

https://dspace.org/

An analysis of transient and chronic multidimensional poverty in South Africa between 2008 and 2017

Munzhelele, Tumelo

2024

University of the Witwatersrand, Johannesburg

https://hdl.handle.net/10539/43514

Munzhelele, Tumelo. (2024). An analysis of transient and chronic multidimensional poverty in South Africa between 2008 and 2017 [Masters, University of the Witwatersrand, Johannesburg]. WireDSpace.

Downloaded from a DSpace repository. https://dspace.org/

AN ANALYSIS OF TRANSIENT AND CHRONIC MULTIDIMENSIONAL POVERTY IN SOUTH AFRICA BETWEEN 2008 AND 2017

A Research Report submitted in partial fulfilment of the Degree of
Master of Commerce (Economics/Economic Science)
in the School of Economics and Finance,
University of the Witwatersrand

by

Name: Tumelo Munzhelele
Student No: 367021

Supervised by Professor Miracle Benhura

Word Count: 13 583

Date: 7 June 2024

Abstract

This study derives a Multidimensional Poverty Index (MPI) for each wave using data from the South African National Income Dynamics Study (NIDS) between 2008 to 2017. The MPI is measured using the counting method of Alkire and Foster (2011). In addition, the duration approach of Foster (2009) is used to measure, depending on the MPI, whether households suffer multidimensional chronic or transient poverty. Furthermore, variables that increase a household's likelihood of experiencing chronic or transient multidimensional poverty as opposed to never experiencing multidimensional poverty are found using multinomial logit regression analysis.

The results show that the MPI decreased from approximately 7% to 4% between 2008 and 2017. Additionally, the share of South African households which experienced multidimensional poverty decreased from approximately 15% to 10% between 2008 and 2017. However, the intensity of poverty has only decreased by two percentage points from 44% during the same period. This indicates that there has not been much progress in the number of dimensions in which poor households are deprived even as multidimensional poverty decreased. Years spent in school for adults living in the household and unemployment were the dimensions which contributed the most towards the MPI for households that were either chronically or transiently poor.

Approximately 73% of households in South Africa never experienced Multidimensional Poverty between 2008 and 2017. Based on the specified deprivation score cut-off, between 1% and 13% of South African households were living in chronic multidimensional poverty. Transient multidimensional poverty affected more than 25% of South Africans. Notably, a higher portion of South Africa's multidimensional poverty is transitory in nature. Black households and female-headed households had the highest incidence of both chronic and transient multidimensional poverty. The multinomial logit model indicates that the likelihood of experiencing chronic or transient multidimensional poverty is higher among households led by individuals without formal education, those with an economically inactive head, and those based in rural areas.

List of Tables

Table 3.1: The dimensions, indicators, and their weights (source: Statistics South Africa, 2014) 15
Table 4.1: Demographics of the balanced panel 19
Table 4.2: Summary statistics of households in the balanced panel 20
Table 4.3: Proportion of households deprived in each dimension and indicator by wave 22
Table 4.4: Balanced panel results for Headcount, intensity, and adjusted headcount by wave 23
Table 4.5: The contribution to the MPI by each indicator by wave 24
Table 4.6: Adjusted headcount ratio (MPI) by province 28
Table 4.7: Simple poverty transition matrix – comparing wave 1 and wave 5. 29
Table 4.8: Headcount ratio for households who were never poor, transient poor and chronic poor. 29
Table 4.9: Characteristics of individuals who experienced chronic multidimensional poverty, transient poverty and never poor. 31
Table 4.10: Multinomial logit regression for multidimensional never poor, chronically poor, and transitory poor 35

List of Figures

Figure 4.1: MPI by headship from wave 1 to wave 5. 25
Figure 4.2: MPI by race from wave 1 to wave 5 25
Figure 4.3: Adjusted headcount ratio (MPI) by the age of the head of the household from wave 1 to wave 5. 26
Figure 4.4: Headcount ratio by education level from wave 1 to wave 5 26
Figure 4.5: Headcount ratio and adjusted headcount ratio by dwelling type. 27
Figure 4.6: MPI by employment of the head of the household. 28
Figure 4.7: The MPI at deprivation score cut-off of k=20%, k=33.3% and k=50% 32
Figure 4.8: sensitivity analysis to the duration of cut-off 33

Contents

Abstract 2
List of Tables 3
List of Figures 3
1. Introduction 5
1.1. Background and Problem Statement 5
1.2. Relevance of the study 7
1.3. Structure of the paper 9
2. Literature Review 9
2.1. Introduction 9
2.2. Conceptual framework of poverty 10
2.3. Theoretical Framework of poverty 11
2.4. Empirical findings in the existing multidimensional poverty literature 12
3. Methodology And Data 13
3.1. Data 13
3.2. Methodology 14
3.2.1. Measuring Multidimensional Poverty 14
3.2.2. Measuring Transient and Chronic Poverty 16
3.2.3. Sensitivity cut-offs: deprivation score cut-off and duration cut-off 16
3.2.4. Multinomial Logit Regression 17
4. Empirical Findings 19
4.1. Introduction 19
4.2. Descriptive Statistics 19
4.3. Multidimensional Poverty empirical Findings 21
4.3.1. Identification and aggregation Empirical findings 21
4.3.2. Transient and Chronic Poverty Empirical findings 28
4.3.3. Sensitivity to the deprivation cut-off empirical findings 32
4.3.4. Sensitivity to the duration cut-off empirical findings 33
4.4. Multinomial logit regression empirical findings 33
5. Conclusion 36
References 38

1. Introduction

1.1. Background and Problem Statement

The democratically elected government of South Africa has been working to reduce poverty and inequality since 1994. Several development plans have been developed and implemented to lower poverty and inequality. Despite this effort, over 55.5% (approximately 30 million people) still live below the upper bound poverty line (United Nations South Africa, 2020). The latest World Bank data show that South Africa had a consumption per capita Gini coefficient of 0.67, making it one of the most unequal countries in world (Sulla et al., 2022). Therefore, it should come as no surprise that the South African government has included alleviating poverty and inequality in all the development plans and policy frameworks since 1994. The first established policy framework known as the reconstruction and development plan (RDP), included the goal "to alleviate poverty, low wages, and extreme inequalities in wages".

Labor market income is the main source of income for households in South Africa when compared to other sources such as social grants, remittances, business revenue, and pensions (Mabuza, 2020). Consequently, the high unemployment rate and income disparity may explain a significant amount of South Africa's high levels of inequality and poverty. According to statistics South Africa, the official unemployment rate was 31,9% in the third quarter of 2023. The last ten years have seen an upward trend in the unemployment rate, which peaked in the first quarter of 2022 at the height of the Corona virus pandemic. For those who are fortunate enough to be employed in South Africa, there are disparities in incomes across race, gender, and other arbitrary characteristics. According to Mabuza (2020), In South Africa, women make 14% less money than men across all the main racial groups. Black South Africans earn the least income from the labour market followed by Colored and Indians. White South Africans earn 23% more than their Black counterparts (Mabuza, 2020). This places White men at the top and Black women at the bottom of the labour wage hierarchy.

Since the RDP, there have been additional development policy frameworks, each of which included a plan for reducing poverty and inequality. The latest development policy in South Africa is the National Development Plan (NDP) which also sets out to "reducing the proportion of households with a monthly income below R419 per person (in 2009 prices) from 39% to zero by 2030". The NDP also aims to reduce inequality by bringing the Gini coefficient down from 0.69 to 0.6. In pursuit of these goals, the South African government has implemented policies to reduce poverty using direct transfers such as social grants and indirect methods such as providing services like housing, electricity, healthcare, education, and other public services.

The biggest challenge facing the government is ensuring equal access to these basic services across the country. Generally, access to basic services such as clean water, refuse removal, electricity, hospitals, schools, etc tend to be better in urban areas compared to rural areas. Additionally, the degree of access to these services varies across different demographics.

Given the dimensions used to calculate the MPI, the index essentially measures the impact of provision of basic services such as water, sanitation, education, and electricity. Although the South African government has consistently allocated resources towards reducing poverty since 1994, it remains high in the country. This could be because some welfare dimensions are not considered when formulating policies aimed at reducing poverty. Furthermore, the policy instruments may not consider whether a person is impoverished on a transient or chronic basis. Thus, knowledge gained from research that analyses multidimensional poverty and its persistence is essential for enhancing the way poverty reduction policies are formulated and implemented.

To preserve a stable society, it is crucial that government resources are allocated towards decreasing both poverty and inequality. Societies with high levels of poverty and inequality tend to struggle with social issues such as high levels of crime, public unrest, poor health outcomes, etc. These issues are already present in South Africa, as seen by the rise in some crimes like stock theft and public unrest, such as those that broke out in Kwa-Zulu Natal in July 2021. Therefore, tackling poverty is crucial for social stability as well as the country's economic success. And understanding poverty in all its dimensions is crucial towards alleviating it. Using multidimensional poverty approach is further advantageous because the index can be decomposed into demographics, location, and individual characteristics. This improves targeting the right people and/or locations when deploying poverty alleviation policy instruments.

Considering the above, it is important to understand the trend in multidimensional poverty in South Africa, focusing on the distinction between chronic and transitory multidimensional poverty. However, this distinction has currently received trivial attention in the literature such as Gallant (2012), Fransman (2017) and Jackson & Yu (2023), yet the findings are important to inform policy for the reduction of both chronic and transitory poverty in South Africa. This study aims to analyse the trend in chronic and transient multidimensional poverty (MPI) in South Africa for the period 2008 – 2017. After the trend is established, the following research questions are investigated: What percentage of households experience either chronic or

transient multidimensional poverty? What is the proportion of households that are deprived in each indicator of the MPI? What is the contribution of each indicator towards the MPI? And what characteristics increase a household's likelihood of experiencing either chronic or transient multidimensional poverty?

1.2. Relevance of the study

This study has identified four gaps in the literature on poverty in South Africa: disproportionate focus on unidimensional (monetary) poverty, making no distinction between chronic or transient poverty, using cross-sectional data rather than panel data, and reporting mainly descriptive statistics.

Poverty can be measured using either unidimensional or multidimensional approaches (Wagle, 2002). Monetary variables such as income, consumption, and/or spending are used to measure unidimensional poverty (Costa, 2003). Whereas welfare characteristics such as access to public services, education, the labour market, etc., are used to measure multidimensional poverty. The most important weakness of unidimensional poverty approaches is that they don't capture the fact that income and/or consumption do not necessarily translate into better living conditions, neither does a lack of income or consumption necessarily makes one worse off (Wagle, 2002). For example, if a person has limited access to proper sanitation but has an income above the poverty line, their standard of living can be considered low. This is especially crucial in South Africa, where there are differences in access to basic services depending on location and/or demographics. As such, unidimensional poverty approaches would underestimate the level of poverty compared to multidimensional poverty approaches (Bersisa & Heshmati, 2021).

South African literature has focused disproportionately more on unidimensional poverty analysis compared to multidimensional poverty. Even though studies by Rogan (2016) and von Fintel (2021) focused on multidimensional poverty, they used limited data i.e., one or three wave of NIDS, respectively. Although this paper is not using a novel approach to measure poverty in South Africa, it is intending to add to the literature on poverty by studying multidimensional as opposed to unidimensional poverty. This is because using Multidimensional poverty approach does a better job of measuring poverty by incorporating a range of living conditions (dimensions) to capture the complexity of poverty.

The persistence of poverty is not a topic that is frequently covered in South African poverty literature. Thus, neglecting to distinguish between transient and chronic poverty. One of the constraints to effective poverty reduction policies in South Africa is the lack of clear distinction

between chronic and transient poverty (Aliber, 2003). As such, it is important to understand whether poverty experienced by households is chronic or transient to avoid formulating "one size fits all" poverty reduction policies. Chronic poverty refers to persistent deprivation over time and transient poverty refers to the movement of people (households) in or out of poverty over a specified period. Unfortunately, transient, and chronic poverty are routinely categorised as just poverty in literature. Therefore, eliminating an opportunity to create policies which address the unique aspects of each type of poverty (Leal Filho et al., 2022).

According to Duclos et al. (2010) the provision of public services such as housing, health, education etc., which improve human and physical capital are better suited to alleviate chronic poverty. And social grants and other direct transfers from the government are better suited policy instruments to address transient poverty (Duclos et al., 2010). Consequently, knowing how much of South Africa's overall observed poverty level is transient or chronic would support policymakers in developing strategies for reducing poverty that effectively direct the limited resources available to the government toward addressing poverty. This is why this paper includes an analysis of the duration of poverty in South African households between 2008 and 2017.

Another observation in the South African literature on poverty is the use of cross-sectional as opposed to panel data. Also related is the use of fewer than five waves of NIDS data. Cross-sectional data can only measure poverty at a particular point in time. However, poverty is a dynamic phenomenon i.e. over time, people (households) may enter, leave, or remain impoverished. Because cross-sectional data cannot reflect the dynamic nature of poverty, it is unable to differentiate between chronic and transient poverty (Kruger, 2018). Nationally representative panel data are uncommon in developing nations. However, South Africa is unique in that it has a nationally representative panel data called the National Income Dynamics Study (NIDS), which collected data for approximately a decade between 2008 and 2017 (Zizzamia et al., 2019). Even with the availability of NIDS data, more recent research has continued to focus mostly on unidimensional poverty analysis, such as Kruger (2018), Finn et al. (2014) and Finn & Leibbrandt (2013). Finn et al. (2014) used the first two waves of NIDS, whereas Finn & Leibbrandt (2013) used the first three waves and Kruger (2018) used four waves of NIDS dataset.

Rogan (2016) used a cross-section of the first wave of NIDS to measure multidimensional poverty in South Africa. After decomposing the MPI, Rogan (2016) recommended that the

poverty gender gap would be narrowed by increased investments in healthcare and basic services delivery, especially, in rural areas. Although the study made important findings, they were static and likely relevant to that point in time i.e., 2008. Since Rogan (2016) did not study how the households fared over time, the recommendations for eradicating the poverty gender gap may be limited to a particular point in time. Given the dynamic nature of poverty and the availability of panel data, this paper uses panel data analysis to study poverty as a dynamic phenomenon. This enables a comprehensive analysis of multidimensional poverty which include incidence, intensity, and duration of poverty (whether poverty is chronic, and transient).

From the available multidimensional poverty literature in South Africa, the researchers tend to report the summary statistics and decomposition of multidimensional poverty ((Finn, 2021), Finn et al. (2013) and Rogan (2016)). While descriptives and MPI decomposition are important, regression analysis can enrich the analysis by identifying statistically significant determinants of multidimensional poverty. By being aware of these determinants, policymakers could predict the likelihood that a household would experience multidimensional poverty. This could enhance the effectiveness of policies aimed at reducing poverty so that individuals are not only lifted out of poverty but also prevent the likelihood of poverty entry. Hence, this paper uses multinomial logit regression to determine characteristics which make households more likely to fall into chronic or transient multidimensional poverty as opposed to never falling into multidimensional poverty.

1.3. Structure of the paper

The study is organized into five sections; section 1 is the introduction, section 2 is the literature review, section 3 presents the data and methodology, section 4 discusses the empirical findings of this paper, and the conclusion is presented in section 5.

2. Literature Review

2.1. Introduction

The conceptual framework and theoretical foundation for poverty in economics are presented in this section. This section also includes an overview of empirical findings from South Africa multidimensional poverty literature. The conceptual framework section focuses on the definition of poverty and associated concepts in economics. While the theoretical framework section presents theories that economists developed to explain the causes and potential remedies of poverty.

2.2. Conceptual framework of poverty

Definition of poverty

Poverty can be defined and measured in terms of economic well-being, capability, or social exclusion (Wagle, 2002). Economic well-being measures income, consumption, and expenditure, while capability measures an individual's inability to achieve basic human well-being due to lack of resources. Social exclusion measures factors influencing human welfare on a social, behavioural, and political level (Silver & Miller, 2003). The measurement of poverty is sensitive to the method used to identify the poor, resulting in different poverty levels depending on the chosen definition (Belhadj & Limam, 2012).

Unidimensional and Multidimensional poverty

Unidimensional poverty is a form of economic well-being poverty definition that uses money variables like income, expenditure, or consumption to study poverty (Belhadj & Limam, 2012). Unidimensional poverty uses poverty lines as poverty thresholds, such as the Food Poverty Line (FPL), Lower-Bound Poverty Line (LBPL), and Upper-Bound Poverty Line (UBPL). The poverty line is defined as the lowest income level deemed necessary to achieve a basic standard of living in a particular country (Belhadj & Limam, 2012).

Multidimensional poverty uses the idea that poverty is a condition in which people are exposed to multiple disadvantages, actual or perceived (Fusco & Dickes, 2008). The methodologies define dimensions and their indicators to measure poverty, making this a type of capability definition of poverty. An individual (household) is deemed to suffer multidimensional poverty if they experience deprivation below a specified cut-off.

Absolute poverty vs. relative poverty and subjective vs. objective poverty

According to Hagenaars and De Vos (1988), absolute poverty is when a person's income falls below certain objectively established criteria. Examples of these thresholds include food poverty lines and upper- and lower-bound poverty lines. Hagenaars and De Vos (1988) defines relative poverty as the state of having less than others in society, either in actual or perceived terms. Whether or not people feel impoverished is subjective poverty. Whereas, objective poverty can be quantified by a variety of methods, such as multidimensional poverty approach, consumption, household income, access to basics, and calorie intake (Mahmood, 2019).

Transient and chronic poverty

Transient poverty is temporary, while chronic poverty is persistent over time. Foster (2009) offers two methods to study the duration of poverty: component approach and spells approach. The component approach adds the duration of poverty by constructing an average income, while the spells approach defines a duration cut-off. The spells approach is generally used in multidimensional poverty analysis because it is simple to use and is based on the same axiomatic foundations as the Alkire–Foster family of multidimensional poverty indices (Alkire et al., 2017a).

Incidence and intensity of poverty

There are two characteristics of poverty which are important to distinguish in the study of poverty: incidence and intensity. The incidence of poverty is the percentage of people who are poor in a population. Incidence is measured as the headcount ratio (H) of multidimensional poverty. Intensity of multidimensional poverty (A) on the other hand is the average percentage of dimensions in which poor people are deprived (Aristondo, 2018). The product of the incidence and intensity of poverty is the adjusted headcount ratio (M_0) which is referred to as the multidimensional poverty index (MPI).

2.3. Theoretical Framework of poverty

Economics has various schools of thought on poverty. This section presents theories relevant to multidimensional poverty as well as poverty at a microeconomic level.

Keynesian vs Marxism theories of poverty

Keynesian school of thought focus on macroeconomic forces and government's role in economic stabilization and public goods (Yapa, 1996). Marxism emphasizes class and group discrimination as central to poverty, with state intervention and market regulation being key (Davis, 2014). These theories' macroeconomic stance makes them inadequate for explaining the causes of household poverty. Nevertheless, their recommendation for government intervention to reduce poverty is important for multidimensional poverty analysis. This is relevant as multidimensional poverty includes a focus on the provision of basic services by the government.

Classical theory vs Neoclassical theory of poverty

Classical economic theories argue that individuals are ultimately responsible for their poverty, while neoclassical economics focuses on market failures which are beyond individual's control (Davis, 2014). Both schools emphasize incentives and individual productivity in generating poverty but overemphasize monetary aspects and limited government involvement (Young, 2022). These theories imply that the market as opposed to government intervention can solve poverty. Classical theories like "sub-culture" suggest that poverty is intergenerational and can be addressed through lifestyle changes such as moving away from cramped living spaces (e.g. townships), reduce their propensity for violence and learn to defer gratification (Davis, 2014). While neoclassical theories like human capital theory suggest that individuals can overcome poverty by changing their attributes like low educational attainment, working low earning jobs and low mobility. These theories explain the causes of household poverty but lack recommendations for alleviation, leaving it to market forces.

Sen's Capability Approach

According to Frediani (2010), Amartya Sen's Capability Approach (CA) is a framework for assessing human well-being, emphasizing the moral importance of freedom to pursue well-being and the interpretation of well-being in terms of individuals' capabilities and functionings. Functionings are instances of capabilities that have been realized, whereas capabilities are the doings and beings that persons can attain if they so desire (Lopez, 2019). The CA framework identifies conversion factors, which include environmental, social, and demographic characteristics (Robeyns & Byskov, 2023). The CA views wellbeing as multifaceted as opposed to unidimensional. Hence, the CA has an increasing influence in development literature as it emphasizes multidimensional rather than unidimensional analysis of poverty (Frediani, 2010).

2.4. Empirical findings in the existing multidimensional poverty literature

Gallant (2012) studied multidimensional poverty in South Africa from 1996 to 2001 using the fuzzy sets approach, census (1996 & 2001) and community survey 2007 data. Concluded that Mean deprivation in South Africa has decreased since 1996, with provinces like Limpopo, Eastern Cape, and KwaZulu-Natal experiencing higher poverty rates compared to the other provinces. African households experienced the highest mean deprivation, but experienced the highest poverty decline between 1996 and 2007. Over the period, female-headed households were more deprived than male-headed households (Gallant, 2012). Fransman (2017)

investigated multidimensional poverty in South Africa between 2001 and 2016 using the MPI approach, community surveys (2007 & 2016), and census data (2001 & 2011).

Fransman (2017), found that the MPI had fallen by more than 50% in South Africa. Furthermore, the Eastern Cape and KwaZulu experienced the highest MPI score while Gauteng and Western Cape had the lowest. This large fall in multidimensional poverty was found to be driven by a large reduction in the poverty headcount, as only a slight decrease of the intensity of poverty took place during the period under study (Fransman, 2017). Like Gallant (2012), Fransman (2017), also found higher MPI scores in African households compared to other races and rural households compared to their urban counterparts. However, the two groups also showed the highest decline in the multidimensional poverty between 2001 and 2016.

The most recent literature reviewed for this study, Jackson & Yu's (2023) studied multidimensional poverty in South Africa using Statistics South Africa's 2018 General Household Survey data and the global MPI. Jackson & Yu (2023) found that rural African women and households with an unemployed head face the most deprivations, with transport assets, sanitation, refuse removal, and water access being the highest contributing indicators towards the MPI. Even as various methods and datasets are used, studies on multidimensional poverty conducted in South Africa following the country's transition into democracy generally find a downward trend in MPI and headcount ratios with either no or slight change in poverty intensity. In addition, multidimensional poverty is higher in households led by women, those in rural areas, and African households; however, the MPI in these households is trending downwards.

3. Methodology And Data

3.1. Data

This paper uses data from the National Income Dynamics Study (NIDS), which followed a nationally representative sample of South African households (and household members) across time and recorded their incomes, expenditures, access to services and other standard of living variables. The study uses the five waves of NIDS data collected between 2008 and 2017 which was collected approximately two years apart. To study multidimensional poverty as a dynamic phenomenon requires a balanced panel. The balanced panel was created by merging all five waves of NIDS remaining with 21 505 respondents compared to 28 226 respondents in wave 1. There were 5 204 households left from 7 296 in wave 1. Post stratified panel weights were used to correct for non-random panel attrition. The study acknowledges and limited by the

limitations of the NIDS data. Please refer to Brophy et al., (2018) for a detailed discussion on NIDS panel weights.

3.2. Methodology

3.2.1. Measuring Multidimensional Poverty

This paper uses the counting method of Alkire and Foster (2011) (AF method) to identify and aggregate households who experience multidimensional poverty. The analysis is carried out separately for each NIDS survey wave. This paper also uses the spells duration approach of Foster (2009) to measure the persistence of multidimensional poverty over time. Therefore, the measures of multidimensional poverty in this paper can be thought of as using three cut-offs instead of the dual cut-off in the AF method. The Alkire and Foster (2011) methodology for measuring multidimensional poverty consists of two steps: identification and aggregation. These steps are detailed below.

Step 1: identification

According to Alkire et al. (2015), The AF method require the following key decisions to be made before the MPI can be measured; the selection of the unit of analysis, dimensions, weights, and deprivation cut-off. This paper uses the household proxied by the head of the household as a unit of analysis. A decision was made to use the same dimensions as those used by Statistics South Africa Multidimensional index (SAMPI); health, education, standard of living and economic activity. This allows this study to produce MPI results which are easy to compare to other studies on South African multidimensional poverty. The AF counting method can be represented as follows (Alkire et al. 2015):

The population (n) and dimensions (d) data in multidimensional poverty measurement is typically represented by an $n \times d$ dimensional achievement matrix X, where x_{ij} is the achievement of household i in dimension j, it is real and positive. The deprivation cut-off (z_j), is the minimum achievement necessary to be considered non-deprived in dimension j. The deprivation cut-off is the first of the dual cut-off in the AF method. This study uses the deprivation cut-offs specified in the SAMPI shown in table 3.1 below. The deprivation cut-offs are collected in the d-dimensional vector $z = (z_1, \dots, z_d)$. The deprivation matrix $g^0$is derived from the achievement matrix (X) and the deprivation vector (z) where $g^0_{ij} = 1$ if the household i is deprived in dimension j i.e. $x_{ij} < z_j$ and $g^0_{ij} = 0$ otherwise, for all $j = 1, \dots, d$ and $i = 1, \dots, n$.

The weight (w) of each dimension indicates the relative importance of the different deprivations. This paper has chosen to give each dimension equal weight, in accordance with the SAMPI presented in table 3.1 below. Then, the deprivation score for each household (c_i) is calculated as the sum of the weighted deprivations as shown in equation 1 below:

$$c_i = \sum_{j=1}^{d} w_j g_{ij}^0 = \sum_{j=1}^{d} \overline{g}_{ij}^0 \quad 1$$

Where w_j is the weight of dimension j. The household's deprivation score increases with the number of deprivations they suffer, reaching a maximum when they are deprived in every dimension. The second cut-off in AF method, the deprivation score cut-off or poverty cutoff (k) is the minimum deprivation score for a household to be identified as multidimensionally poor i.e. $c_i \geq k$. This study has elected to use a deprivation score cut-off (k) of 1/3 (33.3%), recommended by Statistics South Africa for the SAMPI. The identification function ρ_k, is defined to identify the poor using the weighted deprivations (c_i) along with the dual cut-offs (z *and* k). ρ_k depends on both the "within-dimension" deprivation score z and "across dimension" cutoff k. Therefore, $\rho_k(X_{i.}; z) = 1$ if $c_i \geq k$ and $\rho_k(X_{i.}; z) = 0$ otherwise i.e. a household is considered multidimensionally poor if $\rho_k(X_{i.}; z) = 1$. This concludes the AF dual-cutoff identification method. Table 3.1 below shows the dimensions, indicator, deprivation cut-off and weights used by SAMPI which are adopted in this paper.

Table 3.1: The dimensions, indicators, and their weights (source: Statistics South Africa, 2014)

Dimension	Indicator	Description cut-off	Weight
Health	Child mortality	If any child under the age of 5 has died in the past 24 months	1/4
Education	Years of schooling	If no household member aged 15 or older has completed 5 years of schooling	1/8
	School attendance	If any school-aged child (aged 7 to 15) is out of school	1/8
Standard of living	Fuel for lighting	If household is using paraffin/candles/nothing/other	1/28
	Fuel for heating	If household is using paraffin/wood/coal/dung/other/none	1/28
	Fuel for cooking	If household is using paraffin/wood/coal/dung/other/none	1/28
	Water access	If no piped water in dwelling or on stand	1/28
	Sanitation type	If not a flush toilet	1/28
	Dwelling type	If an informal shack/traditional dwelling/caravan/tent/other	1/28
	Asset ownership	If household does not own more than one radio, tv, telephone or fridge and doe not own a car	1/28
Economic activity	Unemployment	If all adults (aged 15 to 64) in the household are unemployed	1/4

Step 2: Aggregation

The aggregation step of Alkire et al., (2015) defines the adjusted headcount ratio (M_0 or MPI) as the product of two partial indices; multidimensional headcount ratio (H) and the intensity (A) of poverty, represented in equation 2 below:

$$M_0 = \mathrm{H} \times \mathrm{A} \quad 2$$

Where $H = {}^{q}/_{n}$, q is the number of households identified as poor using the dual-cutoff approach detailed above. And $A = \sum_{i=1}^{q} {}^{c_i(k)}/_{q}$, is the average deprivations score across the

poor. The headcount ratio, intensity and MPI results will be reported in the empirical findings section of this study.

3.2.2. Measuring Transient and Chronic Poverty

Having determined who experienced multidimensional poverty in each wave of the NIDS using the AF dual cutoff method detailed in section 3.2.1, the next step is to establish the persistence of poverty. This step uses the Foster (2009) duration approach which states that a household is chronically poor if it is determined to be multidimensionally poor over a sufficiently long period of time. This introduces the third and final cut-off in this paper; the time lapsed while living in poverty for a household to be considered transiently or chronically poor. There is no prescribed cut-off for the duration of transient or chronic poverty in literature. Therefore, to be conservative, in this study a household will be considered chronically poor if that household experienced multidimensional poverty across all waves of NIDS. However, this assumption will be relaxed to determine the robustness of the MPI to changes in the duration cut-off. This analysis is included in the empirical findings section of this paper.

In this study, a household will be considered transiently poor if it entered multidimensional poverty in wave t and exited poverty in wave t+1 or vice versa. Essentially a household is considered to have experienced transient poverty if it was poor in at least one wave during the period under study. This decision was made because NIDS data was taken 2 to 3 years apart which is judged a substantial amount of time for a household to spend in poverty.

3.2.3. Sensitivity cut-offs: deprivation score cut-off and duration cut-off

The determination of multidimensional poverty relies on the dimensions, indicators, weights, deprivation cut-off and deprivation score cut-off. Similarly, the persistence of poverty also relies on the specified duration cut-off. Changing one or more of these variables will result in changes in the predicted MPI and multidimensional poverty persistence. Statistics South Africa undertook a combination of statistical and subjective processes to determine the acceptable dimensions, indicators, deprivation cut-off and deprivation score cut-off for South Africa. This process produced the SAMPI which differs from the global MPI by the addition of the unemployment indicator (Statistics South Africa, 2014).

To evaluate the robustness of the MPI in this study, the dimensions, indicators, and deprivation cut-offs of the SAMPI will remain unchanged for ease of comparison with local multidimensional poverty studies. However, the sensitivity of the MPI to changes in the deprivation score cut-off is included in this study. This is because studies in multidimensional

poverty such as Alkire et al. (2019), who measured the global MPI at deprivation cut-offs of 20%, 33.3%, and 50% and concluded that "no country studied was found to be entirely insensitive to changes in poverty cut-off". Consequently, it's critical to determine whether the predicted MPIs at each deprivation cut-off are statistically different from each other. This paper adopted the same cut-offs used by Alkire et al., (2019) to assess the sensitivity of the MPI to the deprivation cut-off in South Africa for the period under study.

Whether or not a household suffered chronic poverty depends on the selected duration cut-off. In this study a household is considered to have experienced chronic poverty if that household was poor in all five NIDS waves. Alkire et al., (2014), found that chronic multidimensional poverty is statistically correlated with the minimum number of periods a household experiences such poverty. The study varied the minimum periods for a household to be considered chronically poor from t=1, t=1/3 and t=2/3. Where t represents the minimum years, a multidimensionally poor household remained impoverished. This study will adopt these periods to assess the robustness of the level of chronic poverty in South Africa to changes in t. NIDS data was collected for nine years from 2008. In this study, a household would have to live in multidimensional poverty for nine, six, or three years for the poverty to be classified chronic.

3.2.4. Multinomial Logit Regression

This study also aims to establish the characteristic differences between chronically poor households, transitory poor households and those that were never poor between wave 1 and 5. It uses an adaptation of Rodríguez (2007) to derive multinomial logit model. In this paper, the random variable is "poverty" denoted as P_i, and it is equal to 0 if a household is never poor; 1 if the household is chronically poor and 2 if the household transient poor. Where π_{ij} denotes the probability that the i-th response falls in the j-th category. For example, in this paper π_{i1} is the probability that the i-th respondent falls in the category "chronically poor".

In this model, the households which were never poor are chosen as the base (reference) category with a probability denoted as π_{iJ}. We can calculate the odds that a member of group i falls in category j as opposed to the base category as; $\frac{\pi_{i1}}{\pi_{iJ}}$. For this paper, we consider the odds of households which were never poor from those of chronically poor households. And the odds of households that were never poor to those of households which experienced transient poverty. Assuming that the log-odds (η_{ij}) of each response follow a linear model:

$$\eta_{ij} = log\frac{\pi_{i1}}{\pi_{iJ}} = \alpha_j + X_i'\beta_j \quad 3$$

where α_j is a regression constant and β_j is a vector of regression coefficients, for j = 0, 1, 2. and X_i' is a vector of individual i's demographics, labour market participation, educational attainment and location. Taking exponents and using the requirement that all probabilities sum to 1 and equation 4 becomes:

$$\pi_{ij} = \frac{exp\{\eta_{ij}\}}{\sum_{k=0}^{k=2} \exp\{\eta_{ik}\}} \quad 4$$

"The maximum likelihood technique is used to estimate the model parameters; that is, parameter values are determined to maximize the probability that the process modelled by the model generated the observed data (Brooks-Bartlett, 2018). Relative risk ratio (RRR) is common way that the results of a multinomial logit regression are expressed. The regression coefficient's exponent is used to compute the RRR. According to Osborne (2014), the relative risk (RRR) is the ratio of the likelihood (risk) of a case falling into a comparison group to the probability (risk) of the case belonging to the reference category" (Munzhelele, 2022). "In general, if an RRR is greater than 1, then this indicates that with increasing values on the independent variable (IV) there is an increased likelihood (risk) of a case falling into the comparison category and decreased risk of falling into the reference category. If the RRR is less than 1, then this indicates that with increasing values on the IV there is decreased risk of a case falling into the comparison category and increased risk the case falls into the reference category. If the RRR equals 1, then there is no relationship between the IV and the risk of falling into the comparison category relative to the reference category (Osbourne, 2014)".

The independence of irrelevant alternatives (IIA) is an underlying model assumption of multinomial logistic regression. In simple terms, if there are two options; A and B and A is selected. When a third option C is added, the addition of option C has no bearing on the relative likelihood of selecting A over B (Benson et al., 2016). The Hausman-McFadden and Small-Hsiao tests can be used to test the IIA assumption (Starkweather & Moske, 2011). The IIA test often operates as follows: first, for each alternative, make a restricted model by removing the people who selected it; then, re-estimate the model for the alternatives that are still available. Next, create a test that contrasts the updated estimates with the initial estimations (Allison, 2012). The multinomial logit holds and the IIA is not violated if there is no substantial change in the coefficients of the restricted models and the original estimations. And all other regression analysis assumptions should hold.

4. Empirical Findings

4.1. Introduction

This section details the results of this study starting with summary statistics in section 4.2 from the household balanced panel. Section 4.3 details the multidimensional poverty findings including a decomposition of the MPI by various characteristics in section 4.3.1. Section 4.3.2 reports on the duration of poverty. And section 4.3.3 and 4.3.4. presents the results of the robustness check to deprivation score and duration cut-offs. Section 4.3.5 presents the multinomial logit regression results comparing households which experienced either chronic or transient poverty and those who never experienced multidimensional poverty for the duration of the study.

4.2. Descriptive Statistics

This section presents the summary statistics of the balanced panel with heads of the households as proxies for the household. African-headed households constituted the largest share of the households in the balanced panel, as seen in Table 4.1. Coloured, Indian, and White-headed households followed in that order. There are almost four percentage points more male-headed households than female-headed households. The average age of the head of the household is approximately 46 years. The province with the highest number of residents in the balanced panel is Kwa-Zulu Natal. Over 78% of households in this study live in formal structures.

Table 4.1: Demographics of the balanced panel

Race of Household head (%)		**Province of residence (%)**	
African	74.69%	Western Cape	15.23%
Coloured	14.58%	Eastern Cape	12.45%
Asian/Indian	1.61%	Northern Cape	7.89%
White	9.11%	Free State	6.39%
Gender Head of Household (%)		KwaZulu-Natal	21.58%
Female household head	45.79%	North West	6.63%
Male household head	54.21%	Gauteng	14.08%
Age of the head of intervals in wave 1 (%)		Mpumalanga	7.35%
Younger than 14	0%	Limpopo	7.72%
Age 15-24	5.67%	Province change	6.00%
Age 25 - 34	17.76%	**Housing dwelling type (%)**	
Age 35-44	24.71%	Formal	78.40%
Age 45-54	23.65%	Informal	9.32%
Age 55-64	15.32%	Traditional	12.28%
65 and above	12.89%		

Table 4.2 below shows the summary statistics of the balanced households with variables often used in unidimensional and multidimensional poverty studies such Kruger, (2018), Biyase, & Zwane, (2018) and Adeoti (2014). These variables will be used in MPI decomposition and multinomial logit regression in sections 4.3.1, 4.3.2 and 4.4.

Table 4.2: Summary statistics of households in the balanced panel

NIDS wave	**Wave 1**	**Wave 2**	**Wave 3**	**Wave 4**	**Wave 5**
Year	**2008**	**2010 - 2011**	**2012**	**2014 - 2015**	**2017**
Educational attainment of the head of the household (%)					
No schooling	16.93	15.27	15.56	14.62	14.40
Primary education	27.82	25.08	24.91	24.54	22.98
Secondary education	40.90	32.61	31.84	29.60	27.80
Technical diploma and Vocational training	10.54	9.35	10.56	13.03	12.63
Tertiary education	3.61	3.17	3.57	3.80	3.67
Employment status of the head household (%)					
Economically inactive	31.75	37.74	36.10	38.66	40.27
Unemployed	11.38	6.57	7.82	5.60	4.36
Employed	56.88	34.32	35.15	34.74	30.03
Number of people employed in the household (%)					
No person employed	30.51	52.98	49.98	49.42	54.50
1 person employed	46.45	32.94	34.30	33.78	31.53
2 people employed	17.45	11.41	12.51	13.07	10.53
3 - 4 people employed	8.40	3.87	4.89	5.97	5.03
More than 5 people employed	5.59	2.67	3.21	3.73	3.44
Mean (std)	0.99* (0.01)	0.64* (0.01)	0.70* (0.01)	0.72* (0.01)	0.64* (0.01)
Size of household (%)					
1 Person house	19.10	12.09	10.86	11.63	11.41
2 people household	18.02	10.65	11.38	11.15	10.15
3-4 people household	32.11	24.02	23.71	23.62	22.35
5-7 people Household	23.46	22.46	23.29	22.56	21.27
More than 8 people household	7.30	30.78	30.76	31.05	34.82
Mean (std)	3.71* (0.03)	4.37* (0.05)	4.38* (0.04)	4.35* (0.04)	4.36* (0.05)
House ownership status (rent or own) (%)					
Own House	70.26	77.76	77.43	80.67	77.86
Geological Dwelling type (Rural or Urban) (%)					
Rural	56.94	56.71	57.77	57.97	57.75
Household receive any government grant (receive and do not receive any social grant) (%)					
Receives government grant	48.07	54.17	59.53	62.57	65.05

*Note: * p<.05; ** p<.01; *** p<.001 within waves.*

Table 4.2 shows a decrease in households with heads without formal education, primary and secondary education, and an increase in higher education from wave 1 to wave 5. If the human capital theory holds, this trend should decrease poverty because as education increases and unemployment should decrease. However, the increasing economically inactive household heads and decreased employment may negatively impact poverty.

From table 4.2 above, approximately one or fewer individuals work in a home on average, and this figure has stayed constant with 95% confidence from wave 1 to wave 5. During the same period, the average number of people living in one household remained high at four. This is a negative trend for multidimensional poverty as Alkire & Foster (2011) found that there is an inverse relationship between the dependency ratio and multidimensional poverty. Most households own as opposed to renting their homes, this creates the possibility to pass down their homes to the next generation. This should reduce poverty according to the sub-culture theory of poverty. However, more households are based in rural areas, which often receive the least government services, which may have a counter effect. Households receiving government (social) grants accounted approximately 48% to 65% of all households between 2008 and 2017. This should supplement households that would not otherwise have any or enough income.

4.3. Multidimensional Poverty empirical Findings

4.3.1. Identification and aggregation Empirical findings

Table 4.3 shows the percentage of households which were deprived by each indicator. From table 4.3, it is evident that there is a decline in households which were deprived due to the child mortality indicator from 0.92% to 0.29%. South Africa has pledged to reduce child mortality as one of the eight goals of the Millennium Development Goals (MDGs) (Bradshaw & Dorrington, 2007). According to Pillay & Barron (2018), South Africa is on track to meet the MDGs' child mortality target between 2016 and 2020, despite not meeting the target between 2008 and 2015. Notwithstanding missing the child mortality target in the MDGs, child mortality under 5 decreased from 37-40 deaths per 1000 live births to 27-33 deaths per 1000 between 2008 and 2015 (Bamford et al., 2018). This explains the observed declining trend in households which were deprived due to child mortality under 5 in South Africa.

The percentage of households deprived in the years of schooling indicator exhibit a largely stable pattern of approximately 33% between wave 1 and wave 5. This trend is a legacy from the apartheid era, when most South Africans who were not white had restricted access to schooling. Due to this indicator's persistent level, resources should be allocated to lower the number of households experiencing this deprivation. For example, the government could

enhance the quality and quantity of Adult Basic Education and Training (ABET) and other skills development programs for adults who could not complete their education.

The percentage of households deprived in the school attendance indicator is negligibly low, this is in line with the observed trend in table 4.2 of increasing educational attainment. The study shows a decrease in the proportion of households deprived in standard of living indicators, except for the sanitation type indicator, which remains largely unchanged. Even though there is a decrease in households deprived in the water access and fuel for heating indicator, it changed the least (approximately 15 percentage points) compared to the other standard of living indicators. While Finn et al. (2013) only examined multidimensional poverty in wave 2, they also found a comparable pattern in the proportion of households deprived in these basic services. Therefore, when developing policies to lessen multidimensional poverty in South Africa, attention should be paid to the provision of basic services like access to electricity, safe drinking water, and proper sanitation.

The households which were deprived in the unemployment indicator remained largely unchanged above 20% for the duration of the study. Therefore, focusing on job creation should be a significant part of any multidimensional poverty reduction policy.

Table 4.3: Proportion of households deprived in each dimension and indicator by wave

K = 1/3		**Wave 1**	**Wave 2**	**Wave 3**	**Wave 4**	**Wave 5**
Dimension	**Indicator**	**% Deprived**	**% Deprived**	**% Deprived**	**% Deprived**	**% Deprived**
Health	Child mortality	0.92	0.725	0.42	0.37	0.29
Education	Years of schooling	33.80	36.69	35.45	33.27	33.71
	School attendance	0.14	0.29	0.12	0.08	0.53
Standard of living	Fuel for lighting.	20.49	16.35	13.22	10.49	6.80
	Fuel for heating	43.21	30.07	33.78	33.22	36.39
	Fuel for cooking	29.12	22.74	21.19	19.07	15.85
	Water access	33.25	28.97	28.18	27.77	28.42
	Sanitation type	45.28	45.61	44.66	44.73	46.55
	Dwelling type	11.17	9.83	7.49	8.60	8.44
	Asset ownership	5.77	4.30	2.09	1.94	1.75
Economic activity	Unemployment	21.60	27.54	22.55	19.99	20.01

Table 4.4. presents the headcount ratio, intensity of deprivation and the adjusted headcount ratio (MPI) at a 99% confidence interval in each wave. The headcount ratio and the MPI have declined between wave 1 and wave 5. The MPI declined from approximately 7% to 4% between wave 1 and wave 5. The headcount ratio and MPI declined by approximately 32% and 34% between the waves, respectively. However, the intensity, the average percentage of deprivations amongst households which experience multidimensional poverty, only decreased by approximately 2.5% over the same period. This means that multidimensionally poor households suffered similar levels of deprivation even as overall multidimensional poverty was decreasing. Simply put, the poor are being left behind. This decreasing trend in headcount ratio, intensity and adjusted headcount ratio is like that observed in literature of multidimensional poverty in South Africa such as von Fintel (2021) and Finn et al. (2013) and those discussed in section 2.4 of this report. The declining trend in multidimensional poverty was also observed globally by Alkire et al., (2017b) when they studied MPI across 34 countries.

Table 4.4: Balanced panel results for Headcount, intensity, and adjusted headcount by wave

Wave	Headcount ratio (H) (%)	Intensity (A) (%)	Adjusted Headcount ratio (MPI)
Wave 1	15.00	44.30	0.067
Wave 2	16.50	44.86	0.074
Wave 3	13.70	43.90	0.060
Wave 4	11.30	43.80	0.049
Wave 5	10.20	43.20	0.044

The contribution of each indicator to the MPI for each wave is displayed in Table 4.5 below. According to table 4.5, years of schooling and unemployment were the two indicators that had the largest contribution to MPI, accounting a total of approximately 65% to 71% of the MPI in each wave. A similar observation was made by Rogan (2016) and Finn (2012) for years of education and unemployment, respectively. This suggests that decreasing the unemployment rate and improving adult education in South Africa will have the biggest impact in lifting households out of multidimensional poverty. The total of all the standard of living indicators was the third largest contributor to the MPI, contributing more than 27% towards the MPI throughout the study. Therefore, an effective poverty reduction policy should also include equitable delivery of basic services such as electricity, clean water, and proper sanitation.

Table 4.5: The contribution to the MPI by each indicator by wave

K=1/3		Wave 1 (%)	Wave 2 (%)	Wave 3 (%)	Wave 4 (%)	Wave 5 (%)
Dimension	**Indicator**					
Health	Child mortality	2.2	1.7	1.0	1.3	1.2
Education	Years of schooling	18.9	21.0	20.3	19.9	19.5
	School attendance	0.2	0.3	0.2	0.00	0.6
Standard of living	Fuel for lighting	4.3	3.4	3.1	2.6	1.9
	Fuel for heating	6.5	5.0	5.7	5.6	5.5
	Fuel for cooking	5.6	4.6	4.6	4.3	3.5
	Water access	5.6	4.9	5.2	5.0	5.2
	Sanitation type	6.6	6.4	6.5	6.6	6.8
	Dwelling type	1.7	1.3	1.0	1.1	1.2
	Asset ownership	1.7	1.3	0.7	0.7	0.6
Economic activity	Unemployment	46.8	50.1	51.7	52.9	53.9

One of advantages of using the AF method is the ability to decompose the MPI into subgroups. This is important because it enables the analysis of multidimensional poverty by various subgroups. This enables the design of poverty reduction policies which are targeted to the most vulnerable subgroups. This section shows the decomposition of MPI by gender of the head of the household, race, age of the head of the household, education level of the head of the household, employment status of the head of the household, dwelling type, and province.

Figure 4.1 below shows the MPI by headship from wave 1 to wave 5. Similar to the findings in Rogan (2016), Figure 4.1 shows that there exists a gender-gap in multidimensional poverty in South Africa. Households headed by women had an MPI of 7% on average, compared to 4% for households headed by men. There is a decline in the MPI from wave 1 to wave 5, the rate of decline for households headed by women is roughly 40% compared to 38% for households headed by men. The MPI for female-headed households is decreasing at a similar rate to male-headed households. The challenge is that female-headed households make up a higher a proportion of households which experience multidimensional poverty in the first instance. Therefore, the MPI for female-headed households needs to decrease faster than for male-headed households to close the gender poverty gap. Therefore, any policy to eradicate poverty should include measures specifically designed to target women. And from table 4.5, these efforts should be towards increasing years of schooling, provision of basic services and decreasing unemployment.

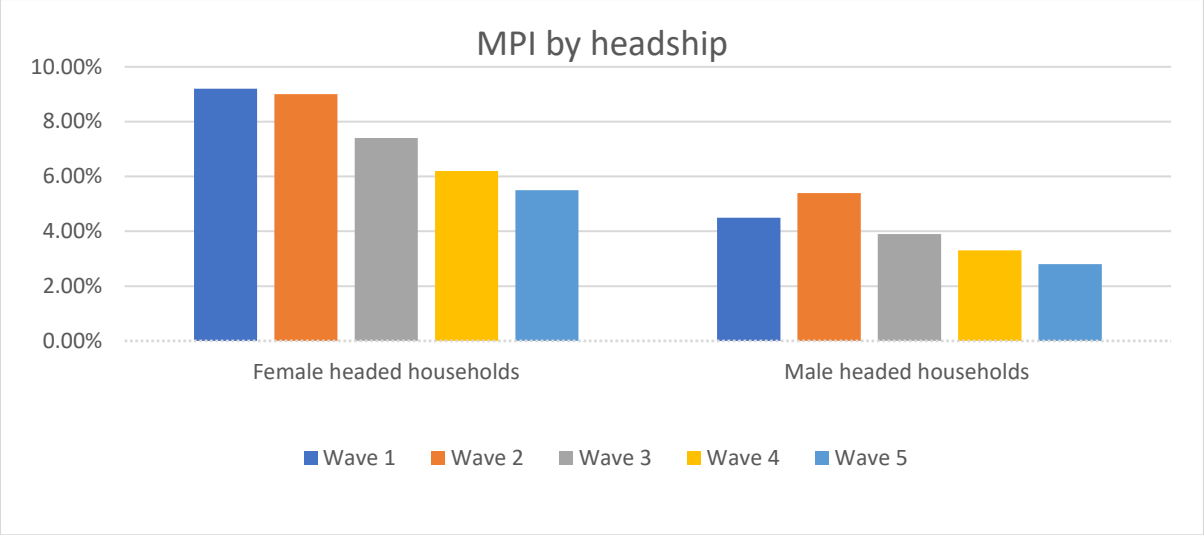


Figure 4.1: MPI by headship from wave 1 to wave 5.

Figure 4.2 below shows that black households had the highest MPI averaging approximately 7 % across all waves compared to white households which had the lowest MPI averaging 0.14% across all waves. Coloured and Indian South Africans had similar range of MPI of 2% throughout the study. The MPI trend by race is consistent with other research on poverty, including multidimensional (Finn et al., 2017) and unidimensional (Kruger, 2018) studies.

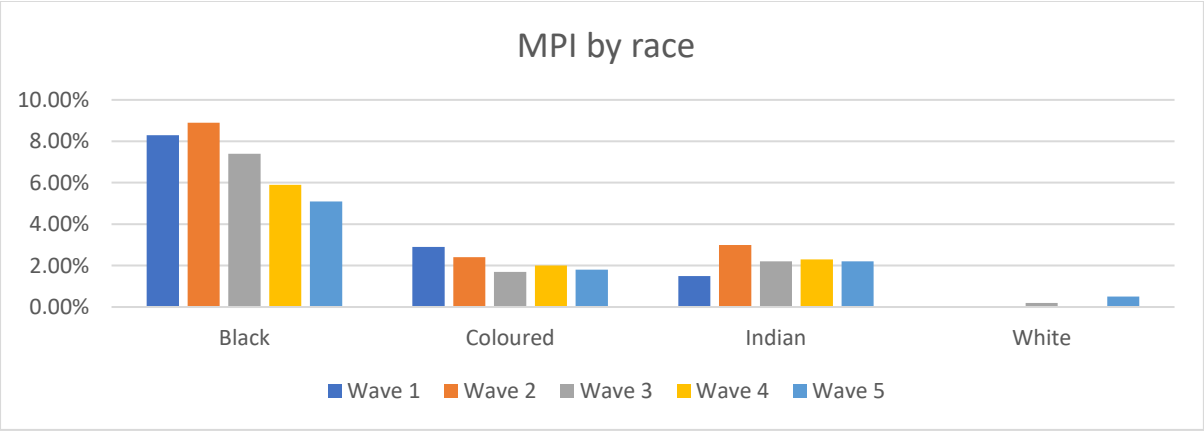


Figure 4.2: MPI by race from wave 1 to wave 5

Figure 4.3 shows the MPI by age of the head of the household. Households headed by individuals aged 55 to 64 years old experience more multidimensional poverty compared to all other age groups throughout the study. However, the MPI for households headed by people aged 55 to 64 years old decreased from approximately 25% to 9% from wave 1 to wave 5. Similarly, there is a declining trend in the MPI across all age groups throughout the study period.

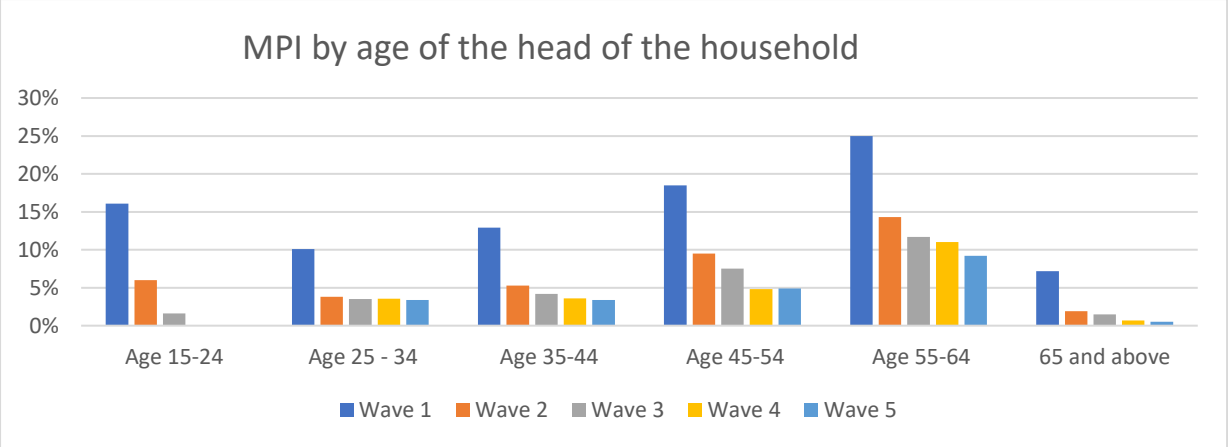


Figure 4.3: Adjusted headcount ratio (MPI) by the age of the head of the household from wave 1 to wave 5.

Figure 4.4. shows the MPI of households by the education attainment of the head of the household. The MPI is highest for households headed by individuals with no schooling, ranging from approximately 14% to 9% between wave 1 and wave 5. In contrast, the MPI for households headed by an adult with tertiary education was the lowest throughout the study, ranging between 0% to 1.7 %. Additionally, the MPI decreased as the head of the household's education level increased, moving from primary to secondary education to vocational training, in that order. This is in line with the arguments of human capital theory of poverty, there is a negative correlation between education and poverty. In general, the MPI for all levels of educational attainment of the head of the households decreased from wave 1 to wave 5. The highest decline rate experienced by households headed by someone with a secondary education.

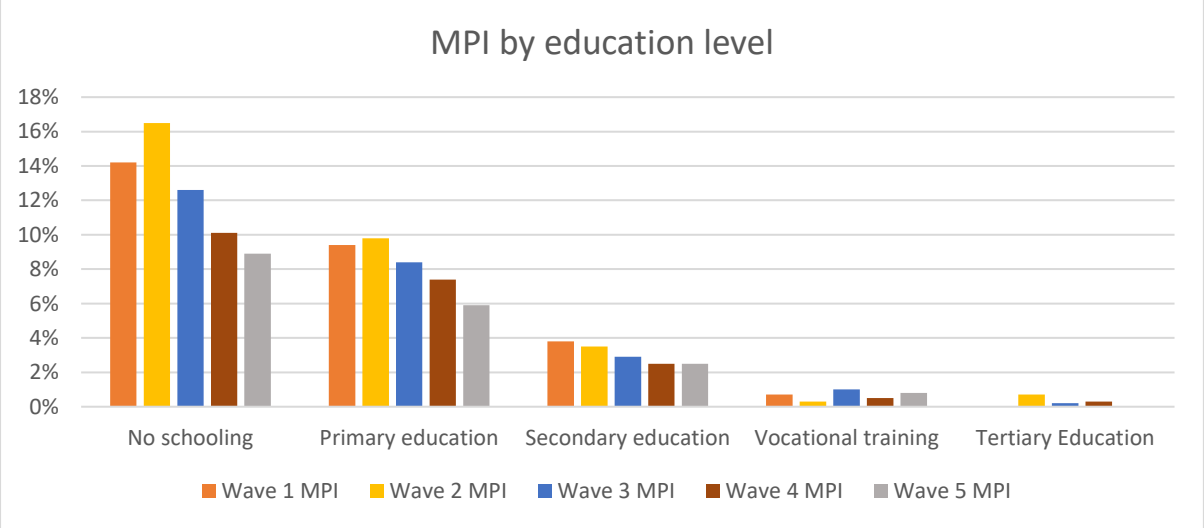


Figure 4.4: Headcount ratio by education level from wave 1 to wave 5.

Figure 4.5 shows the MPI by the location of the household i.e. urban or rural area. On average the MPI for households in rural areas is 9.5% compared to 2.9% for households in rural areas throughout the study. However, there is a declining trend in the MPI in households in rural and urban areas. The conundrum is that the rates of decline are comparable for both rural and urban areas at 37% and 35%, respectively. The tendency of greater rates of poverty in rural households relative to urban households may be one of the causes of South Africa's increasing urban migration. According to Mlambo (2018), it is projected that 80% of South Africans will be living in urban areas by 2050.

Urban migration causes a 'brain drain' from rural areas. This will make it difficult to reduce multidimensional poverty in rural areas since older and less educated individuals who believe their chances of success in urban areas are slim will probably continue to live in rural areas. This finding for the rural and urban poverty gap are consistent with literature in multidimensional poverty in South Africa (Gallant (2012), Fransman (2016) and Jackson & Yu's (2023)). As such, a rural development plan ought to be a part of any effective poverty reduction policy.

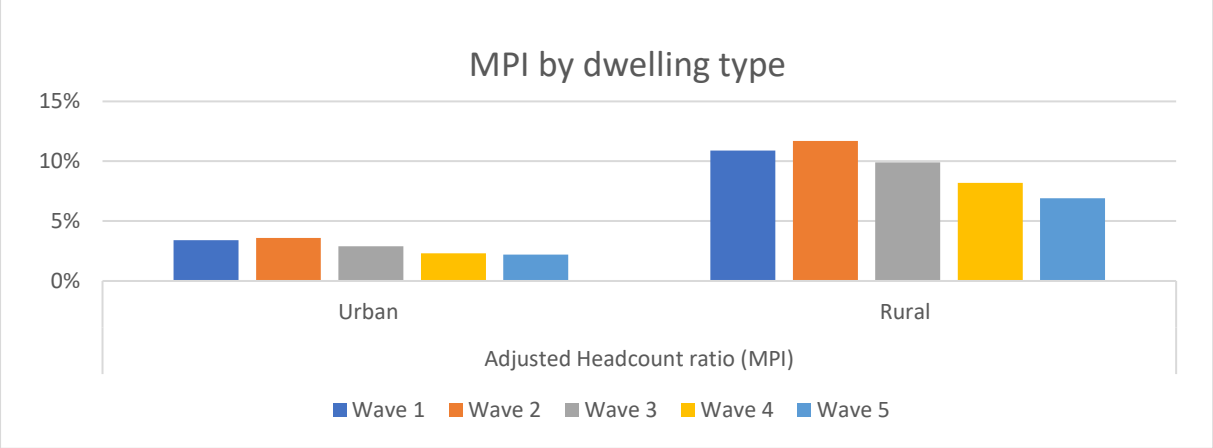


Figure 4.5: Headcount ratio and adjusted headcount ratio by dwelling type.

Figure 4.6 below shows the MPI by the employment status of the head of the household. On average across all waves, the study found that households headed by employed individuals had the lowest MPI (Apr. 0.5%) when compared to the MPI of households headed by economically inactive (Apr. 10%) and unemployed (Apr. 12%) individuals. It is evident that households headed by individuals who are not economically active or unemployed suffer disproportionately higher multidimensional poverty compared to households with an employed head. Therefore, poverty reduction policies should also include a plan for job creation.

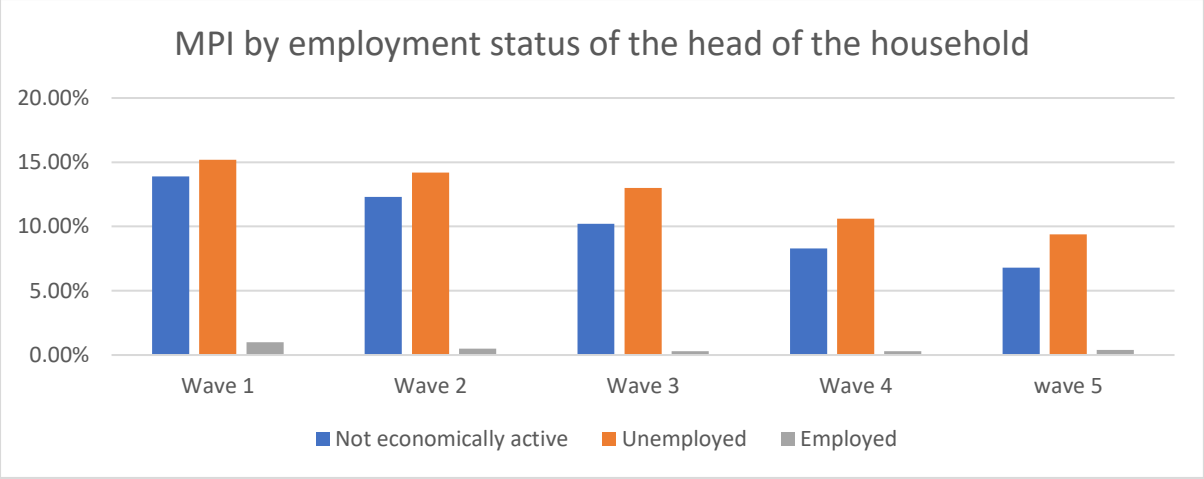


Figure 4.6: MPI by employment of the head of the household.

MPI by province is displayed in Table 4.6. Comparing the MPI of the provinces, Kwa-Zulu-Natal, Eastern Cape, and Limpopo had the highest MPI compared to the other provinces. While Rogan (2016) found the same three poorest provinces as this paper, the order was different i.e. Limpopo, Eastern Cape, and Kwa Zulu Natal. However, Kruger (2018) found the same names and order of the poorest provinces in South Africa as this paper. Nonetheless, in all waves, every province has experienced a decrease in multidimensional poverty.

Table 4.6: Adjusted headcount ratio (MPI) by province

Province	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5
Western Cape	2.0	1.6	1.6	1.0	1.4
Eastern Cape	13.4	10.5	11.4	7.1	6.5
Northern Cape	4.6	4.8	3.5	4.0	4.1
Free State	4.7	5.0	4.8	2.8	2.5
KwaZulu-Natal	10.0	13.2	10.0	9.0	6.7
North West	6.7	6.7	5.5	5.1	4.6
Gauteng	2.9	3.3	2.0	1.9	2.0
Mpumalanga	4.5	5.2	2.6	3.4	3.5
Limpopo	8.1	8.5	7.3	5.8	5.2

4.3.2. Transient and Chronic Poverty Empirical findings

This section presents the results of poverty dynamics using the household balanced panel. Households are considered to suffer chronic multidimensional poverty if they were determined to be poor in all waves. Households are considered to suffer transient poverty if they were determined as having experienced multidimensional poverty in at least one wave of NIDS. Table 4.7 shows the simple transition matrix between wave 1 and wave 5. Table 4.7 shows that 93.2% of those who were non-poor in wave 1, were non-poor in wave 5. There were 6.8% of

non-poor households in wave 1 which were poor in wave 5 i.e., poverty entry. Whereas poverty exit for poor households was 50.7% between wave 1 and wave 5.

Table 4.7: Simple poverty transition matrix – comparing wave 1 and wave 5.

		Wave 5	
		Non-Poor	**poor**
Wave 1	**Non-Poor**	93.20	6.80
	Poor	50.66	49.34

There were more households which exited than entered multidimensional poverty in the period under study. This is in line with the observed declining MPI between 2008 and 2017. However, 49.3% of households which were poor in wave 1, were still poor in wave 5. This shows that poverty tend to persistent and perhaps the best way to ensure households do not become poor is to ensure they do not fall into poverty in the first instance. The persistence of poverty makes it necessary for studies such as these which seek not only to understand poverty levels but poverty dynamics as well. It is not enough to observe that poverty is decreasing, it is also important to determine the duration of poverty in households.

Table 4.8: Headcount ratio for households who were never poor, transient poor and chronic poor.

	Never poor	**Transient poor**				**Chronic poor**
		Poor once	**Poor twice**	**Poor three times**	**Poor four times**	
Headcount Ratio (%)	73.08	12.74	6.73	4.25	2.25	0.96

Table 4.8 shows that approximately 73% of South African households have not experienced multidimensional poverty between wave 1 and wave 5. And approximately 26% of households experienced transient poverty. The highest percentage of households which experienced transient multidimensional poverty were poor at least once between 2008 and 2017. There was approximately 1% of South Africans who were chronically poor between 2008 and 2017. From table 4.8 South African households suffer more transient poverty rather than chronic poverty. Due to the limited literature which decomposes South African poverty into chronic and transient, there is a varying finding of the incidence of chronic poverty ranging from 33 % by Roberts (2000), 22% by Aliber, (2001) and 9% by Cichello et al. (2000). These differences are due to the use of different datasets, different periods under study, different cut-offs and whether the poverty is unidimensional or multidimensional.

Table 4.9 below shows characteristics of households which experienced multidimensional chronic or transient poverty and those who were never poor between 2008 and 2017. Households headed by black individuals made up 98% of the households that were chronically poor while coloured household made up the remaining 2%. Similar to the findings in Kruger (2018), Indian and white households did not experience chronic multidimensional poverty for the period under study. Female-headed households made up the highest proportions of households which experienced both chronic (86%) and transient (60%) multidimensional poverty compared to male-headed households. But female-headed households only made up 40% of households which never experienced poverty compared to their male counterparts.

According to Table 4.9, the share of households led by individuals without formal education was lowest among 'never poor' households and higher among chronic and transient poor households. Households headed by an individual with tertiary education or vocational training were the minority in households experiencing transient poverty and never experienced chronic multidimensional poverty.

Table 4.9 shows that approximately 79% of households with a head that is economically inactive experienced chronic multidimensional poverty compared to 19% and 2% for households headed by unemployed and employed heads, respectively. And a similar trend is observed for transiently poor households. In contrast, the majority of households that never experienced poverty was headed by an employed individual. Households with more than 2 people who worked experienced no chronic multidimensional and the least transient poverty.

There is a discernible pattern of rural poverty, with most chronically and transiently impoverished households being found in rural areas as opposed to urban areas. Similarly, households living in formal structures experienced less chronic and transient poverty compared to those living in informal and traditional structures. Households which received a government grant made up the smallest proportion of both chronically and transiently poor households. This indicates that South Africa's existing social welfare system is effective at reducing poverty.

Table 4.9: Characteristics of individuals who experienced chronic multidimensional poverty, transient poverty and never poor.

Characteristic	Chronically poor	Transiently poor	Never poor
Race (%)			
African	98	91.86	68.29
Coloured	2.0	7.48	17.28
Asian/Indian	0.0	0.4	2.1
White	0.0	0.2	12.4
Gender of the head of the household (%)			
Female	86.00	60.10	40.18
Male	14	39.9	59.82
Educational attainment (%)			
No schooling	40	31.86	11.48
Primary education	53.6	39.11	23.97
Secondary education	6.4	25.36	42.05
Vocational training	0	3.36	22.34
Tertiary education	0	0.32	0.15
Labour market characteristics (%)			
Not economically active	79.2	55.34	33.46
Unemployed	19.2	13.23	7.29
Employed	1.6	31.43	59.25
Number of people employed in the household (%)			
No person employed	98	61.02	42
1 person employed	2	29.5	38.48
2 people employed	0	7.4	15.15
More than 2 people employed	0	2.06	4.2
Size of household (%)			
1 Person house	13.16	18.71	23.54
2 people household	6.84	14.11	17.13
3-4 people household	31.58	28.38	30.46
5-7 people Household	36.32	25.59	22.53
More than 8 people	12.37	13.15	5.71
Geological type (%)			
Rural	24	32.67	66.97
Urban	76	67.33	33.03
Household receive any government grant (%)			
Receives government grant	14	26.88	49.62
Does not receive government grant	86	73.12	50.38

4.3.3. Sensitivity to the deprivation cut-off empirical findings

As discussed above, setting the deprivation score cut-off at 1/3 is a decision made by Statistics South Africa for the country based on objective and subjective analysis of deprivations. As such the deprivation cut-off could be amended to inform different policy directions. This section presents the results for the sensitivity of the MPI to changes in the deprivation score cut-off. The deprivation cut-offs were set at 20%, 33.3% and 50% between wave 1 and wave 5. This means that households with deprivation score above 20%, 33.3% or 50% are considered poor in each scenario.

From Figure 4.7 below shows the MPI at different deprivation cut-offs in each wave to 95% confidence interval. Every deprivation cut-off exhibits a decreasing trend, despite the MPI changing at each cut-off. This indicates that poverty in South Africa is declining even as the standard for what constitutes poverty rises. The 50% deprivation cut-off is typically used to measure the risk of households falling into multidimensional poverty (Alkire & Foster, 2011). Thus, there is almost 31% of South African households which are at risk of falling into Multidimensional poverty. Because of this risk, it is critical that the government provide both equitable access to basic services and ongoing service delivery improvement.

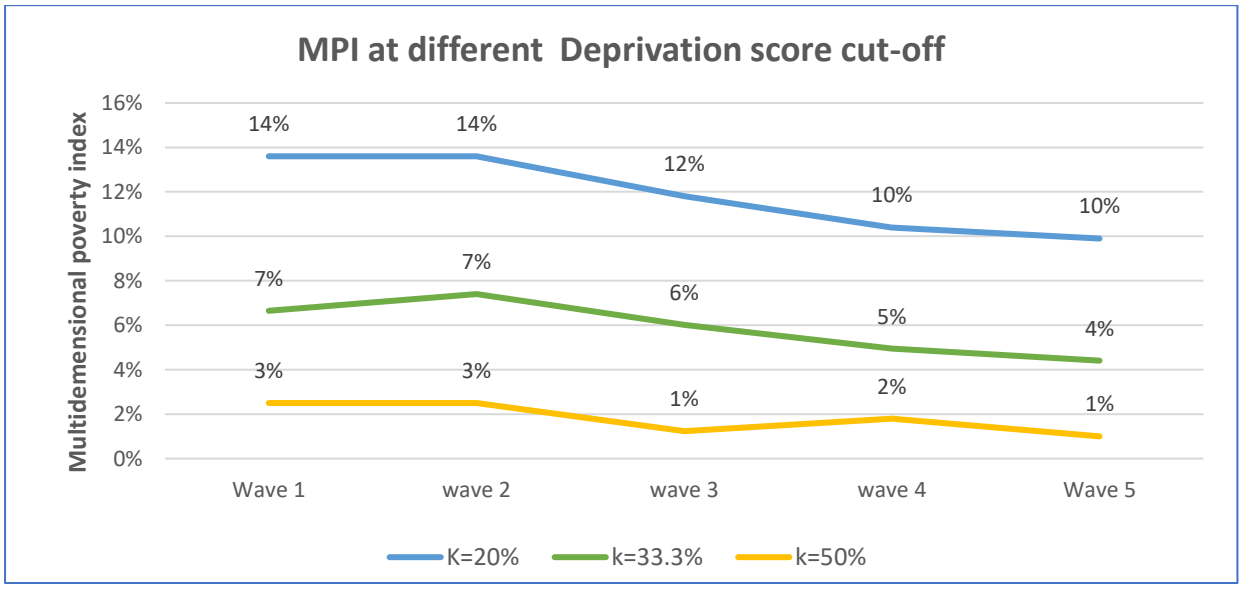


Figure 4.7: The MPI at deprivation score cut-off of k=20%, k=33.3% and k=50%

4.3.4. Sensitivity to the duration cut-off empirical findings

To investigate the sensitivity of the MPI to changes in the duration cut-off, the cut-off for households classified as chronically poor was varied from 9 to 6 to 3 consecutive years. It is anticipated that more households will be classified as having suffered chronic multidimensional poverty when the duration cut-off is decreased. The results are shown in figure 4.8 below at a 95% confidence interval. Approximately, 1%, 12% and 13% suffered multidimensional chronic poverty for 9, 6 and 3 consecutive years duration cut-off.

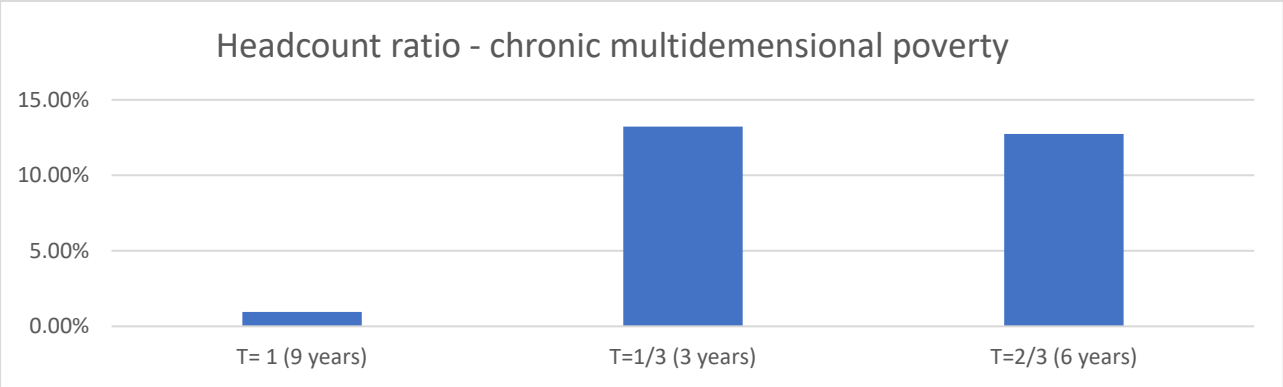


Figure 4.8: sensitivity analysis to the duration of cut-off

4.4. Multinomial logit regression empirical findings

This section presents the result of the multinomial logistic model where the dependent variable (poverty status) is equal to 0 if a household is never poor; 1 if the household is chronically poor and 2 if the household transient poor. The results are presented in Table 4.10 below, where the base outcome is 0 for household which were never poor. Probability weights are used to assign weights to all estimates. The IIA is valid because, according to the Hausman McFadden test findings for this model, probability > chi squared is 1, which is more than 0.09. Therefore, Multinomial logit model can be used to make inferences. The coefficients of the multinomial logit model themselves are complex to assign any economic meaning. However, the multinomial logit regression coefficients expressed in terms of Relative Risk Ratio (RRR) are simpler to understand and assign an economic meaning. Therefore, this paper provides an interpretation of the RRR and not the coefficients of the multinomial logit regression.

Table 4.10 shows RRR and associated standard errors for all regression variables. The standard errors are notably high on some of the RRR results. The significance level of the variables is also included to make inferences. Table 4.10 shows that compared to African households, Coloured households are 77% (RRR=0.23) while both Indian and white households are 100% (RRR=0.00) less likely to fall into chronic multidimensional poverty. A household's likelihood

of experiencing transient multidimensional poverty is 20% (RRR=0.80) lower for Coloured households than for African households, 92% (RRR=0.08) lower for Indian households than for African households, and 78% (RRR=0.22) lower for white households than for African households. Notably, for all racial groups, the likelihood of experiencing transient multidimensional poverty is greater than the likelihood of experiencing chronic multidimensional poverty compared to African households.

Compared to female-headed households, male-headed households are 22% (RRR=0.78) less likely to endure transient poverty and 67% (RRR=0.33) less likely to endure chronic multinomial poverty for the duration under the study. Households with a head with primary school attainment have a 1% (RRR=1.01) higher risk of experiencing chronic multidimensional poverty and 24% lower risk of experiencing transient multidimensional poverty compared to households with a head with no formal education. Compared to households headed by someone without any formal education, those headed by someone with secondary or higher education have a lower risk of experiencing either transient or chronic multidimensional poverty. Comparing households led by an individual who is economically inactive, those with an unemployed head are 46% (RRR=1.46) more likely to experience chronic multidimensional poverty and 61% (RRR=1.61) more likely to experience transient poverty. This is an unexpected outcome, however, without any further studies would be hard to explain. Whereas households headed by an employed person are at a lower risk of falling into either chronic (RRR=0.03) or transient (RRR=0.57) multidimensional poverty compared to households headed by an economically inactive individual.

Rural households were more likely to experience either chronic (RRR=4.90) or transient (RRR=2.23) multidimensional poverty compared to urban households. This is a similar trend observed by Alkire and Housseini (2014) when studying Sub-Saharan African countries. Households which experienced multidimensional poverty tend to live in rural areas compared to urban areas in Sub-Saharan Africa. Compared to households which received a government grant, households which did not receive a government grant were at 37% higher risk of falling into either chronic or transient multidimensional poverty. Indicating that receiving a social grant reduces the risk of falling into multidimensional poverty but has no differing impact on the persistence of poverty.

Table 4.10: Multinomial logit regression for multidimensional never poor, chronically poor, and transitory poor

	RRR	std. er	RRR	std. er
Base = never poor				
	Chronically poor		**Transiently Poor**	
Race of Household head				
Coloured	0.23**	0.12	0.80	0.11
Asian/Indian	0.00***	0.00	0.08***	0.03
White	0.00***	0.00	0.22***	0.07
Gender of the head of household				
Male	0.33***	0.08	0.78***	0.04
Educational attainment (%)				
Primary education	1.01	0.20	0.76***	0.05
Secondary education	0.10***	0.03	0.36***	0.03
Technical and Vocational training	0.00***	0.00	0.01***	0.01
Tertiary education	0.00***	0.00	0.08	0.03
Labour market characteristics				
Unemployed	1.46	0.34	1.61***	0.14
Employed	0.03***	0.02	0.57***	0.04
Geological type in wave 1				
Rural	4.90***	1.02	2.23***	0.12
Household receive any government grant				
Do not receive government grant	1.37***	0.35	1.37***	0.09
_cons	0.02	0.01	0.64	0.06

Base categories: African, female head, no schooling, unemployed, and urban, does not receive government grant. * p<0.05; ** p<0.01; *** p<0.001

In summary, this paper found a decline in multidimensional poverty in South Africa from approximately 7% to 4% between 2008 and 2017, like previous studies since 1994. The literature also agrees on who experiences multidimensional poverty: households headed by women, those residing in rural areas, and Africans. However, the indicators that contributed the most towards the MPI vary within the literature. Similar to Fransman & Yu (2019), this study found that years of schooling and unemployment contributed the most towards the MPI. In contrast, Finn et al. (2013) found the highest contributing indicators to be sanitation, water, and assets while Rogan (2016) found it was child mortality and nutrition. This could be due to the different datasets used and periods studied. Nevertheless, this is an important difference as the indicators' contribution towards the MPI forms the basis of the recommendations made in literature to reduce multidimensional poverty.

Unlike the majority of multidimensional literature from South Africa, this paper also studied the persistence of multidimensional poverty. This distinction could aid policymakers determine the resources required to alleviate either transient or chronic poverty, based on the number of households affected by either type of multidimensional poverty.

5. Conclusion

The multidimensional poverty in South Africa and its persistence were investigated in this study. Using NIDS dataset between 2008 and 2017, the MPI was measured using the counting method of Alkire and Foster (2011) and multidimensional poverty persistence was measured using the spells duration approach of Foster (2009). This study found that the MPI and incidence of poverty decreased between 2008 and 2017 both by over 30%. Unfortunately, there was no appreciable decline in the intensity of poverty. Consequently, to lower multidimensional poverty, South African policymakers should include lowering the deprivations that the poor endure. This study found that years of schooling, unemployment, and standard of living indicators especially access to water, electricity and sanitation contributed the most towards the MPI. This implies that improving these indicators will lead to the reduction in multidimensional poverty.

This paper also focused on the persistence of poverty. Distinguishing between transient and chronic multidimensional poverty is important because the duration of poverty has distinct effects on people's welfare and, hence, necessitates different policy interventions. It was found that between 1% and 13% of South Africans experienced chronic multidimensional poverty, whereas roughly 25% of people experienced transient multidimensional poverty. Therefore, policy instruments required to alleviate poverty in South Africa would need to be geared towards uplifting people out of temporary deprivations. Additionally, a multinomial regression was used to identify factors that increase a household's likelihood of experiencing either transient or chronic poverty. It was found that households which had a head with no formal education or located in a rural area were more likely to experience chronic multidimensional poverty than to never experience multidimensional poverty. Whereas households headed by Africans, female-headed households, or an unemployed head were more likely to suffer transient multidimensional poverty than to never experience poverty. Thus, South African policies aimed at reducing poverty should be sensitive to gender and race.

This study is limited by the limitations inherent in the data and the methodology used. The AF technique includes different cutoffs that have been demonstrated to produce significantly

different MPI results when varied, as highlighted in this study. Thus, the degree of multidimensional poverty in South Africa may be over or understated, depending on the cutoffs and assumptions used in the study. Monetary poverty analysis is frequently criticized for its one-dimensional perspective on poverty, which ignores its complexity. This study uses the SAMPI to study multidimensional poverty. Ultimately using the SAMPI, the experience of multidimensional poverty is reduced to a number, even though this number contains several nuances and can be decomposed by a variety of demographic factors. Hence, research to improve multidimensional poverty studies such as this one, should also include a critical analysis of dimensions used in the SAMPI. Perhaps, to improve multidimensional poverty studies, researchers should consider an analysis of additional dimensions like indebtedness, crime statistics, and nutrition.

References

- Adeoti, A. I. (2014). Trend and determinants of multidimensional poverty in rural Nigeria. *Journal of Development and Agricultural Economics*, *6*(5), 220-231.
- Agüero, J., Carter, M. R., & May, J. (2007). Poverty and inequality in the first decade of South Africa's democracy: What can be learnt from panel data from KwaZulu-Natal? *Journal of African Economies*, *16*(5), 782-812.
- Aliber, M. (2003). Chronic poverty in South Africa: Incidence, causes and policies. *World development*, *31*(3), 473-490.
- Aliber, M. A. (2001). Study of the incidence and nature of chronic poverty and development policy in South Africa: an overview. *Chronic Poverty Research Centre Working Paper*, (3).
- Alkire, S., & Foster, J. (2011). Counting and multidimensional poverty measurement. *Journal of public economics*, *95*(7-8), 476-487.
- Alkire, S., & Housseini, B. (2014). Multidimensional poverty in sub-Saharan Africa: Levels and trends. Available at: https://ora.ox.ac.uk/objects/uuid:1652adc2-3788-4cd2-8de1-d44212ddb638
- Alkire, Sabina & Maria Emma Santos. (2010). South Africa Country Briefing. Oxford Poverty & Human Development Initiative (OPHI) Multidimensional Poverty Index Country Briefing Series. Available at: www.ophi.org.uk/policy/multidimensional-poverty-index/mpi-country-briefings/
- Alkire, S., Apablaza, M., Chakravarty, S., & Yalonetzky, G. (2014). Measuring chronic multidimensional poverty: A counting approach. Available at https://ora.ox.ac.uk/objects/uuid:20557bb7-2f64-40f0-b2ab-933ec740729f
- Alkire, S., Apablaza, M., Chakravarty, S., & Yalonetzky, G. (2017a). Measuring chronic multidimensional poverty. *Journal of Policy Modeling*, *39*(6), 983-1006.
- Alkire, S., Kanagaratnam, U., Nogales, R., & Suppa, N. (2019). Sensitivity analyses in poverty measurement: the case of the global multidimensional poverty index.
- Alkire, S., Roche, J. M., & Vaz, A. (2017b). Changes over time in multidimensional poverty: Methodology and results for 34 countries. *World Development*, *94*, 232-249.
- Alkire, S., Roche, J. M., Ballon, P., Foster, J., Santos, M. E., & Seth, S. (2015). *Multidimensional poverty measurement and analysis*. Oxford University Press, USA.
- Bamford, L. J., McKerrow, N. H., Barron, P., & Aung, Y. (2018). Child mortality in South Africa: Fewer deaths, but better data are needed. *South African Medical Journal*, *108*(3), 25-32.
- Benson, A. R., Kumar, R., & Tomkins, A. (2016). On the relevance of irrelevant alternatives. In Proceedings of the 25th International Conference on World Wide Web (pp. 963-973).
- Belhadj, B., & Limam, M. (2012). Unidimensional and multidimensional fuzzy poverty measures: New approach. *Economic Modelling*, *29*(4), 995-1002.
- Bersisa, M., & Heshmati, A. (2021). A distributional analysis of uni-and multidimensional poverty and inequalities in Ethiopia. *Social Indicators Research*, *155*, 805-835.
- Biyase, M., & Zwane, T. (2018). An empirical analysis of the determinants of poverty and household welfare in South Africa. *The Journal of Developing Areas*, *52*(1), 115-130.
- Bradshaw, D., & Dorrington, R. (2007). Child mortality in South Africa-we have lost touch. *South African medical journal*, *97*(8), 582-583.
- Brophy, T., Branson, N., Daniels, R.C., Leibbrandt, M., Mlatsheni, C., & Woolard, I., (2018). National Income Dynamics Study panel user manual. Release 2018. Version 1. Cape Town: Southern Africa Labour and Development Research Unit.

- Brooks-Bartlett J., (2018). Probability concepts explained: Maximum likelihood estimation. Accessed from https://towardsdatascience.com/probability-concepts-explained-maximum-likelihood-estimation- on 01 April 2024.
- Cichello, P, Fields, G & Leibbrandt, M. (2000). *Which African workers have gotten ahead and by how much? The story of KwaZulu-Natal, South Africa, 1993–1998*. Paper presented to the Trade and Industrial Policy Secretariat (TIPS) '2000 Annual Forum' conference.
- Costa, M. (2003). *A comparison between unidimensional and multidimensional approaches to the measurement of poverty*. (IRISS Working Papers; No. 2003-02). CEPS/INSTEAD.
- Datt, G. (2017). Multidimensional poverty in the Philippines, 2004-13: do choices for weighting, identification, and aggregation matter? *World Bank Policy Research Working Paper*, (8099).
- Duclos, J. Y., Araar, A., & Giles, J. (2010). Chronic and transient poverty: Measurement and estimation, with evidence from China. *Journal of development Economics*, *91*(2), 266-277.
- Finn, A., & Leibbrandt, M. (2013). *Mobility and inequality in the first three waves of NIDS*.
- Finn, A., Leibbrandt, M., & Levinsohn, J. (2014). Income mobility in a high-inequality society: Evidence from the first two waves of the National Income Dynamics Study. Development Southern Africa, 31(1), 16-30.
- Finn, A., Leibbrandt, M., & Woolard, I. (2013). *What happened to multidimensional poverty in South Africa between 1993 and 2010?*.
- Foster, J. E. (2009). A class of chronic poverty measures. *Poverty dynamics: interdisciplinary perspectives*, *16*, 59.
- Fransman, T. (2017). *Investigating multidimensional poverty in South Africa in 2001-2016: The multidimensional poverty index (MPI) approach*. Unpublished M Dissertation. Western Cape: University of the Western Cape.
- Fransman, T., & Yu, D. (2019). Multidimensional poverty in South Africa in 2001–16. *Development Southern Africa*, *36*(1), 50-79.
- Frediani, A. A. (2010). Sen's Capability Approach as a framework to the practice of development. *Development in practice*, *20*(2), 173-187.
- Fusco, A., & Dickes, P. (2008). The Rasch model and multidimensional poverty measurement. In *Quantitative approaches to multidimensional poverty measurement* (pp. 49-62). London: Palgrave Macmillan UK.
- Gallant, R. G. (2012). *A multidimensional analysis of poverty in South Africa since the transition (1996-2007)* using the fuzzy sets approach. Accessed from https://etd.uwc.ac.za/handle/11394/4596 on 12 Dec 2023
- Hagenaars, A., & De Vos, K. (1988). The definition and measurement of poverty. *Journal of human resources*, 211-221.
- Hsiao, C. (1996). Logit and probit models. *The Econometrics of Panel Data: A Handbook of the Theory with Applications*, 410-428.
- Jackson, S., & Yu, D. (2023). Re-examining the multidimensional poverty index of South Africa. *Social Indicators Research*, *166*(1), 1-25.
- Kruger, K. J. (2018). Investigating transitory and chronic poverty in South Africa, 2008-2015.
- Laderchi, C. R., Saith, R., & Stewart, F. (2003). Does it matter that we do not agree on the definition of poverty? A comparison of four approaches. *Oxford development studies*, *31*(3), 243-274.
- Leal Filho, W., Henrique Paulino Pires Eustachio, J., Dinis, M. A. P., Sharifi, A., Venkatesan, M., Donkor, F. K., & Vargas-Hernández, J. (2022). Transient poverty in a sustainable development context. *International Journal of Sustainable Development & World Ecology*, 1-14.

- Leibbrandt, M., Woolard, I., Finn, A., & Argent, J. (2010). Trends in South African income distribution and poverty since the fall of apartheid. *OECD Social, Employment and Migration Working Papers*, No. 101, OECD Publishing, Paris, https://doi.org/10.1787/5kmms0t7p1ms-en.
- Liberto D. (2021). Marxian Economics: Definition, Theories, Vs. Classical Economics. Accessed from: https://www.investopedia.com/terms/m/marxian-economics.asp on [26 February 2023]
- López Barreda, R., Robertson-Preidler, J., & Bedregal García, P. (2019). Health assessment and the capability approach. Global bioethics = Problemi di bioetica, 30(1), 19–27. https://doi.org/10.1080/11287462.2019.1673028
- Mabuza, N. 2020. Salary disparities in South Africa: an analysis on race and gender in the Labour Market. Faculty of Commerce, Graduate School of Business (GSB). http://hdl.handle.net/11427/33769
- Mahmood, T., Yu, X., & Klasen, S. (2019). Do the poor really feel poor? Comparing objective poverty with subjective poverty in Pakistan. *Social Indicators Research, 142*, 543-580.
- Mlambo, Victor. (2018). *An overview of rural-urban migration in South Africa: its causes and implications.* Archives of Business Research 6.4.
- Munzhelele T., (2022), *The ability to work from home and its impact on wages in South Africa: evidence from wave 5 of NIDS-CRAM*, ECON4018A: Honors in economics, University of Witwatersrand, Unpublished assignment.
- Osborne, J. W. (2014). *Best practices in logistic regression*. Sage Publications.
- Pillay, Y., & Barron, P. (2018). On the path to reach the SDG targets: Decreasing maternal and child mortality in South Africa. *South African Medical Journal*, *108*(3), 2-3.
- Posel, D., & Rogan, M. (2016). *Measured as poor versus feeling poor: Comparing money-metric and subjective poverty rates in South Africa*. Journal of Human Development and Capabilities, 17(1), 55-73.
- Roberts, B. (2000). *Chronic and transitory poverty in post-apartheid South Africa: Evidence from KwaZulu-Natal. Durban: Centre for Social and Development Studies*, University of Natal. (Working paper; no. 28.)
- Robeyns, Ingrid and Morten Fibieger Byskov, (2023*) "The Capability Approach"*, The Stanford Encyclopedia of Philosophy (Summer 2023 Edition), Edward N. Zalta & Uri Nodelman (eds.), https://plato.stanford.edu/archives/sum2023/entries/capability-approach
- Rodríguez, G. (2007). *Lecture Notes on Generalized Linear Models*. Retrieved September 2021 accessed from: https://data.princeton.edu/wws509/notes/
- Rogan, M. (2016). *Gender and multidimensional poverty in South Africa: Applying the global multidimensional poverty index (MPI).* Social Indicators Research, 126(3), 987-1006.
- Silver, H., & Miller, S. M. (2003). *Social exclusion*. *Indicators*, *2*(2), 5-21.
- Starkweather, J., & Moske, A. K. (2011). *Multinomial logistic regression*. Available at: http://bayes.acs.unt.edu:8083/BayesContent/class/Jon/Benchmarks/MLR_JDS_Aug2011.pdf
- Statistics South Africa. (2014). *The South African MPI: Creating a multidimensional poverty index using census data*. Statistics South Africa. accessed from https://www.statssa.gov.za/publications/Report-03-10-08/Report-03-10-082014.pdf on 26 March 2023
- Statistics South Africa. (2021), *National Poverty Lines:2021* accessed from https://www.statssa.gov.za/publications/P03101/P031012021.pdf on 26 March 2023.
- Sulla, V., Zikhali, P., Cuevas, PF. (2022) *Inequality in Southern Africa : An Assessment of the Southern African Customs Union (English). Washington, D.C. : World Bank Group.* Accessed from: http://documents.worldbank.org/curated/en/099125303072236903/P1649270c02a1f06b0a3ae02e57eadd7a82

- The World Bank (2023). *Unemployment, youth total (% of total labor force ages 15-24) (modeled ILO estimate)*. Accessed from https://data.worldbank.org/indicator/SL.UEM.1524.ZS?end=2021&locations=ZA&start=2021&view=bar on [19 February 2023]
- United Nations South Africa., (2020), *Embedding Multidimensional poverty for structural recovery*, accessed on [23 Oct 2022]. Accessed from https://southafrica.un.org/en/106905-embedding-multidimensional-poverty-structural-recovery#:~:text=According%20to%20the%20Statistics%20South,7%20per%20cent%20in%202016. [19 February 2024]
- Van der Berg, S., Louw, M., & Yu, D. (2008). *Post-transition poverty trends based on an alternative data source 1*. South African Journal of Economics, 76(1), 58-76.
- Von Fintel, M. (2021). *Chronic child poverty and health outcomes in South Africa using a multidimensional poverty measure*. Child Indicators Research, 14(4), 1571-1596.
- Wagle, U. (2002). *Rethinking poverty: definition and measurement*. International Social Science Journal, 54(171), 155-165.
- Woolard, I. D. (2002). *An overview of poverty and inequality in South Africa*. Working paper for DFID (SA)
- Woolard, I., & Leibbrandt, M. (1999). *Measuring poverty in South Africa*. University of Cape Town.
- World Bank data, (2022), *Gini index - South Africa*, source: https://data.worldbank.org/indicator/SI.POV.GINI?locations=ZA&name_desc=false on [11/Nov/2022]
- World Health Organization, n.d., *Child mortality and causes of death*, source: https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/child-mortality-and-causes-of-death [26/Feb/2024]
- Yapa, L. (1996). *What causes poverty? A postmodern view*. Annals of the Association of American Geographers, 86(4), 707-728.
- Young J. (2022). Classical Economics. Accessed from https://www.investopedia.com/terms/c/classicaleconomics.asp on 26 February 2023
- Zedini, A., & Belhadj, B. (2015). *A New Approach to Unidimensional Poverty Analysis: Application to the Tunisian Case*. Review of Income and Wealth, 61(3), 465-476.
- Zizzamia, R., Schotte, S., & Leibbrandt, M. V. (2019). *Snakes and ladders and loaded dice: Poverty dynamics and inequality in South Africa, 2008-2017* (No. 2019/25). WIDER Working Paper.
- Zoli, C. (2009). *From unidimensional to multidimensional inequality, welfare, and poverty measurement*. University of Verona. Mimeo.