinardo, J. (1997). *Econometric Methods*, 4th (ed), McGraw hill (eds), Singapore.

Joseph, G. (1983). *Women at Work: The British Experience.* Oxford, Philip Allan Publishers.

Juhn, C., Murphy, K and Pierce, P. (1993). "Wage Inequality and the Rise in Return to Skill", *Journal of Political Economy*, 101(3): 410-422.

Kabubo-Mariara, J. (2002). "Labour Force Participation and Gender differences in Kenya," *Journal of Economic Policy*, 9(2): 103-115.

Kalb, G. (2002). "Estimation of Labour Supply Models for Four Separate Groups in the Australian Population". Melbourne Institute of Applied Economic and Social research, Working Paper No 24/02.

Kee, H. J. (2005). "Glass ceiling or Sticky floor? Exploring the Australian Gender pay gap using Quantile Regression and counterfactual Decomposition Methods", The Australian National University Discussion Paper, 487.

Killingsworth, M.R and Heckman, J.J. (1986). *Female Labour Supply*: A survey, in O Ashenfelter and R Layard (Eds) *Handbook of Labour Economics*. Vol 1, New York: North-Holland,

Killingsworth, M.R. (1983). *Labour Supply*. Cambridge: Cambridge University Press.

Kingdon, G and Knight, J. (1999). "Unemployment and Wages in South Africa: A Spatial Approach", Centre for the Study of African Economies, Working Paper WPS/99.12, Oxford University.

Kingdon, G and Knight, J. (2000). "Are Searching and Non-Searching Unemployment Distinct States when Unemployment is High? The Case of South Africa", Working Paper: Centre for the Study of African Economies, University of Oxford.

Kingdon, G. and Knight, J. (2001) "Race and the Incidence of Unemployment in South Africa". Oxford: Centre for the Study of African Economies: CSAE Working Paper, 2001-18.

Klasen, S. (2000). "Measuring Poverty and Deprivation in South Africa", *Review of Income and Wealth,* 46(1): 33-58.

Klasen, S. and Woolard, I. (1999). "Levels, Trends and Consistency of Employment and Unemployment Figures in South Africa". *Development Southern Africa,* 16 Autumn (1) 3-36.

Klein, R.L and Spady, R.H. (1993). "An Efficient Semi parametric Estimator for Binary Choice Models", *Econometrica*, 61: 387-421.

Knight, J.B. and McGrath, M.D. (1977). "An Analysis of Racial Wage Discrimination in South Africa", *Oxford Bulletin of Economics and Statistics*, 39(4): 245 – 271.

Knight, J.B. and Sabot, J. (1982). "Labour Market Discrimination in a Poor Urban Economy", *Journal of Development Studies*, 19 (1): 67-87.

Koenker, R and Basset, G. (1978). "Regression Quantiles", *Econometrica*, 46(1): 33-50.

Kuhn, P. (1987). "Sex Discrimination in Labour Markets: The Role of Statistical Evidence", *American Economic Review*, 77(4): 567-83.

Kunze, A (2006) "Gender Wage Gap Studies: Consistency and decomposition", forthcoming in *Empirical Economics*.

Kosters, M. (1966). "Income and Substitution Effects in a Family Labour Supply Model", Report No. P3339. The Rand Corporation.

Lam, D. (1999). "Generating Extreme Inequality: Schooling, Earnings, and Intergenerational Transmission of Human Capital in South Africa and Brazil." PSC Research Report No. 99-439.

Lam, D and Duryea, S. (1999). 'Effects of Schooling on Fertility, Labour Supply and Investments in Children with Evidence from Brazil', *The Journal of Human Resources*, 34(1): 160-192.

Leibbrandt, M., van der Berg, S and Bhorat H. (2001a). "Introduction" in Bhorat, H, Leibbrandt, M., Maziya, M., Van Der Berg, S. and Woolard, I. *Fighting Poverty: Labour Markets and Inequality in South Africa*. Cape Town: UCT Press, Lansdowne: 1-20.

Leibbrandt, M., Woolard, I and Bhorat, H. (2001b). "Understanding Contemporary Household inequality in South Africa". Chapter 4 in Bhorat, H, Leibbrandt, M., Maziya, M., Van Der Berg, S. and Woolard, I. *Fighting Poverty: Labour Markets and Inequality in South Africa*. Cape Town: UCT Press, Lansdowne.

Leibbrandt, M., Levisohn, J., and McCrary, J. (2005). "Incomes in South Africa since the Fall of Apartheid", University of Michigan, RSIE Discussion Paper No. 536.

Leigh-Doyle, S. (1991). "Increasing Women's participation in Technical Fields: A Pilot Project in Africa", *International Labour Review*, 130 (4): 427-444.

Leuthold, J. (1968). "An Empirical Study of Formula Income and the Work Decision of the Poor", *Journal of Human Resources*, 3 (3): 312-323.

Levinsohn, J. (2003). "The World Bank's Poverty Reduction Strategy Paper Approach: Good Marketing or Good Policy?" G-24 Discussion Paper, United Nations Publication.

Lewis, H .G. (1974). "Comments on Selectivity biases in Wage comparisons", *Journal of Political Economy*: 82, 1145-1155.

Lipton, M. (1986). *Capitalism and Apartheid: South Africa, 1910-1986*. Aldershot: Wildwood House (2nd edition).

Lipton, M and Ravallion, M. (1995). "Poverty and Policy", Berghman, J and Srinivasan, T.N, (Eds) 1995. *Handbook of Development Economics*, Volume 3. Amsterdam: North Holland. pp 2551-657.

Lundberg, S and Pollak, R. (1993). "Separate Spheres Bargaining and the Marriage Market", *Journal of Political Economy,* 106 (6): 988-1010.

Lundberg, S and Pollak, R. (1996). "Bargaining and Distribution in Marriage", *Journal of Economic Perspectives*, 10 (4): 139-158.

Lundberg, S and Startz, R. (1983). "Private Discrimination and Social Intervention in Competitive Labour Markets", *American Economic Review*, 73 (June):340-47.

Lundhal, M and Moritz, L. (1996). *Det nya Sydafrika-Economi och Politik efter Apartheid*. (The new South Africa- Economics and Politics after Apartheid). Stockholm, Sweden, SNS Publication.

Machado, J.A.F and Mata, J. (2001). "Earning Functions in Portugal 1982-1994: Evidence from Quantile Regressions", *Empirical Economics*, 26(1): 115-34.

Machado, J.A.F and Mata, J. (2005). "Counterfactual Decomposition of Changes in Wage Distributions using Quantile Regression", *Journal of Applied Econometrics*, 20(4): 445-465.

Macpherson, D.A and Hirsch, B.T. (1995). "Wages and Gender Composition: Why do Women's Jobs Pay less?" *Journal of Labour Economics*, 13(3): 426-71.

MaCurdy, T., Green, D. and Paarsch, H. (1990). "Assessing Empirical Approaches for Analysing Taxes and Labour supply",. Journal of Human Resources, 25(3): 415-90.

Maddala, G. (1983). Limited Dependant and Qualitative Variables in Econometrics. New York: Cambridge University Press.

Maglad, N.A. (1998). "Female Labour Supply in Sudan", AERC Special Paper Number 30.

Manda, D.K, Bigstern, A and Mwabu, G. (2001). "Trade Union Membership and Earnings in Kenyan Manufacturing Firms", Working Paper in Economics Number 50, Department of Economics, Gothenburg University.

Manser, M and Brown, M. (1980). "Marriage and Household Decision Making: A Bargaining Analysis", *International Economic Review*, 21(1): 1-44.

Mas-Colell, A., Whinston, M.D and Green, J.R. (1995). *Microeconomic Theory*. Oxford University Press, New York.

Mashin, S. (2002). "Factors of Convergence and Divergence in Union Membership", Paper published by Centre for Economic Performance, London School of Economics and Political Science.

Mavromaras, K.G. (2003). "Indirect Reemployment Wage Discrimination", *Bulletin of Economic Research*, 55(1): 53-89.

Maxwell, S. (1999). "The Meaning and Measurement of Poverty", Oversees Development Institute.

May, J., Govender, J., Budlender, D., Mokate, R., Regerson, C and Stavrou, A. (1998). "Poverty and Inequality in South Africa", Report prepared for the Office of the Executive Vice President and the Inter-Ministerial Committee for Poverty and Inequality.

Maziya, M. (2001). "Contemporary Labour Market Policy and Poverty in South Africa", Chapter 8 in Bhorat, H, Leibbrandt, M., Maziya, M., Van Der Berg, S. and Woolard, I. *Fighting Poverty: Labour Markets and Inequality in South Africa*. Cape Town: UCT Press.

McConnell, C., Brue, S., and Macpherson, D (2006) *Contemporary Labor Economics*, 7th Edition, McGraw-hill.

McElroy, M.B and Horney, M.J. (1981). "Nash Bargained Household Decisions: Towards a Generalisation of the Theory of Demand", *International Economic Review*, 22(June): 333-349.

McElroy, M. (1990). "The Empirical Content of Nash-Bargained Household Behaviour", *Journal of Human Resources*, 25(4): 559-583.

McFadden, D. (1966). "Quantal Choice Analysis: A survey", *Annals of Economic and Social Measurement*, 5(4): 363-90.

Macpherson, D. A and Hirsch, B.T,. (1995). "Wages and Gender Composition: Why Do Women's Jobs Pay Less?," Journal of Labour Economics 13(3): 426-71.

Michaud, P-C and Vencatachellum, D. (2001). "The Union Wage premium for Blacks in South Africa", CentER Department of Economics, Tilburg University and Ecole dec HEC, 3000 Cote-ste-Catherine, Montreal, Quebec, Canada.

Mincer, J. (1958). "Investment in Human Capital and Personal Income Distribution", *Journal of Political Economy*, 66(4): 281-302

Mincer, J. (1962a). "On- the- Job Training: Costs, Returns and Some Implications", *Journal of Political Economy*, 70(5): 50-79.

Mincer, J. (1962b). "Labour Force Participation of Married Women"; in H.G Lewis ed. *Aspects of Labour Economics*, National Bureau of Economic research, Princeton N.J Princeton University Press.

Mincer, J. (1974). *Schooling Experience and Earnings*. New York: Colombia University Press for the National Bureau of Economic Research.

Mincer, J. and Polachek, S. (1974). "Family investments in Human Capital: Earnings of Women", *Journal of Political Economy*, 82(2): 76-108.

Mlatsheni, C and Leibbrandt, M. (2001). "The Role of Education and Fertility in the Participation and Employment of African Women in South Africa", DPRU Working Paper, 0 1 / 5 4.

Moghadam, V.M. (1998). *Women, Work and Economic Reform in the Middle East and North Africa*, Lynne Rienner Publishers, United Kingdom.

Moll, P. (1991). "The Decline of Discrimination against Coloured People in South Africa 1975-1985", *Journal of Development Economics*: 37: 289-307.

Moll, P. (1993). "Black South African Unions: Relative Wage Effects in International Perspective", *Industrial and Labour Relations Review*, 46 (2): 245-61.

Mwabu, G. and Schultz, T. P. (1996). "Education Returns across Quantiles of the Wage Function: Alternative Explanations for Returns to Education by Race in South Africa", *American Economic Review*, 86(2): 330 – 334.

Mwabu, G and Schultz, T.P. (1998). "Labour Unions and the Distribution of Wages and Employment in South Africa" *Industrial Labour Relation Review*, 51 (4): 680-703.

Mwabu, G and Schultz, T.P. (2000). "Wage premiums for Education and Location of South African Workers, by Gender and Race", *Economic Development and Cultural Change*, 48(2): 307-334.

Nakamura, A and Nakamura, M. (1992). "The Econometrics of Female labour Supply with Children" *Econometric Review*, 11(1): 1-71.

Nattrass, N. (2000). "Inequality, Unemployment and Wage Setting Institutions in South Africa", *Journal of Studies in Economics and Econometrics*, 24(3): 129-142.

Natrass, N and Seekings, J. (1997). "The Wage Board: Empowerment or Emasculation', South Africa *Labour Bulletin*, 21 (5): 16-20.

Naylor, R.A. (1990). "A Social Custom Model of Collective Action", *European Journal of Political Economy*, 6(2): 201-216.

Neuman, S and Oaxaca, R.L. (2003). "Estimating Labor Market Discrimination with Selectivity-Corrected Wage Equations: Methodological Considerations and an Illustration from Israel", The Pinhas Sapir Centre for Development, Tel-Aviv University; Discussion Paper No. 2-2003.

Neumark, D and McLennan, M. (1995). "Sex Discrimination and Women's Labour Market Outcomes", *The Journal of Human Resources*, 30 (4, autumn):723-740.

Newey, W.K., Powell, J.L and Walker, J.R. (1990). "Semi Parametric Estimation of Selection models: Some Empirical Results", *American Economic Review*, 80(2): 324-328.

Nielsen, H.S and Rosholm, M. (2001). "The Public-Private wage gap in Zambia in the 1990s, A quantile regression approach", *Empirical Economics*, 26(1): 169-82.

Oaxaca, R.L. (1973). "Male Female Wage Differentials in Urban Labour Markets", *International Economic Review*, Philadelphia: 14(3): 693-709.

Oaxaca, R.L and Ransom, M.R. (1994). "On Discrimination and the Decomposition of Wage Differentials", *Journal of Econometrics*, 61(1): 5-21.

Oaxaca, R.L and Ransom, M. R., (1999). "Identification in detailed wage Decomposition", *Review of Economics and Statistics,* 81(1):154-157

Olson, M. (1965). *The Logic of Collective Action*. Cambridge: Massachusetts.

Osterman, P. (1975) "An Empirical Study of Labour Market Segmentation", *Industrial Relations Review*, 28: 508-23.

Pencavel, J.H. (1971) "The Demand for Union Services: An Exercise", *Industrial and Labour Relations Review*, 24 (2): 180-190.

Pirouz, F. (2004). "Have Labour Market Outcomes Affected Household Structure in South Africa? A Preliminary Descriptive Analysis of Households", Paper Submitted to the Conference "African development and Poverty Reduction: The Micro-Macro linkages, Hosted by the DPRU and TIPS in Association with Cornell University.

Phelps, E.S. (1972). "The Statistical Theory of Racism and Sexism", *American Economic Review*: 62: 659-661

Phipps, S and Burton, P. (1992). "What's Mine is Yours? The Influence of Male and Female Incomes on Patterns of Household Expenditures", *Economica*: 65(260): 599-613.

Polachek, S.W. (1981). "Occupational Self Selection: A Human Capital Approach to Sex Differences in Occupational Structure", *Review of Economics and Statistics*: 63(1): 60-69.

Psacharopoulos, G and Tzannatos, Z. (1991). *Female Labour force Participation and Education*, in G Psacharopoulos (ed) *Essay on Poverty, Equity and Growth*, Oxford, Pergam Press for the World Bank.

Psacharopoulos, G. and Tzannatos, Z. (1992). *Case Studies on Women's Employment and Pay in Latin America*, World Bank: Washington D.C.

Quant, R. (1966). "Probablistic Theory on Consumer Behaviour", *Quarterly Journal of Economics*, 70: 507-36.

Reimers, C.W. (1983). "Labour Market Discrimination against Hispanic and Black Men", *Review of Economic and Statistics*, 65(4):570-9.

Riley, N.M. (1997). "Determinants of Trade Union Membership: A Review", *Labour*, 11 (2): 265-301.

Rosenzweig, M.R and Wolpin, K.I. (1980). "Life Cycle Labour Supply and Fertility Causal Inferences from Household Models", *Journal of Political Economy*, 88(2): 328-348.

Rospabe, S. (2001a). "An Empirical Evaluation of Gender Discrimination in Employment Occupation and Wage in South Africa in the late 1990s", Mimeographed University of Cape Town.

Rospabe, S. (2001b). "How did Labour Market Racial Discrimination Evolve After the end of Apartheid? An analysis of the Evolution of Hiring Occupational and Wage Discrimination in South Africa Between 1993 and 1999", Paper presented at the International Jubilee Conference of the Economic Society of South Africa, Johannesburg.

SALDRU (1991). *Directory of South African Trade Unions*, 5th edition, Cape Town: South Africa.

Samuelson, P-A. (1956). "Social Indifference Curves", *Quarterly Journal of Economics*, 70(1): 1-22.

Sapsford, D. and Tzannatos, Z. (1993). *The Economics of the Labour Market*. London: Macmillan.

Serumaga-Zake, P-A.E and Kotze, D. (2004). "Determinants of Labour Force Participation for Married Women in South Africa", *Journal for Studies in Economics and Econometrics*: 28(3):99-111.

Serumaga-Zake, P-A.E and Naude, W.A. (2003) "Determinants of Labour Force Participation in North West Province of South Africa", *Development Southern Africa*: 20(4): 505-514.

Schnabel, C. (2003). "Determinants of Trade Union Membership" in J.T. Addison and C Schnabel (eds.), *International Handbook of Trade Unions*. Cheltenham pp 13-43.

Schnabel, C and Wagner, J. (2005). "Determinants of Union Membership in 18 European Union Countries: Evidence from Micro Data 2002/03", IZA Discussion Paper, 1464.

Schultz T.W. (1960). "Capital Formation by Education", *Journal of Political Economy*, 68(6): 571-583.

Schultz, T.W. (1961). "Investment in Human Capital", *American Economic Review*, 51(5): 1-17.

Schultz, T.P. (1990). "Testing the Neoclassical Model of Family Labour Supply and Fertility", *Journal of Human Resources*, 25(Fall): 599-634.

Schultz, T.P and Mwabu, G. (1998a). "Labour Unions and the Distribution of Wages and Employment in South Africa", *Industrial and Labour Relations Review*, 51(4): 680-703.

Schultz, T. P and Mwabu, G. (1998b). "Wage Premia for Education Location by Gender and Race in South Africa", Economic Growth Centre Yale university, Discussion Paper, 785.

Siphambe, H.K and Thokweng-Bakwena, M. (2001). "The Wage Gap between Men and Women in Botswana's Formal Sector", *Journal of African Economies*, 10(2): 127-142.

Shere, G. (2000). "Intergroup Economic inequality in South Africa: The post Apartheid Era", American *Economic Review*, 90(2): 317-321.

Sloane, P. (1985). *Discrimination in the Labour Market*. In Carline D (ed), Labour Economics, Longman.

Smith, J.P. (1980). *Female Labour Supply*: Theory and Estimation. Princeton N.J: Princeton University Press.

Sprague, A. (1994). "Work Experience, Earnings and Participation: Evidence from the Women and Employment Survey", *Applied Economics*: 26: 659-667.

Standing, G. (1999). "Global Feminisation Through Flexible Labour: Theme Revisited", *World Development*, 27(3): 583-602.

Standing, G, Sender, J and Weeks, J. (1996). *Restructuring the Labour Market: The South African Challenge, An ILO Country Review*. Geneva, International Labour Office.

StataCorp. (2001). *Stata Statistical Software*: Release 7.0. College Station, TX: Stata Corporation

StataCorp. (2003). *Stata Statistical Software*: Release 8.0. College Station, TX: Stata Corporation.

StataCorp. (2005). *Stata Statistical Software*: Release 9.0. College Station, TX: Stata Corporation.

Stats SA (1996-2000). "October Household Survey 1995-1999", Statistical Release P0317, Pretoria: Statistics South Africa.

Stats SA (2001-2005). "Labour Force Survey 2000-2004", Statistical Release P0210, Pretoria: Statistics South Africa.

Tansel, A. (2001). "Economic Development and Female Labour force participation in Turkey: Time Series Evidence and Cross Province Estimates", Department of Economics, Middle East Technical University.

Thomas, D. (1990). "Intra household Resource Allocation: An inferential approach", *Journal of Human Resources*, 25: 635-64.

Treiman, D.J, Mckeever, M and Foder, E. (1996). "Racial Discrimination in Occupation Status and Income in South Africa 1980-1991", *Demography*, 33(1): 111-132.

Tshoaedi, M. (1999) "Functional Differentiation in Trade Union Employment: A Study of Gender Inequality with Specific Reference to Women Union Officials", M-A Thesis, University of Witswatersrand.

Tshoaedi, M and Hlela, H. (2006). "The Marginalisation of Women Unionists during South Africa's Transition', in Trade unions and Democracy: Cosatu Workers' Political Attitudes in South Africa", Buhlungu, S(ed). Cape Town, South Africa: Human Sciences Research Council, 2006.

Udry, C. (1995). "Gender, Agriculture Production and the Theory of the Household"; Department of Economics, North-Western University.

UNDP (2005). *Inequality and Human Development*, Chapter 2 in Human Development Report 2005 http://hdr.undp.org/reports/global/2005/pdf/HDR05_chapter_2.pdf.

Van der Berg, S. and Bhorat, H. (1999). "The Present as a Legacy of the Past: the Labour Market, Inequality and Poverty in South Africa", Cape Town: Development Policy Research Unit: 01/29.

Van der Westhuizen, C., Goga, S. and Oosthuizen, M. (2007) "Women in the South African Labour Market 1995-2005", Development Policy Research Unit working paper: 07/118

Vella, F. (1998). "Estimating Models with Selection Bias: A Survey", *Journal of Human Resources*: 33(1): 127-169.

Vermeulen, F. (2000). "Collective Household Models: Principles and Main Results", Centre for Economic Studies, Katholieke Universitet.

Weichselbaumer, D and Winter-Ebmer, R. (2003). "A Meta-Analysis of the International Gender wage gap", IZA Discussion Paper, 906.

Windolf, P and Haas, J. (1989). "Who joins the Union? Determinants of Trade Union Membership in West Germany 1976-1984", *European Sociological Review*: 5 (2): 147-165.

Wills, R.J. (1986). "Wage Determinants: A Survey and Reinterpretation of Human Capital Earnings Functions", in Ashenfelter and R. Layard, eds., *Handbook of Labour Economics*, Vol.1 (Elsevier Science).

Wilson, F and Ramphele, M. (1989). *Uprooting Poverty: The South African Challenge*. Cape Town: David Philip.

Winter, C. (1999). "Women Workers in South Africa: Participation, Pay and Prejudice in the Formal labour Market," World Bank Informal Discussion Paper series.

Wittenberg, M. (2002). "Job Search in South Africa: A Nonparametric Analysis", *The South African Journal of Economics*, 70(8): 1163-1197.

Wooldridge, J. (2002). *Econometric Analysis of Cross Section and Panel Data*. MIT Press.

Wooley, F (1988). "A Non–cooperative Model of family decision making", STICERD Discussion Paper No TIDI/125, London School of Economics.

Wong, R and Levine, R.E. (1992). "The Effect of Household Structure on Women's Economic activity and Fertility: Evidence from Recent Mothers in Urban Mexico" *Economic Development and Cultural Change*: 41(1): 89-102.

World Bank (1994). *Enhancing women's Participation in Economic Development*, World Bank, Washington D.C.

World Labour Report (1997-1998). Industrial Relations, Democracy and Social Stability. International Labour Office, Geneva, 1997.

World Bank (2001). "Engendering Development through Gender Equality in Rights Resources and Voice", World Bank policy research report, Washington, D.C: Oxford University Press.

World Bank and IMF (2005). "Synthesis 2005 Review of the PRS Approach: Balancing Accountabilities and Scaling up Results", http://siteresources.worldbank.org/INTPRS1/Resources/PRSPReview/Synthesis_2005_PRS_Review.pdf.

Yun, M. (2000). "Decomposition Analysis for a Binary Choice Model", IZA Discussion Paper: 145.

Yun, M. (2005). "A Simple Solution to the Identification Problem in Detailed Wage Decompositions," *Economic Inquiry*, 43(4): 766-772.

Appendix A

Table A.1: Number of African Women by Age and Education Level

Age	*15-19 years*	*20-24 years*	*25-34 years*	*35-44 years*	*45-54 years*	*55-65 years*
1995						
Elementary	31,048	24,938	55,912	72,456	62,941	54,189
Primary	382,935	176,549	419,282	421,011	311,153	230,778
Secondary	1,207,896	952,378	1,059,600	600,140	287,945	141,680
College	-	-	-	-	-	-
Diploma	2,973	42,272	161,850	78,881	21,413	14,458
Degree	-	9,806	33,093	23,376	6,548	2,810
Total	1,657,793	1,263,771	1,906,038	1,443,563	976,486	808,019
1999						
Elementary	16,282	9,961	52,419	58,016	50,360	56,366
Primary	624,999	275,757	634,753	638,316	404,215	321,942
Secondary	1,184,393	1,420,064	1,652,781	748,950	285,651	157,495
College	4,281	19,462	34,902	24,234	4,652	6,564
Diploma	4,073	42,996	154,803	81,785	21,475	8,664
Degree	1,012	12,665	57,156	34,968	15,346	4,354
Total	1,835,040	1,780,905	2,586,814	1,586,269	736,375	969,705
2004						
Elementary	10,958	10,697	25,756	45,953	50,708	51,409
Primary	461,643	218,046	503,098	587,497	546,157	397,348
Secondary	1,434,808	1,655,618	2,179,312	1,007,545	469,199	238,425
College	1,371	17,279	35,924	15,637	5,533	3,962
Diploma	847	50,526	198,672	114,649	47,075	18,160
Degree	-	4,819	56,141	53,144	28,576	6,565
Total	1,924,836	1,972,949	2,998,903	1,824,425	1,147,248	715,869

Source: Own Calculations: using OHS 1995 and 1999 and LFS 2004_2 (weighted statistics).

Appendix B

A. The Mincerian Model

Following Cahuc and Zylberberg (2004: 69-87), to illustrate the model proposed by Mincer the following variables need to be defined

let ρ be the discount rate

let $y(t)$ be the potential earnings after t years of education

let T be the total working lifetime (the cost of schooling must be recouped)

let ρ_x be the rate of return to training after leaving school

let the only cost of education be the forgone income $y(t)$

let $\dot{y}(t)$ be the incremental gain in income in every future date

let t be time in years

let x be the years of experience

let $s(t) \in [0,1]$ be time dedicated to further training by a person with τ years of experience who has already spent t years in school.

Consider the present value at date t of the incremental gain $\dot{y}(t)$ at rate ρ which is given by

$$\dot{y}(t)\int_{t}^{T} e^{-\rho(\tau-t)}d\tau = \dot{y}(t)\left[1-e^{-\rho(T-t)}\right]/\rho \qquad \text{(A.1)}$$

The internal rate of return to education (equalises the gain and the cost) is defined by the following equation

$$\frac{\dot{y}(t)}{y(t)} = \rho\frac{1}{1-e^{-\rho(T-t)}} \qquad \text{(A.2)}$$

If we assume that T is much greater than t the right hand of equation (A.2) will be approximately equal to ρ and income will satisfy the differential equation

$$\frac{\dot{y}(t)}{y(t)} = \rho \qquad \text{(A.3)}$$

Integrating equation (A.3) we get $\ln y(t) = \ln y(0) + \rho t$ (A.4)

Equation (A.4) gives us the basic schooling version (ρ is the rate of return to schooling). To incorporate experience, let the law of motion of human capital $h(t+\tau)$ for this person be described by the differential equation [109]

$$\dot{h}(t+\tau) = \rho_x s(t)\, h(t+\tau) \tag{A.5}$$

Integration of equation (A.5) between dates t = 0 and t = x gives

$$\dot{h}(t+x) = h(t)\, e^{\rho x \int_0^x s(\tau)\, d\tau} \tag{A.6}$$

Suppose that income $y(t+\tau)$ is equal to $A[1-s(\tau)]h(t+\tau)$, the income $y(t+x)$ of a person with x years of experience depends on his income upon leaving school y(t) and on his time devoted to further training according to the formula

$$y(t+x) = [1-s(x)]y(t)e^{s(\tau)d\tau} \tag{A.7}$$

In order to arrive at the explicit equation Mincer assumes $s(t) = s_0 - s_0(t/T)$ under this hypothesis the fraction of time devoted to the accumulation of human capital decreases in linear fashion with the amount of time passed since leaving school. We then have

$$\int_0^x s(t)\, d\tau = s_0 x - (s_0 / 2T)x^2 .$$

Taking logarithms of equation (A.7) and bearing in mind that income y(t) satisfies the law of motion (equation (A.4)), we arrive at the wage equation

$$\ln y(t+x) = \ln y(0) + \rho t + \rho_x s_0 x - \rho_x (s_0 / 2T)x^2 + \ln[1-s(x)] \tag{A.8}$$

Presupposing that the worker acquires a significant amount of supplementary knowledge on the job at the beginning of his/her career and that such supplements in knowledge tail off over time, implies that sx in equation (A.8) will be equal to 0 giving us

$$\ln y(t+x) = \ln y(0) + \rho t + \rho_x s_0 x - \rho_x (s_0 / 2T)x^2 \tag{A.9}$$

[109] adopted from the Ben Porath Model (1967)

Appendix B

DATA APPENDIX

A. Derivation of the Logged Real Gross Monthly Wage Series

The following steps were followed

- Obtaining a nominal wage series
- Converting nominal into real wages
- Dropping outliers
- Getting logs

It is reiterated that our data sources (OHS 1995, 1999 and LFS 2004) present gross nominal wage information in the form of either points or income bands. In turn, both categories are reflected in weekly, monthly or annual payment intervals. Consequently, we used an indirect method to obtain a real gross monthly wage series.

Firstly, in cases where the actual incomes were availed we obtained monthly wages through multiplying gross weekly wages by 4, dividing yearly wages by 12 and retained the gross monthly earnings.

Secondly, we assigned the midpoints of the income bands to those who only indicated their income bands and a monthly payment interval. However, the technique also involved multiplying the midpoint of the income band by 4, if the respondents reported their income bands and indicated that their payments were made on a weekly basis. In the case of individuals who were paid on an annual basis we divided the midpoint of their income band by 12 to obtain the monthly wage. All the same, individuals whose incomes fell within the open ended category were given an income value which is twice the lower bound of their income band. Thereafter, the conversion of their wage to a monthly payment proceeded as above depending on their payment interval. Above all, these steps led to the development of our nominal wage series[110].

Finally, the nominal wages were converted into real earnings deflated to the 1995 base, (expressed in 2000 prices) using the South African Reserve Bank's Consumer Price Index (CPI) series (KBP7031J). In particular, the following CPIs were used 72.41, 94,9 and 123,8 for 1995, 1999 and 2004 respectively. We also dropped some outliers i.e.

[110] Data sets for 1995 and 2004 are problematic. For instance, the one for 1995 does not categorise its income bands according to payment intervals, which leads to overestimation of wages for those who are paid on a daily or weekly basis. The 2004 data does not document payment intervals for those who reported income bands. Consequently, we have used the monthly income bands.

individuals who real monthly incomes were less than R20 and those who earned incomes greater than R 83 334 (see Burger and Yu, 2006). Finally, we obtained the logs of these real gross monthly incomes.

B. Definition of Education levels

The education levels derived and utilised in the study are none, elementary, primary, secondary, college, diploma and degree. The none category comprises of individuals without any education whereas, elementary includes individuals with grade R to grade 2; primary encompasses grades 3-7; secondary captures forms 1-5; college includes vocational/technical training; diploma includes individuals with diplomas and finally degree comprises of individuals with a bachelors degree and above.

C. Derivation of the urban dummy for 2004

The LFS for September 2004 does not provide information on rural/ urban areas. As a result, we created the variable by linking primary sampling units to an area type variable obtained from STATS SA[111]. The area type identifier is per primary sampling unit and it contains the following values: 1 (urban formal), 2 (rural formal), 3 (urban informal) and 4 (tribal area). On the basis of this information the urban dummy was created as a binary variable equal to 1 if area type equals to one or three and 0 otherwise.

[111] I thank Rulof Burger for supplying me with the data.

D. Variable Description

Variable	*Description*
Age	An individual's Age in completed years
Age -squared	The square of one's Age
Log wi	Log real monthly income (deflated to the 1995 base using CPIs for 2000)
Rural	Dummy variable=1 if one resides in a rural area, and 0 otherwise
Urban	Dummy variable=1 if one resides in an urban area, and 0 otherwise
Western Cape	Dummy variable=1 if one resides in Western Cape province, and 0 otherwise
Eastern Cape	Dummy variable=1 if one resides in Eastern Cape province, and 0 otherwise
Northern Cape	Dummy variable=1 if one resides in Northern Cape province, and 0 otherwise
Free State	Dummy variable=1 if one resides in Free State province, and 0 otherwise
KwaZulu/Natal	Dummy variable=1 if one resides in KwaZulu/Natal province, and 0 otherwise
North West	Dummy variable=1 if one resides in North West province, and 0 otherwise
Gauteng	Dummy variable=1 if one resides in Gauteng province, and 0 otherwise
Mpumalanga	Dummy variable=1 if one resides in Mpumalanga province, and 0 otherwise
Northern Province	Dummy variable=1 if one resides in Northern Province, and 0 otherwise
Co-habiting	Dummy variable=1 if one's marital status is Co-habiting, and 0 otherwise
Widow	Dummy variable=1 if one's marital status is a Widow, and 0 otherwise
Divorcee	Dummy variable=1 if one's marital status is a Divorcee, and 0 otherwise
Single	Dummy variable=1 if one's marital status is Single, and 0 otherwise
Married	Dummy variable=1 if one is Married, and 0 otherwise
Elementary	Dummy variable=1if one's highest level of education is Elementary, and 0 otherwise
Primary	Dummy variable=1 if one's highest level of education is Primary, and 0 otherwise
Secondary	Dummy variable=1 if one's highest level of education is Secondary, and 0 otherwise
Diploma	Dummy variable=1 if one's highest level of education is a Diploma, and 0 otherwise
Degree	Dummy variable=1 if one's highest level of education is Degree or higher, and 0 otherwise
Children<6	Dummy variable=1 if a household has children aged below 6 years, and 0 otherwise
Children<15	Dummy variable=1 if a household has children aged below 15 years, and 0 otherwise
Non-labour income	Dummy variable=1 if a member of the household receives social safety nets, and 0 otherwise
ln hours	Log of hours usually worked per week
Tunion	Dummy variable=1 if one is a trade union member, and 0 otherwise
Formal	Dummy variable=1 if one works in the formal or domestic sectors, and 0 otherwise
Manager	Dummy variable=1 if one's occupation is a Manager, and 0 otherwise
Professional	Dummy variable=1 if one is a Professional by occupational, and 0 otherwise
Technician	Dummy variable=1 if one's occupation is a Technician , and 0 otherwise
Clerk	Dummy variable=1 if one's occupation is a Clerk , and 0 otherwise
Skilled	Dummy variable=1 one's occupation is Skilled , and 0 otherwise
Agric worker	Dummy variable=1 one's occupation is Skilled agriculture worker , and 0 otherwise
Artisan	Dummy variable=1 one's occupation is an Artisan , and 0 otherwise
Operator	Dummy variable=1 if one's occupation is an Operator, and 0 otherwise
Elementary Jobs	Dummy variable=1 if one's occupation is Elementary/unskilled, and 0 otherwise
Agriculture	Dummy variable=1 if one works in the Agriculture industry, and 0 otherwise
Mining	Dummy variable=1 if one works in the Mining industry, and 0 otherwise
Electricity	Dummy variable=1 if one works in the Electricity industry, and 0 otherwise
Construction	Dummy variable=1 if one works in the Construction industry, and 0 otherwise
Trade	Dummy variable=1 if one works in the Trade industry, and 0 otherwise
Transport	Dummy variable=1 if one works in the Transport industry, and 0 otherwise
Finance	Dummy variable=1 if one works in the Finance industry, and 0 otherwise
Social Service	Dummy variable=1 if one works in private households, foreign and social Services, and 0 otherwise
Manufacturing	Dummy variable=1 if one works in the Manufacturing industry, and 0 otherwise
African	Dummy variable=1 if one's population group is African , and 0 otherwise
Coloured	Dummy variable=1 if one's population group is Coloured , and 0 otherwise
Indian	Dummy variable=1 one's population group is Indian , and 0 otherwise
White	Dummy variable=1 one's population group is White , and 0 otherwise
Household size	The number of people living in a given household
Other_un	Other union members in the household
Propf	The proportion of household members who are females
Other_fem	Other women aged 15 years and above in the household