Correlates of Parity Progression amongst Migrants in North West Province of South Africa

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ABSTRACT

The decline in South Africa's Total fertility rate from 5.37 in 1970 to 2.38 in 2019 is the subject of scrutiny in this dissertation. The study identifies five socioeconomic variables; Income, Education, Age, place of residence and official employment status for exploration of correlation with the total number of children ever born. The source of data is from the (10%) Post Enumeration Survey Sample of the 2011 Census conducted by Statistics South Africa. A cross sectional research design is adopted where parity progression ratios are calculated based on the independent variables followed by a simple linear regression model to test for association between one dependent and each of the five independent variables. The results reveal that international migrants are less likely than internal migrants to progress beyond parity five. The evidence is drawn from the lower parity progression ratio (PPR_{5+}=0.71) for international migrants than for internal migrants (PPR_{5+}=0.99). The analysis also reveals parity progression ratios for international migrants (PPR_1 = 1.73) as higher than for internal Migrants (PPR_1=1.63) for the first birth meaning that international migrants are more likely to progress from no birth to their first births. Beyond parity 1 international migrants are more cautious with the decision to progress to the next parity, evident from the lower parity progression ratios. Amongst women of parity 2,3, and 4 parity progression ratios of internal migrants is higher than for international Migrants.

Association of income and total children ever born is negative and weak for internal migrants (-0.136) meaning that as income increases the total number of children ever born reduces slightly. A similar scenario is observed between education and total children ever born by international migrants where the association between income is weaker (-0.098***) although highly significant. As the highest education level attained increases from no education to tertiary education the total number of children ever born declines by (-0.305) for internal Migrants and (-0.231***) for international Migrants. A unit change in income results to a significant negative change (-0.086***) in the total number of children. While for international migrants a unit change in income results to (-0.283***) change in total children ever born. Correlation between Age, Place of residence and official employment status are positive significant and weak amongst internal migrants. The association between official employment status and total children ever born amongst international Migrants is not significant. The study recommends that policy and programs that target fertility should target traditional settlements, unemployed women, youth and teenagers and offer opportunities for sustainable livelihoods during and after their education.

PARITY PROGRESSION RATIOS

Fertility in South Africa has dropped remarkably since 1960s, (Caldwell & Caldwell 2003 and Sibanda & Zuberi 1999). Levels and trends of South African fertility documented by Chimere- Dan (1993) and from South Africa Demographic and Health Surveys (SADHS 1999) also indicate a decline from 7 Children in the 1960s, 5 Children in the 1980s and 3.3 children in the 1990s. According to the World data atlas (2019) the decline in South African fertility is the highest in the African Continent; Total fertility rate fell from

5.37 in 1970, 2.66 in 2008 to 2.38 in 2019. Moultrie and Timeous (2002) attribute decline in South African fertility to a lower proportion of women progressing to a higher parity both for women with several children and for women of lower parity. South African fertility continued to decline to a total fertility rate of 2.67 during the 2011 South African Census (SSA 2015). Total fertility rate for White Indian and Asian population was 1.70 and 1.85 respectively indicating a below replacement fertility rate of either two or one child (SSA 2015). Fertility levels of internal and international Migrants in South

Africa are generally contradictory (SSA 2010). During the period of South Africa's fertility decline estimation of total fertility rate of immigrants in South Africa reveals that total fertility rate has either remained constant increased or decreased (Moultrie & Timeaus 2003). The 2011 South African Census data estimate that total fertility rate of International Migrants was 2.8 children per woman while for Internal Migrants total fertility rates was 3.9. children per woman.

1.1 Correlates of Parity Progression

International and internal migration are a potent demographic force although there has been little attention paid to what influences the fertility and the number of births amongst migrants. Analysis of sociodemographic characteristics from Statistics South Africa Fertility Monograph of the 2011 South African Census suggest that the propensity to progress to a higher parity amongst international and internal migrants is dependent on Migrants Education, Income, Employment, Residence and Age (SSA 2011 Report 03-01-63). Changes in these five socioeconomic variables all exert substantial influence on completed parity and are the subject of scrutiny since the fertility schedules are consistent with what has been documented about fertility behaviour of the respective population groups in prior surveys and census data (SSA, 2010)

Female employment as one of the drivers of lower parity progression to third and higher order births is explained by a delay in age at marriage due to time spent schooling. Although education effects on parity progression ratios in northwest province of south Africa have not been explored extensively, the available few studies identify education as a reason for fall in parity with women of secondary education or higher having more exposure to practical experience and lower average parity.

A wider spectrum of work and increased income opportunities generally offers more avenues for self-improvement and social mobility. Notably the effect of income on parity progression ratios requires an in-depth analysis of data on income and fertility in North West Province. It is further difficult to make generalizations on the sign or direction how income influences parity progression ratios. In lower parity's, effect of income on parity progression ratios is significant and negative, on the other hand in higher parities the direction of its effect changes from a net negative effect to a net positive effect.

The Age in which a woman gives birth does influence the Parity. Women who give life at an early age experience higher number of births in their child bearing lifespan. Place of residence is associated with a Parity Progression and has been established to lead to decline in the pace of fertility decline in Urban Total Fertility Rate.

1.2 Statement Of The Problem

Very little is known about the characteristics of South African Migrants, their participation in the labor force their Education Incomes and their fertility behavior (U.N. 2001, Coleman 2006; Sobotka 2008). The main reason is that Immigrants come to North west province to make a better life for themselves and their children. Statistics South Africa publishes aggregated information on the age structure of International and Internal Migration, rarely providing insight into other characteristics of interest like fertility behavior or Parity Progression Ratios.

Sobotka (2008) shows in his paper that insights into the net effect of fertility indicators of Migrants in North

West province are lacking and recommends that it is important to scrutinize fertility of Migrants mainly because international migrants may come from countries exhibiting higher fertility while internal migrants too may come from regions whose cultures favor higher fertility.

Sobotka (2008) further underscores the lack of good datasets to appropriately answer some of the common research questions on the field. Detailed enough information on important dimensions such as the context of migration, fertility intentions of both spouses, complete fertility and marriage histories) or pre-migration information (i.e., labour force participation, years of schooling or family structure prior to migration) are lacking in the data sets made available by Statistics South Africa. To generate further debate on the correlates of parity progression of Internal and International Migrants in North West Province one must rely on reports that have been submitted after occurrence of migration. Dubuc (2009) extends this discussion by revealing a deficiency in such data especially data from the Census because the data reports the number of children living in the household rather than the number of children born. One problem with such data is that children born prior to migration are often ignored during the process of obtaining information on total children ever borne.

Available studies of fertility in North West Province in South Africa have generally focused on the impact of migration on the fertility of migrants. These studies have explored the importance of the crucial factors like Education, Income, Residence and Employment on Total Fertility. None of these studies explored for association between Socio Economic Demographic characteristics of individuals on specific measures of fertility like parity progression ratios amongst internal and international migrants of North West Province South Africa.

1.3 Research Question

1. What are the correlates of parity progression amongst Migrants in North West Province of South Africa?

1.4 General Objective

1.Calculate parity progression ratios of Internal and International migrants in North West province.

1.5.1 Specific Objectives

1. Examine interrelationships between level of education and parity progression of internal and international migrants.
2. Explore for linkages between employment status and parity progression of internal and international migrants.
3. Investigate liaison between place of residence and parity progression of internal and international migrants
4. Probe the connection between income and parity progression of internal and international migrants.
5. Scrutinize any correlation between Age and Parity Progression ratios of internal and international Migrants

1.6 Rationale

An understanding of the socio economic factors that determine parity progression is necessary because data from the South African 2011 census is available. Exploring the socioeconomic factors that determine parity progression ratios will reveal and explain the association between Age, Education, Employment, Income and Place of Residence, on Parity Progression Ratios. This investigation will yield crucial information for understanding fertility behavior of internal and international migrants as has been established in other

middle income countries like Malaysia, Thailand and Argentina. Understanding effects of socio economic and demographic characteristics of the population on parity progression is important because these characteristics of migrants are in turn correlated with progress from one parity level to another. The problem is visible because previous migration into South Africa as revealed by Southern African Development Community (SADC), have mainly been streams of male-dominated contract labor into the mining and commercial farming sectors (Crush et al. 2005; Dodson 1998). Studies of this nature targeting the socioeconomic and demographic determinants of Parity Progression Ratios are lacking.

1.7 Significance Of The Study

This study reveals socioeconomic and demographic predictors of the levels and trends of fertility and parity progression ratios of migrants in North West province of South Africa. Moreover, research on the relationship between internal and international migration and parity progression ratios are scarce. Parity progression ratios is a period fertility measure which may reveal mechanisms with which internal and international Migration are connected with fertility in North West Province. Of more importance is that the findings will reveal various mechanisms by which migration and fertility are connected. Findings will also generate information on fertility behaviour of internal and international migrants in North West province of South Africa and specifically how Education, Employment, Income, Residence and Agein fluences decisions to progress from one parity to the next parity level. Examining parity-specific fertility reveals how migrants advance from one parity level to another.

1.8 Organisation Of The Study

In Chapter 1 A brief introduction of Parity Progression Ratio as a measure of fertility is discussed. The introduction defines parity progression ratio and highlights its relevance to the study of fertility amongst migrants in North West Province of South Africa. The correlates of parity progression ratios are briefly explained. These correlates are Education, Income and Employment. The Problem statement an outlines the reasons why such a study is called for and the Knowledge gap the study intends to fill. Research Questions, General Objectives and Specific objectives of the study are also stated in chapter one. The Chapter concludes with a Rationale and Significance of the study which basically provides reasons why the study is important. In chapter two a literature review of recent articles relevant to the study of parity progression ratios is prepared. The review identifies correlates of parity progression. The main correlates identified are Education, Income Employment, Residence and Age. In chapter three the Methodology of the study is discussed briefly, the data source identified and the models of data analysis and interpretation of results explained. Chapter 4 of the project provides a discussion of the results. First a discussion of the trends in parity progression ratios followed by a discussion of results from analysis of data to explain levels and trends of each of the five specific objectives. The chapter also discusses correlation between age, residence, income, employment and education on Parity Progression. Significant factors are revealed in the discussion that follows in Chapter 5.

LITERATURE REVIEW

The emphasis in the literature has been on how internal and international migration affects fertility. Extensive literature searches reveals that there are no recent works on this topic and area of focus of the study. Much of this focus stems from concern over the impact of migrant fertility on population growth in destination areas. Literature on migration and fertility is explored with the hope of gaining a better understanding of the links between Education, Employment, Income Residence and Age and Parity Progression Ratios. Ford ,1990; Sibanda and Zuberi ,1999 established influences these five variables exert on Parity Progression ratios. These have also been cited by Dorrington and Bradshaw (1999) as some of the reasons for decline in South African Total Fertility Rate from 6.5 in the 1960s to 3.0 in 1990. United

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Nations (1995) and SADHS (1999) expressed need to explore reasons why Total Fertility Rate in South Africa was 3.0. amongst Colored, 1.9 amongst Asians and 3.9 amongst African population and what contributed to a total fertility rate of 3.0 In North West Province.

Studies by Frejka ,2008; Lesthaeghe ,2010 and Bonvalet,2014 from Census data and Large scale surveys from 17 countries established that income is strongly positively associated with decisions to progress from one parity level to a higher parity. This association between income and fertility is further reinforced by Schultz (1994) who established that an income leads to acquisition of physical assets-financial assets, business assets, land, and natural resources, such as oil. The studies identified the income sources as significantly associated with higher parity because income modifies the economic opportunities parents must sacrifice to have another child and also increases transfers available for children. On the contrary Maluccio (2003) hypothesized that parents in reducing their fertility increase their transfers to each child in the form of gifts as well as human capital, motivated possibly by an increase in the returns for their support of schooling, health, and migration investments. From the work of Shields (1982) based on the (10%) probability sample from the 1973 Costa Rican Census income, is established as either negatively or positively correlated with parity progression. Inclusion or exclusion of wage income does not alter the sign value or significance of other variables on Parity Progression Ratios

According to the National Research Council (1999) in its publication *critical perspectives on Schooling and fertility in the Developing World,* Modern school based education for girls and women is one factor that has contributed to declining fertility rates in South Africa. The publication revealed that Education is a key correlate of fertility which generally tends to make women have fewer children. The project for statistics on living standards and development (PSLSD) and the 1994 annual October household survey are good examples of sources of findings which support the opinions that women who spend more time in school signal to employers and their spouses of the abilities and fertility intentions.

The findings revealed that there is a powerful association between fertility and education among black women; an additional year of education is associated with 0.12 fewer children. The findings are similar to results of analysis by Cochrane (1983) who established that among women with more than 5 Years of schooling there is a powerful negative association between education and fertility. Earlier findings by shields (1982) revealed that each year of education is associated with around 0.17 fewer children while an increase in wife's education by five Years results to a decline of 0.1 in Parity progression ratios.

To both authors, Education affects fertility through a variety of channels; Education provides an individual with literacy, practical knowledge and experience and the access to information socialization and attitude change. These specific skills acquired through education provide occupational advantages which in other Studies by (Baudin et al 2015; Kirk and Pillet 1998) from South Africa Migration data established an Inverse education-fertility gradient across foreign-born nativities.

In the studies by Rutherford (2010) established that the effect of education in the transition from parity zero to parity one and two is small because almost all women who have a first birth go on to have a second birth. The level of education doesn't matter whatsoever. In the same study proportion of women with a second child who go on to have a third child typically declines sharply as education increases. These studies echo similar sentiments to Shields (1982) and Cochrane (1983) supporting the hypotheses of a negative relationship between education and fertility.

Temporary labor migration often involves the separation of couples for extended periods of time. The most common pattern is for the husband to migrate while the wife remains in the place of origin. If migration is permanent, the husband migrates alone, and is later joined by his wife and children. In both cases the separation of the couple reduces the wife's exposure to the risk of pregnancy during the period of absence.

The increased number of women working full time was one reason for the fertility transition because women were initially perceived as secondary household earners. The works of Adsera (2011) Delgado et al. 2008 and De Rose et al (2008) identified rising women's employment in combination with precarious labor market conditions, limited work flexibility for women, and traditional gender roles within the family as a cause for decline in both first and second birth rates.

Employment is the practicality of performing tasks for an income. The specific effects of employment are consequently difficult to untangle. According to Richards (1983) the effect of employment on parity progression occur when the economic returns from children diminish as the labor force shifts into industry. Standing (1983) and Brazzell (1983) also established that women working full time tend to have fewer children. The employment of women could interfere with childrearing and provide reasons favoring a smaller family and lower fertility for women working full time.

In a community that is socialized through the process of education incomes from occupational skills are higher and employment opportunities more at reach and the aspirations regarding abilities to provide for marriage partners higher. Education allows women to be salaried workers. This brings with it self confidence, bargaining skills with partners and to a larger extent a degree of autonomy.

How rural- urban residence influences parity progression ratios and fertility is not widely known especially in North West province of South Africa. The few studies that are available indicate that there may be a positive relationship between rural- urban residence of immigrants and fertility. Shields (1982) from findings of ordinary least square(OLS) analysis of the relationship between Place of residence and Parity Progression Ratios in Costa Rica established that urban places of residences are modern and could be reason for a difference of 0.1 in parity progression ratios with rural residences.

Cities offer also more avenues for socioeconomic mobility because of the rise of non agricultural employment and the higher educational level of the population. The economy in the city is monetarized and densely populated conditions which Martine (2013) established to be reasons for lower Parity Progression Ratios than in rural areas. Fertility rates are also lower amongst women who live in urban areas than in rural areas.

It is not in all cases that urban residence is associated with lower fertility. Findings of a cross sectional study by Omondi and Ayiemba (2005) indicate that fertility of Migrants in Urban Areas is lower even for generations born in Urban Areas while White (2008) also established that Internal migrants living in urban areas were also of lower fertility.

An increase in wife's age by 3 years reduces parity progression ratios by 0.05. Furthermore, it is widely assumed that fertility decline usually starts with older women limiting additional births at higher parities (Van De Walle and Foster 1990). A study of the fertility transition in India using parity progression ratios showed that the decline between 1977 and 2004 was mainly caused by women limiting births for parities higher than two (Spoorenberg 2010).

2.1 Theoretical Framework

A framework proposed by Bulatao (1984) forms the basis for a conceptual framework. The conceptual framework in figure 1 below hypothesizes Population and Development Policy levers and three types of fertility behavior as direct determinants of fertility outcomes. These fertility behaviors; Marriage, breastfeeding and contraception may be affected directly through population policies and programs, including family planning programs. They may also be affected indirectly through development policies and programs that change the socioeconomic characteristics of households, and therefore the propensities and decisions of their members with regard to each type of fertility behavior. These aspects of socio economic

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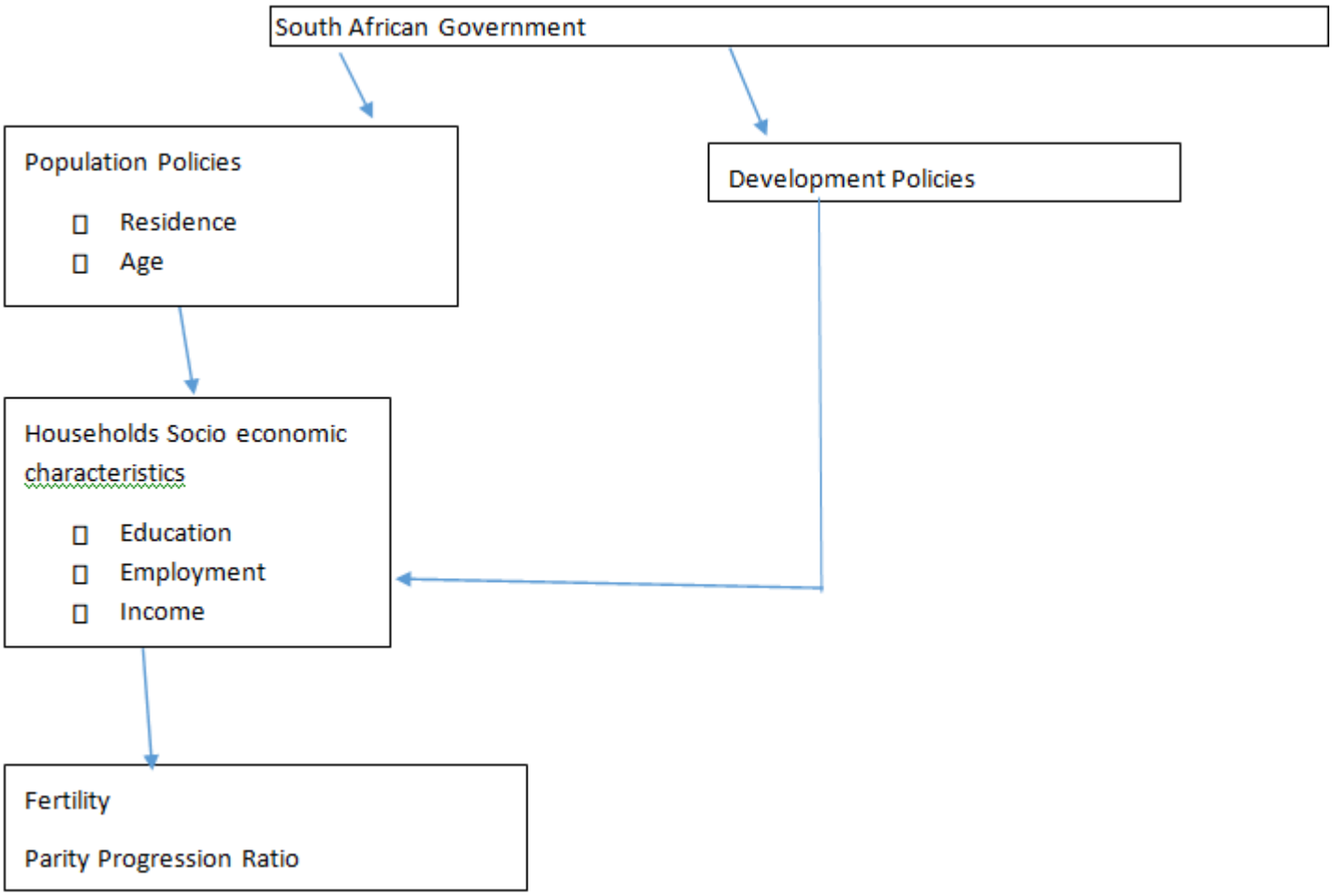
development cited in the framework are education, income and employment.

2.2 Conceptual Framework

Figure 1: Socioeconomic and behavioral determinants of fertility and policies that affect them



Source: Bulatao A R (1984) reducing fertility in developing countries: a review of determinants and policy levers. World bank staff working papers number 680 population and development series number 5.

In the conceptual framework, parity progression ratios is associated population policies on Age and Residence. Income Employment and Education of Internal and International Migrants are also associated with Parity Progression Ratios. The model proposes five variables (Age, Residence Education Employment and Income) that are associated with Parity Progression Ratios.

METHODOLOGY

3.1 Data Source Editing And Analysis

The Study is Cross Sectional in its design. The data source is from the (10%) Post Enumeration Survey

Sample of the 2011 Census. Although South Africa conducted a Census very recently the 2010 PES is preferred due to its completeness and compactness and abilities to meet the objectives of this study. During the Post Enumeration Survey conducted between 23rd November 2011 and 15th December 2011 a sample of

600 out of 89,305 Enumeration Areas was covered. In North West Province 39 Enumeration Areas were sampled from which information on children ever born among all women was collected as a follow up to the 2011 Census. During Fieldwork households were enumerated through Interviews. Responses were recorded in the Post Enumeration Survey Questionnaire. The enumeration areas sampled provides data that reflects the spatial diversity required in a study of internal and international Migrants living in North West Province. International Migrants are persons who migrate from a different country into Northwest province while internal migration considers persons who migrate from a particular place within South Africa into North West Province.

One advantage of the Post Enumeration Survey 10 percent sample is that it produces reasonable distributions of the South African population, even when the data is subjected to a high degree of disaggregation. If both the origin and destination of a specific migratory move are in the same country, the move constitutes internal migration. If the origin and destination are in the same country, the person who migrates from a particular place is called an out-migrant from that area, and at the same time he/she is an in-migrant into the area of destination

Analysis carried out in IBM SPSS Statistics for Windows, version 26 (IBM Corp., Armonk, N.Y., USA)'The first step in analysis of data is to estimate the effects of each predictor variables Education,

Employment, Income, Age and Residence on Parity Progression Ratios through a correlation coefficient. Completed fertility of Internal and International Migrants will be broken down into parity progression ratios. Based on the 2011 (10%) Post Enumeration Survey Sample Female Internal and International Migrants aged 15-49 are identified and classified according to their Parity level to provide a sample of female respondents who progress from one parity level to the next during the next parity based on their socioeconomic and demographic characteristics. In the sample (N=8,142) female international Migrant and (N=111,638) internal migrants in North West province aged 15-49. The outcome variable is some continuous variable total children ever born. The analysis reveals association between independent variables Education, Income, Employment, Residence and Age of respondents with the total children ever born and the parity progression ratios calculated for each of the independent variables.

Step two of analysis involves tabulating predictor values as components of the predicted variable Parity Progression Ratios and exploring for interaction with each of the predictor variables This is accomplished by calculating Pearson's Correlation Coefficient between the independent variables Education Income Employment Residence and Age with the dependent categorical variable Parity Progression. Analysis further involves calculation of Regression Coefficients. The analysis results are tabulated based on association of all the five predictor variables and also while controlling for each of the five predictor variables. Direction and magnitude of association is interpreted. Pearson's *r* varies between +1 and -1, where +1 is a perfect positive correlation, and -1 is a perfect negative correlation. Value zero correlation means there is no linear correlation at all. The association is explored for 2-Tailed Significance < .000. Due to the large sample size (N=111,638) Internal Migrants and (N=8,142) International Migrants the study has enough statistical power to identify even very weak effects. To establish correlation coefficients, a multiple linear regression model is applied to five independent and the dependent variable Total children ever born.

3.2 Analysis Models

3.2.1 MODEL 1: Calculation of Parity Progression Ratios from the distribution of births by order.

$PPRi = \beta_{i+1}/\beta_i$

$PPR_{i=}$ Births of order (i+1)/Births order i

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3.2.2 MODEL 2: Estimation of correlation coefficient.

The correlation coefficient is a measure of the association between two variables. In this study correlation coefficient is calculated with the aim of establishing association between independent variables Education, Income, Employment, Residence and Age with Parity Progression based on the 2011 (10%) Sample Post Enumeration Survey Data. The correlation coefficient also establishes the strength of association. The formulas return a value between -1 and 1 where -1 shows negative correlation and +1 shows a positive correlation.

$$r= \sum(x_i - \bar{x})(y_i - \bar{y}) / \sqrt{\sum(x_i - \bar{x})^2 \ (y_i - \bar{y})^2}$$

A correlation coefficient is calculated for each of the independent variables (x) and dependent variable (y). The correlation coefficient refers to the association between Income Education and Employment Residence and Age on parity progression ratio which is a continuous variable. A result of the analysis is presented in simple bivariate tables that models and also reveals the extent to which predicted values of these measures vary across categories of each predictor variable. An advantage of this approach is that the simple bivariate tables and graphs that are ultimately produced are much more easily understood.

3.2.3 Model 3: Coefficients from the linear regression model

Multiple regression is an extension of simple linear regression. It is used when we want to predict the value of a variable based on the value of two or more other variables. The variable we want to predict is called the dependent variable (Total Children Ever Born). The variables we are using to predict the value of the dependent variable are called the independent variables. The model selected includes five independent variables (Age, Place of Residence, Income, Highest Education level and Official Employment Status).

The multiple linear regression equation is as follows:

$$\hat{y} = \beta 0 + \beta 1X1 + \beta 2X2 + \cdots + \beta pXp$$

where $\hat{y}$ is the predicted or expected value of the dependent variable, X_1 through X_p are p distinct independent variables. From the regression equation $\beta 0$ is the value of $\hat{y}$ when all independent variables (X_1 to X_P) are equal to zero, and $\beta 1$ through $\beta 2$ are the estimated regression coefficients. Each regression coefficient represents the change in Y relative to a one unit change in the respective independent variable. In the multiple regression, $\beta 1$, for example, is the change in $\hat{y}$ relative to a one unit change in X_1, holding all other independent variables constant (i.e., when the remaining independent variables are held at the same value or are fixed). Statistical tests can be performed to assess whether each regression coefficient is significantly different from zero.

3.3 Definition Of Concepts

3.3.1 Dependent Variable

PARITY	The total number of children ever borne. Respondents are classified as being in Parity 1, 2, 3, 4 and 5+
PARITY PROGRESSION RATIOS	Are the fractions of women who ultimately progress from their own birth to first marriage, from first marriage to first birth, from first birth to second birth, and so on. The Parity Progression Ratios so obtained are aggregated to a Total Fertility Rate.

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3.3.2 Independent Variables

Income	Classified as per SSA income distribution.
	Low Income R0-9600
	Middle Income R9601-R38400 High Income R38401+
Highest Level of Education	No education
	Primary Education
	Secondary Education
	Tertiary Education
5 Year age group classification of respondents.	15-19
	20-24
	25-29
	30-34
	35-39
	40-44
	45-49
Geo Type Place of Residence	Urban
	Traditional Farms
Employment	Employed
	Unemployed
	Discouraged work seeker
	Not Economically active

RESULTS AND DISCUSSION

The chapter presents the results of calculations of parity progression ratios for internal and international migrants, and also calculation of parity progression ratios when internal and international Migrants are classified by the independent variables.

4.1 Calculation Of Parity Progression Ratios For International And Internal Migrants In North West Province.

In table 4.1 are the results of calculations of parity progression ratios. The Parity Progression Ratio calculations are based on (N=8,142) female international Migrant and (N=111,638) internal migrants in North West province aged 15-49. Parity progression from parity zero to parity one is higher amongst international migrants (1.73) than amongst internal migrants (1.63). The lowest parity progression ratio for international migrants is PPR_3 and PPR_4 where 0.46 of women progress from the third birth to the fourth birth. The lowest parity progression ratio for internal migrants is PPR_4 where (0.53) of women in parity three go on to parity four.

Table 4. 1 Calculation of Parity Progress Ratios of Internal and International Migrants in North West Province

	INTERNAL MIGRANTS		INTERNATIONAL MIGRANTS	
PARITY	WOMEN 15-49	PPR=βi+1/βi	WOMEN 15-49	PPR=βi+1/βi
0	18131		1563	

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1	29873	1.63	2702	1.73
2	28600	0.95	2120	0.77
3	17187	0.60	985	0.46
4	9022	0.53	448	0.46
5+	8825	0.99	324	0.71
N	111638		8142	

Parity Progression amongst international migrants in North West Province ends earlier than amongst internal migrants, meaning that a higher proportion of internal migrant's progress beyond parity five than international migrants. This is evident from a lower parity progression ratio (0.71) amongst international migrants against a parity progression ratio of (0.99) amongst internal Migrants for women in parity PPR_{5+} .For $PPR_{2,3,4 \text{ and } 5+}$ Parity progression ratios of internal Migrants is higher than for international migrants. The reasons for these levels in Parity progression ratios have been explored by a number of authors with the aim of establishing the profile differentials tempo and quantum variation of fertility. Further analysis is required to expand on the potential explanations for the prevailing Parity Progression Ratios and establish how Education, Income, Employment, Place of Residence and Age contribute to Parity Progression Ratios of both Internal and International Migrants in North West Province of South Africa.

4.2 Parity Progression Ratios Among Women By Income

Table 4. 2 Parity Progression Ratios among women by Income.

Parity Internal Migrants	Parity Progression Ratios		
	Low income	Middle income	High income
1	1.92	1.84	0.95
2	0.97	1.01	0.81
3	0.63	0.61	0.56
4	0.54	0.54	0.34
5+	1.03	0.88	0.55
Parity International Migrants	Low income	Middle income	High income
1	1.92	1.59	0.71
2	0.79	0.79	0.66
3	0.47	0.45	0.44
4	0.47	0.41	0.29
5	0.69	0.59	0.50

In the low income category for internal migrants, Parity progression ratios are highest (1.92) between no birth and the first birth. In the middle income category parity progression ratios are highest (1.84) between parity zero and parity one. In the high income category parity progression ratios are highest (0.95) between parity zero and parity one. The trend of parity progression ratios reveals a decline between parity two and parity four then increases slightly at parity five. The decline in parity progression ratios between parity two and parity four is also observed amongst low income, middle income and high income categories.

Amongst international migrant's parity progression ratios decline from a high of (1.92) in the low income

category, (1.59) in the middle income category and (0.71) in the high income category. The slight increase in parity progression ratios at PPR_{5+} for internal migrants also occurs in all the income categories for international Migrants.

4.3 Parity Progression Ratios Among Women By Education

Table 4. 3 Parity Progression Ratios among women by Education

Parity internal migrants	Parity Progression Ratios			
	No education	Primary education	Secondary education	Tertiary education
1	1.25	1.68	1.89	0.86
2	1.26	1.29	0.93	0.72
3	0.96	0.94	0.54	0.38
4	0.96	0.7	0.44	0.35
5+	1.72	1.29	0.71	0.54
Parity international migrants	No education	Primary education	Secondary education	Tertiary education
1	1.33	1.84	1.93	0.66
2	1.17	1	0.7	0.61
3	0.63	0.6	0.4	0.36
4	0.61	0.57	0.4	0.14
5+	1.24	0.76	0.5	1.5

Parity progression ratios of internal migrants is lowest amongst Women with Tertiary Education for internal and International migrants. The trend reveals a steady decline up to parity four. A slight increase in Parity Progression Ratios is observed from parity 4 to parity 5. This slight increase is observed amongst all the categories of Education. Parity progression ratios are highest amongst internal Migrants with no Education (PPR_{5+}=1.72) and lowest amongst international migrants with tertiary education (PPR_4 =0.14) Generally, the trends of parity progression ratios when internal and international migrants are classified by highest education attained reveals higher parity progression ratios among internal migrants except at parity 0 and parity 1 when Parity Progression Ratios for International Migrants are higher. An explanation for this scenario at PPR_{0-1} is explained by international migrants arriving in North West province for education pursuits or immediately after completing their studies.

4.4 Parity Progression Ratios Among Women by Age

Table 4. 4 Parity Progression Ratios among Women by Age

PARITY INTERNAL MIGRANTS	PARITY PROGRESSION RATIOS						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1	1.01	1.65	1.91	1.92	1.57	1.37	1.15
2	0.18	0.46	0.91	1.44	1.7	1.15	0.94
3	0.14	0.22	0.39	0.65	0.87	1.35	1.53
4	0.15	0.23	0.32	0.42	0.62	0.74	0.8
5+	0	0.25	0.38	0.61	0.88	1.36	1.67
PARITY INTERNATIONAL MIGRANTS	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1	1.1	2.04	1.88	1.57	1.19	1.29	0.78

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2	0.16	0.45	0.95	1.3	1.4	1.36	1.48
3	0.03	0.2	0.39	0.68	0.86	0.87	0.65
4	0	0.12	0.3	0.48	0.71	0.9	1.29
5+	0	0.33	0.32	0.45	0.85	1.19	1.9

Parity progression ratios for international migrants are higher than for internal migrants only in PPR_1 across all age group between 15 and 24 years. This implies that a bigger proportion of international migrants move from parity zero to parity one than internal migrants in all age groups 15-19 and 19-24. One probable reason is that migrants may move into northwest province when young and in search of a livelihood and partners. Another reason is the small number of international migrants in the 15-19 age group. Across all age groups PPR_{2-5} is higher than for internal Migrants than International migrants. In the 15-19 age group PPR_{5+} is zero for both internal and international migrants implying an absence of adolescents in this parity. Amongst International Migrants PPR_4 in the 15-19 age is the least (0.14) scenario similar for both internal and international migrants where PPR_4 is the least. For all age categories between PPR_{0-4} reduces with a slight in PPR_{4-5} within the age group 45-49. For internal migrants classified by age, PPR_{4-5} increases from 0.82 to 1.67 in the 45-49 age group while for international migrants PPR_45 increases from 1.29 to 1.90 in the age group 45-49. More internal migrants progress to $PPR_{5+.}$ The first reason is that international migrants begin their child bearing late and end their child bearing at earlier ages than internal migrants. Meaning that a higher proportion of (2.04) of international Migrants progress to parity one when aged 19-24 while (1.65) of Internal Migrants aged 19-24 progress to parity One. It is at these early ages of childbearing where the momentum of fertility lies. Another reason is that internal migrant's child bearing at ages 45-49 is higher as is revealed by PPR_{0-1} of (1.15) for internal Migrants and a PPR_{0-1} of (0.78) for International Migrants. The duration of childbearing is prolonged for internal migrants than for international migrants as indicated by the lower parity progression ratios small for international migrants 45-49. Age of migrants is therefore important when exploring for differences in parity progression ratios because it reveals differences in PPR_{0-1} where most of childbearing is concentrated and also differences in PPR_{2-5}.

4.5 Place Of Residence And Parity Progression Ratios

Table 4. 5 Parity Progression Ratios among women by Place of Residence

PARITY INTERNAL MIGRANTS	PARITY PROGRESSION RATIOS		
	URBAN	TRADITIONAL	FARMS
0			
1	1.53	2.08	1.82
2	0.9	1.12	1.02
3	0.54	0.74	0.7
4	0.46	0.65	0.59
5+	0.79	1.28	1.03
PARITY INTERNATIONAL MIGRANTS0	PPR URBAN	PPR TRADITIONAL	PPR FARMS
1	1.71	1.83	1.75
2	0.75	0.9	0.85
3	0.43	0.6	0.58
4	0.45	0.59	0.38
5+	0.63	1	0.91

Parity progression ratio is highest amongst internal migrants PPR_{0-1}= (2.08) living in traditional settings and lowest at PPR_4=0.46 amongst internal Migrants living in traditional settings. Similarly, for International

Migrants the highest parity progression ratio is PPR_{0-1} =1.83 in traditional settings while the lowest is internal migrants the ratios are highest at PPR_3=0.43 in urban settings. An Urban resident in North West province has lesser chances of progressing from one parity level to the next parity level. Parity progression ratios PPR_{2-5} of internal migrants are higher than for international migrants irrespective of the place of residence. PPR declines amongst internal migrants and international migrants to PPR_4 then increases from PPR_{4-5} in both urban, traditional settings and farms. International migrants exhibit lower Parity Progression Ratios than internal migrants in all places of residence in North West Province except in PPR_1 where parity progression ratios of international migrants are higher in urban areas of residence.

4.6 Official Employment Status and Parity Progression Ratios

PARITY INTERNAL MIGRANTS	PARITY PROGRESSION RATIOS			
	Employed	Unemployed	Discouraged work seeker	Other not economically active
1	1.34	2.21	2.2	1.59
2	0.96	0.95	1	0.95
3	0.55	0.58	0.67	0.67
4	0.46	0.5	0.56	0.6
5+	0.82	0.87	1.14	1.14

Table 4.6 Parity Progression Ratios among women by Official Employment Status

PARITY INTERNATIONAL MIGRANTS	Employed	Unemployed	Discouraged work seeker	Other not economically active
2	0.82	0.74	0.81	0.78
3	0.49	0.41	0.47	0.49
4	0.41	0.52	0.49	0.45
5+	0.72	0.65	0.73	0.79

A decline in parity progression ratios is spotted from parity 0 to parity 5+. The decline is more pronounced amongst international migrants especially between PPR_1 and PPR_2 where parity progression ratios reduces by 2.24 for international migrants and 2.20 amongst internal migrants who are discouraged work seekers. Parity progression ratios for parity 1 are highest for internal migrants who are unemployed PPR_1=2.21 and for international migrants who are discouraged work seekers PPR=2.24. In the following parity's PPR_{2-5} parity progression ratios are lower for international migrants than for internal migrants. Amongst both category of Migrants, Parity progression increases slightly after parity four with PPR_{4-5+} increasing from 0.52 to 0.65 for international Migrants and 0.50 to 0.87 amongst the unemployed international Migrants the curve is constant at (PPR_3=0.46) and (PPR_4=0.46) implying that official employment status is important because decision to progress from one parity to another are based on capacities to provide for the increased costs associated with upbringing and upkeep. With employment, comes an income which is crucial in providing basic needs for a growing family.

LINEAR REGRESSION OF INDEPENDENT VARIABLES AND TOTAL CHILDREN EVER BORN FOR INTERNAL AND INTERNATIONAL MIGRANTS IN NORTH WEST PROVINCE

Table 5.1 summarizes correlation coefficients and regression coefficients from a Multiple linear regression model with five independent variables Income, Education, Age group, Geotype and official employment

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status.

Table 5. 1 Internal Migrants Coefficients of Linear Regression

Coefficients									
Model 1		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	.810	.023		34.977	.000			
	Income	-.086	.002	-.120	-37.747	0.000	-.136	-.112	-.097
	Education	-.289	.006	-.134	-46.702	0.000	-.305	-.138	-.120
	Age group	.379	.002	.420	154.937	0.000	.446	.421	.398
	Geo type	.248	.006	.103	38.778	0.000	.170	.115	.100
	Official employment status	.016	.004	.014	4.485	.000	.102	.013	.012
Dependent Variable: Total Children Ever Born									

Table 5. 2 International Migrants Coefficients of Linear Regression

	Unstandardized Coefficients		Standardized Coefficients			Correlations		
Model 1	B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part
(Constant)	0.982	0.075		13.089	0			
Income	-0.283	0.027	-0.12	-10.593	0	-0.098	-0.117	-0.103
Education	-0.269	0.019	-0.148	-14.384	0	-0.231	-0.157	-0.14
Age group	0.408	0.01	0.42	42.185	0	0.421	0.424	0.411
Geo type	0.101	0.023	0.045	4.492	0	0.086	0.05	0.044
Official employment status	0.007	0.012	0.007	0.608	0.543	0.028	0.007	0.006
Dependent Variable: Total Children ever born								

5.2 Correlations Coefficients

Results of the test for association between each of the five independent variables and total children ever born, reveal that it is only Income and Education that is negatively associated with the dependent variable Total Children Ever Born both for international and internal migrants. The association between income and total children ever born is weak and negative both for international and Internal Migrants in North West Province. The association between income and children ever born is stronger amongst internal migrants (-0.136***) than amongst internal migrants (-0.098***). The direction of association between income and

Total children ever born is consistently negative but slightly stronger in magnitude (0.112***) for internal migrants when the linear effects of other independent variables are removed for internal and international Migrants.

Association between Education and Children ever born is also stronger amongst internal Migrants (0.305***) than amongst international Migrants (-0.231**). This implies that as income and highest education level increases the total number of children ever born significantly declines both for internal and international Migrants. Association between Education and Total children ever born maintains a consistent negative direction (-0.138***) when linear effects are removed from the independent and dependent variable, although the strength of association reduces slightly.

Association between age and total children ever born is positive strong and significant both for internal (0.446***) and international Migrants (0.421***). These association is stronger amongst internal migrants than amongst international migrants. An increase in age is coupled with an increased number of children ever born both for internal and international Migrants. Though association between age and parity progression is positive, it is clear that international migrants are less likely than internal migrants to progress to higher parity when at higher age groups. The association maintains a positive correlation although the strength of association increases for international migrants (0.424***) and reduces to (0.421***) for internal Migrants.

Geo type place of residence and total children ever born is positive weak and significant for international and internal Migrants. The association is more well defined amongst internal migrants (0.170***) than amongst International Migrants (0.086***), implying that residing in Urban or Traditional places of residence is positively associated with total children ever born. Women make decisions to progress to higher parity irrespective of residing in urban or traditional settings and irrespective of their migration statuses.

In exploring for association between official employment status and Parity progression it is established that official employment status is significantly associated (0.102***) with total children ever born only for internal migrants. Amongst international migrants the association is weak positive (0.028) and not significant. Employed internal Migrants in North West Province are more likely to progress from one parity to the next mainly due to their employment status as opposed to International Migrants where the association between official employment status and total children ever born is not significant. In partial correlation the association between official employment status and total children ever born changes in direction to (-0.003) weak negative association that is not significant. The association is between official employment status and total children ever born is not consistent in direction, strength or significance for internal and international migrants because results show clear differences both for zero order correlation and partial correlation.

5.3 Regression Coefficients

The change in Total Children ever born relative to a unit change in incomes of internal migrants is lower (-0.086***) for internal Migrants than for International Migrants (-0.283). A unit change in income results in a decrease in total children ever born both for internal and international Migrants. The change in Total children ever born associated with a change in income is highly significant, and the effects of a change in income stronger amongst international migrants than internal migrants.

A unit change in Education attained also results to a decline in the number of total children ever born both for internal Migrants (-0.289**) and international Migrants (-0.273***). The change is significant for internal migrants and international Migrants. Whereas the education attainment increases the total number of children ever born declines significantly. The coefficients of the effect of education on total children ever born is higher amongst internal migrants than amongst international migrants although the effect is negative

for both categories of migrants.

For the other three independent variables (Age, Place of Residence and Official Employment Status) a Unit change in the independent variables results to a positive change in number of total children ever born. For Internal Migrants the change in age is significant to total children ever born (0.409***). The change in place of residence is significant to total children ever born (0.103***) as is the case of official employment status which is significant (0.016***) to total children ever born. For International Migrants the Age is significant (0.421***) place of residence is significant (0.026***) while the official employment status (-0.004) is not significant and also results to a decline in number of total children ever born.

SUMMARY CONCLUSION AND RECOMMENDATIONS

6.1 Summary

The study set out broadly to establish what are the correlates of parity progression in North West Province of South Africa. The target population of study were internal and international Migrants in North West province. The sample consisted of (N=8,142) female international Migrant and (N=111,638) female internal Migrants. The correlates hypothesized to influence parity progression are identified in the literature review and theoretical framework. These are Income, Education, Geo type place of residence, Age and Official employment status. A conceptual framework diagram proposed by Bulatao A.R (1984) is adopted to illustrates the association between independent and the dependent variables, Parity Progression Ratios and Total Children ever born. The conceptual framework guides the analysis.

As independent variables of the study, their effect on Parity Progression Ratio is explored using Microsoft Excel 2018.Numbers of women progressing to the next parity are tabulated based on independent variables and Parity progression ratios to reveal the trends for internal and international migrants. The second level of analysis explores for association between independent variables and Total Children ever born through a Linear regression model. Interpretation of results is based on calculation of parity progression ratios, tabulation of levels and trends of parity progression ratios based on each independent variable. Further analysis is performed to reveal effect of independent variables on Parity Progression ratios and also investigate effect of independent variables on total children ever born for women 15-49 in North West Province. Beyond Parity 2, parity progression ratios of internal migrants are higher than for international migrants. For both categories of migrants beyond parity 2, Parity progression ratios continue to decline. Calculated Parity Progression Ratios for international migrants of Parity 1 is higher than for internal migrants implying that international migrants are more likely to progress to parity 1 than internal migrants probably because their income, education, age, place of residence and official employment status is favorable. In all the tabulations (4.1to 4.6), Parity progression ratios decline from parity 0 to parity 5+ then increase after parity 5_+.

The results of the test for association between each of the five independent variables and total children ever born in Table 5.1 and 5.2, reveal that of the five variables in the regression model Income and Education is negatively associated with the dependent variable total children ever Born both for international and internal migrants. The association is significant when all variables are included in the model with a slight decrease in the correlation coefficient when controlling for other variables. Further linear regression model reveals that association between Age Type of place of residence and Official employment status is positive and weak for Internal and international Migrants when all five variables are included in the model. The main difference in the coefficients are that official employment status of international Migrants is not significantly correlated with total children ever born. For internal Migrants regression coefficient between Income Education and Total Children ever born is weak negative and significant while regression coefficient between Type of place of residence, Age and Official employment status is weak positive and significant. The regression

coefficients for income Education and Official employment status of international Migrants are negative and significant while Place of residence and age are positive and significant.

6.2 Conclusion

Future studies should explore more minute details of the socioeconomic variables for which association with parity progression ratios were explored. Notably the association between income Education and parity progression ratios should be investigated and tabulated for each income category, education level, Migration Status and Fertility.

6.3 Recommendations

Policy and programs that target total children ever born should be identified especially in rural settlements, informal settlements and the informal sectors of the North West province economy. Unemployed persons should be approached for inclusion into any such programs initiated in North West province and the reach of population policy should be enhanced to reach not only the women with formal education, but also women with informal education irrespective of nationality. These programs should aim at establishing reasons why parity progression ratios amongst International Migrants are higher at parity 1 and give reasons why parity progression ratios of internal migrants remain higher in parities 2+. Programs should also set out to establish why parity progression ratios PPR_{5+} increases for both internal and international Migrants. As pertains to data, Statistics South Africa must maintain quality of its data and also increase the range of information sought in the (10%) Post Enumeration Sample Survey to broaden the findings and provide possibility for more rigorous analysis. Such a survey should include questions on religion and access to health facilities. The institution should organize Workshops and Trainings for stakeholders, partners and the population at large to disseminate and share findings of past censuses for the purpose of initiating programs, implementing policies and improving socioeconomic conditions in Northwest Province of South Africa.

ABBREVIATIONS

NRC: NATIONAL RESEARCH COUNCIL

OLS: ORDINARY LEAST SQUARES

PES: POST ENUMERATION SURVEY

PPR: PARITY PROGRESSION RATIO

PSLSD: THE PROJECT FOR STATISTICS ON LIVING STANDARDS AND DEVELOPMENT

SADC: SOUTHERN AFRICA DEVELOPMENT COMMUNITY

SADHS: SOUTH AFRICA DEMOGRAPHIC AND HEALTH SURVEY

SSA: STATISTICS SOUTH AFRICA

UN: UNITED NATIONS

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