THE EFFECTS OF EDUCATION ON EMPLOYMENT FROM A GENDER PERSPECTIVE, FACTORING IN SPATIAL EFFECTS

by

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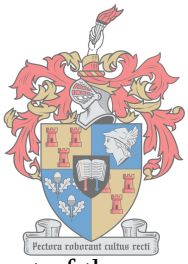

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ABSTRACT

Since the new democracy, government has put in place various policy directives promoting equal opportunities for males and females in the country. However, while improvements in educational attainment have been experienced (particularly for females), gender inequalities in the South African labour market remain large. The present study analyses the relationship between levels of education and employment using data from three censuses (1996, 2001 and 2011) to determine whether the potential for gaining employment and the type of job attained is equivalent for males and females between the ages of 15 and 64, within the period 1996 to 2011. The study is undertaken from a gender perspective in order to ascertain differences in female and male outcomes. Spatial effects are factored in to explain geographical variances in employment and occupation. The results showed an imbalance between male and female labour market participation. Although there was a higher proportion of females in the population of working age, females did not participate in the labour market to the same extent as males. On one hand, they were over represented among the unemployed, on the other hand those that were employed mainly worked in the lower echelons of the occupational structure. In contrast, males dominated in employment, suggesting greater employment access for males than for females. While education was the strongest predictor both for improved male and female employment, this was more relevant for females. However, among females, addition demographic and socio-economic factors further impacted employment and occupation outcomes. Spatial effects also played a role in determining access to employment. The highest percentages of employment and skilled occupations were found in districts and metros belonging to the economic hubs of the country i.e., Gauteng, the Western Cape and Kwa-Zulu Natal. However, while more males recorded the highest percentages than females in most areas, the largest gender differences (in favour of males) were shown to be prominent in areas with the highest concentration of lower levels of educational attainment, further suggesting the importance of education in reducing gender inequities in employment. The clustering of specific industrial sectors in various districts and metros also impacted the extent to which levels of employment for males and females were distributed within different geographical areas, leading to gender employment inequalities in those areas.

Keywords and phrases: Education, Employment, Gender Inequalities, Graduate, Industry, Labour Market, Occupations, Sex Ratio

OPSOMMING

Sedert die nuwe demokrasie het die regering verskeie beleidsriglyne, waarvolgens gelyke geleenthede vir mans en vroue in die land aangemoedig is, neergelê. Alhoewel verbetering in geskooldheid (veral vir vroue) plaasgevind het, het geslagongelykhede in die Suid-Afrikaanse arbeidsmark groot gebly. Die huidige studie analiseer die verwantskap tussen die vlakke van geskooldheid (onderwys) en indiensneming deur gebruik te maak van data van drie sensusses (1996, 2001 en 2011) om vas te stel of die potensiaal van indiensneming en die soort werk wat verkry is ekwivalent vir mans en vroue tussen die ouderdomme 15 en 64, tussen 1996 en 2011 was. Die studie is vanuit ‘n geslagsoogpunt gedoen sodat die verskille in uitkomste tussen vroue en mans vasgestel kan word. Ruimtelike beïnvloedings (effekte) is ingefaktoreer om as verduideliking van die geografiese veranderlikes in indiensneming en beroep te dien. Die resultate dui ‘n wanbalans tussen mans en vroue se deelname in die arbeidsmark aan. Alhoewel daar ‘n hoër proporsie van vroue in die werkende bevolkingspopulasie is, het vroue nie in die arbeidsmark tot dieselfde mate as mans deelgeneem nie. Vroue aan die eenkant was oorverteenwoordigend van die werkloses en, aan die anderkant, was diegene wat werkloos was hoofsaaklik in die laer geskoolde strukture werksaam gewees. In teenstelling hiermee, was mans se indiensneming dominant gewees wat groter toegang tot indiensneming as vroue in die vooruitsig gestel het. Terwyl geskooldheid die sterkste aanduider vir verbetering van beide mans en vroue indiensneming was, was dit meer van toepassing op vroue. Onder vroue het addisionele demografiese en sosio-ekonomiese faktore egter ‘n verdere uitwerking op indiensneming en addisionele uitkomste gehad. Ruimtelike effekte het ook ‘n rol gespeel in die vasstelling van toegang tot indiensneming. Die hoogste persentasies van indiensneming en geskoolde beroepe is in distrikte en metros, wat behoort het aan die ekonomiese kern van die land, gevind. Dit is Gauteng, die Wes-Kaap en Kwazulu-Natal. Terwyl meer mans as vroue egter op ‘n persentasie basis in die meeste van die gebiede was, het die grootste geslagsverskille (in die guns van mans) prominent voorgekom in gebiede met die hoogste konsentrasie van laer vlakke van geskooldheid, wat ‘n verdere aanduiding is van die belangrikheid van onderwys om geslagsongelykhede in indiensneming te verminder. Die samevoeging van spesifieke industriële sektore in verskeie distrikte en metros het ook ‘n invloed op die vlakke van indiensneming vir mans en vroue uitgeoefen wat oor verskillende geografiese gebiede versprei was, wat tot geslagsongelyke indiensneming in daardie gebiede gelei het.

Trefwoorde en frases: Geskooldheid, Indiensneming, Geslagongelykhede, gegradueerde, Nywerhede, Arbeidsmark, Beroepe, Seks verhouding

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ABBREVIATIONS AND ACRONYMS

Statistics South Africa (StatsSA)

Department of Higher Education (DoHE)

National Planning Commission (NPC)

National Development Plan (NDP)

Gender Parity Ratio (GPR)

Science, Technology, Engineering, Mathematics (STEM)

Business, Finance, Communication (BFC)

CHAPTER 1: INTRODUCTION

Since the new democracy, the South African government has put in place various policy directives promoting equal opportunities for males and females in the country. Some of these policy measures include the Constitution of South Africa (1996), the Promotion of Equality and Prevention of Unfair Discrimination Act (2000) and the Employment Equity Act (1998). However, despite the existence of these comprehensive legislative frameworks, challenges in achieving gender equality persist. Data published by stats SA show that, although females have progressively become more educated than their male counterparts for more than a decade, labour absorption rates (employment rates) amongst females continue to be lower than males (StatsSA, 2015). Females are also more likely to hold jobs with lower level occupational status compared to their male counterparts (StatsSA, 2015).

The present study analyses the relationship between levels of education and employment using data from three censuses (1996, 2001 and 2011) to determine whether the potential for gaining employment and the type of job attained is equivalent for males and females between the ages of 15 and 64 (official economically active ages), between 1996 and 2011. The study is undertaken from a gender perspective because the nature of gender inequalities in South Africa with respect to education and employment has evolved over recent decades. The study also analyses demographic and socio-economic factors to explain any variances observed.

This study will also seek to explain spatial variances in employment and occupation by examining the distribution and concentration of employment opportunities within the country. It is necessary to introduce spatial effects because the various types of occupations are not equally distributed in all regions of the country. The vast majority of jobs, especially those requiring higher levels of education, are mainly situated in cities, whereas agricultural jobs are found in rural areas. In practice, this means that poorly located persons may remain unemployed or underemployed unless they are able to relocate. This is particularly true for females. Spatial effects will therefore be introduced for further analysis in this regard.

The study's research problems are stated as follows:

- Have males and females in South Africa with equivalent levels of education enjoyed equitable access to employment opportunities and are there any differences in the different types of occupations in which they have been employed during the period 1996 to 2011?
- Can any discrepancies between male and female employment and occupational opportunities be explained by household-related constraints such as child-care responsibilities, flexibility in relocation choices, historical discrimination practises, household income or age?
- Are access to employment and appropriate occupations limited by geographic locations of places of residence and locations of industry?

The present study will show that variances in household attributes result in males and females with equivalent levels of educational attainment not achieving equitable access to employment and occupation opportunities. These factors include household size, age at first birth and the presence of minor children in the household. The age at which a woman gives birth to her first child could delay when she starts to work and consequently the level of occupational status that she achieves over time. The impact of the number of minor children in the household relates to expectations of child-care responsibilities and could influence the extent to which women can progress in their careers.

Variances in employment opportunities are also affected by factors such as marital status, population group and household income. Wit][
h respect to marital status, single females could be freer to make career-related decisions such the relocation of place of residence than their attached counterparts. Racial attributes are also compared as historical discrimination against certain races in the labour market in South Africa could also delay the progression of careers irrespective of educational qualifications obtained. On the other hand, the adequacy of household income could determine alternative choices for a variety of factors such as opportunities for obtaining further education or child care choices which could affect females' overall participation in the labour force i.e., choices in looking for or accepting job opportunities.

Finally, the study examines spatial variances in terms of the impact of household migration for work purposes and the diversity of industries where people are employed as a proxy for the distribution and concentration of different types of employment regionally. Additional variables that could further explain any variances found between access to employment of males and females may be exposed during the course of the study.

CHAPTER 2: LITERATURE REVIEW

Chapter two provides a comprehensive review of the literature pertaining to the research topic. This literature review begins with providing the rationale for the study. In this respect, the South African economic situation and the legislative and policy frameworks for employment growth will be discussed. Having provided a context to the study, the literature review focuses on exploring the role of education and its influence on employment. In addition, the literature reviews factors in demographic, social and economic elements which may influence education and access to employment. This is particularly critical in assessing gender and geographical impacts which are crucial aspects for influencing targeted policy intervention strategies.

2.1 MOTIVATION FOR THE STUDY

Why focus on education? According to the National Development Plan, the South African Government has committed itself to halving poverty and unemployment (joblessness) by 2030 (NPC, 2011). This commitment came about as a result of concerns about the increasing proportion of the South African population living below the poverty line, that is, under $2 a day (World Bank, 2009) and the increasing numbers of unemployed families. In order for this target to be realised, there is therefore a need for the country to adopt innovative measures that re-evaluate strategies leading to economic growth and job opportunities.

The present study works on the premise that investment in human capital is the primary key for employment growth. Investment in human capital in this study focuses on education. Locally, the issues of poverty, unemployment and high-levels of inequalities have also been found to be linked to education. Studies show that levels of unemployment were highest among persons with less than matric, while serious concerns regarding issues such as the unemployed graduate, as well as labour market demands and skills mismatch have also been raised (Klasen, 1997; StatsSA, 2016). Literature emphasises at least three areas through which education could be related to employment growth. The first theoretical perspective is linked to education and the labour force i.e., education increases the human capital for the labour force, which in turn increases labour productivity leading to higher levels of output (Mankiw, Romer, & Weil, 1992). The second area is linked to processes of innovative capacity. According to theorists, Romer (1990) and Aghion and Howitt (1998), education rises the innovative capacity within an economy. Newly attained knowledge on new products, technologies, as well as the accompanying processes, has been found to stimulate growth. Lastly, education has also been found to facilitate the flow of knowledge. This diffusion is needed to comprehend and process new information. It is critical to creating innovation and is critical for the successful implementation of new technologies devised by other members of society (Todaro, 1997).

The issue of education and its effect on providing access to employment in South Africa is therefore of paramount importance. However, the relationship between education and labour market outcomes is complex and influenced by diverse factors.

2.2 EDUCATION AND THE LABOUR MARKET

Education is often regarded as one of the most important instruments countries have in order to mitigate against levels of poverty. This is due to the fact that education has been found to increase access to employment and better paying jobs (Margolis & Simonnet, 2003; Goldberg & Smith, 2007; Stiglitz, Sen & Fitoussi, 2009; Edgerton, Roberts, & von Below, 2012). Moreover, education in the labour market does not only provide access to employment but more importantly, it also affords individuals productive capacities to employers. The type of an educational qualification attained in this respect, also becomes an important advantageous tool when workers compete for jobs in the labour market (Tomlinson, 2008).

Literature points to various ways in which the relationship between education and employment manifest. The discussion below covers some of the main arguments by looking into two key areas found to be central in the research debate regarding education and employment. These are:

- Processes by which education affects employment outcomes
- Employment effects impacted by education

2.2.1 Factors affecting education and consequently employment outcomes

There are many different, critical and diverse channels through which education affect people's employment in the labour market. These include:

- The number of productive years individuals spent at school, their levels of education achieved and the types of qualifications obtained;
- Household compositional factors such as household size, minor children in the household and parents' educational attainments; and
- Lastly, demographic effects.

2.2.1.1 Number of years spent at school

Literature, focusing on the influence of the number of years spent at school with respect to employment outcomes is largely anchored around research conducted by Becker (1985) and Mincer (1974). These researchers determined that annual earnings were positively related to an individual's years of schooling. More recently, work conducted by Goldberg and Smith (2007) strengthened this positive correlation by further controlling for individuals' experiences.

2.2.1.2 Levels of education achieved

A study using multivariate logistic regression models in a South African population showed that between the years, 2006-2010, the odds of both males and females participating in the labour force increased positively with levels of education (Mabela & Fanoe, 2016). Participation was particularly highest for those with a tertiary level education. Moreover, while controlling for different social-economic effects, research conducted by Pascarella & Terenzini (2005) further indicated that the level of educational obtained has a critical effect on employment and status in occupation. This study suggested that the higher the level of education (e.g. tertiary education) the higher the substantial advantage of obtaining employment compared to a high school qualification. On the other hand, a high school level of education provided better employment opportunities over those who have not completed high school (Pascarella & Terenzini, 2005).

2.2.1.3 Types of qualification obtained

An additional factor which is inadequately investigated – particularly in South Africa - is the influence of the type of qualification obtained on employment outcomes. Research conducted by Cosser, (2011), Kraak (2010) as well as Rogan and Reynolds (2016) show that the attainments of specific educational qualifications are significant to employers and the demands of the labour market. In terms of the labour market, a report conducted on behalf of the South African Department of Higher Education (DoHE) shows that as of 2014/15, the country was producing inappropriate skills and qualifications (at both levels of education, i.e., basic and higher education) required to facilitate not only inclusive employment but also the supply and potential supply of skills needed in the labour market. This included human capital required with respect to vocational occupations (Rogan, 2016).

2.2.1.4 Household composition

The compositions of household structures have also been found to impact educational attainment and employment outcomes (Glick, & Sahn, 2000; Margolis & Simonnet, 2003; Tansel, 2004; Mabela & Fanoe, 2016). For example, research alludes to the dual role of women as employees and as primary givers for families and children as a potential obstacle (Turk, 2015). Evidence shows that during the years 2006 to 2010, women with no or fewer minor children as well as those living in smaller households were more likely to be employed (Mabela & Fanoe, 2016). Increased levels of employment, on the other hand, have a positive impact on household income. A study conducted by researchers, Glick and Sahn, (2000) revealed that increases in household incomes have a positive impact on children's level of schooling. Literature also shows that higher levels of parental education are positively linked to childrens' educational attainments. This was particularly true of the impact of a mother's level of education on a girl child's schooling (Glick, & Sahn, 2000).

2.2.1.5 Demographic effects

Various demographic factors have been found to be significant determinants of both education and employment. For example, the effects of past discriminatory educational and labour policy laws, which left particularly the black African and coloured population groups most disadvantaged, are revealed in that in South Africa, higher employment rates and levels of educational attainment have consistently been reported amongst the white and Indian/Asian races (StatsSA, 2016). In ascertaining variations in education and employment, it therefore becomes critical to ascertain implications for various population groups because of the historical connotation, where racial identification determined available opportunities in both education and in the labour market. With respect to age, research indicates an unvarying positive relationship between education and age, as well as employment and age with higher proportions reported among older persons (Mabela & Fanoe, 2016).

2.2.2 Employment effects impacted by education

Research on employment effects that are impacted by education, focus on factors such as employment and unemployment, earnings, worker productivity and nature of occupation (i.e., type of work obtained) (Gangl, 2000; Goldberg & Smith, 2007; Edgerton et al., 2012, StatsSA, 2016). These factors are explored in greater detail below.

2.2.2.1 Employment and unemployment

Individuals with lower levels of education have typically lower levels of employment and employment rates increase with increasing levels of educational attainment (Gangl, 2000, StatsSA, 2016). Moreover, individuals with higher qualifications are less likely to be impacted by economical fluctuations (up and downturns) as revealed in research conducted by Bowles, Gintis and Osborne (2001). On the other hand, workers with lower levels of education are especially vulnerable to job losses and unemployment during economic recessions (Gangl, 2000).

2.2.2.2 Earnings

Literature, mostly under the discipline of economics, examining the effects of education on earnings, reveals that this relationship is influenced by many other factors (Card, 2001). These include that amongst other factors, personality characteristics of an individual, a person's intellectual ability in completing set tasks, as well as academic achievement (i.e., level of educational attainment) (Card, 2001). However, when controlling for all other characteristics, as listed above, education was found to be a strong predictor of earnings (Edgerton et al., 2012).

2.2.2.3 Worker productivity

The term 'worker productivity' refers to the amount of output produced per work hour (Ramirez & Nembhard, 2004). When focusing at an individual level, increased levels of education have been found to increase peoples' worker productivity, thereby ensuring better jobs and improved earnings (Edgerton et al., 2012).

2.2.2.4 Nature of occupation

How does education affect the nature of occupation? Literature based on work conducted by Edgerton et al. (2012) regarding the effect of education on people's behaviour shows that those with higher levels of educational attainment will be more prone to the types of work that result in higher levels of both extrinsic and intrinsic rewards. For example, people with high educational achievements were found to be less prone to have jobs that require repetitive labouring and more likely to be engaged in the types of jobs that allow for greater independence, creativity and greater opportunities for increased learning and personal growth (Sanchez, Shen, & Peng, 2004; Edgerton et al., 2012). Moreover, a regression model predicting occupational choice based on education attainments (and other factors) conducted by Aggarwal and colleagues (2010) further indicated that for all the years of reporting, higher levels of educational attainment increased the likelihood that persons included in the study entered professional jobs (non-manual work), while the likelihood that they will enter manual work declined.

The literature reviewed in the section above was conducted so as to provide context on the relationship between education and employment. The next set of research reviewed focuses on the impact of gender in education and employment outcomes

2.3 GENDER DIFFERENCES IN EDUCATIONAL AND EMPLOYMENT OUTCOMES

The matter of gender and inequalities in South Africa with respect to education and employment has evolved over recent decades. This has been found to be true irrespective of the various policy directives promoting equal opportunities for males and females in the country. Some of these policy measures include the Constitution of South Africa (1996), the Promotion of Equality and Prevention of Unfair Discrimination Act (2000) as well as the Employment Equity Act (1998). However, despite the existence of these comprehensive legislative frameworks, challenges in achieving gender inequalities equality with regard to education and employment persist.

A critical focus of this study is thus to look at the role of gender on employment outcomes given educational attainments. The number of employed males has consistently been higher than that of females. In 2009, only 5,9 million women aged 15-64 years were working, compared to 7,3 million men. This reflects in part, a lower participation rate of females, that is, the lower percentage of females actively participating in the labour market. This was true irrespective of levels of educational attainment. Furthermore, those that are employed are similarly more likely to earn less than their male counterparts (StatsSA, 2015). Variations in gender employment outcomes brought about by educational effects can in part be linked to pathways created from basic and secondary education transitioning to tertiary education and ultimately impacting on employment. In this respect, research conducted by Lamb and McKenzie (2001), focusing on males and females who had graduated with diplomas and university degrees, showed that the highest qualified male graduates who worked and studied part-time recorded the highest weekly earnings. This was followed by males who moved directly from secondary education into tertiary education and then into working full-time. In contrast, earnings were differently related to female education work pathways. For example, females were more likely to earn better incomes when they first obtained their academic qualifications (studying full-time first) and then joining the labour market. This was true regardless of the amount of time spent before finding work. Those who combined part-time studying with working earned less than those who obtained their qualifications before seeking employment. Of importance to note however, is that, Lamb and McKenzie (2001) also found that, irrespective of observed pathways, female workers earned considerably lower remuneration than their male counterparts. The observed male-female variations in earnings were found to be partly attributed to differences in the type of jobs occupied by the two sexes (Lamb & McKenzie, 2001). Furthermore, data also shows that and in spite of wage differentials in earnings for females, educational returns to employment are higher for females compared to males (Tansel, 2004).

Literature discussed under this section provided empirical support for the notion that gender gaps in education are likely to impact employment outcomes. However, further evidence is required to explore the relationship in more detail. For example, there is a need for reliable in-depth research and data which will allow researchers to determine gender based variations in employment rates regardless of differences observed in male-female educational attainment. This study therefore aims to add to existing literature on the topic in this respect. It does so by critically exploring the relationship between education and employment outcomes through a gender lens.

2.4 SPATIAL ATTRIBUTES

The clustering of economic activities is a common feature evident across all sectors in both developed and developing countries (Coe, 2013). Economic activities have also been found to be influenced by gender. For example, the construction industry has traditionally employed a higher percentage of males, while females have been largely concentrated within the education and health sectors, making gender a key variable in the analysis of job markets (Coe, 2013). In this section, spatial effects (geography) as a function of concentrated employment within the country's labour market are assessed. While the composition of the South Africa labour force has in many ways changed in recent years, the literature review conducted in this section shows how both spatial and labour market characteristics have a bearing on the concentration of employment and how such spatial arrangements impact employment outcomes.

2.4.1 Employment, Job access and the location of economic activities

Literature shows that the location of economic activities is influenced by both aspatial and spatial characteristics (Rodrigue, Comtois, & Slack, 2016). Spatial effects have been found to be especially critical with regard to sectors such as the industrial sector where employment depends heavily on access to the availability of land and access to customers (i.e., households and organisations), as revealed by a study by Wilson & Rees (1974). In terms of aspatial factors, these relate to characteristics such as the demographic and social profile of the labour force within a residential area such as, the availability of required skills (i.e. education), gender and age (Sanchez, Shen, & Peng, 2004). One of the ways in which the availability of labour can be determined is in terms of the distance to the central point of workers' residences, i.e., how proximate is the labour to the employment area (Sanchez, et al., 2004; Rodrigue, Comtois, & Slack, 2016). In this respect, job access becomes crucial.

If access to suitable work opportunities is available locally and within reasonable travelling distance then a spatial match between supply and demand is achieved. Founded by Kain (1968), spatial discrepancy theory relates to geographical obstacles to employment. At the core of this theory is that limited geographical access to jobs lowers employment opportunities. Factors leading to unemployment or underemployment with respect to the spatial discrepancy theory include a mixture of individual restrictions combined with a broader context of poor job access. Research conducted in the United Kingdom by Fielding and Taeuber (1992) and by Fielding and Halford (1993) showed that levels of migration (national figures) toward the southeast (which was considered rich in employment) generated positive labour-market outcomes. However, at a regional level it was more critical to distinguish between social group differences. For example, according to a book written by Hanson and Pratt (1995) *titled "Gender, Work, and Space"* , persons searching for work that is close to their residences (a group largely consisting of women), the location from which searching for work starts becomes crucial in defining access to different kinds of jobs.

Job accessibility is also influenced by the spatial flexibility of workers and job seekers (Phelps, 1970). A study by Phelps in the 70's depicted the economy as a group of separate local labour markets within which movement between is costly. The cost of covering the distance between islands inhibits workers from accepting jobs located on other islands (Phelps, 1970). Researcher, Hagerstrand (1970) further postulated that, in addition to costs related to money, time costs are equally critical on spatial flexibility. From a specified and predetermined residential location, commuting to work and from work becomes probable when the journey occurs within a person's daily activity space. Therefore, job accessibility is

only attained when the job area can be reached on a daily basis within an acceptable commuting time (Van Ommeren, Rietveld & Nijkamp, 1999).

2.4.2 Spatial effects, employment and gender

Studies reviewed above have shown that there are two main findings relating to the effect of job access (spatial) on employment outcomes. Firstly, access to places of employment increase the likelihood that one could find a job. It is therefore postulated that persons residing in locations with good access to places of employment are more likely to be employed. Research points to women as having a low spatially flexibility compared to men. It is therefore further opined that for females, job access has a stronger effect on employment outcomes. A second area, common in literature on spatial effects on employment outcomes was based on the spatial disparity hypothesis. Spatial disparities (amongst other factors) were found to induce workplace and job seeking mobility in response to poor access to local (and suitable) jobs. It is therefore suggested that individuals residing in locations with poor job access, who are unable to obtain suitable jobs will therefore need to have greater spatially flexibility which will enable them to accept jobs at a greater distance. In this respect, the issue of gender with respect to household responsibilities, marital status (e.g. having a partner will limit mobility among women), and child care responsibilities will result in male-female job access variability.

Studies also show that women have smaller space ranges and therefore their places of work tend to be closer to home locations. Moreover, their commuting patterns also tend to be shorter due to home-related and childcare responsibilities (Gilbert, 1997; Antipova & Wang, 2011). This was found to be particularly true for lower class and middle class women (Hanson & Pratt, 1995). In contrast, males have generally been found to have better employment opportunities as they largely have lesser childcare responsibilities compared to females (Sanchez et al., 2004).

CHAPTER 3: METHODOLOGY

The data was used to analyse and to assess the gender relationship between levels of education and employment to determine whether the potential for gaining employment and the types of job attained was equivalent for males and females. Analyses are conducted over a fifteen year period, focusing on the years; 1996, 2001 and 2011. The study was also undertaken to ascertain geographical male and female variations with regard to access to employment and occupations.

Firstly, the study analyses whether males and females in South Africa with equivalent levels of education enjoy equitable access to employment and types of occupations during the period 1996 to 2011. Contingency tables were used to determine the association between education and employment taking into account gender, educational attainments, qualifications in educational attainment, employment status, and types of occupations (i.e., type of employment) to identify differences in employment attainments between males and females. Secondly, the study determines whether any discrepancies observed between male and female employment and occupational opportunities could be attributed to a selection of demographic and socio-economic intervening variables. Factors such as age, household-related constraints, including child-care responsibilities, marital status and household income; flexibility in relocation choices, migration and race, were taken into account.

Significant intervening variables found in the previous analyses were then modelled, together with educational attainment, as independent variables in a multivariate binomial logistic regression model in order to determine relative risks (odds values) to test for the best predictors of employment, represented as a binomial variable. A multivariate, multinomial logistic regression model was used to test for predictors of the type of employment obtained using occupational status as the dependent variable. Type of employment was recoded into three categories: high skilled (made up mangers, professionals and technicians), medium/semi-skilled (comprises clerks, sales and services, skilled agriculture, crafts and related trade, plant and machine operators) and low skilled occupations which consisted of elementary and domestic workers (StatsSA, 2015). Gender variations were accounted for by conducting separate binomial and multinomial models for males and females.

Lastly, ArcGIS analysis tool was used to determine the spatial distribution of employment and types of employment at district level by determining where spatial clustering with regard to employment, occupation and industrial sectors occur.

The study investigates the relationship between education and employment in cohorts of persons in the working age population. Measuring educational effects for males and females respectively involved splitting the working age cohort group further into two groups, i.e. males and females. The purpose of cohort analysis is to ascertain cohort effects in the incidences of a phenomenon. The most crucial benefit of conducting longitudinal studies utilising cohorts, is that different members of the same cohort can be studied at each point in time.

Weighted secondary data from StatsSA's Censuses 10% samples, collected during the years 1996, 2001 and 2011 were used for the analyses. The person and household files were combined so as to link personal attributes with demographic variables. The 10% Census data

are well suited for such an investigation for the following reasons. Firstly, the 10% sample is sufficient for the lowest level of data analysis considered for the present study i.e., district level. Unit Census record data is more useful for analyses taking into account ward level data. Secondly, the sample is large enough for the analysis of the study population i.e., the working age population. Within each study, i.e., 1996, 2001 and 2011, , a cohort group of the working age population of approximately between 3 and 4 million persons respectively, was followed. Lastly, the data contain detailed information on the demographic and social characteristics of individuals, as well as their economic information (labour market status).

The data are specifically stratified according to province and district council. Within each district, records are additionally implicitly stratified by the type of local authority. Weights have been calculated in the datasets to weight up the data to the entire population using the variables, age, population group and sex, stratified by province and district level (StatsSA 1996). STATA 11 statistical package was used to conduct all quantitative data analyses, while ArcGIS was used for spatial analyses.

CHAPTER 4: RESULTS

The first part of the analysis provides context to the study by assessing trends in employment, while the second part focuses on education and its relationship to employment. In both parts descriptive statistical analyses are used to test for the mitigating effects of demographic and socio-economic variables on employment and education for the period, 1996 to 2011. Logistic regression analyses (binomial and multinomial) were also used at the multivariate level to determine the best predictors of employment and occupation. Spatial effects with respect to job availability and the potential of obtaining work in different regions in the country forms the last part of data analysis. The study is undertaken from a gender perspective; therefore, comparative analyses are conducted to ascertain differences between males and females of working age (i.e., aged 15 to 64 years). Employment status in this study is determined using the Stats SA's official definition i.e. (Stats SA, 2015).

4.1 EMPLOYMENT

This section provides context to the study by analysing employment and sex differentials. Data analyses examine female participation in the labour force as compared to that of males. In order to find whether females enjoy equality in the work place, analyses focus on the gender composition of the work force first. Comparisons between the participation and employment rates of females and males were then conducted. Employment rates were examined over the period 1996 to 2011 so as to discover whether any changes occurred over that period.

4.1.1 Male and Female participation in the labour market

Table 4.1.1 shows the composition of the working age population (15 to 64 age group) by labour market status and sex for 1996, 2001 and 2011. Sex ratios are added to show male/female disparities. A sex ratio is the ratio of males to females in the population (normalized to 100). A score of less than a hundred indicates a higher female population.

Table 4.1.1: Job status by sex – sex ratios, 1996-2011

Job Status	2011			2001			1996		
	Male	Female	Sex ratio	Male	Female	Sex ratio	Male	Female	Sex ratio
Employed	55,9	44,1	126,8	58,1	41,9	138,7	58,4	41,6	140,4
Unemployed	45,4	54,6	83,2	45,8	54,2	84,5	43,1	56,9	75,7
NEA	42,5	57,5	73,9	40,2	59,8	67,2	37,4	62,6	59,7
Total	**48,3**	**51,7**	**93,4**	**47,6**	**52,4**	**90,8**	**46,3**	**53,7**	**86,2**

Source: Census, 2011, 2001, 1996

The sex ratios reflected in the totals show a higher proportion of females in the population of working age, e.g. 93,4 in 2011 and 86,2 in 1996. This creates the expectation of a higher female representation in each of the three job statuses. However, females were over represented amongst the unemployed and economically inactive populations resulting in higher gender gaps in respect of the employed. Although, this was valid for all three years of reporting, a declining trend in the sex gap of the employed was observed between 1996 and 2011. However, although improvements were noted, there was a continuing imbalance between the job-statuses of males and females.

The job statuses of males and females have changed between 1996 and 2011. The data shows that only half of the total number of females of working age had been actively participating in the labour market over this period. Conversely, just more than half of the

females who were participating in 1996 and 2001 were actually employed. This situation improved by 2011 where 1,9 females were employed for every female that was unemployed.

4.1.2 Access to employment and demographic and socio-economic effects

The following table shows the distribution of employed males and females by various demographic and socio-economic variables. The percentages reflect the employed as compared to the unemployed among those of working age who are participating in the labour market.

Table 4.1.2: Employed by demographic characteristics, 1996-2011

Variable	2011		2001		1996	
	Male	Female	Male	Female	Male	Female
Age						
15-24yrs	52,4	42,1	41,6	30,7	52,8	39,3
25-34yrs	74,5	62,8	63,6	48	71,4	54,7
35-44yrs	81,3	72,7	72,1	61,7	77,9	66
45-54yrs	83,4	78,6	73,6	67,3	79,6	70,9
55-64yrs	86,0	83,7	75,1	72,5	79,7	72,2
Population group						
Black African	69,3	58,7	56,6	42,4	63,6	47,3
Coloured	79,0	76,1	74,2	71,6	81,8	75,9
Indian/Asian	90,2	85,8	84,4	81,9	88,8	86,0
While	95,1	93,1	93,9	93,5	95,8	95,0
Marital status						
Married/cohabiting	86,3	71,1	79,1	58,3	84,2	62,5
Never married	60,3	57,2	44,9	42,3	54,6	48,8
Lost a spouse	79,4	80,2	65,6	68,3	74,5	74,3
No of minor children						
No minor	76,1	74,0	66,1	62,0	73,6	67,6
At least one minor	72,7	59,8	62,8	45,6	71,7	53,3
2 or more minors	67,9	50,9	57,3	35,8	65,2	41,4

Source: Census, 2011, 2001, 1996

The percentages of employed persons, both male and female, increased by age, but the percentages of employed males were consistently higher than that of females for each age group. These differences had, however, decreased between 1996 and 2011 in respect of each age group. The largest difference in employment percentages was observed for those within the 25-34 age group. Males also showed a higher percentage of employment than females for all population groups in each year of reporting. The differences between coloured, Indian/Asians and white population groups were minuscule, but the differences between black African males and females remained significant between 1996 and 2011. This difference had, however decreased from a gap of 16,3 percentage points in 1996, where 63,6% of males and 47,3% of females were employed, to a difference of 10,6 percentage points in 2011 where 69,3% of males and 58,7% of females were employed. In contrast, the gaps between male and female employment in the Indian/Asian and white populations had, however, increased since 1996, 2,8 to 4,4 percentage points for Asian/Indians and 2 percentage points for whites.

Table 4.1.3: Percentage employment by age and population groups

	Black		Coloured		Indian/Asian		White	
Age Groups	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
1996								
15-24yrs	40,6	24,4	69,0	58,8	77,6	73,8	90,4	90,5
25-34yrs	63,8	44,1	84,7	78,3	91,6	88,8	96,6	95,6
35-44yrs	71,4	57,3	86,3	84,1	92,1	91,6	96,9	96,0
45-54yrs	72,1	61,6	86,2	86,5	90,5	92,7	96,8	96,1
55-64yrs	71,9	63,6	86,6	87,3	90,6	88,5	96,4	96,5
2001								
15-24yrs	33,1	20,2	56,5	52,5	68,0	66,1	84,9	85,7
25-34yrs	56,7	38,0	78,0	73,8	88,0	85,0	94,8	94,4
35-44yrs	66,0	53,2	79,9	80,1	88,4	87,6	95,5	94,6
45-54yrs	66,4	58,8	80,5	81,1	87,2	87,8	95,0	95,2
55-64yrs	66,2	63,4	81,4	85,2	87,7	86,2	95,5	95,9
2011								
15-24yrs	47,1	35,1	59,9	57,0	75,9	71,8	84,9	83,5
25-34yrs	70,7	56,6	79,8	76,9	91,2	87,5	95,9	93,9
35-44yrs	77,2	66,8	85,5	81,4	94,1	89,3	96,9	94,4
45-54yrs	78,7	73,5	86,1	84,1	92,6	88,9	96,6	94,6
55-64yrs	80,5	78,2	87,8	87,3	93,8	88,2	96,0	95,1

Source: Census, 2011, 2001, 1996

The table above reflects the percentages of employed males and females by population and age groups. Gender inequalities were highest among black Africans, especially among the 15-34 year age group. These inequalities have been gradually declining between 1996 and 2011, but still far exceed those observed for the other three population groups. In contrast, the decline in the disparities among young coloured males and females (15 to 34 yrs) was significant over this period. There were 10,2 percentage points difference between the percentage of employed coloured males and females between the ages of 15-24 in 1996, considerably higher than for all the other age groups. This difference decreased to 4 percentage points in 2001 and further to 2,9 percentage points in 2011. Gender discrepancies were lowest between White and Indian/Asians within all age groups, but have risen gradually between 1996 and 2011.

Table 4.1.2 shows that the percentage of employment was at its highest for males and females who had no minor children in the household. It was lowest for males and females who had two or more minors in the household. This was true across all three years of reporting. There were considerable gender differences between the percentages of employed males and females living in households consisting of one or more minor over the fifteen year period. More than 65% of males were employed compared to 41,4% of females in 1996. The gap between males and females narrowed by 2011 where 67,9% of males and 50,9% of females were employed. The percentage difference between males and females was 23,8% in 1996 and 17,0% in 2011. Observed gender gaps were highest particularly among the black African and coloured population groups. The percentage of employed Black females dropped significantly with an increase in the number of minors in the household. Indian/Asian females showed smaller decreases in the percentage of employment with the additional of minors.

When looking at the effects of marital status on the percentages of employed males and females, it was found that the largest discrepancies between males and females were with those married or cohabiting. Males had a much higher percentage of employment than females. This discrepancy decreased from 21,7 percentage points in 1996 to 15,2 percentage points in 2011. When examining these statistics (table 4.1.4), by population group, however,

it was found that they were heavily influenced by the findings for the black African population group. The percentage of employed married/cohabiting males exceeded females in this group by 29,2 percentage points in 1996. This decreased to 20 percentage points in 2011. That of coloureds increased from 6,1 in 1996 to 7,5 percentage points in 2011. The differences between the employment percentages of Indian/Asians who were married/cohabiting were negligible during 1996 and 2001, but a larger discrepancy of 6,2 percentage points was found in 2011. The difference in the percentages of married/cohabiting whites also increased slightly from 1,5 percentage points in 1996 to 3 percentage points in 2011.

Table 4.1.4: Percentage employment by marital status and population group, 1996-2011

	Black African			Coloured			Indian/Asian			White		
Marital status	**Male**	**Female**	**Diff.**	**Male**	**Female**	**Diff.**	**Male**	**Female**	**Diff.**	**Male**	**Female**	**Diff.**
1996												
Married/cohabiting	78,2	49,0	29,2	89,9	83,8	6,1	92,9	90,5	2,4	97,5	96,0	1,5
Never married	47,6	42,0	5,6	70,5	66,5	4,0	78,4	77,5	0,9	91,2	92,2	-1,0
Lost a spouse	63,0	66,6	-3,6	80,9	83,2	-2,3	82,4	86,2	-3,8	93,0	94,7	-1,7
2001												
Married/cohabiting	73,1	45,4	27,7	84,9	79,6	5,3	90	86,9	3,1	96,3	94,8	1,5
Never married	39,3	36,6	2,7	59,2	61,4	-2,2	71,2	72,3	-1,1	86,9	89,2	-2,3
Lost a spouse	55,6	60,4	-4,8	69,8	79,2	-9,4	76	81,5	-5,5	89,7	93,2	-3,5
2011												
Married/cohabiting	82,3	62,3	20,0	88,2	80,7	7,5	94,4	88,2	6,2	97,1	94,1	3,0
Never married	56,9	53,7	3,2	65,2	68,4	-3,2	81,4	79,3	2,1	88,6	89,0	-0,4
Lost a spouse	73,8	75,1	-1,3	78,6	83,2	-4,6	85,6	88,2	-2,6	93,3	94,3	-1,0

Source: Census, 2011, 2001, 1996

The lowest percentage of employment in the overall population is shown to be among the never married, both males and females. When looking at the different population groups, it was found that in many cases females showed a higher percentage of employment than males, except within the black African population. In the overall population it was shown that females had the highest percentage of employment among those who had lost a spouse. When looking at the statistics by population group, however, it was found that this pertains mainly to coloured females.

4.1.3 Predicting for the effects of demographic and socio-economic variables on access to employment

This section examines the effects of various demographic and socioeconomic variables on the likelihood of being employed. Logistic binomial Models were developed separately for males and females. Analyses discussed in this section therefore focus on comparing predictive effects between males and females.

Table 4.1.5: Logistics Regression for predicting the effects of demographic and socio-economic variables on employment for males and females, respectively- Odds ratios, 2011

Variable	Male	Female
Age		
15-24yrs	1,000	1,000
25-34yrs	1,722***	1,745***
35-44yrs	1,724***	2,592***
45-54yrs	1,667***	3,382***
55-64yrs	1,691***	Omitted
Population group		
Black African	1,000	1,000
Coloured	1,373***	1,724***
Indian/Asian	2,398***	1,957***
While	3,366***	2,984***
Household head		
Household member	1,000	1,000
Household head	2,677***	2,121***
Household size		
1 Person household	1,000	1,000
2-4 household members	0,474***	0,403***
5 or more household members	0,294***	0,293***
Moved since last census		
Moved	1,000	1,000
Did not move	1,584***	1,150***
Marital status		
Married/cohabiting	1,000	1,000
Never married	0,448***	1,001
Lost a spouse	0,572***	1,145***
Number of minor children		
No minor	1,000	1,000
At least one minor	0,927***	0,767***
2 or more minors	0,849***	0,609***
Education		
No schooling	1,000	1,000
Less than matric	0,883***	0,870***
Matric	1,168***	1,253***
Other tertiary	1,194***	1,623***
Graduates	1,609***	2,784***
Age at first birth		
Under 20 yrs		1,000
20-24yrs		1,056
25-29yrs		1,079***
30-50yrs		1,111***
Province		
Western cape	1,000	1,000
Eastern cape	0,750***	0,706***
Northern cape	0,874***	0,680***
Free state	0,855***	0,646***
Kwazulu-Natal	0,880***	0,833***
North west	0,979	0,653***
Gauteng	0,868***	0,744***
Mpumalanga	0,995	0,735***
Limpopo	0,789***	0,611***
Gross annual income		
No income	1,000	1,000
R 1 - R 4800	2,179***	0,968
R 4801 - R 9600	3,846***	1,666***
R 9601 - R 19200	6,772***	4,067***
R 19201 - R 38400	13,236***	6,137***
R 38401 - R 76800	24,663***	10,174***
R 76801 - R 153600	30,995***	14,588***
R 153601 - R 307200	31,298***	18,778***
R 307201 - R 614400	38,174***	29,230***
R 614401- R 1228800	45,404***	38,652***
R 1228801 - R 2457600	34,257***	25,009***
R2457601 or more	31,774***	23,451***
Geo type		
Urban	1,000	1,000
Traditional	0,815***	0,834***
Farms	2,930***	2,712***

*Legend: *p<0,05 **p<0,01 ***p<0,001*
Source: Census, 2011

The results show that males between the ages of 25 and 44 and females between the ages of 45 and 54 were more likely to be employed. The odds of being employed were lowest for persons between the ages of 15 and 24, both males and females. White and Indian/Asian males and females were more likely to be employed than coloured and black African males and females with the likelihood of white males and females being in employment approximately three times higher than that observed for their black African counterparts. Both male and female household heads had twice the odds of gaining employment than non-

household heads, with females recording slightly lower odd ratios than males. The odds of married or cohabiting males being in employment were more than 40% higher than that of males in other categories. The odds of married women obtaining employment did not differ from the other categories of marital status except for those who had lost a spouse, which was 14,5% higher. In terms of the effects of having minor children present in a household, the chances of obtaining employment was less for those males and females who lived in households with one or more minors in the household. A positive strong relationship was found between education and access to employment. Both males and females with increased levels of educational attainments (compared to those with no schooling as the reference group) had higher probabilities for obtaining employment. The highest odds ratios were observed for those with a graduate tertiary education. This was true for both males and females. However, odds ratios recorded for females were significantly higher when compared to their male counterparts. Lastly, the model above shows that females, who had their first child between the ages of 30 and 50 years had an 11,1% higher odds of gaining employment than at any other age.

With regard to geographic influences, both males and females had higher odds of gaining employment in the Western Cape than in any other province. The next highest odds for males were in Mpumalanga and for females in Kwazulu-Natal. The lowest odds for males were in the Eastern Cape and for females in the Free State. Unexpectedly, the employment of both males and females was higher in farm areas than in urban areas. However, this could indicate the economic and social structures of South Africa where most people have low levels of education and are largely employed in unskilled, elementary occupations.

4.1.4 Occupation and industrial classification for employed males and females

This section ascertains variations in the employment of males and females according to the industries and occupations in which they work.

4.1.4.1 Occupations

Table 4.1.6: Occupational categories of employed persons by sex, 1996-2011

Occupational categories	2011		2001		1996	
	Male	Female	Male	Female	Male	Female
	%					
Managers	9,9	6,4	7,0	4,0	5,8	3,0
Professionals	6,9	8,0	7,4	7,7	8,7	14,5
Technicians	7,2	13,1	7,8	13,7	6,4	7,9
Clerks	9,3	16,0	7,2	18,1	4,9	14,8
Services workers	19,0	12,7	12,1	9,3	11,6	8,7
Skilled agriculture	1,3	0,5	3,8	1,8	6,2	2,1
Craft and related trades	17,2	5,9	18,9	4,7	23,0	5,0
Plant and machine operators	8,4	4,5	14,0	2,9	13,1	3,2
Elementary	20,9	32,7	21,8	37,8	20,4	40,7
Total	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**

Source: Census, 2011, 2001, 1996

Table 4.1.6 above reveals that most males and females were employed in elementary occupations in 1996, 2001 and 2011. The percentage of males has been consistent, 20,4% in 1996 and 20,9% in 2011. The percentage of females has, however, been steadily decreasing, 40,7%, 37,8% and 32,7% in 1996, 2001 and 2011 respectively. The second highest percentage of males was employed in the craft and related trades in 1996 and 2001, 23,0% and 18,9%, respectively. However in 2011, more males were employed as service workers

than those employed in crafts and related trades. The second highest percentage of females was employed as clerks, increasing slightly from 14,8% in 1996 to 16,0% in 2011. Females have consistently shown a lower percentage of employment as legislators, senior officials and managers than males. The percentages of both male and female managers had, however, increased from 5,8% for males and 3,0% for females in 1996 to 9,9% for males and 6,4% for females in 2011. The percentages of male and female professionals has decreased from 8,7% for males and 14,5% for females in 1996 to 6,9% for males and 8,0% for females. Although females now show a higher percentage than males in this regard, the reduction from 14,5% to 8,05 is a significant reduction. The percentage of females in the technical and associate professions has consistently been higher for females than for males: 7,2% for males and 13,1% for females in 2011. Employment of females as plant and machine operators and assemblers has been consistently lower than that of males.

4.1.4.2 Industry

The next table shows the distribution of employed males and females according to grouped industries. Although a category for private households was introduced after Census 1996 requiring a re-categorisation of some industries, the data nevertheless provides useful information on trends between 1996 and 2011.

The analysis below groups occupations into the following three categories: High-skilled jobs consist of two categories, a group comprising managers and one that contains professions and technicians. Medium skilled jobs are made up of clerks, services, skilled agriculture, craft and related trade as well as plank and machine operators. Occupations grouped under low-skilled work included elementary occupations and domestic workers.

Table 4.1.7: Industry by required skills and sex, 1996-2011

Industry	High skills						Medium skills						Lower skills					
	2011		2001		1996		2011		2001		1996		2011		2001		1996	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
	%						%						%					
Agriculture	2,4	1,4	2,6	0,9	2,2	1,2	4,6	3,3	9,6	5,8	11,6	7,7	13,2	7,3	30,4	14,4	41,9	71,5
Mining	1,7	0,8	3,1	0,5	2,9	0,6	6,0	2,6	9,1	0,8	5,8	0,9	2,1	0,7	4,1	0,3	3,7	0,3
Manufacturing	9,5	5,3	13,6	6,3	11,9	5,7	13,5	11,1	17,4	18,5	15,8	20,2	9,1	4,9	10,8	5,2	10,6	4,5
Utilities	1,0	0,5	1,2	0,3	1,6	0,4	1,3	0,9	1,2	0,5	2,3	0,7	0,5	0,2	0,8	0,1	0,7	0,1
Construction	5,9	2,2	4,2	0,7	3,8	0,8	14,8	5,7	10,9	1,8	14,2	1,9	7,7	3,9	8,4	0,9	7,8	0,6
Trade	17,5	12,7	15,1	10,1	13,0	8,3	18,9	27,4	17,1	28,0	13,5	25,0	12,3	9,6	11,9	9,2	10,1	7,2
Transport	6,5	3,6	6,7	2,8	6,6	2,1	9,9	6,0	8,1	3,7	10,7	3,5	3,9	1,6	2,8	0,7	3,3	0,5
Finance	21,6	17,3	17,5	14,7	17,1	12,0	15,4	18,1	9,0	13,6	6,9	13,3	9,2	8,2	3,7	3,0	2,3	1,5
Community and social services	33,8	56,1	35,8	63,3	40,9	68,9	15,1	24,1	16,7	26,1	19,1	26,8	11,5	11,1	14,9	14,2	19,6	13,8
Private households	-	-	0,2	0,3	-	-	1	1	0,9	1,3	-	-	30	53,0	12,3	52,0	-	
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Census, 2011, 2001, 1996

Although both males and females having high skills were mainly employed in community and social services between 1996 and 2011, females enjoyed a higher percentage of employment. 68,9% of females were employed in this industry as compared to males at 40,9% in 1996 and 56,1% of females and 33,8% of males were employed in 2011. In 1996, the highest percentage of males (19,1%) and females (26,8%) having medium skills were employed in community and social services. This changed in 2001 and 2011 where the majority of both males and females having medium skills were found in trade. The employment of females was significantly higher than that of males, i.e., 27,4% of females compared to 18,9% of males in 2011. Both males (41,9%) and females (71,5%) with lower skills were found in the agricultural industry in 1996 with a significantly higher percentage of females. While the vast majority of males with low skills remained in agriculture in 2001 (30,4%) the majority of females had moved to private households (52,0%). In 2011, the majority both males and females were found in private households; males at 30% and females at 53%.

4.1.4.3 Predicting the likelihood of working in high, medium and low skilled occupations for employed males and females using multivariate, multinomial, analysis

In this section, the effects of various demographic and socio-economic variables were used to predict level of occupational status (high, medium and low skilled occupations). Separate predictor models were produced for females and males. Table 4.1.8 - A gives the relative risk ratios of being employed in high-skilled jobs relative to being employed in medium skilled jobs while B predicts the relative risk ratios of being employed in low skilled jobs relative to being employed in medium skilled jobs.

Table 4.1.8: Predicting the effects of demographic and socio-economic variables on occupation status for employed males and females, respectively using multinomial regression modelling (relative risk ratios), 2011

	Base outcome: Medium-skilled occupations		**Base outcome: Medium-skilled occupations**	
	Female	**Male**	**Female**	**Male**
	High-skilled occupations		Low-skilled occupations	
	Dependent effect			
Age groups				
15-24yrs	1,00	1,00	1,00	1,00
25-34yrs	0,96	0,98	1,02	0,96**
35-44yrs	1,06**	1,03*	1,12***	0,98
45-54yrs	1,14***	1,07***	1,25***	1,02
55-64yrs		1,10***		1,09***
Population group				
White	1,00	1,00	1,00	1,00
Black/African	1,06***	0,51***	2,55***	1,12***
Coloured	1,15***	0,75***	1,18***	0,90***
Indian/Asian	1,08**	1,09***	0,69***	0,67***
Household headship				
Not household head	1,00	1,00	1,00	1,00
Household head	1,00	0,99	0,91***	1,00
Size of the household				
1 person household	1,00	1,00	1,00	1,00
2-4 persons household	0,99	1,02	0,81***	1,00
5 or more persons household	1,00	1,03	0,82***	1,03
Moved since 2001				
Moved	1,00	1,00	1,00	1,00
Did not move	0,94***	1,03***	1,03*	0,99
Marital status				
Married/cohabiting	1,00	1,00	1,00	1,00
Never married	0,98	1,03*	0,98	1,03*
Lost a spouse	1,03	1,05*	0,98	1,00
Presence of minors				
No minors	1,00	1,00	1,00	1,00
At least one minor	1,02	1,00	1,04*	0,98*
Two or more minors	1,04*	0,99	1,07***	1,01
Level of education				
No schooling	1,00	1,00	1,00	1,00
Less than matric	0,94	0,98	0,71***	0,70***
Matric	1,20***	1,44***	0,29***	0,48***

	Base outcome: Medium-skilled occupations		Base outcome: Medium-skilled occupations	
	Female	Male	Female	Male
	High-skilled occupations		Low-skilled occupations	
	Dependent effect			
Other tertiary	2,42***	2,50***	0,19***	0,47***
Graduates	4,59***	5,57***	0,20***	0,51***
Household income				
Between R0 and R38400	1,00	1,00	1,00	1,00
Between R38401 to R76800	0,92***	0,87***	1,04*	0,99
Between R76801 and R153600	1,03	0,89***	0,88***	0,84***
Between R153601 and R307200	1,16***	1,01	0,79***	0,79***
R307201 and higher	1,21***	1,212***	0,76***	0,76***
Age at first birth				
under 20 years	1,00		1,00	
20-24 years	1,02		0,97*	
25-29 years	1,02		0,93***	
30-50 years	1,02		0,92***	
Geo-type				
Urban	1,00	1,00	1,00	1,00
Traditional	1,26***	1,14***	1,00	1,05***
Farms	0,98	1,08***	1,16***	1,77***
Province				
Gauteng	1,00	1,00	1,00	1,00
Western Cape	1,07***	0,97*	1,21***	1,23***
Eastern Cape	1,30***	0,94***	1,18***	1,32***
Northern Cape	0,87***	0,72***	1,43***	1,47***
Free State	1,05	0,81***	1,19***	1,14***
KwaZulu-Natal	1,17***	0,86***	1,24***	0,99
North West	0,89***	0,65***	1,01	0,96**
Mpumalanga	0,83***	0,62***	1,20***	0,92***
Limpopo	1,00	0,77***	1,18***	0,98

***p<0,001 **p<=0,02 **p<=0,05
Source: Census, 2011

Compared to all factors included in the models, education had the strongest effect in predicting both high and low skilled occupation statuses. This was true for males and females. The likelihood of working in high skilled occupations, increased with levels of educational attainment. The highest predictor variable for both females and males was having a graduate tertiary qualification. Among females, graduates were over 5 times more likely to work in high skilled occupations than females with no schooling. Probability ratios were even higher between males, where graduates were more than 6 times likely to be occupying high-skilled jobs compared to males with no schooling.

Other strong predictors for working in high skilled occupations included age and the variable 'moved place of residence'. With regard to age, observed ratios increased with age. For females, the highest ratios were found between those aged 34 - 55 years. Increases among males also started at 34 years, but increased up to the age of 64 years. This could indicate early female retirement (usually at 55yrs). In terms of 'moving', females who did not move since 2001 were least likely to work in high-skilled occupations. On the other hand, between males, those who had not moved were more likely to be employed in high-skilled work compared to those who moved. Variables such as household headship, household size and the presence of minors had no significant effect (p>0,05) in predicting high skilled occupations for both males and females, while the age at first birth and marital status had no effect among females. Among males, those without a partner (i.e., never married or lost a spouse through death or divorce) were more likely to be working in high skilled jobs in 2011.

Lastly, the provincial effect was also accounted for in both male and female predictor models. The results showed that when predicting employment for, females, those living in provinces such as the Eastern Cape, KwaZulu-Natal, Western Cape and Gauteng were most likely to be employed in high skilled occupations. In contrast males residing Gauteng showed the highest ratios, while the lowest ratios were in respect of Mpumalanga and North West.

4.2 EDUCATION AND EMPLOYMENT

The second part of the analyses in this chapter pays attention to education and its impact on access to employment taking into account gender variations.

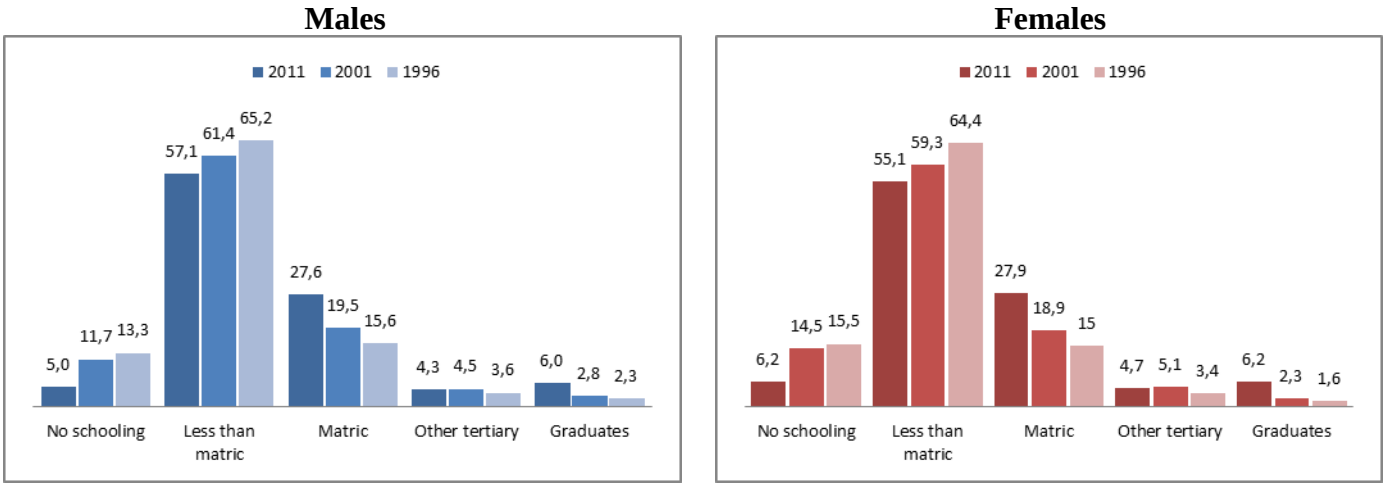


Figure 4.2.1: Working age population and educational attainment, 1996-2011

Source: Census, 2011, 2001, 1996

Since 1996, persons with less than matric (grade 12) accounted for a higher percentage of the South African working age population. However, over the 15 year period (1996-2011), notable improvements among males and females who had attained matric as well as those with tertiary education, i.e., graduates and non-graduates (i.e., other tertiary) were observed. Graduates in this study refer to individuals who had attained at least a university degree or a higher diploma, while the category 'other tertiary' relates to a non-degree tertiary qualification. Although the percentage of both males and females with a post school qualification remained considerably low, between 1996 and 2011, the percentage of male graduates doubled, while that of their female counterparts tripled.

Figure 4.2.2: Employment and educational attainment, 1996-2011

Source: Census, 2011, 2001, 1996

The distribution of educational attainment for both the employed and unemployed populations largely mirrors that of the working age population. However, gender variations were observed with regard to increased levels of education. For example, although males account for a higher percentage of the overall employed population, Figure 4.2.2 reveals that for females, a higher percentage with tertiary education were employed compared to males in 2001 and 2011. Moreover, observed gender gaps increased with the level of educational attainment. Over the 15 year period, the percentage difference between employed males and females with matric remained constant at around one percentage point in favour of females. The difference increased to more than 2 percentage points for employed persons with tertiary education (both graduates and non-graduates). The largest increase between 1996 and 2011 was however observed amongst graduates. The percentage of employed female graduates was 3,5 percentage points higher than that observed amongst employed male graduates, an increase of 100% compared to 15 years prior.

Table 4.2.1: Gender Parity Ratios in educational attainments for employed and unemployed persons, 1996-2011

Education	2011		2001		1996	
	Unemployed	Employed	Unemployed	Employed	Unemployed	Employed
	Gender Parity Ratios					
No schooling	1,3	0,7	1,2	0,7	1,2	0,6
Less than matric	1,1	0,7	1,1	0,7	1,3	0,7
Matric	1,3	0,8	1,2	0,8	1,4	0,8
Other tertiary	1,6	1,0	1,6	1,0	1,4	1,0
Graduates	1,3	1,0	1,1	0,8	0,9	0,7
Total	**1,2**	**0,8**	**1,2**	**0,7**	**1,3**	**0,7**

Source: Census, 2011, 2001, 1996

The table above contains Gender Parity Ratios (GPR) which measure gender disparities by calculating the ratio of females to males in education and employment. A value of this ratio of less than 1 reflects inequalities in favour for males i.e., fewer females recorded than males. A value greater than 1 reflects inequalities in favour of females. Parity (equality) is reached at 1,0. Within each education category, a higher percentage of females were unemployed than males during each census. The largest gender inequalities were found within the unemployed population, specifically for male and female non-graduates (those with other tertiary education). The percentage of unemployed females for this education category was about 60 higher than that of their male counterparts.

Notable gender inequalities, in favour of males, were also observed for the employed population. In contrast to the unemployed, disparities were found in all education groupings except those with other tertiary qualifications, where a GPR score of 1,0 indicated no gender inequalities. The gender gap also widened with a decline in educational attainment. Between 1996 and 2011, the percentage of employed females with less than matric was on average, 70 percent that of their male counterparts. This figure improved to 80% amongst those who had obtained matric. Contrarily, gender inequalities among graduates declined over the 15 years of reporting. Between 1996 and 2001, parity ratios of 0,7 and 0,8 respectively, were also observed for employed graduates. However, by the year 2011, no gender inequalities were observed for male and female graduates who were employed with a GPR of 1,0.
Unequal

4.2.1 Education and socio-demographic variables

Table 4.2.2: Educational profile of the employed by population group, 1996-2011

Population group		2011					2001					1996				
		No schooling	Less than matric	Matric	Other tertiary	Graduates	No schooling	Less than matric	Matric	Other tertiary	Graduates	No schooling	Less than matric	Matric	Other tertiary	Graduates
		%					%					%				
Male	Black/African	5,0	50,7	31,9	5,6	6,7	14,7	57,4	20,0	5,4	2,5	17,6	63,2	13,7	4,0	1,5
	Coloured	2,5	56,6	30,5	4,7	5,6	6,1	64	23,3	4,6	2	8,1	71,2	15	4,0	1,8
	Indian/Asian	1,2	25,1	45,6	8,4	19,6	1,5	35,3	43,3	10,4	9,5	1,5	46,7	37,6	7,6	6,6
	White	0,3	17,7	39,6	13,1	29,3	0,7	20,8	41,7	18,1	18,7	0,7	27,3	39,9	17,0	15,1
Female	Black/African	4,7	44,5	32,2	8,2	10,4	14	53,1	19,6	9,7	3,6	15,8	61,8	12,7	7,9	1,8
	Coloured	1,8	51,1	34,3	5,8	7,0	4,8	61,5	25,8	6	2	5,9	69,5	17,1	5,8	1,7
	Indian/Asian	0,7	20	44,7	9,4	25,1	1,7	31,6	42,9	12,9	10,9	2,4	41,2	40,2	9,4	6,7
	White	0,3	13,5	41,7	13	32,0	0,6	17,6	45,3	20,5	16	0,8	21,4	48,4	16,2	13,1

Source: Census, 2011, 2001, 1996

Data above indicates that there has been a shift to a higher level of skills among the employed. This is mainly due to a decrease in the percentages of black Africans and coloureds, both males and females, with less than matric and an increase in the percentages of those having matric. Females have excelled more than males in this regard for those between the ages of 15 and 34. The percentages of Black/African and coloured graduates have also increased. This could be due to improved access to higher learning education after democracy. The percentage increases in black African and coloured graduates are higher for females than for males. The growth in black African and coloured graduates has, however, been exceeded by that of Indian/Asians and whites showing a still-existing imbalance between the population groups in high education. The increase in the percentages of Indian/Asian and white graduates is shown to be higher for females than for males.

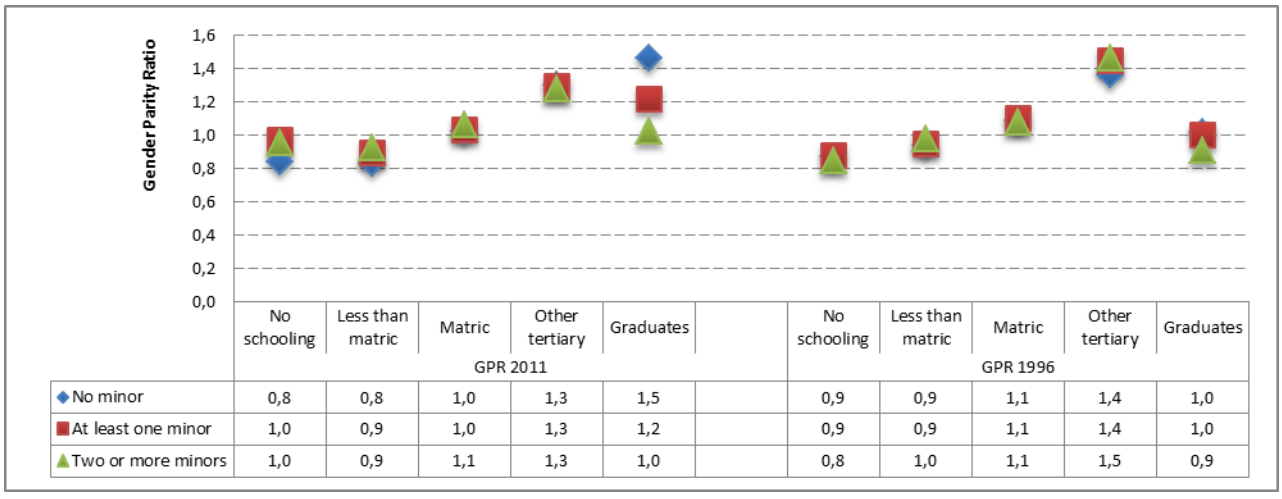


Figure 4.2.3: Gender gaps between employed males and females by the number of minor children present in a household, 1996 and 2011

Source: Census, 2011, 2001, 1996

Since 1996, individuals with no schooling or less than matric recorded the highest percentages of persons living in households with more minors (two or more minor children). In contrast, those who were better educated i.e., matric or more lived in households with one minor child or no minor children. With regard to gender gaps, figure 4.2.3 above indicates that in 1996, irrespective of number of minor children present in the household, wider gaps in favour of females were observed in the percentage of employed males and females with non-graduate tertiary qualifications. Fifteen years on (2011), not only were larger gender gaps noted against

employed graduates but also, the gaps increased with a decline in the number of minors reported within a household. This suggests that in 2011, for each household category, the fewer the number of children were reported, the higher the percentage of employed female graduates was reported compared to their male counterparts.

The variable age at first birth, is only derived for females aged between 12 and 50 years. This variable indicates the age at which women gave birth to their first child, irrespective of whether the child was born alive or not. Figures reported here were calculated for females of working age i.e., those aged between 15 and 50 years.

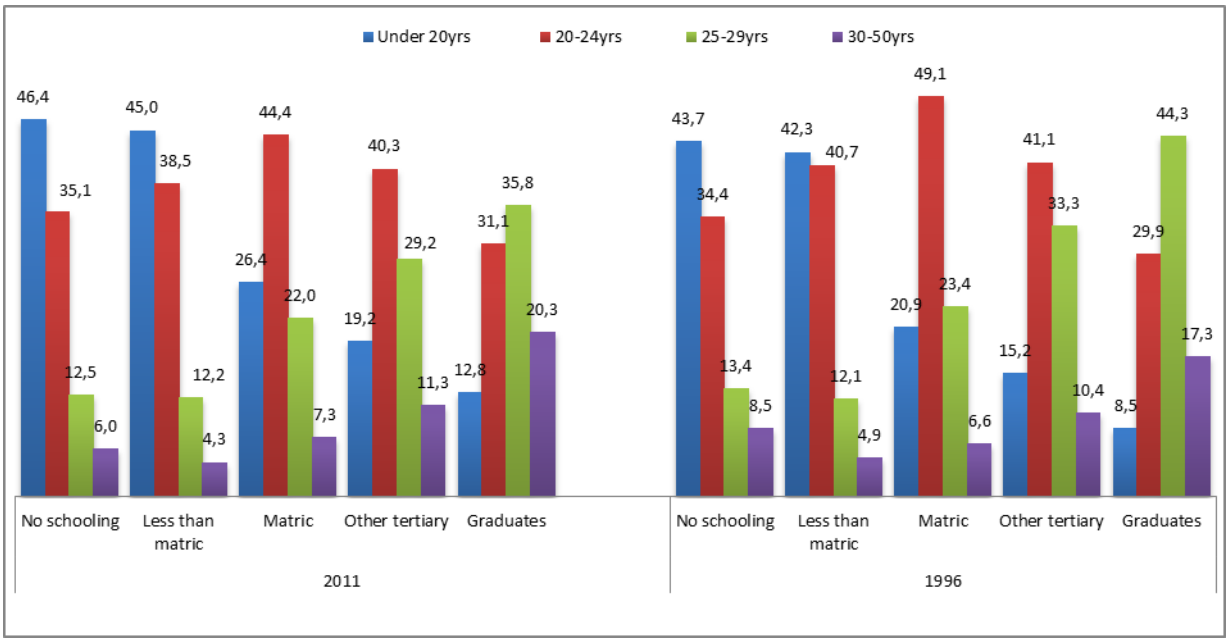


Figure 4.2.4: Percentages of employed females by educational attainment and age at first birth, 1996 and 2011

Source: Census, 2011, 1996

Figure 4.2.4 shows that the age at first birth was negatively related to increases in levels of educational attainment. Between 1996 and 2011, the highest percentage of employed females who had given birth as teenagers (between 15 and 19 years) was found among those with no schooling or less than matric. For employed females who had attained matric or a non-graduate tertiary education qualification, the largest percentages were recorded among those who had their first birth between the ages of 20 and 24 years. In contrast, noticeable percentages of employed females who had given birth between 25 and 29 years were found amongst graduates.

In this study, the variable, ever moved, is used as a proxy for migration. During the data collection of all three censuses i.e., 1996, 2001 and 2011 provision was made in the questionnaires to ascertain if respondents had moved places/houses since the previous census data collection. For example, during the 2011 Census data collection, respondents were asked to indicate if they had moved places or houses since Census 2001.

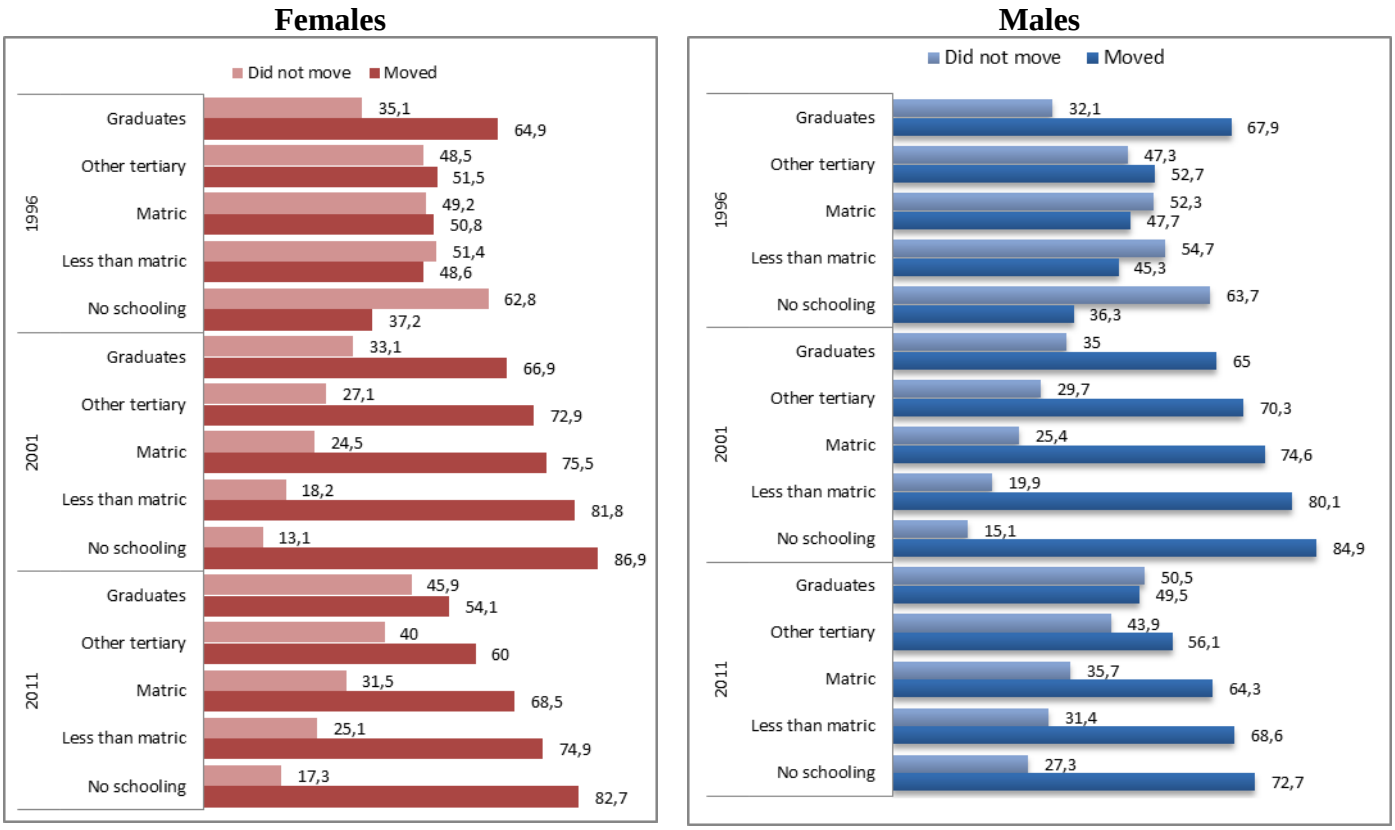


Figure 4.2.5: Percentages of employed persons by whether they moved houses/places and level of educational attainment, 1996, 2001 and 2011

Source: Census, 2011, 2001, 1996

Figure 4.2.5 above indicates that in 1996, higher percentages of persons who moved were recorded for employed males and females with higher levels of educational attainment. However, the period 2001 to 2011 saw large percentages recorded for employed males and females who had moved, irrespective of level of educational attainment. The difference between those who moved and those who had not moved increased with a decrease in level of education attainment. This gap was wide for females and males with no schooling in 2011 (a difference of 65 percentage points; between employed female movers and non-movers and 45 percentage point difference between male movers and non-movers).

With respect to graduates, in 1996, a higher percentage indicated they had moved since 1987. With a difference of around 3 percentage points, slightly more employed male graduates had moved than females. Five years on (2001), a similar pattern was observed for both males and females. However, in 2011, higher percentages of employed graduates who has moved were noticed for females than males. In fact, by the year 2011, the percentage of male graduates who had moved declined to reveal virtually no differences between graduate males who had moved and those who had not moved.

4.2.2 Field of study

In this section, the field of study of those who had obtained a university degree or a higher diploma (graduates) was analysed against employment status.

Table 4.2.3: Graduates' field of study by status in employment and sex, 1996-2011

	2011											
	STEM			Humanities			BFC			Other		
	Male	Female	Both sexes	Male	Female	Total	Male	Female	Total	Male	Female	Total
	%											
Employed	36,6	22,8	29,6	28,0	44,7	36,5	27,9	25,1	26,5	7,5	7,3	7,4
Unemployed	34,1	22,6	27,6	25,9	33,4	30,2	27,9	34,0	31,4	12,1	10,0	10,9
Total	36,5	22,8	29,5	27,9	44,1	36,2	27,9	25,6	26,8	7,7	7,5	7,6
	2001											
	STEM			Humanities			BFC			Other		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	%											
Employed	35,1	24,2	30,3	33,6	54,9	42,9	26,4	16,9	22,3	4,9	1,7	4,5
Unemployed	24,9	16,9	20,8	47,2	63,5	55,5	23,6	15,2	19,3	4,3	2,3	4,4
Total	34,5	23,6	29,7	34,4	55,6	43,7	26,2	16,8	22,1	4,9	1,8	4,5
	1996											
	STEM			Humanities			BFC			Other		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
	%											
Employed	28,3	18,8	24,4	41,5	62,3	50,1	25,0	14,2	20,6	5,2	4,6	4,9
Unemployed	17,8	11,2	14,6	57,5	68,1	62,5	20,0	15,9	18,1	4,8	4,8	4,8
Total	28,0	18,6	24,1	41,9	62,5	50,5	24,9	14,3	20,5	5,2	4,6	4,9

Source: Census, 2011, 2001, 1996

Table 4.2.3 shows percentages of male and female graduates by their employment status as distributed among the different fields of study. While the majority of female graduates remained in the humanities between 1996 and 2011, most male graduates were found to be qualified in STEM (science, technology, engineering, mathematics) in 2001 and 2011. The table reveals that among STEM graduates, higher percentages of both males and females were employed than unemployed. This trend was repeated between 1996 and 2011. In 1996 and 2001, the percentages of employed male STEM graduates were around 10 percentage points higher than the unemployed. This gap remained positive (still in favour of the employed) but narrowed to a percentage difference of 2 percentage points in 2011. The proportion of employed female STEM graduates was also 7 percentage points higher than their unemployed counterparts in both 1996 and 2001. However in 2011, less than half a percentage point difference (0,2) separated employed and unemployed female STEM graduates.

In 1996 and 2001, high percentages of unemployed males and females were observed among humanities graduates. For males, those unemployed recorded 16,0 and 13,6 percentage points higher than their employed counterparts in 1996 and 2001 respectively. Percentage differences of 5,8 in 1996 and 8,5 (in favour of the unemployed) were in turn recorded between employed and unemployed female humanities graduates in 2001. An inverse trend was however observed in 2011. The total percentages of employed individuals, both male and female, who had graduated in the humanities, were higher than those recorded for the unemployed. Employed females recorded 11,4 percentage points higher than their unemployed counterparts in 2011 (44,5% compared to 33,4%). In contrast, a difference of 2,1 percentage points was observed between the percentages of employed (28,0%) and unemployed (25,9%) male humanities graduates in 2011.

In 2011, a larger percentage of unemployed BFC (business, finance, communications) female graduates (34%) was observed compared to their employed counterparts (25,1%). No differences were observed between the percentages of employed (27,9%) and unemployed (27,9%) male BFC graduates in 2011. This trend was different 15 years prior (1996) when BFC graduate

percentages for employed males were higher than for the unemployed. Although females maintained higher unemployment figures in both 1996 and 2011, the gap between unemployed and unemployed within the female group was narrower in 1996 compared to 2011 (1,7 percentage points in 1996 vs. 8,9 percentage points in 2011).

4.2.3. Education, industries and occupational status

An important aspect of this study is to ascertain the impact of male and female education on access to different occupational jobs. Additionally, the employment of males and females by industrial sector are assessed with respect to their levels of educational attainment.

4.2.3.1 Industries

In 2011, males whose highest level of education attainment was between no schooling or less than matric generally worked in agriculture or in trade while their female counterparts were largely employed in private households. Persons who had attained a tertiary level qualification (graduate and non-graduate) predominantly held jobs in community and social services and financial sectors, with higher percentages observed amongst graduates. However, among this group (tertiary qualification holders) notably higher percentages of males were employed in the financial sector (18% of those with tertiary and 24% of graduates) than females. On the other hand, more females (43% with other tertiary and 51% of graduates) worked in community and social services compared to males.

Table 4.2.4: Education and industry: Gender Parity Ratios, 2011

Industry	GPR					
	No schooling	Less than matric	Matric	Other tertiary	Graduates	Total
Agriculture	0,7	0,8	0,8	0,7	0,6	0,7
Mining	0,3	0,3	0,4	0,4	0,6	0,4
Manufacturing	0,6	0,7	0,7	0,6	0,7	0,6
Utilities	0,4	0,4	0,6	0,5	0,6	0,5
Construction	0,5	0,3	0,4	0,5	0,5	0,4
Trade	0,8	1,1	1,1	0,9	0,9	1,0
Transport/storage/communication	0,4	0,4	0,5	0,7	0,7	0,5
Financial	0,8	0,9	1,0	0,9	0,8	0,9
Community/social/personal services	1,1	1,4	1,4	1,6	1,5	1,5
Private households	3,1	3,4	2,2	1,4	1,2	2,7

Source: Census, 2011

In terms of gender inequalities observed in 2011, wide gender gaps were found amongst those who had lower levels of education (matric or lower) working in private households (a sector overwhelmingly dominated by females). Large gaps (in favour for males) were also observed between males and females employed in mining, utilities, transport and construction. Gender gaps in these sectors generally declined with an increase in education attainment, except for construction. Irrespective of level of education, the percentage of females working in construction was on average 40% that of males.

4.2.3.2 Occupation

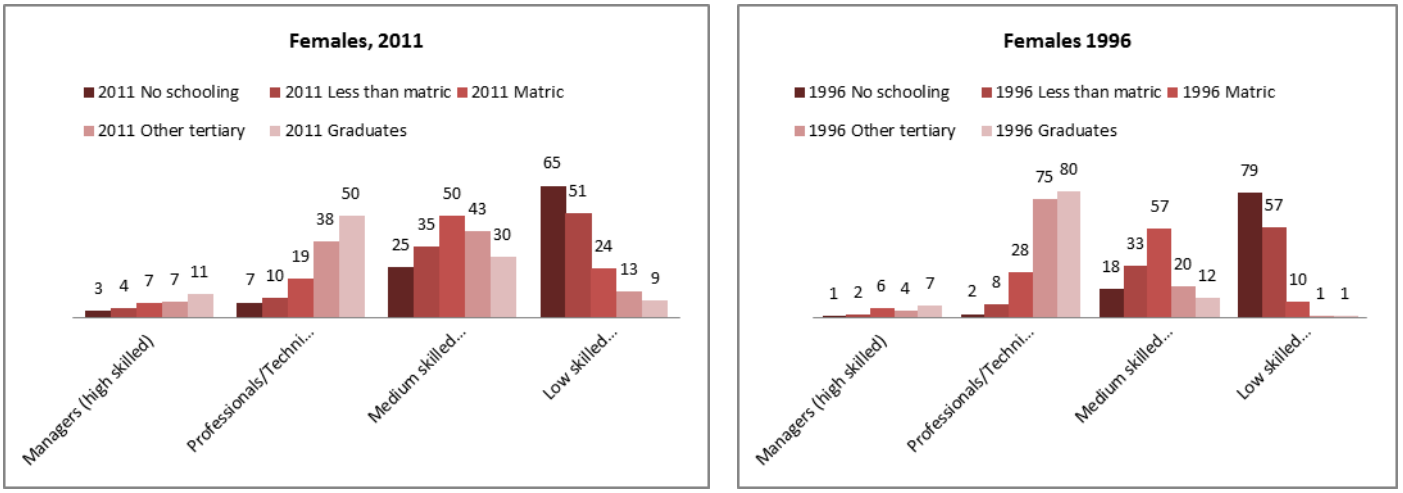


Figure 4.2.6: Employed females by education and type of occupational grouping, 1996 and 2011
Source: Census, 2011, 1996

Figure 4.2.6 above indicates that although the percentage of females in managerial occupations remained remarkably low between 1996 and 2011, increases were observed for tertiary qualification holders. A slightly bigger increase was recorded for graduates (4 percentage points) than non-graduates (3 percentage points). Over the 15 year period of reporting, high percentages of female tertiary qualification holders were also recorded amongst those occupying professional and technical high-skilled jobs. However, remarkable declines were observed for non-graduates with a drop of 37 percentage points from 75% to 38% compared to 30 percentage points from 80% to 50% for graduates. These results may suggest that in 2011, a graduate (university degree or a higher diploma) tertiary education qualification was more important in determining the extent to which females occupied high skilled jobs.

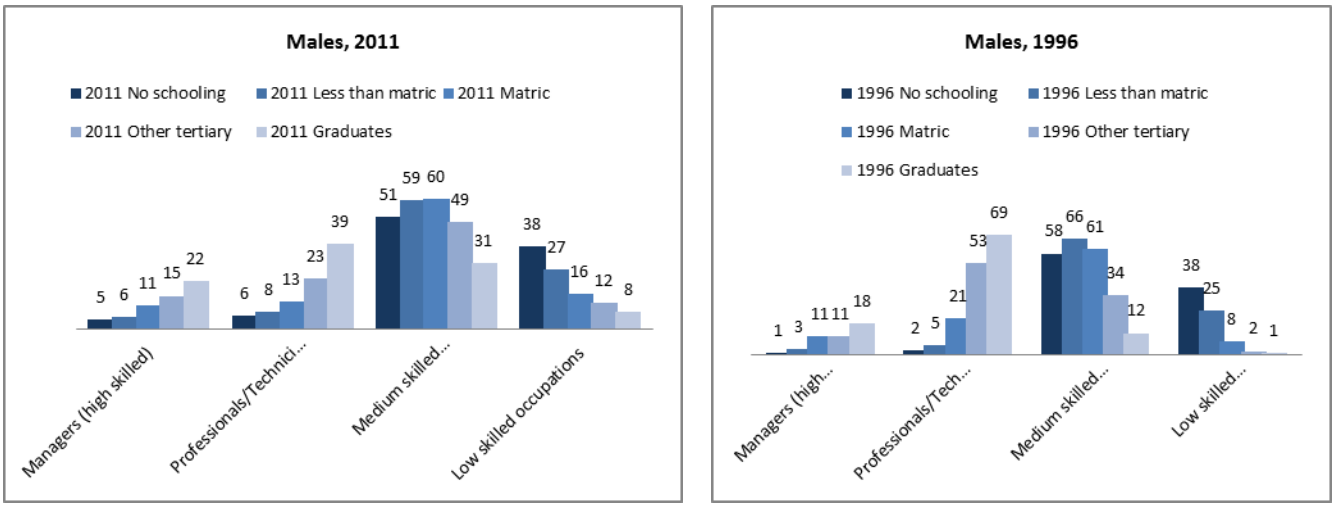


Figure 4.2.7: Employed males by education and type of occupational grouping, 1996 and 2011
Source: Census, 2011, 1996

In general, similar employment trends observed in high skill occupations for females were also evident for males in that those with higher levels of education mainly occupied high skilled jobs

(managers/professional/technical). However, for males, increases in these jobs were observed across all levels of educational attainment between 1996 and 2011.

Table 4.2.5: gender parity in occupation grouping and education, 1996 and 2011

Occupation groupings	GPR 1996					GPR 2011				
	No schooling	Less than matric	Matric	Other tertiary	Graduates	No schooling	Less than matric	Matric	Other tertiary	Graduates
Managers (high skilled)	0,5	0,6	0,5	0,4	0,4	0,7	0,8	0,6	0,5	0,5
Professionals/Technicians (high skilled)	1,0	1,5	1,4	1,4	1,2	1,2	1,2	1,5	1,6	1,3
Medium skilled occupations	0,3	0,5	0,9	0,6	1,0	0,5	0,6	0,8	0,9	1,0
Low skilled occupations	2,1	2,3	1,2	0,5	0,8	1,7	1,9	1,5	1,0	1,1

Source: Census, 2011 and 1996

The table above contains parity ratios which indicate gender inequalities in occupation and educational attainment between 1996 and 2011. The widest gender gaps (were recorded for those working in managerial (in favour of males) and professional/technical (in favour of females) jobs with matric or a tertiary qualification.

The smallest changes in gender gaps were observed for males and females holding managerial jobs with a tertiary education qualification. In 1996, the GPR stood at 0,4 (in favour of males) for this group. Fifteen years on, the ratio minimally narrowed to a GPR of 0,5 indicating that differences between males and females virtually remained the same.

4.3 SPATIAL ANALYSIS

Figure 4.2.8: Spatial distribution of employed females by district, 2011 (Map1)

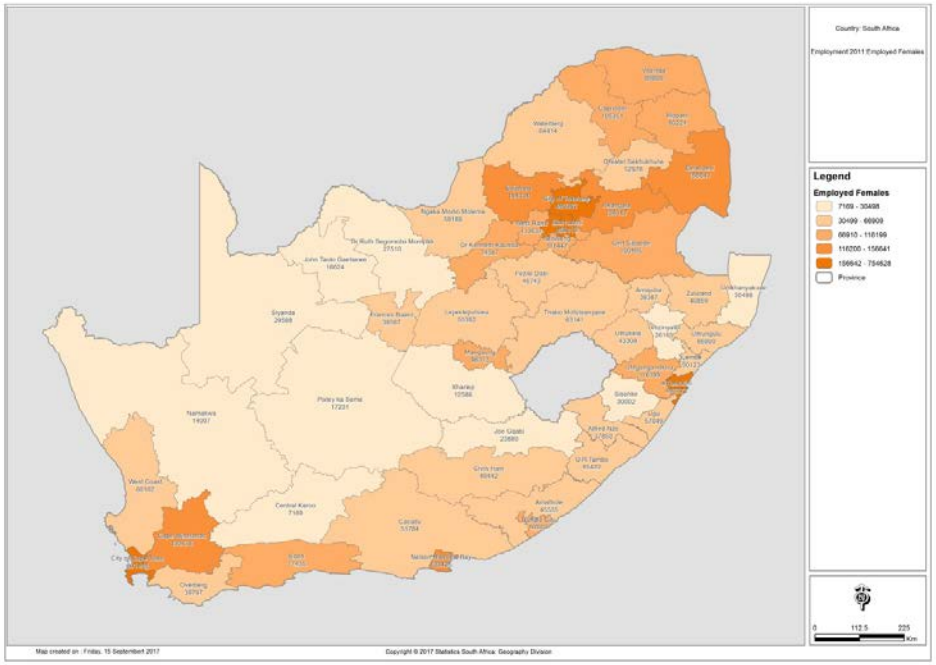
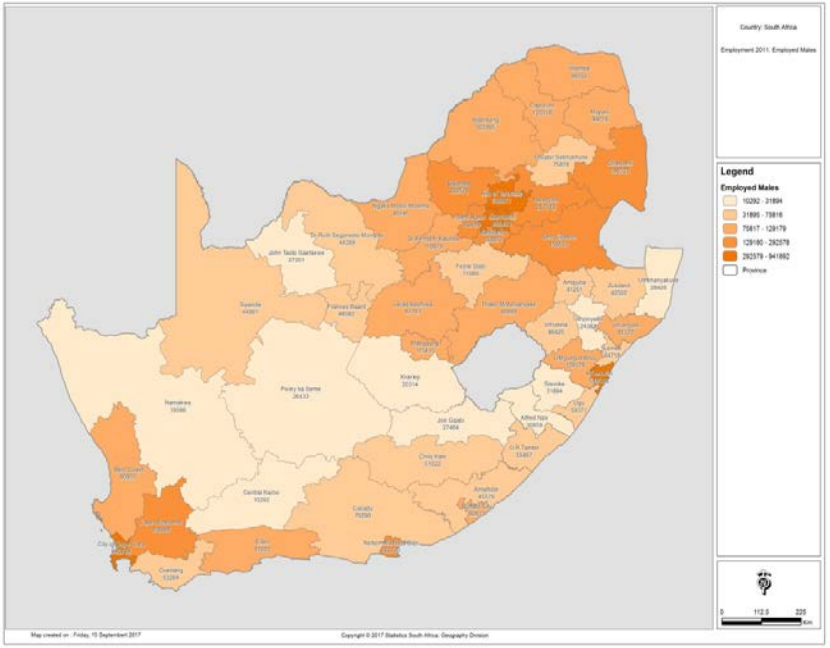


Figure 4.2.9: Spatial distribution of employed males by district, 2011 (Map 2



The highest percentages of employed males and females were found in districts/metros belonging to the provincial economic hubs of the country, i.e., Gauteng (City of Johannesburg, Ekurhuleni and City of Tshwane), Western Cape (City of Cape Town,) and KwaZulu-Natal (EThekwini). Slightly higher percentages of employment were also observed in districts such as Cape Winelands (CP), Nkangala (MP), Bojanala (NW), Ehlanzeni (MP) AND Nelson Mandela Bay (EC).

Figure 4.2.10: Gender variations in employment by district, 2011 (Map 3)

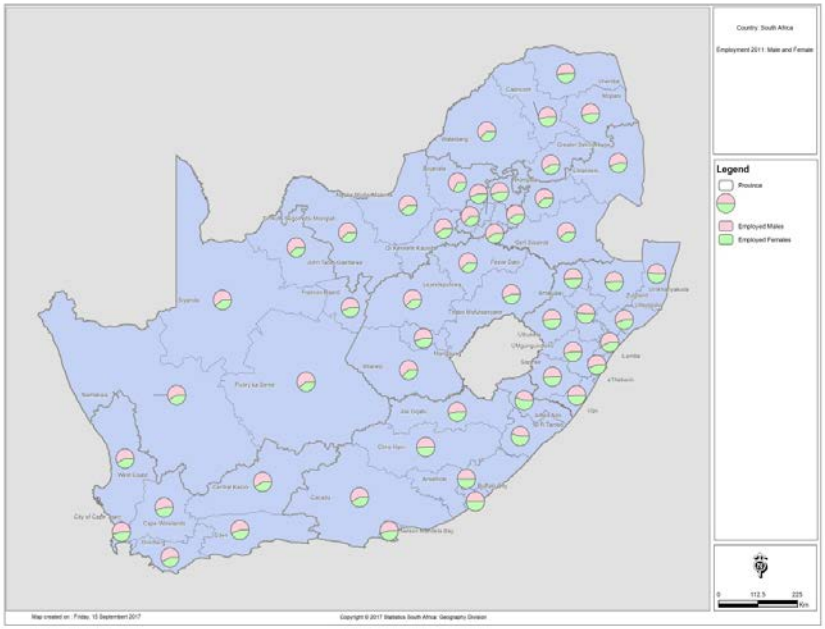
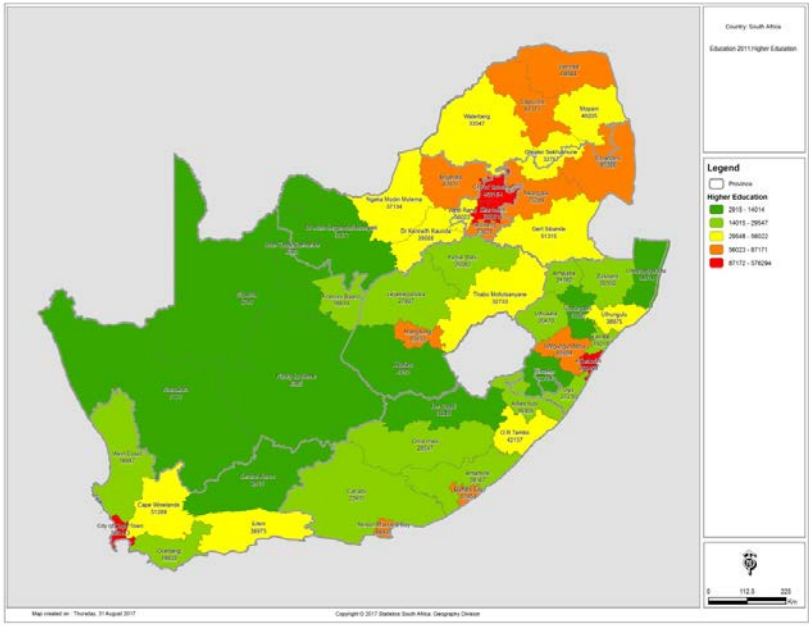


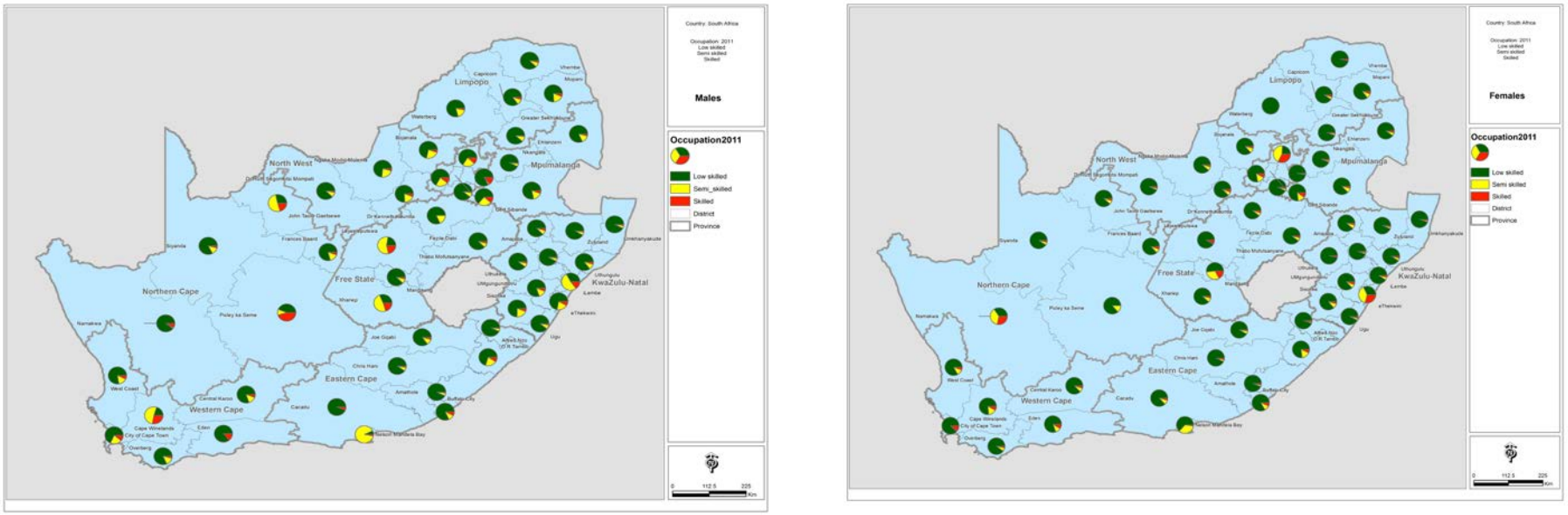
Figure 4.2.11: Tertiary level education attainment by district (Map 4)



Map 3 above shows that more males than females were employed in all districts except Alfred Nzo (EC) and OR Tambo (EC) where a higher percentage of females were employed compared to their male counterparts. The largest gender differences (in favour of males) were generally concentrated within districts found in three provinces; Northern Cape (Siyanda, Namakwa, Pixley ka Seme, John Taolo Segaetwe), North West (Dr Ruth Segomotso mopani, Gaka Modiri Molema, Bojanala, Dr Kenneth Kaunda), and Western Cape (West Coast, Overberg, Central Karoo, Eden). However, large gender gaps were also noted in Mpumalanga (Enhlanzeni , Gert Sibande), Limpopo (Greater Sekhukhune, Waterberg), Free State (Lejweleputswa, Xhariep), as well as in the West Rand (GP) and in Cacadu (EC). Map 4 further shows two factors. Firstly, high percentages of tertiary educational attainment are aligned with areas depicting higher levels of employment (Maps 1 and 2). And secondly, low percentages of tertiary educational attainment were shown for districts where larger gender gaps in employment were reported (Map 3), further suggesting the importance of education in reducing gender inequities in employment.

Figure 4.2.12: Clustering of levels of occupation by district and sex (Map 5)

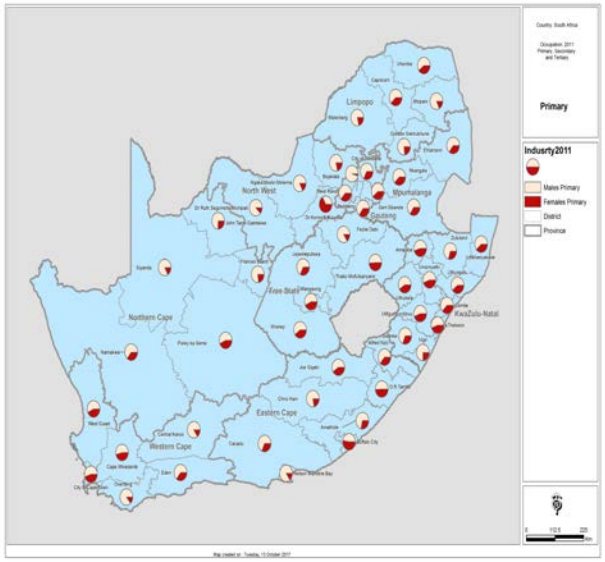
Males **Females**



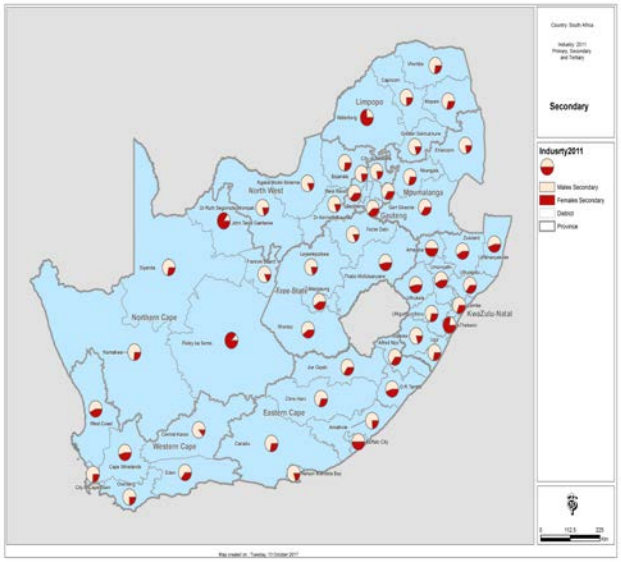
Map 5 shows that while a larger proportion of the employed population works in low skilled jobs, this mainly consisted of females than males with overwhelmingly large percentages observed in districts in Limpopo (Waterberg, Vhembe) and KZN (Uthukela, Alfred Nzo, Ugo, Ilembe). Though less prominent than males, higher female concentrations of high skilled occupation were found mainly in metros such as City of Tshwane, Ethekwini, Mangaung, City of Johannesburg, Namakwa and the City of Cape Town. These are mainly government administration centres in the country and the high numbers could be as a result of the state equity policies. Of note is that within the regions mentioned above, an almost equal distribution of high skilled females were employed in medium and low skilled jobs, except City of Cape Town where employed females predominantly occupied either high skilled or low skilled jobs suggesting higher levels of gender inequalities in the metro. In contrast males held high skilled jobs in more districts/metros than females particularly in NC (Prixley Ka Seme, John Taolo Gaetsewe), Gauteng (Ekurhuleni, City of Tshwane, city of JHB), KZN (Ilembhe, Ethekwini, Afred Nzo).

Figure 4.2.13: Clustering of industrial sectors by district and sex (Map 6)

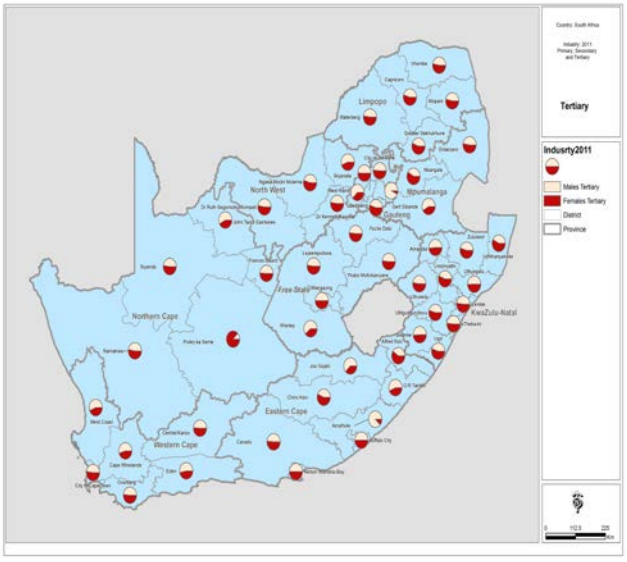
Primary sector



Secondary sector



Tertiary sector



Map 6 shows that males dominated in the primary (made up on agriculture, mining) and secondary (manufacturing, construction, utilities) sectors. However, gender inequalities were more prominent in the secondary sector. Within the primary sector, females were least employed in Overberg (WC), Klein karoo (WC), Nelson Mandela Bay (SC) as well as most districts in Northern Cape, North West, Limpopo, Mpumalanga and the Free State. These areas predominantly have large mining and agricultural economic sectors and have experienced very little female penetration in employment over the 15 year period of reporting. While the secondary sector is also overwhelmingly male dominated, more females than males residing in John Taolo Gaetsewe (NW), Prixley ka Seme (NC), Ethekwini (KZN) and Waterberg (LP) worked in the secondary sector compared to their male counterparts. There was more gender equality in the tertiary sector (trade, transport, finance, community and social services, private households), with an almost equal distribution of males and females recorded in most districts and metros. Females largely dominated in Prixley ka Seme (NC), most districts in KZN (Alfred Nzo, Umzinyathi, Umgugundlovu, Umkhanyakude), Greater Sekhukune (LP), Nkangala (MP) and Sedibeng (GP), while male domination was experienced particularly in Amathole (EC), Ekurhuleni (GP), the West Rand (GP), Gert Sibande and Xhariep (NC).

CHAPTER 5: DISCUSSION AND CONCLUSION

This chapter concludes the study by reviewing and discussing the main outcomes of the research findings. Where relevant, important policy implications and recommendations are also discussed. Of note however, is that the findings in the present study are limited by economic conditions prevalent in the country during the period 1996-2011. These conditions include slow economic growth which directly impacts job creation and demand.

Overall, data revealed an imbalance in the relationship between the proportion of males and females of working age and their participation in the labour market. Although there was a higher proportion of females in the population of working age, females did not participate in the labour market to the same extent as males. They were over represented among the unemployed and economically inactive populations. On the other hand, a higher percentage of males were found to be in employment than females, suggesting greater employment access for males than for females.

5.1 THE EFFECT OF EDUCATION

Could education however influence male and female access to employment? Key to the study is to examine the role of education and its impact in determining the extent to which males and females with equivalent levels of education have been able to obtain equitable access to employment and occupational opportunities. It was found that for both males and females, access to employment and higher levels of occupational opportunities improved with increased levels of education. However, during 1996 to 2011, the employment of females with higher levels of education increased at a faster rate than that of males with similar qualifications. Moreover, although education was the strongest predictor for working in high-skilled occupations for both males and females, this was more relevant for females, with a graduate degree having a greater effect. Females also achieved equity with males in respect to access to employment once they achieved tertiary education. Females with lower levels of education were less successful in competing with males for jobs that required lower levels of skills.

Since the findings showed that a tertiary level education (particularly a graduate degree) was positively related to access to employment, it was important to also determine the extent to which the field of study obtained influenced observed trends. The results showing persistent gender variations in the type of fields males and females obtained. There was a high male concentration in science, technology, engineering and mathematics (STEM) while females mostly studied subjects in humanities. The year 2011 further saw a higher proportion of males being employed compared to females regardless of the field of study obtained. However, while the number of females who had qualified in STEM remained significantly low, a higher percentage of those who studied in this field were more likely to be employed than unemployed. This suggested that for females in 2011, a qualification in STEM provided greater access to employment than other qualifications. In general, a substantial decline in the percentage of females who had studied in the humanities was observed between 1996 to 2011 (from 62,5% to 44,1%). A larger shift was to business, finance and communications (BFC). However, the shift not only increased female employment amongst BFC but it also resulted in higher levels of

unemployment. In contrast, between 1996 and 2011, lower percentages of female unemployment were consistently observed among STEM graduates compared to those qualified in BFC or humanities. The expansion of STEM and BFC graduates is a positive outcome for the country for two reasons. Firstly, these fields have been linked to improved economic growth in both developed and developing countries (Derudder & Witlox, 2008). Secondly, increases observed amongst females, if maintained, could contribute towards gender inclusive economic development in the country.

With regard to occupational opportunities, data further indicated clear male and female variations in employment and according to educational attainment. A greater proportion of females held low levels status jobs than males. However, slightly more females than males dominated professional and technical jobs. Managerial positions imply decision making powers (Heilman, 2001). Over the 15 years of reporting, very few females occupied managerial positions. While the percentage of female managers had doubled between 1996 and 2011, the increase observed was not enough to offset a gender balance in such positions. In fact, virtually no changes had occurred in gender gap rates for males and females working in managerial jobs. Males' entry into highs killed occupations were not necessarily limited by their levels of qualification whereas it was found that for females, a higher level of education was a determinant in obtaining employment in high skilled occupations. This was particularly true for those who had obtained a graduate qualification.

The results with regard to the industrial structure showed that education influenced access to the type of sectors males and females occupied in employment. Increased levels of education were found to have a positive effect in minimising gender inequalities observed in traditionally male dominated sectors (except construction) such as mining, transport and utilities thereby increasing access to female employment in those industrial sectors

5.2 THE INFLUENCE OF DEMOGRAPHIC AND SOCIO-ECONOMIC FACTORS

The discussion above showed that the period 1996 to 2011 has seen males and females experiencing unequal access to employment and occupational opportunities. While education improved particularly female access to labour market opportunities, gender differences persisted. The next discussion therefore examines if any observed variations between males and females can be explained by specific demographic and socio-economic factors.

It was revealed that employment increased with age. This finding was confirmed by both binomial and multivariate modelling, with sex gaps consistently observed in favour of males irrespective of age. However, the employment gender gap narrowed between 1996 and 2011, especially for young persons aged 15-34 years. While the influence of age between the sexes appears to suggest increased female inclusion in access to employment over time, two accompanying findings presented challenges. Firstly, over the 15 year period of reporting, the employment sex gap among young black Africans remained the highest and virtually unchanged between 1996 and 2011. Secondly, it was concerning also to note that the highest unemployment percentages were still observed among individuals aged 15 to 34 years. This was particularly true for black Africans and

coloureds, which indicates serious barriers to access to employment experienced by the majority of young South Africans. In order for South Africa to maximise the benefits of decreasing gender inequalities in future employment trends, targeted interventions (by age and race) have to be prioritised. Where such strategies exist e.g. National Youth Policy, 2009–2014, barriers to implementation have to be monitored and evaluated.

The results of this study showed the persistence of the country's historical patterns in employment. White males and females were more likely to be employed, followed by Indian/Asians, while lower percentages of employment were observed among coloureds and black Africans suggesting that 17 years into democracy, individuals' racial profiles influenced access to employment. At the descriptive level, some improvements were observed among the black African population. However, at a binomial level, the gains were not significant enough to disrupt historical trends. Within each race group, more males were employed than their female counterparts. Gender inequalities in employment were lowest for white and Indian/Asian population groups while a larger percentage of black African females were not employed compared to their male counterparts. Differences were however observed when age was factored into employment patterns by race. In 2011, young coloured females aged 15-34 years were the only group to record higher percentages of employment than males within the same age group, a picture that was different 15 years prior (1996). It therefore appears that the new democracy increased the inclusion of coloured females into employment. The position in the education status of persons of all races improved; however, the improvement observed in the black African graduate group had not been enough to offset a change in trends observed in the racial profile of high education. Improved levels of education were also positively related to increased employment access. Although, the proportion of employed black African females remains low (when compared to males and females belonging to other race groups), the gradual increases observed for those with a graduate qualification resulted in the biggest employment increases observed within this group over the 15 year period.

Marital status had a greater effect on males who were married or cohabiting and for females who had lost a spouse. Married/cohabiting males were more likely to be employed, while it was females who had lost a spouse who were mostly in employment. This suggests that, married or cohabiting females may be less compelled to seek employment due to possible financial safety net provided by working partners. However, they may be propelled to do so should the situation change when they lose spouses/partners. The results also revealed that marital status had a larger impact within the black African population group when compared to other race groups. This was shown in that there was a significant gender employment gap between males and females who were either married or cohabiting. On the other hand, although no gender gaps were observed between males and females who were never married, lower employment percentages were found among the black African population group when being compared to persons belonging to other race groups. These findings are not surprising. Between 1996 and 2011, high employment rates were found among young black Africans aged 15-34 while the never married population largely consisted of persons below the age of 24 years.

The results pointed to a number of factors that presented specific challenges to females' access to employment. Firstly, although higher percentages of employment were observed for both males and females with fewer minors, the impact was strongest for females than it was for males. Moreover, employment gender gaps (in favour of males) increased with an increase in the number of minor children, i.e., the more minor children in a household the lower the percentage of female employment compared to their male counterpart. Secondly, it was also found that after the age of child-bearing (35-54 years), the likelihood of females being in employment and working in high skilled occupations increased significantly than that of males in the same age group. Lastly, females who had delayed childbirth (first gave birth after the age of 30) were more likely to have improved access to employment and hold high skilled jobs. These results are supported by literature showing that the disproportionate burden of childcare between men and women within households influence female's access to employment (Margolis & Simonnet, 2003; Mabela & Fanoe, 2016). On the other hand, the dual roles of those in employment, i.e., as employees and as primary care givers limit occupational opportunities at work places (Turk, 2015). Results also showed that increased childcare responsibilities negatively impact percentages observed for employed persons with academically intense tertiary qualifications (i.e.., at least a university degree/higher diploma vs non-graduate qualification). For example, the fewer the number of children reported, the higher the levels of female educational attainment and employment compared to males. Solutions to childcare needs (such as the availability and affordability of childcare support e.g. crèches) may contribute to improved gender equality in access to childcare.

5.3 THE IMPACT OF SPATIAL EFFECTS ON ACCESS TO EMPLOYMENT

The last research question in this study ascertained if access to employment and occupations could be limited by the geographic locations of places of residence and locations of industry. Spatial effects were shown to play a critical role in determining access to employment. The highest percentages of employment in skilled occupations were found in districts and metros belonging to the economic hubs of the country i.e., Gauteng, the Western Cape and Kwa-Zulu Natal. However, while more males in these economic hubs recorded the highest percentages employment than males in most other areas, the largest gender differences (in favour of males) were shown to be prominent in areas with the highest concentration of lower levels of educational attainment, further suggesting the importance of education in reducing gender inequities in employment. The clustering of specific industrial sectors in various districts and metros impacted the extent to which levels of employment were distributed between males and females in those areas. For instance, the concentration of the primary (agriculture, mining) and secondary (manufacturing, construction, utilities) sectors within specific geographical areas led to some of the highest employment gender inequalities recorded within those geographical areas. Low levels of employment for both males and females were mostly reported in rural underdeveloped districts.

In this study the variable "move" was also used to determine the extent to which both males and females moved places of residence in relation to their levels of employment. In this respect, it was found that the lower the level of education, the least likely that both males and females had moved to obtain employment. However, literature shows that women have a low spatially flexibility compared to men but that for females, job access

has a stronger effect on employment outcomes (Antipova & Wang, 2011; Rodrigue, Comtois, & Slack, 2016). Indeed, the findings in this study showed that for female graduates having moved residential locations increased not only access to employment but also opportunities for occupying high skilled jobs. The results of this study also showed that while a higher percentage of males were more likely to be employed and hold high levels of jobs across all provinces in the country; females had increased access to employment and better occupations in provinces such as the Western Cape, Gauteng, Kwa-Zulu Natal and the Eastern Cape. Consequently, smaller gender gaps in employment were observed in those provinces. These results indicate that the ability to move to locations of employment is not only critical to improved access to jobs for all but also that a significant proportion of female migration into those areas could potentially lead to gender equality in employment within those regions/locations.

The effects of pre-democratic laws which geographically segregated different population groups in different areas could additionally, explain some of the racial and gender variations reported in access to employment. Apartheid policy resulted in the larger part of the population group (black African) being concentrated in semi-rural and rural areas (Dubow, 1989), while high male urban labour migration (from rural to urban areas) saw many black African males leaving families behind in search of employment opportunities (Brown, 1983). This also resulted in a high concentration of the black African female population in rural areas. To this day, rural areas in this country remain largely economically underdeveloped. The areas are characterised by low levels of education, lack of access to employment and high poverty levels (Carter, & May, 1999). These findings suggest that the effectiveness of gender equality redress strategies in employment for South Africa depend on the extent to which they are accompanied by the implementation of suitable policies to address rural socio-economic development.

In conclusion, 17 years (1994 – 2011) into a new political dispensation, the structure of the South African labour market remained largely unchanged with the black African population lagging behind in terms of employment and occupational opportunities. Moreover, the study showed that gender disparities in employment remained wide in favour of males. However, education attainment lowered observed gender gaps. This was especially true for females who had obtained a graduate degree. Additionally, specific demographic and socio-economic factors further restricted female employment and occupational outcomes. Geographical effects and industrial spatial clustering further determined access to employment and types of occupations. However, in terms of gender inequalities, levels of education also determined the extent of gender gaps with respect to employment geographically. Minimal gender inequalities in employment were recorded in areas with the highest concentration of higher levels of educational attainment. This further highlighted the importance of education in reducing gender inequities in access to employment.

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