Gendered trends in labour force participation and education in South Africa

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As the candidate's supervisor, I acknowledge that the dissertation has been submitted for examination. I have also perused the Turn-it-in report for the final dissertation and am of the view that any similarities between the candidates work and published or internet sources is incidental.

Supervisor signature 

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Abstract

In many countries, including South Africa, the average educational attainment of women has surpassed that of men. Economic theory and previous literature suggest that increases in education should result in increased economic participation. Despite this, in South Africa, the labour force participation rates of women lag behind those of men. Using NIDS data, this dissertation aims to investigate why this phenomenon occurs. Whilst several international studies have used decomposition analyses to investigate the factors responsible for gender differences in participation rates, there is a dearth of South African research that does so. This dissertation, therefore, adds to the literature by investigating South African gendered trends in labour force participation and education using descriptive statistics, and regression and decomposition analyses. The gender gap in participation is decomposed at cross-sections, and the general rise in African labour force participation rates over time, are then decomposed for men and women separately. Results indicate that the educational attainments of African men and women had consistently risen between 2008 and 2017. Women are found to have attained higher average levels of education than men but remain less likely to participate in the labour force. Education is shown to be positively and significantly related to the likelihood of labour force participation for men and women. Despite this, factors including the unequal division of childcare and the fact that fewer women live in urban areas, are suggested to be reasons why the participation gender gap persists. Overall, the results of this dissertation suggest that increasing female urbanisation and educational attainments (particularly to tertiary levels), as well as reducing the uneven division of childcare between genders, is likely to increase female labour force participation rates and reduce the gender gap in participation. Despite this, the study also finds that a larger portion of this gap remains attributable to behavioural differences in the way men and women respond to their individual characteristics. This suggests that even if the characteristics of men and women are equalised, unless differences in the way men and women behave are reduced, the participation gap is likely to persist.

Keywords: Labour force participation, gender, decomposition analysis

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Chapter One: Introduction

1.1. Background

The fifth sustainable development goal was to empower women and promote gender equality (United Nations, 2015). A success of this goal is reflected in the fact that for many countries, including South Africa, the average educational attainment of women has caught up with and even surpassed that of men (Ganguli et al., 2014). Human capital theory and previous empirical studies suggest that empowering women through improvements in education should lead to increased economic participation (Ntuli and Wittenberg, 2013; Ganguli et al., 2014; McConnell et al., 2016). For many countries, including South Africa, however, labour force participation rates are still higher for men than for women. This means that whilst, on average, women are more educated, they are less likely to participate in the labour force than men. This dissertation aims to investigate why this phenomenon is occurring in South Africa.

When examining the feminisation of the South African labour force, Casale and Posel (2002), for example, find that strict African female labour force participation rates had increased from 38,3% in 1995 to 46,7% in 1999, whilst male labour force participation rates had increased from 58,6% to 61,2%. These results indicate that firstly, a definite gender gap in participation existed, but secondly, that this gap had declined from 20,3% to 14,5% across this post-apartheid period. In spite of the well documented feminisation of the South African labour force and the seemingly large reduction in the participation gap in the immediate post-apartheid period, more recent studies show that participation gap persists and has since only faced modest declines. In particular, in 2019 the strict labour force participation rate for women was still 13.3% lower than the participation rate of men (Casale et al., 2020).

In terms of gender gaps in education, on the other hand, Casale and Posel (2002) find that the average years of education attained by women increased faster, and from a lower base than men post-apartheid, such that younger women were found to be more educated than younger men[1]. In addition, and more recently, women have been found to be increasingly more likely to achieve higher levels of education than men[2] (Statistics South Africa, 2015).

[1] This gap in education was larger, the younger the cohort considered, suggesting that the gap was also growing post-apartheid.

[2] For example, in 2001, women aged 20-29 were 1,2% more likely than men to obtain a tertiary qualification. By 2011, this had increased to 2,3%.

Evidently, despite women achieving higher average educational attainments than men, the participation gap persists.

A few international studies have specifically investigated gender differences in labour force participation and their determinants, using regression and decomposition analyses (Contreras et al., 2011; Abdulloev et al., 2014; Ganguli et al., 2014). In South Africa, however, there is a dearth of research that specifically explores this topic with decompositions. This dissertation, therefore, aims to fill this research gap by investigating gender differences in labour force participation using descriptive statistics, regression analyses, and decomposition analyses.

At the outset of this study, it is also important to note why labour force participation is the chosen labour market outcome of interest. The international literature often uses employment and labour force participation interchangeably. A likely reason for this is that in developed countries, especially, unemployment rates are typically low (Van der Stoep, 2008). South Africa's high unemployment rates, on the other hand, often mean that many people want to work but are unemployed (Bhorat and Leibbrandt, 2001). This dissertation aims to investigate why women are less likely to *choose* to join the labour force than men, despite their higher average educational attainments. Labour force participation is, therefore, a more suitable measure to use than employment as it includes the employed, as well as individuals who want to work but are unemployed. In the South African literature, two definitions of labour force participation are commonly used to account for the country's high level of unemployed individuals and discouraged workers. These definitions will be expanded on in Chapter Two (Ntuli and Wittenberg, 2013).

1.2. Overall Objective and Aims

The overall objective of this dissertation is to investigate why labour force participation rates are lower for women than for men, even though the average educational attainments of women have surpassed that of men in South Africa. This dissertation will investigate this phenomenon using recent data from the National Income Dynamics Study (NIDS). NIDS questionnaires contain detailed information on labour force participation, education, and are unique in their ability to determine the main caregiver for each child under 15 years of age (which the literature frequently suggests could impact participation gap). All available waves of NIDS will be used which cover the period from 2008 to 2017.

More specifically, this dissertation aims to answer three questions:

Firstly, how have the labour force participation rates for men and women changed in South Africa over time?

Secondly, in South Africa, how do the levels of education attained by men and women differ, and how have they changed over time?

And thirdly, how do the factors that influence labour force participation in South Africa differ by gender, and how have these influences changed over time for each gender?

1.3. Dissertation Structure

This dissertation will begin with an analysis of the available literature relevant to labour force participation and education. In the literature review chapter (Chapter Two), relevant Economic theories will be discussed that highlight the relationship between education and labour force participation and suggest reasons labour force participation decisions may differ by gender. This will be followed by a discussion of the empirical methods and findings of international and South African studies that are relevant to the topic of gendered trends in education and labour force participation.

Following this, Chapter Three will discuss and justify the chosen dataset, sample, and weighting methods used in this study. Descriptive statistics will then be presented that highlight the overall gendered trends in labour force participation and education in South Africa.

In Chapter Four, a discussion of the methods used in the multivariate analysis will be presented. The results of Probit participation regressions and multiple decomposition analyses will then follow and be discussed. Finally, the limitations of the chosen methods will be outlined with suggestions for future research.

Lastly, Chapter Five concludes this dissertation with a discussion of the overall findings of the literature, descriptive results, and multivariate results. A brief discussion on policy recommendations will also be presented.

Overall, this dissertation adds to the South African literature, firstly by using recent data to investigate why women are less likely to participate in the labour force than men despite their increasing educational attainments. Secondly, it adds to the dearth of literature that specifically decomposes gender differences in labour force participation in South Africa. Lastly, this dissertation investigates whether empowering women through education is sufficient to eliminate gender differences in labour force participation rates. It also highlights whether there are additional factors that are contributing to these differences that need to be addressed.

1.4. Hypothesis

Whilst the South African literature exploring the participation gap is limited, an analysis of Economic theory, and available South African and international studies (discussed fully in Chapter 2), suggests that factors such as prestige or social status, poor employment prospects and possible employment discrimination may be contributing towards women being less likely to participate in the labour force than men, despite their higher average educational attainment. In addition, South African women have been found to be more likely to act as the primary caregivers of children than men. If this constrains the amount of time they have to participate in the labour force, this unequal division of childcare is likely to be contributing to the participation gap. The international literature also suggests that it is likely that a larger portion of the participation gap will be explained by behavioural differences between men and women (as opposed to differences between their average observable characteristics). This implies that even if men and women had identical observable characteristics, unless they responded to these characteristics in the same way, the participation gap would persist. Such behavioural differences may be a significant reason why South African female labour force participation rates lag behind those of men, despite the fact that women are, on average, more educated.

Chapter Two: Literature Review

Introduction

South Africa is one of many countries where the average educational attainment of women has surpassed that of men (Ganguli et al., 2014). Previous literature and Economic theories suggest that increases in educational attainment should result in increased probabilities of labour force participation (Ntuli and Wittenberg, 2013; Ganguli et al., 2014; McConnell et al., 2016). For many countries, including South Africa, however, labour force participation rates remain higher for men than for women. The purpose of this chapter is to further investigate national and international gendered trends in labour force participation and education found in previous literature. The chapter also aims to review and discuss the relevant theories and literature available that may suggest reasons why in multiple countries, women are still less likely to participate in the labour force than men, even though they are, on average, more educated.

This chapter broadly consists of three main sections. The first section explains the Economic theory relevant to labour force participation and education, as well as the division of time within households. The second section of this chapter will discuss the key methods and findings of international studies that have investigated gender gaps in labour force participation[3]. Finally, the last section of this chapter will discuss the results and conclusions of relevant South African studies. Whilst there is a dearth of South African research that specifically decomposes labour force participation gender gaps, there are papers that directly or indirectly investigate participation trends and influences. These are useful in suggesting potential reasons why the participation gap persists.

At the outset of this chapter, it is important to define labour force participation. As mentioned previously, in the international literature, employment and labour force participation are often used interchangeably. In the South African literature, however, two definitions of labour force participation are commonly used to account for the country's high level of unemployed individuals and discouraged workers (Ntuli and Wittenberg, 2013). These definitions are based on two widely accepted definitions of unemployment. The strict definition of labour force participation classifies those who are employed or those who are unemployed, but actively searching for employment (known as the strictly unemployed), as participants. Those who would like to work but are unemployed and have not actively searched for work four weeks

[3] The gender gap in labour force participation refers to the difference in labour force participation rates between men and women (Ganguli et al., 2014).

before being interviewed (also known as discouraged workers) are classified as inactive (Casale, 2003). The broad definition of labour force participation, on the other hand, includes employed individuals and broadly unemployed individuals (which include those actively searching for work and discouraged workers) as participants (Casale, 2003). To study labour force participation and its influences in this dissertation, both definitions will be used to examine whether results vary according to how it is defined.

2.1. Theoretical Review

The first important theory to consider when investigating decisions centred around labour force participation, is the Neoclassical theory of labour supply[4]. The basic model assumes that an individual divides their time between either leisure or labour. Labour provides the benefit of wages at the cost of giving up leisure, but not all individuals decide to work (McConnell et al., 2016). Assessing the impact of wages on labour supply occurs at two margins; the intensive margin and the extensive margin (Cahuc et al., 2014). At the extensive margin, individuals first decide whether to work or not. At the intensive margin, on the other hand, individuals then decide how many labour hours to supply. The theory of labour supply is more broadly concerned with labour supply at the intensive margin (i.e., how many hours of labour individuals are willing to supply). This dissertation, however, focuses on whether individuals participate in the labour force or not, so the theory relevant to the extensive margin will be the focus of this discussion.

To decide to work, an individual's wage offering must be above their reservation wage[5], which could be affected by multiple factors. Non-labour income available from a spouse, or the need to take care of younger children, for example, may increase an individual's reservation wage and reduce their likelihood of participation (McConnell et al., 2016). Furthermore, if women are more likely to take care of younger children than men, for example, they are likely to face higher reservation wages which may be a reason they face lower probabilities of participation[6]. It follows that the higher the wage an individual can obtain, the more likely it is that their wage offering will exceed their reservation wage, which increases their likelihood of participation in the labour force (McConnell et al., 2016). This theory suggests that firstly, if individuals can

[4] See, for example, McConnell et al. (2016) for a more extensive summary of this model.
[5] A reservation wage refers to the minimum wage at which an individual is willing to work (McConnell et al., 2016)
[6] Hatch and Posel (2018), for example, show that in South Africa, women are more likely to be the primary caregivers of children than men. This will be discussed more in the third section of this chapter.

obtain higher wage offerings, their likelihood of participation should increase, but secondly, the chances of participation will also be dependent on the individual's reservation wage.

The Theory of Human Capital suggests that one possible way that individuals can obtain higher wage offerings is through increasing their investment in education. This theory was introduced by Becker in 1964 with the hypothesis that investment in education would be rewarded by higher earnings in the future (Cahuc et al., 2014). In this context, differences in individual wages reflect differences in certain productivities, or competencies, that are rewarded in the labour market. To obtain such productivities, investments in education are required at the expense of training costs. These include costs associated with attending educational facilities, learning materials, the opportunity cost of sacrificing potential revenue during the time devoted to studying, and even psychological costs from stress (Cahuc et al., 2014). The costs of education may also depend on an individual's abilities. Those with higher abilities may, for example, be able to progress through higher levels of education with lower amounts of effort, stress, or costs required. An individual will invest in a certain level of education if the present value of doing so is larger than the present value of not investing[7](Boeri and Van Ours, 2008).

From Becker's perspective, education can only be a source of increased earnings in the future, if wages reflect differences in productivities (Cahuc et al., 2014). Because of imperfect information in the labour market, however, employers cannot always observe a worker's ability or productivities. They can, nevertheless, infer the worker's productivity or abilities, using their investment in education as a signal (Boeri and Van Ours, 2008). In 1973, Spence suggested that education could serve to select individuals for specific labour market opportunities without actually increasing their productivities or efficiencies. Spence (1973) stated that often those who perform effectively in life also often perform effectively in their studies. Whilst productive efficiencies may not always be observable to employers, success as a student can serve as a signal of these competencies (Cahuc et al., 2014).

Regardless of whether education improves individual competencies or merely signals productive characteristics to future employers, these theories suggest that individuals who have attained higher levels of education, are likely to be rewarded in the labour market with higher wages. The theory of labour supply outlined previously explains that higher wage offerings are likely to increase an individual's likelihood of participation. One would, therefore, expect a

[7] This decision involves the comparison of the present values of future income flows less the full costs of education (Boeri et al., 2008).

more educated individual to be more likely to participate in the labour force. So, if women are, on average, more educated than men, theory implies that they should be more likely to participate in the labour force, *ceteris paribus*. As mentioned previously, however, even though their educational attainments are higher, on average, South African women are still less likely to participate in the labour force than South African, which contradicts this logic.

It is important to note, however, that the basic model of labour supply has faced multiple criticisms from the feminist literature. Some of these criticisms elucidate why women are still less likely to participate in the labour force than men. One main criticism of the model is that it does not differentiate between leisure and household work (Casale, 2003). Any time not spent in the labour market is, therefore, labelled as leisure. Dex (1985) argues that this is a primarily 'male' focused label. She explains that if women's work were the focus when developing the Neoclassical theory of labour supply, it is unlikely that non-market household chores, which consume much of a woman's time, would be categorised as leisure. More inclusive models have since been developed. Becker's (1965) model, 'A theory of the Allocation of Time', for example, improves on the basic labour-leisure model by differentiating between leisure and work in the home. The model assumes that a household's time is efficiently allocated between market work, work at home, and leisure. Time is also efficiently allocated amongst its members. Those who are more efficient in market activities, for example, would spend less time on non-market activities (such as household work) (Becker, 1965). Additionally, an increase in the market activity efficiency of a given member would impact the reallocation of time of other members in the household toward non-market activities (Becker, 1965). Even if women are intrinsically as productive as men in the market sector, they may be intrinsically more productive than men in the non-market sector, especially in terms of caring for children (Becker, 1974). Through socialisation, many women also tend to develop a comparative advantage in household activities and therefore spend more time working in the home (McConnell et al., 2016). If women spend more time completing household activities and looking after children than men, they may be less likely to have time to participate in the labour market. Men, on the other hand, may traditionally spend more time in market activities and are likely to gain more experience[8].

8 Results from the Australian Bureau of Statistics (2009), for example, found that in 2006, women spent an average of 33 hours and 45 minutes a week on housework, whilst men spent around 18 hours and 20 minutes on housework a week. Men were also found, on average, to spend more time in paid work than women. Cerrato and Cifre (2018) similarly find that in Spain, women's involvement in household chores are, on average, at least twice as much as the involvement of their male partners.

To examine how the allocation of time may further affect labour force participation decisions, one needs to consider a second component of Human Capital. In 1958, Mincer presented the notion that experience was an important component of training for work in the labour market. He suggested that the quality of work performance will depend on both formal education (as mentioned previously) and an individual's work experience. Over time, as individuals acquire more skills and experience, earnings are likely to increase (Mincer, 1958). Since women have been found to spend more time in non-market activities or take time off work to bear and raise children, they may be spending less time gaining work experience and may, therefore, face lower potential earnings (Becker, 1974). Again, if women face lower wage offerings, this may reduce their likelihood of participation.

An important criticism of Becker's 'A Theory of the Allocation of Time' is that the model assumes a joint utility function and an altruistic household head (Seiz, 1995). Household strategies would be based on assumed productivities of men and women, leading to women doing housework and men doing more market work, and this was assumed to be rational behaviour that maximised welfare (Seiz, 1995). These strategies, however, could be reflecting the fact that men may have more influence over decision making and may be acting in self-interest (Casale, 2003). To explore this idea, bargaining theories were developed that viewed households as an arena whereby decisions such as the division of activities would be bargained over (Seiz, 1995). The individual with the highest bargaining power would be the individual who would be in a situation that is relatively better off than their spouse if 'cooperation' failed. The individual with fewer options outside the household would be better off losing the bargain than failing to cooperate (Seiz, 1995). A woman with relatively low bargaining power who wants to work may be less likely to do so if her spouse would prefer for her to complete the household activities (Seiz, 1995).

From these theories, a few relevant implications should be noted. Firstly, Human Capital theory would suggest that higher educational attainments should increase an individual's wage prospects and, therefore, their likelihood of labour force participation. Despite this, there may be other factors, such as comparative advantage in childcare and non-market work, that may dampen this effect for women especially. Additionally, bargaining power within a household may also affect an individual's freedom to choose to join the labour force. Whilst one might predict that an increase in the educational attainment of women relative to men, should increase female participation and therefore lead to a decrease in the participation gender gap, gender

differences in bargaining power and the roles women often play in the household, may elucidate why the gap has not yet closed. The next two sections of this chapter will further investigate the potential reasons behind the labour force participation gap using empirical evidence from both the international and South African literature.

2.2. International Literature

As mentioned previously, the trend of women facing a higher average educational attainment than men, but lower labour force participation rates is not one that is unique to South Africa (Ganguli et al., 2014). This section will discuss international papers that have specifically investigated the participation gender gap. The general international trends of participation and education will first be discussed. This will be followed by a discussion of the relevant methods that have been used to investigate the reasons behind these trends further. Lastly, a discussion will be presented on the potential contributors to the gender gap in labour force participation that were suggested by the results of these studies.

2.2.1. Labour Force Participation and Education: Some General Trends

A study conducted by van Hek et al. (2016) compares gender differences in educational attainments across 33 European and US countries. Results indicate that overall, for cohorts born in 1965, women's average educational attainments had exceeded those of men. This gap (favouring women) seems to widen for cohorts born in the late 1970s onwards. In countries such as Hungary, Poland and Belgium, women actually started out-performing men in 1950 with this advantage expanding across the study period (up until cohorts born in 1982). Switzerland was the only country of the 33 studied where women's educational attainment still lagged behind that of men for cohorts born in 1982. Ganguli et al. (2014) similarly investigates gender gaps in education and participation for 40 countries. Their results show that in 27 countries (including both developed and developing countries), women have attained at least the same level of education as men. In countries such as Mongolia, Portugal, Brazil, Greece, Argentina and the Bolivarian Republic of Venezuela, women have attained, on average, between 0.8 and 1.2 years of schooling more than men.

A study by the OECD (2021) has also shown that the gender gap in education (favouring women), is wider at tertiary levels than at secondary levels. One of the potential reasons for this is suggested to be the relatively higher performance of girls at school which may give them greater access to tertiary education. In particular, the OECD's programme for international student assessment, shows that 15 year old girls consistently outperform boys in reading across

all OECD countries. The general finding of women achieving higher results than men is not unique to this study, or level of education. Conger and Long (2010), for example, find that in 2002 in Florida and Texas, men earned lower GPAs than women in college, and would often fall further behind after their first semester in college. Lai (2010), similarly finds that Japanese girls outperform boys in both middle school and primary school.

Despite this, globally, women have been found to be less likely to participate in the labour force than men (International Labour Organization, 2018). Ganguli et al.'s (2014) findings show that out of all 40 countries considered (including those in which the average female educational achievement surpassed that of men), only one country, Rwanda, reported labour force participation rates that were higher for women than for men. This was probably because the studied cohort had lived through a genocide which was likely to have altered gender roles in households and labour force participation (Ganguli et al., 2014). On a global scale, the participation gap also appears to have remained relatively persistent over time. In particular, the international labour organisation found that between 1990 and 2018, the global gap in labour force participation had only narrowed by 2% with the majority of the reduction occurring before 2009. Since 2009 the rate of improvement has slowed (International Labour Organization, 2018).

The phenomenon of women being less likely to participate in the labour force than men, despite their higher average educational attainments, is evidently not one that is unique to South Africa. Many international papers have specifically investigated such gender differences in labour force participation and education. This next section will discuss the methods of these papers in more detail as these will aid in guiding the chosen method of this dissertation.

2.2.2. Methods for Investigating Gender Differences in Participation

Much of the international literature investigating gender differences in participation, use a combination of descriptive and multivariate analyses. Regressions with binary dependent variables representing participation are frequently estimated, either for men and women separately, or for men and women together, with a dummy variable controlling for gender (Contreras et al., 2011; Abdulloev et al., 2014; Totouom et al., 2018). To further investigate the labour force participation gap, some studies also use decomposition analyses (Contreras et al., 2011; Abdulloev et al., 2014; Ganguli et al., 2014). Contreras et al. (2011) and Abdulloev et al. (2014), for example, use Probit regressions for labour force participation in conjunction with a detailed decomposition suggested by Yun (2004). This decomposition is used by the authors to explain the differences in the predicted average likelihoods of labour force

participation between two groups[9]. It is used in these studies to break down the participation gap into two components; the first component is the portion of the participation gap that can be explained by differences in the average characteristics between the two groups (such as differences in average educational attainments between men and women). The second component is the portion that can be explained by the differences in the coefficients of these two groups from their participation regression analyses (Yun, 2004). In participation decompositions, this coefficient effect is often interpreted as behavioural differences in the way the two groups respond to their characteristics (for example, this portion could suggest how much of the gap is caused by differences in the way men and women respond to education) (Abdulloev et al., 2014).

Contreras et al. (2011) decompose the difference in participation rates for the same group of women between two periods. They then do the same for men separately. This is useful as it highlights which factors are responsible for driving any changes in participation rates over a specific period for men and women separately. Abdulloev et al. (2014), on the other hand, decompose the differences in participation rates between men and women at a single point in time. This specifically explains potential reasons for the gender gap in participation at a cross-section. Ganguli et al. (2014) similarly follow an Oaxaca-Blinder decomposition style approach between genders at a cross-section. Their method examines how much of the gender gap in labour force participation can be explained by gaps in education, marriage, and motherhood[10]. In this analysis, they predict what the participation rates would be if the women had the same average levels of education as men and did not face marriage or motherhood gaps.

Shapiro et al. (2011) and Totouom et al. (2018) similarly investigate labour force participation differences in Kinshasa in the Democratic Republic of the Congo, and Cameroon, respectively. Unlike the papers discussed above, Shapiro et al. (2011) and Totouom et al. (2018) do not use decomposition analyses but focus on the results of multinomial logit regressions. In these

[9] The decomposition analysis proposed by Yun (2004) is similar to the Oaxaca-Blinder decomposition that is commonly used to explain wage differentials and investigate wage discrimination. Yun's (2004) decomposition, however, can be applied to non-linear functions. He also proposes a solution that overcomes the identification problem that occurs when using binary variables in the Oaxaca-Blinder analysis (Yun, 2005, 2008). This problem will be expanded on in Chapter Four of this dissertation.

[10] Here the 'education gap' is the average years of education of men less the average years of education of women. The 'marriage gap' is given by the difference in employment rates between women who are single and women who are married. Lastly, the 'motherhood gap' is given by calculating the difference in employment rates between women, aged 35 to 44, who have three children, and women who have no children (Ganguli et al., 2014).

regressions, the dependent variable represents participation in various sectors of the economy[11]. Totouom et al. (2018) raise the point that education and labour force participation may also be endogenous. To overcome this, they also use the instrumental variable technique in regression analyses, whereby the education of the household head is used as an instrument for education[12].

Finally, Chatterjee et al. (2018) investigate labour force participation for married women in India. Whilst the study does not specifically look at gender differences, it investigates the unusual 'U-shaped' relationship between education and labour force participation for women. In India, moderately educated women are less likely to participate in the labour force than less educated women and more educated women. To explore the reasons behind this, a combination of descriptive statistics and logit regressions for participation in the labour force are used. The results indicate that marriage, status/prestige, and a lack of employment for moderately skilled women could be reasons behind this unusual relationship (these are elaborated on below). The factors that influence this 'U-shape' also suggest reasons why education does not have the same effect on men and women.

Almost all the international papers discussed make use of regression analyses for labour force participation. Decomposition-style analyses have also been used multiple times to further identify the determinants of the labour force participation gap. The findings and implications of these studies will be discussed below.

2.2.3. Findings

Most of the international studies mentioned, find a positive relationship between labour force participation and education in general. Contreras et al.'s (2011) regression analysis suggests that education increases the likelihood of both employment and labour force participation for men and women (aged 25-54), and Abdulloev et al. (2014) find that an increase in the average level of educational attainment of women specifically, is likely to help close the gender gap in participation. Shapiro et al.'s (2011) regression results similarly suggest that in Kinshasa,

[11] Totouom et al.'s,(2018) dependent variable includes categories for whether individuals are employed in the public formal sector, the private formal sector, the informal sector, or whether they are unemployed (which is the base category). Shapiro et al.'s (2011) dependent variable has categories for variables for whether individuals are employed in the formal sector, unemployed, or out of the labour force with informal employment as the base category.

[12] The endogeneity could occur because those who are from advantageous backgrounds may be more likely to achieve higher levels of education and may be more likely to have connections and networks for employment opportunities. Alternatively, those who are employed may be able to use the money received from employment to finance further studies (Totouom et al.'s, 2018). The main idea behind the chosen instrumental variable here, is that the more educated a household head, the more the head would invest in their child's education, who would in turn have a high level of education.

education increases the likelihood of participation and improves access to jobs in the modern sector[13]. They also find that there is a gender dimension to this relationship. Men without university qualifications are more likely to find employment in the modern sector than women with the same level of education. Their findings suggest that there may be labour market discrimination against women in this sector (Shapiro et al., 2011). A report by the OECD (2021) similarly suggests that men with upper secondary qualifications (but not tertiary qualifications), face lower unemployment rates than equally educated women. More specifically, at an upper secondary level, female unemployment rates in OECD countries, are estimated to be 9%, whilst the estimated male unemployment rate for this education category is 6%. At a tertiary level, the female unemployment rate falls to 6%, whilst the male unemployment rate falls to 5%. Whilst even at a tertiary level, women are slightly less likely to find employment than equally educated men in OECD countries, the *reduction* in unemployment rates faced when moving from secondary to tertiary education is higher for women than for men. This suggests that women have more to gain in the labour market from acquiring a tertiary qualification than men do (which may be why women are more likely to acquire higher levels of education than men in so many countries).

Totouom et al. (2018) similarly find that education increases the chance of participation in the formal sectors in Cameroon, specifically. Although their findings imply that being a woman reduces the chances of employment or participation, they also suggest that being more educated aids in offsetting this negative effect (Totouom et al., 2018). As stated above, Chatterjee et al. (2018) find that the relationship between education and labour force participation for women, specifically, changes according to the level of education attained.

The literature suggests that factors that may be dampening the impact of education on labour force participation for women are marriage, the presence of young children in a household, and status/prestige. Contreras et al. (2011), for example, find that higher numbers of children in a household are associated with lower likelihoods of participation for women but higher likelihoods of participation for men (Contreras et al.'s., 2011). Chatterjee et al. (2018) find that part of the reason why women with moderate education levels are less likely to participate in the labour force than women with low levels of education, is that education allows them to marry into households with higher average incomes and drop out of the labour force. They also explain that caste or 'status production', or the prestige of a family contributes toward this

[13] In this study, the terms 'modern sector' and 'formal sector' are used interchangeably. The survey used distinguishes between the formal (modern) and informal sector based on factors including whether a given employer had a tax identification number or contributed to social security (Shapiro et al., 2011).

trend. In India, it is more acceptable for women of lower castes to be seen participating in the labour force. Women from higher castes are more restricted in their mobility. Middle-class women tend to strive towards staying at home to improve the prestige of their family but are also more likely to be more educated than women of much lower castes (but remain less educated than women of much higher castes) (Chatterjee et al., 2018). This helps explain why moderately educated women are less likely to participate than those with lower education levels. Their results also suggest that there is a lack of employment opportunities for moderately educated women in India. For women with much higher levels of education, on the other hand, the demand for labour is greater. This is especially true for occupations such as teaching and nursing, which require higher qualifications. The authors explain that such occupations tend to conform more to the gender stereotype of women being nurturing and may thus be seen to be more appropriate. The greater demand for female labour at this level is perhaps a reason why women of higher educational attainments (especially of tertiary levels) then become more likely to participate in the labour force, than moderately educated women.

Contreras et al. (2011) find that women are also more likely to participate in the labour force when they are household heads. This may be because women have more bargaining power as household heads and are more likely to be able to participate in the labour force freely, should they choose to. Alternatively, as a household head, they may be in a position where they need to work to provide for their family. These papers suggest that whilst education improves the chances of labour force participation for men and women, the presence of children, getting married, status production, employment opportunities, and bargaining power may dampen this effect for women by reducing the likelihood of female participation.

After 'closing' the education, marriage, and motherhood gaps, in the Oaxaca-Blinder *style* analysis, Ganguli et al. (2014) find that a large portion of the labour force participation gap remains unexplained by marriage, motherhood, and education across countries[14]. Whilst their findings suggest that education, motherhood, and marriage do impact the gender gap in labour force participation, there seem to be other factors that have a large impact on gender differences in participation. Abdulloev et al. (2014) similarly find that a large share of the participation differences remains attributable to coefficient differences between men and women. In their

[14] To 'close the gaps' Ganguli et al. (2014) calculate what labour force participation rates would be firstly, if women had the same education rates as men, secondly, if the motherhood gap did not exist, and thirdly if a marriage gap was not displayed, *ceteris paribus*. These 'counterfactual' female participation rates are then subtracted from participation rates of men to acquire counterfactual participation gaps. These gaps are then compared to the actual participation gaps observed to see how much of the gap can be explained by education, marriage and motherhood.

interpretations, Abdulloev et al. (2014) mention that this suggests that behavioural differences are responsible for a large portion of the participation gender gap[15].

The findings thus far generally indicate a positive relationship between education and labour force participation. Despite this, the possibility of employment discrimination, status, the effects of marriage, and the presence of children in a household may dampen this effect. The decomposition analyses from the international literature also commonly indicate that a large portion of the gender gap in participation remains unexplained by observable characteristic differences and can be attributed to differences in the way men and women respond to their average observable characteristics. Abdulloev et al. (2014) explain that this finding suggests that even if men and women's observable characteristics were equalised, the participation gap would remain unless behavioural differences were reduced.

2.3. South African Literature

Whilst the South African literature does not appear to have used any decomposition analysis to specifically break down the labour force participation gender gap, the articles discussed in this section outline labour market trends and aid in suggesting reasons why female labour force participation rates remain lower than participation rates of men in South Africa.

2.3.1. Labour Force Participation and Education

A study by Casale and Posel (2002) examines the feminisation of the post-apartheid South African labour force. Their results show that that strict African female labour force participation rates had increased from 38,3% in 1995 to 46,7% in 1999, whilst male labour force participation rates had only increased from 58,6% to 61,2%. This suggests that the gender gap in participation declined from 20,3% to 14,5% post-apartheid. Despite this seemingly large reduction in the participation gap in the immediate post-apartheid period, more recent studies have shown that further reductions in the participation gap have been modest. Three recent studies in particular have investigated South Africa's gendered trends in participation using descriptive statistics. Nishimwe-Niymbanira and Sabela (2019) use data from the Quarterly

[15] In decomposition analyses, the coefficient contribution is sometimes referred to as the 'unexplained portion' of a gap as it is the portion that cannot be explained by differences in the observable characteristics between the two groups. This is often attributed to discrimination when the given outcome is determined by a choice made by others (i.e., an employer determining individual wages) (Ntuli and Wittenberg, 2013). In a detailed decomposition (which will be expanded upon in Chapter Four) for a wage gap, coefficient differences in education, for example, can also be interpreted as gender differences in the returns of an additional year of education. If a given outcome is a choice made by individuals themselves, on the other hand, (e.g., the choice to participate in the labour force), the coefficient contribution is often interpreted as differences in behavioural responses to individual characteristics (Ntuli and Wittenberg, 2013). For example, a detailed labour force participation decomposition could show whether an additional year of education has a larger impact on increasing the likelihood of labour force participation rates of women than the labour force participation rates of men.

Labour Force Survey (QLFS) from 2010 to 2016, Mosomi (2019) uses cohort data from 2000 to 2014 that is constructed using both the Labour force survey (LFS) (2000-2007) as well as the QLFS (2008-2014)[16], and finally, Casale, Posel and Mosomi (2020) use data from the Post-Apartheid Labour Market Series (PALMS) from 1994 to 2019. Although all three studies show that there has been a general increase in the labour force participation rates of women, they also indicate that a definite gender gap in participation remains. In 2019, for example, the strict labour force participation rate for women was still 13,3% lower than the strict participation rate of men. The broad female labour force participation rate was similarly 12% lower than the broad male labour force participation rate (Casale et al., 2020)

In terms of education, Casale and Posel (2002) find that the average years of education attained by women increased faster and from a lower base than men post-apartheid, such that younger women were found to be more educated than men. This gap in education was larger, the younger the cohort considered, suggesting that the gap was growing post-apartheid. Mosomi (2019) similarly finds that women born more recently, are more likely to have attained qualifications that are of a matriculation (matric) level or higher, than men of the same age cohorts. Results from statistics South Africa (2015) corroborate these findings. In particular, in 2001, women aged 20-29 were 1,2% more likely than men to obtain a tertiary qualification. By 2011, this had increased to 2,3%.

In addition to South African women increasingly attaining higher average levels of education than men, studies have also suggested that women tend to outperform men in terms of their average results. Van Broekhuizen and Spaull (2017), for example, use population-wide panel data (including NSC exam results from the department of Basic Education South Africa, and university outcomes from the Higher Education Management Information System) to follow South African students from a 2008 cohort, as they enrol in and progress through university. They find that women are more likely to qualify for, enrol in, and complete undergraduate and bachelor's degrees than their male counterparts. After investigating 19 fields of study, they find that women are more likely to graduate than men in 12 of those fields. They also find that women are only less likely to obtain degrees in five fields, and this is mostly because men are more likely to enrol in those fields, not because women face lower completion rates. At a

[16] Mosomi defines a cohort as a group of individuals with the same year of birth. Studying cohorts allows for insight on how changing social norms and legislation have impacted female wages and labour force participation (Mosomi, 2019).

secondary level of education, Spaull and Makaluza (2019) similarly find that women tend to outperform men. Using recent 2018 Matric microdata and comparing the mean performance of an equal number of men and women in Grade 12, women were found to achieve better average results than men in all 13 potential subjects.

Moving beyond descriptive analyses, there have been a few South African studies that have estimated gender differences in labour force participation indirectly. Bhorat and Liebbrandt (2001), for example, investigate the determinants of wages for African men and women in South Africa but use Probit regressions for labour force participation as part of their method. These regressions are estimated separately by gender and include independent categorical variables for the levels of education an individual has attained. These regressions form the first of three stages used to model gender differences in earnings. The labour force participation regressions are used with a full sample of potential African participants. From the smaller sample of actual labour force participants, employment probability models are then estimated. Finally, the further reduced sample of employed individuals is then used to estimate a wage model. Following the Heckman two-step approach, the participation regressions act as selection equations for employment, and the employment regressions then act as selection equations for the wage model[17]. This again highlights the fact that employment and labour force participation cannot be used interchangeably in a country with such high unemployment rates (Bhorat and Leibbrandt, 2001). A more recent study by Mackett (2016) investigates gender differences in labour market outcomes in South Africa. This analysis similarly includes Probit regressions for participation for men and women, multinomial logistic models for labour market outcomes for men and women, and binary logistic panel models for the likelihood of participation. Finally, Fredericks and Yu (2018) also estimate Probit participation regressions for men and women separately, between 1997 and 2015 in South Africa. After estimating these regressions, they estimate similar regressions for employment and use the employment regressions to estimate an Oaxaca-Blinder style decomposition proposed by Burger and Jafta in 2006. This approach is used to break down the employment gender gap and determine whether employment discrimination is present (Fredericks and Yu, 2018)[18]. Whilst the study

[17] This procedure is used because the employment and wage equations are likely to be biased as they are estimated with a reduced, non-random portion of the potentially employable sample (Bhorat and Leibbrandt, 2001)

[18]Here, the coefficient contribution of the gender gap in employment is interpreted as discrimination. As mentioned above, Ntuli and Wittenberg (2013) explain that the 'coefficient differences' between two groups (i.e., the portion of a gap not explained by observable characteristics) is often interpreted as discrimination when the outcome of choice is dependent on decisions made by others (i.e., an employer choosing to hire certain employees).

only estimates decompositions based on employment, the basic participation regressions presented remain relevant to this dissertation, as they highlight gender-based differences in the influences of participation.

The regression results for the participation equations estimated by Bhorat and Leibbrandt (2001) show that education is an important influence of labour force participation for both men and women. Their results also suggest that women may need to attain a higher level of education than men, for education to significantly affect their decision to join the labour force. Frederiks and Yu (2018), on the other hand, generally find that any level of education greater than 'no schooling' increases the likelihood of participation for both men and women. Mackett (2016) finds that the higher the level of education, the more likely an individual is to participate, but that this impact is most important for younger women (age 19 – 35).

Ntuli and Wittenberg (2013) similarly use labour force participation regressions in their study. Their paper, however, focuses specifically on female participation. The study uses a decomposition proposed by Even and Macpherson (1993) to investigate why the labour force participation rates of women had increased in a post-apartheid period. This method is another decomposition analysis associated with binary dependent variables and is used to explain the increase in female labour force participation between two points in time. Again, this decomposition does so by explaining which part of the increase resulted from changes in the average characteristics of women, and which portion resulted from changes in their behavioural responses to thir characteristics over time (i.e., changes in their coefficients). The Even Macpherson (EM) method is, however, sensitive to the choice of the reference group for any dummy variables used in the analysis, and this is corrected for in the study by using a method suggested by Yun in 2005[19]. Although this study focuses specifically on women, the findings highlight the factors influencing labour force participation and indicate how these have changed over time in South Africa. In line with the above findings, the logit models estimated by Ntuli and Wittenberg (2013) show that education has positively impacted African female labour force participation, and they find that the impact generally increased with the level of education obtained. Their decomposition analysis showed that the increase in the education of women from 1995 to 2004 positively contributed to the increase in female labour force participation. Ntuli and Wittenberg's (2013) findings also suggest that an African woman in

[19] This problem is known as the identification problem, and it occurs when dummy variables are used in the EM and Oaxaca-Blinder decomposition methods. These methods are sensitive to the choice of reference groups used for dummy variables. This means that if dummy variables are used in these decompositions, the total coefficient effect from the decomposition will vary according to the chosen omitted group of the dummy (Yun, 2008). The procedure proposed by Yun corrects for this.

2004 would still be more likely to participate in the labour force than an equally educated woman with identical characteristics in 1995. In line with the general findings of Contreras et al. (2011), Ntuli and Wittenberg (2013) find that a large portion of the increase in female labour force participation remains attributable to changes in the way African women responded to their characteristics across the period studied[20].

The above results consistently indicate a positive relationship between labour force participation and education for men and women, which is in line with Human Capital theory predictions. The findings also show that the average educational attainment of women in South Africa has overtaken that of men, but their labour force participation rates lag behind men. As mentioned previously, this dissertation aims to investigate this contradiction further.

It is important to note here, however, that although education is generally associated with higher labour force participation rates, the impact of education on labour market participation is likely to be dependent on the fields of study and the types of qualifications that individuals attain. A paper by Moleke (2006) investigates the employment successes and experiences of graduates in South Africa. She suggests that some qualification fields, such as Engineering, impart skills that are job-specific and are understood clearly in the labour market. Such qualifications may provide evidence that graduates have the necessary skills required to perform productively at work. More general qualification fields, such as the Humanities, on the other hand, impart skills that may not be job-specific and may result in employers being less certain about the graduate's potential productivity (Moleke, 2006). She further explains that this may be a reason that Humanities students, for example, typically face lower employment prospects[21] (Moleke, 2006). If women tend to acquire qualifications in fields that have lower employment prospects, they may be more likely to drop out of the labour force, which could contribute to the gender gap in participation.

Moleke (2006) finds that for the fields of Engineering, Agriculture and Medical Sciences, and Economics and Management Sciences, 60% or more of the graduates find work immediately. Three out of these four fields of study comprise more males than females (Moleke, 2006). Van Broekhuizen and Spaull (2017) similarly find that male-dominated fields include Engineering, Computer Sciences, Mathematical Sciences, Architectural Science and Agricultural Sciences.

[20] The authors explain that changing political, social, and economic conditions after the apartheid period are likely to be potential reasons for the changes in behavioural responses, and thus seem to have contributed to the significant increase in African female labour force participation.

[21] In this case, employment prospects refer to how long it takes individuals to find work.

They find that women, on the other hand, tend to dominate fields such as Consumer Sciences, Psychology, Social Sciences, Communication, Education, Health Sciences, Linguistics, Arts, Public Management, Natural Sciences, Law and Business Sciences. Moleke (2006) similarly finds that women were more likely to pursue fields such as Humanities and Arts, Education and Medical Sciences. Whilst she finds that those studying Medical Sciences faced high probabilities (79.3%) of finding work immediately, less than 60% of those who studied Humanities, Education, Law and Natural Sciences were able to do so (Moleke, 2006).

Whilst the average level of education attained by women has overtaken that of men in South Africa, women may be more likely to obtain qualifications that do not secure employment as quickly as some of the fields dominated by men. Again, if it takes longer for women to find employment, they may be more likely to become discouraged workers (and therefore drop out of the labour force according to the strict definition) or even become strictly inactive. This could be a factor contributing to the participation gender gap.

Thus far, the potential relationship between education and labour force participation in South Africa has been discussed. The next section will investigate what other factors may be contributing to the persistent participation gender gap.

2.3.2. Other potential influences

Another important trend to consider in the South African labour market, is the fact that the recent increase in female labour force participation was not met with equal increases in female employment. When looking at unemployment rates, Nishimwe-Niymbanira and Sabela (2019) find that the strict unemployment rates (which exclude discouraged workers) of women were higher than those of men. Fredericks and Yu (2018) find a similar trend between 1995 and 2015. The findings of Mosomi (2019) and Nishimwe-Niymbanira and Sabela (2019) also suggest that women are more likely to be discouraged workers than men. Mosomi (2019) explains that a lack of employment is likely to increase the number of individuals who become discouraged and drop out of the labour force altogether. Since women are more likely than men to be unemployed or discouraged workers, by this logic, more women would be expected to drop out of the labour force than men. This could be a reason why female participation rates are lower than those of men.

Another important driver of the labour force participation gap could be the responsibilities taken on by men and women after marriage. Mackett (2016), for example, finds that marriage significantly increases the likelihood of male labour force participation but has an insignificant

impact on female labour force participation. Fredericks and Yu (2018) similarly find that being married increases the likelihood of male participation, whilst it consistently decreases the likelihood of female labour force participation. This may be because traditionally, women may be more likely to take responsibility for work in the home. The results from Nishimwe-Niymbanira and Sabela (2019), and Casale et al. (2021) support this notion as they show that women are more likely to do unpaid work (such as household maintenance) than men. Ntuli and Wittenberg (2013) similarly find that marital status is negatively related to female labour force participation. It should be noted, however, that the proportion of African married women declined between 1995 and 2004 (Ntuli and Wittenberg, 2013). The influence of marriage could be another reason for the participation gender gap, but since the proportion of married women is declining in South Africa, it may not be responsible for a particularly large component. With the decline in marriage rates, the number of households headed by females has increased (Casale and Posel, 2002). These household heads were mostly unmarried or not living with a partner. Casale and Posel find that unmarried women faced participation rates that were much higher than married women. The decline in marriage rates and the rise in the number of female-headed households is, therefore, likely to be a reason female labour force participation has previously increased. At the same time, Posel et al. (2011) point out that although marriage rates are low, particularly for African women, cohabitation rates are increasing. This may have a similar effect on labour force participation as marriage and may, therefore, contribute to the gender gap in participation. Various marital states are, therefore, likely to have contradicting impacts on gender differences in labour force participation and are important to consider.

If women are more likely to stay at home and look after children, the presence of children in the home may also be a reason why the labour force participation gender gap has been so persistent. A study by Hatch and Posel (2018), for example, uses South African data from the National Income Dynamics Study (NIDS) and finds that women are the primary caregivers of children for a large majority of their sample. This could suggest that women's labour force participation decisions are more likely to be constrained by the need to look after children, than the participation decisions of men.[22] In line with this finding, Bhorat and Leibbrandt (2001) find that the presence of children in a household does not impact the likelihood of labour force

[22] Casale et al. (2021) further show that working-age women spend a larger amount of time caring for persons than working-age men. This gender difference in time spent on care increases substantially when the sample is restricted to working age individuals with at least one child younger than 7 years old.

participation for men. In contrast to this, for women, the number of children in the household significantly decreases their likelihood of participation. Fredericks and Yu's (2018) study, on the other hand, finds that the number of children in a household is negatively related to the likelihood of participation for both men and women, although it should be noted that generally, the negative relationship was stronger for women than for men. Ntuli and Wittenberg (2013) also generally find that having children under the age of 14 in the household is associated with lower likelihoods of female labour force participation with one main exception; when using the broad definition, children under the age of seven were positively related to the likelihood of participation, but when moving to the strict definition, they negatively affected the likelihood of participation. This could indicate that having younger children may increase a woman's desire to work but may not lead to her actively searching for employment (Ntuli and Wittenberg, 2013). Another important finding of Hatch and Posel's (2018) study may help to explain this result. In South Africa, women were found to be more likely to pay for their child's educational expenses than men. This suggests that having children may increase the need for a woman to work and provide financial support for her child's schooling. It should also be noted that in South Africa, the average family does not conform to the normal conjugal family unit. From the general household survey in 2005, it was found that approximately 35% of South African children live with both a mother and father, whilst at least the same proportion lives with a mother and without a father (Budlender and Lund, 2011). It was similarly found that men are less likely to provide financial support, and women often have to reconcile the need to be both the income-earner and caregiver within a home (Budlender and Lund, 2011). If women want to work and provide financial support for children, but are also the primary caregivers of their children, this may constrain their ability to work or actively seek employment.

Again, it should be reiterated that in the international studies, when using decomposition analyses, Ganguli et al. (2014) and Abdulloev et al. (2014), find that a large portion of the labour force participation gender gap remains unexplained by characteristic differences between men and women, and this portion is attributed to differences in the behavioural responses of men and women. Whilst the above papers do not specifically test for this in the South African context, it is worth noting that that differences in unobservable characteristics (such as attitudes towards working) or behavioural differences between men and women (i.e., differences in the way they respond to certain characteristics) may also be contributing to the gender gap in participation and how it has changed over time.

Concluding remarks

Human Capital theory suggests that higher educational attainments should increase the likelihood of labour force participation by increasing an individual's potential wage. The international literature has found that whilst a positive relationship exists between education and participation, the effects of marriage, prestige, possible employment discrimination, and the presence of children in a household may dampen this effect. The international literature also suggests that a large portion of the gender gap in labour force participation may be attributed to behavioural differences in the way men and women respond to their characteristics. South African research has shown that the average educational attainment of women has overtaken that of men. In line with theory and international literature, the South African literature has also shown that education positively impacts labour force participation in South Africa for both genders. Despite this, labour force participation rates are lower for women than for men. This literature suggests that women are more likely to do unpaid work and care for children than men. Getting married or having children have been found to have differing effects on labour force participation for men and women. These factors, along with high female unemployment rates, could be contributing to the persistent labour force participation gap. Women may also be more likely to pursue fields where it takes them longer to find employment than men, which may lead to women dropping out of the labour force. There is, however, a lack of South African research that specifically investigates the participation gender gap by breaking it down using decomposition-type methods. There is, therefore, a definite need to use a decomposition analysis to investigate that factors responsible for the gender participation gap in South Africa. This dissertation aims to meet this need and, therefore, contribute to the South African literature by specifically investigating gender differences in labour force participation using descriptive statistics, Probit regressions, and decomposition analyses. The next chapter will explain the dataset, sample, and weighting methods used to do so and present a descriptive analysis of recent gendered trends in labour force participation and education in South Africa.

Chapter Three: Description of Data and Trends in Labour Force Participation and Education

Introduction

South Africa has been found to be one of the multiple countries where the educational attainment of women has surpassed that of men. Despite this, the labour force participation rates of women have consistently lagged behind the participation rates of men. This chapter aims to examine the existence of these trends further using recent data from the National Income Dynamics Study (NIDS). The chapter will start with an explanation and justification of the choice of the dataset used in this dissertation. The chosen sample and weighting methods used in all empirical work will then be described. Finally, descriptive statistics will be presented that highlight recent gendered trends in labour force participation and education in South Africa. Overall, the findings of this chapter generally mirror the findings of previous studies in terms of the fact that women, on average, are found to be more educated than men. Despite this, the results also find that a persistent gender gap in labour force participation remains.

3.1. Data

To conduct this study, survey data from NIDS will be used. NIDS comprises a large sample with more than 7 300 households across South Africa, and contains valuable information on labour market participation and education (Brophy et al., 2018). The survey began in 2008 and has been repeated amongst the same household members every two years[23].

Whilst it must be recognised that there are other South African data sources, such as the Quarterly Labour Force Survey (QLFS), or the Post-Apartheid Labour Market Series (PALMS), that cover a longer time period and have larger samples, NIDS is unique in its ability to match children with their primary care-givers. Very few labour market studies have such detailed information relevant to children and child-care specifically. [24]

NIDS includes a child questionnaire (for household members below the age of 15) with detailed information on parental status and child-care (Magadla et al. 2019). In addition, it includes a

[23] It should be noted, however, that in 2017, a 'top up sample' of additional households was added to the NIDS dataset. This was done in the hopes of improving the representation of higher income households, amongst which there had been greater attrition (especially amongst the Indian and White households which, on average, have higher incomes) (Branson, 2019).

[24] In particular, a paper by Budlender (2019) investigates the changes in the care burden over the transition to adulthood, and similarly uses the NIDS dataset. One of the characteristics used to justify NIDS as the chosen dataset, is the question available identifying the main caregiver for each child under 15 years of age. Budlender further explains that this characteristic is not found in other South African datasets.

household questionnaire, and an adult questionnaire (for those 15 years old and older). Together, the adult and child questionnaires uniquely allow for a variable to be created, that measures the total number of children that an individual is the primary caregiver of.

As mentioned in Chapter 2, the South African literature in particular, has recognised an uneven division of childcare within households, and has even pointed to this as a potential reason for the participation gap (see for example Casale et al, 2020). The ability to further investigate the impact of the uneven division of childcare on the labour force participation gap, therefore, remains an important aspect of this study. In the next chapter, characteristic differences in this variable, between men and women, similarly prove to be a significant contributor to the participation gap. The combination of multiple education variables, labour force participation information, and the unique ability to match children with their primary caregivers, therefore makes NIDS an ideal dataset to use for the purpose of this study.

The dissertation will make use of all five waves, which were surveyed between 2008 and 2017 (Brophy et al., 2018). It is important to note that the NIDS dataset will be used as repeated cross-sections and that panel data techniques will not be employed. This is because being able to investigate the influence of education on participation is a key focus in this study. When using panel data methods such as fixed effects estimations, variables that are constant or grow at a constant rate are omitted (Wooldridge, 2010). Even if there are some labour force participants who are also studying, little variation is likely to be present in the education categorical variables. Education is, therefore, likely to be dropped out of the estimations or be insignificant or unreliable due to little variation (Wooldridge, 2010). Whilst random effects estimations allow for the inclusion of time-invariant variables within a panel, the models assume unobserved characteristics are uncorrelated with the independent variables – this would assume that unobserved characteristics, such as ability, would be uncorrelated with education, which is unlikely (Wooldridge, 2010). Such panel data methods would, therefore, be inappropriate in this context.

The data source of this study will be confined to all five waves of NIDS and will, therefore, cover the period of 2008 – 2017 alone. This allows the data to be confined to one source, which reduces inconsistencies in survey samples and survey questions.

3.2. Chosen Sample

The sample used in this dissertation will be restricted to working-age African individuals. This is because NIDS attained a low baseline response from White and Indian individuals, and this response had declined further by 2014 due to high attrition (Brophy et al., 2018). Not all races

are fully or evenly represented in all waves of the survey, and African individuals make up the majority of the NIDS working-age sample. African individuals also had the lowest attrition rates across the five waves (Brophy et al., 2018). Multiple South African studies investigating labour force participation similarly restrict their samples to those who are African only (Naudé and Serumaga-Zake, 2003; Ntuli and Wittenberg, 2013; Mosomi, 2019). Ntuli and Wittenberg (2013), for example, explain that after the end of apartheid in 1994, the constitution had been altered to encourage more fair and equal treatment of African women in the labour force. Whilst multiple studies have investigated changes in labour market participation for African women in the post-apartheid period, Mosomi (2019) points out that more than two decades after the end of apartheid it is important to investigate what progress has since been made by Africans and women, especially. It is also likely that the after-effects of apartheid still have a large impact on racial differences in education, labour force participation and their relationship[25]. For these reasons, the sample will be restricted to African individuals only.

In this dissertation, individuals are classified as working-age if they are between 15 and 59 years old, as South Africans can apply for a state pension from the age of 60 (South African Government, 2020). Theoretically, from the age of retirement, they should no longer be considered as part of the working-age population (Casale, 2003).

3.3. Weighting

Because the data are used as repeated cross-sections, this dissertation makes use of calibrated cross-sectional weights provided by NIDS. These weights are calculated as the inverse of the probability that a given individual would be selected and respond to the survey. They are then calibrated to match Statistics South Africa's (Stats SA's) mid-year estimated South African population totals of each wave (Branson and Wittenberg, 2018). All results are also weighted

[25] Fredericks and Yu (2018) for example, found that for those who were employed in both 1997 and 2003, white individuals had significantly higher average educational attainments than African individuals. This difference had only declined slightly across the six-year period. After estimating separate participation regressions for each race, they find that education at high levels had a larger impact on increasing participation for African individuals than white individuals. There are evidently large differences between the average levels of, and the relationship between education and labour force participation between African and white individuals.

so that the standard errors and confidence intervals account for the NIDS stratification and clustering[26].

3.4. Descriptive Analysis

3.4.1. Trends in Labour Force Participation

The first research question in this dissertation entailed investigating how the labour force participation rates for men and women have changed in South Africa. As mentioned previously, in South Africa, two definitions of labour force participation are used which are based on two definitions of unemployment. This is done to account for the country's high number of unemployed and discouraged workers.

The strict definition of labour force participation includes those who are employed or actively searching for employment as participants, whilst discouraged workers are classified as inactive. The broad definition of labour force participation, on the other hand, includes employed individuals, those actively searching for work, and discouraged workers as participants (Ntuli and Wittenberg, 2013). When investigating labour force participation, both definitions are used to examine whether (or how) results vary according to how it is defined. The labour force participation variables are dummy variables that equal one when an individual is classified as a labour force participant, and zero when inactive.

To address the first research question, labour force participation rates (LFPR) are calculated according to the following equation:

$$LFPR = (actual\ labour\ force \div potential\ labour\ force) \times 100$$ (McConnell et al., 2016)

These participation rates are calculated for men and women for each wave of the NIDS dataset. A participation gap is then calculated by subtracting male labour force participation rates from female participation rates for each wave. These results are presented in table 3.1 and 3.2 below.

[26] It should be noted that one of the strata in the chosen sample had a single cluster/primary sampling unit (PSU). This resulted in insufficient information to calculate an estimate of that stratum's variance (Dan, 2021). To correct for this Stata's built-in single unit option is used when setting up the weights mentioned above. Within this option there are three methods that can be chosen to account for this issue. All results use the scaled option – this uses the average of the variances from strata that have multiple sampling units, for the stratum with a single PSU. The other two available options include the centred method with centres the stratum with a single PSU at the grand mean instead of the mean of the stratum. Lastly, the certainty method treats the stratum with single PSUs as a certainty unit, which contributes nothing to the standard error (Dan, 2021). The analyses of this dissertation were attempted using all three methods and the overall results and their significance were mostly the same.

Table 3.1. Broad Labour Force Participation Rates for African Men and Women

	Wave 1 (2008)	Wave 2 (2010)	Wave 3 (2012)	Wave 4 (2014/15)	Wave 5 (2017)
Female	60,582%	49,186%	55,903%	57,731%	57,042%
	(1,290)	(1,393)	(1,216)	(1,00)	(1,014)
Male	69,595%	59,522%	68,209%	69,081%	69,812%
	(1,532)	(1,630)	(1,204)	(1,010)	(0,980)
Difference	-9,013%	-10,335%	-12,306%	-11,350%	-12,770%

Source: Own Calculations using NIDS data from 2008 - 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
Sample is restricted to working-age African individuals

Table 3.2. Strict Labour Force Participation Rates for African Men and Women

	Wave 1 (2008)	Wave 2 (2010)	Wave 3 (2012)	Wave 4 (2014/15)	Wave 5 (2017)
Female	53,154%	43,706%	52,123%	56,042%	55,223%
	(1,248)	(1,378)	(1,179)	(1,016)	(1,067)
Male	65,998%	55,311%	65,361%	67,276%	68,530%
	(1,600)	(1,736)	(1,257)	(1,071)	(1,040)
Difference	-12,843%	-11,606%	-13,238%	-11,233%	-13,307%

Source: Own Calculations using NIDS data from 2008 - 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
Sample is restricted to working-age African individuals

The first important finding of these calculations is that regardless of the wave considered, the participation rates of African women are substantially lower than the participation rates of African men in South Africa. This is in line with previous South African studies (Fredericks and Yu, 2018; Nishimwe-Niymbanira and Sabela, 2019; and Mosomi, 2019).

Unlike the findings of some South African studies (especially papers focusing on female labour force participation in the post-apartheid period) the above results do not show a consistent rise

in African female labour force participation rates. That being said, many of the post-apartheid studies that find evidence of more consistent trends of rising female labour force participation rates (such as those by Casale, 2003 and Ntuli and Wittenberg, 2013) use earlier data that focus on five to ten year periods post-1994. Whilst Nishimwe-Niymbanira and Sabela's more recent study (2019) still finds that female labour force participation rates have risen, they only compare strict participation rates of women in 2010 and 2016. If one looks only at the strict labour force participation rates of women for Wave 2 and Wave 5, the results presented above are still in line with their findings. Mosomi's (2019) more recent labour force participation statistics are presented in age cohorts, so it is harder to compare total labour force participation rates found between 2008 and 2015. Mosomi's (2019) results do, however, show that the increase in female labour force participation was less substantial between 2008 and 2015, than between 1993 and 2005 (which again represents a period more similar to that used in post-apartheid studies).

For both men and women, labour force participation rates had dropped substantially between Wave 1 and 2. Using QLFS data, Fredericks and Yu (2018) similarly find a drop in labour force participation rates between 2008 and 2010 for men and women in South Africa. This is likely to be because Wave 2 (2010) occurred after a global recession and financial crisis. The aftereffects of the Economic crisis could have made it difficult for individuals to find employment and may have led to them dropping out of the labour force. A research report prepared by Ngandu et al. (2010) uses QLFS data to investigate the socio-economic impact of the global world recession in South Africa. They find that job losses linked to this crisis were apparent from the first quarter of 2009 and continued into the first two quarters of 2010. They also found that between the last quarter of 2008 and the second quarter of 2010, 739 000 individuals dropped out of the labour force as they became discouraged from seeking employment (Ngandu et al., 2010). Verick (2011) similarly found a substantial drop in South African employment rates and a rise in the proportion of discouraged workers between 2008 and 2010. In addition, his multinomial logistic estimations suggest that a main impact of the crisis in South Africa was evident in increases in discouragement. At least strictly speaking, this similarly suggests that the crises resulted in a drop in labour force participation rates between 2008 and 2010. [27]

[27] A report on labour market dynamics by Statistics South Africa (2015) similarly suggests that the global recession resulted in a decline in the number of employed individuals for two successive years (2009 and 2010), with large increases in the number of unemployed individuals, discouraged workers, and individuals who were not economically active. Data from the World Bank (2021) generally corroborate the above findings indicating that South African labour force participation rates decreased between 2008 and 2010.

To further confirm that the observed decline in participation rates between Wave 1 and 2 is not out of place, this dissertation also calculates labour force participation rates using data from the QLFS and PALMS. The sample is similarly restricted to working-age African men and women between 2008 and 2010. For both datasets, the estimated participation rates for the strict and broad definitions similarly face a general decline across the period. It is worth noting that the proportional decline is smaller when using QLFS or PALMS data than when using NIDS data, particularly for the broad labour force participation rates. Whilst multiple factors could explain the size differences in the drop in participation rates across datasets (such as differences in the sample of respondents, the sample size and even the phrasing and structuring of the questionnaires) the general direction of the trend between 2008 and 2010 consistently remains the same.

The dire employment conditions that followed the global financial crisis are, therefore, likely to be responsible for the considerable decline in labour force participation rates in between Wave 1 and 2. It is also worth noting that globally, there has been some slowing and even reversing of the previous trends of rising participation rates (International Labour Organization, 2019). In the United States, for example, total labour force participation rates declined between 2007 and 2014[28].

After Wave 2, however, there is a general trend of rising female labour force participation rates with a very slight decline in Wave 5[29]. Male labour force participation rates have also risen more consistently after Wave 2. This has resulted in a persistent gender gap in labour force participation. For both men and women, the strict labour force participation rates are always lower than the broad labour force participation rates demonstrating the presence of discouraged workers in the country. The gender gap in participation is also larger for the strict definition for most waves, which suggests that women are more likely to be discouraged workers than men. This is in line with the findings of Mosomi (2019) and Nishimwe-Niymbanira and Sabela (2019). As stated in the previous chapter Mosomi (2019) even points out that poor employment prospects (such as high chances of unemployment and high discouraged worker rates) may

[28] Whilst the recession between 2006 and 2007 is suggested as one potential reason for this decline, other drivers of this trend have been suggested to include the aging population and the baby boom generation's retirement (McConnell et al., 2016).

[29] As mentioned above, in Wave 5, NIDS underwent a sample top-up whereby additional wealthier individuals of all race groups were interviewed. This sample change could be a reason the general trend in participation rates fluctuated or changed slightly between 2015 and 2017. Regardless of the slight dip in female labour force participation rates, overall, the general trend between 2010 and 2017 was one of increasing participation rates.

lead to women becoming discouraged from seeking work without finding employment, and may lead to them dropping out of the labour force altogether.

Overall, the above findings are generally similar to the results of recent South African studies. The participation rates for both men and women have mostly increased from Wave 2 to Wave 5, but a persistent gender gap in labour force participation remains.

3.4.2. Trends in Education

The second research question of this dissertation aims to assess how the levels of education attained by men and women differ in South Africa, and how these have changed over time. The NIDS surveys include questions that allow for education to be measured in multiple ways. The first measure of education used in this chapter calculates the years of schooling each individual has attained[30]. Table 3.3 below shows the mean years of schooling attained by men and women for each wave of the dataset. An education gender gap (similar to the labour force participation gap mentioned above) is also calculated by subtracting the mean years of education attained by men from the mean years of education attained by women.

Table 3.3. Mean Years of Schooling Attained by Each Gender

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5
Women	9,061	9,414	9,637	9,965	10,361
	(0,106)	(0,0949)	(0,087)	(0,073)	(0,073)
Men	8,864	9,237	9,416	9,764	10,222
	(0,122)	(0,109)	(0,095)	(0,084)	(0,076)
Difference	0,197	0,177	0,221	0,201	0,139

Source: Own Calculations using NIDS data from 2008 to 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
Sample is restricted to working-age African individuals

For both men and women, the mean years of education attained has consistently increased between 2008 and 2017. The educational attainment of the population remarkably increased between Wave 1 and 2, despite the potential after-effects of the Economic crisis. The education gap is somewhat persistent, apart from its drop in Wave 5. Regardless, this gap is always positive suggesting that the mean years of education attained by women is higher than that attained by men. In line with previous studies (such as Ganguli et al., 2014 and Mosomi, 2019), this implies that women are, on average, more educated than men in South Africa.

The NIDS survey can also be used to create categorical variables that indicate the highest level of education an individual has attained. These include categories for individuals with no

[30] This variable is calculated by considering the highest qualification or education level an individual has achieved, and assigning the years in which an individual would be expected to achieve that qualification. For example, an individual with a matric, or qualification equivalent to a matric, is assigned a 'years of school' value of 12. This continuous measure of education allows for gender comparisons of mean educational values.

schooling, those who have attained levels of education between grades 1 and 7, those who have achieved levels between grades 8 and 11, those who have matric, and those who have a tertiary qualification (which includes those with degrees, tertiary diplomas and tertiary certificates). Table 3.4. shows the proportion of men and women who have attained each level of education. These proportions are calculated for each wave of the dataset.

In line with the above means, the proportions shown below indicate that both African men and women are becoming more educated. The proportions of African men and women without any schooling declined across the period of 2008 to 2017. The proportion of African men and women with tertiary qualifications, on the other hand, increased consistently across all five waves.

Whilst the proportion of those with no schooling is declining, the below findings suggest that women are actually more likely than men to achieve no schooling at all. This is true for all waves. Despite this, women are also consistently more likely to attain tertiary qualifications than men. This difference fluctuated but was substantially larger in Wave 5 than Wave 1, favouring women. These results suggest that women are more likely than men to have no education at all, but if women are educated, they are likely to attain higher levels, on average, than men.

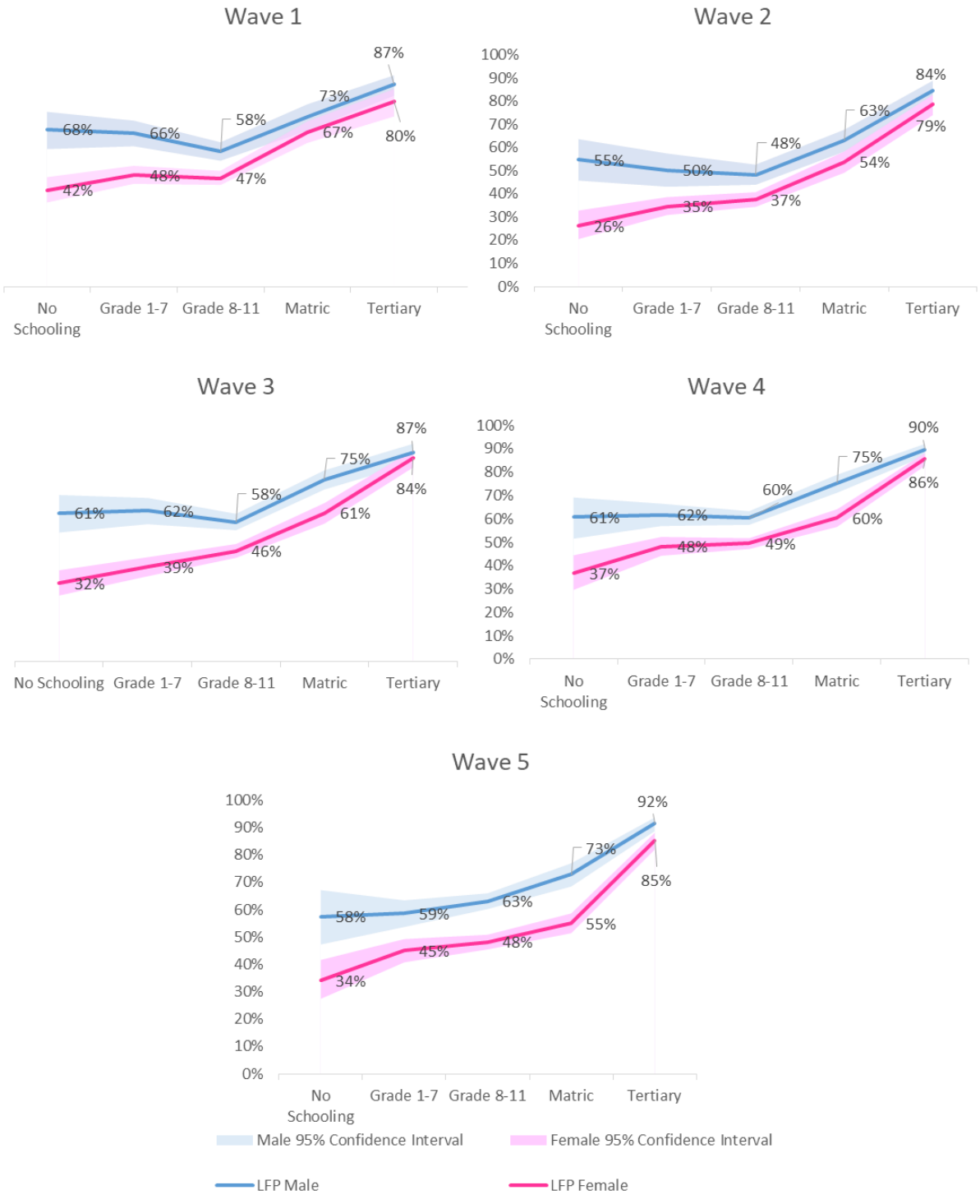
The results of this chapter thus far help highlight the motivation behind this study. Whilst women are more likely to obtain tertiary qualifications than men, and have obtained, on average, more overall years of schooling, they are still consistently less likely to participate in the labour force. The fact that women's average educational attainments are higher than those of men, appears to be insufficient to close the gender gap in labour force participation.

This begs the question of how education and labour force participation are related for men and women in South Africa. To explore this, labour force participation rates can be calculated across each education category for men and women. Figures 3.1 to 3.5 graph the labour force participation rates for men and women across each education category for each wave separately. In these graphs, the labour force participation gap can be measured as the distance between the female labour force participation curve and the male labour force participation curve. The graph patterns for both the strict and broad labour force participation rates are very similar, and so only the graphs using the strict definition are presented.

Table 3.4. Proportion of Individuals in each Educational Category by Gender

	Wave 1	(2008)	Wave 2	(2010)	Wave 3	(2012)	Wave 4	(2014/15)	Wave 5	(2017)
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
No School	0,060	0,067	0,043	0,052	0,037	0,046	0,026	0,035	0,020	0,028
	(0,006)	(0,005)	(0,005)	(0,004)	(0,004)	(0,003)	(0,003)	(0,003)	(0,002)	(0,002)
Grade 1-7	0,224	0,194	0,203	0,171	0,188	0,149	0,158	0,128	0,117	0,098
	(0,011)	(0,009)	(0,011)	(0,008)	(0,012)	(0,006)	(0,008)	(0,006)	(0,007)	(0,005)
Grade 8-11	0,445	0,471	0,474	0,490	0,471	0,495	0,502	0,514	0,508	0,500
	(0,012)	(0,010)	(0,013)	(0,012)	(0,012)	(0,008)	(0,010)	(0,008)	(0,012)	(0,010)
Matric	0,187	0,166	0,173	0,170	0,192	0,177	0,177	0,175	0,211	0,197
	(0,010)	(0,007)	(0,009)	(0,007)	(0,009)	(0,007)	(0,008)	(0,006)	(0,010)	(0,006)
Tertiary	0,084	0,101	0,107	0,116	0,111	0,133	0,137	0,148	0,144	0,176
	(0,008)	(0,008)	(0,010)	(0,008)	(0,009)	(0,009)	(0,008)	(0,008)	(0,008)	(0,010)
Total	1	1	1	1	1	1	1	1	1	1

Source: Own Calculations using NIDS data from 2008 to 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
Sample is restricted to working-age African individuals



Source: Own Calculations using NIDS data from 2008 to 2017
All results are weighted
Sample is restricted to working-age African individuals
Lighter colour shades represent a 95% confidence interval for labour force participation estimates

Figure 3.1. Graph Showing Labour Force Participation Rates (LFP) of Men and Women in each Educational Category

The graphs above show that for both men and women, labour force participation tends to increase with the level of education attained. One main contradiction to this rule appears in most waves, for men especially, for those whose highest qualification lies between grade 8-11. The slight dip in participation rates at this point may be because the working-age population (aged 15-59) includes younger individuals who could still be in secondary school. If still in school, they would be a lot less likely to have time to participate in the labour force. This dip is, therefore, not likely to be because secondary education has lower returns than primary education (Casale, 2003)[31].

For all waves, the above graphs show that the participation gender gap is highest for individuals who have attained no schooling. For those without any schooling at all, men are, therefore, much more likely to participate in the labour force than women. The participation gap generally tends to narrow as the education category attained increases. For almost all waves, the participation gap is smallest for individuals who have attained tertiary qualifications. These results suggest that women need to achieve much higher levels of education to have participation rates that are similar to those of men.

Overall, the results clearly show a positive relationship between education and labour force participation for men and women. Substantially increasing the educational attainment of women (especially to tertiary levels) is likely to reduce the gender gap in participation.

Whilst these results suggest that education is an important tool to use in closing the participation gap, education alone may be insufficient. This can be seen by the fact that even at tertiary levels of education, the participation rates of women remain lower than the participation rates of men, although this difference is only significant at a 5% level in Wave 5 (as shown by the confidence intervals). This suggests that there may be other factors responsible for the gender gap in participation that need to be addressed. Whilst the impact of these factors on labour force participation appears to be much lower at tertiary levels, it exists at least in Wave 5, nonetheless. To achieve equal participation from men and women in the labour force, it is necessary to determine what other factors are contributing towards this gap.

[31]Descriptive statistics were calculated to determine whether a large portion of the sample indicated that they were enrolled in school and indicated that they were labour force participants at the same time. The clear majority of the sample chose not to enter the labour force if enrolled in education. It, therefore, makes sense that younger working-age individuals still in secondary school would be unlikely to participate. Those who were enrolled in school were not excluded from the sample used, however, as the small portion of individuals who were enrolled and participating in the labour force may include individuals studying part-time or through correspondence while working.

Concluding Remarks

This chapter used descriptive statistics to address the first two research questions of this dissertation. Generally, the results mirror the findings of previous South African studies. Although the participation rates of African men and women had dipped in Wave 2, they mostly increased across the remaining period. The average educational attainment of both African men and women had also increased across all five waves. In terms of gender differences, women were found to be, on average, more educated than men. Despite this, men were consistently more likely to participate in the labour force. This participation gap is highest for individuals with no schooling but generally declines as education levels increase. At tertiary levels, the participation gap is smallest, but remained significant in Wave 5. Whilst increasing the proportion of women with higher qualifications appears to be an important policy tool, it may be insufficient to close the participation gap completely. The next chapter aims to investigate why women are still less likely to participate in the labour force despite their higher average educational attainments, using multivariate analyses. Addressing these factors is likely to aid in reducing the gender gap in participation.

Chapter Four: Factors Contributing to the Participation Gap

Introduction

As evident in the previous chapter, the African population is becoming more educated and generally more likely to participate in the labour force. The overall average educational attainment of African women has also surpassed that of African men. Despite this, women have consistently been found to be less likely to participate in the labour force. Whilst the previous chapter showed that increasing the educational attainment of women (to tertiary levels especially) is likely to aid in closing the gender gap, it also showed that education alone is insufficient to close the gap completely. There are evidently other factors contributing to this gap that need to be addressed.

This chapter uses both Probit regressions and decomposition analyses to investigate what these factors are. The differences in participation rates between men and women are decomposed at cross-sections for each wave of the dataset. After this, the general rise in participation rates between 2010 and 2017, will be decomposed for men and women separately. A description and justification of each method will be presented, followed by the presentation and discussion of their results. Lastly, the limitations of the chosen methods will be outlined, along with potential areas that require future research.

4.1. Methods

4.1.1. Probit Regressions

The third research question of this dissertation aims to assess how the factors that influence labour force participation in South Africa differ by gender, and how these influences have changed over time for each gender. To address this research question, firstly, Probit regressions will be estimated separately for men and women (as done by Bhorat and Leibbrandt, 2001; Contreras et al., 2011; Abdulloev et al., 2014; Fredericks and Yu, 2018). These regressions will be estimated for each wave of the dataset where the dependent variable will be a binary variable for labour force participation taking the following form:

$$\Pr(y_{iw} = 1|X_{iw}) = \Phi(\beta X) \quad (1)$$

Here, y_{iw} is a dummy variable that will equal 1 when individual, i, in wave, w, is a labour force participant and zero when they are inactive. *X* represents a vector of observed characteristics, and β represents a vector of parameters. Finally, since a Probit model is used in the estimation,

Φ represents the cumulative distributive function for the standard normal distribution (Hilmer and Hilmer, 2014).

The coefficients from the Probit regressions are useful in highlighting factors that have differing relationships with the likelihood of labour force participation for men and women. These factors may be contributing to the persistent participation gap. From these regressions, however, it cannot immediately be concluded whether it is the gender differences in the average characteristics between men and women that are responsible for the largest portion of the gap, or whether it is gender differences in the relationship between these characteristics and the likelihood of labour force participation. Similarly, it is unclear whether changing coefficients (or changing behavioural responses) or changing characteristics themselves (represented by changes in the independent 'X' variables) are most responsible for driving changes in labour force participation over time (Casale, 2003). The detailed decomposition explained below, helps disentangle these effects by separating the contributions of differing coefficients and differing characteristics, to the participation gap. It will help identify whether it is major differences in the characteristics between men and women that are responsible for the participation gap, or whether it is differences in the way men and women behave or react in response to such characteristics (or a combination of both).

4.1.2. Decomposition Analysis

One of the best-known decomposition analyses is the Oaxaca-Blinder decomposition that is often used to investigate wage discrimination. Using regression analyses, the decomposition breaks down a specified gap between two groups (such as the wage gap between men and women) into two main components. The first component of the gap is the portion that is attributable to differences in the overall observed characteristics of the two groups. The second component represents the portion of the gap that is attributable to overall differences in their regression coefficients[32]. A *detailed* decomposition breaks down these two components further by identifying the contribution of each independent variable to the total coefficient and

[32] In the Oaxaca-Blinder decomposition, the coefficient effect is often interpreted as discrimination. As mentioned in Chapter Two, Ntuli and Wittenberg (2013) explain that the difference in coefficients between two groups can be interpreted as behavioural responses to individual characteristics if the given outcome is a choice made by individuals themselves (e.g., the choice to participate in the labour force). If on the other hand, the given outcome is affected by a choice is made by others (such as an employer determining an individual's wage), the coefficient effect (i.e., the portion of the gap not explained by observable characteristics) is frequently interpreted as discrimination.

characteristic effects (for example, it can demonstrate how much of a wage gap can be attributed to differences in the average educational attainments between men and women, this would be the characteristic contribution of education to the wage gap) (Yun, 2004). The detailed Oaxaca-Blinder decomposition is commonly used to identify such contributions, but is only suitable for linear models (Casale, 2003; Yun, 2004). The participation regressions mentioned above, however, are non-linear with a binary dependent variable. Yun (2004) proposes a method whereby a detailed decomposition can be estimated for such models.

Assume, for example, a function for labour force participation, where Y is a function of a linear combination of independent variables, but the function, F, itself is non-linear:

$$Y = F(X\beta) \qquad (2)$$

Here, Y would represent labour force participation, X would represent a vector of independent variables, and β would represent a vector of coefficients. Y is then estimated for two groups; group A and B. From the estimations, the mean difference in predicted participation rates (Y) between the two groups (A and B) can be decomposed as follows[33]:

$$\overline{Y_A} - \overline{Y_B} = \left[\overline{\mathrm{F}(X_A\beta_A)} - \overline{\mathrm{F}(X_B\beta_A)}\right] + \left[\overline{\mathrm{F}(X_B\beta_A)} - \overline{\mathrm{F}(X_B\beta_B)}\right] \qquad (3)$$

where the bar represents the sample average (Yun, 2004). The left-hand side of the equation represents the difference in the predicted average likelihood of participation between group A and group B, i.e., a predicted participation gap. The first part of the right-hand side of the above equation, represents the portion of the gap in labour force participation that can be attributed to the overall characteristic differences (i.e., differences in the average values of the independent variables) between group A and B. The second part of the right-hand side represents the portion of the gap that is attributable to overall differences in the coefficients of the regressions for the two groups. Yun (2004) then transforms the above equation to find each variable's contribution to the aggregate differences in labour force participation. To create this detailed decomposition, Yun (2004) suggests a method that first evaluates the value of the function using its mean characteristics. It then uses a first-order Taylor expansion to linearise coefficients and characteristics around $\overline{(X_A}\beta_A)$ and $\overline{(X_B}\beta_B)$. The results of this are weights that can be used to estimate a detailed decomposition analysis as follows:

[33] The decomposition in equation (3) is a widely accepted method to decompose a gap in terms of overall differences in characteristics and coefficients between two groups (Yun, 2004). This means it decomposes a given gap into the portion attributed to total overall coefficient differences and total overall characteristic differences between two groups, without identifying the individual contributions of each variable to the gap.

$$\overline{Y_A} - \overline{Y_B} = \sum_{j=1}^{k} w_{\Delta x}^{j} \left[\overline{\Phi(X_A\beta_A)} - \overline{\Phi(X_B\beta_A)}\right] + \sum_{j=1}^{k} w_{\Delta\beta}^{j} \left[\overline{\Phi(X_B\beta_A)} - \overline{\Phi(X_B\beta_B)}\right] \quad (4)$$

Where $\sum_{j=1}^{k} w_{\Delta x}^{j}$ and $\sum_{j=1}^{k} w_{\Delta\beta}^{j}$ represent the sum of the calculated weights of each individual variable, j (which make up the vector of independent variables, X), for the coefficient and characteristic effects[34]. Once coefficient estimates from a given regression are available, the above weights can be calculated using the mean values of the two groups' characteristics and their coefficients (Yun, 2004)[35]. This decomposition indicates how average differences in each independent variable contribute to the total characteristic effect, and how differences in the relationship between each independent variable and the likelihood of labour force participation contribute to the total coefficient effect. It can also now be applied to Probit regressions.

One limitation of this decomposition, however, (which is common to other decomposition analyses such as the Oaxaca-Blinder decomposition) is that it is subject to the identification problem. This problem occurs when dummy variables are used in the decomposition equations. The estimated total of the coefficient effects presented by the decomposition will vary according to the dummy variable's chosen base category (Yun, 2008). To correct for this, Yun (2005, 2008) suggests an algorithm that derives a normalised equation for $Y = F(X\beta)$. This normalised equation, in short, can be seen as the result of averaging all estimates whilst permuting their base categories (Yun 2005, 2008). After a normalised version of the function is formed, the detailed decomposition can be derived in the same way as above.

As seen in Chapter Two, there are other types of decomposition methods that can be used with binary dependent variables. Ntuli and Wittenberg (2013), for example, used a decomposition analysis proposed by Even and Macpherson in 1993 (the EM decomposition) to decompose female labour force participation between two time periods. This method only provides the detailed decomposition information for the characteristic component and not the coefficient component, i.e., using education as an example, the decomposition would only indicate how differences in the level of education attained by two groups affected the change in participation. It would not indicate how much of the gap could be attributed to differences in the way the women responded to education over time. To overcome this, they extend the EM

[34] Since this decomposition has been adapted to be used with non-linear binary dependent variables, such as the Probit regression in equation (1), Y similarly represents $\Pr(y_{iw} = 1|X_{iw})$ and Φ represents the standard normal cumulative distribution.

[35] $\sum_{j=1}^{k} w_{\Delta x}^{j} = \frac{(\bar{X}_A^j - \bar{X}_B^j)\,\beta_A^j}{(\bar{X}_A - \bar{X}_B)\beta_A}$ and $\sum_{j=1}^{k} w_{\Delta\beta}^{j} = \frac{(\beta_A^j - \beta_B^j)\bar{X}_B^j}{(\beta_A - \beta_B)(\bar{X}_B)}$, where $\bar{X}_A^j$ and $\bar{X}_B^j$ are the average values of explanatory variable j for groups A and B (Abdulloev et al., 2014).

decomposition using Yun's detailed decomposition for the coefficient effect. The decomposition used is also subject to the identification problem, so they similarly use the approach suggested by Yun (2005) to normalise the equation used in the decomposition analysis.

Other methods used include the aggregate decomposition suggested by Burger and Jafta in 2006. Fredericks and Yu (2018) use this method to determine the total impact of the overall coefficient and overall characteristic differences on employment gaps. In their study, however, they do not estimate the contribution of individual variables to employment gaps. Casale (2003) uses a detailed decomposition technique, known as growth accounting, suggested by Gomulka and Stern in 1990. This list of decomposition methods is not exhaustive.

None of the studies mentioned above, however, specifically decompose gender differences in labour force participation. Two of the international papers discussed in Chapter Two that specifically investigate participation differences between men and women, use Yun's (2004) decomposition (Contreras et al., 2011 and Abdulloev et al., 2014)[36]. Abdulloev et al. (2014) similarly use Yun's (2005, 2008) proposed solution of normalised equations to overcome the identification problem. To mirror the methods of the existing studies that have decomposed gender differences in participation, this dissertation will similarly use Yun's (2004) detailed decomposition method, along with the suggested normalisation solution.

As mentioned in Chapter Two, Contreras et al. (2011) and Abdulloev et al. (2014) use the decomposition analysis suggested by Yun (2004) in different ways. Abdulloev et al. (2014) specifically decompose the difference in participation rates between men and women at a single point in time. Instead of decomposing the gender gap in labour force participation, Contreras et al. (2011), on the other hand, decompose the change in labour force participation rates between two points in time. They estimate these decompositions over time for men and women separately.

Because the third research question of this paper aims to determine how the factors influencing labour force participation differ by gender *and* how these influences have changed over time for each gender, both methods mentioned above will be used. The gender gap in labour force participation will first be decomposed at a cross-section for each wave separately. Following

[36] Ganguli et al. (2014), referred to in Chapter Two, use a counterfactual analysis that predicts the gap separately after closing the education, motherhood, and marriage gaps mentioned previously. The analysis does not, however, highlight the individual contributions of all independent variables like the other two international studies.

this, the labour force participation rates of women between Wave 2 and Wave 5 will be decomposed, and the same will be done for men separately. This period has been chosen because it represents a general trend of increased participation rates for both men and women[37].

The decompositions can, therefore, be represented by the following equations:

Firstly,

$$\overline{LFP_F} - \overline{LFP_M} = \sum_{j=1}^{k} w_{\Delta x}^{j} \left[\overline{\Phi(X_F\beta_F)} - \overline{\Phi(X_M\beta_F)}\right] + \sum_{j=1}^{k} w_{\Delta\beta}^{j} \left[\overline{\Phi(X_M\beta_F)} - \overline{\Phi(X_M\beta_M)}\right]$$

Where LFP_F and LFP_M are the average likelihoods of female and male labour force participation, respectively. This is repeated for each wave. The second decomposition equation is represented as follows:

$$\overline{LFP_{W5}} - \overline{LFP_{W2}} = \sum_{j=1}^{k} w_{\Delta x}^{j} \left[\overline{\Phi(X_{W5}\beta_{W5})} - \overline{\Phi(X_{W2}\beta_{W5})}\right] + \sum_{j=1}^{k} w_{\Delta\beta}^{j} \left[\overline{\Phi(X_{W2}\beta_{W5})} - \overline{\Phi(X_{W2}\beta_{W2})}\right]$$

Where LFP_{W5} and LFP_{W2} represent the predicted average likelihood of labour force participation in Wave 5 and Wave 2, respectively. This will be estimated for men and then for women separately.

The wave decompositions will be estimated using the same Probit regressions as those explained previously, but in a normalised form to account for the identification problem. The gender decompositions are similarly estimated with the same independent variables used in the Probit regressions, but without the variables representing the number of adult men and women variables in a household (these are defined in the next subsection). This is because these variables are calculated differently for men and women, and the decompositions require

[37] As mentioned in Chapter Three, labour force participation rates declined between Wave 1 and 2. This was attributed to aftereffects of the global recession. The decomposition is instead estimated across the general increase in participation between Waves 2 (2010) and 5 (2017). It is worth reiterating that Nishimwe-Niymbanira and Sabela (2019) similarly find an increase in participation rates between 2010 and 2016 using QLFS data, so the observed trend across this period (and the choice of the period for investigating labour force participation trends) is not unusual. Identifying the factors driving the increased participation rates of men and women is useful as it may help highlight how labour force participation for women, specifically, can be further increased in the future to catch up to participation rates of men. It may also highlight if there are any major differences in the drivers of the increases in participation for men and women.

regression equations that are the same for the two groups in question (Casale, 2003). Since the gender decomposition breaks down the gap between men and women, variables that are calculated differently for men and women must be omitted. The time decompositions, on the other hand, work with each gender separately. It breaks down the difference in participation rates of men in Wave 5 and men in Wave 2 (and this is then done for women separately). The inclusion of the 'other adult variables' is, therefore, possible in the time decompositions.

4.1.3. Independent Variables

Education

A key focus of this dissertation is how education impacts labour force participation. The education categorical variables used in the previous chapter, representing the highest level of education attained, will be used in the regression and decomposition analyses. The categories include no schooling (which is the reference category), grade 1-7, grade 8-11, matric, and tertiary qualifications (in the form of a diploma, certificate, or degree). Several previous South African studies have used similar categorical variables for education in participation regressions (such as Casale, 2003; Ntuli and Wittenberg, 2013 and Fredericks and Yu, 2018). In the decompositions, the overall aggregated impact of education will be estimated, as well as the disaggregated impacts of the individual education categories[38]. Chapter Three, for example, showed that the participation gap was much smaller at tertiary levels than at lower education levels. This necessitates an investigation of, not only how the overall average differences in the educational attainments of men and women impact the participation gaps, but also how this gap is affected by gender differences in each category of education attained.

Marital Status

As indicated in Chapter Two, the findings of the previous literature suggest that marriage has a different relationship with labour force participation for men and women (Contreras et al., 2011; Frederiks and Yu 2018). Again, it is important to note that the marriage rates of young Africans in South Africa are declining, but their cohabitation rates are rising (Posel et al., 2011). There has also been an increase in female-headed households and women living without partners in South Africa, which has been associated with rising female labour force participation rates (Casale and Posel, 2002; Casale, 2003). It is, therefore, important to consider

[38] The aggregated impact of education represents the total effect all five education categorical variables have on labour force participation. In the decomposition, the individual impacts of each education category, for example, add up to the total aggregated/group impact of education. Any other variables mentioned to be in aggregated form similarly represent the total/sum of the impacts of a group of categorical variables.

the relationship between various potential marital states and labour force participation. The NIDS survey includes a question where individuals are asked to indicate whether they are married, living with a partner, divorced, widowed, or have never been married. For this analysis, categorical variables are created using all five of these possibilities, with never having been married as the base category. In the decompositions, the overall aggregated impact of marital status will be estimated along with the disaggregated individual impact of each possible marital status[39].

Household Composition

Previous literature indicated that having children may have different relationships with the likelihood of participation for men and women and may, therefore, be contributing towards the participation gap (Bhorat and Leibbrandt, 2001; Contreras et al.'s. 2011). This is likely to be because women are more likely to be the primary caregivers of their children (as shown by Hatch and Posel in 2018) and may, therefore, have less time to participate in the labour force. The presence of children in households is often used to pick up the effect of the need to care for a child (Casale, 2003). The NIDS dataset allows for the creation of a variable that counts the number of children cared for by an individual[40]. This will be used in the analyses as it provides a more direct indication of the relationship between caring for children and the likelihood of labour force participation for men and women.

The presence of pensioners or the elderly in a household has also been used in previous labour force participation regressions (Casale, 2003; Contreras et al., 2010; Fredericks and Yu, 2018). In the South African context especially, the presence of pensioners in a household is often used as a proxy for access to pension incomes (Casale, 2003). As mentioned in Chapter Three, the age at which individuals qualify for a state pension in South Africa is now 60 (South African Government, 2020). It is also worth noting that the presence and number of pensioners in a household may impact labour force participation in ways other than through providing access to additional income. Intra-household arrangements with the elderly for childcare, for example,

[39] Again, the aggregated impact of marital status represents the impact the five marital status categories have as a group on the participation gap in total. Each individual marital status impact, sums to the aggregated marital status impact.

[40] The NIDS questionnaire that is focused on acquiring details of children in the household, enquires who the person responsible for a given child is. The person identifier of the member responsible is then matched to the person identifier of the adult in the adult dataset provided by NIDS. A variable can, therefore, be created that indicates whether an adult is the carer of a given child, and another variable is then created which counts the number of children an individual is responsible for.

may allow mothers with young children to join the labour force[41] (Contreras et al., 2011). Variables will, therefore, be created for the number of men and women older than 60 in a household representing male and female pensioners.

Other household composition variables frequently used in the previous literature include variables for the number of other working-age adults in the household (Bhorat and Leibbrandt, 2001; Casale, 2003; Fredericks and Yu; 2018). The impact of these variables may be affected by several potential influences that depend on whether the additional adults in the household are unemployed, employed, or inactive (Casale, 2003). An additional employed woman or man in a household, may reduce the need for a given individual to seek work. Alternatively, an additional employed member of the household may provide an unemployed or inactive individual with access to more information about employment opportunities and increase their likelihood of participation (Mackett, 2016).

If an additional unemployed woman joins the household, and she takes up some of the housework, a given individual may need to (or even have more time to) start working (Bhorat and Leibbrandt, 2001). An additional unemployed man in a given household may similarly lead to a given individual needing to seek work to cover their expenses[42].

It should be noted that variables representing the number of male and female adults in the household may be correlated with the variables representing marital status (Posel and Bruce-Brand, 2020). For example, if a woman lives with a male partner, this will affect the 'number of male adults' variable and the 'living with a partner' variable. Ideally, partners and spouses would be removed from the calculations of the adult variables, but this becomes very complicated when attempting to account for relationships such as those that are polygamous or marriages where husbands and wives do not live together[43]. A variable that accounts for such factors, therefore, falls beyond the scope of this study. To investigate the potential overall effects of multicollinearity, however, the estimations were attempted, including the number of

[41] There are additional behavioural impacts pensioners may have on the likelihood of labour force participation. These will be discussed in more detail in the results section of this chapter.

[42] Casale (2003) explains that disaggregating the adult variables according to employment status, however, is likely to lead to multicollinearity among the disaggregated variables and variables such as marriage and other household income. The variables are, therefore, left as is.

[43] During the apartheid era, African individuals were forced to live in homelands separate from white individuals. Some poorly paid African workers were, however, allowed to live in towns and cities as migrants. Most of the time, they had to do this alone which resulted in workers leaving children and wives behind in their original homeland areas. One of the results of this, was that many married couples lived in separate households or areas. After the demise of apartheid laws, many established patterns continued (Budlender and Lund, 2011). It is, therefore, not unlikely that there were husbands living away from their wives and vice versa, across the period studied.

adults in the household, and then excluding them. Overall, there were no noteworthy differences in the signs and significance of the results for the rest of the independent variables (including the results representing the impact of marital status)[44]. The unusual and often large household size and composition of many South African homes, coupled with the fact that some of the adult variables are significant in the results below, also aid in justifying the inclusion of these variables.

Variables will, therefore, be included for the number of other men and women aged 15 -59 in a household. For the female labour force participation regressions, the variables consist of the number of male adults in the household and the number of *other* female adults, i.e., excluding the woman in question. The male labour force participation regressions will similarly include variables for the number of female adults in the household, and for the number of *other* male adults present, i.e., excluding the man in question.

Other Control Variables

Other control variables used in the Probit regressions, will include those that have frequently been used in the previous literature when investigating labour force participation. These will firstly include categorical variables representing the age of an individual. The base category will be individuals that are 15-19 years old[45]. This variable is aggregated in the decompositions giving the total contribution the group of age categories is likely to make to the participation gender gap. A dummy variable for whether an individual lives in an urban or rural area will also be included, as well as categorical variables for the province in which an individual resides[46].

Finally, variables representing other household income (not earned in the labour force by the individual in question) have frequently been used in participation regression analyses in the previous literature (Contreras et al., 2011; Ntuli and Wittenberg, 2013; Abdulloev et al., 2014).

[44] It is also worth noting the potential for multicollinearity between household income (other than that earned by a given individual in the labour market – this variable is described in the next subsection) and the number of adults in the household. Again, however, as mentioned this would be more of an issue if the individuals in the household were disaggregated by employment status (the number of employed adults in a household for example, would be correlated with other household income). Regardless, the estimation results without the 'other adult variables' were compared to the results with the other adult variables, and there were no changes in the sign or significance of the impact of other household income on labour force participation.

[45] In line with age category variables used by Casale (2003), and Ntuli and Wittenberg (2013), the age categories are defined as follows: age 15 – 19, age 20 – 24, age 25 – 34, age 35 -44, age 45 – 54, and age 55 – 59.

[46] Ntuli and Wittenberg (2013) find that in 2004, Gauteng had the most African female labour force participants. Gauteng is, therefore, used as the base category for the Provincial categorical variables in this study. The Provincial variables are similarly aggregated in the decomposition. The aggregated Province variable therefore represents the total impact of the group of Provincial categorical variables.

A variable has, therefore, been created, which represents an individual's access to inflation-adjusted income that they did not earn from labour (the variable therefore comprises the labour income of *other* household members and non-labour household income)[47].

Whilst the mean characteristics of the key variables of this study (education and labour force participation) were calculated and discussed in the previous chapter, the mean values of additional independent and control variables have also been calculated. These additional independent variables do not make up the main focus of this study and, for the sake of brevity, are not included and discussed at length in this chapter. They do, however, give a broad idea of the average characteristics of the population and, at times, aid in explaining the characteristic contribution of the decomposition results. The relevant explanations and trends will be discussed with the detailed decomposition results. All such statistics have been included in Appendix 1.

4.2. Multivariate Results

The next section of this chapter presents and discusses the results of the multivariate analyses. All analyses are estimated using both the strict and broad definitions of labour force participation. The regression results are very similar for both definitions, and thus for the sake of brevity, only the strict labour force participation results are discussed below[48]. There are, however, a few noteworthy differences between the strict and broad participation decomposition results. Any such differences are noted in the discussions below. The strict definition results are presented in this chapter, but all results for the broad definition of participation can be found in Appendix 2.

[47] Non-labour income available is calculated by first creating a variable that totals the income an individual earned from the labour force. This amount is then subtracted from the total income of the household in which a given individual lives (but the labour income earned by other household members is retained in this measurement). This income measure is then converted to a measure of real income using Stats SA's average yearly Consumer Price Index (as done by Casale in 2003). This is then divided by the number of people in the household to get the variable in per capita terms. In this calculation, private and public pensions are subtracted from the total household income variable provided by NIDS. This is because the presence of pensioners in the household, as mentioned above, is likely to pick up the impact of pension income in the household. Because of the additional potential impacts pensioners may have on labour force participation, however, it would be inappropriate to omit the pensioner variables completely and use the other income variable to pick up the effect of a pension. Including pension income in the household income variable and including variables for pensioners would also be problematic as it would be likely to introduce collinearity.

[48] Marginal effects of the Probit regressions are also calculated at the sample means. The marginal effects indicate the changes in the probability of participation from a one unit increase in the continuous variables, *ceteris paribus*. For dummy variables, the marginal effect indicates the change in the probability of participation when there is a discrete change in the variable from 0 to 1, *ceteris paribus* (Ntuli and Wittenberg, 2013). Because a large focus of the decomposition analyses is on coefficient differences between men and women, the Probit coefficients are presented in this chapter, whilst the marginal effects can be found in Appendix 2.

Table 4.1. Probit Regression Results for Strict Labour Force Participation

	Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**Wave 5**	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Grade 1 - 7	0.230*	0.230***	0.144	0.307***	0.399***	0.308***	0.355**	0.414***	0.386**	0.326***
	(0.128)	(0.0874)	(0.132)	(0.113)	(0.115)	(0.0930)	(0.141)	(0.110)	(0.157)	(0.108)
Grade 8 – 11	0.273**	0.478***	0.255*	0.509***	0.427***	0.635***	0.515***	0.652***	0.478***	0.577***
	(0.129)	(0.0934)	(0.132)	(0.122)	(0.115)	(0.0895)	(0.132)	(0.106)	(0.135)	(0.108)
Matric	0.529***	0.971***	0.435***	0.837***	0.653***	0.884***	0.624***	0.849***	0.545***	0.662***
	(0.152)	(0.108)	(0.139)	(0.130)	(0.142)	(0.100)	(0.149)	(0.116)	(0.159)	(0.127)
Tertiary	0.762***	1.216***	0.935***	1.426***	0.885***	1.442***	0.894***	1.389***	1.061***	1.359***
	(0.176)	(0.158)	(0.178)	(0.124)	(0.158)	(0.118)	(0.156)	(0.131)	(0.165)	(0.156)
Western Cape	-0.144	-0.248**	-0.535**	-0.228*	-0.0218	0.0436	0.0275	0.248**	-0.405***	-0.105
	(0.328)	(0.117)	(0.256)	(0.130)	(0.133)	(0.184)	(0.116)	(0.104)	(0.116)	(0.0852)
Eastern Cape	-0.613***	-0.443***	-0.334**	-0.192	-0.394***	-0.124	-0.0529	-0.153	-0.441***	-0.293***
	(0.135)	(0.121)	(0.135)	(0.123)	(0.113)	(0.106)	(0.112)	(0.110)	(0.103)	(0.0870)
Northern Cape	-0.201	-0.286**	0.0895	0.00382	-0.142	0.0108	0.170	-0.0480	-0.185	-0.157*
	(0.155)	(0.127)	(0.171)	(0.148)	(0.136)	(0.116)	(0.145)	(0.109)	(0.146)	(0.0935)
Free State	-0.253*	-0.0890	-0.115	-0.187	-0.100	-0.00251	-0.0938	-0.264***	-0.426***	-0.328***
	(0.135)	(0.132)	(0.133)	(0.136)	(0.125)	(0.127)	(0.119)	(0.0997)	(0.105)	(0.0996)
KZN	-0.0269	0.0851	-0.369***	-0.307**	-0.252**	0.0491	-0.113	-0.232***	0.0725	-0.0361
	(0.128)	(0.0990)	(0.142)	(0.130)	(0.111)	(0.108)	(0.105)	(0.0846)	(0.118)	(0.0894)
Northwest	-0.140	-0.137	-0.151	-0.214	-0.0698	-0.0821	0.205	-0.272**	-0.0420	-0.160
	(0.168)	(0.151)	(0.148)	(0.144)	(0.182)	(0.128)	(0.128)	(0.114)	(0.146)	(0.127)
Mpumalanga	-0.113	0.0570	-0.277*	-0.282**	0.0559	0.122	0.109	-0.128	-0.0391	-0.0836
	(0.135)	(0.113)	(0.159)	(0.128)	(0.151)	(0.127)	(0.126)	(0.102)	(0.101)	(0.0956)
Limpopo	-0.536***	-0.417***	-0.488***	-0.280**	-0.312**	0.0676	0.116	0.0431	-0.236**	-0.0601
	(0.174)	(0.124)	(0.163)	(0.133)	(0.137)	(0.130)	(0.133)	(0.107)	(0.112)	(0.103)
Urban	0.172**	0.228***	0.0284	0.214***	0.0902	0.334***	0.268***	0.168***	0.255***	0.294***
	(0.0816)	(0.0703)	(0.0894)	(0.0809)	(0.0902)	(0.0609)	(0.0691)	(0.0585)	(0.0719)	(0.0630)
Age 20 - 24	1.218***	1.152***	1.207***	1.221***	1.545***	1.261***	1.390***	1.410***	1.281***	1.415***
	(0.0847)	(0.0968)	(0.0994)	(0.108)	(0.0896)	(0.0777)	(0.0736)	(0.0948)	(0.0960)	(0.129)
Age 25 – 34	1.889***	1.699***	1.690***	1.693***	2.048***	1.924***	2.112***	2.115***	2.012***	1.989***
	(0.105)	(0.104)	(0.106)	(0.100)	(0.092)	(0.0824)	(0.0705)	(0.0966)	(0.117)	(0.117)
Age 35 -44	1.847***	1.901***	1.880***	1.956***	2.253***	2.043***	1.965***	2.371***	2.042***	2.245***
	(0.122)	(0.128)	(0.127)	(0.116)	(0.123)	(0.0981)	(0.101)	(0.104)	(0.125)	(0.121)
Age 45 – 54	1.527***	1.765***	1.601***	1.772***	1.826***	1.863***	1.650***	2.162***	1.488***	2.092***
	(0.124)	(0.123)	(0.141)	(0.116)	(0.111)	(0.102)	(0.119)	(0.104)	(0.153)	(0.128)
Age 55 – 59	1.105***	1.452***	1.300***	1.568***	1.542***	1.520***	1.389***	1.786***	1.253***	1.710***
	(0.182)	(0.147)	(0.161)	(0.152)	(0.152)	(0.120)	(0.137)	(0.127)	(0.168)	(0.115)
Married	0.624***	-0.00126	0.431***	-0.127*	0.429***	-0.0875	0.553***	-0.134**	0.644***	-0.123**
	(0.110)	(0.0790)	(0.113)	(0.0667)	(0.0942)	(0.0729)	(0.109)	(0.0652)	(0.0947)	(0.0595)

	Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**Wave 5**	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Lives with partner	0.295**	0.000592	0.375***	-0.131	0.110	0.00260	0.342***	0.0107	0.389***	0.0742
	(0.123)	(0.109)	(0.112)	(0.0953)	(0.127)	(0.0991)	(0.104)	(0.0748)	(0.111)	(0.0849)
Divorced	0.661***	0.0117	0.0791	0.181*	-0.185	-0.0415	0.820***	0.204**	0.204	-0.00500
	(0.242)	(0.116)	(0.284)	(0.107)	(0.263)	(0.0955)	(0.211)	(0.0926)	(0.232)	(0.100)
Widow	0.228	0.556***	-0.0844	0.0776	0.652***	-0.245	0.229	0.117	0.516*	0.250*
	(0.213)	(0.171)	(0.278)	(0.158)	(0.205)	(0.155)	(0.248)	(0.138)	(0.285)	(0.129)
Real other household income p.c	-0.00004**	-0.00004***	-0.0001***	-0.00004***	-0.0001***	-0.00008***	-0.00005***	-0.00003***	-0.00006***	-0.00004***
	(0.00002)	(0.00002)	(0.00002)	(0.00001)	(0.00002)	(0.00001)	(0.00001)	(0.00001)	(0.000014)	(0.000013)
Number of children cared for	-0.0801	-0.0489**	-0.0111	-0.0827***	0.0599	-0.0447**	0.126*	-0.0575**	0.100	-0.0524**
	(0.118)	(0.0234)	(0.0811)	(0.0234)	(0.100)	(0.0208)	(0.0762)	(0.0251)	(0.0901)	(0.0215)
No. female pensioners	-0.177*	-0.0721	-0.376***	-0.00675	-0.384***	-0.107	-0.217***	-0.171***	-0.294***	-0.0751
	(0.0929)	(0.0695)	(0.0813)	(0.0646)	(0.0669)	(0.0727)	(0.0690)	(0.0609)	(0.0648)	(0.0675)
No. male pensioners	0.0217	0.0571	-0.0616	0.0298	-0.113	-0.111	-0.0889	-0.109	0.0212	-0.209**
	(0.146)	(0.0829)	(0.102)	(0.0844)	(0.0950)	(0.0812)	(0.100)	(0.0789)	(0.0962)	(0.0852)
No. other male adults	0.0286		-0.0432		-0.0434		-0.0605*		-0.0861***	
	(0.0297)		(0.0347)		(0.0337)		(0.0324)		(0.0275)	
No. female adults	-0.0976**		-0.0904***		-0.0891***		-0.108***		-0.112***	
	(0.0382)		(0.0279)		(0.0296)		(0.0244)		(0.0225)	
No. other female adults		-0.00547		-0.00949		-0.0321		-0.0436*		-0.00785
		(0.0224)		(0.0191)		(0.0196)		(0.0230)		(0.0246)
No. of male adults		-0.00203		-0.0209		0.00123		-0.0290		-0.00908
		(0.0247)		(0.0200)		(0.0181)		(0.0222)		(0.0268)
Constant	-1.023*** (0.197)	-1.721*** (0.170)	-1.054*** (0.177)	-1.940*** (0.189)	-1.256*** (0.184)	-2.162*** (0.150)	-1.566*** (0.188)	-2.100*** (0.155)	-1.383*** (0.176)	-2.179*** (0.168)
N	165832	166188	166263	166361	166777	166735	166721	166724	169305	166678

Source: Own Calculations using NIDS data from 2008 to 2017
Results represent Probit coefficients
Standard errors in parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
* p<.1, ** p<.05, *** p<.0.01
Sample is restricted to working-age African individuals
Reference categories for categorical variables are as follows; Education: No schooling; Province: Gauteng; Age: 15 – 19; Marital Status: Never married

Table 4.2. Gender Decompositions of Strict Labour Force Participation Rates for each Wave

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Result	%	Result	%	Result	%	Result	%	Result	%
(A) Overall										
Predicted Average Participation rate of women	0.537***		0.445***		0.525***		0.562***		0.554***	
	(0.0108)		(0.0137)		(0.0115)		(0.00992)		(0.00989)	
Predicted Average Participation rate of men	0.662***		0.561***		0.658***		0.675***		0.688***	
	(0.0114)		(0.0159)		(0.0111)		(0.00933)		(0.00917)	
Total Predicted Participation Gap (LFPw - LFPm)	-0.125***	-100%	-0.116***	-100%	-0.133***	-100%	-0.113***	-100%	-0.134***	-100%
	(0.0129)		(0.0156)		(0.0120)		(0.0109)		(0.0101)	
Portion of gap due to average characteristic differences	-0.00978	-8%	-0.0295***	-25%	-0.0171*	-13%	-0.0102	-9%	-0.0146*	-11%
	(0.0104)		(0.0104)		(0.00893)		(0.00798)		(0.00850)	
Portion of gap due to average coefficient differences	-0.115***	-92%	-0.0867***	-75%	-0.115***	-87%	-0.103***	-91%	-0.119***	-89%
	(0.0120)		(0.0144)		(0.0105)		(0.0100)		(0.00954)	
(B) Contribution of each variable to total characteristic contribution										
Aggregated education	0.000868	0.69%	0.00276	2.38%	0.00592*	4.45%	0.00281	2.49%	0.0088**	6.57%
	(0.00349)		(0.00357)		(0.00308)		(0.00279)		(0.00431)	
No schooling	-0.000881	-0.70%	-0.00124	-1.07%	-0.00158*	-1.19%	-0.0018**	-1.59%	-0.0015**	-1.12%
	(0.00117)		(0.00115)		(0.000839)		(0.00083)		(0.00074)	
Grade 1 – 7	0.00259*	2.07%	0.00324**	2.79%	0.0034***	2.56%	0.00214**	1.89%	0.00136*	1.01%
	(0.00133)		(0.00132)		(0.00113)		(0.00089)		(0.00073)	
Grade 8 – 11	-0.00115*	-0.92%	-0.00106	-0.91%	-0.000370	-0.28%	-0.000032	-0.03%	0.000080	0.06%
	(0.00069)		(0.000731)		(0.000360)		(0.00014)		(0.00016)	
Matric	-0.00196	-1.57%	-0.000457	-0.39%	-0.000868	-0.65%	-0.000183	-0.16%	-0.000395	-0.29%
	(0.00143)		(0.000690)		(0.000758)		(0.00059)		(0.00045)	
Tertiary	0.00227	1.82%	0.00228	1.97%	0.00535**	4.02%	0.00267	2.36%	0.0093**	6.94%
	(0.00186)		(0.00273)		(0.00228)		(0.00212)		(0.00416)	
Aggregated marital status	0.00339	2.71%	0.00345*	2.97%	-0.000216	-0.16%	0.0059***	5.22%	0.00257	1.92%
	(0.00216)		(0.00194)		(0.00127)		(0.00193)		(0.00185)	
Never married	0.0035**	2.80%	0.00205	1.77%	0.000872	0.66%	0.00356**	3.15%	0.0038**	2.84%
	(0.00171)		(0.00155)		(0.000853)		(0.00140)		(0.00174)	

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Result	%	Result	%	Result	%	Result	%	Result	%
Married	0.000084	0.07%	0.0000721	0.06%	0.000341	0.26%	-0.000273	-0.24%	-0.000331	-0.25%
	(0.00024)		(0.000497)		(0.000408)		(0.00036)		(0.00058)	
Lives with partner	-0.000223	-0.18%	0.0000025	0.00%	0.0000005	0.00%	-0.000043	-0.04%	0.000041	0.03%
	(0.00024)		(0.000152)		(0.000023)		(0.00014)		(0.0001)	
Divorced	-0.000488	-0.39%	0.00138	1.19%	-0.00139*	-1.05%	0.0027***	2.39%	-0.000590	-0.44%
	(0.00112)		(0.00104)		(0.000812)		(0.00105)		(0.00101)	
Widow	0.000535	0.43%	-0.0000586	-0.05%	-0.000037	-0.03%	0.0000046	0.00%	-0.000371	-0.28%
	(0.00040)		(0.000200)		(0.000152)		(0.00004)		(0.00042)	
Aggregated province	-0.00378	-3.02%	-0.0078***	-6.72%	-0.00180	-1.35%	-0.000444	-0.39%	-0.00119	-0.89%
	(0.00244)		(0.00276)		(0.00147)		(0.00138)		(0.00178)	
Aggregated age	0.0174	13.92%	0.0125	10.78%	0.00560	4.21%	0.00391	3.46%	0.000714	0.53%
	(0.0108)		(0.00873)		(0.00670)		(0.00608)		(0.00610)	
Urban	-0.00238*	-1.90%	-0.00216	-1.86%	-0.0032**	-2.41%	-0.004***	-3.54%	-0.004***	-2.99%
	(0.00134)		(0.00137)		(0.00133)		(0.00126)		(0.00162)	
Real other household income	-0.00137	-1.10%	-0.00198	-1.71%	-0.00365	-2.74%	-0.00113	-1.00%	0.00238	1.78%
	(0.00150)		(0.00144)		(0.00331)		(0.0009)		(0.00235)	
No. of children cared for	-0.024***	-19.20%	-0.035***	-30.17%	-0.018***	-13.53%	-0.017***	-15.04%	-0.021***	-15.67%
	(0.00731)		(0.00684)		(0.00577)		(0.00603)		(0.00575)	
No. female pensioners	-0.000617	-0.49%	-0.000557	-0.48%	-0.000209	-0.16%	0.000336	0.30%	-0.000481	-0.36%
	(0.00043)		(0.000726)		(0.000608)		(0.00053)		(0.00050)	
No. male pensioners	0.000261	0.21%	-0.000729	-0.63%	-0.0015**	-1.13%	-0.00101*	-0.89%	-0.002**	-1.49%
	(0.00101)		(0.00107)		(0.000653)		(0.00054)		(0.00091)	
(C) Contribution of each variable to total coefficient contribution										
Aggregated education	-0.00145	-1.16%	0.00505	4.35%	0.00460	3.46%	0.00379	3.35%	0.00806	6.01%
	(0.00820)		(0.0101)		(0.00804)		(0.00962)		(0.00876)	
No schooling	-0.00374*	-2.99%	-0.00375**	-3.23%	-0.00210	-1.58%	-0.00162	-1.43%	-0.000651	-0.49%
	(0.00216)		(0.00190)		(0.00130)		(0.00108)		(0.00093)	
Grade 1 – 7	-0.0126**	-10.08%	-0.00552	-4.76%	-0.013***	-9.77%	-0.00441	-3.90%	-0.00392*	-2.93%
	(0.00548)		(0.00507)		(0.00438)		(0.00308)		(0.00226)	
Grade 8 – 11	-0.00129	-1.03%	-0.00151	-1.30%	0.00435	3.27%	-0.00396	-3.50%	0.00288	2.15%
	(0.00916)		(0.0112)		(0.00816)		(0.00893)		(0.00718)	
Matric	0.0103**	8.24%	0.00802*	6.91%	0.00252	1.89%	0.00235	2.08%	0.00173	1.29%
	(0.00502)		(0.00431)		(0.00531)		(0.00384)		(0.00437)	

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Result	%	Result	%	Result	%	Result	%	Result	%
Tertiary	0.00589	4.71%	0.00780*	6.72%	0.0132***	9.92%	0.0114***	10.09%	0.00801*	5.98%
	(0.00364)		(0.00420)		(0.00381)		(0.00363)		(0.00451)	
Aggregated marital status	0.0169	13.52%	0.00583	5.03%	0.0460*	34.59%	0.0466**	41.24%	0.0354*	26.42%
	(0.0219)		(0.0265)		(0.0235)		(0.0191)		(0.0212)	
Never married	0.0379**	30.32%	0.0346	29.83%	0.0536***	40.30%	0.0606***	53.63%	0.056***	41.79%
	(0.0177)		(0.0224)		(0.0200)		(0.0170)		(0.0179)	
Married	-0.021***	-16.80%	-0.0229***	-19.74%	-0.0104	-7.82%	-0.015***	-13.27%	-0.02***	-14.93%
	(0.00776)		(0.00674)		(0.00650)		(0.00531)		(0.00624)	
Lives with partner	0.000073	0.06%	-0.00885**	-7.63%	0.00432	3.25%	0.00132	1.17%	0.000591	0.44%
	(0.00418)		(0.00385)		(0.00319)		(0.00227)		(0.00194)	
Divorced	-0.0021**	-1.68%	0.00146	1.26%	0.00230**	1.73%	-0.00173*	-1.53%	0.000156	0.12%
	(0.00106)		(0.00115)		(0.000920)		(0.00103)		(0.00118)	
Widow	0.0023**	1.84%	0.00146	1.26%	-0.004***	-3.01%	0.00110	0.97%	-0.000126	-0.09%
	(0.00096)		(0.00126)		(0.00128)		(0.00125)		(0.00168)	
Aggregated province	0.00434	3.47%	0.000330	0.28%	0.00312	2.35%	0.00701	6.20%	-0.00487	-3.63%
	(0.00994)		(0.0102)		(0.00805)		(0.00644)		(0.00523)	
Aggregated age	-0.0166**	-13.28%	-0.00960	-8.28%	-0.0160*	-12.03%	-0.000379	-0.34%	-0.00940	-7.01%
	(0.00730)		(0.0104)		(0.00846)		(0.00779)		(0.0106)	
Urban	0.000670	0.54%	0.00251	2.16%	0.00430*	3.23%	-0.00235	-2.08%	0.000231	0.17%
	(0.00121)		(0.00209)		(0.00255)		(0.00183)		(0.00214)	
Real other household income	0.00145	1.16%	0.0197***	16.98%	0.0260***	19.55%	0.00765	6.77%	0.00474	3.54%
	(0.00630)		(0.00735)		(0.00894)		(0.00476)		(0.00721)	
No. of children cared for	0.00658*	5.26%	0.00535	4.61%	0.00315	2.37%	-0.00296	-2.62%	0.000718	0.54%
	(0.00360)		(0.00348)		(0.00313)		(0.00248)		(0.00284)	
No. female pensioners	0.00413	3.30%	0.0200***	17.24%	0.0130***	9.77%	0.00248	2.19%	0.009***	6.72%
	(0.00395)		(0.00511)		(0.00362)		(0.00307)		(0.00342)	
No. male pensioners	0.00162	1.30%	0.00493	4.25%	0.00167	1.26%	0.000289	0.26%	-0.00292	-2.18%
	(0.00277)		(0.00318)		(0.00279)		(0.00233)		(0.00243)	
Constant	-0.133***	-106.40%	-0.141***	-121.55%	-0.201***	-151.13%	-0.165***	-146.02%	-0.161***	-120.15%
	(0.0294)		(0.0324)		(0.0312)		(0.0245)		(0.0270)	
N	12397		13759		15511		17935		18342	

Source: Own Calculations using NIDS data from 2008 to 2017
Standard errors in parentheses

All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
* p<.1, ** p<.05, *** p<.01
Sample is restricted to working-age African individuals
% Column represents the percentage contribution of each variable to the total gap in labour force participation

Table 4.3. Decompositions of Strict Labour Force Participation rates between Wave 2 and 5 by Gender

	Male	%	Female	%
(A) Overall				
Predicted Average Participation rate wave 5	0.689***		0.554***	
	(0.00911)		(0.00983)	
Predicted Average Participation rate wave 2	0.562***		0.445***	
	(0.0168)		(0.0142)	
Predicted Difference (LFP wave 5 – LFP wave 2)	0.127***	100%	0.109***	100%
	(0.0163)		(0.0139)	
Portion of gap (increase) due to total characteristic differences	0.054***	42%	0.059***	54%
	(0.009)		(0.007)	
Portion of gap (increase) due to coefficient differences	0.074***	58%	0.050***	46%
	(0.014)		(0.013)	
(B) Contribution of each variable to total characteristic contribution				
Aggregated education	0.0122***	9.61%	0.0257***	23.58%
	(0.00272)		(0.00335)	
No schooling	0.00263***	2.07%	0.00406***	3.72%
	(0.00077)		(0.00075)	
Grade 1 – 7	0.00408***	3.21%	0.00622***	5.71%
	(0.00135)		(0.00096)	
Grade 8 – 11	-0.000665	-0.52%	-0.0000388	-0.04%
	(0.00045)		(0.00016)	
Matric	0.000648	0.51%	0.00144***	1.32%
	(0.000687)		(0.000545)	
Tertiary	0.00544***	4.28%	0.0140***	12.84%
	(0.00169)		(0.0026)	
Aggregated marital status	-0.0019	-1.50%	0.000722	0.66%
	(0.00223)		(0.000721)	
Never married	-0.00087	-0.69%	-0.000102	-0.09%
	(0.00109)		(0.000228)	
Married	0.00000389	0.00%	-0.000191	-0.18%
	(0.000974)		(0.000347)	
Lives with partner	-0.000953	-0.75%	0.000682	0.63%
	(0.000780)		(0.000557)	
Divorced	-0.000183	-0.14%	0.0000712	0.07%
	(0.000218)		(0.000096)	
Widow	0.0000663	0.05%	0.000261	0.24%
	(0.000730)		(0.000208)	
Aggregated province	0.00014	0.11%	0.00226**	2.07%
	(0.00178)		(0.00112)	

	Male	%	Female	%
Aggregated age	0.0348***	27.40%	0.0263***	24.13%
	(0.00451)		(0.00487)	
Urban	0.00287**	2.26%	0.00517***	4.74%
	(0.00126)		(0.00153)	
Real other household income p.c.	-0.0117***	-9.21%	-0.00546***	-5.01%
	(0.00381)		(0.00156)	
No. of children cared for	0.0000249	0.02%	0.00152**	1.39%
	(0.000092)		(0.000631)	
No. female pensioners	0.00223*	1.76%	0.000275	0.25%
	(0.00117)		(0.000413)	
No. male pensioners	0.000111	0.09%	0.000528	0.48%
	(0.000256)		(0.000490)	
No. other male adults	0.00529**	4.17%		
	(0.00226)			
No. female adults	0.0101***	7.95%		
	(0.00216)			
No. other female adults			0.000685	0.63%
			(0.00159)	
No. male adults			0.00159	1.46%
			(0.0016)	
(C) Contribution of each variable to total coefficient contribution				
Aggregated education	0.0116	9.13%	0.010	9.17%
	(0.00893)		(0.0129)	
No schooling	-0.000923	-0.73%	0.000381	0.35%
	(0.000934)		(0.00162)	
Grade 1 – 7	0.004	3.15%	0.00255	2.34%
	(0.00357)		(0.0039)	
Garde 8 – 11	0.0101	7.95%	0.0191	17.52%
	(0.0097)		(0.0127)	
Matric	-0.0013	-1.02%	-0.00986**	-9.05%
	(0.00437)		(0.00485)	
Tertiary	-0.0003	-0.24%	-0.00213	-1.95%
	(0.00378)		(0.00542)	
Aggregate marital status	-0.0333	-26.22%	-0.0108	-9.91%
	(0.0254)		(0.0179)	
Never married	-0.0329	-25.91%	-0.00948	-8.70%
	(0.0211)		(0.0167)	
Married	0.00109	0.86%	-0.00302	-2.77%
	(0.00737)		(0.00511)	
Lives with partner	-0.00325	-2.56%	0.00453	4.16%
	(0.00260)		(0.00328)	
Divorced	-0.000148	-0.12%	-0.00389**	-3.57%
	(0.000783)		(0.00198)	

	Male	%	Female	%
Widow	0.00199	1.57%	0.00106	0.97%
	(0.00155)		(0.00121)	
Aggregated province	0.0143	11.26%	0.0142	13.03%
	(0.00948)		(0.00902)	
Aggregated age	0.0186*	14.65%	0.0282*	25.87%
	(0.0103)		(0.0147)	
Urban	0.00526	4.14%	0.00167	1.53%
	(0.00332)		(0.00218)	
Real other household income p.c.	0.0117*	9.21%	-0.00262	-2.40%
	(0.00663)		(0.0101)	
No. children cared for	0.00158	1.24%	0.0101	9.27%
	(0.00158)		(0.00971)	
No. female pensioners	0.00301	2.37%	-0.00395	-3.62%
	(0.0038)		(0.00454)	
No. male pensioners	0.00131	1.03%	-0.00897*	-8.23%
	(0.00244)		(0.00453)	
No. other adult males	-0.00858	-6.76%		
	(0.00807)			
No. female adults	-0.00588	-4.63%		
	(0.0103)			
No. other female adults			0.000928	0.85%
			(0.0129)	
No. male adults			0.00491	4.50%
			(0.0143)	
Constant	0.0539	42.44%	0.00650	5.96%
	(0.0359)		(0.0396)	
N	34365		43558	

Source: Own Calculations using NIDS data from 2010 to 2017
Standard errors in parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
* p<.1, ** p<.05, *** p<.01
Sample is restricted to working-age African individuals
% Column represents the percentage contribution of each variable to the total gap in labour force participation

4.3. Discussion of Results

The findings of the above results will be interpreted as follows; Firstly, Table 4.1. presents the results of the Probit regressions. The signs and significance of the coefficients will be compared – major gender differences could indicate that a given variable may be contributing (whether it be positively or negatively) towards the gap in participation. The number of children an individual cares for will be used as an example. In Table 4.1., there is a significant and negative relationship between the number of children a woman cares for and the likelihood of female labour force participation in all five waves. For men, on the other hand, the coefficient of childcare is mostly insignificant. Because childcare and the likelihood of labour force participation are related differently for men and women, it may be a factor contributing to the participation gender gap (the potential reasons for these findings will be elaborated on in the discussion of the more detailed results in the next subsections).

Table 4.2 then displays the gender decomposition results, which are repeated for each wave. The average predicted likelihood of participation for men and women, and the average participation gap are calculated as part of the decomposition and presented in section A of the table. The last two rows in part A of Table 4.2, represent the total portion of the gap that can be explained by overall differences in the average characteristics of men and women, and the total portion of the gap attributed to overall differences in their coefficients, respectively. The individual characteristic and coefficient effects for each variable in part B and C represent the portion that each variable contributes to the total participation gap. Because the participation gap, in this instance, is measured as female labour force participation minus male labour force participation, any negative signs on these contributions indicate that the given variable should contribute to women being less likely to participate in the labour force than men. The opposite is true for any contributions with a positive sign. Once again, consider the number of children an individual cares for in Table 4.2., in Wave 1, as an example. Section B of the table shows that the characteristic contribution of the number of children cared for is significant and negative. This suggests that differences in the average number of children men and women care for, are contributing to the fact that women are less likely to participate in the labour force than men (i.e., these differences contribute to increasing the magnitude of the participation gap). The percentage contribution further suggests that 19.2% of the participation gap is attributable to differences in the number of children men and women care for. The coefficient contribution of the number of children cared for (shown in section C of the table), on the other hand, is insignificant. Overall, this suggests that in Wave 1, it was differences in the average

number of children men and women cared for that contributed to the participation gap, and not differences in the way men and women respond to caring for children.

Table 4.3. then displays the wave decomposition results. The basic manner in which these decompositions are interpreted remains the same, apart from the fact that this now indicates what has driven the increase in labour force participation over time (for men and women separately), as opposed to what is driving the gender gap in participation (for each wave separately). Because the difference in participation rates over time is measured as participation rates in Wave 5 minus participation rates in Wave 2, any positive contribution indicates that the variable in question should have resulted in individuals more likely to participate in the labour force in Wave 5 than in Wave 2 (and has thus contributed positively to the rise in participation rates). The opposite would be true for a negative sign. Consider the childcare contributions once again in part B of Table 4.3. for the female wave decomposition. The positive, significant characteristic contribution indicates that changes in the average number of children a woman cared for, are positively associated with the rise in female labour force participation rates between Wave 2 and Wave 5 (this is in line with the descriptive statistics in Appendix 1 and will be discussed in the next subsection). The insignificant coefficient contribution of childcare, on the other hand, indicates that changes in the relationship between childcare and female labour force participation, did not significantly contribute to the rise in female participation rates (again, the reasons behind these findings will be expanded on in the next subsections).

Finally, it should be noted that the coefficient impacts should be interpreted with caution. This is because they may also be picking up the effects of factors not included in the model, or factors that cannot be observed. These could include differences in Economic environments, abilities, and bargaining power. The large constant terms at the bottom of part C in the decomposition tables may also be picking up some of this effect (Casale, 2003)[49].

In the following subsections, the overall decomposition results, shown in section A of Table 4.2. and 4.3., will first be interpreted. This will be followed by more detailed interpretations of

[49] The finding of the large contributions of the constant terms is not unique to this study. See for example, Yun's (2008) estimations and Casale's (2003) decomposition results (particularly for the sample where she excluded those who reported that still being in education, or being ill/retired/disabled was the reason for not working). Whilst Ganguli et al.'s (2014) decomposition-type counterfactual analysis, does not follow the exact same method, they similarly find that the residual percentage of the gap remains large in many countries, even after controlling for motherhood, marriage and education.

the Probit and decomposition results for each variable (shown in Table 4.1 and section B and C of Table 4.2 and 4.3).

Overall Findings

The overall findings of the gender decomposition (presented in section A from Table 4.2.) suggest that whilst there are characteristic differences between men and women that are significantly contributing to the gender gap in participation, a much larger and more frequently significant portion of the gap (75% or more in all waves) can be attributed to overall coefficient differences between men and women. This is true for both the strict and broad definitions of participation. As mentioned, since these decompositions are looking at whether individuals have made a choice to participate, this coefficient impact can be interpreted as behavioural differences in the way men and women respond to their characteristics (Ntuli and Wittenberg, 2013; Abdulloev et al., 2014). The majority of the participation gap (for the strict and broad definitions), therefore, seems to be a result of behavioural differences between men and women. This suggests that whilst equalising the observable characteristics between men and women is likely to *help* reduce the gender participation gap, it is unlikely to be sufficient unless their behavioural differences are also reduced (Abdulloev et al., 2014). This finding is not one that is unique to this study (Abdulloev et al., 2014; and Ganguli et al., 2014 have similar results). It is also worth noting that in Wave 2, whilst the majority of the gap remains attributable to coefficient differences between men and women, the characteristic component is substantially larger in this wave, than in all other waves. It is worth reiterating that Wave 2 represents the period following a global recession and financial crisis which is likely to have had multiple, varying effects on households. The reverberating effects of this crises may be a reason the characteristic component is so much larger in this wave.[50]

For the time decompositions in Table 4.3., on the other hand, the characteristic impacts are larger and closer to the coefficient impact. It should be reiterated that Table 4.2, explained

[50] For example, the crises is likely to have resulted in less households being able to afford social services, or even school fees. This could have resulted in more care work being shifted to the home and onto the shoulders of women (See for instance Raaber, 2010). The characteristic contribution of the 'number of children cared for' is substantially larger in Wave 2 than in all other waves, suggesting a worsening in the unequal division of childcare. If the financial crises/global recession did result in less households being able to afford to send their children to school (and thus resulted in more children having to stay at home during the day), this may have increased the need for women to stay at home in order care for children in their households, families, and/or communities. Wave 2 is also the only wave in which characteristic differences in the provinces men and women tend to live in, significantly contribute to the participation gap. This suggests that in Wave 2 women were less likely to live in provinces associated with higher levels of employment. If the care burden worsened in Wave 2, and was typically borne by women, this may have resulted in female migrant labourers needing to return to hometowns or communities to care for household members.

above, decomposes labour force participation between men and women at cross-sections in each wave, whilst Table 4.3 compares women in Wave 5 to women in Wave 2, and men in Wave 5 to men in Wave 2. Overall, between Wave 2 and Wave 5, approximately 55% of the increase in strict female labour force participation rates, can be explained by changes in a woman's average observable characteristics across this period. When considering the broad definition, on the other hand, the characteristic impact contributes to more than 75% of the increase over time. Changes in a woman's average observable characteristics have therefore contributed more to women indicating that they want to work, than to them actively searching for work or becoming employed. The same can be said for men, although the increase across participation definitions is less drastic. Approximately 42% of the increase in strict participation rates, and 50% of the increase in broad participation rates across this period for men, can be explained by changes in their average observable characteristics. Characteristic differences were, therefore, a larger driver of the increase in participation rates for women than for men across this period. Despite this, as with the gender decompositions, even if characteristics from Wave 2 and 5 were equalised, men and women would still be more likely to participate in the labour force in Wave 5, than in Wave 2[51].

The Probit regressions and results of part B and C of the decompositions highlight some individual factors that appear to be contributors to the gender gap in participation. These will be discussed below.

Education

In Table 4.1., the Probit regressions show that any level of education, greater than no schooling, is positively and significantly correlated with the likelihood of labour force participation for both African men and African women. The magnitudes of the marginal effects for higher education categories, especially (as seen in Appendix 2), are mostly larger for women than

[51] This general finding for the wave decompositions for women is consistent with the findings of Casale (2003) and Ntuli and Wittenberg (2013). It is worth noting, however, that in this study, a much larger portion of the increase in female labour force participation is attributable to changing characteristics, than what was found in Casale's (2003) and Ntuli and Wittenberg's (2013) post-apartheid studies. Ntuli and Wittenberg (2013) attribute the large behavioural contribution to improved opportunities, and changes in social, political, and economic environments that altered a woman's behavioural responses. Perhaps because the period studied in this dissertation starts from 13 years after apartheid (whereas the previous two studies look at periods much closer to the demise of apartheid), some of the anti-discrimination legislation may have begun to impact the average characteristics of the African population. As seen in Chapter Three, for example, the education levels of the African population have been consistently growing. Appendix 1 also indicates that the proportion of individuals living in urban areas has consistently increased between Wave 2 and 5. The fact that post-apartheid legislation may now be starting to affect the average characteristics of the African sample, may be a reason a much larger portion of the increase in participation is attributed to changing characteristics in this study than previous studies.

men. In line with the previous chapter's findings, education, particularly at higher levels, is an important tool for increasing female labour force participation especially.

Section B of the gender decomposition in Table 4.2. shows that the aggregated characteristic contribution of the five education categories is positive. This indicates that overall gender differences in educational attainments should actually contribute to women being more likely to participate in the labour force than men and should work towards reducing the participation gap. This is true for all five waves but is only significant in Wave 3 and 5 for both participation definitions. The contributions of each education category indicate that there are conflicting impacts that may be causing some of the insignificant results. Section B indicates that in waves 3, 4, and 5, differences in the average number of men and women with no schooling should contribute to women being less likely to participate than men (as seen by the negative sign on its characteristic contribution). This is expected as Chapter Three indicated that women are more likely to have no schooling at all, which would be predicted to work towards reducing their participation rates in comparison to those of men. In Waves 3 and 5, however, the characteristic contribution of tertiary qualifications is positive and significant, suggesting that differences in the number of men and women with tertiary qualifications should result in women being more likely to participate in the labour force than men. Chapter Three also indicated that women were more likely to attain tertiary qualifications than men, so it would be expected that this characteristic difference would work toward reducing the participation gender gap. Whilst overall, as seen in Chapter Three, women tend to achieve higher levels of education than men, and this is expected to reduce the overall participation gap, the fact that they are also more likely than men to have no schooling at all, seems to be dampening this overall expected impact. Generally, these findings are the same for both participation definitions.

Section C of Table 4.2. shows that the aggregated coefficient contribution of education is insignificant in all waves of the gender decompositions. The positive, significant coefficient contribution of tertiary education suggests that the participation-increasing effects of tertiary qualifications, are stronger for women than for men (in Waves 2, 3, 4 and 5) (Abdulloev et al., 2014). This is only significant in Wave 3 and 4 when considering the broad definition. Tertiary qualifications, therefore, have a more significant impact on women being employed or actively searching for work. In contrast to this, the contribution of the grade 1 – 7 coefficient contribution is negative and significant in three waves for the strict definition and four for the broad definition. The no schooling coefficient contribution is similarly negative and significant

in two waves for the strict definition (but not significant for the broad definition). This suggests that the participation-increasing effects of attaining lower qualifications are weaker for women than men, which again dampens the overall impact education has on female labour force participation[52]. Again, these results show that increasing the educational attainment of women, specifically to higher levels (including matric and tertiary qualifications), is an important tool for reducing the participation gender gap.

Moving on to the decomposition of participation rates between Waves 2 and 5, section B in Table 4.3. shows that for both men and women, the aggregated characteristic contribution of the education categorical variables, is positive and significant. Whilst changes in educational attainments seemed to be a proportionately larger contributor to the rise participation rates for women than men, the results still suggest that changes in the overall average educational attainment of both men and women between Wave 2 and Wave 5, were important drivers of the rise in participation rates. The positive and significant contributions of the 'no schooling' and 'grade 1 – 7' variables indicate that changes in the portion of individuals with these lower education categories, contributed significantly to the rise in male and female labour force participation between Wave 2 and 5. The educational descriptive statistics in the previous chapter, indicate that between Wave 2 and 5, the proportion of the sample with these lower levels of education declined. In line with the decomposition results it would, therefore, be expected that a reduction in the proportion of the sample with the lowest levels of education would significantly contribute to the rise in labour force participation rates. The characteristic contributions of tertiary qualifications are similarly positive and significant. This indicates that changes in the portion of men and women with tertiary qualifications significantly contributed to the increase in participation rates. The descriptive statistics in Chapter Three show that the proportion of men and women with tertiary qualifications increased between Wave 2 and 5. Together, these results suggest that increases in the proportion of men and women with tertiary qualifications (and reductions in the proportion of men and women with the lowest levels of qualifications) were significant drivers of the rise in labour force participation rates between Wave 2 and 5. This is true for men and women across both participation definitions.

Generally, section C of table 4.3., on the other hand, indicates that aggregated changes in the behavioural responses to educations have not significantly contributed to the rise in strict

[52] This is also in line with the findings of Chapter Three which indicated that the participation gap was largest at low levels of education. These results imply that women have to attain much higher levels to achieve participation rates that are closer to men.

participation rates for men and women. According to the strict definition, the negative and significant contribution of having a matric, indicates that changes in the way women respond to acquiring a matric should have actually resulted in them being less likely to participate in 2017 than in 2010. Overall, however, it was mostly rising educational attainments of men and women, as opposed to changes in their responses to education, that contributed to the increase in labour force participation.

The Probit regressions and decomposition analyses confirm that increasing the proportion of women with higher qualifications (especially to tertiary levels) is likely to increase their chances of participation and contribute to narrowing the participation gap. Rising educational attainments of African men and women have also significantly contributed to their increased participation rates.

Marital Status

Considering the Probit regression results in Table 4.1., in line with the findings of the literature discussed in Chapter Two, marriage appears to have differing relationships with the likelihood of male and female labour force participation. In three out of the five waves, married women are significantly less likely to participate in the labour force than women who were never married. Married men, on the other hand, are significantly more likely to participate than men who were never married in all five waves. It is worth noting that the positive coefficient and marginal effect of marriage on male labour force participation is much larger in magnitude than the negative marginal effect marriage has on women. Living with a partner, compared to never being married, is similarly positively related to the likelihood of male participation in most waves, but is insignificant for women. These results are true for both participation definitions. The smaller but negative effect of marriage for women could arise because married women are less likely to need to participate in the labour force if their husbands earn income (Casale, 2003; Ntuli and Wittenberg, 2013). Alternatively, if husbands have more bargaining power than their wives, as discussed in Chapter Two, they may prefer to keep their wives at home to complete household chores (Casale, 2003). If men are doing less housework, on the other hand, (which as explained in Chapter Two, is likely) they may have more time to spend in the labour market. Additionally, once married or living with a partner, men may feel the need or obligation to provide financially (McConnell et al., 2016). This obligation could lead to such men being more likely to spend time in the labour market, searching for income. A male marriage premium has also been found in previous studies whereby married men tend to earn more than

unmarried men with the same characteristics[53] (Bartlett and Callahan, 1984; Casale and Posel, 2010). Considering the theory of labour supply mentioned previously, if married men are likely to face higher earnings than unmarried men, their likelihood of labour force participation would also be expected to be higher. On the other hand, according to the literature based on marriage markets, there is also the possibility that men who are employed (or earn higher wages), are more likely to enter into marriage (Ahituv et al., 2005). If employed men are more likely to get married than unemployed or economically inactive men, this could also be contributing to the positive relationship observed between marriage and male labour force participation. Being divorced or being a widow, compared to never being married, however, either has an insignificant impact on participation or is inconsistent in the direction of its impact for men and women.

In section B of Table 4.2., the gender decompositions show that gender differences in the portion of men and women who were never married should contribute to women being more likely to participate in the labour force than men. This is significant in Waves 1, 4, and 5 for the strict participation definition, and Waves 4 and 5 for the broad definition. Calculations of the proportion of men and women of each marital status (seen in Appendix 1) indicate that women are always less likely to have never been married than men. As seen in the Probit regressions, men who are married are a lot more likely to participate in the labour force than unmarried men. Since men are more likely to have never been married than women, and this marital state may reduce their chances of participation, it makes sense that the characteristic effect should work towards making men less likely to participate in the labour force than women. The other characteristic contributions of the marital status variables are either insignificant or inconsistent in sign.

Section C of Table 4.2. shows that gender differences in the behavioural responses (i.e., the coefficient differences) to being married significantly contribute to the gender gap in participation. This is true for both definitions of participation. This finding is in line with

[53] In the study by Bartlett and Callahan (1984), the authors found that a significant portion of the marriage premium in Britain could be accounted for by specialisation within the home i.e., the more domestic chores that a woman in the household does (or the more specialised a woman is in household work), the more the man in the household is likely to earn. Despite this, even after controlling for individual, employer and household characteristics, as well as individual specific unobserved effects, a marriage premium still existed for men (Bartlett and Callahan, 1984). Casale and Posel (2010) similarly find a marriage premium for African men in South Africa. This premium declines when accounting for fixed effects. Additionally, in South Africa men are often required to make payments to bride wealth (known as ilobolo) to get married. It is found that growth in wages is positively related to the probability of getting married in consecutive years. This may also result in an upward bias on their estimations of the fixed effects wage premiums.

expectations, as again, the literature has suggested that different roles and responsibilities taken on by men and women after marriage, is likely to be a reason the participation gap still exists. The behavioural responses to never being married, on the other hand, work towards making women more likely to join the labour force than men (i.e., the participation-increasing effects of never being married are stronger for women than for men)[54]. This contribution is significant in four of the five waves for both definitions of labour force participation.

Again, the signs and significance of being a widow, or being divorced are inconsistent in their contributions to the participation gap. The aggregate coefficient contribution of the group of marital status variables, is only significant in Waves 4 and 5 at a 5% level and is positive. Whilst in line with expectations, gender differences in responses to marriage should contribute towards widening the gender gap in participation, it appears that gender differences in responses to never being married overpower this impact. This has resulted in aggregate coefficient contributions for marital status that should actually work towards increasing the likelihood of female labour force participation relative to male labour force participation.

For the time decompositions in Table 4.3., the characteristic contribution of changes in the aggregate marital states, of men and women, had a mostly insignificant impact on the increase in strict (and broad) participation rates. Similarly, for the coefficient contributions in section C, marital status was not a significant contributor to the rise in strict and broad participation rates for women, and for strict participation rates for men. In the broad decomposition for men, on the other hand, the aggregate coefficient contribution of marital status and the contribution of never having been married, is negative and significant. This suggests that responses to never being married were more negatively related to the likelihood of broad labour force participation in Wave 5 than in Wave 2. A man who was never married in Wave 5, was, therefore, less likely to participate in the labour force than an identical man who was never married in Wave 2.

Childcare

Another factor that has differing relationships with the likelihood of labour force participation for men and women, is childcare. As mentioned above, the Probit regressions in Table 4.1. indicate that the number of children for which an individual cares is negatively and

[54] This finding for women is in line with previous findings that have suggested that higher female labour force participation rates have been associated with increases in female headed households/households without the support of a man. It is, therefore, not surprising that the 'never married' variable has a stronger impact on female labour force participation.

significantly related to the likelihood of female labour force participation in all five waves. For men, on the other hand, the impact of childcare is mostly insignificant.

Gender decomposition results in Table 4.2. indicate that differences in the average number of children men and women care for, is a significant contributor to the gender differences in strict (and broad) labour force participation rates. This can be seen by the negative characteristic contribution of the number of children cared for in section B of the table (this variable also consistently contributes a substantial portion to the overall gap). The descriptive statistics (in Appendix 1) suggest that women consistently care for a higher average number of children than men (this is in line with the findings discussed in Chapter Two). These results suggest that the greater average number of children cared for by women compared to men, is associated with widening the gender gap in labour force participation. The coefficient contribution of childcare in section C, however, is mostly insignificant for both definitions. This suggests that it is not differences in the way men and women respond to childcare that is contributing to the gap, but rather the fact that women care for a higher average number of children than men do.

In terms of decomposing the increase in labour force participation between Waves 2 and 5, Table 4.3 indicates that changes in the number of children a man cared for, was not a significant driver of the increase in strict or broad male participation rates. For women, on the other hand, section B of the table indicates that changes in the number of children cared for, had significantly, and positively contributed to the rise in strict and broad female labour force participation rates (albeit a relatively small proportional contribution). The descriptive statistics presented in Appendix 1 indicate that in Wave 5, women cared for a lower number of children, on average, than women in Wave 2. This is similarly in line with expectations as a reduction in the average number of children for which a woman cares, is likely to reduce constraints on her time and, therefore, contribute to increases in the likelihood of female participation across this period.

Overall, the above findings indicate that whilst a reduction in the average number of children a woman cares for has contributed to increases in female labour force participation rates over time, the unequal division of childcare between men and women remains a significant contributor to the participation gap.

Household Composition

Table 4.1. indicates that the Probit results for other household composition variables are mixed. An additional male or female adult in a household generally does not significantly affect the

likelihood of female labour force participation. For men, on the other hand, an additional woman in the household is negatively and significantly correlated with the likelihood of participation in all waves. In Waves 4 and 5, an additional man in the household similarly has a negative, significant relationship with the likelihood of male participation.

As mentioned above, there are multiple factors that could be affecting the relationship between the number of adults in a household and the likelihood of labour force participation. An additional employed adult may reduce the need for a man to participate in the labour force in search of income. This may be a reason for the negative impact of male and female adults on labour force participation. If a man has more bargaining power than a woman in a household, he may be able to acquire and make use of a larger portion of her available income. This could be a potential reason why the impact of women in the household is more consistently significant than the impact of men.

If women have less bargaining power, they may have less control over income in the household. This may be why other adults do not significantly impact the likelihood of female labour force participation. Alternatively, the multiple potential conflicting impacts of employed and unemployed adults in a household (listed previously in this chapter) could be reasons the adult variables are mostly insignificant for women.

As mentioned above, the additional adult variables are not included in the gender decomposition because it requires identical regression equations for men and women. The additional adult variables are, however, included in the wave decompositions.

In part B of Table 4.3, the wave decomposition results suggest that both the number of working-age women and the number of working-age men in a household, excluding the man in question, were significant contributors to the rise in strict male participation rates. The descriptive results in Appendix 1 indicate that between Wave 2 and 5 the number of male and female adults in the household declined. Since the presence of other adults in the household are generally negatively related to the likelihood of male labour force participation, it would be expected that a decline in the number of adults in the household would result in a rise in male labour force participation rates, *ceteris paribus*.

For the broad decomposition, only changes in the number of adult women in a household, had significantly and positively contributed to the increase in male labour force participation. The reduction in the number of other male adults (mentioned above), therefore, contributed to increasing the likelihood of men actively seeking employment, or being employed, but did not

likely contribute to an increase in male discouraged workers. For women, on the other hand, changes in the number of adult men and women in the household were not significant contributors to rising female labour force participation rates.

In part C of Table 4.3., the coefficient contributions of adult men and women in the household did not significantly impact the rise in male or female labour force participation. This is true for both participation definitions. Overall, the results suggest that a decline in the average number of adults with which a typical man resides, had contributed to the rise in male participation rates, but the relationship between the presence of other adults in a household and the likelihood of labour force participation, did not.

For the number of pensioners in the household, the Probit regressions results in Table 4.1. indicate that an additional female pensioner in a household, is negatively and significantly associated with the likelihood of male labour force participation. The presence of male pensioners, on the other hand, has a mostly insignificant effect on both male and female labour force participation (apart from in Wave 5, when male pensioners were significantly and negatively correlated with the likelihood of female labour force participation). The female pensioners coefficient generally has an insignificant impact on female labour force participation. The significant negative coefficient of female pensioners, for male participation, is expected since the number of pensioners in a household is used as a proxy for pension income. This additional income is likely to reduce the need for working-age individuals in the household to participate in the labour force (Casale, 2003). Bertrand et al. (2003) similarly find that men reduce their labour supply more than women in response to pensioners in a household. Female pensioners were also found to have a larger impact on male labour supply, than male pensioners. Whilst labour supply and labour force participation cannot be compared directly, the general direction of the impact remains relevant (Casale, 2003)[55].

Bertrand et al. (2003) find that most of the negative impact of female pensioners is the result of them contributing pension income to a household. This reduces the hours a working-age man needs to work. The authors suggests that adult men are more responsive to female pension income because men are likely to have more bargaining power in the household than women and can, therefore, acquire more benefit from a woman's pension. This would also help to explain why male pensioners do not significantly impact labour force participation.

[55] Although they do not differentiate between male and female pensioners, Fredericks and Yu (2018) similarly find that the presence of pensioners within a household significantly reduces male labour force participation, but not female labour force participation.

Alternatively, Bertrand et al. (2003) suggest that female pensioners may care more about men in the household and give them access to larger portions of their pension income.

Posel et al. (2006) similarly find that the effect of a social pension on labour supply (and in this case, migrant labour supply) derives mostly from *female* pensioners. Their results, however, suggest that female pension income may increase the supply of female migrant labour. Male labour migration on the other hand, was found to be mostly negatively (but rarely significantly) affected by pension income (particularly female pension income). Unlike Bertrand's suggested hypothesis, Posel et al. (2002) suggest that the female pension income may provide other women in the household with the resources necessary to migrate in search of work or continue with their migrant job search.

Female pension income may thus have conflicting effects on female labour force participation – on the one hand, as mentioned above, it may lower the need for a woman to work or seek employment, whilst on the other hand, it may provide her with the resources needed to migrate in search of employment. These potentially conflicting effects could help explain the insignificant impact on female labour force participation.

It is also possible that the 'number of female pensioners' variable is picking up other behavioural impacts. An alternate reason for the negative relationship between female pensioners and the likelihood male labour force participation, could be that elderly individuals may fall ill and require care from another adult within the household. Bertrand et al. (2003), state that it may, at first, be expected that women would stay at home and care for pensioners, but then argue that women are often expected to both care for pensioners and work. Men, on the other hand, may only be expected to work or care for pensioners, hence the negative relationship of female pensioners with the likelihood of male participation, and not female participation.

The gender decompositions in Table 4.2, suggest that differences in the average number of female pensioners in a man or woman's household do not significantly contribute towards the gender gap for either definition of participation[56]. This is suggested by the consistently insignificant characteristic contributions in section B of the table. Section C, on the other hand,

[56] In line with this finding Appendix 1 shows that there are no large differences in the average number of female pensioners men and women have in their household.

indicates that coefficient contributions of female pensioners are positive and significant in three waves. Gender differences in the relationship between the presence of female pensioners and the likelihood of participation should, therefore, actually contribute to women being more likely to participate in the labour force than men in three of the five waves for both definitions. Again, if adult males have more bargaining power than women, or female pensioners favour men in the household, it is likely that adult men will acquire more benefit from a female pension than women. This potential benefit is likely to reduce the need for men to participate in comparison with women. Alternatively, if (as suggested by Posel et al, 2002) the female pension enables working-age women in the household to migrate in search of labour, this could be a reason why the presence of female pensioners should contribute towards women being more likely to participate in the labour force than men. The alternate behavioural factors mentioned above could also be responsible for this coefficient contribution. The results confirm that it is not differences in the average number of female pensioners in the household's of men and women, that contribute to the gender gap. Instead, gender differences in the way men and women respond to female pensioners, affect (act towards reducing) the size of the gender gap in participation.

Section B of Table 4.2 suggests that in Waves 3 to 5, differences in the average number of male pensioners in the households of men and women, should result in women being less likely to participate in the labour force than men. This is suggested by the negative and significant characteristic contribution of male pensioners. The descriptive statistics in Appendix 1 indicate that women consistently have a higher average number of male pensioners in the household than men do. Since the previous literature indicates that the presence of pensioners (male or female) is expected to reduce the likelihood of labour force participation, if women have a larger average number of male pensioners in their household than men do, it would be expected that this would work towards making women less likely to participate in the labour force than men (which is, therefore, in line with the decomposition results)[57]. The coefficient contribution of male pensioners to the participation gap, however, is insignificant. This suggests that it is not differences in the way men and women respond to the presence of male pensioners that contributes to the participation gap, but rather the fact that women tend to live with a higher average number of male pensioners than men do.

[57] Perhaps women may have a higher mean number of male pensioners in their households than men do, because a male pensioner that is ill, may be more likely to choose to stay in a household with an adult woman who may be expected to cook, clean or care for him.

Moving on to the time decompositions in Table 4.3., the positive characteristic contributions of female pensioners in the household significantly contributed to the fact that men were more likely to participate in the labour force in Wave 5, than in Wave 2 (this is true for both definitions of participation). Appendix 1 indicates that the average number of pensioners in a man's household, declined between Wave 2 and Wave 5. The Probit regressions discussed above suggest that female pensioners especially, are negatively correlated with male labour force participation. In line with the decomposition findings, a decrease in the number of female pensioners in a given man's household over this period, would, therefore, be expected to lead to increased male participation rates. The characteristic contribution of female pensioners to the rise in female labour force participation rates, on the other hand, is insignificant. In part C, the coefficient contribution of the number of female pensioners in a household, is similarly insignificant for male and female labour force participation. This is true for both definitions.

Section B of Table 4.3. indicates that changes in the average number of male pensioners in a household did not significantly contribute to the rise in male or female labour force participation rates. Part C of Table 4.3. shows that the negative coefficient contribution of male pensioners, on the other hand, should have resulted in women being less likely to participate in the labour force in Wave 5 than in Wave 2 according to the strict definition of participation. This suggests that even if the number of male pensioners in the household had remained the same, the relationship between male pensioners and female labour force participation had changed. This could suggest that in Wave 5, male pensioners were more likely to be able to keep women at home and prevent them from actively participating in the labour force (perhaps suggesting increases in male bargaining power), or that women were more likely to get a larger share of male pension income in Wave 5, reducing their need to participate in the labour force (perhaps suggesting an increase in female bargaining power). This impact is only significant for the strict definition suggesting that changes in the response to having male pensioners in the household reduced the likelihood of a woman *actively* searching for work or being employed.

Real Other Household Income

For both men and women, the Probit regressions results in Table 4.1. indicate that the higher the real household income available per capita, the less likely an individual is to participate in the labour force (although it is worth noting that the magnitude of this effect is mostly smaller for women than for men). This negative relationship is expected and in line with previous

findings as additional available household income is likely to lower the need for an individual to seek work (Contreras et al., 2011; Ntuli and Wittenberg, 2013). This finding is true for both definitions.

In the gender decompositions in Table 4.2., section B indicates that characteristic differences in other household income per capita, do not appear to significantly contribute to the gender gap in strict or broad labour force participation rates[58]. In Waves 2 and 3, however, the coefficient contribution of other household income per capita (seen in section C) is positive and significant for both definitions of participation. This contribution suggests that differences in the way men and women respond to household income, should be associated with women being more likely to participate in the labour force than men. Men are, therefore, more likely to drop out of the labour force in response to additional household income, than women (which is in line with the findings of the Probit regressions mentioned above). This could, again, be because of differences in bargaining power. If men have more say in how the household income is distributed, they may benefit more from a larger share of the available income than women in the household, and therefore, have a lower need to participate. Similarly, if women have less bargaining power, they may be likely to get a much smaller share of the household income available, and thus the impact of other income on participation, whilst negative, may not be as large as the impact it has on men. Even if men and women lived in households with identical amounts of 'real other household income per capita', the participation reducing effects of this income would be stronger for men than for women.

For the time decomposition in Table 4.3., the negative and significant characteristic contribution of income in section B, suggests that changes in the average real household income both of men and women between Wave 2 and Wave 5, worked towards reducing the likelihood of participation across this period. Appendix 1 indicates that the average, real value of other household income per capita increased between Wave 2 and 5 for both men and women. Since household income, on average, is expected to reduce the need for individuals to participate, it is expected that an increase in real average household income acted towards reducing labour force participation rates across this period.

The coefficient impact of other household income in part C of Table 4.3, on the other hand, is positive and significant for men, for the strict definition. The coefficient contribution of this

[58] In line with this finding, the descriptive statistics in Appendix 1 show small and inconsistent differences in the average 'other household income' values between men and women.

income is insignificant for men according to the broad definition, and insignificant for women according to both definitions. This suggests that differences in the relationship between income and the likelihood of male participation in Wave 5 and Wave 2, should result in men being more likely to *actively* participate in the labour force in Wave 5. So, whilst, as explained above, household income is negatively related to the likelihood of male labour force participation, the strength of this relationship seems to have declined between 2010 and 2017.

Location

The Probit regressions results in Table 4.1. suggest that living in an urban area has similar impacts on labour force participation for men and women. As expected, and in line with previous findings, those living in an urban area are more likely to participate in the labour force (strictly and broadly speaking) than those in rural areas (Casale, 2003; Ntuli and Wittenberg, 2013).

Part B of Table 4.2. indicates that the characteristic contribution of living in an urban area is negative and significant (this is true for the broad definition as well). This indicates that differences in the proportion of men and women living in urban areas work towards increasing the magnitude of the participation gap. The descriptive statistics in Appendix 1 indicate that women are less likely to reside in urban areas than men. Because urban areas have been associated with increased labour force participation rates in the literature, and women are less likely to reside in urban areas, it would be expected that this would lead to women being less likely to participate in the labour force than men, *ceteris paribus*. The coefficient impact in section C, on the other hand, is mostly insignificant for men and women according to the strict and broad definitions. This indicates that it is the differences in the portion of men and women residing in urban areas contributing to the gap, and not differences in the way men and women respond to living in an urban area.

For the time decomposition in Table 4.3., the positive characteristic contribution indicates that between Wave 2 and 5, changes in the proportion of men and women living in urban areas significantly contributed to the rise in labour force participation rates (this is also true for the broad definition). The descriptive results in Appendix 1, indicate that the portion of men and women living in urban areas increased across this period. These results together are in line with

expectations and suggest that continued urbanization has resulted in increased labour force participation rates (Ntuli and Wittenberg's, 2013). Changes in the way men and women respond to living in an urban area (i.e., the coefficient contribution of living in an urban area), on the other hand, does not appear to have significantly contributed to the rise in participation rates for men and women according to either participation definition.

The changes in urbanisation and gender differences in individuals living in urban areas could also be explained, or at least impacted by labour migration to urban areas. Posel and Casale (2002), for example, use data from 1993 to 1999 to study labour migration in South Africa. In their study, they investigate how the migration of African individuals to urban areas was affected by the lifting of the formal sanctions prohibiting African migration during the Apartheid period[59]. They explain that urban areas are generally thought to house more economic opportunity and that South African migration is viewed as movements from rural to urban areas driven by the search for employment (although at the time, almost half the households to which individuals had migrated, were still in rural areas). Overall, across the period studied, they find a small increase in labour migration driven by increases in female migration. Whilst the percentage of female migration had increased, men still consistently made up a much larger portion of migrant workers. Female labour migrants were also found to be more likely to migrate to places closer to home or be reported in rural destination households. If the increase in labour migration to urban areas had continued, between 2010 and 2017, this is a likely reason for the rise in individuals living in urban areas between Wave 2 and 5. Similarly, the fact that men were more likely than women to migrate, and to do so in urban areas, could also be a reason why men are more likely to live in urban areas than women.

Overall, these results suggest that increasing the number of women in urban areas relative to men, is likely to result in increased female labour force participation rates, and work towards reducing the gender gap in participation.

In terms of Provinces, the regression results in Table 4.1. suggest that individuals living in any province other than Gauteng, are generally less likely to participate in the labour force than those residing in Gauteng. This relationship is only consistently significant for the Eastern Cape. The significance of the impact of other provinces fluctuated for both definitions. Table

[59] In the study, migrants are defined as individuals who were absent from their households for at least one month of the year, in order to work or search for work.

4.2. indicates that the characteristic and coefficient contributions of the provincial variables have a mostly insignificant impact on the participation gap for either participation definition.

In Table 4.3. on the other hand, section B suggests that characteristic differences in the provinces in which women tend to reside, seem to be contributing to the increase in female labour force participation rates (again, this is true for both definitions). Descriptive statistics in Appendix 1, for example, show that the portion of women living in Gauteng increased between Wave 2 and Wave 5. Ntuli and Wittenberg find that in 2004, women's labour force participation rates were highest in Gauteng. Women may, therefore, have moved more towards areas with better employment opportunities which could be another reason their participation rates increased. The coefficient impact in Part C on the other hand, is insignificant. For men, neither the characteristic nor coefficient impacts of provinces were significant contributors to the rise in strict or broad participation rates.

Age

Table 4.1. indicates that age tends to have a similar impact on labour force participation for both men and women. As expected, any individual older than age 15-19 is more likely to participate than those of age 15-19. As mentioned in the previous chapter, this is the age where some individuals are likely to still be in secondary school, and thus have minimal time to participate in the labour force. For both men and women, the age category 35 – 44, generally has the largest positive coefficient (and marginal effect). This suggests that the prime working-age category of men and women is age 35 – 44.

For the gender decompositions in Table 4.2., the results indicate that generally, overall characteristic differences in the age categories of men and women do not significantly contribute to the gender gap in participation. Coefficient differences in age, on the other hand, significantly contribute to the strict participation gender gap in Waves 1 and 3 (although the contribution of wave 3 is only significant at a 10 percent level), and to the broad participation gap in wave 1 only. These coefficient contributions are, however, more often insignificant than significant.

Section B of the time decompositions in Table 4.3. indicate that the aggregated changes in the average age of individuals between Wave 2 and 5, significantly contributed to the rise in both male and female labour force participation. Ntuli and Wittenberg (2013) similarly find that characteristic changes in a woman's average age significantly contributed to the increase in female labour force participation in the post-apartheid period. Descriptive statistics indicate

that in Wave 5, a lower portion of men and women fell in age category 15 – 20, whereas a larger portion fell into older categories, including prime-age categories. This is likely to be because NIDS tracks mostly the same households over time. Any adults interviewed in multiple waves would have aged in each consecutive wave. As seen from the Probit results, all age groups of the working-age sample that are older than 15 to 19 years old, are more likely to participate than those between the age of 15 and 19. It, therefore, makes sense that many of the working-age adults who were interview in multiple waves, progressed to age categories that are associated with high labour force participation rates.

The differences in the way men and women responded to age also contributed to the increase in strict labour force participation rates, although this contribution was less significant than the characteristic contribution. This suggests that African men and women in Wave 5, of the same age as African men and women in Wave 2, were, on average, more likely to participate in the labour force (Ntuli and Wittenberg, 2013). For the broad definition of labour force participation, on the other hand, the coefficient contribution to rising participation rates was only significant for men. This suggests that the rise in the participation-increasing effects of age, was associated with women being more likely to be employed or actively search for work in Wave 5, but contributed to men being more likely to broadly indicate that they are participants, as well as actively search for work or being employed in Wave 5. Overall. these results suggest the increase in the average age of the sample, coupled with the changes in the relationship between age and the likelihood of participation, both contributed significantly to the rise in male and female labour force participation.

4.4.Limitations and Need for Future Research

Whilst the above results are useful in suggesting some of the factors responsible for the gender gap in participation and the increases in participation over time, it is important to note the limitations of the above methods.

A first limitation that is common in the literature on labour force participation, is that the above analysis is likely to be subject to endogeneity. Decisions around participating in the labour force, getting married and having children, for example, are likely to occur at the same time for women, especially (Ntuli and Wittenberg, 2013). There is similarly the potential for endogeneity with marriage, children, and other household composition variables. Unmarried or single women, for example, may be more likely to participate in the labour force, but women participating in the labour force may be less likely to need to get married or live with a partner

(Casale, 2003). Additionally, variables such as location and participation could be endogenous. An individual may move to an urban area or given province because they are labour force participants that have been required to relocate to work (or actively seek work), or an individual may be more likely to become a labour force participant, because they reside in an area with many employment opportunities (Mackett, 2016). Removing this endogeneity would require the use of instrumental variables, which are difficult to find and beyond the scope of this study (Ntuli and Wittenberg, 2013). Results should, therefore, be interpreted with caution.

Secondly, the fact that one of the focuses of this study is on education in the context of labour market participation, also brings an empirical limitation to the study. This focus on education, as mentioned in the previous chapter, makes the use of panel data methods to remove fixed unobserved heterogeneity unideal. Whilst decomposition coefficient effects are often interpreted as behavioural differences (as is done in Abdulloev et al.'s (2014) study), they have also been interpreted as the 'unexplained component' of a gap (as it is the component not explained by observable characteristics). This component may be picking up effects that cannot be quantified or included in the model (such as abilities, beliefs, and attitudes) (Casale, 2003).

In addition, it should be noted that the time period studied is relatively short. Some of the changes this study attempts to identify (such as urbanisation, rising educational attainments and changing labour force participation rates) are likely to have been gradual, with numerous larger changes occurring earlier in the post-apartheid period, as a result of abrupt changes in the political setting.

Finally, the decomposition analyses are done at cross-sections between genders for each wave, and then over time for each gender separately. Whilst this highlights potential reasons for the gaps between genders for each wave, and how the determinants of labour force participation change over time for each gender, it would be ideal if the gender gap could be decomposed over time (i.e., if both dimensions could be decomposed simultaneously). The potential proposed methods for this, however, have not yet been specifically developed for binary dependent variables, and such a method is, therefore, beyond the scope of this study.

It should be reiterated that the focus of this study is on gender differences in the choice to participate in the labour market, and not employment. It cannot be guaranteed that increasing female labour force participation to the same levels as men will result in equal increases in employment (in fact, as mentioned in Chapter Two, the observed increase in female labour force participation rates previously occurred with increases in female unemployment rates).

Despite this, it is still important to investigate why women have consistently been less likely to make the decision to participate in the labour force than men considering their higher average educational attainments.

Given the above limitations, there is a need for future studies that further investigate the participation gap whilst accounting for the possible endogeneity mentioned above. It would also be useful to conduct the analysis across a wider time frame, including the immediate post-apartheid period. Additionally, since it is highly likely that factors such as attitudes, status, beliefs, bargaining power, and culture are also related to gender differences in labour force participation, it would be useful to investigate gender differences in participation after removing the impact of unobserved fixed heterogeneity. Whilst the focus on education makes panel data techniques inappropriate in this study, there is a need for future studies without a focus on education, that use such methods to investigate gender differences in participation.

Concluding Remarks

Using Probit regressions and decomposition analyses, this chapter investigated the factors that influence labour force participation for African men and women and examined how these factors have changed over time. The overall decomposition results indicate that a small portion of the gender gap in participation can be explained by characteristic differences between men and women, but the majority of the gap is a result of their behavioural differences. This suggests that whilst equalising the characteristics between men and women is likely to help reduce the gender gap, it will be insufficient unless their behavioural differences are also reduced (Abdulloev et al., 2014). This helps explain why the participation rates of women are still lower than those of men despite their higher average educational attainments.

Whilst the results show that education has a significant effect on male and female labour force participation, and overall characteristic differences in education should generally result in women being more likely to participate in the labour force than men, there are other specific factors that seem to be contributing to the persistent gender gap. Firstly, the proportion of women with no schooling at all, appears to be dampening the impact education has on reducing the size of the participation gap. Secondly, the number of children for which an individual is the primary caregiver, is much larger for women than for men and seems to be a reason the participation gap persists. Thirdly, the fact that men are more likely to reside in urban areas appears to be a significant contributor to the gender gap in participation. Again, the majority

of this gap remains attributable to behavioural differences in the way men and women respond to their characteristics, and these are also likely to include factors that are omitted from the analysis or are unobserved.

The gender differences in behavioural responses to household income and female pensioners in a household, as mentioned above, may also be picking up differences in the bargaining power of men and women. Whilst in this instance, the higher bargaining power would allow men potential access to more of the available household income and reduce their chances of participation (thus reducing the gender gap in participation), bargaining power also has the potential to increase the size of the gender gap as mentioned in Chapter Two. If these results do indicate that men have more bargaining power, a man, for example, may also prefer to keep the women of the household at home to complete household chores. This type of unobserved effect could also significantly contribute to the participation gender gap.

On the other hand, characteristic changes make up a larger portion of the increase in male and female labour force participation rates between 2010 and 2017. Despite this, a significant portion of the rise in participation remains attributed to changing coefficients. This indicates that men and women in 2017, were, on average, more likely to participate in the labour force than their identical counterparts in 2010. Nevertheless, results indicate that increasing educational attainments and urbanisation were significant characteristic contributors to the rise in labour force participation rates for both men and women. A reduction in the average number of children a woman cares for was also a significant driver of the increase in female labour force participation specifically. Policies aimed at urbanisation, increasing educational attainments, and reducing the burden of childcare, for women especially, are, therefore, likely to increase female labour force participation rates and perhaps help reduce the participation gap.

Whilst the results highlight certain factors that can be addressed to reduce the participation gender gap, unless women behave and respond to their characteristics more like men do, or men behave and respond to their characteristics more like women do, the gap is likely to remain persistent. Potential policies implications of this will be discussed in the next chapter.

Chapter Five: Conclusion

This study aimed to investigate why women are still less likely to participate in the labour force than men, despite the fact that they are, on average, more educated in South Africa. It adds to the literature by using descriptive statistics, regressions analyses, and decomposition analyses to determine the factors that appear to be driving labour force participation differences and changes in participation over time.

A review of previous literature and Economic theories suggested that increases in educational attainments should increase the likelihood of labour force participation. If women are, on average, more educated than men, it is expected that they should be more likely to participate in the labour force than men, *ceteris paribus*. Economic theories suggest that gender differences in the allocation of housework and market work in a household, and gender differences in bargaining power, may be reasons the participation gap still exists. Multiple international studies have investigated gender differences in participation and have found that the impact of marriage, the presence of children in a household, and potential employment discrimination, may be additional reasons the participation gap persists. It has also been suggested that a large portion of this gap may be attributed to behavioural differences between men and women. The South African literature has shown that the average educational attainment of women has surpassed that of men, and that education significantly increases the likelihood of labour force participation for men and women. Despite this, South African female participation rates consistently lag behind that of men, and the literature has suggested that unpaid work done by women, the impact of marriage and having children, and high female unemployment rates may be reasons for this. Despite this, there is a dearth of South African studies that have further investigated this gap with decomposition analyses.

To address this dearth of research, this dissertation used Wave 1 to 5 of NIDS to specifically investigate gendered trends in labour force participation and education in South Africa. Descriptive statistics were first used to determine the overall trends in participation and education for African men and women. Probit regressions for labour force participation were then estimated for African men and women separately in each wave. This was followed by a decomposition of the gender gap in participation at cross-sections for each wave of the dataset. Finally, the general increases in labour force participation for African men and women between 2010 and 2017 were also decomposed.

The descriptive results indicate that for both men and women, the average educational attainment achieved, had consistently risen between 2008 and 2017. The mean years of schooling attained by women were also higher than men in all five waves. Women were found to be more likely to attain tertiary qualifications than men, but also more likely to have no schooling at all. As seen in the decompositions, this dampened the overall effect of women's higher educational attainments on reducing the participation gender gap. Between 2008 and 2010, the labour force participation rates of both men and women dropped substantially (this was attributed to aftereffects of the global financial crisis). Between 2010 and 2017, however, the participation rates of men and woman generally increased. In line with previous studies, women were also consistently found to be a lot less likely to participate in the labour force than men. The descriptive results suggested that higher levels of education are generally associated with higher labour force participation rates, and that at tertiary levels, the gender gap in labour force participation is smallest. Whilst the gap still exists at this level in Wave 5, the analysis shows that increasing the proportion of women with a tertiary qualification remains an important tool for reducing the size of the gender gap in participation.

The Probit regressions similarly indicate that higher levels of educational attainment are associated with higher likelihoods of participation for both men and women. The gender decompositions suggest that higher average educational attainments of women should work towards decreasing the magnitude of the gender gap in participation, but that again, this overall impact is dampened by the fact that women are more likely to have no education at all, than men. In line with previous studies, the Probit regressions and gender decompositions suggest that childcare may be a reason the participation gap still exists. More specifically, women were found to be the caregivers of a much larger number of children than men, on average, and this difference contributed significantly to the gender gap in participation in all waves of the dataset. The fact that women were, on average, less likely to reside in urban areas also significantly contributed to the predicted participation gap. Whilst in line with expectations, gender differences in responses to marriage contributed toward the gender gap in participation, the results suggest that gender differences in responses to never being married, overpowered this impact. This has resulted in aggregate coefficient contributions for marital status that actually work towards reducing the size of the participation gap. Although these results suggest a few factors that are significantly contributing to the gender gap in participation, the majority of the gap is attributed to behavioural differences in the way men and women respond to their

characteristics. Equalizing observable characteristics between men and women is, therefore, unlikely to reduce the participation gap completely.

For the decompositions of the increase in labour force participation rates over time, on the other hand, for both men and women, a much larger portion of the rise could be explained by changes in their average characteristics. Increases in education and urbanisation significantly contributed to the rising participation rates between 2010 and 2017, for men and women. For women specifically, there was also a decline in the average number of children for which they were the primary caregivers. This reduction was another significant contributor to the rise in female labour force participation rates. Despite this, overall changes in the behavioural responses of men and women to their average characteristics also significantly contributed to the rise in male and female labour force participation rates. This suggests that men and women of identical observable characteristics were more likely to participate in the labour force in Wave 5 than in Wave 2.

Recommendations

Overall, this dissertation finds a clear link between labour force participation and education. Reducing the proportion of women with no schooling, and increasing the proportion of women with tertiary qualifications, is likely to help reduce the labour force participation gap. Whilst increasing the educational attainments of women should remain a priority, the descriptive results and the coefficient contributions of the gender decompositions indicate that women respond less positively to lower education levels than men do, and therefore, have to attain much higher levels to achieve participation rates that are closer to those of men. Encouraging women of all education levels to join the labour force, perhaps through increasing the employment opportunities available for women with lower levels of education, may be an important way to reduce the differences in the way men and women respond to low education levels. This may, in turn, also help reduce the participation gap.

Additionally, since the uneven distribution of childcare is shown to be a significant contributor to the participation gap, policies that help reduce the uneven share of childcare would likely contribute toward reducing the gap. Despite this, this dissertation shows that none of these recommendations are likely to be sufficient in closing the labour force participation gap completely unless men and women respond to their characteristics more similarly. Behavioural responses to being married for example, contributed to widening the gap which could be attributed to typical gender roles taken on after marriage or differences in bargaining power

(even if this specific impact were overpowered by responses of other marital states). Furthermore, several coefficient contributions of other variables discussed above (as well as the literature in Chapter Two) similarly suggest gender differences in bargaining power that favour men. Other unobserved differences (such as attitudes, status, culture, beliefs, and employment discrimination) are also likely to play a major role in the coefficient contribution of the participation gap. There is, therefore, a need for policies aimed at empowering women and encouraging gender equality, in the economy, but also within households[60]. Furthermore, it remains important to ensure that the disadvantages that women face in the labour market, such as discrimination and less favourable employment prospects (reflected by their higher unemployment rates discussed in Chapter Two rates), are remedied.

The limitations highlighted in Chapter Four suggest that there is a need for research that further investigates gender differences in labour force participation whilst controlling for individual unobserved heterogeneity, as this is likely to have a large impact on the participation gap. Furthermore, there is potential for endogeneity in the above analysis. Whilst controlling for this is beyond the scope of this study, there is a need for further research on gendered trends in participation in South Africa that does so.

[60] Policies aimed at discouraging gender stereotypes, for example, may encourage more women to join the labour force. Additionally, policies addressing gender based violence, which remains a pressing issue in South Africa (Republic of South Africa, 2020), may help reduce gender differences in bargaining power and allow women to make decisions (including those revolved around labour market participation) more freely.

Appendix

Appendix 1: Additional Descriptive Results

Table A1: Average Characteristics of Working-Age African Men and Women in each Wave

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Marital Status										
Never Married	0.63839	0.58901	0.68425	0.63063	0.704421	0.648467	0.699174	0.637713	0.702429	0.640933
	(0.01501)	(0.01194)	(0.0165)	(0.01142)	(0.01537)	(0.00998)	(0.01079)	(0.00953)	(0.01134)	(0.00925)
Married	0.236297	0.235666	0.205721	0.218154	0.193594	0.214349	0.1909	0.206566	0.198206	0.226031
	(0.01364)	(0.00992)	(0.01479)	(0.00961)	(0.0131)	(0.00788)	(0.00971)	(0.00731)	(0.00971)	(0.00735)
Lives with partner	0.099807	0.10265	0.086151	0.086007	0.074455	0.0743	0.071774	0.078028	0.058867	0.059701
	(0.00767)	(0.00761)	(0.00794)	(0.00698)	(0.00645)	(0.00623)	(0.0046)	(0.00517)	(0.00381)	(0.00441)
Widow	0.012431	0.0533	0.009318	0.04661	0.008044	0.044133	0.016628	0.055024	0.012931	0.049545
	(0.00197)	(0.00377)	(0.00195)	(0.00317)	(0.00153)	(0.00293)	(0.00268)	(0.00314)	(0.00219)	(0.00322)
Divorced	0.013074	0.019376	0.014557	0.0186	0.019487	0.018752	0.021523	0.02267	0.027567	0.02379
	(0.00225)	(0.00214)	(0.00304)	(0.00225)	(0.00387)	(0.0025)	(0.00313)	(0.0025)	(0.00416)	(0.00268)
No. children cared for	0.056954	0.880315	0.052779	0.863145	0.052952	0.850488	0.066486	0.818686	0.057875	0.816561
	(0.0056)	(0.02244)	(0.00539)	(0.01888)	(0.00518)	(0.01576)	(0.00495)	(0.01594)	(0.00459)	(0.01791)
No. female pensioners	0.128984	0.14392	0.163257	0.169246	0.150299	0.152422	0.145759	0.142992	0.13904	0.140902
	(0.01035)	(0.01013)	(0.01246)	(0.01106)	(0.01123)	(0.01095)	(0.00886)	(0.00862)	(0.00872)	(0.00814)
No. male pensioners	0.069542	0.096697	0.075331	0.113044	0.06803	0.096691	0.070103	0.089478	0.059278	0.088152
	(0.00835)	(0.01028)	(0.00785)	(0.01115)	(0.00676)	(0.0084)	(0.00594)	(0.00677)	(0.00472)	(0.00652)
No. female adults	1.210313		1.372788		1.208386		1.107278		0.997451	
	(0.05826)		(0.06579)		(0.05446)		(0.04474)		(0.03408)	
No. other male adults	0.86187		0.939738		0.889924		0.760351		0.678121	
	(0.06337)		(0.07173)		(0.05816)		(0.0359)		(0.03499)	
No. male adults		1.129073		1.295542		1.161318		1.075797		0.970621
		(0.0493)		(0.05666)		(0.04479)		(0.03715)		(0.03025)
No. other female adults		1.126938		1.341831		1.175777		1.128538		1.002181
		(0.05786)		(0.06087)		(0.04336)		(0.04576)		(0.03718)
Location										
Western Cape	0.042499	0.046898	0.042135	0.053009	0.042843	0.052304	0.046681	0.051659	0.058405	0.065163
	(0.01598)	(0.01957)	(0.01433)	(0.02062)	(0.0154)	(0.01887)	(0.01541)	(0.0195)	(0.01838)	(0.02161)
Eastern Cape	0.122518	0.135025	0.126731	0.135753	0.125272	0.136542	0.123393	0.13686	0.105833	0.116313
	(0.02082)	(0.02469)	(0.02179)	(0.02401)	(0.02073)	(0.02319)	(0.0187)	(0.02176)	(0.01579)	(0.01836)
Northern Cape	0.014677	0.013663	0.012479	0.012998	0.014331	0.012855	0.014673	0.012851	0.018474	0.015127
	(0.0038)	(0.00369)	(0.00311)	(0.00339)	(0.00339)	(0.00331)	(0.00325)	(0.00318)	(0.00384)	(0.00344)
Free State	0.073775	0.066441	0.069668	0.067575	0.07176	0.063115	0.064435	0.058643	0.061543	0.057334
	(0.01451)	(0.01344)	(0.01426)	(0.01337)	(0.01374)	(0.01225)	(0.01106)	(0.01103)	(0.01056)	(0.01041)
KZN	0.185418	0.209931	0.188852	0.21123	0.186796	0.211525	0.189576	0.213295	0.19121	0.216541
	(0.02868)	(0.02954)	(0.02964)	(0.03)	(0.02701)	(0.02788)	(0.02501)	(0.02635)	(0.02515)	(0.02661)

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
North-West	0.085724	0.07325	0.081573	0.068926	0.080353	0.07036	0.080559	0.068899	0.064871	0.056612
	(0.01899)	(0.01489)	(0.01559)	(0.01378)	(0.01508)	(0.01353)	(0.01363)	(0.01293)	(0.011)	(0.01031)
Gauteng	0.285147	0.239424	0.280083	0.235572	0.285889	0.240297	0.284452	0.24383	0.307126	0.26963
	(0.041)	(0.03643)	(0.04094)	(0.03653)	(0.03801)	(0.03445)	(0.03529)	(0.03224)	(0.03537)	(0.03264)
Mpumalanga	0.084656	0.087415	0.089286	0.085938	0.08856	0.089682	0.094732	0.091551	0.098317	0.094545
	(0.0158)	(0.01672)	(0.01605)	(0.01569)	(0.01513)	(0.0164)	(0.01467)	(0.01593)	(0.01422)	(0.01558)
Limpopo	0.105585	0.127954	0.109193	0.129	0.104196	0.123319	0.101499	0.122414	0.094222	0.108735
	(0.01823)	(0.02106)	(0.01761)	(0.02032)	(0.01704)	(0.01978)	(0.01595)	(0.01866)	(0.01491)	(0.01618)
Age categories										
15-19	0.193867	0.181274	0.184155	0.174438	0.169552	0.163403	0.160308	0.15615	0.137191	0.135053
	(0.00981)	(0.00732)	(0.0094)	(0.00748)	(0.00791)	(0.00663)	(0.00618)	(0.00544)	(0.00556)	(0.00448)
20-24	0.173143	0.168356	0.182345	0.172122	0.17382	0.167268	0.166904	0.162042	0.150222	0.148061
	(0.00876)	(0.00644)	(0.00722)	(0.00603)	(0.00698)	(0.00566)	(0.00728)	(0.00666)	(0.0061)	(0.00541)
25-34	0.269075	0.271491	0.267802	0.273414	0.285579	0.285758	0.295352	0.292395	0.323303	0.316021
	(0.01046)	(0.00943)	(0.01387)	(0.00887)	(0.0125)	(0.0088)	(0.0113)	(0.00702)	(0.00854)	(0.00723)
35-44	0.192527	0.193324	0.194152	0.193585	0.197947	0.195435	0.201958	0.199599	0.221157	0.209415
	(0.0106)	(0.00692)	(0.01184)	(0.00647)	(0.01086)	(0.00655)	(0.0093)	(0.00659)	(0.00875)	(0.00764)
45-54	0.127381	0.135843	0.126972	0.135512	0.12803	0.135882	0.13003	0.136964	0.12447	0.137949
	(0.0066)	(0.00559)	(0.00756)	(0.0048)	(0.0074)	(0.00501)	(0.00776)	(0.00509)	(0.00874)	(0.00518)
55-59	0.044007	0.049712	0.044575	0.050929	0.045073	0.052254	0.045449	0.05285	0.043658	0.053502
	(0.00412)	(0.0032)	(0.00517)	(0.00323)	(0.00443)	(0.00365)	(0.00416)	(0.0028)	(0.00372)	(0.00303)
Real other household income p.c	1066.962	1094.642	1049.827	1143.206	1208.161	1312.022	1385.715	1449.892	1769.366	1667.846
	(79.5545)	(83.5282)	(54.0052)	(70.4314)	(56.160)	(97.9841)	(63.9164)	(68.2949)	(148.377)	(109.854)
Urban	0.582288	0.542574	0.567678	0.526285	0.587806	0.546431	0.603364	0.554651	0.633685	0.595867
	(0.03568)	(0.03549)	(0.03578)	(0.03583)	(0.03291)	(0.03288)	(0.02918)	(0.0305)	(0.02759)	(0.02877)

Source: Own Calculations using NIDS data from 2008 to 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
Means are calculated for continuous variables. For categorical variables, the proportion of individuals in each category have been calculated for men and women separately.
Education Categories omitted because they are presented and discussed in Chapter Three
Sample is restricted to African working-age individuals

Appendix 2: Multivariate Analyses

Table A2: Probit Regression Results for Broad Participation Definition

	Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**Wave 5**	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Grade1 - 7	0.383***	0.254***	0.246*	0.295**	0.374***	0.273***	0.370***	0.374***	0.401**	0.272***
	(0.127)	(0.0942)	(0.137)	(0.120)	(0.113)	(0.0888)	(0.141)	(0.109)	(0.159)	(0.104)
Grade 8 – 11	0.292**	0.555***	0.325**	0.510***	0.423***	0.565***	0.513***	0.605***	0.450***	0.494***
	(0.133)	(0.100)	(0.140)	(0.125)	(0.115)	(0.0900)	(0.129)	(0.108)	(0.137)	(0.102)
Matric	0.569***	0.959***	0.500***	0.804***	0.578***	0.796***	0.567***	0.803***	0.503***	0.571***
	(0.158)	(0.124)	(0.146)	(0.138)	(0.140)	(0.101)	(0.145)	(0.118)	(0.162)	(0.123)
Tertiary	0.800***	1.182***	1.025***	1.356***	0.788***	1.288***	0.853***	1.331***	1.015***	1.236***
	(0.173)	(0.155)	(0.182)	(0.134)	(0.155)	(0.120)	(0.155)	(0.133)	(0.167)	(0.147)
Western Cape	-0.324	-0.318**	-0.541**	-0.236	0.0707	0.0741	0.116	0.218**	-0.427***	-0.0799
	(0.332)	(0.136)	(0.266)	(0.155)	(0.110)	(0.190)	(0.118)	(0.106)	(0.114)	(0.0769)
Eastern Cape	-0.75***	-0.532***	-0.296**	-0.205*	-0.382***	-0.102	-0.0252	-0.122	-0.328***	-0.205**
	(0.135)	(0.122)	(0.139)	(0.114)	(0.104)	(0.112)	(0.114)	(0.117)	(0.102)	(0.0868)
Northern Cape	-0.167	-0.162	0.136	0.0129	-0.192	-0.0391	0.175	-0.0241	-0.179	-0.153
	(0.162)	(0.139)	(0.169)	(0.137)	(0.133)	(0.122)	(0.144)	(0.109)	(0.142)	(0.0953)
Free State	-0.256**	0.0166	-0.0740	-0.143	-0.0721	0.00436	-0.0798	-0.271***	-0.418***	-0.317***
	(0.123)	(0.149)	(0.133)	(0.142)	(0.109)	(0.141)	(0.120)	(0.101)	(0.0970)	(0.0958)
KZN	0.0645	0.0827	-0.0188	-0.135	-0.307***	0.0621	-0.0115	-0.203**	0.117	-0.00723
	(0.128)	(0.107)	(0.152)	(0.132)	(0.102)	(0.114)	(0.114)	(0.0892)	(0.114)	(0.0864)
Northwest	-0.0439	-0.0810	0.0105	-0.108	-0.115	0.0337	0.260**	-0.283**	-0.0324	-0.131
	(0.156)	(0.161)	(0.149)	(0.142)	(0.180)	(0.147)	(0.129)	(0.114)	(0.147)	(0.148)
Mpumalanga	-0.240*	-0.0355	-0.227	-0.241*	0.0368	0.183	0.125	-0.0692	-0.0782	-0.0378
	(0.134)	(0.117)	(0.167)	(0.141)	(0.152)	(0.134)	(0.124)	(0.107)	(0.0970)	(0.104)
Limpopo	-0.69***	-0.678***	-0.477***	-0.340**	-0.419***	0.121	0.154	0.0701	-0.263**	-0.0825
	(0.173)	(0.132)	(0.173)	(0.141)	(0.130)	(0.141)	(0.124)	(0.110)	(0.111)	(0.102)
Urban	0.168**	0.146*	-0.00276	0.134*	0.0718	0.349***	0.246***	0.145**	0.239***	0.258***
	(0.0825)	(0.0754)	(0.0978)	(0.0812)	(0.0844)	(0.0618)	(0.0738)	(0.0605)	(0.0739)	(0.0643)
Age 20 - 24	1.276***	1.333***	1.121***	1.221***	1.494***	1.366***	1.405***	1.312***	1.322***	1.419***
	(0.0892)	(0.0964)	(0.0949)	(0.0948)	(0.0769)	(0.0700)	(0.0733)	(0.0836)	(0.0963)	(0.123)
Age 24 - 34	2.015***	1.801***	1.614***	1.636***	2.019***	1.967***	2.099***	2.051***	2.028***	2.007***
	(0.124)	(0.106)	(0.109)	(0.0854)	(0.0904)	(0.0755)	(0.0716)	(0.0833)	(0.116)	(0.113)
Age 35 -44	2.021***	2.020***	1.791***	1.848***	2.189***	2.120***	1.991***	2.314***	2.043***	2.266***
	(0.139)	(0.133)	(0.120)	(0.107)	(0.123)	(0.0883)	(0.103)	(0.0941)	(0.123)	(0.115)
Age 45 - 54	1.641***	1.715***	1.507***	1.674***	1.797***	1.892***	1.707***	2.088***	1.497***	2.100***
	(0.142)	(0.133)	(0.143)	(0.104)	(0.122)	(0.0967)	(0.121)	(0.0949)	(0.151)	(0.127)
Age 55 - 59	1.073***	1.418***	1.321***	1.468***	1.476***	1.490***	1.420***	1.722***	1.225***	1.680***
	(0.189)	(0.153)	(0.163)	(0.139)	(0.146)	(0.120)	(0.136)	(0.113)	(0.165)	(0.114)
Married	0.543***	-0.000183	0.412***	-0.0912	0.385***	-0.0196	0.483***	-0.164**	0.636***	-0.147**
	(0.118)	(0.0858)	(0.118)	(0.0733)	(0.102)	(0.0757)	(0.110)	(0.0648)	(0.0953)	(0.0591)

	Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**Wave 5**	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Lives with partner	0.331**	0.0915	0.336***	-0.137	0.0947	0.0750	0.280***	0.0121	0.463***	0.0879
	(0.135)	(0.115)	(0.125)	(0.0942)	(0.136)	(0.0961)	(0.106)	(0.0752)	(0.114)	(0.0850)
Divorced	0.617**	-0.0743	-0.0481	0.157	-0.241	-0.0222	0.735***	0.209**	0.181	-0.0128
	(0.263)	(0.121)	(0.293)	(0.106)	(0.262)	(0.0930)	(0.211)	(0.0959)	(0.231)	(0.101)
Widow	0.156	0.460**	-0.126	0.185	0.700***	-0.127	0.129	0.100	0.544*	0.211
	(0.247)	(0.184)	(0.280)	(0.163)	(0.216)	(0.168)	(0.248)	(0.145)	(0.295)	(0.129)
Real other household income p.c.	-0.0001***	-0.00003**	-0.0001***	-0.00004***	-0.0001***	-0.0001***	-0.0001***	-0.00003***	-0.00006***	-0.00004***
	(0.00002)	(0.00001)	(0.00002)	(0.00001)	(0.00002)	(0.00002)	(0.00001)	(0.00001)	(0.00001)	(0.000013)
No. of children cared for	-0.0222	-0.0135	0.0229	-0.077***	0.0329	-0.06***	0.0986	-0.068***	0.0963	-0.061***
	(0.100)	(0.0240)	(0.0855)	(0.0224)	(0.099)	(0.0193)	(0.0752)	(0.0248)	(0.0905)	(0.0214)
No. female pensioners	-0.156	-0.0405	-0.424***	-0.0307	-0.228***	-0.0688	-0.203***	-0.158***	-0.282***	-0.0528
	(0.113)	(0.0760)	(0.0827)	(0.0666)	(0.0698)	(0.0696)	(0.0645)	(0.0596)	(0.0649)	(0.0640)
No. male pensioners	-0.0351	0.0454	-0.0335	-0.0119	-0.135	-0.142*	-0.127	-0.0911	0.0253	-0.210**
	(0.166)	(0.0932)	(0.100)	(0.0841)	(0.122)	(0.0817)	(0.0954)	(0.0806)	(0.0976)	(0.0853)
No. other male adults	0.0305		-0.0160		-0.0368		-0.0605*		-0.0650**	
	(0.0322)		(0.0381)		(0.0320)		(0.0328)		(0.0270)	
No. female adults	-0.091**		-0.09***		-0.0653**		-0.100***		-0.108***	
	(0.0378)		(0.0272)		(0.0281)		(0.0239)		(0.0223)	
No. other female adults		0.0188		-0.0158		-0.00876		-0.0314		-0.00395
		(0.0241)		(0.0185)		(0.0192)		(0.0236)		(0.0238)
No. of male adults		-0.00347		-0.0126		-0.00686		-0.0351*		0.0000303
		(0.0265)		(0.0237)		(0.0181)		(0.0207)		(0.0267)
Constant	-0.94***	-1.565***	-1.013***	-1.703***	-1.099***	-2.064***	-1.514***	-1.925***	-1.345***	-2.047***
	(0.204)	(0.176)	(0.187)	(0.178)	(0.177)	(0.150)	(0.184)	(0.146)	(0.175)	(0.166)
N	165832	166188	166263	166361	166777	166735	166721	166724	169305	166678

Source: Own Calculations using NIDS data from 2008 to 2017
Results represent Probit coefficients
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
* p<.1, ** p<.05, *** p<.01
Sample is restricted to working-age African individuals
Reference categories for categorical variables are as follows; Education: No schooling; Province: Gauteng; Age: 15 – 19; Marital Status: Never married

Table A3. Marginal Effects for Strict Probit Participation Regression

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Grade1 – 7	0.08708	0.08580	0.05720	0.09760	0.15568	0.10578	0.13860	0.15071	0.14808	0.11875
	(0.04932)	(0.03194)	(0.05191)	(0.03373)	(0.04524)	(0.03134)	(0.05541)	(0.03791)	(0.06108)	(0.03732)
Grade 8 - 11	0.10272	0.18381	0.10147	0.17123	0.16599	0.23268	0.19645	0.24531	0.18055	0.21797
	(0.04980)	(0.03403)	(0.05212)	(0.03625)	(0.04539)	(0.02918)	(0.05220)	(0.03565)	(0.05341)	(0.03663)
Matric	0.18772	0.37256	0.17208	0.29989	0.24489	0.33135	0.23318	0.32303	0.20315	0.25145
	(0.05490)	(0.03844)	(0.05416)	(0.04169)	(0.05321)	(0.03434)	(0.05710)	(0.03990)	(0.06049)	(0.04408)
Tertiary	0.25249	0.45328	0.34653	0.52125	0.31514	0.52897	0.31345	0.51132	0.34398	0.50122
	(0.05699)	(0.05109)	(0.06258)	(0.03684)	(0.05421)	(0.03612)	(0.05681)	(0.04167)	(0.05724)	(0.05008)
Western Cape	-0.04592	-0.09837	-0.20967	-0.08972	-0.00725	0.01737	0.00938	0.09283	-0.13927	-0.04129
	(0.10883)	(0.04636)	(0.09997)	(0.05109)	(0.04435)	(0.07313)	(0.03969)	(0.03861)	(0.04159)	(0.03363)
Eastern Cape	-0.22007	-0.17541	-0.12998	-0.07612	-0.14309	-0.04950	-0.01842	-0.06035	-0.15320	-0.11643
	(0.04677)	(0.04691)	(0.05146)	(0.04831)	(0.04034)	(0.04215)	(0.03883)	(0.04340)	(0.03619)	(0.03426)
Northern Cape	-0.06534	-0.11359	0.03270	0.00152	-0.04898	0.00432	0.05537	-0.01878	-0.05979	-0.06220
	(0.05114)	(0.05030)	(0.06227)	(0.05901)	(0.04717)	(0.04608)	(0.04667)	(0.04253)	(0.04901)	(0.03700)
Free State	-0.08361	-0.03508	-0.04351	-0.07401	-0.03412	-0.00100	-0.03302	-0.10450	-0.14756	-0.13014
	(0.04469)	(0.05220)	(0.05052)	(0.05331)	(0.04289)	(0.05071)	(0.04201)	(0.03938)	(0.03742)	(0.03929)
KZN	-0.00083	0.03295	-0.14381	-0.12003	-0.08881	0.01957	-0.03988	-0.09162	0.02146	-0.01414
	(0.03929)	(0.03847)	(0.05481)	(0.05054)	(0.03848)	(0.04293)	(0.03650)	(0.03318)	(0.03486)	(0.03505)
Northwest	-0.04473	-0.05398	-0.05774	-0.08466	-0.02352	-0.03272	0.06618	-0.10793	-0.01297	-0.06334
	(0.05450)	(0.05993)	(0.05633)	(0.05635)	(0.06174)	(0.05091)	(0.04122)	(0.04515)	(0.04540)	(0.05020)
Mpumalanga	-0.03594	0.02216	-0.10699	-0.11045	0.01813	0.04869	0.03619	-0.05054	-0.01205	-0.03290
	(0.04267)	(0.04386)	(0.06170)	(0.04987)	(0.04862)	(0.05057)	(0.04169)	(0.04000)	(0.03108)	(0.03767)
Limpopo	-0.18978	-0.16502	-0.19125	-0.10979	-0.11146	0.02695	0.03855	0.01667	-0.07749	-0.02361
	(0.06255)	(0.04853)	(0.06286)	(0.05189)	(0.04917)	(0.05167)	(0.04404)	(0.04122)	(0.03721)	(0.04053)
Urban	0.05954	0.09074	0.01123	0.08318	0.03226	0.13276	0.09289	0.06660	0.08549	0.11666
	(0.02837)	(0.02778)	(0.03531)	(0.03127)	(0.03224)	(0.02395)	(0.02427)	(0.02314)	(0.02425)	(0.02486)
Age 20 - 24	0.45336	0.35391	0.39807	0.30048	0.53305	0.34599	0.49709	0.37492	0.46294	0.37742
	(0.02798)	(0.02599)	(0.03010)	(0.02715)	(0.02390)	(0.02088)	(0.02227)	(0.02169)	(0.02796)	(0.02866)
Age 24 - 34	0.64616	0.56648	0.58053	0.48514	0.69201	0.60403	0.70709	0.64630	0.68347	0.60144
	(0.02735)	(0.02633)	(0.02950)	(0.02211)	(0.02114)	(0.01777)	(0.01669)	(0.01785)	(0.02941)	(0.01995)
Age 35 -44	0.63719	0.63587	0.64243	0.58726	0.74011	0.64572	0.67406	0.72829	0.68981	0.68979
	(0.03173)	(0.03082)	(0.03302)	(0.02736)	(0.02610)	(0.02234)	(0.02477)	(0.01820)	(0.03058)	(0.02131)
Age 45 - 54	0.55490	0.58982	0.54933	0.51646	0.62848	0.58170	0.58570	0.66215	0.53690	0.63834
	(0.03676)	(0.03134)	(0.04317)	(0.03055)	(0.03015)	(0.02637)	(0.03530)	(0.02288)	(0.04577)	(0.02639)
Age 55 - 59	0.41212	0.47298	0.43474	0.43550	0.53208	0.44886	0.49637	0.52412	0.45248	0.49470
	(0.06531)	(0.04539)	(0.05571)	(0.04753)	(0.04842)	(0.04037)	(0.04716)	(0.03649)	(0.05548)	(0.03358)
Married	0.19798	-0.00050	0.16578	-0.04912	0.14344	-0.03489	0.17313	-0.05317	0.18894	-0.04895
	(0.03079)	(0.03147)	(0.04169)	(0.02561)	(0.02919)	(0.02905)	(0.02994)	(0.02591)	(0.02342)	(0.02366)
Lives with partner	0.10351	0.00024	0.14551	-0.05049	0.03998	0.00104	0.11479	0.00421	0.12536	0.02920
	(0.04072)	(0.04329)	(0.04209)	(0.03631)	(0.04546)	(0.03950)	(0.03252)	(0.02953)	(0.03206)	(0.03324)

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Divorced	0.20706	0.00466	0.03148	0.07161	-0.07069	-0.01656	0.23162	0.07902	0.06976	-0.00198
	(0.05975)	(0.04608)	(0.11266)	(0.04254)	(0.10271)	(0.03811)	(0.04214)	(0.03517)	(0.07484)	(0.03973)
Widow	0.08133	0.20685	-0.03367	0.03062	0.20189	-0.09730	0.07945	0.04578	0.15905	0.09646
	(0.07253)	(0.05707)	(0.11061)	(0.06275)	(0.04882)	(0.06057)	(0.08088)	(0.05321)	(0.07196)	(0.04809)
Real other household income p.c	-0.00002	-0.00001	-0.00004	-0.00002	-0.00005	-0.00003	-0.00002	-0.00001	-0.00002	-0.00002
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00000)	(0.00000)	(0.00000)	(0.00001)
Number of children cared for	-0.02764	-0.01947	-0.00438	-0.03226	0.02134	-0.01781	0.04303	-0.02274	0.03298	-0.02077
	(0.04055)	(0.00933)	(0.03201)	(0.00914)	(0.03568)	(0.00829)	(0.02620)	(0.00995)	(0.02968)	(0.00854)
No. female pensioner	-0.06122	-0.02867	-0.14853	-0.00263	-0.13681	-0.04273	-0.07429	-0.06760	-0.09670	-0.02979
	(0.03199)	(0.02765)	(0.03238)	(0.02519)	(0.02374)	(0.02900)	(0.02350)	(0.02406)	(0.02125)	(0.02677)
No. male pensioner	0.00749	0.02271	-0.02430	0.01161	-0.04022	-0.04435	-0.03041	-0.04317	0.00698	-0.08271
	(0.05038)	(0.03297)	(0.04038)	(0.03293)	(0.03375)	(0.03240)	(0.03437)	(0.03122)	(0.03169)	(0.03381)
No. other male adults	0.00988		-0.01707		-0.01548		-0.02070		-0.02835	
	(0.01029)		(0.01372)		(0.01201)		(0.01105)		(0.00906)	
No. female adults	-0.03370		-0.03569		-0.03174		-0.03702		-0.03687	
	(0.01314)		(0.01102)		(0.01063)		(0.00828)		(0.00737)	
No. other female adults		-0.00218		-0.00370		-0.01279		-0.01726		-0.00311
		(0.00891)		(0.00746)		(0.00781)		(0.00912)		(0.00976)
No. of male adults		-0.00081		-0.00816		0.00049		-0.01149		-0.00360
		(0.00984)		(0.00781)		(0.00722)		(0.00877)		(0.01062)

Source: Own Calculations using NIDS data from 2008 to 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
* p<.1, ** p<.05, *** p<.01
Sample is restricted to working-age African individuals
Reference categories for categorical variables are as follows; Education: No schooling; Province: Gauteng; Age: 15 – 19; Marital Status: Never married

Table A.4. Marginal Effects for Broad Probit Participation Regression

	Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**Wave 5**	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Grade1 - 7	0.13327	0.10018	0.09778	0.10402	0.14165	0.10161	0.14161	0.14099	0.14993	0.10340
	(0.04652)	(0.03655)	(0.05428)	(0.04017)	(0.04385)	(0.03257)	(0.05490)	(0.03915)	(0.06073)	(0.03838)
Grade 8 - 11	0.10403	0.21874	0.12873	0.18734	0.15896	0.21735	0.19114	0.23320	0.16671	0.19180
	(0.04953)	(0.03847)	(0.05545)	(0.04182)	(0.04473)	(0.03228)	(0.05079)	(0.03823)	(0.05366)	(0.03691)
Matric	0.18728	0.36113	0.19548	0.30423	0.20981	0.30766	0.20907	0.31043	0.18413	0.22210
	(0.05349)	(0.04433)	(0.05706)	(0.04757)	(0.05106)	(0.03663)	(0.05562)	(0.04246)	(0.06094)	(0.04548)
Tertiary	0.24271	0.42606	0.36299	0.50178	0.27062	0.47619	0.29222	0.48889	0.32023	0.45675
	(0.05255)	(0.04965)	(0.06196)	(0.04299)	(0.05205)	(0.03847)	(0.05613)	(0.04358)	(0.05748)	(0.04925)
Western Cape	-0.09556	-0.11996	-0.21060	-0.09398	0.02075	0.02928	0.03804	0.08049	-0.14509	-0.03123
	(0.10813)	(0.05190)	(0.10433)	(0.06123)	(0.03205)	(0.07498)	(0.03850)	(0.03896)	(0.04088)	(0.03008)
Eastern Cape	-0.25013	-0.20501	-0.11321	-0.08163	-0.12988	-0.04078	-0.00861	-0.04766	-0.10875	-0.08080
	(0.04375)	(0.04623)	(0.05227)	(0.04523)	(0.03538)	(0.04448)	(0.03891)	(0.04567)	(0.03458)	(0.03416)
Northern Cape	-0.04649	-0.05928	0.04773	0.00510	-0.06183	-0.01556	0.05623	-0.00928	-0.05681	-0.06003
	(0.04600)	(0.05136)	(0.05913)	(0.05443)	(0.04400)	(0.04851)	(0.04536)	(0.04191)	(0.04671)	(0.03757)
Free State	-0.07363	0.00586	-0.02730	-0.05699	-0.02233	0.00173	-0.02764	-0.10684	-0.14202	-0.12550
	(0.03490)	(0.05262)	(0.04909)	(0.05641)	(0.03415)	(0.05602)	(0.04158)	(0.03989)	(0.03375)	(0.03781)
KZN	0.01611	0.02867	-0.00687	-0.05389	-0.10247	0.02455	-0.00390	-0.07976	0.03312	-0.00281
	(0.03230)	(0.03739)	(0.05551)	(0.05264)	(0.03328)	(0.04516)	(0.03879)	(0.03466)	(0.03202)	(0.03353)
Northwest	-0.01155	-0.02923	0.00381	-0.04302	-0.03611	0.01337	0.08102	-0.11156	-0.00974	-0.05150
	(0.04128)	(0.05849)	(0.05402)	(0.05663)	(0.05785)	(0.05842)	(0.03987)	(0.04493)	(0.04446)	(0.05845)
Mpumalanga	-0.06875	-0.01267	-0.08608	-0.09608	0.01096	0.07149	0.04066	-0.02683	-0.02389	-0.01473
	(0.03799)	(0.04181)	(0.06350)	(0.05578)	(0.04506)	(0.05240)	(0.04042)	(0.04148)	(0.02971)	(0.04068)
Limpopo	-0.22732	-0.26246	-0.18514	-0.13487	-0.14387	0.04751	0.04987	0.02666	-0.08558	-0.03227
	(0.05939)	(0.04957)	(0.06614)	(0.05518)	(0.04574)	(0.05532)	(0.04009)	(0.04161)	(0.03684)	(0.04015)
Urban	0.05243	0.05562	-0.00105	0.05355	0.02419	0.13738	0.08239	0.05690	0.07771	0.10165
	(0.02578)	(0.02860)	(0.03733)	(0.03226)	(0.02843)	(0.02417)	(0.02496)	(0.02368)	(0.02427)	(0.02527)
Age 20 - 24	0.47643	0.45837	0.39913	0.35769	0.53352	0.40483	0.50749	0.37037	0.48168	0.39214
	(0.02910)	(0.02759)	(0.03072)	(0.02870)	(0.02239)	(0.02062)	(0.02239)	(0.02170)	(0.02851)	(0.02899)
Age 24 - 34	0.65891	0.62367	0.57674	0.52179	0.68692	0.63324	0.70206	0.65182	0.68483	0.61957
	(0.03070)	(0.02727)	(0.03169)	(0.02240)	(0.02174)	(0.01751)	(0.01730)	(0.01729)	(0.02948)	(0.02010)
Age 35 -44	0.65971	0.68595	0.62916	0.60026	0.72270	0.68302	0.67924	0.73218	0.68795	0.70575
	(0.03304)	(0.03125)	(0.03234)	(0.02810)	(0.02642)	(0.02038)	(0.02445)	(0.01818)	(0.03044)	(0.02059)
Age 45 - 54	0.58254	0.59624	0.54167	0.53618	0.62986	0.60729	0.60547	0.66399	0.54207	0.65196
	(0.03991)	(0.03550)	(0.04454)	(0.02992)	(0.03294)	(0.02563)	(0.03409)	(0.02265)	(0.04519)	(0.02714)
Age 55 – 59	0.40509	0.49117	0.47533	0.45582	0.52712	0.45419	0.51260	0.53246	0.44585	0.49579
	(0.06723)	(0.04756)	(0.05571)	(0.04680)	(0.04729)	(0.04233)	(0.04592)	(0.03395)	(0.05507)	(0.03438)
Married	0.15486	-0.00007	0.15108	-0.03628	0.12117	-0.00775	0.14641	-0.06470	0.18096	-0.05826
	(0.02964)	(0.03270)	(0.04114)	(0.02911)	(0.02973)	(0.02998)	(0.02990)	(0.02564)	(0.02295)	(0.02343)
Lives with partner	0.10253	0.03438	0.12522	-0.05448	0.03264	0.02947	0.09120	0.00473	0.14111	0.03409
	(0.03821)	(0.04278)	(0.04455)	(0.03719)	(0.04591)	(0.03753)	(0.03252)	(0.02928)	(0.03021)	(0.03270)

	Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**Wave 5**	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Divorced	0.17064	-0.02862	-0.01895	0.06254	-0.08955	-0.00880	0.20142	0.07910	0.06084	-0.00501
	(0.05598)	(0.04689)	(0.11562)	(0.04194)	(0.10100)	(0.03684)	(0.04227)	(0.03551)	(0.07355)	(0.03970)
Widow	0.05122	0.15833	-0.05002	0.07343	0.19471	-0.05066	0.04394	0.03871	0.16067	0.08051
	(0.07770)	(0.05559)	(0.11157)	(0.06430)	(0.04369)	(0.06684)	(0.08193)	(0.05519)	(0.06935)	(0.04784)
Real other household income p.c	-0.00002	-0.00001	-0.00004	-0.00001	-0.00005	-0.00003	-0.00002	-0.00001	-0.00002	-0.00002
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00000)	(0.00000)	(0.00000)	(0.00001)
Number of children cared for	-0.00687	-0.00514	0.00873	-0.03088	0.01104	-0.02357	0.03253	-0.02650	0.03076	-0.02388
	(0.03107)	(0.00910)	(0.03265)	(0.00894)	(0.03353)	(0.00764)	(0.02494)	(0.00975)	(0.02894)	(0.00844)
No. female pensioners	-0.04816	-0.01537	-0.16174	-0.01222	-0.07648	-0.02721	-0.06697	-0.06170	-0.09013	-0.02079
	(0.03488)	(0.02884)	(0.03164)	(0.02655)	(0.02340)	(0.02749)	(0.02115)	(0.02325)	(0.02061)	(0.02516)
No. male pensioners	-0.01087	0.01723	-0.01278	-0.00474	-0.04529	-0.05603	-0.04194	-0.03568	0.00808	-0.08278
	(0.05136)	(0.03536)	(0.03822)	(0.03351)	(0.04098)	(0.03224)	(0.03153)	(0.03156)	(0.03120)	(0.03357)
No. other male adults	0.00945		-0.00611		-0.01236		-0.01996		-0.02078	
	(0.01003)		(0.01459)		(0.01075)		(0.01083)		(0.00861)	
No. female adults	-0.02811		-0.03441		-0.02193		-0.03298		-0.03449	
	(0.01164)		(0.01036)		(0.00948)		(0.00783)		(0.00711)	
No. other female adults		0.00715		-0.00629		-0.00346		-0.01230		-0.00155
		(0.00914)		(0.00738)		(0.00760)		(0.00928)		(0.00935)
No. of male adults		-0.00132		-0.00501		-0.00271		-0.01376		0.00001
		(0.01006)		(0.00943)		(0.00714)		(0.00812)		(0.01052)

Source: Own Calculations using NIDS data from 2008 to 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
* p<.1, ** p<.05, *** p<.01
Sample is restricted to working-age African individuals
Reference categories for categorical variables are as follows; Education: No schooling; Province: Gauteng; Age: 15 – 19; Marital Status: Never married

Table A.5: Gender Decompositions of Broad Labour Force Participation Rates for each Wave

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Result	%	Result	%	Result	%	Result	%	Result	%
(A) Overall										
Predicted Average Participation rate of women	0,611***		0,499***		0,563***		0,579***		0,573***	
	(0.0102)		(0.0140)		(0.0118)		(0.00974)		(0.00960)	
Predicted Average Participation rate of men	0,698***		0,603***		0,685***		0,693***		0,701***	
	(0.0104)		(0.0150)		(0.0104)		(0.00890)		(0.00864)	
Total Predicted Participation Gap (LFPw - LFPm)	-0,087***	-100%	-0,104***	-100%	-0,123***	-100%	-0,114***	-100%	-0,129***	-100%
	(0.0118)		(0.0148)		(0.0121)		(0.0107)		(0.00991)	
Portion of gap due to total characteristic differences	-0.000809	-1%	-0,0255**	-25%	-0,0193**	-16%	-0.0121	-10.62%	-0,0154*	-12%
	(0.00957)		(0.00993)		(0.00844)		(0.00772)		(0.00827)	
Portion of gap due to coefficient differences	-0,086***	-99%	-0,078***	-75%	-0,103***	-84%	-0,102***	-89.47%	-0,113***	-88%
	(0.0109)		(0.0140)		(0.0108)		(0.00973)		(0.00929)	
(B) Contribution of each variable to total characteristic										
Aggregated Education	0.000142	0.16%	0.00244	2.35%	0.005**	4.07%	0.00254	2.23%	0.0078**	6.05%
	(0.00130)		(0.00324)		(0.00249)		(0.00242)		(0.00350)	
No Schooling	-0.000197	-0.23%	-0.00122	-1.17%	-0.00132*	-1.07%	-0.0016**	-1.40%	-0.0013**	-1.01%
	(0.00171)		(0.00113)		(0.0007)		(0.00074)		(0.00062)	
Grade 1 – 7	0.000449	0.52%	0.0028**	2.69%	0.0028***	2.28%	0.00189**	1.66%	0.00111*	0.86%
	(0.00385)		(0.0012)		(0.00094)		(0.00076)		(0.00058)	
Grade 8 – 11	-0.000173	-0.20%	-0.000833	-0.80%	-0.000216	-0.18%	-0.000018	-0.02%	0.000108	0.08%
	(0.00151)		(0.00061)		(0.00032)		(0.00013)		(0.00018)	
Matric	-0.000389	-0.45%	-0.000424	-0.41%	-0.000698	-0.57%	-0.000152	-0.13%	-0.000263	-0.20%
	(0.00334)		(0.00064)		(0.00062)		(0.00049)		(0.00034)	
Tertiary	0.000452	0.52%	0.00211	2.03%	0.0044**	3.58%	0.00243	2.13%	0.0082**	6.36%
	(0.00381)		(0.00251)		(0.00183)		(0.00184)		(0.00332)	
Aggregated province	-0.00122	-1.40%	-0.0065**	-6.25%	-0.00175	-1.42%	0.000295	0.26%	-0.000629	-0.49%
	(0.0107)		(0.00257)		(0.00139)		(0.00131)		(0.00163)	
Aggregated marital status	0.000397	0.46%	0.00280	2.69%	-0.000113	-0.09%	0.0050***	4.39%	0.00209	1.62%
	(0.00333)		(0.00195)		(0.00125)		(0.00161)		(0.00164)	
Never Married	0.000598	0.69%	0.00188	1.81%	0.00115	0.93%	0.0027**	2.37%	0.0035**	2.71%
	(0.00507)		(0.00154)		(0.00088)		(0.00120)		(0.00150)	
Married	0.000026	0.03%	0.000223	0.21%	0.000305	0.25%	-0.000361	-0.32%	-0.000485	-0.38%
	(0.00023)		(0.00052)		(0.00039)		(0.00037)		(0.00057)	
Lives with Partner	0.0000062	0.01%	-0.000030	-0.03%	0.0000006	0.00%	-0.000034	-0.03%	0.0000876	0.07%
	(0.00007)		(0.00015)		(0.00003)		(0.00013)		(0.00011)	

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Result	%	Result	%	Result	%	Result	%	Result	
Divorced	-0.000318	-0.37%	0.000721	0.69%	-0.0015**	-1.22%	0.0027***	2.37%	-0.000668	-0.52%
	(0.00276)		(0.00093)		(0.00076)		(0.00095)		(0.00097)	
Widow	0.0000850	0.10%	0.000009	0.01%	-0.000048	-0.04%	-0.000004	0.00%	-0.000324	-0.25%
	(0.00073)		(0.00019)		(0.00019)		(0.00004)		(0.00037)	
Aggregated Age	0.00369	4.24%	0.0111	10.67%	0.00495	4.02%	0.00370	3.25%	0.000573	0.44%
	(0.0306)		(0.00756)		(0.00596)		(0.00552)		(0.00569)	
Urban	-0.000386	-0.44%	-0.00118	-1.13%	-0.0029**	-2.36%	-0.003***	-2.63%	-0.004***	-2.87%
	(0.00336)		(0.00121)		(0.00120)		(0.00111)		(0.00139)	
Real other household income p.c.	-0.000328	-0.38%	-0.00166	-1.60%	-0.00356	-2.89%	-0.00108	-0.95%	0.00226	1.75%
	(0.00294)		(0.00122)		(0.00325)		(0.00085)		(0.00216)	
Number of children cared for	-0.00302	-3.47%	-0.031***	-29.81%	-0.019***	-15.45%	-0.019***	-16.67%	-0.022***	-16.67%
	(0.0268)		(0.00644)		(0.00491)		(0.00578)		(0.00537)	
No. female pensioners	-0.000089	-0.10%	-0.000589	-0.57%	-0.000117	-0.10%	0.000295	0.26%	-0.000394	-0.31%
	(0.00077)		(0.00077)		(0.00034)		(0.00046)		(0.00041)	
No. male pensioners	0.0000047	0.01%	-0.000925	-0.89%	-0.0014**	-1.14%	-0.00097*	-0.85%	-0.0019**	-1.43%
	(0.00022)		(0.00101)		(0.00067)		(0.00051)		(0.00086)	
(C) Contribution of each variable to total coefficient contributions										
Aggregated Education	0.00405	4.66%	0.00437	4.20%	0.000193	0.16%	0.00117	1.03%	0.00562	4.36%
	(0.00694)		(0.0103)		(0.00748)		(0.00963)		(0.00853)	
No Schooling	-0.00262	-3.01%	-0.00239	-2.30%	-0.00161	-1.31%	-0.00149	-1.31%	-0.000311	-0.24%
	(0.00194)		(0.00194)		(0.00118)		(0.00109)		(0.00088)	
Grade 1 – 7	-0.015***	-17.24%	-0.00672	-6.46%	-0.011***	-8.94%	-0.00576*	-5.05%	-0.00438*	-3.40%
	(0.00484)		(0.00472)		(0.00391)		(0.00314)		(0.00233)	
Grade 8 – 11	0.00909	10.45%	0.00129	1.24%	-0.00114	-0.93%	-0.00730	-6.40%	0.00190	1.47%
	(0.00743)		(0.0107)		(0.00763)		(0.00892)		(0.00721)	
Matric	0.00826*	9.49%	0.00706	6.79%	0.00315	2.56%	0.00389	3.41%	0.00173	1.34%
	(0.00472)		(0.00437)		(0.00519)		(0.00391)		(0.00434)	
Tertiary	0.00425	4.89%	0.00512	4.92%	0.011***	8.94%	0.0118***	10.35%	0.00668	5.18%
	(0.00299)		(0.00377)		(0.00361)		(0.00376)		(0.00440)	
Aggregated marital status	0.0176	20.23%	-0.0106	-10.19%	0.0325	26.42%	0.0378*	33.16%	0.0383*	29.69%
	(0.0206)		(0.0261)		(0.0229)		(0.0198)		(0.0210)	
Never married	0.0317*	36.44%	0.0180	17.31%	0.0382*	31.06%	0.0529***	46.40%	0.0585***	45.35%
	(0.0169)		(0.0220)		(0.0196)		(0.0176)		(0.0180)	
Married	-0.0146**	-16.78%	-0.023***	-22.12%	-0.00836	-6.80%	-0.016***	-14.04%	-0.020***	-15.74%
	(0.00648)		(0.00667)		(0.00604)		(0.00534)		(0.00610)	
Lives with Partner	0.000602	0.69%	-0.0092**	-8.85%	0.00397	3.23%	0.00127	1.11%	0.0000771	0.06%
	(0.00373)		(0.00369)		(0.00311)		(0.00246)		(0.00190)	
Divorced	-0.0019**	-2.18%	0.00147	1.41%	0.0021**	1.71%	-0.00152	-1.33%	0.000401	0.31%
	(0.00088)		(0.00111)		(0.00084)		(0.00104)		(0.00115)	

	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5	
	Result	%	Result	%	Result	%	Result	%	Result	
Widow	0.00181**	2.08%	0.00179	1.72%	-0.004***	-3.25%	0.00132	1.16%	-0.000379	-0.29%
	(0.00089)		(0.00126)		(0.00120)		(0.00129)		(0.00170)	
Aggregated province	-0.00335	-3.85%	-0.00298	-2.87%	0.00386	3.14%	0.00755	6.62%	-0.00658	-5.10%
	(0.00846)		(0.00923)		(0.00781)		(0.00668)		(0.00521)	
Aggregated age	-0.0149**	-17.13%	-0.00348	-3.35%	-0.00743	-6.04%	-0.00404	-3.54%	-0.00860	-6.67%
	(0.00642)		(0.00883)		(0.00734)		(0.00731)		(0.01000)	
Urban	-0.000317	-0.36%	0.00179	1.72%	0.00456*	3.71%	-0.00244	-2.14%	-0.000260	-0.20%
	(0.00103)		(0.00169)		(0.00264)		(0.00194)		(0.00206)	
Real other household income p.c.	0.00495	5.69%	0.0160**	15.38%	0.0171**	13.90%	0.00713	6.25%	0.00490	3.80%
	(0.00556)		(0.00681)		(0.00833)		(0.00472)		(0.00697)	
No. children cared for	0.0066**	7.57%	0.00410	3.94%	0.00211	1.72%	-0.00244	-2.14%	0.000209	0.16%
	(0.00275)		(0.00327)		(0.00292)		(0.00256)		(0.00280)	
No. female pensioners	0.00365	4.20%	0.0195***	18.75%	0.0069**	5.61%	0.00232	2.04%	0.009***	7.34%
	(0.00418)		(0.00442)		(0.00318)		(0.00295)		(0.00341)	
No. male pensioners	0.00221	2.54%	0.00258	2.48%	0.00105	0.85%	0.00147	1.29%	-0.00301	-2.33%
	(0.00292)		(0.00280)		(0.00304)		(0.00221)		(0.00230)	
Constant	-0.107***	-123%	-0.109***	-104.8%	-0.164***	-133%	-0.150***	-132%	-0.153***	-118.60%
	(0.0280)		(0.0301)		(0.0299)		(0.0253)		(0.0269)	
N	12397		13759		15511		17935		18342	

Source: Own Calculations using NIDS data from 2008 to 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
* p<.1, ** p<.05, *** p<.01
Sample is restricted to working-age African individuals
% Column represents the percentage contribution of each variable to the total gap in labour force participation

Table A.6: Decompositions of Broad Labour Force Participation Rates between Wave 2 and 5 by Gender

(A) Overall	**Result**	**%**	**Result**	**%**
Predicted Average Participation rate wave 5	0.702***		0.573***	
	(0.0086)		(0.00953)	
Predicted Average Participation rate wave 2	0.603***		0.499***	
	(0.0159)		(0.0144)	
Predicted Difference (LFP wave 5 – LFP wave 2)	0.0987***	100%	0.0736***	100%
	(0.0156)		(0.0148)	
Portion of gap due to total characteristic differences	0.0491***	50%	0.0565***	77%
	(0.00871)		(0.00677)	
Portion of gap due to coefficient differences	0.0496***	50%	0.0172	23%
	(0.0139)		(0.0137)	
(B) Contribution of each variable to total characteristic contributions				
Aggregated Education	0.0115***	11.65%	0.0246***	33.42%
	(0.00263)		(0.00316)	
No Schooling	0.00285***	2.89%	0.00384***	5.22%
	(0.000811)		(0.000725)	
Grade 1 – 7	0.00324**	3.28%	0.00605***	8.22%
	(0.00128)		(0.000973)	
Grade 8 – 11	-0.00063	-0.64%	-0.0000341	-0.05%
	(0.000457)		(0.00015)	
Matric	0.000582	0.59%	0.00134**	1.82%
	(0.000685)		(0.00247)	
Tertiary	0.00549***	5.56%	0.0134***	18.21%
	(0.00171)		(0.00247)	
Aggregated Marital Status	-0.00201	-2.04%	0.000813	1.10%
	(0.00222)		(0.000729)	
Never Married	-0.000831	-0.84%	-0.000102	-0.14%
	(0.00105)		(0.000249)	
Married	0.00000382	0.00%	-0.000197	-0.27%
	(0.000956)		(0.000359)	
Live Together	-0.00112	-1.13%	0.000751	1.02%
	(0.000835)		(0.000560)	
Divorced	-0.000246	-0.25%	0.0000527	0.07%
	(0.000242)		(0.0000826)	
Widow	0.00018	0.18%	0.000308	0.42%
	(0.000748)		(0.000233)	
Aggregated Province	-0.000319	-0.32%	0.00241**	3.27%
	(0.00204)		(0.00111)	
Aggregated Age	0.0337***	34.14%	0.0260***	35.33%
	(0.00440)		(0.00483)	
Urban	0.00239*	2.42%	0.00400***	5.43%
	(0.00124)		(0.00136)	

	Result	%	Result	%
Other household income np	-0.0116***	-11.75%	-0.00552***	-7.50%
	(0.00368)		(0.00152)	
No. of children cared for	0.0000377	0.04%	0.00160**	2.17%
	(0.000128)		(0.000663)	
No. female pensioners	0.00237*	2.40%	0.000308	0.42%
	(0.00125)		(0.000403)	
No. male pensioners	0.0000653	0.07%	0.000675	0.92%
	(0.000247)		(0.000540)	
Other male adults	0.00295	2.99%		
	(0.00216)			
No. female adults	0.00999***	10.12%		
	(0.00218)			
No. other female adults			0.000958	1.30%
			(0.00151)	
No. male adults			0.000646	0.88%
			(0.00173)	
(C) Contribution of each variable to total coefficient contributions				
Aggregated Education	0.00761	7.71%	0.00448	6.09%
	(0.00884)		(0.0223)	
No schooling	-0.000297	-0.30%	0.00169	2.30%
	(0.000911)		(0.00305)	
Grade 1 – 7	0.00373	3.78%	0.00466	6.33%
	(0.00337)		(0.00782)	
Grade 8 – 11	0.00829	8.40%	0.0199	27.04%
	(0.00952)		(0.0269)	
Matric	-0.0023	-2.33%	-0.0176	-23.91%
	(0.00424)		(0.0160)	
Tertiary	-0.00181	-1.83%	-0.00419	-5.69%
	(0.00371)		(0.00971)	
Aggregated marital status	-0.0432*	-43.77%	-0.00552	-7.50%
	(0.025)		(0.0306)	
Never married	-0.0415**	-42.05%	-0.00212	-2.88%
	(0.0208)		(0.0281)	
Married	-0.00123	-1.25%	-0.00864	-11.74%
	(0.0074)		(0.0122)	
Lives with partner	-0.00232	-2.35%	0.0100	13.59%
	(0.00260)		(0.00991)	
Divorced	-0.0000366	-0.04%	-0.00501	-6.81%
	(0.000767)		(0.00203)	
Widow	0.00191	1.94%	0.000245	0.33%
	(0.00153)		(0.00203)	
Aggregated province	0.0112	11.35%	0.0179	24.32%
	(0.00899)		(0.0178)	

	Result	%	Result	%
Aggregated age	0.0256**	25.94%	0.0589	80.03%
	(0.0104)		(0.0588)	
Urban	0.00543	5.50%	0.00454	6.17%
	(0.00342)		(0.00583)	
Real other household income p.c.	0.00814	8.25%	-0.00652	-8.86%
	(0.00634)		(0.0177)	
No. of children cared for	0.00100	1.01%	0.00915	12.43%
	(0.00160)		(0.0160)	
No. female pensioners	0.00493	4.99%	-0.00212	-2.88%
	(0.00354)		(0.00794)	
No. male pensioners	0.00088	0.89%	-0.0123	-16.71%
	(0.00232)		(0.0125)	
No. other male adults	-0.00904	-9.16%		
	(0.00899)			
No. female adults	-0.00466	-4.72%		
	(0.00940)			
No. other female adults			0.00862	11.71%
			(0.0219)	
No. male adults			0.00883	12.00%
			(0.0263)	
Constant	0.0417	42.25%	-0.0688	-93.48%
	(0.0348)		(0.0105)	
N	34365		43558	

Source: Own Calculations using NIDS data from 2010 to 2017
Standard Errors in Parentheses
All results are weighted and the standard errors and confidence intervals account for the NIDS stratification and clustering
* p<.1, ** p<.05, *** p<.01
Sample is restricted to working-age African individuals
% Column represents the percentage contribution of each variable to the total gap in labour force participation

Appendix 3: Ethical Clearance

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

5 February 2021

Miss Amy Lee Wagner (216003343)
School Of Acc Economics&Fin
Westville

Dear Miss Amy Lee Wagner,

Protocol reference number: 00010599
Project title: Gendered trends in labour force participation and education in South Africa

Exemption from Ethics Review

In response to your application received on 4 February 2021, your school has indicated that the protocol has been granted **EXEMPTION FROM ETHICS REVIEW.**

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:
Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

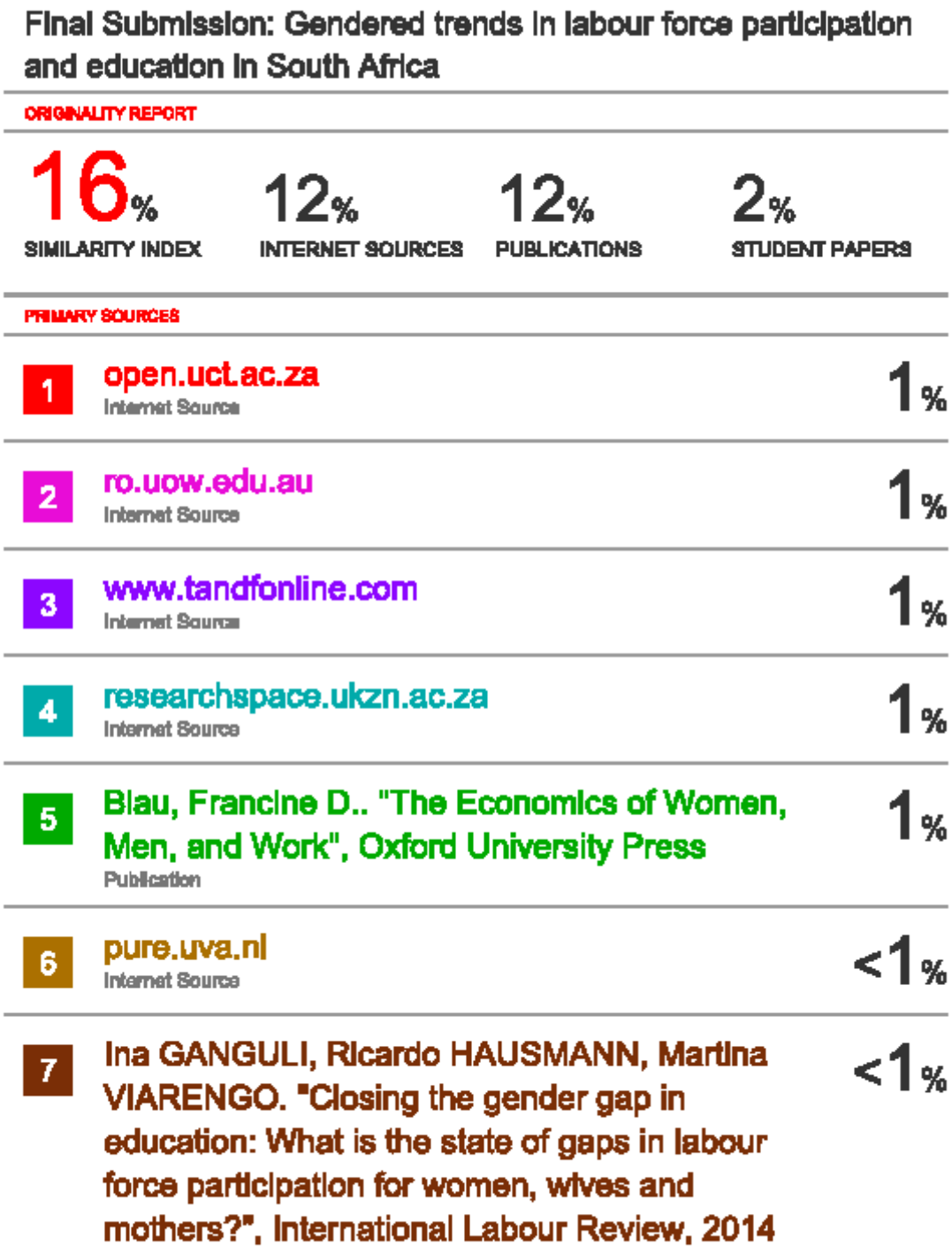
Yours sincerely,

[redacted] 5 February 2021

Prof Josue Mbonigaba
Academic Leader Research
School Of Acc Economics&Fin

UKZN Research Ethics Office
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag X54001, Durban 4000
Website: http://research.ukzn.ac.za/Research-Ethics/

Appendix 4: Turnitin Report Summary



Final Submission: Gendered trends in labour force participation and education in South Africa

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