

# **The effects of household indebtedness on multidimensional poverty**

by  
Lungile Ntsalaze

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Supervisor: Prof, Sylvanus Ihenyen Ikhide

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## **Declaration**

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This dissertation includes two published and one accepted but not yet published original papers in peer-reviewed international journals. The fourth paper representing chapter eight is ready for submission for peer review. The development and writing of the papers (published and unpublished) were the principal responsibility of myself and, for each of the cases where this is not the case, a declaration is included in the dissertation indicating the nature and extent of the contributions of co-authors.

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## Abstract

Global household indebtedness has reached unprecedented levels over the past few decades. The household sector has had to cope with significant losses in income and wealth as well as the burden of debt service since the beginning of the financial crisis. Research focus on this phenomenon, together with its social implications, has grown. This study uses the National Income Dynamics Study (NIDS) data to empirically investigate the effects of household debt on multidimensional poverty. This was achieved through four independent research papers meant to address different angles of the subject.

Chapter 2 provides the background to the South African economy and developments in the credit market. Regulation is constantly being examined, especially in the micro-segment of the market, because of rising over-indebtedness, abuse and reckless lending. The theoretical literature in Chapter 3 indicates that there is no consistency in the definition of household over-indebtedness. Besides the standard economic theory underpinning the use of debt, behavioural economics field provides other aspects that influence consumer credit decisions. In Chapter 4, the Generalised Additive Model and the Multiple Correspondence Analysis are the main estimation models applied in this study in the context of the Alkire-Foster methodology for multidimensional poverty.

Chapter 5 provides a snapshot of the prevalence of over-indebtedness, using various international indicators and the National Credit Regulator (NCR) indicator, and describes which households are over-indebted. A total of eight percent of South African households are over-indebted, and 61.4 percent of those households are found in the lowest income category (R0 – R2 000), spending more than 45 percent of their household income on debt repayments, which is beyond levels that are considered sustainable. The alarming revelation is that, according to the unsecured debt indicator, 15.2 percent of households are over-indebted, while 11 percent of households are driven below the relative income poverty line after making debt repayments.

The racial distribution indicates that households headed by Africans are overrepresented (79%). Most over-indebted households are found amongst those who own their places of residence (78.6%), do not receive government grants (71.7%), are male (53.8%), and have an unemployed household head (53.5%).

Chapter 6 examines the presence of thresholds in the debt-poverty nexus at micro level, i.e. the tipping point above which debt is associated with more multidimensional poverty. By applying the Generalised Additive Model (GAM) using regression splines, the study finds the existence of critical tipping points between household debt service-to-income ratio and multidimensional poverty along with other explanatory variables (age, government grants, education and household size).

The results show that the tipping point at which debt is associated with improved household welfare is 42.5 percent (level of debt service-to-income). With significant findings, household heads younger than 60 years of age and more children are associated with lower multidimensional poverty. Government grants may suffer from fungibility as they do not seem to be an effective tool for multidimensional poverty eradication. The ideal household size with negative significant correlation to multidimensional poverty is less than four members. Lastly, education proves to be the best instrument by means of which households can escape multidimensional poverty.

The social implications of the difficulties brought about by household debt include its effects on deteriorating physical and mental health, relationship difficulties, and breakdown. Significant social costs arise, such as medical treatment and, indirectly, reduction of productivity. Further effects on society include increasing criminal behaviour and children dropping out of school, thereby transferring poverty to succeeding generations. Nonperforming loans increase and in turn lead to reduced credit availability. The overall health of the economy is impacted due to reduced aggregate demand.

Chapter 7, the study applies Multiple Correspondence Analysis (MCA) in the context of multidimensional poverty in South Africa to identify statistically valid additional dimensions. The results confirm the argument that financial commitment (over-indebtedness) can be regarded as an important dimension in the South African Multidimensional Poverty Index, because its occurrence constrains households from participating in the activities that are essential in modern society. As such, it is proposed that in addition to health, education, living standard dimensions and economic status, financial commitments should be included in the framework for the South African Multidimensional Poverty analysis. A central contribution of this work is a proposal of a hybrid measure in multidimensional poverty measurement, which recommends a combination of both nonmonetary and monetary indicators, in particular over-indebtedness.

Chapter 8 constructs a Multidimensional Poverty Index for South Africa, which incorporates financial commitment (over-indebtedness), and analyses results by race and settlement type. The contribution of different indicators towards the index score is also provided. Following the Alkire-Foster method, the results suggest that poverty rates are underreported when over-indebtedness and unemployment are not taken into account. Poverty remains severe amongst Africans and those living in rural areas. Indicators associated with unemployment, adult schooling and over-indebtedness should be prioritised across all population groups in tackling poverty.

The overall findings of the study have significant policy implications for the credit industry, poverty analysis practitioners, financial institutions and government. Household debt is useful up to a certain point (42.5%), beyond which it becomes associated with increased multidimensional poverty. It is evident that over-indebtedness forms part of capability limitations and, therefore, government should elicit cross-portfolio policy responses when addressing multidimensional poverty problems.

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## List of acronyms and abbreviations

AF	Alkire-Foster
AIC	Akaike Information Criterion
ASGISA	Accelerated and Shared Growth Initiative for South Africa
ATMs	Automated Teller Machines
BOE	Bank Of England
CGAP	The Consultative Group to Assist the Poor
CPI	Composite Poverty Indicator
DTI	Department of Trade and Industry
EPWP	Expanded Public Works Programme
EU	European Union
FA	Factor Analysis
FAOC	First Axis Ordinal Consistency
FGT	Foster Greer Thorbecke
GAM	Generalised Additive Model
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
HDI	Human Development Index
HPI	Human Poverty Index
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
ISRDP	Integrated Sustainable Rural Development Programme

JIPSA	Joint Initiative for Priority Skills Acquisition
LC-PI	Life-Cycle and Permanent Income Model
LSM	Living Standards Measure
MCA	Multiple Correspondence Analysis
MFRC	Micro Finance Regulatory Council
MPI	Multidimensional Poverty Index
NCA	National Credit Act
NCR	National Credit Regulator
NDP	National Development Plan
NGP	New Growth Path
NIDS	National Income Dynamics Study
OECD	Organisation for Economic Cooperation and Development
OPHI	Oxford Poverty and Human Development Initiative
PCA	Principal Component Analysis
PPA	Poverty Participatory Assessment
RDP	Reconstruction and Development Programme
SALDRU	Southern Africa Labour and Development Research Unit
SAMPI	South African Multidimensional Poverty Index
SAMPI-OI	South African Multidimensional Poverty Index-Over-Indebtedness
SARB	South African Reserve Bank
SDGs	Sustainable Development Goals
SEDA	Small Enterprise Development Agency

SETA	Sector Education and Training Authority
SMMEs	Small, Micro and Medium Enterprises
UK	United Kingdom
UN	United Nations
UNDP	United Nations Development Program
URP	Urban Renewal Project
US	United States

# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND

Debt has become a part of everyday life. Financial institutions seem to be readily prepared to issue credit to households as well as increasing households' dependency on borrowed funds in making ends meet (Karacimen, 2014). Debt, by itself, is not always bad, and as such should be assessed as to its sustainability and other consequences. It is like a double-edged sword, able to improve welfare when used wisely, but disastrous when it is in excess and used imprudently. Accumulated evidence demonstrates that access to finance is essential for economic development, both at macro and micro-levels (King & Levine, 1993). Cecchetti, Mohanty and Zampolli (2011) referred to finance as foundational to any economy, without which countries remain poor.

In South Africa, financial liberalisation and political transformation in the early 1990s led to wider access to and uptake of credit. The most notable positive impact of financial liberalisation was the reduction in credit constraints (Aron & Muellbauer, 2000; Prinsloo, 2002). At the same time, improvements in the socio-economic conditions of a large number of South Africans who previously did not have access to financial products enhanced their ability to borrow. Both the increased availability of credit and the ability to borrow have seen household debt climb significantly in the past two decades. To some extent, this has been beneficial, by allowing households to smooth consumption over their lifetime, to take care of temporary situations and to invest in productive activities. Yet debt can become problematic when households find it difficult to repay because of too much debt. Cecchetti *et al.* (2011) suggested that household debt beyond a threshold of 85 percent of the gross domestic product (GDP) could be damaging to an economy. Pescatori, Sandri and Simon (2014) believe that there is no magic threshold,

and found that the level of debt alone is an inadequate predictor of future growth, but that its trajectory is important.

It is worrisome when household finances become fragile and households begin to struggle, or can no longer meet their obligations as they become due. Household indebtedness, measured as the value of debt service to disposable income, has climbed significantly in recent years, during a rather low interest rate environment. A ratio as high as 77.8 percent implies that South African households are spending a major portion of their income on debt service (South African Reserve Bank, 2015).

The central question is what effect this rapid growth in household debt has on poverty in an environment of a rather pronounced poverty problem. The focus of this study is on the effects of household indebtedness on multidimensional poverty. Dubois and Anderson (2010) suggested that over-indebtedness is significantly associated with deprivation, which is going without necessities because of inadequate disposable income after the repayment of debts. Over-indebtedness can be caused by, and contribute to, poverty. Poverty compels households that do not have enough resources to accumulate debt with no repayment plan (Russell, Maitre, & Donnelly, 2011; D'Alessio & Iezzi, 2013). On the other hand, over-indebtedness can also be a cause of poverty and deprivation because households are left with less disposable income to meet basic needs as a result of debt service. Evidence shows that over-indebtedness can adversely affect standards of living and household well-being, as servicing debt reduces disposable income (Civic Consulting of the Consumer Policy Evaluation Consortium, 2008). The relationship between debt and poverty is embedded in one of the measures of over-indebtedness, where a household is over-indebted if debt service payments force the household below the poverty line (Russell, Maitre & Donnelly, 2011; D'Alessio & Iezzi, 2013; Ntsalaze & Ikhida, 2016a). On a macro level, Loko, Mlachila, Nallari and Kalonji (2003) carried out a cross-country study on the impact of debt on poverty in low-income countries, and confirmed that a high level of external debt contributes to poverty through its impact on economic growth.

This study applies a Generalised Additive Model (GAM), using regression splines to this effect. A Multiple Correspondence Analysis (MCA) is applied to assess financial commitments (over-indebtedness) as a valid dimension in the South African Multidimensional Poverty Index (SAMPI). Lastly, the Alkire-Foster (AF) methodology is used to construct a new multidimensional poverty index for South Africa. Statistical work on this study is based on the National Income Dynamics Study (NIDS) data set.

## 1.2 MOTIVATION

The concern over rising household debt trends and over-indebtedness is not misplaced in the case of South Africa, even though it has not yet fully materialised in the form of institutional collapses. Economic costs of over-indebtedness include blacklisting processes, and the costs of increased stress, absenteeism and industrial relations instability. In 2012, it was reported that the protest actions in the platinum belt that led to deaths in Marikana were induced by, amongst other things, inadequate income owing to high interest charged by micro-lenders in the area (Bond, 2015). There is an overwhelming number of reports about repossession of homes and vehicles that were acquired on credit. The *Credit Bureau Monitor* reports that more than 54 percent of active credit users are outside their credit terms (National Credit Regulator, 2015).

The 2008 global financial crisis is reported to have been prompted by, amongst other factors, the high amount of household debt (Barba & Pivetti, 2009; Van Treeck, 2014). The economic recession that followed the crisis was characterised by job losses and the tightening of credit supply; hence any indication of high indebtedness raises concerns. In 2006, the debate on household debt growth was already taking place amongst policymakers, and culminated in the introduction of the National Credit Act, which replaced the Credit Agreements Act, the Usury Act, and the Usury Exemption Notices of 1992 and 1999. The regulatory body, the National

Credit Regulator is tasked with monitoring consumer indebtedness and the social effects of over-indebtedness.

Financial inclusion remains a key element for economic development and social progress (Cull, Ehrbeck & Holle, 2014). South Africa's government policies and legislation have increasingly promoted access to credit to those previously excluded from mainstream financial services. In this process, it appears that credit discipline is being sacrificed as indicated by the number of credit users with impaired records (National Credit Regulator, 2015). Credit growth enables a much greater household consumption smoothing but it also entails certain risks such as financial system fragility. The unsustainable levels of debt inevitably lead households into financially distressed situations.

For many, debt-servicing costs consume a large share of monthly income, despite the low level of interest rates. In other words, problem debt can deepen people's poverty, even if it is not the direct cause. Other reported consequences of over-indebtedness, over and above the impact on disposable income, are the heightened risks of defaults. The domino effect of defaults is not only a problem for the household involved. When defaults occur, financial institutions' ability to lend is undermined, and they respond by tightening credit supply. Consequently, productivity-enhancing investment is reduced, resulting in a fall in income. Households who made long-term financial commitments in better times become unable to service their debts.

High debt levels are detrimental from both the social and the financial point of view, and therefore warrant research to develop a better understanding of the social effects of household over-indebtedness. De Clercq, Van Aardt and Venter (2009) found that South African consumers are generally financially vulnerable, because of, amongst other things, extreme poverty, too much debt, and high interest rates. In the UK, debt represents an important aspect of poverty; with an additional five percent of the population estimated to have experienced

poverty in 2010 after debt service had been taken into account (Whitfield, 2013). Lower income households are constantly getting into debt just to cover consumption needs.

Poverty remains at the core of South Africa's developmental challenges, even though the country has been largely successful in reducing poverty, both in monetary terms and in multidimensional forms of deprivation (Posel & Rogan, 2012). Many measurement approaches consider poverty as a shortfall in resources, whether in income, consumption expenditures or a lack of essential goods. The manner in which households experience well-being is, *inter alia*, subject to the constraint of limited financial resources available. Over-indebtedness constitutes a deprivation symptom since excessive debt repayments dilute the instrumental power of households' disposable income to secure necessities.

Formulated on this evident link between debt and poverty, the aim of this study is to understand the threshold effects of household debt on poverty in South Africa. Empirical work is limited in this regard especially when all income groups are taken into account. It is in the literature on microfinance where financial inclusion (access to credit), in particular for women, is theoretically argued as a tool for reducing poverty. There is no doubt that the intervention of microfinance has improved the reach to the poor, but the extent of its victory in decreasing poverty remains less certain. In South Africa, microcredit has recently been associated with over-indebtedness (Bond, 2015), and heightened participation by informal unregistered credit providers, hence the amendment to the legislation which requires all credit providers to be registered regardless of size (National Credit Regulator, 2016c). This exposed credit providers such as African Bank Investments Limited to defaults, which was later put on curatorship (South African Reserve Bank, 2016).

### **1.3 GAP IN THE LITERATURE**

Most previous research work has investigated debt and poverty concepts in separate studies, generally focusing on definitions, measurements, causes and consequences without

investigating the empirical relationship between the two. Extant literature on debt is concentrated in developed economies with a focus on household characteristics associated with over-indebtedness. Researchers in South Africa have attempted to understand the link between debt and poverty by studying household over-indebtedness in view of income levels, which by implication reflects poverty status only from a money-metric perspective (Collins, 2008; Hurwitz & Luiz, 2007). Following a similar approach, Pressman and Scott (2009), and D'Alessio and Iezzi (2013) investigated the link between debt and poverty for the US and Italy respectively. According to the author's knowledge, no empirical work has explored the effects of debt on multidimensional poverty with particular reference to its threshold effects. This is partly explained by the nascent nature of multidimensional approaches to poverty, and the limited and fragmented nature of relevant data. However the need to explore and understand the issues around household over-indebtedness and multidimensional poverty is more relevant now than ever before. This study applies the multidimensional poverty concept, based on the capability approach, to measure household poverty, while household debt is measured as a ratio of debt service cost to disposable income.

#### **1.4 SIGNIFICANCE OF THE STUDY**

Karlan and Zinman (2010) state that access to and use of finance are fundamental drivers for improving the livelihoods of the poor by increasing household income and resilience in an increasingly shock-prone global economy. South Africa has experienced a strong growth in access to credit facilities. On the other hand, though reducing, poverty doesn't show a corresponding decline. Such growth in debt levels may lead to a crisis if household over-indebtedness is not appropriately monitored as recently evidenced in the global financial crisis. Subsequently, the very objectives of using access to credit to improve household welfare could be compromised.

This highlights the need for empirical research to better understand the dynamics of the relationships between household debt and multidimensional poverty. The results from this study

are expected to provide a better understanding of household over-indebtedness through a parallel application of internationally used measures of over-indebtedness with those used by the National Credit Regulator (the government institution responsible for credit market regulation in South Africa), using nationally representative data. Additionally, the identity of the types of households that are over-indebted is provided, which should be valuable to the credit industry and financial regulatory bodies, and also to the current debate on over-indebtedness. With improved knowledge about how over-indebtedness differs across a variety of households, targeted education could help households to better manage their finances. To the best of the author's knowledge, this study presents the first application of GAM as developed by Hasties and Tibshirani (1990) in the threshold debt-poverty nexus at a micro-level. The study also highlights the need for effective debt management strategies, which should incorporate debt ceilings to limit household over-indebtedness. Lastly, it highlights the importance of, and need for, considering over-indebtedness in poverty measures. It shows how dimensions of education, health, living standards, economic activity (unemployment) and financial commitment (over-indebtedness) can be combined to create a new poverty measure which can be used to measure multidimensional poverty in South Africa. Although the South African government already has policies to improve health and education, generally policies to improve living standards or reduce poverty only look at improving income levels. By identifying households within society which suffer from multiple forms of capability limitations simultaneously, it is hoped that government will respond by introducing policies that take a holistic view of the factors that determine multidimensional poverty.

## **1.5 RESEARCH QUESTIONS**

With regard to the research problem presented above, the main research question addressed in this study is: What are the effects of household debt on multidimensional poverty? In order to answer this question, the following questions arise:

- (i) Are South African households over-indebted?
- (ii) What is the critical tipping-point in the relationship between debt and multidimensional poverty?
- (iii) Is over-indebtedness the missing dimension in the South African Multidimensional Poverty Index (SAMPI)?
- (iv) What are the poverty rates when SAMPI incorporates over-indebtedness?
- (v) What are the implications of these findings?

## **1.6 RESEARCH OBJECTIVES**

The main objective of the study is to examine the effects of household debt on multidimensional poverty in South Africa, and covers the following specific objectives:

- i. To determine the extent and the characteristics of over-indebted households.
- ii. To explore the existence of thresholds between explanatory variables: in particular, household debt service-to-income, and multidimensional poverty.
- iii. To argue for the inclusion of financial commitments (over-indebtedness) to the existing education, health, living standards and economic activity dimensions of the SAMPI.
- iv. To construct a South African Multidimensional Poverty Index that incorporates household over-indebtedness.
- v. To articulate the implications of the findings above.

These research objectives, together with the research questions, will be addressed in the chapters that follow, and through discussions of policy implications in the conclusion.

## **1.7 LIMITATIONS OF THE STUDY**

Since the NIDS survey is based on self-reported data, it poses an inherent risk associated with households underreporting their debt for fear of embarrassment, which may lead to a degree of difference in results. Future studies could extend the current work by using data that is

independently sourced from organisations such as financial and/or regulatory institutions. Assessment of over-indebtedness through the subjective and arrears measures could not be performed due to data limitations. The survey does not capture the intended purpose or usage of personal loans taken out by households. This poses a limitation, which makes it impossible to differentiate between money used for business activities and money used to support basic livelihood.

## **1.8 THESIS OUTLINE**

This study is organised into nine chapters. Chapter 1 provides the background and presents the research problem, its significance, the research questions, objectives and limitations. Chapter 2 provides the context in which household debt interacts with poverty in the economy of South Africa. Chapter 3 provides the theoretical framework for the study. Chapter 4 discusses methodologies employed to achieve the objectives of the study. In Chapter 5, a descriptive analysis of household over-indebtedness, including the characteristics of affected households is investigated. The threshold effects of debt, government grants, number of children, household size, age and years of education of the household head on multidimensional poverty is presented in Chapter 6. Chapter 7 builds upon the existing work of Statistics South Africa to include an additional dimension of poverty, namely financial commitments indicated by over-indebtedness, followed by the construction of the South African Multidimensional Poverty Index - Over-Indebtedness in Chapter 8. The overall conclusions, policy implications and future research directions are contained in Chapter 9.

## **CHAPTER 2**

### **CONTEXTUAL BACKGROUND**

#### **2.1 INTRODUCTION**

This chapter presents an overview of the South African economy and its associated political, economic, and socio-economic developments since the advent of democracy to set the context in which poverty and household indebtedness evolve. It identifies broad trends in economic growth and debt service-to-disposable income ratio. An account of socio-economic programmes is offered to provide an understanding of the efforts made by the government to improve the lives of South Africans. It also provides the regulatory developments that have occurred over time in the credit market.

#### **2.2 POLITICAL CONTEXT**

In the pre-democratic era, South Africa functioned under an apartheid system. Apartheid produced structures of privilege that coexisted with deliberate impoverishment for the majority of citizens (Wilson & Ramphela, 1989). It perpetuated income poverty and exacerbated income inequality in very obvious ways. Land and livestock were disposed from the African majority, while they were denied opportunities to, for instance, create wealth or quality education (Aliber, 2001).

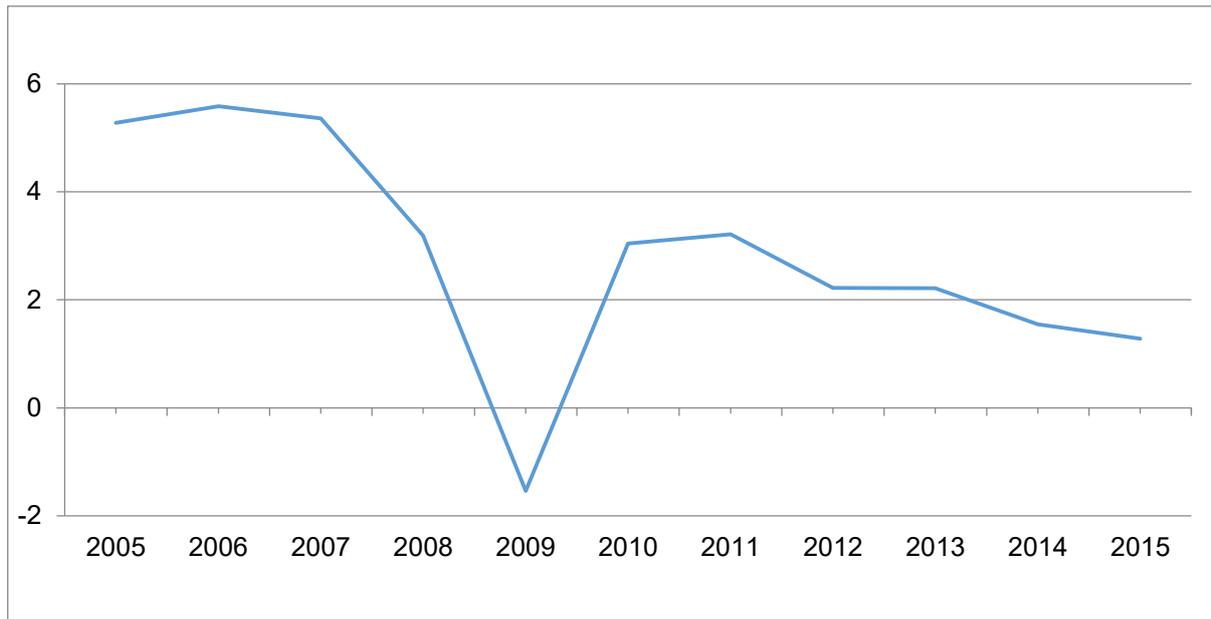
The Natives Land Act of 1913 enforced the confinement of Africans to the impoverished parts of the country. These areas known as homelands depended on the apartheid government for budgetary transfers hence they suffered major underdevelopment, poor healthcare services and the inferior 'Bantu education'. At the same time, their cheap labour, through a migrant labour system, was still needed for industrialisation and agricultural enterprises. Although South Africa has undergone a political transition into democracy in the last two decades, the challenges of poverty, unemployment and inequality still bear a racial footprint. The cornerstone of

development policy in the democratic government is to reduce poverty and inequality, and create jobs.

### **2.3 ECONOMIC CONTEXT**

South Africa is one of Africa's biggest economies and the most developed. The size of the economy as reported by National Treasury is R3.8 trillion for the fiscal year ending March 2014 (National Treasury, 2016). Economic growth stagnated during apartheid due to sanctions on international trade and investment, uncompetitive local industries, rigid exchange controls, restricted skills development, and high levels of poverty and inequality (Aron, Kahn & Kingdon, 2008). South Africa embarked on a process of trade liberalisation in the mid-1980s, intensifying considerably in the post-apartheid period under the World Trade Organisation commitments. There was therefore a significant reduction in average tariff rates, combined with a simplification of the tariff structure (Edwards, 2006). Evidence, in turn, indicates that this liberalisation process has resulted in a twin process of a growth in exports and increased import penetration ratios.

Figure 2.1 shows South Africa's recent GDP growth. Economic growth experienced from 2005 to 2007 was impressive, surpassing five percent per year which could be attributable to macroeconomic stability and high commodity prices. However, in 2008, the electricity supply crisis and later the global financial crisis caused a major setback in the economy. South Africa's financial system was largely able to protect the economy against the full effects of the crisis in emerging market economies. The economy weakened substantially into recession in the first quarter of 2009. In 2011, GDP growth climbed to 3.2 percent. However, structural challenges such as the widening gap between the rich and the poor, high unemployment rate and new vulnerabilities imposed by labour tensions in the mining sector, compromised the economic recovery, hence annual growth was only 2.2 percent in 2013, 1.5 percent in 2014, and only 1.3 percent in 2015.



**Figure 2.1: GDP growth (annual %)**

Source: Author, compiled from the World Bank national accounts data, and OECD National Accounts data files.

South Africa continues to be confronted by a deteriorating domestic economic growth outlook due to weak domestic demand, low commodity prices, a weak rand, and the impact of the widespread drought. High levels of unemployment remain a big challenge in the economy at 24.5 percent, while youth unemployment rate rose slightly to 50.4 per cent in the fourth quarter of 2015 from 48.8 per cent in the third quarter (South African Reserve Bank, 2016a). Persistent weak economic fundamentals, a high current-account deficit, the growing trend of the fiscal debt, the “fees must fall” students’ campaign, structural constraints, and slow implementation of the National Development Plan have raised concerns with credit rating agencies that are due to assess the country’s credit in December 2016. The impact of a downgrade to non-investment grade on the South African economy and financial system could lead to increased capital outflows, higher cost of, and reduced access to funding.

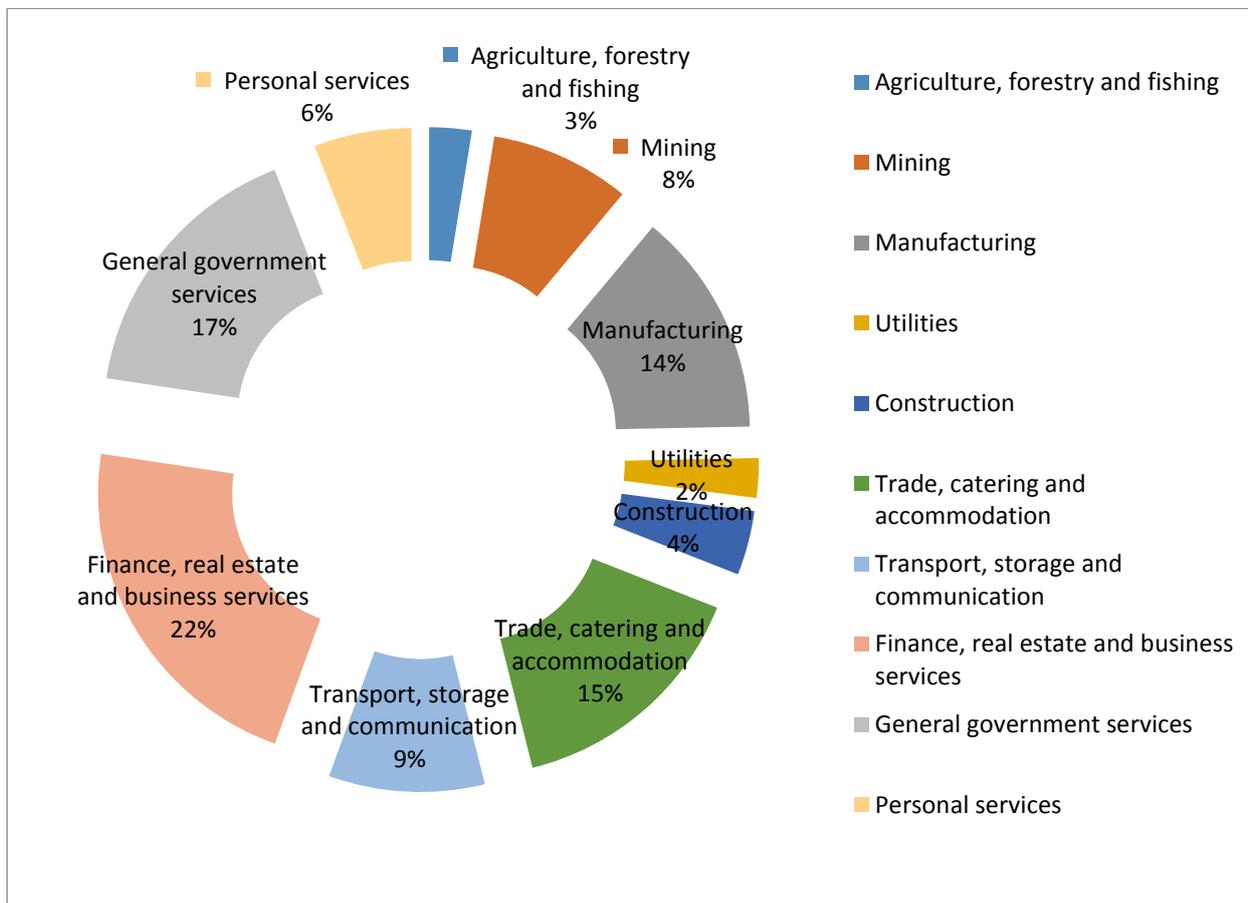
In the monetary policy committee statement of July 2016, the South African Reserve Bank revised its forecast to zero percent growth in 2016, while 1.1 percent and 1.5 percent are forecast for 2017 and 2018 respectively (South African Reserve Bank, 2016b). The Reserve

Bank's policy targets an inflation range between three and six percent, but allows temporary breaches before hiking interest rates. Inflation moderated to 6.1 percent in May, before rising to 6.3 percent in June 2016 (South African Reserve Bank, 2016a). Inflation is expected to accelerate further in 2016 and is only expected to return within range during the third quarter of 2017. This, together, with somewhat higher interest rate environment, tighter credit conditions and low employment have put more pressure on household finances. In South Africa, household consumption is largely driven by credit (Owusu-Sekyere, 2016). According to Mutezo (2014), household consumption expenditure accounted for almost 60 percent of GDP. This suggests that the effects of any stalling in consumption caused by household over-indebtedness will ultimately be reflected in a weak economic growth.

## **2.4 STRUCTURE OF THE ECONOMY**

The World Bank ranks South Africa's economy as upper-middle income. Historically, South Africa's economy was primarily built on primary and secondary sectors, such as agriculture, mining and manufacturing, but in recent decades, these sectors have seen slow growth and a smaller share of GDP. Major growth has shifted to the tertiary sector. These changes are considered unusual for the level of development of South Africa (Fedderke, 2014). Typically emerging markets are driven by the industrial sectors.

Figure 2.2 outlines the structure of the South African economy in 2015. More than 68 percent of GDP is contributed by the tertiary sector. Financial services are the biggest contributor (22%), followed by government services at 17 percent. Manufacturing (14%) and mining (8%) lag behind the trade, catering and accommodation (15%) and transport, storage and communication (9%) sub-sectors, respectively. Other sub-sectors have each contributed at most six percent to GDP.

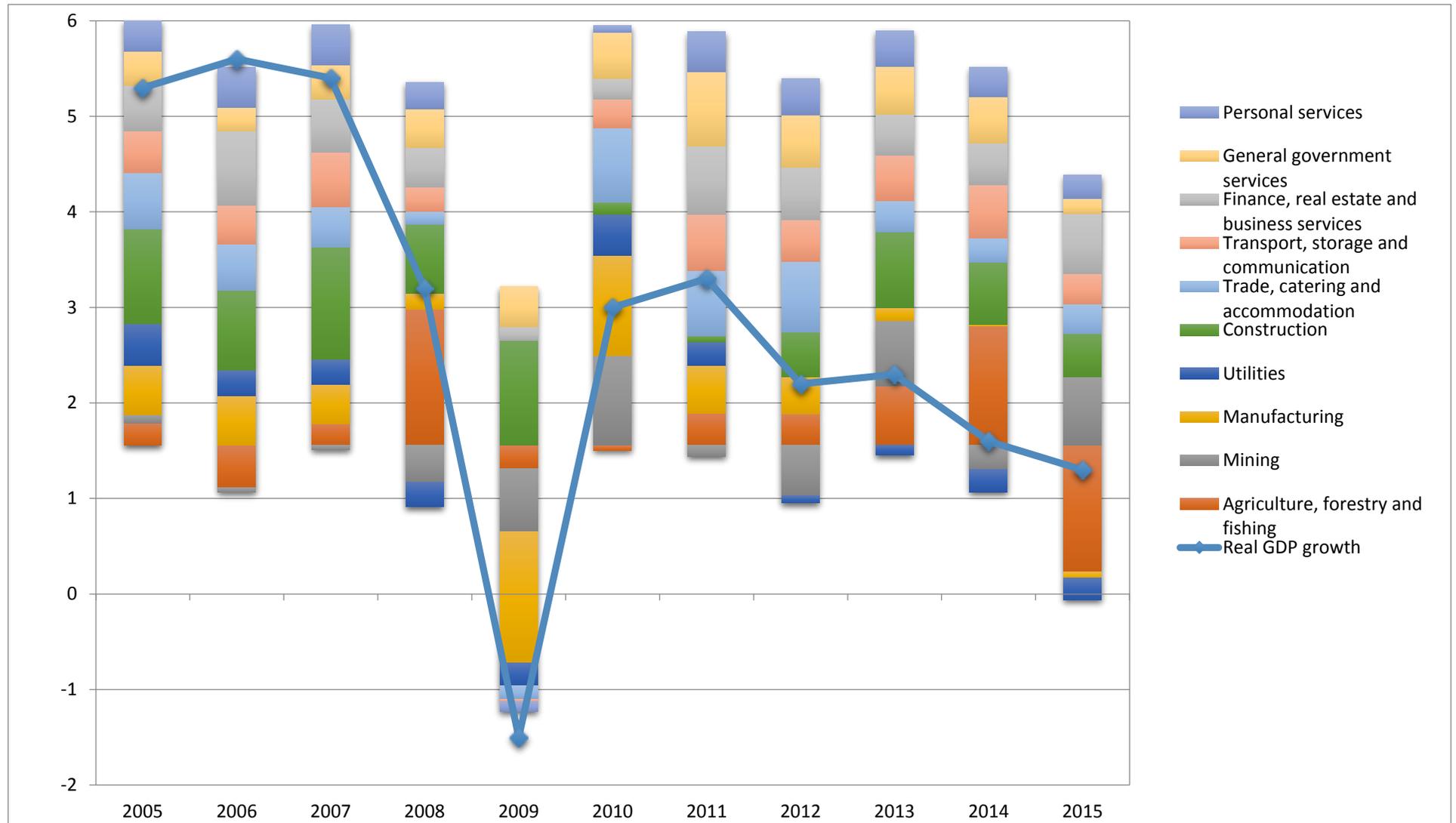


**Figure 2.2: GDP break down by sub-sector (%) at constant 2010 prices**

Source: Author, compiled from the South African Reserve Bank Online statistical query data.

Figure 2.3 shows sub-sectoral contributions to overall economic growth between 2005 and 2015. The construction sub-sector, although relatively small, played an important role in boosting economic activity as demand for residential buildings and non-residential construction escalated during the period 2005 to 2007. In 2008, the agriculture sub-sector grew by 19 percent from the previous year. The effects of the global financial crisis were severely felt by the manufacturing sub-sector recording a decline of more than ten percent in 2009. Over the years, finance insurance, real estate and business services have shown the strongest contribution to GDP growth at an average of more than four percent whereas mining and quarrying registered a sustained contraction amid a labour market volatile environment. In 2012, the sub-sector

suffered the longest strike that brought platinum production to a standstill. Adverse weather conditions resulted in contraction of more than five percent in the agricultural sub-sector in 2015.



**Figure 2.3: Sub-sectoral contribution to overall GDP growth**

Source: Author, compiled from the South African Reserve Bank Online statistical query data.

## 2.5 SOCIO-ECONOMIC CONTEXT

The historical experience of apartheid has left the country with a deeply divided socio-economic structure. Poverty, unemployment and inequality remain the consistent developmental challenges that South Africa faces after more than two decades of democracy. It is not surprising that the democratic government's programmes are preoccupied with these challenges. The Reconstruction and Development Programme (RDP) is the embodiment of government's long-term goals to improve the lives of South Africans. This was reiterated in 2011 with the launch of the New Growth Path (NGP) and the National Development Plan (NDP) (2011). The National Development Plan-Vision for 2030, the most current guiding framework for development, builds on the NGP and is anchored by three fundamental objectives, namely the elimination of poverty, reduction of inequality, and job creation.

Trends in poverty and inequality during the post-apartheid period have been the subject of intensive analysis in South Africa. There is some consensus in the literature that poverty increased during the years 1993 to 2000, and slightly reduced between 2000 and 2011 (Roberts, 2001; Ozler, 2007; Leibbrandt, Woolard *et al.*, 2010; Statistics South Africa, 2014a).

During the mid-1970's, it was estimated that between 68 and 77 percent of all African families fell below the poverty line indicating a swell in poverty levels at the height of apartheid (McGrath & Whiteford, 1994). During the 1980s, 75 percent of Africans lived in rural areas while the poverty headcount was reported at 43 percent of the total population, most of whom were African (Nattrass & May, 1986). By 1995, the national poverty headcount was at 58 percent with a marginal decline from 68 percent to 67 percent for Africans (Ozler, 2007). The proportion of households living below the upper poverty line has declined substantially from 42.2 percent in 2006 to 32 percent in 2011, but the majority of those identified as poor were Africans (Statistics South Africa, 2014a). Based on the Alkire-Foster methodology, Finn and Woolard (2013) found that 10.7 percent of South Africans were multidimensionally poor in 2008. This count fell to nine percent in 2010. Statistics South Africa also adopted this index and developed it to include unemployment as a measure of economic activity of households, using the 2001 and 2011 census data (Statistics South Africa,

2014b). The results of the South African Multidimensional Poverty Index indicate that in 2001, 17.9 percent of households in South Africa were poor, which dropped to eight percent in 2011.

The initial rise in poverty was probably due to a combination of sluggish economic growth and poor labour market prospects in the second half of the 1990s (Van der Berg, Louw & Du Toit, 2009), while the later decline in poverty resulted from increased social grant spending (Van der Berg, Louw & Yu, 2008). As a result of increased disposable income, social grant recipients also became more creditworthy, and consequently able to incur more debt. Another important factor was strong income growth due to the emergence of the black middle class. Between 2006 and 2011, the income growth for Africans was 34.5 percent compared to that of 0.4 percent for Whites, in real terms (Statistics South Africa, 2014a). However, large disparities still exist between Africans and Whites in terms of average income levels.

The country has made progress in reducing poverty, both in monetary terms and in multidimensional forms of deprivation (Posel & Rogan, 2009 & 2012). But reduction in non-monetary poverty is more pronounced than that reported in monetary based measures (Bhorat & Naidoo, 2006; Bhorat & Van der Westhuizen, 2013). The non-monetary measure includes items such as dwelling type (formal or not), construction materials of roofs and walls, water access, power sources for lighting and cooking, and sanitation. These are provided through government's social wage.

Despite progress against income poverty, inequality remains persistent with trends that are consistently on the rise over the post-apartheid years (Seekings, 2007; Leibbrandt, Wegner & Finn, 2011). Historical racial inequality has been the main driver of overall inequality in South Africa (Leibbrandt, Bhorat & Woolard, 2001). The economy's Gini coefficient increased from 0.66 in 1993 to 0.68 in 2000 and to 0.70 in 2008, characterised by a sharp rise for Africans (Leibbrandt *et al.*, 2010). The Gini coefficient is calculated at 0.65 based on an expenditure approach and 0.69 on an income approach in 2011 (Statistics South Africa, 2014a).

South Africa's historical circumstances have shaped the present configuration of poverty and income distribution. While poverty is not limited to any particular race in South Africa, it is

concentrated among Africans. All literature shows that African poverty incidence was and remains a lot higher than Coloured, which in turn is a lot higher than Indians/Asians and lastly Whites. Klasen (2000) reported a deprivation rate of 67 percent for Africans in contrast with only 0.6 percent for Whites in 1993. According to May (1998) in 1995, 60.7 percent Africans, 38.2 percent Coloureds, 5.4 percent Asians and one percent of Whites lived in poverty.

In the former homeland regions where many households are headed by women, poverty still continues unabated (Wilson & Ramphela, 1989; Borat & Naidoo, 2006). According to the Income and Expenditure Survey of 1995, 62 percent of rural dwellers were poor, compared to 32 percent of people living in small towns, 25 percent in secondary cities, and 13 percent in major metropolitan areas (Woolard, 2002). Leibbrandt *et al.* (2010) and Sekhampu (2013) said this problem replicated in townships as well. This could be because rapid migration to urban areas constrains cities' capacity to provide services and opportunities.

In 1994, government's policy framework was guided by the RDP, which contained both transformative and redistributive goals. These included public expenditure on social services, especially education, health, social security, housing, electricity and water. It was clear that such goals needed to be supported by strong fiscal discipline. This resulted in the introduction of the Growth, Employment and Redistribution (GEAR) policy framework in 1996. This economic strategy was premised on the view that higher economic growth creates economic opportunities, which are key to improving welfare (Dollar & Kraay, 2000). GEAR was criticised as being neoliberal and inappropriate to solve the country's pressing economic problem (Bond 2000). In 2005, government introduced the Accelerated and Shared Growth Initiative for South Africa (ASGISA) policy programme to further improve GDP growth. ASGISA envisioned a sustainable six percent growth rate and was a continuation of its two predecessors, GEAR and the RDP with the emphasis on infrastructure delivery and skills development.

Although growth was achieved, the economy performed poorly against expectations and failed to stimulate the creation of the hundreds of thousands of formal-sector jobs promised. Unemployment worsened in the presence of growth. This scenario of jobless growth became more pronounced

especially in 2000, when growth reached a four-year high even while formal sector job losses accelerated. Unemployment is a concomitant problem to that of poverty and inequality. Unemployment in the formal sector worsened between 1995 and 1998, and rose from 20 to 26 percent according to the narrow definition (Statistics South Africa, 2000). High unemployment remains the key challenge facing South Africa as the country struggles to generate sufficient jobs. In the recent Quarterly Labour Force Survey, Statistics South Africa (2017) reported the official unemployment rate at 26.5 percent in fourth quarter of 2016. According to the expanded definition of unemployment, the unemployment rate is very worrying at 37%.

Kingdon and Knight (2007) claim that the country's unemployment rate has remained high since democracy due to increase in the labour force participation. After the first democratic elections economic sanctions were dropped, labour restrictions were lifted and policies were put in place to advance the interests of Black workers. The formal sector has not been able to absorb this surplus labour. Consequently, the informal sector has gained prominence as an alternative to formal-sector opportunities. However, South Africa has a small informal sector compared to other countries at similar income levels (Maloney 2004). Currently the informal sector constitutes 17 percent of the labour force (Statistics South Africa, 2017).

Employment plays a key role in reducing poverty (Desai, 2005). Given the importance of job creation, government made efforts to implement mechanisms that could generate poverty reducing jobs. These include the provision of skill-enhancing education and training, providing support to SMMEs, and special pro-employment programmes such as public works programmes. Bantu education produced a low-skilled labour. Learnerships and Sector Education and Training Authorities (SETAs) became the channel for improving the skills base of the economy. They provided practical experience and incentives for employers to undertake skills development programmes. Another skills intervention was the launch of the Joint Initiative for Priority Skills Acquisition (JIPSA) to build a strong skills base by involving retirees and immigrants, where needed.

Government is not well placed to foster the SMME sector. SMMEs are better placed for unskilled labour absorption (Rwigema & Karungu, 1999), which, in turn, can lead to an improvement in their living standards. The Department of Trade and Industry through the National Small Business Development Act of 1996 led to the establishment of The Ntsika Enterprise Promotion Agency for non-financial support and Khula Enterprise Finance Ltd for financial support. These initiatives have evolved but with unchanged mandates. The Department of Small Business Development, for example, is now responsible for the SMME sector, while nonfinancial support is provided by the Small Enterprise Development Agency (SEDA). Financial support is offered by Small Enterprise Finance Agency which was established as a result of a merger between the South African Micro Apex Fund, Khula Enterprise Finance Ltd and the small business activities of the Industrial Development Corporation. Youth-specific initiatives were led by the establishment of the National Youth Commission in 1996, followed by that of Umsobomvu Youth Fund in 2001 to fund skills development and employment creation. These two institutions have since merged in 2009 to form the National Youth Development Agency. The Employment Tax Incentive Act, commonly known as the youth wage subsidy, came into effect in 2014, with an employer tax rebate to promote the employment of young people. The New Growth Path strategy was launched in 2011 with the aim to create decent jobs. In turn, the Jobs Fund was launched to fund this objective. With this scheme, the National Treasury seeks to form partnerships, through grant funding, with public, private and civil society organisations on projects that will significantly contribute to job creation.

Public Works programmes were another key channel of government's short-term response to poverty reduction, financed by the Poverty Relief Fund and other programme specific funding. These labour intensive projects include the Clean Cities Campaign, Working for Water Programme, Coastal Care, the LandCare Programme, Municipal Infrastructure Programme, Welfare programmes (which offer training, education and other opportunities for the destitute), Community-Based Public Works Programmes, and Arts and Culture poverty relief projects. Although most of the jobs created were temporary in nature they did help participants to gain skills.

Public works programmes were strengthened under the Expanded Public Works Programme (EPWP) to continue the success of the initial programme.

Access to basic services or needs is another mechanism through which government seeks to improve the conditions of the poor. The RDP of 1994 remains the main policy framework to achieve the provision of basic services. The provided social services are: education (no-fee paying schools and schools nutrition programme), health (free primary healthcare, HIV/AIDS anti-retroviral programme), proper free RDP housing, free basic electricity and water up to specified levels, sanitation, and social security. The Integrated Sustainable Rural Development Programme (ISRDP) and the Urban Renewal Project (URP) launched in 2001 were targeted at stimulating economic development and reducing poverty in the 21 development nodes identified across the country.

It is worth noting that South Africa's social assistance system has expanded tremendously. The number of recipients has grown from 2.9 million in 1995 to 16 million in 2014, representing expenditure of 3.4 percent of GDP on social grants (The Presidency, 2014). The most common types of grants are the old-age pension, the disability grant, war veterans', foster care, care dependency, grant-in-aid, and child support grant (introduced in April 1998). The coverage of the child support grant has successively been extended to children in older years, reaching those between the ages of 15 and 16 in 2010. Woolard and Leibbrandt (2011) clearly showed that social grants reduced both poverty and inequality. Finally, land restitution, tenure reform and land redistribution are the other major policy instruments used to alleviate asset poverty since 1994. This intervention is made complex by the need to prove evictions for racial reasons and the 'willing buyer, willing seller' stance adopted by the government.

## **2.6 HOUSEHOLD DEBT**

### **2.6.1 Role of political developments**

The apartheid legislation denied Africans access to basic services including financial services. In addition, land dispossession programmes destined Africans to unproductive low market areas

(homelands). This highly compromised prospects for asset ownership that could potentially serve as collateral upon borrowing. Consequently, the only available alternative was the informal sector to meet demands for financial services such as stokvels, burial societies etc. Guided by the proposition that access to formal finance improves welfare, the post-apartheid government embarked on an aggressive programme to ensure that universal financial inclusion is achieved. As such financial sector reforms were undertaken to increase access to credit.

The enactment of economic transformative policies (e.g. Broad-Based Black Economic Empowerment) led to improved socio-economic status of many who became clients of mainstream banking. However, persistent poverty, inequality and unemployment meant that poor people were still excluded, although no longer on racial grounds. Through the efforts of the Financial Sector Charter of 2003, affordable financial services and products were extended to the poor, notably through the low-cost transactional Mzansi account.

### **2.6.2 Financial liberalization and innovation**

The economy has undergone profound structural reform over the years, including liberalisation of the financial sector (Calitz, 2002). The process initiated by the De Kock Commission's recommendations in the 1980s (Calitz, 2002; Misati & Nyamongo, 2011) gained momentum in the 1990s particularly after the first democratic elections in 1994. McKinnon (1973) and Shaw (1973) published their seminal works diagnosing the prevalence of what they termed financial repression in developing countries and went on to argue the case for financial liberalization. Financial liberalization can be characterised as the process of giving the market the authority to determine who gets and grants credit and at what price. South Africa removed credit ceilings and interest-rate controls in 1980 and allowed greater competition in banking after 1983. Greater ease of entry facilitated competition and saw a number of foreign firms entering the banking sector.

Financial liberalisation, in this respect, increased the availability of and access to credit by mobilising savings and investment by allowing interest rates to be market-determined, and through the relaxation of the rules stifling competition among banks. Negotiations towards a democratic

South Africa also played a role in stopping international sanctions and political isolation making way for a conducive environment for market-oriented economy.

Another indicator of development in the credit market is the extent to which it is associated with innovation. Financial innovations can be seen in a positive or negative view. Securitisation, for example, was identified as a root cause of the global financial crisis (Brunnermeier, 2009). On the other hand, innovation improves the quality and variety of banking services (Miller, 1992; Berger, 2003) and facilitates risk sharing (Allen & Gale, 1994). In South Africa, greater competition resulted in more dynamism, innovation, and efficiency in the financial services sector. Corporate product innovation introduced financial instruments like securitisation and derivatives. In the retail sector, innovations include, *inter alia*, the spread of automated teller machines (ATMs) and expansion of services through ATMs, telephone banking, and internet banking.

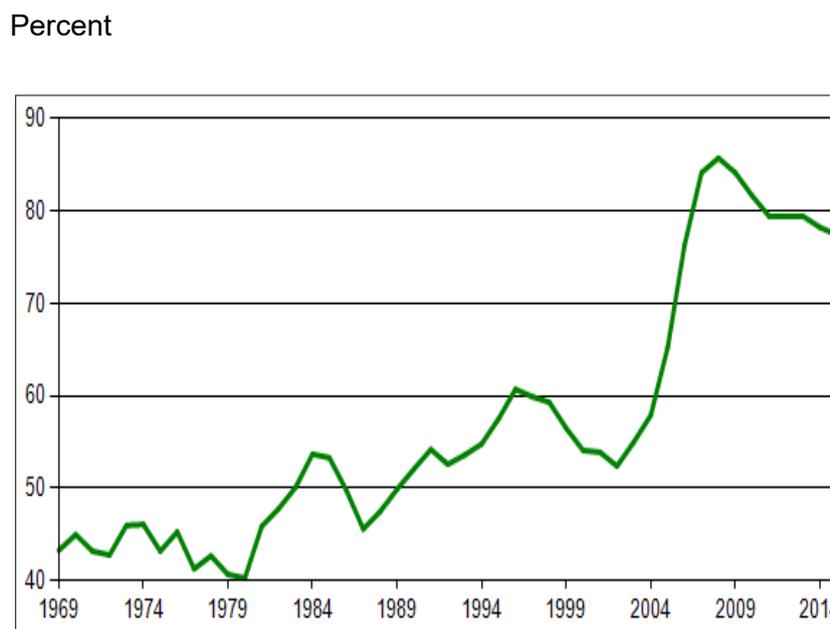
### **2.6.3 Composition of household debt**

The credit market size for the quarter ended March 2016 was reported at R1.66 trillion (National Credit Regulator, 2016a), a tremendous growth from R3.1 billion in the fourth quarter of 1969 (Van der Walt & Prinsloo, 1995). According to the National Credit Regulator (2016a), mortgages accounted for 52 percent, secured credit agreements for 22 percent, credit facilities for 13 percent, unsecured credit for 10 percent, developmental credit for two percent and short-term credit for 0.2 percent of the total gross debtors' book. In comparison to the statistics reported in the first credit report issued by the National Credit Regulator, some interesting observations are noted. In the fourth quarter of 2007, mortgage agreements accounted for 63 percent of the total rand value of the debtors' book, while unsecured credit showed a modest four percent share of the total (National Credit Regulator, 2008). This shows that the uptake of mortgage debt has decreased even beyond the 1970s level in relation to other credit instruments. Prinsloo (2000) reported that mortgage advances, on average, accounted for 57 percent of aggregate household debt during the 1970s.

According to Devnomics (2012) the housing market is significantly depressed hence mortgage lending has dropped notably since the implementation of the National Credit Act (2005). This has

led to a bias towards unsecured lending rather than providing increases on mortgages, specifically within the banking sector. Unsecured credit has changed substantially over the past three decades. Aggressive marketing of personal loans and the ready availability of such financing helped to increase the share of unsecured balances to about ten percent in the first quarter of 2016. The bulk of household debt is borrowings from the banking sector (83%), retailers (2%), non-bank financiers (5%) and other credit providers (10%) (National Credit Regulator, 2016a). Other credit providers consist primarily of pension-backed lenders, developmental lenders, micro loan lenders, agricultural lenders, insurers, non-bank mortgage lenders and securitised debt.

Figure 2.4 indicates that for the most part of 1970s the ratio of outstanding debt to the disposable income of households varied around an average rate of approximately 45 percent. In the period 1980 to 1985, household debt, as a percentage of disposable income, rose from an average of 40 percent to 55 percent in 1985.



**Figure 2.4: Household debt as percentage of households' disposable income**

Source: South African Reserve Bank Online statistical query data.

Household debt slowed down between 1985 and 1986 because monetary policy measures were decisively tightened. Other factors include adverse socio-political developments and South Africa's international debt crisis, resulting in a sharp drop in net capital inflows. In subsequent years the

use of consumer and mortgage credit accelerated to higher levels. In the early 1990s, the upward trend is associated with the abolishment of discriminatory legislation which opened up the opportunity for Africans to use credit. In addition, banks developed innovative attractive financial products for consumers. Exchange controls on domestic residents, in existence since before the 1960s, were partially relaxed after 1997. After the Asian financial crisis in 1997, interest rates were raised quite rapidly to new record levels, with the prime overdraft rate rising as high as 25.5 percent per annum. These plausibly led to a decline in access to credit by South African households.

The graph also reveals that the debt to disposable income ratio of South African households peaked in 2008, prior to the downward trajectory which characterised the international financial crisis period. An international comparison shows that although South Africa's ratio of household debt to disposable income increased tremendously, it is still lower than most of the Organisation for Economic Cooperation and Development (OECD) countries. It is also significantly lower than in the United States of America, Japan, Canada and the United Kingdom, where household debt ranges between 100 and 120 per cent of disposable income.

With this continuous growth in debt, households find it increasingly difficult to meet their obligations. The high household debt levels are caused by both demand and supply side factors such as the overall decrease in interest rates, greater financial inclusion post-1994, a lack of financially educated consumers, vague debt contracts and reckless lending by financial intermediaries (Roestoff & Renke, 2005; Hurwitz & Luiz, 2007; National Credit Regulator, 2012). As such, the process of credit provision has been under the spotlight for some time. South Africa began to open credit access to previously disadvantaged populations mainly through micro-lending and unsecured credit. A significant increase is observed in unsecured debt, from R8 billion in the last quarter of 2008 to R165 billion in the first quarter of 2016. Unsecured borrowing has risen faster than household disposable income, raising concerns among policy makers. The manner in which unsecured credit expansion was undertaken via outdated legislation was fragmented and not well-thought-out. Not all lenders were required to register, which left room for unregistered

lenders to contravene the Act by offering even qualifying and vulnerable borrowers multiple loans at exorbitant interest rates. The most victims of abusive and reckless lending are lower and middle-income earners (Schoombee, 2004), 47 percent of the credit granted during the first quarter of 2016 was to consumers who have a gross monthly income of less than R10 000. A further 17 percent was granted to consumers who have a gross monthly income of more than R10 000 but less than R15 000. The crash of Saambou and Unibank, and the near collapse of BOE in South Africa in 2002 indicated some regulatory problems in the credit market (Department of Trade and Industry, 2003). This, *inter alia*, motivated for the introduction of the National Credit Act 34 of 2005 to replace Usury Act and the Credit Agreements Act to protect consumers against over-indebtedness (Goodwin-Groen & Kelly-Louw, 2006). However, South African households still remain dangerously leveraged with debt. Recently, in August 2014, increasing unsecured loan defaults by consumers led to the collapse of South Africa's largest unsecured lender, African Bank Limited. The Credit Bureau Monitor reported that only 48 percent of consumers were within their terms, 12 percent were one to two months in arrears, 40 percent were three or more months in arrears, or face judgements and administrative orders as at the first quarter of 2016 (National Credit Regulator, 2016b).

#### **2.6.4 Regulation and over-indebtedness**

Prior to the enactment of the National Credit Act 34 of 2005, the credit market was primarily regulated by the Usury Act of 1968 and the Credit Agreements Act 74 of 1980. The Usury Act covered monetary transactions to the value of R500 000 and capped interest rates for these loans to protect consumers. However, the unintended consequences were that financial institutions became reluctant to offer small loans as these could not compensate for perceived risks in lower income consumers by charging higher interest rates than what was allowed. The low-income market, therefore, remained neglected.

The Usury Exemption Notices of 1992 were later added to exempt loans of up to R6 000 from the interest rate cap regulation of the Usury Act. This, however, led to a rise in unregulated and high cost micro-lending and wide-ranging abuses, affecting mainly low-income consumers. For this

reason, the Exemption Notice of 1992 was replaced by the Exemption Notice of 1999, which extended the exemption amount to R10 000 for instalment credit agreements of less than three years. At the same time, government also established the Micro Finance Regulatory Council (MFRC) to regulate the micro-lending industry (Meagher, 2002; Schoombee, 2004).

This brought some form of regulation to the micro-lending industry. The regulation was key in improving transparency and abusive behaviour by credit providers, thus allowing many individuals to access credit. The credit deprivations experienced during the apartheid regime and the easy access to credit, accompanied by affirmative action as part of the transformation process, led to a high potential for aspirational borrowing that led many consumers into debt. The figures show that since the early 1990s when financial sector reforms were initiated, households have accumulated debt to unsustainable levels, while household savings dropped considerably.

According to Goodwin-Groen and Kelly-Louw (2006), all these efforts were not enough, and the credit market regulation remained fragmented, outdated, thus compromising consumer protection. A new comprehensive regulation became necessary. The National Credit Act, the current legislation, came into effect on 1 June 2007. Its key aim is, *inter alia*, to protect consumers. This objective is achieved by, amongst others, promoting responsibility in the credit market by avoidance of over-indebtedness by consumers and discouraging reckless credit granting by credit providers.

#### **2.6.5 Financial inclusion drive and over-indebtedness**

Microcredit for the poor has sparked critical debates over its 'acclaimed' successes and failures. South Africa is one of the many developing countries that opted to deploy the microcredit model as a poverty reduction and local development initiative. The National Development Plan – the government's economic vision – calls for 90 percent of the population to be banked by 2030. In 2003, by signing the Financial Sector Charter, all financial industry bodies committed themselves to take a lead to achieve financial inclusion and empowerment financing targets of the Black Economic Empowerment Act.

The launch of the Mzantsi account (designed for low-income households) by the four big banks and Postbank is a consequence of The Financial Sector Charter initiative, which improved the population's financial inclusion. Mzansi has managed to fulfil its objective of providing access to the banking system for the lower socio-economic groups. In 2010, the total number of Mzantsi accounts was more than four million. The number declined thereafter as banks found other ways, such as lowering the cost of financial services, to serve low-income customers and then stopped promoting the Mzantsi account.

The overall increase in financial inclusion from 61 to 86 percent over the past ten years is mainly driven by an increase in banking with more people accessing banking products (Finmark Trust, 2014). Organic banking growth and the rollout of the South African Social Security Agency spurred much of the growth – the new social security system requires a bank account for payment. Innovative new platforms are still emerging to bring more people into the financial system. Accessibility of banking infrastructure therefore is key, however with technological advancement to e-wallet, point-of-sale (till point withdrawals), M-Pesa, etc, the infrastructure barrier is set to be overcome. The M-Pesa programme in South Africa has not achieved the success it has in countries like Kenya, and as a result Vodacom announced its discontinuation in 2016. This could be attributed to large banks having recognised the business opportunity in the low-income segment and therefore engaging in intense competition. Other forms of financial services include deposits and withdrawals that can be made at supermarkets.

According to Bond (2015), the most disturbing recent developments in the South African microcredit market reveal consumer over-indebtedness. Consumers face extreme exploitation in the form of high interest rates exceeding the stipulated thresholds as well as harsh debt collection tactics by credit providers. Over-indebtedness from a combination of low wages and easy lending was seen as one of the causes of the 2012 Marikana mining strike, claiming the lives of 34 demonstrating miners (Bond, 2015). In 2014, African Bank Investments Limited (ABIL), a micro lender, collapsed and had to be rescued by the South African government. These developments heightened concerns about the adequacy of the current National Credit Act of 2005. Previously,

small credit providers, who used to fall outside specified thresholds (less than 100 credit agreements or R500 000 of outstanding book) were not required to register with the National Credit Regulator. The National Credit Amendment Act 19 of 2014 requires that any person or entity that is involved in the provision of credit must now register, irrespective of the number of agreements and or the value of the principal debt.

## **2.7 SUMMARY**

This overview has highlighted some stylised facts, socio-economic developments and the current trends in the South African credit market with particular focus on the household sector. Recognizing financial inclusion's potential to improve welfare; South Africa has diligently attempted to correct the injustices of the apartheid era by expanding credit access to low-income, historically disadvantaged populations. Although economic progress since 1994 has been significant, the problems of unemployment, inequality and poverty remain.

The substantial growth in credit extension reflects a structural shift that seeks to accommodate large parts of the population that had been historically excluded from accessing the formal credit market. The benefits of more credit access to stimulate investment and growth as well as that of consumption smoothing are accompanied, however, by the risk of being over-indebted. The most vulnerable households are in the low-income groups although a comprehensive social security system is in existence. They make use of micro-loans to meet basic survival expenses. The desired outcomes in terms of poverty eradication are not being achieved, which is evidenced by the coexistence of over-indebtedness and poverty.

The overview also identified that, initially, there was no comprehensive regulatory framework to support the surge in household debt. Many micro-lenders were not registered and could not be regulated or punished for abusive and reckless lending. The consequences were dire in the unsecured credit market segment. As a result, the National Credit Act is continuously being reviewed to ensure tighter conditions for the provision of credit, in particular in the microfinance industry.

## **CHAPTER 3**

### **THEORETICAL FRAMEWORK**

#### **3.1 INTRODUCTION**

There is no consensus on the definition of over-indebtedness. This chapter explores different definitions of household over-indebtedness applied in the literature as well as the one being used by the National Credit Regulator in South Africa. Well-established theoretical frameworks explain growth in household debt from the standard economic theory of utility maximisation, which is based on the principle of rationality. Section 3.4 provides a brief look at literature on the different conceptual approaches used in poverty measurement with support for a hybrid measure that includes both monetary and non-monetary variables. Finally, Section 3.5 discusses the debt-poverty nexus.

#### **3.2 DEFINING OVER-INDEBTEDNESS**

The steady growth in literature on over-indebtedness reveals some difficulties, both in definition and measurement. There is no universal definition of over-indebtedness. This has led, for example, to the formulation of different definitions and measures, each with its own strengths and weaknesses (Kearns, 2004; Oxera, 2004; Haas, 2006; Betti, Dourmashkin, Rossi & Yin, 2007; Stamp, 2009). Even in Europe, where household indebtedness is considered to be prevalent, the literature is inconsistent. Causes of over-indebtedness are broadly categorised into supply and demand factors, with the former focused on deregulation, marketing and innovation by financial intermediaries. Demand factors look at consumer behaviour and the related aspects that influence credit decisions (Civic Consulting of the Consumer Policy Evaluation Consortium, 2008; Fatoki, 2015). According to Fatoki (2015), over-indebtedness experienced by households had adverse effects on, amongst other things, consumption, investment and economic growth.

In the UK, over-indebtedness is defined as a state where households are in arrears, or at a significant risk of being in arrears on a structural basis (Oxera, 2004). Although this definition justly excludes the situation of being temporarily in arrears, it does not present the precise meaning of 'significant', and for how long in arrears a household should be for debt to be considered a structural problem. Haas (2006, p. 4) proposed a definition derived from the German Federal Ministry, which defined over-indebtedness as follows: "A household is regarded to be over-indebted when its income, in spite of a reduction of the living standard, is insufficient to discharge all payment obligations over a longer period of time." A longer-term view of the definition requires the estimation of minimum living standards and potential income, which is difficult to ascertain. Kearns (2004) used a summary indicator termed 'debt at risk' (DAR), which captured the borrowing capacity and a share of all debts with a high probability of falling into arrears for Irish households and corporate borrowers. According to D'Alessio and Iezzi (2013), in France an individual is considered over-indebted when he or she is incapable, although willing, of fulfilling his or her debt obligations obtained for non-professional reasons. In a cross-country study, Betti *et al.* (2007) introduced a subjective definition that focuses on the individual's own assessment of debt burden. This definition is prone to error, as people may have a problem with disclosing their debt difficulties, and may suffer from different interpretations of what repayment difficulties actually are.

Given the difficulty in defining over-indebtedness, the European Commission appointed researchers to develop a common operational definition in Europe (Davydoff *et al.*, 2008).

The researchers identified some common elements that can be applied as criteria:

- The household is used as a unit of measurement, since individual resources are typically pooled within it.
- All financial commitments are incorporated, such as the mortgage, vehicle finance, consumer credit, utility bills, and rent.
- There is a persistent inability to meet recurrent expenses.

- It is impossible to resolve the problem by simply borrowing more.
- To resolve the issue, a household needs to significantly reduce its expenses or increase its income.

Based on these criteria, an over-indebted household is defined as one whose existing and foreseeable resources are insufficient to meet its financial commitments without lowering its living standards. This has social and policy implications if this means reducing those standards below what is regarded as the minimum acceptable in the country concerned (Fondeville, Ozdemir, & Ward, 2010). In Ireland, Stamp (2009) also borrowed criteria from the European definitions, and stated that “People are over-indebted if their net resources (income and realisable assets) render them persistently unable to meet essential living expenses and debt repayments as they fall due”.

In South Africa, over-indebtedness is generally seen as the inability to repay debts as they become due. Academic literature does not provide a conceptual, comprehensive definition for over-indebtedness. Nonetheless, it is clear that definitions are derived from the indicators or measurements that are being used. The National Credit Regulator, established in terms of the National Credit Act (NCA) of 2005 (Department of Trade and Industry, 2006), is the institution responsible for the regulation of the South African credit market. It therefore appears appropriate to adopt its definition. According to the prescripts of the NCA, Part B, Section 3 of the NCA sets out the objectives of the NCA, and, among other things, lists:

- a) Promoting the development of a credit market that is accessible to all South Africans, and in particular, to those who have historically been unable to access credit under sustainable market conditions.
- b) Addressing and preventing over-indebtedness of consumers, and providing mechanisms for resolving over-indebtedness based on the principle of satisfaction by the consumer of all responsible financial obligations. (Department of Trade and Industry, 2006)

Over-indebtedness is defined in the NCA as a situation that arises when a consumer, given the information at the time, the current financial prospects and obligations, and the consumer's debt repayment history, will probably not be able to service or meet all debt obligations in a timely manner (Department of Trade and Industry, 2006). In terms of the provisions of regulation 24(7) of the Act:

- a) "A consumer is over-indebted if his/her total monthly debt payments exceed the balance derived by deducting his/her minimum living expenses from his/her net income.
- b) Net income is calculated by deducting from the gross income statutory deductions, and other deductions that are made as a condition of employment.
- c) Minimum living expenses are based upon a budget provided by the consumer, adjusted with reference to guidelines issued by the NCR". (Department of Trade and Industry, 2006: 23)

This definition prioritises basic necessities over debt repayment, as households' well-being should not be compromised by debt service in view of the socio-economic status of many South Africans. The inherent difficulty with this definition lies in determining the minimum living expenses.

### **3.3 THEORETICAL FRAMEWORK UNDERPINNING DEBT USE**

The work of Modigliani (2005) and Friedman (1957) known as the life-cycle-permanent-income model (LC-PI) is a dominant theoretical framework in explaining household indebtedness and consumption behaviour related. The model is based on the assumptions that consumers are rational and do not face credit constraints. Households borrow with the aim to smooth out consumption over the life cycle. The lifecycle stages are specified based on a range of variables namely age, employment status, marital status and the presence of children (Baek & Hong, 2004). Assuming the upward sloping path for labour income over the working life of the household, households borrow early in their lives when income is below the desired level of consumption expenditure. As the household ages and labour income grows, indebtedness decreases and once it is repaid, assets are accumulated. Low real interest rates also contribute to higher level of

borrowing rates (Debelle, 2004). On the other hand, the decline in interest rates adversely affects the return on assets, and therefore the ultimate effect of rate-cutting depends largely on which stage of the life cycle most households are in. The empirical evidence, however, is mixed on the net effect of changes in interest rates on household borrowing (Muellbauer, 1994).

Over time, the LC-PI model has evolved. The basic version theorizes that, at any particular point in the life cycle, household's optimal consumption is a constant fraction of discounted lifetime resources (Betti *et al.*, 2007; Deaton, 1992). However, due to uncertainty with regard to income, Hall (1978) made improvements to the model so that optimal consumption in each period takes into account new information about present or future income. Another more recent version of the LC-PI model included risk attitude as a factor explaining optimal consumption growth (Betti *et al.*, 2007; Hayashi, 1997). Crook (2001) also found that US households demand for debt is negatively related to risk aversion.

In the LC-PI framework, the present value of all future debts would be equal or not exceed the current value of assets during the lifetime. The implication is that, households could still be indebted at some point during their life cycle but are safe from being over-indebted. In this context, only unexpected adverse shocks to household expenditures or/and resources could lead to over-indebtedness within the LC-PI framework (Keese, 2009). These shocks may lead to households current assets no longer sufficient to offset the present value of all future debts and affect the ability to repay the debt (Betti *et al.*, 2007). The shocks could express themselves through a reduction of household income (e.g. a job loss), an unforeseen expense (e.g. expensive medical care), an increase in the cost of debt (e.g. a rise in interest rates) or changes in family structure (e.g. divorce or birth or death of a family member) (D'Alessio & Iezzi, 2013). Accordingly, the only way to meet debt repayment commitments in this particular case entails a substantial lowering of consumption levels in order to absorb the shocks and consequences pertaining to over-indebtedness.

Besides the above framework, recent research has presented alternative theories explaining why a household may accumulate more debt than it can repay. Financial imprudence in the form of poor

financial decisions caused by an inadequate understanding of the real cost of repaying the loan leads to over-indebtedness (Disney, Bridges and Gathergood, 2008; Anderloni and Vandone, 2010). This factor may be linked both to the issue of the transparency of lenders' terms and conditions (Department of Trade and Industry, 2005) and to borrowers' financial literacy and ability to manage their finances correctly (Lusardi & Tufano, 2009).

Imprudence may also come from psychological biases and mental shortcuts that affect consumers' decisions and predictions about borrowing, such as the over-confidence bias, i.e. the tendency to underestimate the probability of suffering an adverse event (Kilborn, 2005). According to the prospect theory, for example, in situations where the outcome of a decision is unknown or uncertain, people's optimistic inclination or positive rather than negative outcomes unduly influence their decision making (Kahneman and Tversky, 1979). In the relative income hypothesis by Duesenberry (1951), a typical explanation is described as 'keeping up with the Joneses' whereby people borrow in order to acquire goods necessary to keep up with their reference group.

Market failures in the credit realm could highlight another channel. Here, notably, "liquidity constraint" helps deviate from optimal "smooth path" behavior and explicates over-indebtedness utilizing borrowing blockages which ensue in the wake of adverse negative shocks (Betti et al., 2007).

Others have argued that individuals' habits and preferences are constantly evolving and social institutions and information provision affect this process (see, Hodgson, 2003; Ekelund et al., 1995). Such an evolving and inter-dependent nature of preference formation and decision making could generate behavioural inertia or inappropriate risk attitude and time preference, which in turn could lead to downward rigidity in consumption levels, excessive risk-taking or myopia. Myopic consumers may mismanage resources, and are more susceptible to external shocks and hence fall victims to over-indebtedness more readily than consumers who are far-sighted planners.

### 3.4 POVERTY MEASUREMENT APPROACHES

There are several methods to assess poverty, and each method follows its specific conceptual framework, for example the basic needs approach, the capability approach, the social inclusion approach, and the poverty participatory assessment (PPA) among others (Laderchi, Saith & Stewart, 2003).

The basic needs approach focuses on the resources people command to satisfy their basic needs. The most common resource measures are monetary indicators of income or consumption. Traditional approaches to poverty involve imputation of a monetary value. While resources are clearly vital and essential instruments for moving out of poverty, Sen argues against monetary measures alone to assess poverty status (Sen, 1979). Firstly, it is difficult to arrive at and justify the most appropriate income threshold. Secondly, in addition to earning low income, people below the poverty line engage in indecent work, suffer health conditions, skip meals, remain uneducated, experience violence and humiliation, continue disempowerment, enjoy no rights and so on. The non-monetary yet essential attributes of welfare suffer from imperfect markets, or no markets at all and hence no monetary value can be attached to them (Tsui 2002; Bourguignon and Chakravarty 2003). Thirdly, people's ability to convert resources into resource-based outcomes varies. Two people might earn the same income but do not enjoy the same quality and quantity of food every day.

Townsend (1979) used an income threshold to identify the poor although he had attempted to measure deprivation directly. The work of Townsend was criticised for failing to acknowledge that people's way of living is influenced by their different values, needs and preferences as opposed to lack of resources (Nolan & Whelan, 1996). Mack and Lansley (1985) sought to address this in their survey, in which respondents were asked whether they liked what they could not afford. Subsequently, Townsend and Gordon (1989) produced an income level that distinguished the deprived from the non-deprived in relation to the deprivation index developed earlier by Townsend. The rationale behind the use of income as a measure was based on the thinking that income provides money, which can be used to satisfy and fulfill basic human needs (Scott, 2002).

In order to overcome the shortcomings of the traditional poverty measures, literature has embraced the fact that poverty is multidimensional hence monetary measures alone are seen to provide an incomplete picture of the situation. Building on the weaknesses of the income-based measures, other approaches have emerged such as the capability approach (Sen, 1993; Wolff & De-Shalit, 2007), social inclusion (Atkinson & Marlier, 2010) and the poverty participation approach (PPA) method, which incorporates the perspective on poverty from the poor themselves. These approaches drew attention to the importance of looking at the actual satisfaction of basic needs. Resources were understood to be of secondary importance and merely as a means to an ends (Stewart, 1985).

Sen's capability approach gained increasing recognition as providing an appropriate space for evaluating poverty (Sen, 1979). He developed the concepts of "functionings and capabilities". A 'functioning' is an achievement, and a 'capability' is the ability to achieve. Functionings are directly related to what kind of life people actually lead, whereas capabilities are connected with the freedom people have in the choice of life they lead, which is their functionings. Thus, Sen (1979) argued that wellbeing came from capability to function in society and therefore concentrated on the actual freedoms a person had rather than mere means of living. This influential work provides a conceptual framework for many poverty studies – this study adopts the capability approach which also informs its choice of indicators as discussed in chapter 7.

Notwithstanding recognition of the need for non-monetary based multidimensional poverty measures, income-linked dimensions remain important and are often used to proxy functionings (Heady, 2005; Kuklys, 2005; Zaidi & Burchardt, 2005). Thus, poverty, which is defined as an insufficiency of well-being, should be analysed using both approaches in a multidimensional perspective (Bourguignon & Chakravarty 2003). The living standards that individuals or households experience are related to their command over economic resources. Ringen (1988) advocated for the use of both income and deprivation. Various authors have emphasized that the combination monetary and non-monetary components would be able to improve the measurement and understanding of poverty (Betti & Verma, 2004; Nolan & Whelan, 2009; Battiston *et al.*, 2013;

Bruck & Kebede, 2013; Yu, 2013; Siani, 2015; Krishnan, 2015; Angulo, Diaz & Pardo, 2016; Kaptan, 2016; Martinez-Martinez *et al.*, 2016). Local literature that also uses a hybrid measure includes (Hirschowitz *et al.*, 2000; Klasen, 2000; Noble, Barnes, Wright & Roberts, 2010; Statistics South Africa, 2014b). Alkire and Santos (2010) also admitted that all the living standard indicators were means rather than ends; they were not direct measures of functioning's.

### **3.5 DEBT-POVERTY NEXUS**

High household debt can be a cause or a consequence of poverty (Dubois & Anderson, 2010). Some have advanced the hypothesis that over-indebtedness causes poverty because high debt service costs significantly reduce households' disposable income to the extent that they experience material deprivation. On the contrary, it is also hypothesised that poverty causes over-indebtedness for the reason that, faced with insufficient income or resources, households are pushed below the poverty line as they are not able to repay their existing debt and continue using debt to meet their needs. Layte *et al.* (2001) regard over-indebtedness as a symptom of deprivation.

Most commonly, studies on debt-poverty nexus have found a close link between over-indebtedness and low income (Kempson, 2002; Davydoff *et al.*, 2008; Bryan *et al.*, 2010; D'Alessio & Iezzi, 2013). Using the subjective measure of poverty, Graham (2008), and Howell and Howell (2008) found that high debt can have a stronger impact on subjective well-being than low income. Very few studies examine the relationship between over-indebtedness and poverty based on non-monetary measure of poverty. Recently, using the concept of multidimensional poverty (Strotmann & Volkert, 2016) demonstrated that debt problems have significant negative impact on wellbeing. Over-indebted households also have a higher rate of basic deprivation (Russell *et al.*, 2011).

In terms of threshold effects, no study was found which has investigated debt-poverty threshold effects at a micro level. In this context, theory on macro literature regarding the relationship between debt and poverty is drawn as a basis for discussion. The Debt Laffer

curve theory supports the existence of a non-linear relationship between debt and economic development. According to this theory, initial levels of debt accelerate economic growth but as stock of debt increases, the economy experiences a debt overhang and growth begins to decline. Sachs (1989) and Krugman (1988) developed debt overhang theory models to explain channels through which debt affects growth. High debt servicing costs crowd out investment and capital accumulation, thus lowering economic growth. Conversely, Daud and Podivinsky (2012) argue that there is no evidence that the Debt Laffer curve relationship exists in the debt-growth model, even though accumulation of external debt is associated with economic slowdown in developing countries, although they are safe from crowded out investment rate i.e. debt overhang. There is a number of macro studies that have been conducted on debt threshold (Reinhart & Rogoff, 2010; Cecchetti *et al.*, 2011; Law & Singh, 2014).

Traditionally, studies on the role of external debt concentrated on its linkages to growth in the economy with the assumption that economic growth automatically translate to poverty alleviation. Dollar and Kraay (2000) confirmed that economic growth has a vital role to play in poverty alleviation. Ravallion and Chen (1997) find that poverty falls systematically with higher GDP per capita. However, Holden and Prokopenko (2001) argue that growth in the economy is not adequate for reducing poverty.

Limited studies have directly examined the impact of debt on poverty reduction. The direct impact of external debt on poverty is the crowding out effect of debt service payments on social spending (Shraideh, 2008). Moreover, investment channels lead to economic growth and in so doing facilitate the indirect contribution of financial development to poverty reduction (Saungweme & Mufandaedza, 2013; Shraideh, 2008). According to Honohan (2004) a ten percentage point increase in the ratio of private credit to GDP reduces poverty headcount by 2.5–3 percentage points. In the case of South Africa, Odhiambo (2009) demonstrates that economic growth and financial development lead to poverty alleviation. Loko *et al.* (2003), explores the relationship between external debt and poverty, the main findings of their work

confirm that once the effect of income on poverty has been taken into consideration, high debt service and related external indebtedness indicators have an adverse, but limited impact on non-income poverty indicators. This forms the basis of the study's hypothesis development, that, high indebtedness has an adverse impact on multidimensional poverty after reaching a certain threshold.

### **3.6 SUMMARY**

Despite extensive research on over-indebtedness, literature seems far from reaching consensus on its definition. There seems to be no attempt to find a global definition; most of the focus is on the detection of over-indebtedness, its causes, and the consequences in the financial system. Review of literature on existing theories underpinning debt accumulation suggests that the incorporation of behavioural insights in policy development could be more appropriate to deal with the prevention of over-indebtedness.

Sen's capability approach is popular in poverty measurement studies. It focusses on the actually achievements that people experience rather than means. In this approach, means are also used to proxy for achievements hence it is acceptable to include both monetary and non-monetary variables in poverty measurements. For instance, since over-indebtedness places a burden on households' financial resources, this demonstrates some form of deprivation, as resources used to service debt are not available for other necessities. Lastly, debt, poverty and economic growth linkages are well researched at a macro-level, including the determination of applicable thresholds. This study relies on the debt-poverty literature discussed above in a macro level context to develop the hypothesis for the micro analysis.

## CHAPTER 4

### DATA AND METHODOLOGY

#### 4.1 INTRODUCTION

This study begins with providing descriptive statistics on the prevalence of household over-indebtedness in South Africa by applying the National Credit Regulator indicator and describes the types of households that are over-indebted to achieve the first objective of the study. The second objective requires the assessment of threshold effects of household debt on multidimensional poverty. In this context, a Generalised Additive Model (GAM) is used. Household deprivation score, the depended variable, is calculated using the Alkire-Foster methodology, which is based on the capability approach. Household indebtedness is based on debt service to disposable income ratio. The third objective performs an exploratory analysis using the Multiple Correspondence Analysis (MCA) to statistically justify the inclusion of over-indebtedness as an additional dimensions of the South African Multidimensional Poverty Index (SAMPI). Lastly, the South African Multidimensional Poverty Index – Over-indebtedness which incorporates over-indebtedness, is created to report incidences of multidimensional poverty.

#### 4.2 DATA

The study uses the 2012 National Income Dynamics Study (NIDS) data containing 8040 households. The NIDS, a panel data study conducted by the Southern African Labour and Development Research Unit at the University of Cape Town, is a nationally representative household survey which contains comprehensive household information on income, expenditure, health, the labour market and demographics. Monetary variables have been deflated, with December 2012 used as the base period. Weights are provided in the survey to account for attrition, as well as the original survey design and non-response. The sample represents a total of 15 815 236 households in South Africa after the relevant variables have been weighted.

## 4.3 METHODS

### 4.3.1 Measuring over-indebtedness

It is widely accepted that the concept of over-indebtedness is multifaceted, and no single indicator can encapsulate it. This is illustrated by the fact that overlaps between the different indicators are not perfect. The indicators represent different dimensions of credit behaviour, and some show current debt problems (arrears indicators), while others provide a warning sign of debt problems to come (multiple loans). The common indicators, as set out in Table 4.1, cover features in relation to debt service relative to income; being in arrears; heavy use of credit; and finding debt a burden (Bryan, Taylor & Veliziotis, 2010; D'Alessio & Iezzi, 2013).

**Table 4.1: Common indicators of over-indebtedness**

Category	Indicator
Cost of servicing debt ( <i>objective</i> )	Households spending more than 30% (or 50%) of their gross monthly income on total borrowing repayments (secured and unsecured).
	Households spending more than 15% of their gross monthly income on unsecured lending repayments.
	Households below poverty line, with debt.
	Households whose spending on debt service takes them below the poverty line.
Arrears	Households that are more than two months in arrears on a credit commitment or household bill.
Multiple lines of credit	Households with three or more credit commitments.
Perception of burden ( <i>subjective</i> )	Households declaring that their borrowing repayments are a 'heavy burden'.

Source: Compiled by author, and adopted from D'Alessio and Iezzi (2013).

The objective indicators refer to a defined benchmark beyond which a household is considered burdened by debt. However, no recognised methodology exists for determining the benchmarks. Oxera (2004) and Bryan *et al.* (2010) identified a 50 percent threshold for debt service relative to income, but some studies have used a benchmark of 30 percent (Hurwitz & Luiz, 2007; D'Alessio & Iezzi, 2013). For unsecured loans a 25 percent threshold is used (Kempson, 2002). However, D'Alessio and Iezzi (2013) suggested a reduction from 25 percent to 15 percent for unsecured loans, following their impressive study in which they tested the indicators for statistical associations with the subjective measure. It was found that the association measure reached a peak when the limit was 15 percent. The weakness in this ratio is that it ignores assets that might be available to settle the households' obligations (D'Alessio & Iezzi, 2013). In addition, it does not take into account the Life Cycle-Permanent Income (LC-PI) hypothesis, which suggests that debt accumulation is not uniform over the life cycle, and a breach of the cut-off by a young adult may be normal – unlike when it happens for senior citizens. The third indicator identifies households as being over-indebted when their income is below the poverty line; and under the fourth indicator households are over-indebted if after servicing debt, their disposable income goes below the poverty line (Davydoff *et al.*, 2008; D'Alessio & Iezzi, 2013). The poverty line is calculated as 50 percent of the median income (OECD, 2014)<sup>1</sup>.

With the arrears indicator, if the household bill or loan remains unpaid for more than two months, the household is considered to be over-indebted (D'Alessio & Iezzi, 2013). Since this indicator looks at households that are currently in arrears, those who can still manage repayments, or have borrowed much more, will be overlooked. There are, however, differences in opinion over how long the time ought to be in order for the debt to be considered a structural problem. Davydoff *et al.* (2008) and Russell *et al.* (2011) specified that falling in arrears more than once during the past 12 months constitutes being over-indebted.

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<sup>1</sup> For this purpose, the square root scale is used, which divides household income by the square root of household size.

In terms of the number of loans indicator, Kempson (2002) recognised a significant relationship between experiencing repayment difficulties and holding four or more credit commitments. Investigating over-indebtedness in the Philippines, Diaz and Ledesma (2011) state that multiple borrowing leads clients to take a further loan to repay existing loans. D'Alessio and Iezzi (2013) suggested that three credit commitments only are enough to expose the household to financial difficulties. Multiple lines of credit do not automatically translate into financial difficulties; for instance, small loans do not pose a threat to a household with a good income. The more credit commitments households have and the larger the proportion of their income spent on repaying credit, the more likely they will be in arrears (Kempson, McKay & Willitts, 2004). Households that hold more than four outstanding credit commitments are those with higher levels of income – which again is not unexpected (Department for Business Enterprise & Regulatory Reform, 2007). However, interestingly, regression analysis has shown that credit commitments have statistically significant effects on levels of arrears among families, when all other factors are held constant, including income (Kempson *et al.*, 2004).

The indicator preferred in Betti *et al.* (2007) recommended that households should be placed in a better position to assess their own scale of burden imposed by debt. Households who declare that they are confronted with debt repayment problems are classified as over-indebted. The shortcoming with this indicator is that the state of being heavily burdened may be interpreted in different ways by different households.

In a study of financial diaries of households in South Africa (Collins, 2008), it was stated that households were over-indebted if more than 20 percent of gross monthly income was spent on debt. This reflects a departure from the 30 percent threshold (Hurwitz & Luiz, 2007). The difference in benchmarks might be caused by the sample evaluated; the earlier study considered poorer households earning below R2 000 per month. In Lea *et al.* (1995), a household was considered

over-indebted if, without a choice, it could not repay at the agreed-upon time. Nyaruwata (2009) identified over-indebted households as those in which debt servicing and basic expenditure did not exceed 70 percent of disposable income. Ardington, Lam, Leibbrandt and Levinsohn (2004) presented another way of looking at over-indebtedness, and stated that a household is over-indebted if it required another loan in order to repay a current loan.

The National Credit Regulator appointed a debt-review task team to evaluate over-indebtedness in the National Credit Act, its definitions, and the manner in which it is applied in practice. The minimum living expenses set out in the legislation are difficult to operationalise in terms of how they are calculated. In the interim, the task team provided the following guidelines to assess over-indebtedness (see Table 4.2). The approach being followed recognises that the debt service burden is experienced differently based on income level. The guidelines provide for a minimum level of net income that a household should have available for debt repayments, and beyond the upper limit a household is considered over-indebted.

**Table 4.2: Acceptable debt service ratios**

<b>After-tax income</b>	<b>Percentage of household income available for debt service</b>
R0 – R2 000	23% to 45%
R2 001 – R5 000	32% to 47%
R5 001 – R10 000	35% to 49%
R10 001 – R20 000	37% to 51%
R20 001 – R40 000	40% to 53%
R40 001 – R60 000	45% to 55%
R60 001 +	45% to 58%

Source: National Credit Regulator (2010)

The literature supports the view that income is a strong predictor of over-indebtedness (Kempson *et al.*, 2004; Department of Trade and Industry, 2005; Mashigo, 2006; Nyaruwata, 2009; Stamp, 2009; Bryan *et al.*, 2010; Russell *et al.*, 2011). In addition, the South African economy is

characterised by high levels of income inequality, and therefore it appears appropriate to consider debt burdens in terms of income levels. Consequently, the National Credit Regulator indicator will be used in the rest of this work.

#### 4.3.2 Alkire-Foster (AF) methodology

The study applies the Alkire-Foster counting approach to identify the deprivation vector for each household. This methodology is applied in the determination of the Global Multidimensional Poverty Index (GMPI), an index of three dimensions (education, health and standards of living) consisting of ten indicators in total. The GMPI was developed by Oxford Poverty and Human Development Initiative to measure multidimensional poverty as a complement to the traditional poverty measurements. Table 4.3 contains the selected dimensions with their respective weights and the deprivation cut-offs. Equal weighting is attached to all dimensions and indicators, and a cut-off of  $k = 1/3$  is set (Oxford Poverty and Human Development Initiative, 2015). A household is identified as poor if it is deprived in a third or more of the weighted deprivation count.

Following the AF methodology (Alkire & Foster, 2011), the weighted deprivation count is calculated as follows: consider poverty in  $d$  indicators across  $n$  households. Let  $y = [y_{ij}]$  denote the  $n \times d$  matrix of achievements for  $i$  households across  $j$  indicators. Each row vector  $y_i = (y_{i1}, y_{i2}, \dots, y_{id})$  gives  $i$  households' achievements in each dimension. The deprivation cut-off in indicator  $j$  is represented by  $z_j > 0$  where  $z$  is the vector of deprivation cut-offs. Each of the indicators is associated with a deprivation cut-off, where  $g_{ij}^0 = 0$  represents non-deprivation when  $y_{ij} < z_j$  while  $g_{ij}^0 = 1$  represents deprivation when  $y_{ij} \geq z_j$ . A weighting vector  $w$  whose  $j$ th element  $w_j$  represents the weight that is applied to indicator  $j$  is defined. The dimensional weights sum to the total number of indicators which is specified by  $\sum_{j=1}^d w_j = d$ .

Lastly a deprivation score, specified as  $C_i = \sum_{j=1}^d w_j g_{ij}^0$ , is derived from the deprivation matrix whose  $i$ th entry represents the sum of the entries in a given row, and represents the weighted deprivations suffered by households  $i$ . The poverty cut-off  $k=1/3$ , is used to identify whether a household is deprived or not.

**Table 4.3: Global dimensions and indicators used to calculate the MPI**

<b>Dimension</b>	<b>Indicator</b>	<b>Deprivation cutoff</b>	<b>Weight</b>
Education	Years of schooling	No adult household member has completed five years of schooling	1/6
	Child enrolment	At least one school-aged child (aged 7 to 15) is out of school	1/6
Health	Child mortality	Household has had a child under the age of 15 who has died in the past 20 years	1/6
	Nutrition	At least one adult (> 18 years old) has a Body Mass Index (BMI) less than 18.5	1/6
Living standards	Electricity	Household has no electricity	1/18
	Drinking water	No piped water in dwelling or on stand	1/18
	Sanitation	No flush toilet or pit latrine, or household shares toilet with another household	1/18
	Cooking fuel	Household does not use electricity, gas or paraffin for cooking	1/18
	Assets	Household does not own more than one of radio, TV, telephone, fridge, bicycle, and does not own a car	1/18
	Floor	The household has a dirt, sand, or dung floor	1/18

Source: Oxford Poverty and Human Development Initiative (2015).

### **4.3.3 Proposed dimensions for the South African Multidimensional Poverty Index – Over-indebtedness (SAMPI-OI)**

Using 2001 and 2011 census data, Statistics South Africa produced a national multidimensional poverty index with the inclusion of economic activity (unemployment) as an additional dimension (Statistics South Africa, 2014b). This work incorporates financial commitments (over-indebtedness) as a dimension to extend the work of Oxford Poverty and Human Development Initiative and Statistics South Africa. Table 4.3 has been adapted as shown in Table 4.4. The discussion of the rationale for the inclusion of additional dimensions and the statistical assessment are contained in Chapter 7. The extreme left column of Table 4.4 shows the indicator variables that are categorised into five dimensions: education, health, living standards, economic activity and financial commitments. The two second and the third columns show the indicators within each dimension and how they are denoted, respectively. The fourth column shows the deprivation cut-off followed in the AF methodology (Alkire & Foster, 2011) where 0 represents non- deprivation and 1 represents deprivation. Weights assigned to each indicator are shown in the extreme right column.

**Table 4.4: Proposed dimensions and indicators for SAMPI-OI**

<b>Dimension</b>	<b>Indicator</b>	<b>Denoted by</b>	<b>Deprivation cut-off</b>	<b>Weight</b>
Education	Years of schooling	e.sy	No adult household member has completed five years of schooling	1/10
	Child enrolment	e.ca	At least one school-aged child (aged 7 to 15) is out of school	1/10
Health	Child mortality	h.cm	Household has had a child under the age of 15 who has died in the past 20 years	1/10
	Nutrition	h.n	At least one adult (> 18 years old) has a Body mass index (BMI) less than 18.5	1/10
Living standards	Electricity	l.e	Household has no electricity	1/30
	Drinking water	l.w	No piped water in dwelling or on stand	1/30
	Sanitation	l.s	No flush toilet or pit latrine, or household shares toilet with another household	1/30
	Cooking fuel	l.c	Household does not use electricity, gas or paraffin for cooking	1/30
	Assets	l.a	Household does not own more than one of radio, TV, telephone, fridge, bicycle and does not own a car	1/30
	Floor	l.f	The household has a dirt, sand, or dung floor	1/30
Economic activity	Employment status	em.sta	If all adults (aged 15 to 64) in the household are unemployed	1/5
Financial commitments	Over-indebtedness	db.sta	Over-indebtedness status per Table 4.2	1/5

Source: Adapted from Oxford Poverty and Human Development Initiative (2015).

## 4.4 ESTIMATION MODELS

This study uses different methods or estimation techniques to address research objectives. Research objectives one and four are descriptive and have been discussed in detail above. The fifth objective is captured in the discussion of policy implications in the conclusion section. This section outlines the estimation techniques used to address research objectives two and three. First, in order to explore the existence of thresholds in the debt-poverty nexus, GAM will be used. In order to achieve the third objective, MCA is used to test whether the new proposed additional dimension (financial commitments) is statistically valid to justify its incorporation into the South African Multidimensional Poverty Index.

### 4.4.1 Generalised Additive Model (GAM)

The second objective of this study is to estimate the threshold effects of household debt on multidimensional poverty. In this context, the study uses a combination of smoothing splines and the Generalized Additive Model (GAM) developed by Hasties and Tibshirani (1990), a robust estimation methodology to estimate the relationship between multidimensional poverty and the six explanatory variables in order to interrogate the second objective. Table 4.5 lists the various explanatory variables.

**Table 4.5: Explanatory variables**

<b>Explanatory variables</b>	<b>Denoted by</b>
Debt service ratio (debt repayments/household income)	debt.s
Household head age in years	age
Government grants received in Rands	govt.g
Number of children aged 0-15 in a household	children

Household size (total number of members in the household)	hhsiz
Education (household head years of education)	edu.n

Source: Compiled by author

GAMs are very flexible in modelling the effects of specific variables, but not so pliable that they find nonlinear patterns where none exist (Beck & Jackman, 1998). In statistical analysis, linearity is one of the most used assumptions. The advantage of using splines lies in the fact that by increasing the degree of freedom of the estimation function, a non-linear relationship between multidimensional poverty and the various explanatory variables can be estimated without making any *a priori* assumption about the nature of the relationships. This allows non-linear features of the data to be revealed automatically.

The GAM model is estimated using a backfitting algorithm, also known as Gauss-Seidel method, which iteratively applies locally weighted regression smoother (Friedman & Stuetzle, 1981). The equivalent degrees of freedom are used as smoothing parameters, a measure of the amount smoothing done i.e the higher the value, the smoother the curve. The smoothing parameters are selected in a stepwise process for each independent variable. The procedure begins with a model where all terms are linearly, followed by upgrading or downgrading the degrees of freedom for each variable by one level. However, because one can manipulate the model to increase fit to the data, penalising the goodness of fit is appropriate. In order to control the balance between the goodness of fit and smoothness, the Akaike's Information Criterion (AIC) is used where a smaller score indicates a better fit. According to Everitt (1998), the AIC imposes a penalty for increasing the number of parameters.

The functional form of the relationship to be estimated is:

$$C_i = \beta_0 + f_1(\text{debt.}s) + f_2(\text{age}) + f_3(\text{govt.}g) + f_4(\text{children}) + f_5(\text{hhsiz}) + f_6(\text{edu.}n) + \varepsilon_i$$

Where  $C_i$  is the household's deprivation score and the other variable notations are as mentioned in Table 4.5,  $\beta_0$  is the intercept and  $\varepsilon_i$  is the error term. The  $f_i$ 's approximate the non-linear relationship between the  $C_i$  and respective explanatory variables by increasing the degree of the estimating polynomial function and the degree of freedom.

The strength of GAMs is their ability to deal with highly non-linear and non-monotonic relationships between the response and the set of explanatory variables. Although the generalized additive model can be more flexible than traditional models, there are still limitations. Firstly, output may be more difficult to interpret as the model uses spline functions (Wood, 2006). However, graphical representations are used and often better reflect the resultant relationships. Secondly, too many degrees of freedom can lead to overfitting (describing random error as if they were real nonlinearities) (Moore *et al.*, 2011). Wood (2006) advocates restricting the degrees of freedom available to each covariate to a relatively small value and then performing model selection afterwards if necessary. Diagnostic plots of residuals can also be used for evidence of over- and under-fitting (Cleveland, Grosse & Shyu, 1992).

In this study,  $f_1(\text{debt.s})$ ,  $f_2(\text{age})$ ,  $f_3(\text{govt.g})$ ,  $f_4(\text{children})$ ,  $f_5(\text{hhsz})$  and  $f_6(\text{edu.n})$  are assumed as a polynomial of first or second degree and their corresponding degrees of freedom is one more than their degrees of polynomial. For example if  $f_1(\text{debt.s})$  is a second degree polynomial, then its corresponding degrees of freedom are 3.

#### **4.4.2 Multiple Correspondence Analysis (MCA) approach**

For the purpose of testing the third objective, MCA was used to explore the quality of contribution that over-indebtedness (db.sta) has towards the South African Multidimensional Poverty Index for it to be regarded as an additional indicator to the index.

A Principal Component Analysis (PCA), first proposed by Pearson (1901) and later developed by Hotelling (1933) is a natural choice as a data exploration technique. It seeks to find fewer principal components (PCs) that retain most of the information in the original set of observed indicators. The technique also provides weights or contributions for each indicator based on the covariance matrix.

A major weakness of PCA is that it was developed for quantitative variables while MCA, a new version of the PCA is appropriate when variables are categorical or binary (Alkire *et al.*, 2015). Moreover, quantitative variables can always be transformed into categorical ones. Asselin and Anh (2008) deal specifically with the use of MCA in multidimensional poverty analysis.

Introduced by Benzecri (1973), MCA is a method of finding the interrelationship between variables and the strength of the association between them (Greenacre, 2007). A matrix, with elements of 0s and 1s, is created. Observations with missing values are omitted from the analysis. The MCA performs a correspondence analysis on Burt matrix in this study which is obtained by multiplying the disjuncture matrix by its transpose. The application of MCA on the Burt matrix performs better in comparison to the results obtained from the indicator matrix (Greenacre, 2007).

There are four major advantages of using MCA over PCA. (1) MCA makes fewer assumptions than PCA regarding the distribution of the indicator variables and quantifies each indicator in a non-linear way, thus being free from the linearity hypothesis. (2) MCA addresses marginalisation bias by giving more importance to indicators with a smaller observations, thus focusing on the highly impoverished (Asselin & Anh, 2008). (3) MCA contains a reciprocal bi-additive character in that it can be applied to row-profiles (observations) or column-profiles (categories), and (4): while PCA studies the linear relationship between the variables, MCA studies the more complex non-linear relationships between them (Asselin & Anh, 2008). In a comparative study of multidimensional poverty between PCA, MCA and the fuzzy approach, Njong and Ningaye (2008) concluded that MCA is more sensitive to deprivation and therefore to be preferred to PCA.

It should be noted that even with its strengths, MCA suffers some weaknesses. The results of MCA are data driven making it difficult for intertemporal and cross-country comparisons, for instance, weights obtained may vary from one period to the next (Alkire *et al.*, 2015). The MCA also artificially inflates the chi-squared distances between profiles and thereby underestimating the percentage of variance explained by the first dimension. Introducing scale adjustments to the MCA solution corrects this challenge (Gower, 2006). The choice of factorial axis (dimensions) could

imply a high information loss (Asselin & Anh, 2008). This is remedied by consistency requirements that should be satisfied for results obtained through MCA as discussed later in this section.

In the analysis, the indicator variables are encoded as either 0 or 1. The distance (d) between two households i and i' in category D (for example) is calculated as:

$$d_{i,i'}^2 = C \sum_{d=1}^D \frac{(x_{i,d} - x_{i',d})^2}{I_d} \dots\dots\dots (1)$$

where C is a constant and  $I_d$  is the number of households that falls in d.

The distance between the two categories n and nd is calculated by determining the number of households that fall within d and nd, and is given by

$$d_{d,nd}^2 = C' \frac{1}{I_d I_{nd}} \sum_{i=1}^I (x_{i,d} - x_{i,nd})^2 \dots\dots\dots (2)$$

where  $C'$  is a constant, and  $I_d$  and  $I_{nd}$  are the number of households that fall within the category d and nd respectively<sup>2</sup>. Following Ezrari and Verme (2012), there are two ways of analysing poverty on a multidimensional dataset: (i) vertical analysis, in which the individual households are compared against one another; and (ii) horizontal analysis, in which the dimensions (indicator variables) are compared against one another. In extending the work of Ezrari and Verme (2012), who follow the horizontal approach only, this chapter uses both equation 1 and 2 to understand the nature of poverty in South Africa.

In addition, in understanding how over-indebtedness (db.sta) affects multidimensional poverty, the question of impact or weightage of various indicator variables that influence the Composite Poverty Indicator (CPI) is addressed. While some researchers use the subjective measure of providing equal weight to all indicator variables, this study uses the objective measure of using the weights from MCA to evaluate the importance of each variable on CPI. In this regard CPI is defined as a latent multidimensional combination of deprivation and non-deprivation of 12 indicator variables. It

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<sup>2</sup> Equation 1 and 2 are adopted from *Exploratory Multivariate Analysis by Example Using R*, Francois Husson, Sebastien Le and Jerome Pages, (2011), Boca Raton, Fla: CRC Press.

is latent because poverty here is measured through the observed proxies of  $d$  and  $nd$ . The functional form of CPI is

$$CPI_i = \frac{1}{K} \sum_{k=1}^K \sum_{j_k=1}^{J_k} W_{jk}^k I_{jk}^k \dots\dots\dots (3)$$

With

$$W_{jk}^k = \frac{s^k}{\sqrt{\lambda}} \dots\dots\dots (4)^3$$

where  $k = (1,2,3,\dots,K(=12))$  is the number of indicator variables,  $j = (1,J_k(=2))$  is the number of modalities of each variable,  $I$  (0/1) is the indicator of the modality of each variable,  $W$  is the weight-age or the factor scores of the first dimension of MCA normalised by the eigen value  $\lambda$  with  $s$  factor score. The first dimension accounts for most of the total variance and all subsequent dimensions have decreasing variances. Asselin (2009) discusses the consistency requirements (axioms) that a multidimensional poverty analysis done through MCA should satisfy as robustness checks. The monotonicity axiom suggests that if a household's poverty situation, for any given indicator, improves then its overall poverty value should decrease. This requirement has two elements: First Axis Ordering Consistency (FAOC-I) for indicator states that there must be an ordinal consistency between the ordering of categories and the ordering of weights across categories, either increasing or decreasing order, and Global First Axis Ordering Consistency (FAOC-G) – for all indicators states that the ordering of weights for all indicators should be consistent as evidence by either decreasing or increasing trend. A binary variable always meets the FAOC-I requirement. The CPI is a by-product of MCA and it deals with multidimensionality of poverty at the household level while aggregation at societal level can follow the counting procedures applied in the AF methodology.

#### 4.5 SUMMARY

This chapter provided a detailed description of this study's research methodology. Through a comparison with literature, different methods of measuring over-indebtedness were discussed. These will be implemented in the next chapter to determine the extent of over-indebtedness in South Africa in pursuance of the first objective of the study. The distribution of over-indebtedness

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<sup>3</sup> Adopted from Ezzrari & Verme (2012)

across household characteristics will also be analysed using the National Credit Regulator measure.

The GAM will be applied in chapter six to estimate the threshold effects of household debt on multidimensional poverty. The model is flexible to capture very complex curves along data points and thus seen as the most appropriate for objective two of the study. With regard to the third objective, MCA will explore the quality of contribution that over-indebtedness status has on SAMPI. Other exploratory analysis techniques are inclined towards using continuous variables, and thus not compatible with dataset that is used in this study. A significant contribution of over-indebtedness in the poverty index will therefore justify its inclusion in the South African Multidimensional Poverty Index that will be constructed in chapter eight.

## CHAPTER 5

### HOUSEHOLD OVER-INDEBTEDNESS: UNDERSTANDING ITS EXTENT AND CHARACTERISTICS OF THOSE AFFECTED<sup>4</sup>

#### 5.1 INTRODUCTION

During the past two decades, many South African households have moved into the middle class – largely financed through credit. Debt is necessary to sustain a constant consumption level, and to boost the economy. It is widely acknowledged that finance plays an important role in promoting economic growth (King & Levine, 1993; Cecchetti *et al*, 2011). However, the ultimate problem is the accumulation of debt, with no repayment plan. With continuous growth in debt, households find it increasingly difficult to make repayments, because of stagnant and smaller earnings.

The economic recession following the global financial crisis, which began in 2008, and the resultant job losses, together with a continuing squeeze on credit, triggered concerns that a substantial and growing number of households are likely to have difficulty in managing their debts. Over-indebtedness poses a serious threat, not only to the households directly concerned, but to society as a whole (Griffiths, 2000). Previous authors have suggested that over-indebtedness may have severe consequences (Civic Consulting of the Consumer Policy Evaluation Consortium, 2008). It can be hard for a person with serious payment difficulties to obtain a home tenancy, employment, new credit, a telephone or internet subscription, life insurance or pension policies. Research has also revealed a clear connection between impaired physical/mental health and over-indebtedness (Civic Consulting of the Consumer Policy Evaluation Consortium, 2008; Cuesta & Budria, 2015). Many people with financial problems suffer from depression, stress-related symptoms, thoughts of suicide, and feelings of helplessness, shame or second-class citizenship

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<sup>4</sup> This chapter has been published as an empirical paper in the *Journal of Social Sciences*. Available online at [http://krepublishers.com/02-Journals/JSS/JSS-48-0-000-16-Web/JSS-48-1,2-000-16-Abst-PDF/JSS-48-1,2-079-16-2005-Ntsalaze-L/JSS-48-1,2-079-16-2005-Ntsalaze-L-Tx\[9\].pdf](http://krepublishers.com/02-Journals/JSS/JSS-48-0-000-16-Web/JSS-48-1,2-000-16-Abst-PDF/JSS-48-1,2-079-16-2005-Ntsalaze-L/JSS-48-1,2-079-16-2005-Ntsalaze-L-Tx[9].pdf)

(Fatoki, 2015). As for the impact on the financial industry, theory predicts that when a negative income shock occurs – particularly in an environment characterised by high levels of household indebtedness – debtors may find it difficult to meet their commitments. This causes an increase in non-performing loans, and therefore weakens the balance sheets of financial intermediaries. This in turn leads to a reduction in credit availability, as financial institutions become more wary about lending, and eventually results in a fall in household consumption (Dynan 2012; Albuquerque & Krustev 2015).

The extent of household over-indebtedness certainly depends on the adopted measurement – which is not uniform in the literature. The South African household debt-to-GDP ratio is relatively low by international standards. It was reported at 46.5 percent in the second quarter of 2015 (South African Reserve Bank, 2015). In a sample of 47 advanced and developing countries, the rich economies of Denmark (129 percent), Norway (124 percent), the Netherlands (115 percent) and Australia (113 percent) have the highest debt-to-GDP ratios while in the BRICS countries, household debt stood at 25 (Brazil), 16 (Russia), 9 (India) and 38 percent (China) in 2014 (McKinsey Global Institute, 2015).

The objective of this chapter is to provide descriptive statistics on the prevalence of households' over-indebtedness in South Africa, using the commonly accepted indicators in the international literature, as well as those of the National Credit Regulator. Additionally, overlap between indicators of over-indebtedness and the characteristics of the types of households who are over-indebted is provided.

## **5.2 RELATED LITERATURE**

The results of empirical studies on over-indebtedness clearly show that indebtedness and over-indebtedness are distinct concepts, though related. This is emphasised by the coexistence of high indebtedness with lower over-indebtedness in some instances. Bryan *et al.* (2010) found a small but significant minority of individuals and households in Great Britain who suffered from problems

of over-indebtedness, depending on the indicator used, over-indebtedness affects four to six percent of individuals (unsecured credit only), and eight percent to 17 percent of households. Kempson (2002) indicated that five and seven percent of households were over-indebted based on debt-service ratios, and a large number of current credit commitments respectively. In the 1990s, only about ten percent of households in Sweden were afflicted by over-indebtedness, and they later found a solution through debt restructuring (Persson, 2010). The Northern Ireland Statistics and Research Agency (2006) ranked Northern Ireland's personal over-indebtedness at an average of ten percent. Betti *et al.* (2007) found that over-indebtedness was a substantial problem across EU countries in the mid-1990s. According to Civic Consulting of the Consumer Policy Evaluation Consortium (2008), average over-indebtedness in the EU is ten percent; the highest rates of over-indebted households are in Greece and Poland (31% and 19% respectively), while fewer households were over-indebted in Austria and Spain (3% and 5%). Bryan *et al.* (2010) found a small but significant minority of individuals and households in Great Britain who suffered from problems of over-indebtedness, depending on the indicator used, over-indebtedness affects four to six percent of individuals (unsecured credit only), and eight percent to 17 percent of households. The Money Advice Service (2013) revealed that across the United Kingdom, 18 percent of the adult population were at least three months behind their bills over a six month period and therefore considered over-indebted. Using the "three times annual income" measure, 23 percent of households in Denmark qualify as over-indebted (OECD, 2015). On average, 11 percent of households are over-indebted, with Norway and the Netherlands showing high over-indebtedness as Denmark. In Italy, 2.3 percent of households spend more than 30 percent of their income on debt repayments, when using the 25 percent threshold for unsecured debt, the share of over-indebted households is only 0.7 percent. About 3.9 percent of households are estimated to be poor and indebted or to have debt servicing costs that take them below the poverty line. Lastly, the share of households with the perception of having debt problems is 8.5 percent in 2013 (D'Alessio & Iezzi, 2016)

There is a lack of comparative information in developing countries, where most studies focus on micro finance, which is targeted only at lower-income groups, or simple non-numerical analyses of over-indebtedness. For example, Porto (2012) looked at regulation aspects of over-indebtedness in Brazil. Both Ruthven (2002) and Rutherford (2003), using data from Bangladesh and India respectively, explored capital formation among poor households, and concurred that informal credit channels such as moneylenders and small shops were popular. A study conducted in SADC reveals that a third of adults are indebted, with a quarter of adults being overindebted (Fanta, Mutsonziwa, Berkowitz & Goosen, 2017). This suggests that, on average, 78 percent of adults that access credit are over-indebted. South Africa and Tanzania are the top of the over-indebted adults ranking with nearly a third of adults reporting to experience over-indebtedness while Mauritius and the Democratic Republic of Congo are at the bottom with 1 percent or less over-indebted.

Financial diaries of the poor in selected areas (Langa, Cape Town; Diepsloot, Johannesburg; and Lugangeni, Eastern Cape), revealed that only 24 percent of households experienced high indebtedness (Nunez, Forrester & De Wet, 2008). In Johannesburg, poor households who had access to credit and were able to pay in time represented only 31 percent (University of Johannesburg, 2008). Applying both objective and subjective measures of over-indebtedness, consumers admitted that they borrowed to repay other credit, could not pay as expected, and their gross monthly income committed to instalments was more than 30 percent, according to Hurwitz and Luiz (2007). They found that 60 percent of the working class were over-indebted, 28 percent were committed to paying more than 100 percent of their gross monthly income, and ten percent were committed to paying more than 200 percent. Using the 20 percent benchmark for households earning below R2 000 per month, Collins (2008) found that over-indebtedness was not endemic, and about 50 percent of households scored zero to ten percent.

With respect to the types of household who are over-indebted, the literature distinguishes between (i) characteristics of the household head, and (ii) characteristics of the whole household in assessing which groups are over-indebted:

**(i) Household head characteristics**

**Age**

Atkinson, McKay, Kempson and Collard (2006) confirmed the general consensus that age is a strong predictor of over-indebtedness. Numerous authors state that debt problems decline with age, that is, households headed by young adults are associated with high risks of experiencing financial difficulties, particularly in the 25-35 age group (Kempson, 2002; Kempson *et al.*, 2004; Bryan *et al.*, 2010). According to the Department of Trade and Industry (2005), the 25-44 age group was significantly over-represented in high levels of debt. Some studies put the most vulnerable group as being under 25 years of age (Department for Business Enterprise & Regulatory Reform, 2007; Russell *et al.*, 2011), whereas Bryan *et al.* (2010) found that age had little impact on the probability of being over-indebted. In contrast, Nyaruwata (2009) argued that, although statistically insignificant, the probability of over-indebtedness increased with age – given that older household heads had more dependents to look after.

**Gender**

The overwhelming evidence is that female-headed households are more likely to be over-indebted than male-headed households (Department of Trade and Industry, 2005; Nyaruwata, 2009; Bryan *et al.*, 2010; Russell *et al.*, 2011). This may be due to their lower than average incomes, and because they are prone to working fewer hours because of their maternal responsibilities (Department of Trade and Industry, 2005). Despite this, research in South Africa indicates that debt to income ratios are much more for male-headed households than for those headed by females. However, females who do get access to credit are more likely to be over-indebted than their male counterparts (Daniels, 2001; Nyaruwata, 2009).

### ***Employment status***

Employment is linked to earning capacity, and therefore being unemployed translates to low income (Taylor, 2011). Over-indebtedness is prevalent in households where the head is not working, sick or disabled (Kempson, 2002; Kempson *et al.*, 2004; Bryan *et al.*, 2010). The argument advanced, given the connection between income and employment, was proved incorrect, and in a logistic regression analysis, Russell *et al.* (2011) found that even after controlling for income, over-indebtedness was associated with being unemployed and the inability to work owing to illness or disability.

### ***Education***

There are contrasting views on whether a household head's level of education influences household over-indebtedness. There is some evidence that education reduces the probability of over-indebtedness (Bryan *et al.*, 2010). Russell *et al.* (2011) agreed, and suggested, through regression analysis, that households where the head had no qualifications were most likely to be over-indebted. Nyaruwata (2009), however, argued that a tertiary academic education increased the odds of being over-indebted. This advances the view that finances need specific financial skills, and an automatic link between higher education and better financial management cannot be assumed. On the other hand, Guerin (2012) was strongly against the belief that financial illiteracy caused over-indebtedness, and pointed to predatory lending practices as being a key problem among low-income groups.

### ***Ethnicity***

There is scant literature on the influence of ethnicity. In the UK, Del-Rio and Young (2005) found that individuals from non-white backgrounds reported more financial difficulties when other factors were controlled for. The Department of Trade and Industry (2005) found that people categorised as British were underrepresented in over-indebtedness indicators compared to ethnic minority groups. Studies in Malaysia found that ethnicity had a significant effect on the probability of living beyond one's means (Loke, Yen & Tan, 2013; Loke 2016). In South Africa, Daniels (2001) found that indebtedness was racially distributed, and that white people were the most indebted, with the

African ethnic group experiencing the lowest levels of indebtedness. This could be because many black South Africans still had limited or no access to a variety of basic services, including financial services, for some years after the 1994 democratic election.

## **(ii) Household characteristics**

### ***Housing tenure***

Housing tenure makes a distinction between those living in rented houses and owner-occupied houses. When all other factors are held constant, home ownership is associated with a lower risk of over-indebtedness than renting (Kempson *et al.*, 2004). The odds of being in arrears are higher for households that buy their homes on a mortgage, compared to outright owners (Department for Business Enterprise & Regulatory Reform, 2007; Bryan *et al.*, 2010). The mortgagors, however, have fewer financial difficulties than tenants (Kempson, 2002; Kempson *et al.*, 2004; Department of Trade and Industry, 2005; Russell *et al.*, 2011). Conversely, Nyaruwata (2009) found that house ownership was associated with significantly more likelihood of being over-indebted, than renting. The study does not distinguish between mortgagors and outright owners.

### ***Settlement type***

South African literature finds that living in an urban area significantly increases the probability of being over-indebted, given the reduced credit constraint that urban households face (Nyaruwata, 2009). Collins (2008) reported that high indebtedness was found among the high-income groups in urban areas, and at all levels in rural areas, driven by informal financial services. According to Kempson *et al.* (2004), arrears in household bills were strongly related to local area deprivation, and therefore over-indebtedness was much more likely in the poorest areas. This is consistent with the cross-country study of Betti *et al.* (2007), where they found that liquidity constraints in a less liberalised credit market was associated with over-indebtedness.

### ***Government grants***

Nyaruwata (2009) demonstrated the significance of receiving social grants in reducing the probability of being over-indebted. Even though Collins (2008) found that high indebtedness was persistent with those receiving social grants, the study did not show that such people were necessarily over-indebted. However, Russell *et al.* (2011) suggested that households that relied on social grants for more than 25 percent of their income had a high chance of being over-indebted.

### ***Income***

There is consensus in the literature that concentration of over-indebtedness is found in the lower sections of the income spectrum. Household income has an independent effect on risk of over-indebtedness (Russell *et al.*, 2011). Households on low incomes were more likely to face persistent over-indebtedness (Kempson *et al.*, 2004; Department of Trade and Industry, 2005; Mashigo, 2006; Nyaruwata, 2009; Bryan *et al.*, 2010). The relationship is stronger when equivalised income (income per person in the household) is used instead of total income (Kempson, 2002). The Department for Business Enterprise and Regulatory Reform (2007) observed a persistent reduction in the prevalence of over-indebtedness as income rose. Interestingly, regression analysis showed that income falls rather than income rises had statistically significant effects on levels of arrears among families, when all other factors were held constant (Kempson *et al.*, 2004). There is a degree of ambiguity in the relationship between debt and income, because some studies have found high indebtedness among high-income groups – (for example Collins, 2008). Daniels (2001) said that limited access to formal financial services in the form of credit might be the cause of lower levels of debt in the lower income brackets, where greater demand for credit existed.

### ***Family type and number of children***

Family circumstances such as having a baby, or relationship breakdown, increase the likelihood of over-indebtedness (Kempson, 2002; MORI Financial Services, 2004; Department of Trade and Industry, 2005; Legge & Heynes, 2009). This could be because a high proportion of childcare expenses cannot be reduced; there is one parent working reduced hours after birth; and in the case of relationship breakdown, adjusting down a lifestyle initially based on double incomes is difficult. Couples without children are hardly ever over-indebted (Haas, 2006).

Some studies suggest that single people who have never married face similar financial difficulties to married couples (Davydoff *et al.*, 2008), and the Department for Business Enterprise and Regulatory Reform (2007) suggested that singletons with and without children were overrepresented in the arrears indicator.

Regression analysis shows that being divorced or separated, or being a lone parent, have the strongest influence on over-indebtedness (Russell *et al.*, 2011). Bryan *et al.* (2010) asserted that separated or divorced household heads had a higher probability of over-indebtedness than those who had never married. A study in Norway found that being a single parent increased the odds of experiencing problems in repaying consumer credit commitments, even when age and relationship breakdown and the debt-to-income ratio were controlled for (Tufte, 1999). However, Kempson *et al.* (2004), after controlling for other factors, found insignificant association between separating from a partner, or having a new baby, and over-indebtedness.

### ***Household size***

Increasing household size is associated with a higher probability of being over-indebted (Nyaruwata, 2009; Bryan *et al.*, 2010). This is in line with expectations, as larger households tend to experience greater pressure on their income in trying to cater for more household members.

## **5.3 METHODOLOGY**

This chapter uses Table 4.1 and Table 4.2 (National Credit Regulator specific indicator) to establish which households are over-indebted. With regard to the subjective perception of debt problems and the arrears indicator, there is no information in the survey that allows the construction of these indicators. All the repayment-income ratios have been calculated using the net, rather than gross, household income, as specified in the indicators.

## 5.4 RESULTS

Table 5.1 summarises the proportion of households that are over-indebted across various indicators. Among households with unsecured debt repayments of more than 15 percent of household income, about 15.2 percent are over-indebted. Unsecured debt includes, personal loans from banks, micro-lenders and loan sharks (commonly known as mashonisa), study loans, credit cards and store-card debts, and loans from family and friends. Households that made total debt repayments amounting to more than 30 percent and 50 percent of income comprised 10.9 percent and 4.6 percent respectively. Surprisingly, considering the media coverage of high indebtedness in the country, it is worth noting that 11 percent of households are below the poverty line, after repaying debts. Over-indebtedness based on those, that are poor and have debt is the lowest of all, and only 1.4 percent of households that are poor used debt as an additional funding source to meet their needs. Based on the number of credit commitments, 7.5 percent of households had three or more commitments. The National Credit Regulator indicator reveals that eight percent of households are over-indebted, but an alarming 61.4 percent of those households are found in the lowest income category (R0 – R2 000), and spend more than 45.0 percent of their household income on debt repayments, which is beyond sustainable levels. Using different measures and data, Nunez *et al.* (2008) found that 24 percent of households were over-indebted. Hurwitz and Luiz (2007) presented worrisome results, and claimed that 60 percent of the working class were over-indebted. The concentration of over-indebtedness in the lowest income groups is consistent with Mashigo (2006).

**Table 5.1: Over-indebted households across various indicators**

Indicator	%	(Total households = 15,815,236)
All repayments/income >30%	10.9	1,730,708
All repayments/income >50%	4.6	721,144
Unsecured repayments/income >15%	15.2	2,400,142
Poor and in debt	1.4	218,454
Debt poor	11.0	1,741,345

Number of credit commitments	7.5	1,192,970
0	0.0	
1	0.0	
2	0.0	
3	44.7	
4	33.7	
5+	21.5	
Income category (R)	8.0	1,259,156
0 – 2 000	61.4	
2 001 – 5 000	15.2	
5 001 – 10 000	10.3	
10 001 – 20 000	7.6	
20 001 – 40 000	5.5	
40 001 – 60 000	0.0	
60 000 +	0.0	

Source: Author, based on weighted data from NIDS

Given the various alternative indicators of over-indebtedness, it is important to assess the degree to which they overlap as contained in Table 5.2. The National Credit Regulator and the three repayment-to-income indicators are linked by construction, as well as, the indicators that look at households in poverty with debt and those that are debt poor. These indicators show the biggest overlaps. Substantial (more than 50%) overlaps are between households that are poor with debt indicator and National Credit Regulator indicator (63.3%), National Credit Regulator and debt poor indicator (66.2%), credit commitment indicator and repayment to income of more than 30.0 percent (61.7%), and credit commitments indicator and unsecured repayments (57.4%).

Results also show that about two-thirds (66.2%) of households declared over-indebted using the National Credit Regulator indicator are debt poor, and 57.1 percent of households that have three or more credit commitments, commit more than 15 percent of their income to unsecured debt repayments. With households that have debts while their income is below the poverty line, 63.3 percent are also declared over-indebted in terms of the National Credit Regulator indicator, and 61.7 percent of households with three or more credit commitments spend more than 30 percent on total debt repayments.

There are very small overlaps (less than 5%) between having three or more credit commitments, spending more than 15 percent of income on unsecured debt, and a debt repayment ratio exceeding 30 percent of income while in poverty. Having three or more credit commitments is a less good predictor of being poor with debt (only 0.9% of households with credit commitments were already poor). Similarly, only 4.4 percent and 4.7 percent of households declared over-indebted under 15 percent and 30 percent benchmark indicators were over-indebted under the poor with debt.

**Table 5.2: Overlap of household over-indebtedness indicators**

	<b>NCR</b>	<b>Debt_30</b>	<b>Debt_50</b>	<b>Unsecured_15</b>	<b>Poor and in debt</b>	<b>Debt poor</b>	<b>Commitments</b>
NCR <sup>1</sup>	-	61.6	56.7	54.9	11.0	66.2	26.0
Debt_30 <sup>2</sup>	44.8	-	41.7	76.6	4.7	21.7	42.6
Debt_50 <sup>3</sup>	98.9	100.0	-	88.3	9.3	45.8	44.3
Unsecured_15 <sup>4</sup>	28.8	55.2	26.5	-	4.4	16.4	28.4
Poor and in debt <sup>5</sup>	63.3	37.5	30.6	48.4	-	100.0	4.9
Debt poor <sup>6</sup>	47.9	21.6	20.1	22.6	12.5	-	7.7
Commitments <sup>7</sup>	27.4	61.7	26.8	57.1	0.9	11.2	-

Source: compiled by author based on the results of various indicators in Table 5.1

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<sup>1</sup> NCR: National Credit Regulator indicator.

<sup>2</sup> Debt\_30: Households spending more than 30% of their income on total borrowing repayments.

<sup>3</sup> Debt\_50: Households spending more than 30% of their income on total borrowing repayments.

<sup>4</sup> Unsecured\_15: Households spending more than 15% of income on unsecured lending repayments.

<sup>5</sup> Poor and in debt: Households below poverty line, with debt.

<sup>6</sup> Debt poor: Households whose spending on debt service takes them below the poverty line.

<sup>7</sup> Commitments: Households with three or more credit commitments.

### 5.4.1 Which households are over-indebted?

Table A.1 presents descriptive statistics of household characteristics for the over-indebted, as measured by the National Credit Regulator. Households in which the heads are aged between 31-40 years have the highest levels of over-indebtedness (29.0%). This falls to 10.6 percent at over retirement ages of 61-70. Over-indebtedness is more common among households that are male-headed (53.8%) compared to those headed by females. Unemployment is associated with high levels of over-indebtedness, and households in which the household head is unemployed make up 53.5 percent. Secondary schooling is associated with relatively high risks of over-indebtedness (49.9%) and those with no schooling are the least over-indebted (6.1%). Black South Africans constitute the most over-indebted race (79.0%) while only 2.8 percent of over-indebted households are Asian/Indians. Homeowners (78.6%) experience more financial difficulties than tenants do. Households in urban areas are more than three times over-indebted (78.8%) compared to those in rural areas (17.9%). Households in Gauteng are the most over-indebted, representing 35.6 percent of over-indebted households. In Limpopo, most households are below the poverty line (Statistics South Africa 2014). Owing to the high prevalence of low-income households in Limpopo, it would seem likely to have the highest rating of household over-indebtedness, but, the province in fact has the second lowest number of over-indebted households (4.0%).

Government grants seem to be making a difference, as households who do not receive them are more over-indebted (71.7%). There is an inverse relationship between household income and household over-indebtedness. The level of over-indebtedness reduces with income, from 61.4 percent in households with an income of R0 – R2 000 to 5.5 percent among households with an income of R20 000 to R40 000. The frequency of over-indebtedness in households with heads who have never been married is high at 47.6 percent, followed by married couples at 32.5 percent.

Surprisingly, households with more children are less likely to be over-indebted. Over-indebtedness reduces with the number of children in a household: 61.3 percent of over-indebted households have no children, followed by 29.9 percent with one child being over-indebted, while 0.0 percent of over-indebted households have 9-10 children. Similarly, households with more household

members are less over-indebted: 1.6 percent of over-indebted households have 11+ members, compared to 54.9 percent that have one or two members.

## 5.5 DISCUSSION

Existing literature associates over-indebtedness with the age groups less than 35 years old (Kempson, 2002; Kempson *et al.*, 2004; Department for Business Enterprise & Regulatory Reform 2007; Bryan *et al.*, 2010; Russell *et al.*, 2011; Rodrigues, 2014). Although compatible with the life-cycle hypothesis, the researchers' results show high over-indebtedness until the age of 40. These findings may suggest shifting patterns in debt use with households carrying more debt into their old age, which might have severe consequences once they are retired. Mann (2011) found that late-life debt use prolonged labour force participation in older segments of the population. These results contradict those of Nyaruwata (2009) – who observed that over-indebtedness increased with age throughout the life-cycle suggesting that older household heads have more dependents to look after, including their grandchildren. Household heads in the most active population age group (31-50 years) are highly indebted. This profile is in accordance with the Life Cycle Hypothesis which posits that people have need in their young and middle age years as this age is generally associated with the acquisition of the first residence.

Inconsistent with most literature, male-headed households are more over-indebted (53.8%) than those headed by females (Department of Trade and Industry, 2005; Nyaruwata, 2009; Bryan *et al.*, 2010; Russell *et al.*, 2011; Keese, 2012). However, Brunetti, Giarda & Torricelli (2012) reported that males were more likely to experience financial fragility. However, Del Rio and Young (2005) and Loke (2016) found no gender difference in self-assessed financial burdens and living beyond ones means, respectively. Even though Daniels (2001) found higher debt to income ratios amongst males, there was greater occurrence of over-indebtedness in females. Results confirm previous research findings that being unemployed is associated with over-indebtedness (Kempson 2002; Kempson *et al.*, 2004; Bryan *et al.*, 2010; Russell *et al.*, 2011; Keese, 2012). However, Hurwitz and Luiz (2007) found that the depth of over-indebtedness among urban working class was worrisome.

Authors such as Bryan *et al.* (2010) and Russell *et al.* (2011) argued that education (of whatever kind) reduced the probability of over-indebtedness. This study's findings agree with this view because household heads with only secondary schooling are the most over-indebted. However, other studies found that tertiary education increased the chances of being over-indebted, and should not be confused with financial literacy, which had a recognisable value in managing debt (Nyaruwata, 2009; Brunetti *et al.*, 2012; Loke, 2016). Lack of financial education is a key determinant of over-indebtedness (Disney & Gathergood, 2011; Cavalletti, Lagazio, Vandone & Lagomarsino, 2012).

Although 78.6 percent of households that own their accommodation were found to be over-indebted, most of the existing literature states that tenants are more likely to experience financial difficulties than owners (Kempson, 2002; Kempson *et al.*, 2004; Russell *et al.*, 2011). The researchers' results are consistent with Nyaruwata (2009), who reported that in South Africa house ownership was more associated with financial difficulties than renting. Urban dwellers are highly over-indebted as also found by Nyaruwata (2009). Kempson *et al.* (2004) said that over-indebtedness was related to local deprivation and was, therefore, expected to be found in rural and poor areas.

Households that receive government grants are less over-indebted. The results agree with Nyaruwata (2009), who showed that receiving government grants reduced the likelihood of being over-indebted. With regard to household income, high over-indebtedness occurs in the lowest income category. Mashigo (2006) confirmed that lower income groups had greater debt burdens, but Daniels (2001) drew on limited access to credit to support seemingly contradictory evidence that there were lower debt levels in the lower income brackets.

The researchers' findings reflect a divergence from the literature, and shows divorced or separated people as the least over-indebted. Bryan *et al.* (2010) and Russell *et al.* (2011) found that being divorced or separated, or being a single parent, had the strongest influence on over-indebtedness. This study found a similar pattern for the number of children and household size, where over-indebtedness decreased as both variables increased. This is in contrast with other research, which

asserts that having a baby increases the likelihood of being over-indebted, as some childcare expenses cannot be reduced or avoided (Kempson, 2002; MORI Financial Services, 2004; Department of Trade and Industry, 2005; Legge and Heynes, 2009). Regarding household size, the association could be due to pooling of resources, but Nyaruwata (2009) and Bryan *et al.* (2010) agreed that larger households were more prone to financial difficulties.

## **5.6 CONCLUSION**

This chapter's objective was to measure over-indebtedness across different indicators, assess overlaps between the indicators, and identify the types of household that are over-indebted.

Results show that households engaged in unsecured borrowing reflect the highest incidence of over-indebtedness at 15.2 percent. The unsecured lending market is notorious for attracting higher interest rates, which may condemn households to vicious cycles of debt together with the associated consequences of a deteriorating livelihood. The extensive overlap in the NCR and debt-poor indicators reveals the extensive relationship between debt and poverty. In terms of distributional spread, the lowest income households are the most over-indebted, and spend almost half of their earnings on debt servicing. Other main results show that over-indebtedness is racially distributed against Africans, those that do not receive government grants and are unemployed.

## CHAPTER 6

# THE THRESHOLD EFFECTS OF HOUSEHOLD DEBT ON MULTIDIMENSIONAL POVERTY<sup>8</sup>

### 6.1 INTRODUCTION

Finance carries the potential to improve households' welfare through various channels, including consumption smoothing. In post-apartheid South Africa, credit access has grown sharply to include households previously excluded from the financial system. The implications thereof point to the diversion of households' substantial financial resources, which could be used to support welfare, towards debt service. Some of the distressing consequences of over-indebtedness are poor mental health, suicide ideation, slowdown of economic growth, and collapse of the financial system (Meltzer *et al.*, 2010; Dynan, 2012; Fatoki, 2015; Hunt, 2015).

The subject of debt and poverty is prevalent in microfinance studies. For example, studies have examined the impact of microcredit on welfare (Khandker, 1998; Morduch, 1998; Akotey & Adjasi, 2016) and the impact of access to welfare via its effects on consumption smoothing (Bae, Han, & Sohn, 2012; Gloede & Rungruxsirivorn, 2013; Hacamo, 2014). In micro-analysis studies, over-indebtedness is indicated by debt repayments that are greater than the income poverty line, which clearly reveals the link between debt and poverty (Russell *et al.*, 2011; D'Alessio & Iezzi, 2013; Ntsalaze & Ikhida, 2016a). On a macro-level, high external debt was found to worsen poverty (Loko *et al.*, 2003). Though not directly linked to poverty, quite a number of macro-studies have been conducted on debt threshold (Reinhart & Rogoff, 2010; Cecchetti *et al.*, 2011; Law & Singh, 2014).

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<sup>8</sup> This chapter has been accepted as an empirical paper and accepted in the *International Journal of Social Economics* - DOI (10.1108/IJSE-03-2016-0086).

This chapter uses these findings from the macro literature as motivation for threshold analysis applying the multivariate Generalized Additive Model using splines at micro-level. The main objective of this chapter is to explore whether there is a threshold above which household indebtedness worsens the households' poverty (measured through the Alkire-Foster methodology). In addition, the chapter also analyses the effect of other variables like government grants, number of children, household size, age and years of education of the household head. The chapter will also add to the debate on the debt-poverty nexus for households using microdata, and highlighting the need to enforce debt ceilings where households go overboard in credit acquisition.

## 6.2 RELATED LITERATURE

Empirically, South African literature associates high indebtedness with low-income households (Mashigo, 2006; University of Johannesburg, 2008), which is inconsistent with the findings of Daniels (2001) and Nunez *et al.* (2008), who demonstrated that only a few poor households experienced high indebtedness because of limited access to formal financial services. With a focus on the settlement type, Collins (2008) reported that high indebtedness was found among the high-income groups in urban areas. Hurwitz and Luiz (2007) found that most (60%) of the working class was over-indebted.

There is consensus that poverty is highly concentrated in rural areas amongst black communities for varying reasons, ranging from South Africa's history of land dispossession and migratory labour patterns, to the inability to use productive assets since some households in these areas spend time on activities like fetching water from afar (Carter & May, 1999; Aliber, 2003; Noble & Wright, 2012). Another study by Carter and May (2001) indicated an increase in the poverty headcount, but later studies show impressive transitions out of poverty (Woolard & Klasen, 2005; Aguera, Carter, & May, 2006; Grieger, Williamson, Leibbrandt, & Levinsohn, 2013).

High household indebtedness has a direct impact on poverty, as the consequential high interest costs lead to a reduction in available resources to meet the needs of the poor. Over-indebtedness can also indirectly affect poverty: household expenditure drives the economy, but households with high debt spend less, thus subduing growth (Dynan, 2012; Kukk, 2014; Albuquerque & Krustev, 2015). Over-indebtedness indicators proposed by Davydoff *et al.* (2008) include assessing high debt service, which pushes households below the poverty threshold. This indicator best detects the condition of economic distress associated with over-indebtedness. Pressman and Scott (2009) argued that since interest payments cannot be used to support the households' standard of living, even though a household may have income above the poverty threshold, in essence they are poor if these payments reduce the money they have to purchase basic goods and services.

D'Alessio and Iezzi (2013) applied a debt-poverty indicator of over-indebtedness to disentangle the relationship between the two phenomena. They found a positive connection between over-indebtedness and economic poverty. From Italian data, about 6 percent of households were considered poor and indebted, or to have debt servicing costs that took them below the poverty line. Over-indebted households, according to the debt-poverty indicator, have a level of income and wealth that was approximately 45 percent lower than that of other households. This relationship is reversed for non-over-indebted households: they have higher income and wealth levels. Using logistic regression analysis of over-indebtedness, Russell *et al.* (2011) found higher levels of deprivation among over-indebted households: 23 percent of over-indebted households were below the poverty line, and lacked two items on the basic deprivation scale. Ntsalaze and Ikhude (2016a) reported that the incomes of 11.01 percent households were below 50 percent of median income after taking into account debt service repayments.

The literature shows that household poverty is determined by a host of factors, such as household head characteristics, which include age, educational levels, ethnicity, gender, marital status and economic activity; and general household characteristics like household income, government

grants, housing tenure, household size, number of children and settlement type (urban versus rural), and regional or provincial location, among others. Mixed results are found in relation to age. Gounder (2012) and Sekhampu (2013) indicated that older households have better welfare. However, Majeed and Malik (2014) and Myftaraj *et al.* (2014) reported that households with older heads were positively related with probability of being in poverty. Educational attainment is seen as the strongest predictor of poverty: Most studies found that less educated household heads were associated with a high incidence of poverty, which declined as the education level increased (Serumaga-Zake & Naudé, 2002; Woolard & Klasen, 2005; Baiyegunhi & Fraser, 2010; Gounder, 2012; Majeed & Malik, 2014; Myftaraj *et al.*, 2014). In the South African context, the race of the household is relevant owing to the political history and poverty statistics being reported along racial lines. Similarly, race was also considered an important variable in poverty studies in Fiji (Gounder, 2012). Female-headed households face a greater susceptibility to poverty owing to rigid division of labour according to social custom (Hofmeyr, 1997). In Malaysia, all genders are associated with poverty: there is low gender discrimination owing to the maturity of women empowerment programmes (Mok, Gan & Sanyal, 2007). In Pakistan, Majeed and Malik (2014) found a positive association between poverty and male-headed households.

Serumaga-Zake (1990) found that marital status tended to raise income through lowering labour turnover rates. Labour market participation of the household head reduced the probability of being poor (Woolard & Klasen, 2005; De Graaf-Zijl & Nolan, 2011; Sekhampu, 2013; Myftaraj *et al.*, 2014). Majeed and Malik (2014) noted that being engaged in agricultural employment, in particular, had a negative relationship with poverty, and also noted the importance of remittance/grants as a differentiating factor between the poor and non-poor. Ownership of the home that the household lives in was associated with increased welfare (Dartanto & Nurkholis, 2013). Divergent views emerge on the role of household size. Serumaga-Zake and Naudé (2002), Woolard and Klasen (2005), Sekhampu (2013), Majeed and Malik (2014) and Myftaraj *et al.* (2014) provided strong evidence that larger households increased the probability of being poor, particularly when the

number of children increased. However, Lanjouw and Ravallion (1995) suggested that larger households benefited from sharing resources and achieved economies of scale. Lastly, poverty was concentrated more in rural than in urban areas (Gounder, 2012; Dartanto & Nurkholis, 2013; Majeed & Malik, 2014; Myftaraj et al., 2014).

In microfinance, access to credit by poor households provides the direct link between financial development and poverty (Holden & Prokopenko, 2001). Development economists have argued that provision of credit to micro-enterprises was effective in fighting poverty, but evidence of its effectiveness remains controversial, as suggested by Cull, Demirguc-Kunt and Morduch (2009), Bateman (2010), and Imai and Azam (2012). Limited macro-studies have directly examined the impact of debt on poverty reduction. The direct impact of external debt on poverty is the crowding-out effect of interest on social spending (Shraideh, 2008). Moreover, investment channels lead to economic growth, and in so doing facilitate the indirect contribution of financial development to poverty reduction (Shraideh, 2008; Saungweme & Mufandaedza, 2013).

### 6.3 METHODOLOGY

In this chapter, a Generalised Additive Model is used to assess critical tipping points between household debt service-to-income ratio and multidimensional poverty along with other explanatory variables (age, government grants, education and household size). A comprehensive explanation of the selected model is provided in Chapter 4.

The functional form of the relationship to be estimated is:

$$C_i = \beta_0 + f_1(\text{debt.s}) + f_2(\text{age}) + f_3(\text{govt.g}) + f_4(\text{children}) + f_5(\text{hhsz}) + f_6(\text{edu.n}) + \varepsilon_i$$

### 6.4 DESCRIPTIVE STATISTICS

The socio-economic characteristics presented under this section include: debt service ratio, age of the household head, government grant, and education years of the household head. Other

characteristics include: number of children and household size. Table 6.1 shows descriptive results while Figure 6.1 shows their distributions:

**Table 6.1: Descriptive statistics of explanatory variables**

Variable	Denoted by	Mean	Std. Dev.	Min	Max
Debt service ratio	debt.s	0.083	0.166	0	1
Household head age in years	age	53.273	15.255	20	104
Government grants received in Rands	govt.g	467.375	763.379	0	12633.75
Number of children aged 0-15 in a household	children	1.439	1.602	0	15
Household size (total number of members in the household)	hhsiz	4.375	2.783	1	29
Education (household head years of education)	edu.n	6.801	4.725	0	18

Source: Author, based on weighted data from the NIDS

A greater number of households (74 percent) in the data space spend, at most, eight percent of their disposal income towards debt service, thus displaying manageable debt commitments. Household heads with 53 years or less represent 52 percent of the data. The retirement age (60 years and more) group constitute 34 percent of the total sample. About 52 percent of households do not receive government grants and 13 percent of households receive a grant less or equal to the mean value of R467.34. This shows less dependence on grants. Over a third of households do not have children and close to 43 percent have between one and two children. Households with two members are overrepresented at 15 percent, and the biggest household size is 29. In terms of years of education, household heads with no schooling are overrepresented (21 percent) while those above the mean value of six years, consolidated, constitute 57 percent of the sample – even

though a majority of households has primary schooling there is a clear need for investment in education towards those with no schooling at all.

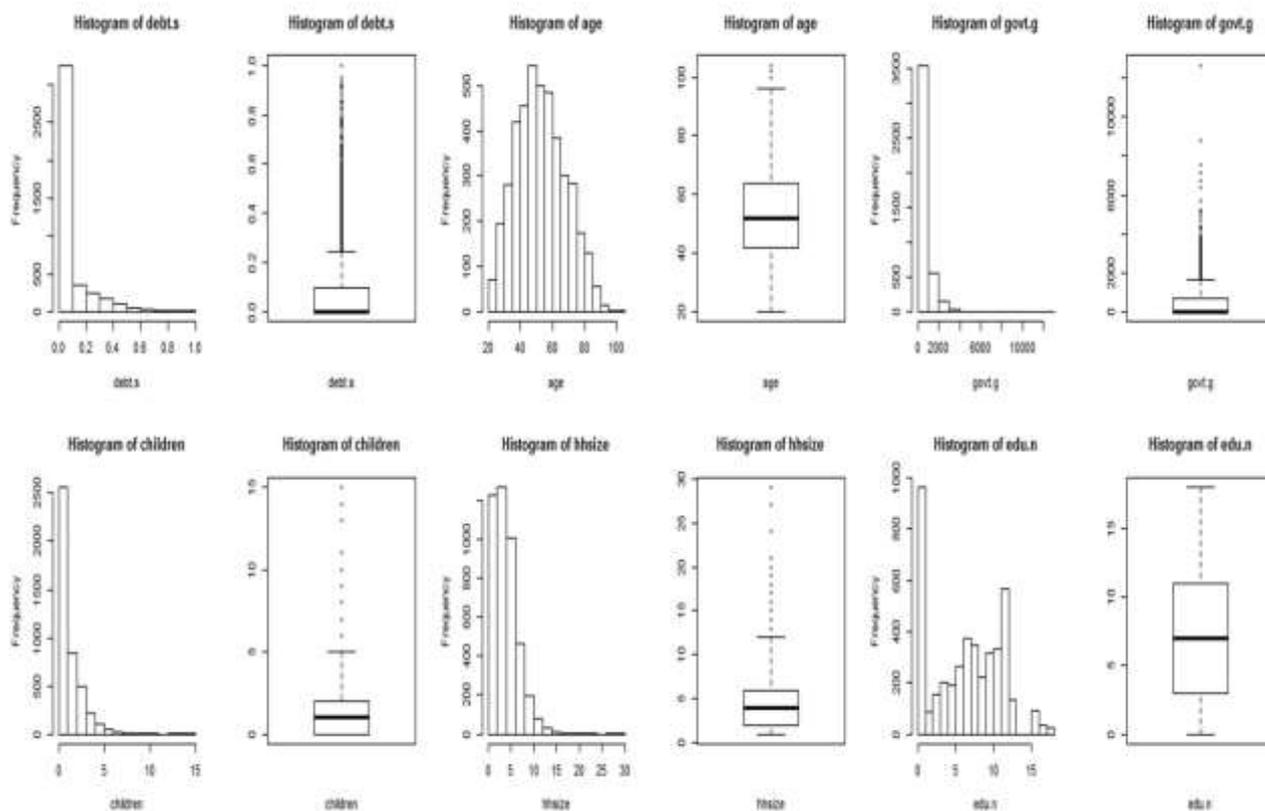


Figure 6.1: Histogram and boxplot of explanatory variables

## 6.5 REGRESSION RESULTS

The study considered two models – model 1 is where all the explanatory variables are the first degree polynomial with two degrees of freedom; and model 2 is the one where  $f_1(debt.s)$ ,  $f_2(age)$ ,  $f_3(govt.g)$ ,  $f_4(children)$ ,  $f_5(hhsz)$ , and  $f_6(edu.n)$  are the second degree polynomial.

**Model 1:**  $hds \sim bs(debt.s, df = 2, degree = 1) + bs(age, df = 2, degree = 1) + bs(govt.g, df = 2, degree = 1) + bs(children, df = 2, degree = 1) + bs(hhsz, df = 2, degree = 1) + bs(edu.n, df = 2, degree = 1)$

**Model 2:**  $hds \sim bs(debt.s, df = 3, degree = 2) + bs(age, df = 3, degree = 2) + bs(govt.g, df = 3, degree = 2) + bs(children, df = 3, degree = 2) + bs(hhsize, df = 3, degree = 2) + bs(edu.n, df = 3, degree = 2)$

The objective is to find which model better fits the data space. Table 6.2 shows the deviance results.

**Table 6.2: Analysis of Deviance Table**

Model	Resid. Df	Resid. Dev	Df	Deviance	F	Pr(>F)
1	4285	29.850				
2	4279	27.965	6	1.886	48.087	< 2.2e-16

Source: Author, based on weighted data from the NIDS

Table 6.2 shows that model 2 fits significantly better than model 1 because the probability of the F value of the second model (48.087) is  $2.2e-16 < 0$ . In other words, model 2 is significant at a confidence interval of zero. In addition, the Akaike Information Criterion (AIC) value of model 1 is -9132.36 and the corresponding value of model 2 is -9400.68. Since the AIC of model 2 is less than that of model 1, model 2 is a better fitted model than model 1. Thus, model 2 is used for the subsequent analysis where  $f_1(debt.s)$ ,  $f_2(age)$ ,  $f_3(govt.g)$ ,  $f_4(children)$ ,  $f_5(hhsize)$ , and  $f_6(edu.n)$  are second degree polynomial (with three degrees of freedom).

The results from the GAM analysis are provided in Table 6.3.

**Table 6.3: GAM regression results**

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	5.99E-02	6.54E-02	0.915	0.360311
bs(debt.s, df = 3, degree = 2)1	-1.85E-02	1.39E-02	-1.329	0.18393
bs(debt.s, df = 3, degree = 2)2	-7.73E-02	2.04E-02	-3.783	0.000157 ***
bs(debt.s, df = 3, degree = 2)3	NA	NA	NA	NA

bs(age, df = 3, degree = 2)1	-2.79E-02	1.15E-02	-2.422	0.015471 *
bs(age, df = 3, degree = 2)2	-4.69E-02	8.75E-03	-5.365	8.54e-08 ***
bs(age, df = 3, degree = 2)3	-3.19E-02	1.97E-02	-1.618	0.105647
bs(govt.g, df = 3, degree = 2)1	1.23E-01	6.31E-02	1.953	0.050930 .
bs(govt.g, df = 3, degree = 2)2	1.84E-01	7.37E-02	2.501	0.012427 *
bs(govt.g, df = 3, degree = 2)3	NA	NA	NA	NA
bs(children, df = 3, degree = 2)1	3.92E-05	4.43E-03	0.009	0.992932
bs(children, df = 3, degree = 2)2	3.83E-02	1.89E-02	2.023	0.043180 *
bs(children, df = 3, degree = 2)3	-1.32E-01	6.37E-02	-2.078	0.037772 *
bs(hhsize, df = 3, degree = 2)1	-1.26E-02	5.58E-03	-2.26	0.023872 *
bs(hhsize, df = 3, degree = 2)2	-1.49E-02	1.91E-02	-0.778	0.436322
bs(hhsize, df = 3, degree = 2)3	2.34E-01	7.05E-02	3.323	0.000897 ***
bs(edu.n, df = 3, degree = 2)1	4.83E-02	5.58E-03	8.657	< 2e-16 ***
bs(edu.n, df = 3, degree = 2)2	-1.74E-01	6.22E-03	-27.985	< 2e-16 ***
bs(edu.n, df = 3, degree = 2)3	-6.84E-02	9.73E-03	-7.032	2.36e-12 ***

Significance codes:

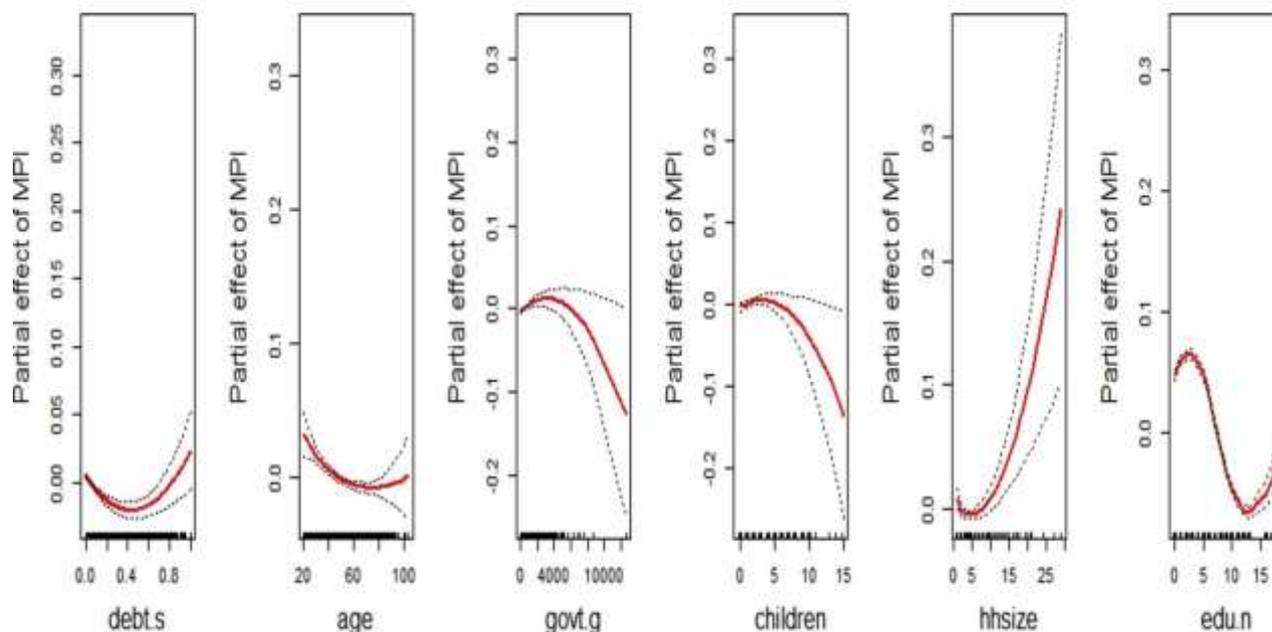
0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.08084 on 4279 degrees of freedom

Multiple R-squared: 0.2738, Adjusted R-squared: 0.271

F-statistic: 100.8 on 16 and 4279 DF, p-value: <2.2e16

Source: Author, based on weighted data from the NIDS



**Figure 6.2: Estimated smoothing components for multidimensional poverty**

Source: Author, based on weighted data from the NIDS

The analyses indicate the existence of non-linear effects between multidimensional poverty and the explanatory variables. For debt service (variable of interest), multidimensional poverty initially decreases as household debt service increases and again increases after reaching bottom. This suggests that debt is effective up to a certain point for the non-poor households. The findings confirm Pressman & Scott (2009) argument that debt service takes away resources that could be used to support the households' standard of living, and thus many households that are counted as non-poor are effectively poor after taking into account the portion of household's disposable income used to finance debt.

Figure 6.2 shows a U shaped relationship between household debt service and multidimensional poverty. Debt improves household welfare up to a certain threshold – it reaches bottom at about 42.5 percent (household debt/disposable income), with statistically significant results. Afterwards, the shape increases, possibly due to household debt becoming more difficult to manage, but the

results are not significant. This, therefore, calls for the National Credit Regulator and financial services providers to be vigilant once a household's debt service exceeds this critical threshold.

The age of the household head is negatively correlated with multidimensional poverty. The results are significant when the slope of the curve decreases until the ages between 60-80 years, suggesting that as the household head advances in age poverty decreases when other explanatory variables are kept constant. This finding is consistent with the work of Gounder (2012) and Sekhampu (2013) who indicated that older households are associated with better welfare. On the other hand Majeed and Malik (2014) and Myftaraj et al. (2014) reported that households with older heads are more likely to be poor.

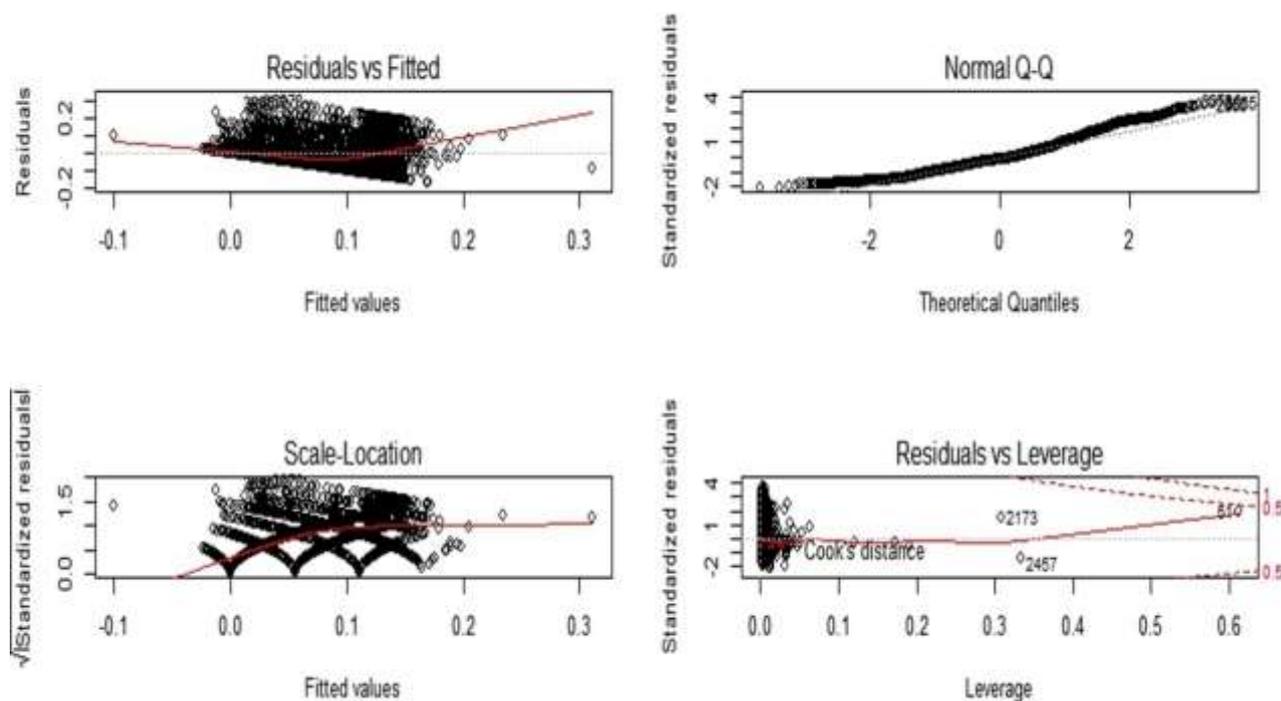
The effects of receiving government grants have received praise in some studies, Majeed and Malik (2014) noted the importance of grants as a differentiating factor between the poor and non-poor. Nyaruwata (2009) demonstrated the significance of receiving social grants in reducing the probability of being over-indebted. The results of this study show significant positive correlation between government grants and poverty, consistent with Russell et al. (2011). This suggests that households' welfare is worsened by the dependence on social grants. This could mean that grants are not used for their intended purposes.

Household size and the number of children exhibit a similar but opposite relationship with multidimensional poverty. For less than four members residing in a specific household, results show a significant negative correlation to multidimensional poverty, however the relationship becomes even more significant in the opposite direction when members are four or more – this could be explained by a high unemployment rate leading to other household members relying on a few individuals for resources. Divergent views emerge from existing literature on the role of household size. Serumaga-Zake and Naude' (2002), Woolard and Klasen (2005), Sekhampu (2013), Majeed and Malik (2014) and Myftaraj et al. (2014) provided strong evidence that larger households increased the probability of being poor, particularly when the number of children is increased. However, Lanjouw and Ravallion (1995) suggested that larger households benefited from sharing of resources and economies of scale. Regarding the number of children, there is

clearly a two-regime scenario - a positive significant and negative significant correlation. Initially, with a small number of children, a household is prone to multidimensional poverty, but again the slope of the curve decreases with more children. Increasing childcare expenses and economies of scales could be the reasons in the respective cases.

Education, represented by the years of schooling of the household head, indicates very significant non-linear results. Lower educational levels are correlated with higher multidimensional poverty. The importance of education is reflected in the lower grades as the curve switches to a negative slope as early as only about three years of schooling. The results are consistent with existing literature that finds education to be a solution against poverty (Serumaga-Zake & Naude', 2002; Woolard & Klasen, 2005; Baiyegunhi & Fraser, 2010; Gounder, 2012; Majeed & Malik, 2014; Myftaraj et al., 2014).

Lastly, the stability and consistency of the model used (model 2) is validated by using residual plots.



**Figure 6.3: Residual plots for the selected model**

Source: Author, based on weighted data from the NIDS

The top-left hand plot shows that the residuals first decrease as the fitted values of the response variable increases to 0.1, and then it again increases - thus showing a systematic relationship between the fitted values and the residuals. In contrast, had the plot shown a haphazard relationship between the fitted values and the residuals, one could have very well concluded that the data might have been approximated by a linear equation. Next the Normal Q-Q plot is used to show the distribution between the standardized residuals and the theoretical quantiles. The top right plot shows that the majority of the standardized residual values lie above the dotted line - thus implying that the data came from a positively skewed distribution. The bottom left (Scale-Location) plot shows similar conclusions as the top left (Residuals vs. Fitted) plot i.e. the residuals follow a definite systematic pattern and is not haphazard. Lastly, the bottom right plot (Residuals vs Leverage) shows that all the points fall within the Cook's distance of 0.5. In standard statistical modelling, any point (corresponding to leverage and standardized residuals) that lies beyond a Cook's distance of 1.0 is considered an outlier. In this case, since all the points lie within the Cook's distance of 0.5, one can safely infer that outlier values do not influence this model. Thus, the stability and consistency of the model is validated by the use of the non-linear model and exploring the nonexistence of any outliers that can destabilize the predictability aspect of the model.

## 6.6 CONCLUSION

The empirical results indicate that there is a threshold in the debt–poverty nexus. Debt tends to improve welfare up to a point above which it is associated with negative multidimensional poverty outcomes. Unlike government grants, increased years of education and younger households are associated with decreasing multidimensional poverty. Clearly, government grants are not effective: investment in education is more important for dealing with poverty.

Given the discussion above, it is important that households with high debt must act quickly and decisively to address their looming welfare problems. In addition, policymakers will need to strike a balance between greater household credit access and heightened threats to financial stability. A

coordinated effort is necessary to promote the role of savings which provides cushioning for a household, to improve debt and money management education to address causes of over-indebtedness, to enforce existing policies on responsible lending, and based on findings in this study, households with a debt service ratio beyond 42.5 percent should be monitored strictly.

## CHAPTER 7

# RETHINKING DIMENSIONS: SOUTH AFRICAN MULTIDIMENSIONAL POVERTY INDEX<sup>13</sup>

### 7.1 INTRODUCTION

In spite of the widespread research on poverty and its significance, there is little consensus about the best way to measure it. Poverty measures focused on income and expenditures are widely recognised as not fully taking into account the multiple aspects and sensitivity of poverty. Multidimensional poverty measurements are gaining rapid traction though they remain a relatively new field of endeavour. In a post-2015 Sustainable Development Goals (SDGs) context, the United Nations General Assembly revised its goal on tackling poverty from money metric oriented measures to dealing with the problem in all its forms. A multidimensional measure seeks to complement the traditional income/expenditure based methods by incorporating a range of indicators to capture the complexity of poverty, and thus offers a robust tool to assist policies designed to fight it.

The Multidimensional Poverty Index (MPI), based on the Alkire-Foster (AF) methodology, measures poverty across three dimensions, namely health, education and living standards. This measure is conceptualised based upon the capabilities approach of Sen (1999). The approach contends that measures of poverty should focus on what people are able to do, or what they have capacity to do. At a national level, governments are encouraged to develop poverty measures that reflect country specific conditions and needs. The South African government has made progress in this regard by implementing the multidimensional index proposed by Alkire and Foster (2011), with some adjustments due to limitations in the data used. A key modification observed is the incorporation of economic activity as an additional dimension. Economic activity is represented by employment status and is crucial because of the intrinsic importance of the issue in relation to the

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<sup>13</sup> This chapter has been accepted and published as an empirical paper in the *Social Indicators Research* journal. Available online at <http://link.springer.com/article/10.1007/s11205-016-1473-4>

current priorities of South Africa. Another rising phenomenon is household over-indebtedness and the National Credit Act was designed to curb this, amongst other things (Department of Trade and Industry, 2006). Debt burdens have grown tremendously. Households in the lowest income group, representing more than 61 percent of households, spend more than 45 percent of their after-tax income on debt repayments (Ntsalaze & Ikhude, 2016a). Debt service eats up economic resources and thus deprives households of basic necessities as a consequence of inadequate disposable income after the repayment of debts.

Some of the consequences of over-indebtedness include a reduced standard of living and social exclusion (Civic Consulting of the Consumer Policy Evaluation Consortium, 2008). These consequences can limit what individuals do and be as contemplated by Sen in his definition of the capabilities approach (Sen, 1999). Porter (2012) articulated a framework for examining over-indebtedness in a multidimensional space based on a capabilities approach and argued that debt should be incorporated in the study of poverty.

In this context, the primary objective of this chapter is to explore and understand whether over-indebtedness is important in multidimensional poverty analysis in South Africa. To assess this as a valid indicator of poverty, a Multiple Correspondence Analysis (MCA) is applied. The transformation of data into categorical variables fundamentally applies the AF methodology, which is based on Sen's capability approach. Unlike other South African poverty indices, data used in this study are comprehensive, and this allows for the exact calculation of MPI and can be compared across countries. Though a composite index is a by-product of MCA, it is not the aim of this chapter. The next chapter operationalises the proposed dimensions following AF counting based methodology.

This chapter moves forward Porter's theoretical framework through empirical testing and builds upon the existing work of Statistics South Africa. It shows how measures of education, health, living standards, economic activity and financial commitments can be combined to create a new poverty measure, which can be used for multidimensional poverty analysis in South Africa. This will have vital implications for facilitating informed policy interventions from government.

## 7.2 RELATED LITERATURE

The well-known composite index is the Human Development Index (HDI) of the United Nations Development Program (UNDP), first developed in 1990 based on Sen's (1985) 'capabilities and functionings' theory of human development. It combines indicators of life expectancy, educational attainment and income into a composite index (UNDP, 2010). Their work was, however, criticised for its choice of dimensions, weights and aggregation rules (Kelley, 1991; Ravallion, 1997). The Human Poverty Index (HPI) was introduced in 1997 and focused on poverty and deprivation. It is composed of indicators for measuring longevity, knowledge and a decent standard of living. It used country averages to reflect aggregate deprivations in health, education and standard of living (UNDP, 1991). Other composite indices that are frequently used or referenced in international literature or in policy include the Physical Quality of Life Index (Morris, 1979), the Quality of Life Index (Dasgupta & Weale, 1992), the Comprehensive Quality of Life Survey (Cummins, McCabe, Romeo & Gullone, 1994), the Combined Quality of Life Indices (Diener, 1995) and the Index of Economic Well-being (Osberg & Sharpe, 2000).

Most recent was the introduction of MPI that uses the AF methodology, which creates a class of measures that both draws on the counting approach and extends the Foster Greer Thorbecke (FGT) class of measures (such as Alkire & Santos, 2010; Alkire & Foster, 2011). Though MPI is an index (single statistic), it has attractive decomposability features, which allows for the separate examination of the different dimensions. Alkire and Foster (2011) also reported that a single statistic could show change over time in a unified and internally consistent framework. However, Ravallion (2011) questioned the rationale for aggregating into a single number in the first place when meaningful information was derived from various dimensions and therefore argued in favour of a dashboard approach rather than a single multidimensional index.

In sub-Saharan Africa, Sahn and Stifel (2000) used the Demographic and Health Surveys (DHS) to compare poverty over time within and between fifteen African countries. In that study, well-being was measured by an asset index estimated using a factor analysis (FA) of various household socioeconomic indicators. Booysen *et al.* (2008) extended the work of Sahn and Stifel (2000) by

analysing poverty comparisons over time and across countries by means of MCA rather than FA, and adding more recent surveys. Von Maltzahn and Durrheim (2008) found a strong correlation in the income levels when compared with living standard measure (LSM) scores. Duclos, Sahn and Younger (2006), and Duclos and Batana (2010) integrated stochastic dominance analysis in order to do country comparisons.

Quite a few studies in South Africa used multidimensional poverty measures. With his pioneering work in this regard, Klasen (2000) found a strong correlation between an expenditure-based poverty measure and a composite measure of deprivation based on the principal component analysis. In the same year, Statistics South Africa developed a household infrastructure index and a household circumstances index based on Census 1996 data to measure poverty from a multidimensional perspective (Hirschowitz, 2000). Kingdon and Knight (2004) used the 1993 Project for Statistics on Living Standards and Development data, while Census 2001 data were used, again by Statistics South Africa to produce a series of provincial indices of deprivation (Noble *et al.*, 2006). Posel and Casale (2011), Blaauw and Pretorius (2012), and Ebrahim, Botha, and Snowball (2013) used the 2008 NIDS data to adopt poverty measures other than the absolute income and relative income methods. Statistics South Africa used data from the Living Conditions Survey (LCS) 2008/2009 and created an index across eight dimensions (Statistics South Africa, 2013). Posel and Rogan (2013) also used the LCS to compare objective poverty (using per-capita income and the absolute poverty line of Woolard and Leibbrandt (2006) and subjective poverty, and found that the objective poverty rate was higher. Other recent studies considered the multidimensional nature of poverty (see Burger *et al.*, 2004; Adams *et al.*, 2015; Bhorat & Van der Westhuizen, 2013; Finn & Woolard, 2013), according to the non-monetary variables. Recently, Statistics South Africa has embraced the Alkire-Foster methodology to produce a national Multidimensional Poverty Index with adjusted indicators, and an additional dimension capturing the unemployment situation of households using data from the censuses of 2001 and 2011 (Statistics South Africa, 2014a). Jansen *et al.* (2015) analysed poverty across various objective and

subjective methods and found a variation in poverty status, with blacks being mostly likely to be poor in at least one method.

### 7.3 RATIONALE FOR THE SELECTION OF INDICATORS

Alkire and Santos (2010) identified three dimensions to be included in the MPI: health, education, and the standard of living, which are similar to those of the HDI. No consensus exists on what dimensions to include in multidimensional poverty indices. Sen (1985) recognized this deficiency: hence, the capability approach is flexible as to the dimensions that should be included in the measurement of poverty. He called for deliberative engagement rather than using a pre-ordained list of dimensions (Sen, 2004). Sen's view was heavily criticised by Nussbaum who proposed a universal list of capabilities (Nussbaum, 2000). In line with Sen's non-prescriptive stance, the architects of MPI advocated for the development of national indices that reflected local conditions. Alkire *et al.* (2015b) highlighted six high-level reasoned judgements to justify choice of dimensions, namely: (1) expert assessments, (2) empirical assessments, (3) deliberative insights, (4) theoretical assessments, (5) Practicalities and (6) policy relevance.

This study adopted the second and sixth methods, resulting in the inclusion of economic activity and financial commitments as indicated by unemployment and over-indebtedness respectively, in addition to the existing three dimensions. It is important to note that unemployment has already been proven as a significant variable in multidimensional poverty index in South Africa (Statistics South Africa, 2014a). Both the proposed dimensions have special importance to the society of South Africa. International empirical evidence shows that dimensions of deprivation include lack of economic resources and unemployment (Atkinson *et al.*, 2002; Noble, Barnes *et al.*, 2010; Mitra *et al.*, 2013)

Over-indebtedness constitutes a deprivation symptom as excessive debt repayments dilute the instrumental power of household's disposable income. Pressman and Scott (2009) argued that the extent of poverty is understated if interest payments are ignored. The inadequacy or lack of income results in material deprivation and is related to the idea of multidimensional poverty (Subramanian & Majumdar, 2002; Chakraborty, Pattanaik & Xu, 2008). Ntsalaze and Ikhide (2017) found a

significant relationship between debt service and multidimensional poverty, when the debt burden breaches the 42.5 percent threshold debt is associated with worsened households' welfare. South African households' debt as a percentage of disposable income has moved from 51 percent in 1993 to 77.8 percent in the third quarter of 2015, after reaching a peak of 88.8 percent in the first quarter of 2008 (South African Reserve Bank, 2015). The South African Government through the enactment of the National Credit Act has demonstrated a firm commitment to monitor the social effects of over-indebtedness (Goodwin-Groen & Kelly-Louw, 2006; Renke et al., 2007; Roestoff et al., 2009).

Since the end of apartheid, unemployment remained as the main objective of the current government despite various policies and programmes to address it. As such job creation occupies a central theme in the new National Development Plan (NDP) (National Planning Commission, 2012). A broad measure of unemployment reflects an increase from 27.5 per cent in 2008 to 32.7 per cent in 2010 (Verick, 2012). The ability to be employed counts as an important indicator of well-being with obvious instrumental, but also considerable intrinsic significance. The literature regarding factors that play the biggest roles in influencing wellbeing in South Africa have identified employment as one of these factors (see Hirschowitz et al., 2000; Bookwalter, Fuller & Dalenberg, 2006; Higgs, 2007; Hinks & Gruen, 2007; Posel & Casale, 2011; Møller, 2013; Greyling & Tregenna, 2016). Lugo (2007) and Ataguba, Ichoku, and Fonter (2013) also found unemployment to be associated with higher counts of multiple deprivations.

Fundamentally, the choice of dimensions, indicators and deprivation cut-off points proposed for the multidimensional poverty analysis in South Africa, is informed by the Multidimensional Poverty Index, the work of Statistics South Africa's South African Multidimensional Poverty Index (SAMPI) analysis for 2014 and public policy relevance as contained in the National Credit Act and the National Development Plan 2030.

## 7.4 METHODOLOGY

### 7.4.1 Over-indebtedness – National Credit Regulator (NCR)

The NCR indicator is used to measure household over-indebtedness. The NCR is responsible for the regulation of the South African credit market. Although difficulty is experienced in operationalising the legislated definition of over-indebtedness, the institution's task team has provided guidelines to assess over-indebtedness (see Table 4.2: Acceptable debt service ratios). For each income category, the guideline provides a range of debt service to household income that is considered reasonable, and beyond these thresholds, a household is defined as over-indebted.

Following the guidelines in Table 4.2, based on the after-tax income bracket, the maximum income that can be allocated for debt payment of each household is calculated. Next, the potential difference between the maximum income that can be allocated for debt payment and the actual debt payment is calculated. If this potential difference is greater than zero, it means that the household is non-deprived, and its debt status (d.sta) is encoded as zero. On the other hand, for the household in which the potential difference is less than 0, the household is deprived, and d.sta is encoded as 1.

### 7.4.2 Multiple correspondence analysis (MCA) approach

The MCA is employed in an exploratory exercise to assess whether over-indebtedness can be a valid additional dimension to the existing education, health, living standards and economic activity dimensions in the South African Multidimensional Poverty Index. Indicator variables used in the analysis are shown in Table 4.4 (Section 4.3.3). The selection of MCA and its mathematical expressions are discussed in detail in Chapter 4.

Equations used are:

$$d_{i,i'}^2 = C \sum_{d=1}^D \frac{(x_{i,d} - x_{i',d})^2}{I_d} \dots\dots\dots (1)$$

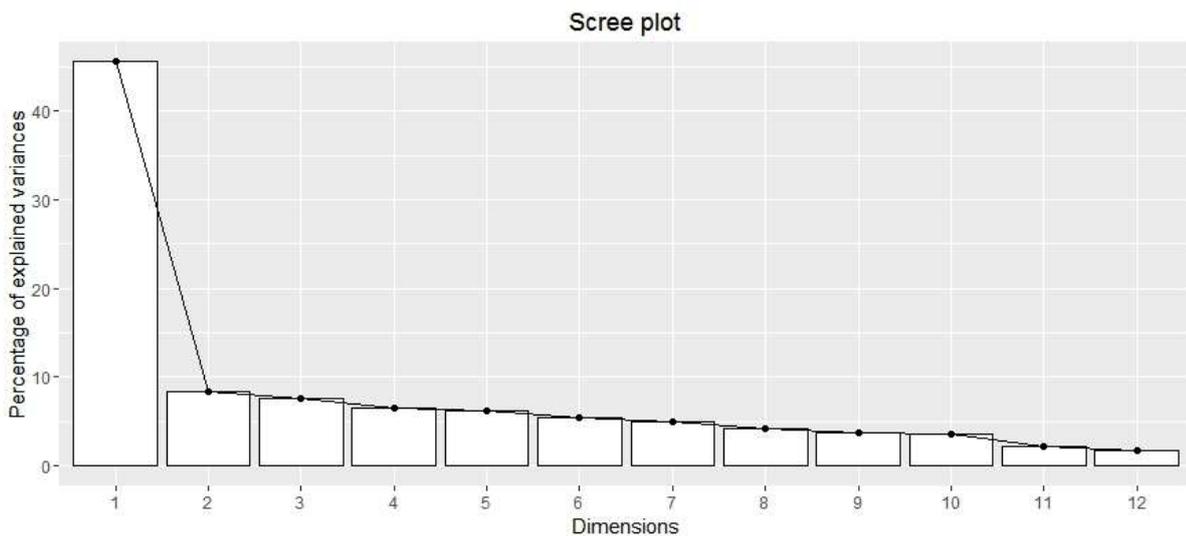
$$d_{a,nd}^2 = C' \frac{1}{I_a I_{nd}} \sum_{i=1}^I (x_{i,d} - x_{i,nd})^2 \dots\dots\dots (2)$$

$$CPI_i = \frac{1}{K} \sum_{k=1}^K \sum_{j_k=1}^{J^k} W_{jk}^k I_{jk}^k \dots\dots\dots (3)$$

$$W_{jk}^k = \frac{s^k}{\sqrt{\lambda}} \dots\dots\dots (4)^{14}$$

### 7.5 RESULTS AND DISCUSSION

Figure 7.1 shows the percentage of variance explained by each dimension. It should be noted that dimension 1 explains 45.6 percent of the variation and dimension 2 explains 8.3 percent of the variance. Thus, in total, the first two dimensions explain 53.9 percent of the variance. In the subsequent analysis, the discussion will be concerned with these two dimensions only. Also, since dimension 1 explains a substantial amount of variance, this chapter will use dimension 1 as a measure on CPI.

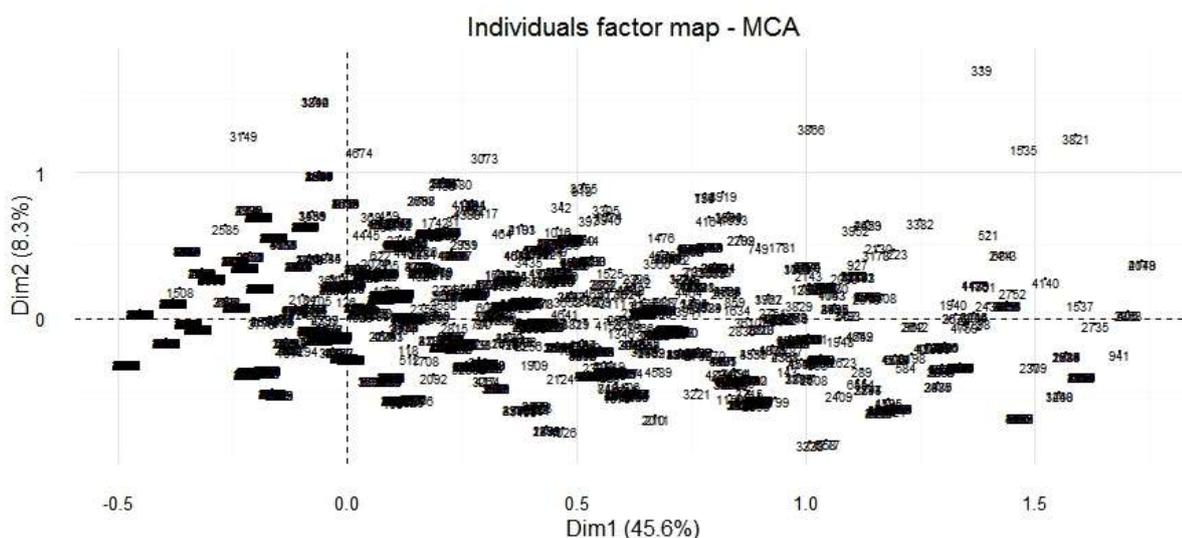


**Figure 7.1: Percentage of variance explained by each dimension or indicator variable**

Source: Author, based on weighted data from the NIDS survey

<sup>14</sup> Adopted from Ezzrari & Verme (2012)

Using equation 1, the next objective is to analyse the cloud of individual households in order to see if there is any specific shape of notable households with the first two dimensions (that explains a total of 53.9 percent of the variance). Figure 7.2 shows that barring a small number of households that lie in the upper right-hand side of the graph, most households are clustered in the origin region of dimensions 1 and 2. Thus, it might be concluded that, based on the features shared by the households, there is not much difference between them.

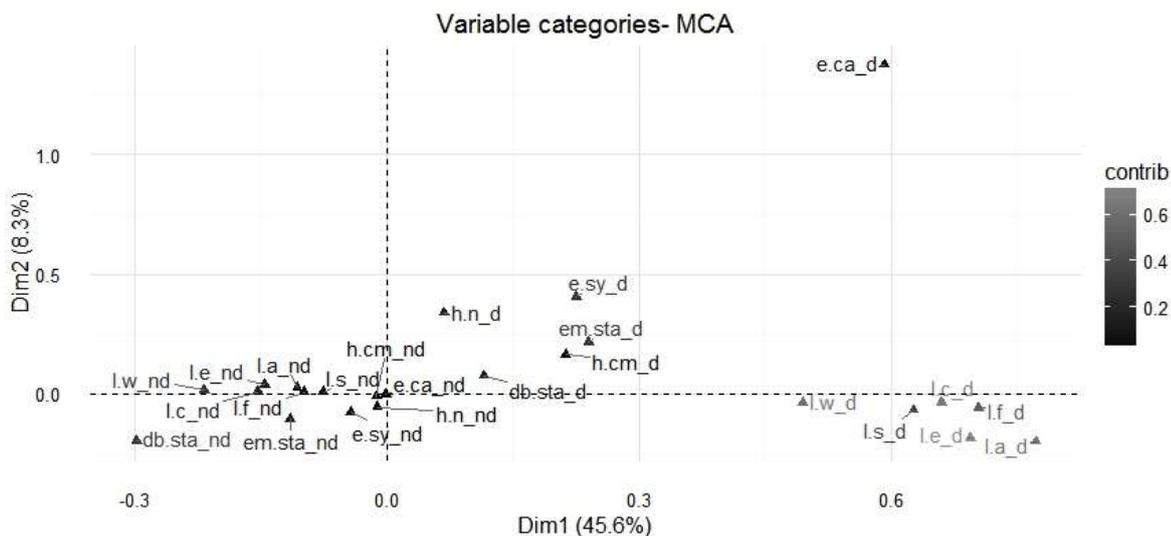


**Figure 7.2: Plane representation of the households**

Source: Author, based on weighted data from the NIDS survey

Next, the distance between the indicator variables and their categories is calculated by using equation 2. As can be seen from the Figure 7.3<sup>15</sup>, child enrolment\_deprived (e.ca\_d) is unrelated to all other variables. It is worthwhile to note that dimension 1 mostly separates the non-deprived indicator variables (nd) (on the left side of the y axis) from the deprived (d) (right side of the y axis) for the variables.

<sup>15</sup> d denotes deprived indicator variable while nd denotes non-deprived



**Figure 7.3: Plane representation of the variables and their categories**

Source: Author, based on weighted data from the NIDS survey

In addition, the position of each of the indicator variables in the dimension 1, their contribution to the dimension, and the quality of the contribution are shown in Table 7.1. Variables that are to be included in the computation of CPI have to satisfy the First Axis Ordinal Consistency (FAOC) property. According to Asselin (2009), the modalities of the variables describing the poverty situation must have increasing scores on the first factor axis, which is the poverty axis.

As mentioned earlier, CPI as a latent multidimensional variable is measured through dimension 1. It might be noted from Table 7.1, for all indicator variables, as deprivation (d) increases, poverty increases; and vice versa. This satisfies the monotonicity axiom requirements and is in alignment with the First Axis Ordering Consistency (FAOC). FAOC states that “there must be an ordinal consistency between the ordering of categories and the ordering of weights across categories, either increasing or decreasing order” (Ezzrari & Verme, 2012). The modalities with a positive score (on Dim.1) increase poverty, while those with negative scores reduce poverty. For example, for a household that does not have access to electricity (l.e\_d), its poverty value increases by 0.694. On the contrary, if the household has access to electricity (meaning it is non-deprived); it is not affected by poverty (thus non-deprived (l.e\_nd) is -0.145). This is true for all the variables. Asset ownership (the household does not own more than one of radio, TV, telephone, fridge or

bicycle, and does not own a car) is the most significant sign of multidimensional poverty (because of its score of 0.772), and not being over-indebted (with a score of -0.298) is the most patent sign of lower poverty.

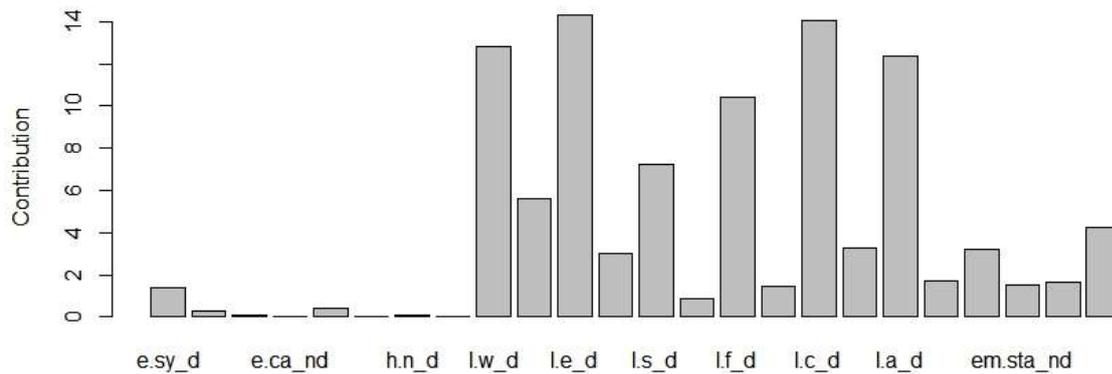
**Table 7.1: The effect of the indicator variables on MPI**

Indicator	Dim.1	contribution	Quality of contribution	v.test
Years of schooling_deprived (e.sy_d)	0.225	1.388	0.109	6.812
Years of schooling_non-deprived (e.sy_nd)	-0.043	0.263	0.109	-6.812
Child enrolment_deprived (e.ca_d)	0.592	0.112	0.008	1.777
Child enrolment_non-deprived (e.ca_nd)	-0.001	0	0.008	-1.777
Child mortality_deprived (h.cm_d)	0.213	0.426	0.031	3.561
Child mortality_non-deprived (h.cm_nd)	-0.012	0.025	0.031	-3.561
Nutrition_deprived (h.n_d)	0.068	0.112	0.009	1.911
Nutrition_non-deprived (h.n_nd)	-0.011	0.018	0.009	-1.911
Drinking water_deprived (l.w_d)	0.495	12.802	0.795	22.759
Drinking water_non-deprived (l.w_nd)	-0.217	5.619	0.795	-22.759
Electricity_deprived (l.e_d)	0.694	14.297	0.755	22.048
Electricity_non-deprived (l.e_nd)	-0.145	2.991	0.755	-22.048
Sanitation_deprived (l.s_d)	0.626	7.214	0.454	15.073
Sanitation_non-deprived (l.s_nd)	-0.075	0.866	0.454	-15.073
Floor_deprived (l.f_d)	0.704	10.399	0.605	18.252
Floor_non-deprived (l.f_nd)	-0.098	1.448	0.605	-18.252
Cooking fuel_deprived (l.c_d)	0.66	14.06	0.767	22.07

Cooking fuel_non-deprived (l.c_nd)	-0.153	3.263	0.767	-22.07
Assets_deprived (l.a_d)	0.772	12.357	0.67	19.88
Assets_non-deprived (l.a_nd)	-0.106	1.698	0.67	-19.88
Employment_deprived (em.sta_d)	0.24	3.208	0.285	11.546
Employment_non-deprived (em.sta_nd)	-0.115	1.534	0.285	-11.546
Over-indebtedness_deprived (db.sta_d)	0.116	1.65	0.347	12.882
Over-indebtedness_non-deprived (db.sta_nd)	-0.298	4.252	0.347	-12.882

Source: Author, based on weighted data from the NIDS survey

By construction, the weights from the MCA procedure can have positive and negative values. To maintain the assumption that CPI is a positive variable, the absolute value of the lowest score in the distribution should be added to the score of each household. The translation of the CPI is done by adding 0.298 to its values. Following the MCA procedure, CPI for each household can be calculated using equation (3). As defined in previous sections, the value of CPI for a household is the average of its weight indicators corresponding to the average of the standardized scores of Dim.1. Next, the contribution of each of the variables is analysed. In order to provide better visualisation, the third column of Table 7.1 is shown in terms of a barplot (Figure 7.4).



**Figure 7.4: Contribution of each of the variables to MPI.**

Source: Author, based on weighted data from the NIDS survey

As can be seen from Figure 7.4, variables like child enrolment (e.ca), nutrition (h.n), child mortality (h.cm) and years of schooling (e.sy) contribute less to CPI than employment status (em.sta) and over-indebtedness status (db.sta).

In addition, empirical results from Table 7.2 show the importance of employment status (em.sta) and over-indebtedness status (db.sta) in the calculation of CPI. The second column of the table shows the squared correlation between dimension 1 and the indicator variables. It may be recalled here that dimension 1 in this analysis is CPI. Thus the correlation between CPI and employment status (emp.sta) or between CPI and over-indebtedness status (db.sta) is far more (0.125 and 0.156 respectively) than between CPI and child enrolment (e.ca:0.003) or CPI and nutrition (h.n: 0.003) or CPI and child mortality (h.cm:0.012) or CPI and years of schooling (e.sy:0.044). This further emphasizes that if education and health indicators are included in the calculation for CPI, results show even more justification for the inclusion of employment status (em.sta) and over-indebtedness status (db.sta) in the calculation of CPI.

**Table 7.2: Squared correlation between CPI and the indicator variables**

<b>Indicator</b>	<b>Dim.1/CPI</b>
Years of schooling (e.sy)	0.044
Child enrolment (e.ca)	0.003
Child mortality (h.cm)	0.012
Nutrition (h.n)	0.003
Drinking water (l.w)	0.487
Electricity (l.e)	0.457
Sanitation (l.s)	0.214
Floor (l.f)	0.313
Cooking fuel (l.c)	0.458
Assets (l.a)	0.372
Employment status (em.sta)	0.125
Over-indebtedness (db.sta)	0.156

Source: Author, based on weighted data from the NIDS survey

Table 7.3 shows the importance of the original indicators in MPI without employment and over-indebtedness status indicators. All the remaining indicators, except for e.sy, increase in value. Thus clearly supporting the quality of contribution that unemployment and over-indebtedness make in the CPI. Consequently, Table 7.4 - referred to as the South African Multidimensional Poverty Index-Over-Indebtedness (SAMPI-OI) proposes a framework for multidimensional poverty analysis that includes unemployment and household over-indebtedness.

**Table 7.3: Squared correlation between CPI and the indicator variables (original MPI)**

<b>Indicator</b>	<b>Dim.1/CPI</b>
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Years of schooling (e.sy)	0.038
Child enrolment (e.ca)	0.003
Child mortality (h.cm)	0.013
Nutrition (h.n)	0.003
Drinking water (l.w)	0.502
Electricity (l.e)	0.496
Sanitation (l.s)	0.225
Floor (l.f)	0.325
Cooking fuel (l.c)	0.477
Assets (l.a)	0.393

Source: Author, based on weighted data from the NIDS survey

**Table 7.4: South African Multidimensional Poverty Index–Over-Indebtedness (SAMPI-OI)**

<b>Dimension</b>	<b>Indicator</b>	<b>Deprivation cut-off</b>
Education	Years of schooling (1/10)	No adult household member has completed five years of schooling
	Child enrolment (1/10)	At least one school-aged child (aged 7 to 15) is out of school
Health	Child mortality (1/10)	Household has had a child under the age of 15 who has died in the past 20 years
	Nutrition (1/10)	At least one adult (> 18 years old) has a Body mass index (BMI) less than 18.5
Living standards	Electricity (1/30)	Household has no electricity
	Drinking water (1/30)	No piped water in dwelling or on stand
	Sanitation (1/30)	No flush toilet or pit latrine, or household shares toilet with another household
	Cooking fuel (1/30)	Household does not use electricity, gas or paraffin for cooking
	Assets (1/30)	Household does not own more than one of radio, TV, telephone, fridge, bicycle and does not own a car
	Floor (1/30)	The household has a dirt, sand, or dung floor
Economic activity	Employment status (1/5)	If all adults (aged 15 to 64) in the household are unemployed
Financial commitments	Over-indebtedness (1/5)	Over-indebtedness status per Table 4.2

Source: Ntsalaze &amp; Ikhide (2016b)

## 7.6 DISCUSSION

As can be seen from Table 7.1 (column 4), the result shows that lack of piped water in a dwelling or household's yard has the highest contribution to multidimensional poverty index with a value of 0.795. Van der Pas *et al.* (2015) reported that a minority (41%) have piped water in their households. Moller and Devey (2003) said that the majority was likely to have access to a tap offsite within 200 metres from the dwelling representing the cut-off as articulated by the Reconstruction and Development Programme (RDP). This minimum standard is not equivalent to that given in Table 4.4. Access to piped water is interlinked with the provision of sanitation (0.454 contribution) represented by the presence of a flush toilet, because flush toilets are water intensive. Similarly, a minority (34%) of households had a toilet, according to Van der Pas *et al.* (2015). Statistics South Africa reported a significantly different outcome, indicating that over half of households had access to a flush toilet, while two out of every ten persons used a pit toilet without ventilation (Statistics South Africa, 2012). The difference may be due to the fact that the latter includes cases where a flush toilet is shared among households.

Cooking fuel is another significant contributor to poverty (0.767). Many households may still be using traditional fuels for cooking such as coal and wood. For instance, in Limpopo, 52.5 percent of the population cook on wood, 24 percent in the Eastern Cape and 19 percent in each of Mpumalanga and KwaZulu-Natal (Statistics South Africa, 2012). This, at times, happens even though electricity is provided, but is not used due to high electricity prices. Next to cooking fuel, provision of electricity contributes with a value of 0.755. Government's goal to extend access to electricity to all citizens of South Africa has not yet been met. (Department of Energy, 2012). About 13 percent of households are not electrified due to topography, high costs per connection and home environment (informal/squatter housing). Over the past few years, energy demands have been growing significantly in South Africa. The South African parastatal power supplier (ESKOM) has been unable to meet the country's escalating energy needs. As a result, there have been widespread and persistent power cuts throughout the country. This has prompted the Renewable

Energy Independent Power Producers Procurement Programme (the REI4P) to expand energy supply from renewables – wind, solar, biomass, biogas and hydropower.

The multidimensional poverty index includes indicators based on private assets (e.g. radio, television sets, telephone, fridge, bicycle and a car). Results indicate that many households live without these assets that are considered to be basic. Unlike public assets, ownership of private assets is usually correlated with the income of a household. Given that assets such as a television and a car are relatively expensive it may be difficult to have these in a country where household earning capacity is taken away by the high unemployment rate. Floor types of dirt, sand, or dung contributes 0.605 to household MPI. This could be influenced by the nature of housing that people use. Rapid urban population growth makes it more difficult for government to provide enough decent free RDP housing to low-income families (Huchzermeyer, 2011; Lemanski, 2011). The housing backlog was 2.3 million and rising in 2014, and community protests over housing and services have escalated (Turok, 2014). The outcome of these factors tends to be extensive informal production of dwellings using makeshift materials ('shacks') located in crowded settlements.

The new proposed indicators, namely unemployment and over-indebtedness have relatively high values; they contribute 0.347 and 0.285, respectively. Not being employed or over-indebted may not in themselves be indicators of wellbeing, but they demonstrate the ability to attain higher levels in other well-being indicators such as the ownership of private assets. Over-indebted households struggle to repay borrowed money, which, among other things, poses a threat to the financial industry. The contribution of the unemployment indicator illustrates the growing challenge around unemployment in the country.

Results also show significant progress on prevention of child mortality likely to be achieved through the aggressive scale-up of prevention of mother-to-child transmission of HIV/AIDS and improved access to healthcare (Kibet, 2010). With regard to adult nutrition, the majority of adults in South Africa are overweight or obese. Rath *et al.* (2016) reported that in 2014, nearly 54 per cent of South Africans were overweight, and 27 per cent were obese. This clearly indicates non-

deprivation in terms of nutrition but raises concerns about the health status of the population. The most progress has been made on enrolment for school-aged children (7-15 years). South Africa has made remarkable progress towards achieving the education for all goals. Enrolment for school-aged children contributes a mere 0.08 in value towards the household multidimensional poverty index. In 2013, almost 99 percent of children aged 7 to 15 were attending educational institutions in South Africa (Department of Basic Education, 2014). The No-Fee Schools policy in poverty-stricken areas has facilitated the increase in access. The remaining challenges are to improve literacy and numeracy levels among learners (Van der Berg *et al.*, 2011).

The household's employment and debt status are at least as important as education and health indicators. Thus, if education and health can be used in the SAMPI, the empirical results suggest that there is justification to incorporate both employment and debt status in measuring multidimensional poverty.

## **7.7 CONCLUSION**

This chapter extends the measurement of multidimensional poverty to other dimensions beyond education, health and living standards. In particular, the focus of the analysis is on employment status and household over-indebtedness for South Africa. With lack of employment and over-indebtedness households are constrained from participating in the normal societal activities they value. Robustness is achieved by the FAOC properties of the variables. In addition, the methodology used assigns weights that are endogenous to the data set, which are determined by statistical rules rather than by assigning equal weights *i.e.* subjectively.

## CHAPTER 8

# CONSTRUCTION OF THE SOUTH AFRICAN MULTIDIMENSIONAL POVERTY INDEX-OVERINDEBTEDNESS (SAMPI-OI)

### 8.1 INTRODUCTION

Over two decades into democracy, poverty alleviation remains a major challenge in South Africa. It is, therefore, crucial for the government to continuously consider which measures of poverty accurately identifies the most deprived in order to implement targeted interventions. Several countries in the developing world such as Mexico, Colombia, Chile as well as in Bhutan and The Philippines, have started to complement unidimensional measures with multidimensional indices that can even capture households' achievements on non-tradable goods. In, particular the South African government has made notably advances in this regard by implementing the South African Multidimensional Poverty Index (Statistics South Africa, 2014). As early as 2000, Statistics South Africa released a report advocating for a mind shift towards a broader construct of poverty.

Despite much debate about the measurement of poverty and deprivation in South Africa (see Bhorat and Kanbur 2006; Meth 2007; Noble et al. 2007; Roberts, 2004), the impact of over-indebtedness on poverty seems to be overlooked except by Klasen (2000). Klasen (2000) included debt service ratios in his composite measure of deprivation. High household indebtedness may indicate financial distress. Debt service eats up economic resources, and thus deprives households of basic necessities as a consequence of inadequate disposable income after the repayment of debts. Recently, Ntsalaze and Ikhide (2016b) have argued that, in the case of South Africa, multidimensional poverty analysis is not complete without unemployment and over-indebtedness indicators. The poverty rates are still unknown, however, when the framework proposed by Ntsalaze and Ikhide (2016b) is implemented. Based on the Alkire-Foster methodology, Finn and Woolard (2013) reported that nine percent of South Africans were multidimensionally poor in 2010. Statistics South Africa reported eight percent in 2011 (Statistics South Africa, 2014b). A report by the Oxford Poverty and Human Development Initiative (2016)

indicated that 11.1 percent South Africans were multidimensionally poor using the NIDS 2012 data, culminating to an index value of 0.044.

This chapter aims to apply Ntsalaze and Ikhide's (2016b) framework and present multidimensional poverty rates for South Africa in 2012, using household-level panel data from the National Income Dynamics Study (NIDS) Survey, and compare its racial and spatial distributions across rural and urban areas. In the multidimensional setting, the main questions are: who is considered to be poor and how can an aggregate poverty measure be obtained? While various approaches have been developed to assess multidimensional poverty, the Alkire Foster method has gained substantial traction because of its theoretical and conceptual innovations and its particular advantages over other methods (Alkire & Foster, 2011). These advantages include the flexibility as to the dimensions that can be added, possibility of decomposing the measure into population subgroups as well as breaking it down into dimension specific contributions, allowing better identification of policy priorities and a wide range of practical applications and satisfying desirable axiomatic properties (Alkire & Foster, 2011). The Alkire Foster method follows Sen's capability approach which focuses on the actual freedoms a person has rather than mere means of living, e.g. ownership of TV sets versus a certain amount of money that can buy a TV set. This method was adopted in the Human Development Report of the United Nations which has been published since 2010 as a global MPI.

## **8.2 MULTIDIMENSIONAL POVERTY MEASUREMENT IN SOUTH AFRICA**

A number of national-level indices have been produced for South Africa, relating to deprivation. Vichi (1997) developed a national index of deprivation broken down by settlement type (urban/rural) based on the 1993 South Africa Living Standards and Development Survey. Using the same dataset, Klasen (2000) found a strong correlation between an expenditure-based poverty measure and a composite measure of deprivation based on the principal component analysis. His national deprivation index consisted of education, income, wealth, housing, water, sanitation, energy, employment, transport, financial services, nutrition, health care, safety and perceived well-being indicators. Hirschowitz (2000) developed a household infrastructure index (state of housing,

access to services, education, and expenditure indicators) and a household circumstances index (unemployment, household size and number of children indicators) based on Census 1996 data to measure poverty from a multidimensional perspective. Based on the same dataset, McIntyre *et al.* (2002) developed four deprivation indices, which focused on the relationship between deprivation and health inequalities at a magisterial district level. Mattes *et al.* (2003) based their Lived Poverty Index on the Afrobarometer data and focused on the ability to obtain basic necessities such as: a cash income, food, medical treatment, home fuel, water, electricity and home safety.

The South African Human Development Index (HDI) is a combination of measures of life expectancy, education and per capita GDP, and is complemented by a Human Poverty Index, Gender Empowerment Index, and Service Deprivation Index (UNDP, 2003). Drawing from the 2006 South African Social Attitudes Survey, Wright (2008) developed a Proportional Deprivation Index, which measures the lack of items defined as essential for an acceptable standard of living. In 1999, in the Western Cape, a provincial HDI was constructed based on the 1996 Census. Indicators of income, employment status, literacy and water supply were used with equal weights to form a composite index (Department of Health and Social Services of the Western Cape, 1999). This work has been further developed using the 2001 Census to produce an HDI at municipal level for the Western Cape (Office of the Premier of the Western Cape, 2005). In 2010, Noble *et al.* (2010) presented the Provincial Indices of Multiple Deprivation at ward level using 2001 census data.

Posel and Casale (2011), Blaauw and Pretorius (2012), and Ebrahim, Botha and Snowball (2013) used the 2008 NIDS data to adopt poverty measures other than the absolute income and relative income methods. Statistics South Africa used data from the Living Conditions Survey (LCS) 2008/2009, and created an index across eight dimensions (Statistics South Africa, 2013). Posel and Rogan (2013) also used the LCS to compare objective poverty (using per-capita income and the absolute poverty line of Woolard and Leibbrandt (2006)) and subjective poverty, and found that the objective poverty rate was higher. Other recent studies considered the multidimensional nature of poverty (see Burger *et al.*, 2004; Adams *et al.*, 2015; Bhorat & Van der Westhuizen, 2013; Finn

*et al.*, 2013) according to the non-monetary variables. Recently, Statistics South Africa has embraced the Alkire-Foster methodology to produce a national multidimensional poverty index with adjusted indicators, and an additional dimension capturing the unemployment situation of households using census of 2001 and 2011 data (Statistics South Africa, 2014b). Jansen *et al.* (2015) analysed poverty across various objective and subjective methods, and found a variation in poverty status, with blacks being mostly likely to be poor in at least one method. A Multidimensional Poverty Index for Gauteng based on Quality of Life survey data indicates that unemployment correlates with multidimensional poverty (Mushongera *et al.*, 2015). Frame *et al.* (2016) focused on the forms of deprivation faced by the current generation of young people in South Africa, and found that education and economic opportunities contributed the highest shares to the overall Youth MPI score. The next section implements the SAMPI-OI as proposed by Ntsalaze and Ikhide (2016b) to determine the multidimensional poverty index and the related poverty rates.

### 8.3 CONSTRUCTING THE SAMPI-OI

The SAMPI-OI is based on the Alkire-Foster method (Alkire & Foster, 2011). The method identifies the poor using a two-stage cut-off process. The first cut-off process relates to deprivation cut-offs for each of the 12 indicators as defined in Table 8.1. Weights are included in parenthesis. Each of the indicators is associated with a deprivation cut-off, a normative minimum level that a household needs to achieve in order to be defined as non-poor in that specific indicators. A household is thus defined as deprived if its achievement is less than the cut-off. The deprivation score is computed for each household as explained in section 4.3.2. Then, with this score the poor are identified using a second cut-off, the poverty cut-off, denoted by  $k$ , which represents the proportion of minimum deprivation a household must experience in order to be identified as poor. That is, a household is poor when  $C_i \geq k$ . In this study, a household is considered multidimensionally poor if they are deprived in at least one-third of the weighted indicators used in the calculation of the SAMPI-OI. This is consistent with the work of Oxford Poverty and Human Development Initiative (2015). The

deprivations of those not identified as poor are then ignored; technically, they are censored.

Censored deprivations are defined as  $g_{ij}^0(k) = g_{ij}^0$  when  $C_i \geq k$  and  $g_{ij}^0(k) = 0$  otherwise.

**Table 8.1: South African Multidimensional Poverty Index – Over-Indebtedness (SAMPI-OI) including weights**

<b>Dimension</b>	<b>Indicator</b>	<b>Deprivation cut-off</b>
Education (1/5)	Years of schooling (1/10)	No adult household member has completed five years of schooling.
	Child enrolment (1/10)	At least one school-aged child (aged 7 to 15) is out of school.
Health (1/5)	Child mortality (1/10)	Household has had a child under the age of 15 who has died in the past 20 years.
	Nutrition (1/10)	At least one adult (> 18 years old) has a Body Mass Index (BMI) less than 18.5.
Living standards (1/5)	Electricity (1/30)	Household has no electricity.
	Drinking water (1/30)	No piped water in dwelling or on stand.
	Sanitation (1/30)	No flush toilet or pit latrine, or household shares toilet with another household.
	Cooking fuel (1/30)	Household does not use electricity, gas or paraffin for cooking.
	Assets (1/30)	Household does not own more than one of radio, TV, telephone, fridge, bicycle, and does not own a car.
	Floor (1/30)	The household has a dirt, sand, or dung floor.
Economic activity (1/5)	Employment status (1/5)	If all adults (aged 15 to 64) in the household are unemployed.
Financial commitments (1/5)	Over-indebtedness (1/5)	Over-indebtedness status per Table 4.2

Source: Ntsalaze &amp; Ikhide (2016b)

Once the multidimensionally poor have been identified, the  $M_0$  measure combines two fundamental subindices: the headcount ( $H$ ) of people who are multidimensionally poor (also called poverty incidence) and their poverty intensity ( $A$ ), given by the average (weighted) deprivations among the poor. Formally, the headcount of poor people is given by  $H = q/n$ , where  $q$  is the number of people identified as poor and  $n$  is the total population. Poverty intensity is given by  $A = \sum_{i=1}^n c_{i(k)}/q$ , where  $C_i(k) = \sum_j^d w_j g_{ij}^0(k)$  is the censored deprivation score of household  $i$ . MPI, as  $M_0$  (adjusted headcount), is the product of these two sub-indices:

$$MPI = M_0 = H \times A = \frac{1}{n} \sum_{i=1}^n \sum_{j=1}^d w_j g_{ij}^0(k)$$

One of the advantages of using the Alkire-Foster methodology for SAMPI-OI is that it fulfils a number of axiomatic properties that other measures do not fulfil. Firstly, by adjusting the incidence of multidimensional poverty by the intensity,  $M_0$  satisfies dimensional monotonicity (Alkire and Foster, 2011a). This ensures that poverty focus and deprivation focus are maintained. The poverty measure does not change if there is an improvement in any of the dimensions of a non-poor household or in any of the non-deprived dimensions of a poor household. But if, for instance, a poor household becomes deprived in an additional indicator,  $M_0$  will increase, providing information in terms of the breadth of deprivation. Secondly,  $M_0$  is not sensitive to changes within a non-deprived dimension and to transfers between non-poor households. The construction of the index does not produce lower levels of poverty due to changes among the non-poor population. Thus, the  $M_0$  fulfils the poverty focus axiom. Lastly,  $M_0$  is decomposable into population subgroups as well as indicator specific contributions, allowing better identification of policy priorities.

Another crucial step in the construction of a multidimensional poverty index is the selection of weights for different indicators. There is no definitive procedure of assigning weights over dimensions in a multidimensional measure of poverty. Decancq and Lugo (2013) suggested three different methods namely: (1) data driven, (2) normative, and (3) hybrid. Data-driven weights are

generated from the distribution of the achievements alone and reduce the arbitrariness involved in the weighting process (Asselin, 2009). However, such weights change over different data sets and time. Normative approaches, on the other hand, only depend on the value judgements to set the weights. Despite its popularity, the arbitrariness of equal weighting is far from uncontroversial (Chowdhury & Squire, 2006; Ravallion, 2011). The fundamental problem is: whose value judgements on welfare are used? A hybrid approach combines the previous two using both information on the actual distribution and the value judgments.

In the absence of any well-justified reasons for differential weighting, this chapter applies a normative approach with a nested weighting structure, where each dimension has the same weight and each indicator has the same weight within each dimension. The advantage of applying equal weighting is that it allows for a more straightforward interpretation of the index and reflects the normative assessment that each dimension has equal importance in contributing to overall wellbeing (Alkire, 2008).

One of the key attributes of the AF method is that it is decomposable by subgroups and individual indicators. The relative contributions of individual indicators to the overall adjusted headcount can be derived by (Alkire & Santos, 2010; Alkire & Foster, 2011):

$$\text{Contribution of indicator } j \text{ to } M_0 = \frac{W_j * CH_j}{M_0}$$

where  $W_j$  is the respective weight assigned to each indicator (from Table 1),  $CH_j$  is the censored headcount and  $M_0$  is the aggregate adjusted headcount. A contribution that far exceeds the indicator's relative weight highlights a high deprivation in that specific indicator (Alkire & Santos, 2013).

#### **8.4 NEW ESTIMATES OF POVERTY**

Table 8.2 presents estimates of the SAMPI-OI scores at a national level and decomposition by settlement type and population group subgroups. Although the new South Africa aims to be a non-

racial society, it remains a common practice to collect demographics on settlement types and population groups, and to disaggregate social indicators by such categories for purposes of monitoring progress in redressing past discrimination (Møller, 2013).

A household is excluded from the SAMPI-OI calculation if there is missing data for one or more indicators. As a result the sample size reduced from 8040 successfully interviewed households to 5429. This represents 68% of the data space. Sampling weight was used in order to keep the original distribution across population groups.

Table 8.2: Multidimensional Poverty across settlement types and ethnicity

		Headcount ratio (H)	Intensity (A)
<b>National</b>		14.8%	39.9%
<b>Settlement type</b>			
Rural		22.3%	39.9%
Urban		7.8%	40.2%
Farms		12.3%	39.5%
<b>Ethnicity</b>			
African		18.2%	39.9%
Coloured		7.6%	40.3%
Asian/ Indian		2.8%	40.0%
White		0.1%	50.0%

Source: Author, based on weighted data from the NIDS survey

The results show that, in 2001, one in seven (14.8%) South Africans were multidimensionally poor. In terms of absolute values, out of a population of R52 million (Statistics South Africa, 2014c), about 8 million people were multidimensional poor. The poverty intensity estimate indicates that on average those that are multidimensionally poor experience deprivation in 40% of the weighted indicators. The overall SAMPI-OI, which accounts for both the depth and the severity of multidimensional poverty, is 0.060.

There were substantial differences in poverty headcounts across settlement type - these have maintained the pattern observed in the pre-1994 period. The results are consistent with the findings of Statistics South Africa (2014a). The poverty headcount was highest in rural areas (22.3%), followed by farm areas (12.3%). The average intensity varied slightly across settlement types. Urban areas have the highest poverty intensity, but rural areas still recorded the highest SAMPI-OI of 0.089.

With regard to poverty estimates between population groups, there are significant differences in poverty headcounts between the population groups in South Africa. About one in five (18.2%) poor people in South Africa were black Africans in 2012, 7.6 percent of Coloureds were found to be poor, as were 2.8 percent of Indians/Asians and very few Whites (0.1%). Population groups with higher headcounts tended to have higher SAMPI-OI score. The composition of the multidimensionally poor consists of 92.1 percent Africans, 7.5 percent coloureds, 0.3 percent Asians/Indians and 0.2 Whites. Yet, more than two decades after the end of apartheid, poverty continues to indicate highly unequal spatial and racial distribution. As would be expected, African households are found to be worse off than other groups (see Klasen, 2000; Higgs, 2007; Posel & Casale, 2011). These findings reflect South Africa's apartheid history and the ongoing legacy thereof (Statistics South Africa, 2014a).

#### 8.4.1 What proportion of South African households is deprived per indicator?

Table 8.3 shows both the uncensored and censored proportion of households that are deprived in each of the indicators reflected in Table 8.1. In five indicators (nutrition, child mortality, over-indebtedness, ownership of assets and child enrolment), both the uncensored and the censored results reveal similar patterns showing less deprivation. Lack of employment is most severe among the multidimensionally poor (censored) in comparison to adult schooling for the overall households. The results on the living standards indicators are marginally different in rankings. The uncensored results are discussed below while the discussion of censored results is more prominence in the discussion of the drivers of poverty as the section is looking at the poor only.

**Table 8.3: Proportion deprived in each indicator – uncensored versus censored**

<b>Dimension</b>	<b>Indicator</b>	<b>Uncensored headcount</b>	<b>Censored headcount (k=1/3)</b>
Education	Adult Schooling	41.55	12.44
	Child enrolment	0.24	0.10
Health	Child mortality	7.50	2.97
	Nutrition	10.32	3.08
Standard of living	Water	33.22	8.28
	Electricity	17.67	4.41
	Sanitation	30.34	6.31
	Flooring	14.31	4.48
	Cooking fuel	22.78	6.52
	Assets	4.56	0.40
Economic activity	Unemployment	23.76	13.04
Financial commitment	Over-indebtedness	5.79	2.22

Source: Author, based on weighted data from the 2012 NIDS survey

Results show that 41.6 percent of households had no adult household member who has completed at least five years of schooling. This is the worst performing indicator but it is encouraging to note that child enrolment (0.24%) is the best performing indicator across all dimensions. This shows a remarkable progress towards achieving access to primary education for the youth.

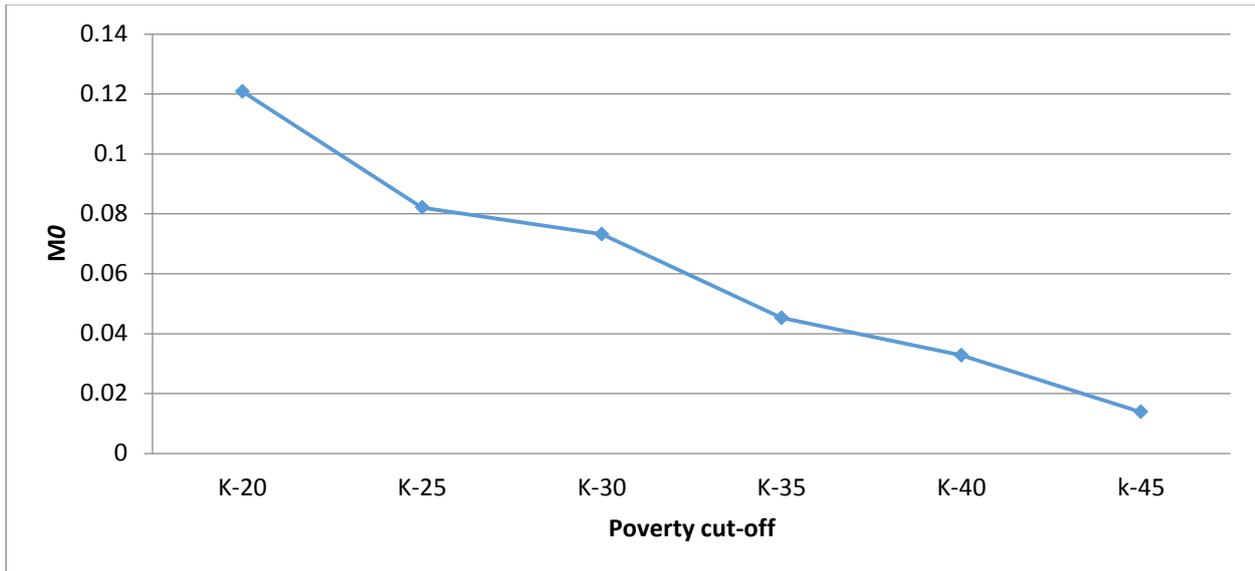
South Africa is reported to have about 81 percent of overweight and obese population (Rath *et al.*, 2016). This could be the reason why only 10.3 percent of households have an adult member with less than 18.5 Body Mass Index. The incidence of child death in the last twenty years affects 7.5 percent of households.

Access to water (33.2%) remains a significant challenge for many households and because it is interlinked with the provision of sanitation, it is not surprising that 30.3 percent of households still need sanitation services. While only 17.7 percent of households do not have electricity, many households (22.8%) still rely on traditional fuels for their cooking. This could be due to relatively high electricity prices. The proportion of households (14.3%) living in houses that have dirt, sand, or dung floor suggests that housing continues to be a challenge for many households. In terms of ownership of basic assets (like radio, TV, telephone, fridge, bicycle), only about five percent of household are deprived.

With regard to economic activity, 23.8 percent of households had none of their members employed. This was expected taking into account the prevalence of unemployment in South Africa. Finally, 5.8 percent of households have financial commitments that have rendered them over-indebted.

#### **8.4.2 Adjusted Headcount Ratio (M0) under different poverty cut-offs (k)**

Alkire and Santos (2010) argue that it is also important to assess the consistency of results when poverty cut-offs are changed. Figure 8.1 shows the SAMPI-OI estimates under different cut-offs. The analysis was done to test the sensitivity of the choice of  $k$  i.e. the number of deprivations that a household must experience in order to be considered multidimensionally poor.



**Figure 8.1: Adjusted Headcount Ratio (M0) under different cut-offs**

Source: Author, based on weighted data from the 2012 NIDS survey

The new poverty estimates were subjected to robustness tests in order to check if the SAMPI-OI is stable or sensitive to the choice of poverty cut-offs. The SAMPI-OI was re-estimated using four alternative poverty cut-offs (20%, 25%, 30%, 35%, 40% and 45%). Alkire *et al.* (2010) suggest the correlation coefficient analysis as one of the tests to undertake for robustness assessment. Correlation coefficients between the cut-offs were estimated using Kendall's Tau method, which measures the association between pairs. The estimated correlation coefficients in Table 8.4 below indicate stability with respect to choice of k.

**Table 8.4: Correlations between SAMPI-OI and adjusted SAMPI-OI for different choices of k**

	Tau-b correlation coefficient	Significance
SAMPI-OI with k = 20%	0.6111	0.0286
SAMPI-OI with k = 25%	0.8889	0.0012
SAMPI-OI with k = 30%	0.7778	0.0049

SAMPI-OI with k = 35%	0.7222	0.0091
SAMPI-OI with k = 40%	0.5556	0.0476
SAMPI-OI with k = 45%	0.5556	0.0476

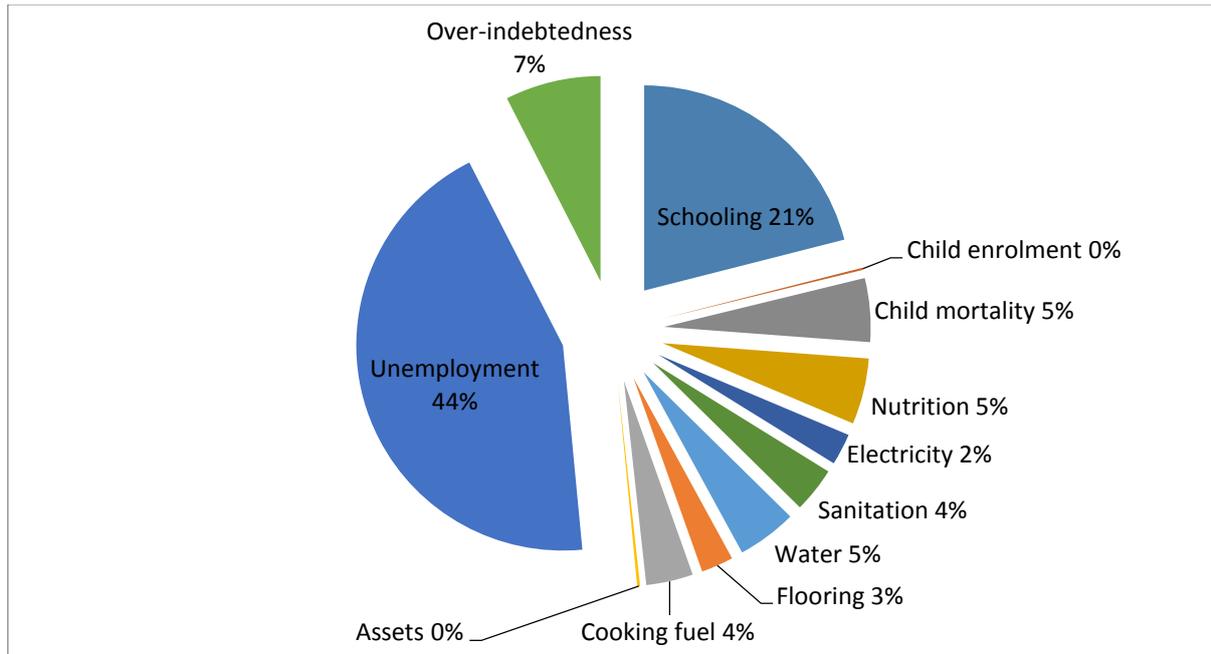
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Source: Author, based on weighted data from the 2012 NIDS survey

### 8.4.3 What is driving the poverty situation?

Figure 8.2 compares the contribution of each weighted indicator to the overall poverty score. Child enrolment (0%) and ownership of assets (0%) have the smallest contributions. Unemployment is the largest contributor, accounting for almost half (44%) to the SAMPI-OI, followed by adult schooling and over-indebtedness at 21 percent and 7 percent respectively. Deprivations in other indicators are less than 5 percent. The percentage of contributions are influenced by the relative weights assigned to each indicator. Accordingly, when the contribution of an indicator greatly exceeds its weight, it means that there are relatively higher levels of deprivation in that particular indicator. Only those indicators where their contributions to the overall SAMPI-OI score greatly exceed their weights, which are indicated in Table 8.1, are discussed.

In this regard, the contribution of deprivations in adult schooling and unemployment greatly exceed their assigned weights, indicating that multidimensionally poor people in South Africa are more deprived in these indicators than in others. Statistics South Africa (2014b), Mushongera *et al.* (2015) and Frame *et al.* (2016) also found that unemployment is a significant contributor to the multidimensional poverty.

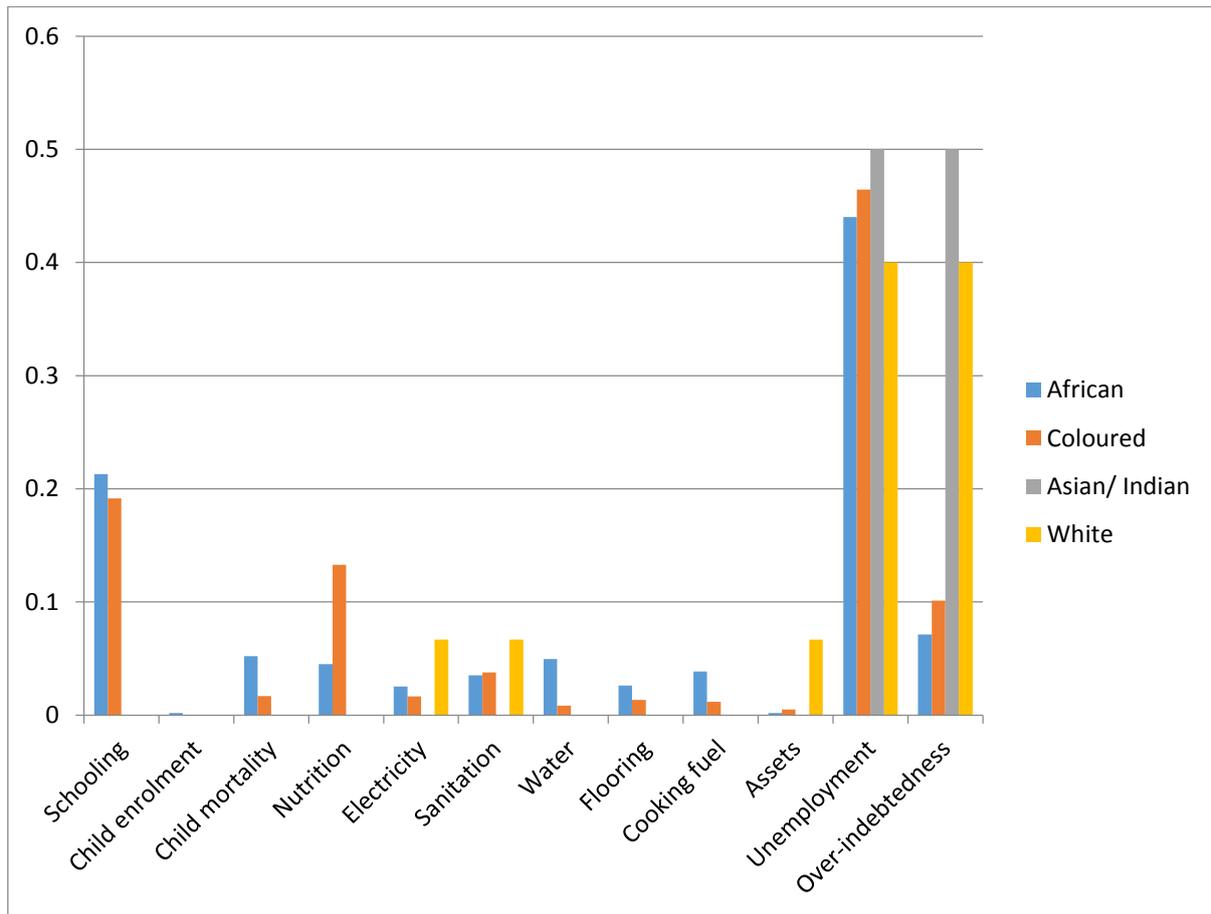


**Figure 8.2: Contribution of weighted indicators to SAMPI-OI**

Source: Author, based on weighted data from the NIDS survey

#### 8.4.4 Indicator decomposition by subgroup – population groups and settlement type

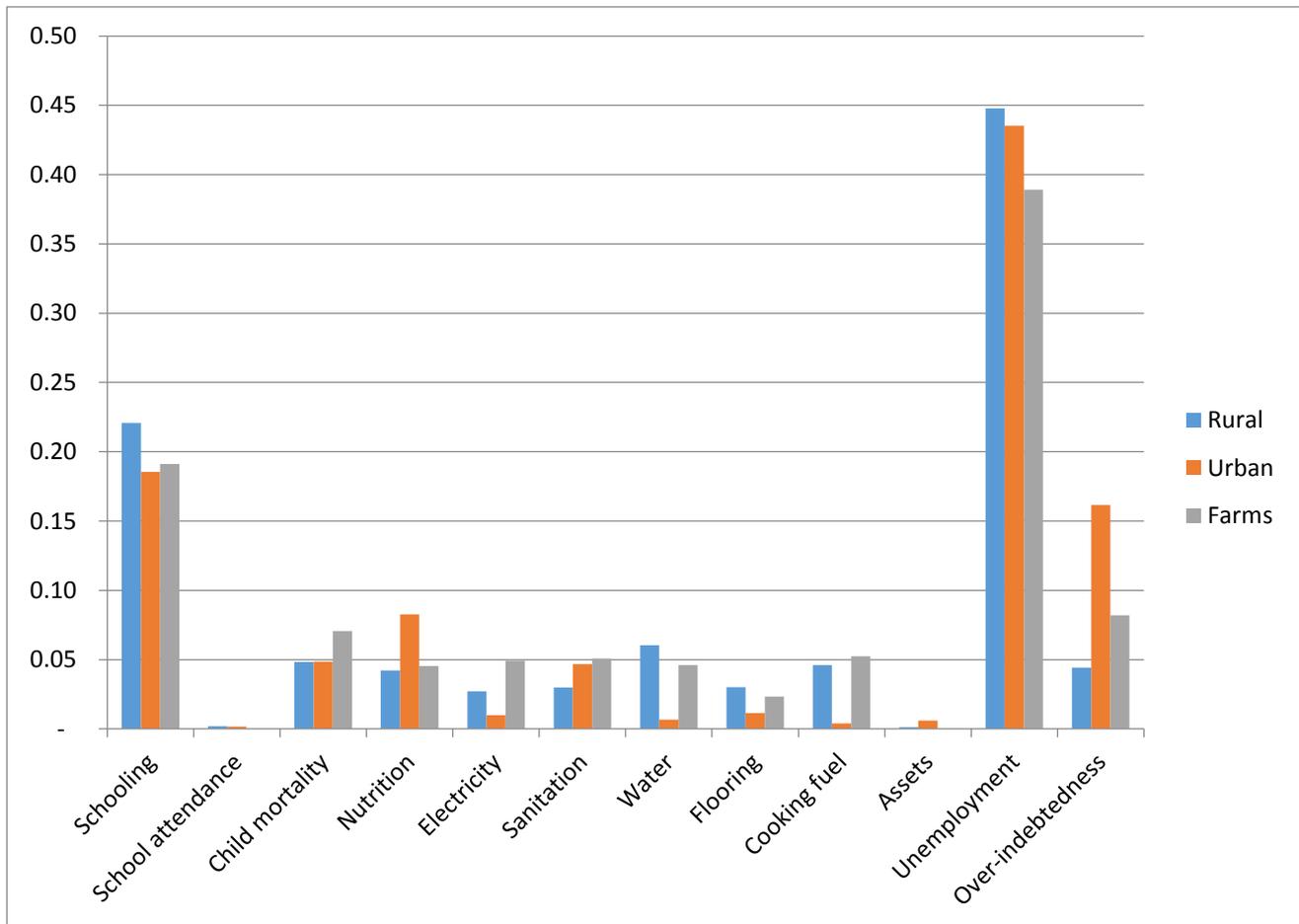
Figure 8.3 compares the contribution of weighted indicators, by population groups, to the overall SAMPI-OI score. All population groups are relatively more deprived in the area of unemployment than in other indicators. Asians/Indians and Whites show higher deprivation on over-indebtedness as well. The Coloured community is more deprived in adult schooling and nutrition. Adult schooling is an area of great deprivation for Africans. It is worth noting that child enrolment and ownership of assets indicate least deprivations.



**Figure 8.3: Contribution of weighted indicators to SAMPI-OI by population groups**

Source: Author, based on weighted data from the NIDS survey

Figure 8.4 compares contribution of weighted indicators, by settlement type, to the overall SAMPI-OI score. Notably, the largest contributors to multidimensional poverty are unemployment and adult schooling across all settlement types. People are particularly deprived in these two indicators. Rural communities are further more deprived in access to water than the rest of the indicators. In addition to unemployment and adult schooling, people on farms experience more deprivation in cooking fuel and sanitation.



**Figure 8.4: Contribution of weighted indicators to SAMPI-OI by settlement types**

Source: Author, based on weighted data from the NIDS survey

## 8.5 CONCLUSION

This chapter deepens the understanding of poverty by computing the SAMPI-OI and examining the racial and spatial configuration of multidimensional poverty. The contribution of each indicator to the overall SAMPI-OI score is also reported. The results indicate that 14.8 percent of South Africans were multidimensionally poor in 2012. Using exactly the same data, OPHI (2016) found that 11.1 percent are poor. While a strict comparison cannot be made with the study of Finn and

Woolard (2013), and (Statistics South Africa, 2014b) although the studies were undertaken in different years, it is worth noting that, based on the Alkire-Foster methodology, the former authors found only nine percent of South Africans to be multidimensionally poor in 2010. Statistics South Africa reported eight percent in 2011, using a different dataset with some adjusted indicators. The results highlight that poverty rates may be underreported when over-indebtedness is ignored.

The racial and spatial distribution of poverty has remained similar to that of the pre-democratic period. The results also reaffirm the seriousness of the unemployment, adult schooling and over-indebtedness situation in the country and the ways in which these are significantly contributing to why households are poor. Rural communities are also considerably deprived in access to water within their dwellings or yards, while farming communities battle with cooking fuel and sanitation. In addition, amongst the coloured community, malnutrition is indicated as an area of concern in terms of relative deprivation.

## CHAPTER 9

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### 9.1 INTRODUCTION

The main objective of this study was to examine the effects of household debt on multidimensional poverty, and subsequently justify the inclusion of over-indebtedness in the South African MPI.

The study used data from the 2012 NIDS survey, conducted by the Southern African Labour and Development Research Unit, University of Cape Town, to achieve the set objectives. In the first instance, it was important to establish the extent of over-indebtedness amongst households, using internationally recognised measures together with the National Credit Regulator measure. The degree of overlap between these measures was assessed. Secondly, the effects of debt on multidimensional poverty was undertaken through a combination of smoothing splines and the Generalised Additive Model (GAM), a robust estimation methodology that is flexible enough to capture any potential shape of the response curve without the necessity for priori knowledge of the relationship. Thirdly, a Multiple Correspondence Analysis (MCA) was performed to explore the significance of household over-indebtedness as a new dimension in the multidimensional poverty index in South Africa. In the fourth instance, a new multidimensional poverty index for South Africa was constructed and the resultant poverty rates analysed.

Threshold effects are widely studied in the macro debt-growth/poverty research studies. This study makes a unique contribution to the literature by exploring non-linearities in the micro-analysis study of household debt and poverty, in particular when multidimensional poverty measurement is used. This was achieved using GAM, which is not frequently used in the welfare/development economics field. GAMs extend generalised linear models through inclusion of smoothing functions of explanatory variables, allowing the curves to better describe the observed data. The study also takes forward and empirically tests the conceptual argument of Porter, which suggests that debt

should be incorporated in the study of multidimensional poverty. Pressman has argued the same for income poverty studies.

The growth and development of the credit industry, together with the prevalence of poverty in South Africa, warrants a determined debate on the relationship between the two, and this study provides a tested basis for such discussions to happen. The results point to a need for strict monitoring of indebtedness as it relates to multidimensional poverty.

## **9.2 KEY FINDINGS**

Evidence from the descriptive analysis of households demonstrates that over-indebtedness is at eight percent as shown by the NCR indicator. The results emphasise, that the excessive use of debt, in particular unsecured debt is gaining traction in the South African society and should be monitored closely because of its potential effect on both the households' financial stability and that of the entire financial system. It is also clear that a considerable number of households fall below the income poverty line after making debt repayments. This is particularly important as such households' disposable income is reduced to a level below what they require to purchase basic necessities. Management of over-indebtedness is thus critical in the effective reduction of income poverty.

Overall, results suggest that over-indebted households are generally male-headed, with a household head aged 31-40, unemployed, have secondary schooling, of African ethnicity, are homeowners rather than tenants, live in urban settlements in the Gauteng province, do not receive government grants, have the lowest income, and have never been married.

The econometric analysis results indicate that there is a debt threshold in the debt-poverty nexus for households. Household debt plays a crucial role in influencing multidimensional poverty levels - an appropriate level of debt is important for improving household welfare but beyond 42.5 percent threshold it is associated with increasing multidimensional poverty. On the lower end, greater access to debt should be encouraged as it improves the quality of life of many households by

making consumption smoothing possible. However, higher debt service obligations relative to income appear to leave households more vulnerable to, for instance, unexpected changes in income and interest rates. Lower educational levels are correlated with higher multidimensional poverty. The results highlight the fundamental role of education of the family head in shaping the socioeconomic characteristics of the household that they lead especially after matriculation. Investment in education is more important for dealing with poverty than government grants. The results show that government grants do not have poverty-reducing effects; this could be an indication that households are not using grants to improve their living standards but rather tempted to use the money on non-essential goods.

Further evidence provided is that for household heads less than 60 years of age, multidimensional poverty is reduced as age advances. However, results also show the incidence of old age (over 60 years) poverty. This could be as a result of such items as medical costs that are considered to be associated with old age. The number of children variable also produces significant results. A positive correlation with multidimensional poverty could be because of the reason that fewer children tend to be the centre of attention and resource usage in their families, and, of course, child care expenses are not easily reducible. However, households with many children could benefit from government grants or the existence of non-fee paying primary schools, even in the least developed areas. Multidimensional poverty status might also force children to drop out of school to participate in the labour market at a young age. It appears that an ideal household size comprises four members, in which case multidimensional poverty is negatively correlated to the household size. Beyond that a household's welfare is significantly constrained. Household size as a predictor of multidimensional poverty could be explained by high levels of unemployment creating a high dependency ratio on the few household members that happen to garner resources. This leaves the typical rural and black households as the most susceptible to multidimensional poverty as they usually have more household members.

With respect to the exploratory analysis undertaken, debt and employment were confirmed to be significant dimensions in the multidimensional poverty index, as disadvantaged positions in these areas limit the households' ability to enjoy free participation in normal societal activities. The influence of these dimensions on multidimensional poverty cannot be ignored. Indeed, future multidimensional poverty analyses in South Africa should include unemployment and over-indebtedness. Expanding the focus of multidimensional poverty measures should provide additional valuable information that can be used to design efficient and effective policy interventions.

Poverty rates are underreported when the applied measures exclude unemployment and over-indebtedness. Despite the major redistributive policy and legislative interventions since the end of apartheid, multidimensional poverty continues to be severe amongst Africans and in rural areas. The results reaffirm the seriousness of unemployment, adult schooling and over-indebtedness in the country and how these significantly contribute to poverty. Rural communities are also considerably deprived in access to water within their dwelling or yards, while farming communities encounter deprivation in cooking fuel and sanitation. In addition, amongst the coloured community, results show that malnutrition as an area of concern.

In conclusion, debt is a common instrument used to maintain a stable level of consumption, compatible with lifetime resources, over different stages of life. However, for various reasons, the level of debt can become burdensome to the borrower. Used wisely and in moderation, debt can improve welfare. The combined evidence revealed that debt is a significant element of multidimensional poverty, and produces a non-linear relationship. It is associated with enhanced welfare at lower levels as a ratio of disposable income. However, as it breaches the cut-off point, debt becomes toxic.

### **9.3 POLICY IMPLICATIONS**

Given the difficulties that over-indebted households face, attempts at widening access to credit cannot afford to ignore the issue of over-indebtedness. An effective policy response to household over-indebtedness must seek to achieve a balance between greater access to credit and

prevention of over-indebtedness for the low income groups. Households should develop a strong culture of saving rather than to rely on debt to meet consumption needs. Savings play a key cushioning role against unforeseen circumstances. Financial literacy programmes could be incorporated in the schooling system curriculum to improve households' money management skills and protect them from becoming bad debtors. Since employment is less associated with over-indebtedness, policies to promote employment or entrepreneurial opportunities are imperative to strengthen households earning capacities. The National Credit Regulator needs to enforce responsible lending behaviour on financial institutions especially in the unsecured lending market where households may be vulnerable to unregistered credit providers.

This study calls for a coordinated response targeted at addressing both over-indebtedness and poverty, especially for the most susceptible population groups. High indebtedness alone poses threats to the country's financial system, and may cause social unrest and political instability. A goal for any intervention should be to first conduct specially commissioned surveys that contain all elements of over-indebtedness in order to better understand it.

The working-age population has an important role in economic development and therefore, policies aimed at creating employment or entrepreneurial opportunities for this group are imperative to strengthen the observed positive outcomes on multidimensional poverty. Even though South Africa has a social pension programme for the elderly, results indicate that it is inadequate in reducing poverty. The government should seriously review the retirement and old age support policies to make them more impactful while encouraging the younger generations to save for retirement. Consideration should also be given to adopting 'in-kind' transfers rather than cash transfers for the social grant system as cash is more fungible.

There are many cogent reasons behind the recent rise in indebtedness, including more lenient lending standards, and willingness to take on more debt. These could be addressed through preventive measures. By reviewing regulations, financial institutions could be made to bear the costs of administration, including that of debt advice, in the form of tax on loans in default, as lending practices are one of the causes of over-indebtedness. This makes financial institutions

responsible for not lending where more chances of over-indebtedness exist. Hopes of changing consumer culture lie in a comprehensive financial literacy education plan. Even though many people are incurring debt, they might lack education on financial matters because of South Africa's economic and political past. Such groups are particularly vulnerable to over-indebtedness. The results have indicated that education is effective in addressing multidimensional poverty. Financial literacy courses should be incorporated in the standard education curriculum from the lowest mainstream schooling level possible, and continue up to adult education. Such courses would enable people to evaluate the sustainability of borrowing, and be more aware of the consequences of their spending decisions. According to Lusardi and Mitchell (2014) there are great benefits from financial knowledge including better debt management and financial decision making. Outside the education system, awareness programmes to warn about the risks of high cost borrowing and failure to save could be driven by all stakeholders, including financial institutions and credit regulatory bodies.

It is unrealistic to assume that debt problems can always be avoided. Nevertheless, when problems emerge, it is important to detect them as early as possible, to avoid escalation. Debt counselling can provide relief when a household has debt problems. It has the advantage of being relatively inexpensive, and can protect those with an adverse credit record from court judgement through temporary suspension of debt servicing. Early warning mechanisms could assist in identifying households at risk to prevent their debt from rising further, and avoid costs of debt recovery. In addition, online financial health checks available free of charge could be provided for consumers to assess for themselves whether they can comfortably apply for more credit without risks of being over-indebted.

In order to assist households to make a sustainable exit from multidimensional poverty, a ratio of debt service to disposable income could be recommended or enforced corresponding to the threshold results. Credit providers could include this as part of their risk management. In terms of implications on economic growth, when borrowers are over-indebted, they struggle to make

repayments, and cut back on basic consumption as well as other important household expenditures, such as education or healthcare, and severely hinder savings and economic growth.

Other proposed policy recommendations for tackling multidimensional poverty are: improve access to piped water within the household and yard. It is also important to align local development goals to the deprivation cut-off used in the multidimensional poverty index for better comparisons (e.g. insistence of piped water in the yard rather than acceptance of 200m radius proximity). Take advantage of innovative energy generation methods and provide affordable electricity while at the same time educating communities about the environmental and health effects of using traditional fuels for cooking together with loss of productive time spent collecting wood. The critical challenge lies in the strengthening of developmental policies, in particular those that focus on human settlement through the provision of formal housing. Poor home environments like informal settlements make it difficult to make improvements in electrification, installation of flush toilets, piped water inside the dwelling unit and modern flooring. Government needs to consciously incorporate informal settlements into infrastructure development plans. Households should be encouraged to save and participate in financial skills courses to avoid over-indebtedness.

A review of behavioural economics literature offers compelling insights into the tendency of consumers to accumulate too much debt. Based on this literature review, it is clear that consumers suffer from limited cognitive abilities, are susceptible to psychological bias and are easily tempted. The creation and implementation of measures targeted at preventing and managing the risk of over-indebtedness must also include behavioural variables as determinants of irrational borrowing decisions.

The following recommendations are useful for credit users, debt counsellors, lenders and regulators. To counter the growth in household debt, the use of debit cards instead of credit cards should be recommended. Mental accounting as a self-control mechanism can assist impulsive individuals to manage their spending. Self-control mechanisms can include budgeting, earmarking,

pre-commitment, reminders, and goal-setting. Parents can encourage and teach their children to learn wise financial skills. Social influences are also key – regulators can establish social norms by highlighting and rewarding behaviour that promotes saving and better management of debt.

Disclosure-based regulation could include requirements for lenders to warn consumers about the danger of products, send individualised warnings in monthly statements that explain how long it will take the consumer to repay the balance with minimum payments, and how much the consumer would need to pay each month to pay off the balance within, for instance, three years. A common behavioural view is that consumers may make poor decisions due to the complexity of the information presented or limited cognitive abilities – in such cases, making standard disclosures as straightforward as possible for people to compare products could help. Human beings have a tendency to be cognisant of what is frequently made available to them.

The challenges are that it may be difficult for financial institutions to deny the use of credit because of the interpretation, for instance, of early childhood experiences or relationships with others. Information on personal circumstances and possible biases of credit users may not be readily available to empirically test this human phenomenon. Furthermore, interventions may restrict the supply of ‘good credit’ to customers who make good choices and therefore care must be exercised. Lastly, the challenge with applying behavioural research in policy is that the field is still emerging — over-zealous use of an incomplete science comes with risks of its own.

#### **9.4 FUTURE RESEARCH**

A goal for future research should be to conduct specially commissioned surveys that contain all the different dimensions of over-indebtedness, assess the persistence of over-indebtedness over time, scientifically evaluate the different indicators to establish an indicator that substantially captures over-indebtedness, and evaluate the performance of the National Credit Regulator indicator against such an improved indicator. More insights about household characteristics correlated with over-indebtedness could be determined through the use of a robust estimation model rather than descriptive analysis alone.

It would also be interesting to explore whether other estimation methods with longer time series, including categorical household variables, would have similar effects on multidimensional poverty. Another question is whether the effect of household debt on poverty is the same for over-indebted households as it is for those with sustainable debt levels. There is also an opportunity to compare the new multidimensional poverty index for South Africa with other poverty measures and to expand future analyses to provide insights at a local government level where service delivery happens.

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## APPENDICES

**Table A.1: Descriptive analysis of the types of over-indebted households, based on the National Credit Regulator indicator**

<b>Variable</b>	<b>(%)</b>
<i>Age</i>	
15-20	2.0
21-30	19.1
31-40	29.0
41-50	20.1
51-60	16.6
60 +	13.2
<i>Gender</i>	
Female	46.2
Male	53.8
<i>Employment Status</i>	
Employed	46.5
Unemployed	53.5
<i>Educational Qualifications</i>	
No schooling	6.1
Primary schooling	16.2
Secondary schooling	49.9
Tertiary	27.8
<i>Ethnicity</i>	
African	79.0
Asian/Indian	2.8
Coloured	7.0
White	11.2
<i>Housing Tenure</i>	
Own	78.6
Rent	21.4
<i>Settlement Type</i>	
Farms	3.3
Traditional	17.9
Urban	78.8
<i>Province</i>	
Eastern Cape	8.9
Free State	8.0
Gauteng	35.6
KwaZulu-Natal	11.9
Limpopo	4.0
Mpumalanga	7.2
Northern Cape	3.4
North West	8.8
Western Cape	12.3

<i>Government Grant Recipient</i>	
No	71.7
Yes	28.3
<i>Household Income Category</i>	
R0 – R2 000	61.4
R2 001 – R5 000	15.2
R5 001 – R10 000	10.3
R10 001 – R20 000	7.6
R20 001 – R40 000	5.5
R40 000 +	0
<i>Marital Status</i>	
Divorced or separated	5.9
Living with partner	6.4
Married	32.2
Never married	47.6
Widow/Widower	8.1
<i>Number of Children</i>	
0 - 2	91.3
3 - 6	8.6
6 +	0.2
<i>Household Size</i>	
1 - 4	80.9
5 - 8	16.4
8 +	2.6

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Source: Author, based on weighted data from the NIDS