

https://dspace.org/

# Determinants of household saving: evidence from the national Income dynamics study

**Qabazi, Nonceba**

**2018**

https://hdl.handle.net/10539/26987

Qabazi, Nonceba (2018) Determinants of household saving: evidence from the national Income dynamics study, University of the Witwatersrand, Johannesburg, <http://hdl.handle.net/10539/26987>

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

**UNIVERSITY OF THE WITWATERSRAND**
**JOHANNESBURG**




# Determinants of household saving: Evidence from the National Income Dynamics Study

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

Nonceba Qabazi
Student No: 1231929
Supervised by Professor Miracle Benhura

Word Count: 14093
18 September 2018

Abstract:

This study investigates the determinants of household savings in South Africa using panel data estimation techniques and National Income Dynamics Study (NIDS) data for the period 2008-2015. Results show that household savings habits in South Africa are strongly driven by socio-demographic factors such as income, relative income, asset ownership and white population group representation. Whereas household size, home ownership, household expenditure and black population group representation remain plausible arguments for household dissaving in South Africa. To some extent, these findings imply that strategies to increase household savings in South Africa should improve the distribution of income and employment among the population. There is also a need for an in-depth analysis as to why and how the country's black population can be encouraged to improve on household savings.

Keywords: Household savings, panel data, National Income Dynamics Study, Microeconomics

## 1. INTRODUCTION

South Africa's gross and national savings have declined significantly over the years, since the 1970s (National Treasury, 2012). More recently, the country's *national* savings rate as a percentage of gross domestic product deteriorated from the third quarter of 2015 (15.4%) to the first quarter of 2016 (15%). At the same time, gross saving by *households* increased by 0.1% and later declined by the same percentage i.e. from 1.2% in first quarter to 1.1% in third quarter of 2016 (South African Reserve Bank (SARB), 2016). The South African Savings Institute (SASI) and the SARB confirm that the last 16 years have shown figures of a steady decline in the South African savings rate, where an ultimate low of -2.70% was reached in 2013 (Govender, 2017). Although South African households are seeing an increase in saving, from -0.50% in the fourth quarter of 2016 to -0.30% in the first quarter of 2017, the increases are of a very small base. In July 2015, 44% of all metropolitan population participating in the Old Mutual Savings and Investment Monitor survey classified their savings as banked cash savings, the figure decreased slightly to 42% in July 2016 and dropped significantly in July 2017 to 35% (Old Mutual, 2017). The decline in the population making use of banked cash savings occurred simultaneously with a slight increase in the percentage of the population making use of informal savings, depicting figures of 57% in July 2015 to 59% in July 2017. SARB (2016) partly attributes the low savings rate to households that spend at more accelerated rates than the growth of their incomes. In 2017, an alarming 40% of adults in metropolitan areas of South Africa admitted that they were without any formal retirement savings (Old Mutual, 2017). Cash savings, through banking and nonbanking channels, were reported to have declined; any reserves and measures in place for emergencies requiring financial contributions were indicated as depleted and Stokvel measures (which many South Africans rely on) had shown declines in contribution and penetration rates which has raised concern (Old Mutual, 2017).

Concern over the South African household savings rate is particularly instigated by its persistently low position when compared to savings rates across the world. When ranked against the G20 countries, South Africa's household savings have shown one of the worst rankings, coming in last behind China, Australia, Russia and India (Kransdorrif, 2018). This is problematic as higher national savings provide an economy with an array of benefits such as improved investment opportunities and economic growth (Nga, 2007; Kazmi, 1993; Kudaisi, 2013; Rehman *et al*., 2011). Moreover, savings that emanate from the household sector are said to be increasingly beneficial for an economy (Samuelson and Nordhaus, 1995). For instance, they allow households the financial security to maintain and enhance their standard of living which reduces dependency on the national social support system (National Treasury, 2012).

The Old Mutual Savings and Investment Monitor report (2017) highlights that the South African lower income populations' satisfaction with their financial situation dropped lower than it has been in the past, with a third of the metropolitan population finding it very difficult to get by. Two thirds of these dwellers categorised their financial stress levels as high or overwhelming and unmanageable (Old Mutual, 2017). Notably, the savings culture in South Africa is inherently shaped by the legacy of the apartheid system (Zwane *et al*., 2016). The majority of the population was legally excluded from participating in mainstream economic activities, conventional financial service products and saving instruments (Carter and May, 2001; Zwane *et al*., 2016). Such discrimination has significantly contributed to the current social and economic setting of high inequality, poverty and unemployment (Mthembu, 2017). Dubois and Muller (2017) assert that there is a negative correlation between segregation and income[1]. The plight of low income households, especially blacks, is unimaginable as worsened by rising costs of living and segregatory land distribution patterns (Njobeni, 2017). The cornerstone of the residential segregation took place in 1923, when the Natives (Urban Areas) Act was introduced. The Act explicitly identified areas where black South Africans could live and the same for white South Africans. This exclusion propagated the response by black South Africans of building *squatter camps* on the peripheral areas of the big cities, which have remained a characteristic of the South African economy today. This has largely impacted on the dwelling types and standard of living the majority of black South Africans currently experience. These negative effects of apartheid on black South Africans are particularly important when investigating determinants of saving in South African households.

The household savings challenge faced by the South African economy necessitates the study proposed herein to investigate the alleviating factors for low household savings in the country. This is crucial as factors affecting household savings have been extensively studied at a macro-economic level and micro-economic studies of household savings in developing countries still remain scarce (Ozcan *et al*., 2012). This is especially so for South Africa where most of the available studies have explicitly relied on time series data (Harjes and Ricci (2005), Simleit, Keeton and Botha (2011), Chipote and Tsegaye, 2014). Therefore, this study aims to carry out a micro-economic analysis of household saving behaviour using a micro panel[2] of data. The study utilizes four waves of the fairly new and established national survey called the National Income Dynamics Study (NIDS) which tracks livelihoods of individuals in South Africa over the period 2008-2015. The data's panel format

[1] Found that past segregation rules can account for up to 40% of the income gap between black and white South Africans.

[2] A micro panel is obtained through surveying a (usually large) sample of individuals, households, firms or industries over a period of time, which in most cases is short (Pillai, 2016).

poses as an advantage in identifying micro-economic level correlates of South African households' saving dynamics and their relative effects (Dubois and Muller, 2017). Zwane *et al.* (2016) were the first to carry out a panel data analysis of the South African household savings rate; using the first three waves of NIDS data. This study extends their analysis in three respects:

1. by updating the period of analysis from waves one to three to waves one to four of the NIDS data.
2. by carrying out a black-white racial analysis of the determinants of household saving in South Africa. Given the apartheid engineered differences in economic opportunities between these population groups, a separate analysis of their saving behaviour may unpack some details as to why some households save while others dis-save; which is informative for policy purposes.
3. the study analyses the effect of individuals' 'life satisfaction' on household saving behaviour. It will proxy for 'life satisfaction' through an analysis of relative income, which is determined by the income gap between the households and that of a determined reference group. This allows for an analysis of whether relative income affects individuals' attitude towards saving. It is in this sense that the NIDS data can be considered rich, as it includes individual level data on subjective well-being[3] (Kannemeyer, 2016).

In order to incorporate the above aspects in the analysis of household saving in South Africa the study proceeds as follows: section 2 reviews current literature on South African household savings; section 3 describes NIDS data and presents some descriptive statistics for the sample used for the analysis; section 4 provides a discussion on the methodology employed in the paper. This is followed by section 5 which provides an analysis of the results obtained through econometric estimation. Section 6 then provides an overview discussion of the results. Lastly, section 7 will outline conclusions.

## 2. LITERATURE REVIEW

This section briefly reviews definitions, empirical and theoretical literature on household saving. Simply put, the definition of saving can be considered as the storage of a portion of income for future use, where saving is equal to income minus expenditure. A more widely used definition of savings asserts that "savings is retained income resulting from the postponement of consumption"

[3] NIDS captures subjective well-being by including questions on rating individual levels of life satisfaction at the point of being interviewed, and asks individuals to think about how their current level of life satisfaction relates to their life satisfaction in the past (Kannemeyer, 2016). However, in this study we use a different measure for life satisfaction in order to obtain a tangible indicator of an individual's relative life satisfaction, in comparison to those around them. The proxy used is a relative income variable.

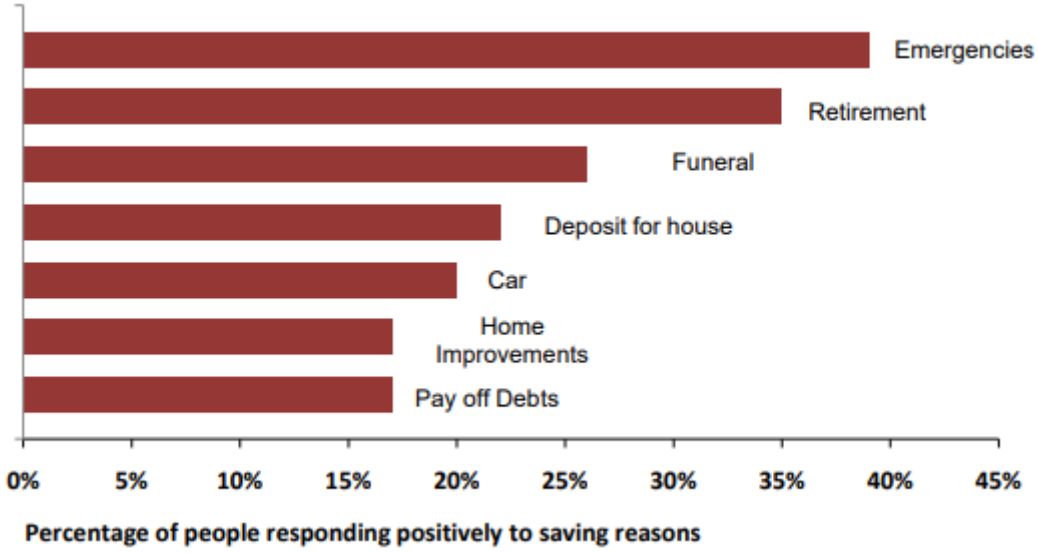
(Prinsloo, 2000: 26). Furthermore, it is important to note that savings have been categorized into two main groups, namely public savings and private savings. Mankiw (2001) closely associated public savings to governments and private savings to the private sector of an economy. A further split can be made when considering the private sector as it can either be regarded as the corporate and business sector or it may be observed as the household sector of an economy. For this study, the household sector of an economy will be adopted for the analysis. Cronje and Roux (2010) uphold Prinsloo's (2000) split of savings and present household savings as the after-tax income which is restricted from current consumption. They go on further to split the definition of savings into contractual and discretionary savings, where contractual savings is the pledge to a sequence of payments to an account or policy for future use. In contrast, discretionary savings refer to the savings frequently made into an account on a voluntary basis where no fixed commitment is present (Cronje and Roux, 2010).

Theoretical literature suggests a number of motives for household saving. Ting and Kollamparambil (2015: 676) identified key motives for household savings into five main categories, namely: aiming to smooth out consumption over retirement years (which is closely linked to the life cycle hypothesis), to benefit from interest and asset appreciation, to bequeath an inheritance, to guarantee partial or full financing of large expenditure (such as down payments for a motor vehicle, a house and an education), and lastly, as a precautionary motive to sustain themselves should an unexpected loss in income occur. Browning and Lusardi (1996) admit that such motives are not mutually exclusive in their entirety, as many possess overlapping features in their nature. In a 2017 savings study by Old Mutual, the ability of South African households in coping with an unforeseen expense, in other words the level of precautionary savings, was analysed and it was found that many households would be heavily reliant on loans and credit cards instead of savings (Old Mutual, 2017). This reinforces the notion that South African households are more debt and consumer driven and as a result struggle to adopt a savings culture. In addition, lower income households have increasingly relied on family and friends for financial assistance when emergency situations arise, which has lowered the burden of saving for an emergency. The same study conducted in 2016 found that retirement and funeral savings by households were declining although they did not fail to remain one of the top reasons South African households stated as savings for emergency expenses (Old Mutual, 2016). Cronje and Roux (2010) highlight further that structural factors such as shifts in urbanization, demography and financial freedom of a country affect the savings rate significantly.

The National Treasury (2012), relying on the results released by the Old Mutual Savings and Investment Monitor survey, found that there were seven reoccurring reasons that individuals saved.

It has been found the precautionary motive is the most prevalent reason for saving (National Treasury, 2012). Saving toward retirement was another pertinent reason for saving amongst South African households, followed by savings for funerals, house and car purchase deposits, home improvements and debt repayment.

**Figure 1: Reasons South Africans Save**




Source: Old Mutual Savings and Investment Monitor, July 2012

Ting and Kollamparambil (2016) state that economic theory currently available on savings behavior is closely linked to the theory of consumption. In a South African context, an unfortunate emerging trend has become popular, as individuals are more likely to spend their income on material goods that do not essentially relieve them of poverty or enhance their livelihoods in the long run (Moav and Neeman, 2010). Although households understand and agree with the importance of saving, most savings are now being administered on a casual basis which only allows individuals to increase a limited balance in a transactional account, rather than a using formal savings platforms, making access to these finances easier (Old Mutual, 2017). It has been reported that the black middle class have steadily become the growing source of consumer spending in South Africa (Cronje and Roux, 2010). More and more households spend large portions of money on items that only provide short-term gratification and enhancement in seeking a higher social status. In other cases, low income households, majority of which include black South African households, are more concerned with immediate survival and therefore develop a habit of higher immediate consumption rather than habits of future saving (Cronje and Roux, 2010). Furthermore, lower income households find higher importance in spending large amount of their income on funerals and other large festivities, which are purely for status gain among their communities (Moav and Neeman, 2010). This strongly relates

to the idea of savings habits and behaviour being highly reliant on the mindset on improvement of livelihoods of individuals. The black middle class has, over the years, gained higher economic significance amongst the rest of the population (Cronje and Roux, 2010). However, it is important to bear in mind that all households experience different livelihoods and each household may take different decisions in trying to improve or maintain the current level. Such decisions are expected to have large impacts on the ways in which households and individuals take decisions to save.

Through employing a demographic analysis of the South African population, Zwane *et al*. (2016) emphasises the possible role that Apartheid policies may have on the savings culture adopted by the majority of the non-white population in South Africa presently. A large majority of the South African marginalized population during Apartheid were stripped of their productive assets, which played an impactful role in distorting economic markets and creating an unfair advantage towards the minority. The cornerstone of the majority's chance to improve their livelihoods and their ability to develop the mind set of savings were prematurely taken away from them. This resulted in the three crucial socio-economic legacies left by Apartheid, namely: unemployment, income inequality and poverty (Zwane *et al.,* 2016). Due to the Apartheid legacy, race plays an important role in identifying the factors affecting household savings in South Africa. Even after the establishment of a democratic South Africa, a large portion of the poor are classified as black Africans (Woolard, 2002).

Over and above the effects of race, the gender dimensions within a population are important to consider. Du Plessis (2008) asserts that women are natural savers. However, it has been found that female headed households are more prone to poverty than male headed households (Dlomo, 2012). Through an Ordinary Least Squares regression analysis, Dlomo (2012) found that males save more than females. Female headed households are also less likely to spend on education, which would therefore result in higher unemployment levels. With unemployment in place, it becomes difficult for households to save as prospects of income are restricted.

Nonetheless, household savings (as a percentage of disposable income) in South Africa has continued to fall over the years and remains reasonably low by international standards (Chipote and Tsegaye, 2014). Household savings have raised concern over the years and are, unfortunately, coupled by an increase in consumption related to indebtedness (National Treasury, 2012). Research shows that consumption has increased and overshadowed the motivation to save. Individuals that are presented with the opportunity to save, often choose consumption over other options, or even dis-save (Nga, 2007). The fact that individuals or households are more likely to increase

consumption when experiencing a temporary or permanent increase in income may partly result in a fall in savings.

Apart from the desire to consume more, a number of factors exist which affect the savings behaviour in South Africa, such as: access to financial services, products offered by banks, access to financial literacy, cultural and societal standards and norms, geographical location, age, income, dependents in the household, age of household head, durable goods purchases and fertility amongst many other factors (du Plessis, 2008; Chipote and Tsegaye, 2014; Zwane *et al.*, 2016; Banerjee, *et* al., 2014). In addition, there are several possible reasons for the trends South African household savings rates have experienced, such as: high unemployment rates, income levels which are low and a strong bias toward instant gratification and present consumption instead of future savings (National Treasury, 2012). With these factors in mind, the research aims to investigate the savings behaviour and motives among South African households.

Due to the vital role played by all categories of savings in promoting economic growth and continued disappointment in the savings rate, it does not come by surprise that may economists and researchers have explored the subject of savings in South Africa in great detail. Given that household savings are an important determinant of current and future standards of living, extensive research has been conducted globally (Juster *et al*., 2004; Horioka and Wan, 2007; Abu *et al.*, 2013). However, available literature comprehensively relies on time-series data and current research is relatively limited in measuring the development and enhancements of the lifestyles of populations. In addition, many studies have provided ambiguous results regarding the factors most likely to affect household savings (Zwane, *et al.*, 2016). This could possibly be due to combining black and white South Africans in the analysis yet they could be having different propensities to save due to cultural and historical factors.

Traditional economic theories accept the idea that individuals exhibit consumption patterns which are optimal for utility, but dependent on the levels of income they expect over their lifetimes (National Treasury, 2012). The traditional hypotheses make assumptions that: individuals are only interested in themselves, individuals are perfectly rational and individuals hold time-consistent preferences (National Treasury, 2012). In contrast, research by behavioural economists confirms that a large portion of the population is, in fact, “myopic and present-biased” (National Treasury, 2012: 9).

Theoretical literature focusing on the study of household saving has followed the work found by Friedman, in the 1950s, which sets a framework that asserts that savings behaviour can be theoretically understood through the life-cycle hypothesis and the permanent income model.

### *2.1. Life-cycle hypothesis*

It is important to keep in mind that the life-stage of an individual dominates the individual's spending decisions (Le Roux, 2017). Additionally, consumption smoothing plays an important role in the savings behaviour individuals have, in order to ensure that they have funds available for consumption expenditure during retirement (National Treasury, 2012). The consumption smoothing theory thus proposes that age has a substantial influence on an individual's motives for saving (National Treasury, 2012). Due to the individual intellectual and attitude decisions found to be made through the life-cycle hypothesis by Modigliani and Brumberg (1954), we will pay more attention to the theory presented by the life-cycle hypothesis. The life-cycle hypothesis is largely considered as an essential part of economic literature (Dlomo, 2012). The theory hypothesizes that the judgment made by individuals on saving and consumption depicts a plan of an ideal consumption framework over their lifetime, while staying aware of the limitations of resources the household has to their disposal (Hompashe, 2014). The life-cycle hypothesis has resulted in a number of conclusions, which have contradicted with the popular Keynesian theory, which states that the portion of household saving is a function of an individual's current income as well as a function of their long run expected income (Modigliani and Brumberg, 1954).

Through studying the life-cycle hypothesis, researchers have argued that early and later stages of life are associated with the habit of dis-saving (Chipote and Tsegaye, 2014). It is suggested that these stages of life are less productive and hence individuals are less likely to find motivation to save. However, the middle age generation is expected to be more productive and thus generate a higher income, making it easier to save for their future and the future of their dependents (Chipote and Tsegaye, 2014). Zwane *et al*. (2016) found that the results associated with age validated the life-cycle hypothesis, by suggesting that as an individual's age increases, the household savings will also increase. In order to analyse and capture the effect of age on saving and the effect of the life-cycle hypothesis, we will make use of the age and age squared variables.

The age distribution plays an important role as it forms the basis for the changes in resources and behavior of an individual over the years. The life-cycle hypothesis argues that individuals build assets in their middle-aged years, trying to build a safety net for their elderly years of retirement (Abu *et al.*, 2013). In order to test the effect of wealth on household saving, the study will incorporate household asset holding status in the analysis. The household's asset holding is

exclusive of any transfers from external parties, instead, this study will focus on assets such as home ownership. By including capital gains of household, the study may test the wealth effect on consumption, and as a result on saving. Case *et al.* (2012) found that the value of financial assets has a significant effect on the consumption behavior of individuals. Case *et al*. (2012: 4) explain the wealth effect as "the casual effect of exogenous changes in wealth upon consumption behaviour". The authors assert that changes in housing wealth have significant effects on household behaviour, which are similar to the effects found from financial wealth. It would be interesting to identify whether households with home ownership have savings patterns different to those without such asset holdings.

### *2.2. Permanent income model*

The analysis of household asset holding will also control for permanent or transitionary income. This is supported by the framework presented by the permanent income hypothesis, developed by Friedman (1957), which identifies the difference between permanent and transitionary components of income as factors affecting household saving (Nga, 2007). Samuelson and Nordhaus (1995) define permanent income as the level of income that a household will accumulate when temporary influences on gains or loss are not considered. Transitionary income can be defined as the difference between actual income and permanent income a household receives (Nga, 2007). It is therefore expected that if an increase in income is persistent then a household is more likely to consume instead of saving, whereas if transitionary income is the standard then households are more likely to save and not consume extensively (Dlomo, 2012). This theory therefore confirms that a household's current level of income will dictate their current saving habits, which are conditional on expectations of future income (Dlomo, 2012). The model implies that the spending decisions households take are dependent on their expectations of income they expect to receive over their lifetime as well as the intention to smooth their consumption over their lifetime (Dlomo, 2012).

It is important to consider that the burden, or lack thereof, on consumption expenditure of a household is a result of the household size (Zwane *et al.*, 2016). Nigus (2015) suggests that household budgets are concentrated on consumption expenditure due to the number of dependents a household has, which in turn affects household savings. The life-cycle hypothesis predicts that the dependency ratio is expected to have a negative impact on the savings rate (Horioka and Wan, 2007). The higher dependency ratio burdens many South African households which in turn strains their ability to save (Njobeni, 2017). Nigus (2015) argues that a decrease in the dependency ratio, when related to the working age population group, is likely to loosen household budget constraints, which would therefore increase the prospects of household saving. To analyse and understand the dependency

ratio's effect on the savings rate, household size is included and considered in this study. It is expected that a larger household size will result in a lower savings rate.

Income growth also plays an important role in savings behaviour, Nwachukwun and Egwaikhide (2007) argue that an increase in the rate of growth of income per capita increases the aggregate savings rate. An Australian study by Harris *et al*., (1999), which estimated the determinants of household savings over the period 1994 to 1999, asserted that income acts as one of the most important determinants of household saving (Chipote and Tsegaye, 2014). Thus, the importance of employment, income and age structure and their relationship with saving proves as being an important analysis to make (Horioka and Wan, 2007).

The Keynesian analysis of income is another theoretical framework important to note, as Keynes views savings through the lenses of the theories of demand and the consumption functions (Modigliani, 1983). As previously mentioned, income is regarded as the main determinant of household saving which formed the basis of the Keynes belief that "the average household's propensity to save will increase as the household reaches a higher income level" (Du Plessis, 2008: 17). If S is regarded as the gross domestic saving dependent variable, $a_0$ as the intercept, $a_1$ as the constant marginal propensity to save and $Y_g$ as gross national product, the linear Keynesian savings function with a constant marginal propensity to save becomes:

$$S = a_0 + a_1 Y_g \qquad (1)$$

which proves the theory that, as an individual's level of income rises, their average propensity to save will increase as a result (Du Plessis, 2008). Using this theory, Browning and Lusardi (1996: 1797) identify a number of motives to save. The study will focus on the following motives: a precautionary motive where households reserve funds against unforeseen future circumstances, *a life-cycle motive* where individuals seek to ensure that their needs at different stages in their lives are able to be met, and an *improvement motive* where individuals have a desire to improve their lives by gradually increasing their expenditure, and the *down payment motive* where households accumulate funds to make deposits for houses, cars and other durables.

However, although studies have been able to identify motives for household savings and provide a sound base of theory to use, researchers have provided contrasting results. For examplein South Africa, Mahlo (2011) found a positive relationship between income and household savings and a negative relationship between savings and consumption and debt. In contrast, Chipote and Tsegaye

(2014) found a negative relationship between income and savings. It is peculiar results as these that command further research into factors which provide a significant influence on household savings in South Africa. The importance of a panel dataset, such as the NIDS survey, presents itself in such a case. This livelihood tracking survey helps in finding enabling conditions for improved livelihoods amongst the population of South Africa, and through that, then analysing their influence on household savings.

NIDS data is also useful as it gathers information on life satisfaction and other related variables. Kannemeyer (2016) makes it clear that in order to study an individual's well-being, it is important to consider the experiences and situations they are faced with. Theoretical studies of happiness provide evidence that income plays an important role in understanding an individual's life satisfaction (Gokdemir, 2014). In addition, authors have found it feasible to consider demographic variables, such as financial status, as reasons and determinants for self-assessed well-being responses (Kennemeyer, 2016; Baird, *et al*., 2010). The expansion of the study of economics has highlighted the importance of subjective well-being (Kannemeyer, 2016). Subjective well-being and its correlates are closely linked to the role of an individual or household's relative well-being or standing, when compared to a distinct reference group (Kannemeyer, 2016). The relative income hypothesis, introduced by James Duesenberry in 1949, states that the life satisfaction of an individual that would derive from any given consumption or saving level would depend on its relative magnitude in the society (Kockesen, 2007). It is inevitable to make the assumption that absolute income is the sole predictor of life satisfaction, however, research shows that individual feelings of deprivation relative to a well-defined reference group prove to be a stronger predictor of life satisfaction (Kannemeyer, 2016). In addition, Duesenberry presents an individual consumption (saving) function that is dependent on the current income of other people. This theory identifies the importance of interpersonal relationships and the influence they play on the variant life satisfaction of an individual. By including relative income variables, this study will measure the variation in life satisfaction and test the relative income hypothesis.

The analysis of the impact of life satisfaction on household saving may be negatively impacted by endogeneity bias from omitted or unobserved variables. Therefore, a relative income variable is included, which acts as proxy for the measure of life satisfaction. This variable is derived from the question presented in the NIDS survey, asking: "*how would you classify your household, in terms of income, to households in the same village or suburb?"* By identifying the income gap between a household and a chosen reference group, we can identify the variation in life satisfaction. This can implicitly test the claim, made by Duesenberry (1949), stating that "an individual's utility index

depended on the ratio of his or her consumption to a weighted average of the consumption of others." The theory is based on a fact developed by psychologists and sociologists, which claims that individuals are concerned with their status in relation to those around them. It has been discovered that a range of economic features and spending habits in certain social groups are related to an underlying psychological aspiration to demonstrate *wealth* through the excessive purchasing of visible goods, and in doing so, accumulate a certain social status (Chai and Kaus, 2013). It is interesting to note that, spending in South African households has a negative relationship to the mean income of the social groups examined (Chai and Kaus, 2013).

Although the relative income hypothesis seems empirically and theoretically appealing, it has not been accepted and adopted widely. This is due to the fact that the life-cycle hypothesis and permanent income hypothesis have dominated in literature (Kockesen, 2007). Both theories have implied that consumption increases as a function of the lifetime resources of an individual. However, due to the fact that these theories are unable to explain the evidence that individuals are in fact concerned about relative income, the interest in the relative income hypothesis remains important to consider (Kockesen, 2007).

## 3. NATIONAL INCOME DYNAMICS STUDY (NIDS) DATA

The NIDS data is collected through a face-to-face longitudinal survey of families and individuals residing in provinces within South Africa (SALDRU, 2017). The purpose of the survey is to give outcomes for the dimensions of the well-being of South Africans, which are tracked over a period of time (SALRDU, 2017). The survey is a panel survey, analysing the evolution (or lack thereof) of the living conditions of a chosen sample group in South Africa. At a broad level, the survey identifies a variety of dimensions of well-being: wealth creation, generated through an analysis of income and expenditure dynamics and asset holding; demographic dynamics related to the composition of the household; social custom together with education and employment dynamics and lastly; access to social services (SALDRU, 2017). The NIDS survey is the first in South Africa to measure increased or decreased welfare over a number of years including a variety of demographic variables and financial variables including wealth, assets, income, expenditure and debt (Chinhema *et al.*, 2016). The period of analysis is 2008-2015, taking note that the NIDS survey presents a bi-annual dataset. This study makes use of the four waves of the survey with wave one taking place in 2008, wave two taking place in 2010-2011, wave three taking place in 2012 and lastly, wave four taking place in 2014-2015. Wave one of the survey collected all the base and detailed information, whereas waves two to four simply re-interviewed the respondents and worked towards gathering information on the developments of their livelihoods and well-being over the years (SALDRU, 2017). A set of data is released separately for each wave, however, the data allows for the combination[4] of data across waves (Chinhema *et al.*, 2016). NIDS is a longitudinal data set, which means the datasets follow certain individuals over a specified period of time and thus ascertain a variety of observations on each individual (Hsiao, 2003). The advantage of NIDS data is that the same individuals are interviewed every second year, which causes us to believe that the survey is more reliable, particularly with data around the progression of incomes of individuals and households (Dubois and Muller, 2016).

Individuals are tracked using a unique individual identifier (*pid*) for responses in each wave (Chinhema *et al.*, 2016). The NIDS survey characterises individuals over the age of 15 years old as adults. For our analysis, we have excluded any responses or data for individuals younger than the age of 15 and have focused our attention on household heads in South Africa. In addition to the

[4] The data can be combined by making use of the unique identifier (*pid*) assigned to each individual taking part in the survey, the unique identifier remains the same across all waves for each particular individual (Chinhema et al., 2016).

restriction by age, the data required an extensive process of cleaning and sorting which, in the end, resulted in a sample size of 7960 individuals as our adult respondents.

Moreover, the NIDS data was arranged in separate formats, including: adult, children and households. In order to arrange our dataset, we used the adult and household file formats which we merged across the four waves into one dataset for ease of use during the regression phase of this study. In order to avoid further problems with the dataset, we removed all observations with inconsistencies.

It is important to note that, as expected, the data sets utilised in this study included a few setbacks, which we addressed before continuing with any analysis. Item non-response patterns are said to be particularly prevalent in the expenditure data due to their perceived sensitivity by individuals providing the data. To deal with this issue, Finn *et al.* (2009) made use of imputations for missing data. All values of cases where responses were missing variables due to item-non-responses, imputations were created. This means that the missing data was substituted with values based on imputation techniques they adopted. The NIDS data is available with full imputations, for example, the total income for each household is provided with imputations and without. For this study, data with imputations was used for regressions. The income variable used from NIDS was derived from a combination of the consistent monthly income received by each household, as well as possible rental income that is received from "owner-occupied housing" (Chinhema *et al.* 2016: 40). Moreover, income and expenditure data required further attention during the data cleaning phase. The information on income and expenditure, although provided by the NIDS group, needed further work during the data cleaning process. All amounts were deflated to 2014 constant prices. The base month used was November 2014, with price indices taken from the national headline CPI index published by Stats SA[5] (SALDRU, 2016).

In relation to this study, the absence of a savings variable was initially an issue. However, with the availability of monthly income and extensive monthly expenditure data, we were able to create a savings as the variable for this study as the gap between these two. We make use of total monthly income, excluding social grants, and total monthly expenditure, which is inclusive of food and non-food expenditure.

Table 1 below depicts the logged savings variables (as used in the regressions that follow), which have been categorised by population groups. It is important to note that the savings variable was

[5] Price indices available here: http://www.statssa.gov.za/publications/P0141/CPIHistory.pdf?

created through the deflated values of income and expenditure, as abovementioned. It is clear that the majority of the sample size is made up of black household heads, with 6424 observations. The black population group (although the largest sample size) depicts the lowest average of savings among the other population groups, with a log savings mean of 7.211. This is followed by coloured household heads, who represent 1116 observations, with a mean of 7.582. In addition, interestingly, the coloured population group has the lowest maximum value of savings among the population groups. The white population group, with 316 observations, depicts a mean value of savings of 8.920. In comparison to the other racial groups, the white population group has the largest average value of savings as well as the highest maximum value of savings. This leads us to believe that the white population group has a greater ability to save as compared to their counterparts. Lastly, the Indian/Asian racial group depict the lowest number of observations in the data set, with average savings of 8.275 among the group. However, the Indian/Asian group depict the highest minimum value of savings as compared to all other income groups.

**Table 1: Log Monthly Household Savings by race; 2008-2015**

| **Indian/Asian** | | | | | |
|---|---|---|---|---|---|
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Savings | 104 | 8.27 | 1.36 | 4.15 | 11.14 |
| **Coloured** | | | | | |
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Savings | 1116 | 7.58 | 1.08 | 3.69 | 10.56 |
| **White** | | | | | |
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Savings | 316 | 8.92 | 1.13 | 3.19 | 13.60 |
| **Black** | | | | | |
| **Variable** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Savings | 6424 | 7.21 | 1.23 | 1.27 | 11.65 |
| | | | | | |

Source: Author's own calculations

For the most accurate representation of an individual's level of education, we use the "best education" variable created by the NIDS team (Chinhema, *et al*., 2016). The variable is created using the question "*what is the highest level of education that … has successfully completed?"* which combines schooling education combined with information on the any post-matric education obtained. This variable is the most accurate representation of the level of education individuals have obtained as it accounts for any changes in data across the waves, post interview dates to ensure the most accurate and most recent data is used. In this study, the household head's "best education" variable (*w_educ*) will be used to measure the impact on household savings within our analysis (Chinhema, *et al*., 2016). Table 2 indicates that the average education level obtained by the

household heads in the sample size is between grade 8 and 9, where the highest level of education is 19 years of education, which includes tertiary education.

**Table 2: Household heads' education level**

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| All education | 8.83 | 3.43 | 1 | 19 |

Source: Author's own calculations

In order to control for household asset holding, we created a proxy for wealth ownership, and limited the variables to physical assets such as house and vehicle ownership. The variables are included in the analysis as dummy variables. The means of the two variables, shown in Table 3 make it clear that a larger portion of the sample size own a home with a mean of 0.960, with a slightly smaller portion owning a vehicle presented with a mean of 0.837. We however acknowledge that the home ownership variable is a crude indicator of wealth for some individuals given the diversity of dwelling types in South Africa.

The household level geographical indicator we use in the dataset is the provincial boundaries, as set out in the 2011 Census. NIDS provides codes for each province which we continue to use in our analysis. As seen in Table 3, we created dummy variables for each province, in order to obtain the effect of provincial boundaries on household savings. Table 3 further displays descriptive statistics for the sample at use across the waves, the variables are described in Table 5. An average household consist of at least four members, with the largest household in the dataset consisting of 24 members and the smallest household consisting of 1 individual. For increased accuracy, the approach taken by Ting and Kollamparambil (2015) was adopted, where the age of the individual was calculated in order to account for any birthdays that had already passed, those that were yet to come and those that had arrived on the date of the interview. Additionally, in order to ensure that the age variable fulfils the expectation of relating to savings non-linearly, we created an age squared variable. We found that the average adult age of the household head respondents in the survey was 50, with the oldest respondent being 104 years old, as shown in Table 3.

**Table 3: Descriptive statistics**

| Variable | Mean | Std. Dev. | Min. | Max. |
|---|---|---|---|---|
| Savings | 3478.88 | 12093.21 | 3.56 | 802260.3 |
| Income | 5115.23 | 13064.33 | 55.77 | 809431.1 |
| Expenditure | 1636.35 | 2898.63 | 0.80 | 87742.8 |

| | | | | |
|---|---|---|---|---|
| Age | 50.74 | 15.61 | 15 | 104 |
| Age squared | 2817.62 | 1648.07 | 225 | 10816 |
| Employment | 0.66 | 0.48 | 0 | 1 |
| Black | 0.81 | 0.39 | 0 | 1 |
| White | 0.04 | 0.20 | 0 | 1 |
| Coloured | 0.14 | 0.35 | 0 | 1 |
| Indian/Asian | 0.01 | 0.11 | 0 | 1 |
| Female | 0.56 | 0.50 | 0 | 1 |
| No schooling | 0.21 | 0.41 | 0 | 1 |
| Primary | 0.5 | 0.50 | 0 | 1 |
| Secondary | 0.21 | 0.41 | 0 | 1 |
| Tertiary | 0.13 | 0.33 | 0 | 1 |
| Household size | 4.36 | 2.75 | 1 | 24 |
| Vehicle owner | 0.84 | 0.37 | 0 | 1 |
| Home owner | 0.96 | 0.20 | 0 | 1 |
| Income above average | 0.11 | 0.31 | 0 | 1 |
| Income at average | 0.39 | 0.49 | 0 | 1 |
| Income below average | 0.32 | 0.47 | 0 | 1 |
| Gauteng | 0.11 | 0.32 | 0 | 1 |
| Western Cape | 0.11 | 0.32 | 0 | 1 |
| Eastern Cape | 0.14 | 0.34 | 0 | 1 |
| Northern Cape | 0.08 | 0.27 | 0 | 1 |
| Free State | 0.07 | 0.25 | 0 | 1 |
| Kwa-Zulu Natal | 0.23 | 0.42 | 0 | 1 |
| North West | 0.08 | 0.27 | 0 | 1 |
| Mpumalanga | 0.07 | 0.25 | 0 | 1 |
| Limpopo | 0.11 | 0.32 | 0 | 1 |
| N | 7960 | | | |

Source: Author's own calculations

In order to assess life satisfaction, we made use of the relative income variable (shown in Table 4 below), which assessed the income levels households viewed themselves as, in relation to the households in their area. NIDS provided a scale of 1 to 5, with 1 being "much below average" and 5 being "much above average". For our study, we created dummy variables, separated into three categories: below average, average and much above average. With each variable equal to one when true and zero otherwise. From Table 4, we note that households which view themselves as below average income earners, displaying an average income of 3354.961, have an average savings of 2208.1. In contrast, respondents who viewed themselves as above average income earners depicted a savings value of 6247.503, while those earning an average income had 8731,616.

**Table 4: Household savings by relative income categories**

| **Income below average** | | | | | |
|---|---|---|---|---|---|
| **Variable** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Income | 2284 | 3354.96 | 4494.45 | 83.23 | 64141.50 |
| Expenditure | 2284 | 1146.86 | 1644.67 | 9.57 | 26567.94 |
| Savings | 2284 | 2208.1 | 3611.61 | 3.56 | 599941.86 |
| | | | | | |
| **Income average** | | | | | |
| **Variable** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Income | 2828 | 6648.11 | 17442.06 | 93.28 | 809431.10 |
| Expenditure | 2828 | 2101.92 | 2970.11 | 1.60 | 37064.75 |
| Savings | 2828 | 4546.20 | 16535.45 | 5.89 | 802260.30 |
| **Income above average** | | | | | |
| **Variable** | **Obs.** | **Mean** | **Std. Dev.** | **Min** | **Max** |
| Income | 778 | 8731.61 | 21301.01 | 278.87 | 491863.80 |
| Expenditure | 778 | 2484.11 | 5507.72 | 13.54 | 87742.80 |
| Savings | 778 | 6247.50 | 19708.11 | 15.14 | 489473.50 |

Source: Author's own calculations

**Table 5: Description of Variables**

| **Dependent Variable** | **Descriptor** |
|---|---|
| **Household savings** | Savings per household head = Household head Income minus Expenditure |
| **Explanatory Variables** | **Descriptor** |
| **Age** | Age of household head (in years) |
| **Employment status** | Employed or unemployed household head (employed = 1, unemployed = 0) |
| **Population group** | Race of household head (Black, White, Coloured, Indian/Asian) |
| **Female** | Gender of household head (woman = 1, man = 0) |
| **Household head education level** | Dummies for highest level of education:<br>no schooling =1 for 0 years of education, otherwise = 0<br>primary =1 for 1 to 7 years of education, otherwise = 0<br>secondary = 1 for 8-12 years of education, otherwise = 0<br>tertiary = 1, if above 12 years of education, otherwise = 0 |
| **Household size** | Number of household residents |
| **Income** | Total monthly income received in the household, after tax |

| | |
|---|---|
| **Type of dwelling** | Formal dwelling type = 1, Informal dwelling type = 0 |
| **Expenditure** | Total monthly expenditure of household |
| **Household asset holding** | Home ownership = 1, no home ownership = 0<br>Vehicle ownership = 1, no vehicle ownership = 0 |
| **Relative income (Comparing household income to reference group)** | Above average = 1, otherwise = 0<br>Average = 1, otherwise = 0<br>Below average = 1, otherwise = 0<br>(Scale of 1 to 5 used by NIDS.) |
| **Geographical location** | Provinces: dummy variables =1 if a household is located in a given province and 0 otherwise; Gauteng, North West, Northern Cape, Western Cape, Limpopo, Kwa-Zulu Natal, Mpumalanga, Free State, Eastern Cape. |

## 4. METHODOLOGY

In this section we discuss the methodology applied in this study to perform the investigation of the determinants of household savings in a South African context. In order to fulfil the objectives of this paper, keeping in mind the diversified and varying societal characteristics of the South African population, the study employs panel data estimation techniques to investigate factors that affect household savings in South Africa. Nerlove (2002) asserts that the primary reason for the heterogeneity found among the individuals is the different history each has transitioned from. The panel data techniques employed in the study, namely the fixed effects and 2SLS estimation models, are best fit for longitudinal datasets.

It is stated that the contribution of the analysis of panel or longitudinal data is rapidly becoming one of the "most innovative bodies of literature in econometrics" (Greene, 2010: 344). Panel data is advantageous as it allows us to observe a large number of data points of cross-section units over a certain time period, which therefore increases the degrees of freedom and reduces the likelihood of collinearity among explanatory variables (Hurlin, 2010). As a result, there is improved efficiency of the econometric estimates, which is favourable. In addition, panel data permits one to control for variables that are unobservable or unmeasurable like, "cultural factors or difference in business practices across companies" (Torres-Reyna, 2007: 3). More importantly, panel data allows for the analysis of important economic questions and analyses as well as the examination and understanding of issues which could not be determined through either cross-sectional or time-series data alone (Hurlin, 2010). Furthermore, one of the most important uses of panel data is the ability to effectively underpin the separate dynamic relationships within the data set and use the methods related to analyse dynamics of behaviour over time (Nerlove, 2002). A dynamic model is used to represent the behaviour of an object, individual, firm or entities over time.

It is especially important to highlight that panel data is especially favoured for its ability to uncover dynamic relationships as the models understand that because panel data sets are often not aggregated as typical time series datasets and because observations are being made of the same individual units over a period of time, more in depth dynamic and behavioural hypotheses can be made and duly tested (Nerlove, 2002). It is argued that "economic behaviour is inherently dynamic so that most econometrically interesting relationships are explicitly or implicitly dynamic" (Nerlove, 2002: 5). Time series data models often overlook this aspect and are faced with the issue of highly collinear current and lagged variables (Hsiao, 2003). Due to the nature of this study, it is for this reason that panel data models are employed.

For this study, different panel data models are adopted. These models are chosen due to their ability to overcome endogeneity bias, their greater capacity to capture the complexity of human behaviour, as well as their ability to overcome unobserved heterogeneity in cross-sectional data. Panel data models are theoretically able to identify and isolate the effects of specific actions and decisions taken by individuals (Hurlin, 2010 and Hsiao, 2003). In this study, we apply a (strongly) balanced data set, meaning that all individuals have data for all years used (Torres-Reyna, 2007). Recognising the advantages and power of panel data, we estimated the following models.

Firstly, the fixed effects model is used due to its ability to analyse the impact of variables which vary over a certain time period and therefore allows us to evaluate the net effect of the independent variables on the dependent variable, household savings (Semykina, 2008; Torres-Reyna, 2007). Furthermore, it is chosen for its uniqueness in controlling for heterogeneity bias in cross section data (Zwane *et al.*, 2016; Horioka and Wan, 2007). This model takes into account the fact that all entities, within the dataset, have their own characteristics which may (or may not) have an influence on the dependent variable. The fixed effects model takes into account any uninformed correlation between the unobserved heterogeneity and explanatory variables (Zwane *et al.*, 2016).

Following the approach adopted by Horioka and Wan (2007) as well as Zwane *et al.* (2016), the paper uses household savings as the dependent variable. Due to the fact that savings can be understood as a long-term or short-term decision on the use of outstanding income after expenditure, it then makes sense that the dependent variable would be derived from the subtraction of expenditure from income provided in the survey data. The explanatory variables will be variables based on individual and regional characteristics, such as: income, age and age squared, employment status, education, gender, education levels, household dependents, dwelling type, household expenditure, household asset holding, household income compared to reference group's and province (as shown in Table 5 below).

Research asserts that the lifecycle hypothesis proposes that savings is dependent on the growth rate of income as well as age (Zwane *et al*, 2016; Adewuyi *et al*, 2010; Horioka and Wan, 2007). It is for this reason we use the log of household savings and the following simple fixed effects regression can be used:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 Z_{it} + \boldsymbol{\delta}_{it} + u_{it} \qquad (2)$$

$Y_{it}$ measures our dependent variable as the log difference between household income and expenditure, that is, household savings. The influence of any outliers in the dependent variable is reduced by the use of a log transformation of the variable. Where *i* is the *pid* representing individual respondents and *t* is the time period, measured in years. βs are the estimated coefficients, $X_{it}$ represents the log of income by each household, $Z_{it}$ accounts for the covariates which are mainly linked to the differentiating characteristics of the household heads. In order to account for heterogeneity, $\boldsymbol{\delta}_{it}$ represents the unobservable time-invariant variables. Lastly, $u_{it}$ is the error term. Although the fixed effects model presents this advantage, it is important to note that it is unable to compute coefficients for time-invariant variables.

We then apply the Two-stage least squares (2SLS) estimator to the dynamic panel data due to the fact that a simple fixed effects estimation cannot control for endogeneity of income in our model. According to Abu *et al*. (2013), the 2SLS approach results in acquiring a factor which is considered to be highly correlated to an endogenous variable, but independent of the disturbance term. However, it has been established that obtaining such variables has proven to be difficult; it may therefore be useful to use a lagged value of an explanatory variable to overcome this problem (Zwane *et al*, 2016). Horioka and Wan (2007) make it clear that the random and fixed effects model makes the assumption that there is no directional relationship between savings and income growth. However, a number of studies, including Abu *et al*. (2013) and Horioka and Wan (2007), find that income growth rate was an endogenous factor related to savings. The 2SLS model to be used is as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{it-1} + \beta_2 Z_{it} + u_{it} \qquad (3)$$

Where, $Y_{it}$ measures our dependent of household savings, β would be the necessary intercepts, $X_{it-1}$ measures the log of household income lagged, $Z_{it}$ accounts for the aforesaid control factors, and $u_{it}$ acts as the error term.

## 5. RESULTS

This section discusses results in line with the methodology applied for the study. Table 6 presents results for the entire sample regardless of race. Column two shows results for the fixed effects model as per equation (2) while column 3 shows those of the 2SLS model estimated as per equation (3). Results for these two models are discussed concurrently. However, we reiterate that the fixed effects model drops time invariant characteristics in order to evaluate the net effect of the explanatory variables on the dependent variable (Torres-Reyna, 2007). Thus time invariant gender and population group variables are omitted from the model. Moreover, although the fixed effects model controls for heterogeneity, results of the 2SLS model are important to consider in order to control for endogeneity of the income variable as highlighted above (Zwane *et al*., 2016; Biyase, 2014).

Table 6 shows that the income variable in the 2SLS model has a positive and statistically significant coefficient, which indicates a positive correlation between income held by households and the savings that they generate. Interestingly, this outcome is consistent with that from the fixed effects model where the log of real household income (*income*) is statistically significant at 1% level. If household income increases by 1% household savings will also increase by 1.43% *ceteris paribus*. This satisfies the economic *a priori* expectation of a positive relationship between household savings and income as assumed by Ando and Modigliani's (1963) lifecycle hypothesis. Although household savings are expected and said to increase when income levels are higher, manners in which South African households save are still questionable as the majority uses transactional bank accounts as a saving mechanism (Old Mutual, 2017). In fact, casual basis savings are still more inherently prevalent in South African households, making the savings term shorter as individuals are still able to access their savings at their discretion. Lower income households save less as a result of lower disposable income amounts and higher demand for income, in the form of escalating expenses as the standard of living continues to increase, proving to be a great barrier to improved savings behaviour.

Rehman *et al*. (2010), who assessed household savings in Pakistan, similarly found a significant and positive relationship between household savings and income. In addition, it has previously been found that the relationship between income and savings is considerably affected by whether income is transitory or permanent. Buatista and Lamberte (1990), who studied savings behaviour in the Philippines, found that permanent and transitory income were persuading savings behaviour. It was found that the marginal propensity to save ranged from 0.218 to 0.548 for individuals who received

a permanent income, whereas the marginal propensity to save ranged from 0.388 to 0.803 for individuals who received a transitory income (Buatista and Lamberte, 1990). As previously mentioned, the income variable used in the study was derived from a combination of the consistent income received by each household, on a monthly basis net of any tax, as well as any rental income which may be received by housing which may occupied by owners (Chinhema *et al.*2016). Further research using extensively identified NIDS income data may reveal that household savings is affected by permanent versus transitory income. Many lower income households are more reliant on transitory income as a means of self-improvement thus, due to the impermanent nature of such an income, will save less than their wealthier counterparts sustaining themselves off a permanent income. These households are weaker savers because of their economic reality; the need to make ends meet, lesser understanding of financial savings instruments and education which overpower their will to save. Wealthier households are more likely to save more as they have larger portions of disposable income and, in some instances, higher levels of education rippling to better confidence related to financial decision making and understanding of the importance of saving and goal setting. While education levels and racial differences (discussed further below) are important drivers of savings, it is plausible that income will remain a key definer and determinant of the savings behaviour inherited by South African households.

The relationship between age and savings indicates a positive relationship, with a statistically significant p-value of 0.00. The results suggest that household savings increase with the age of the household head as was found in Rehman et al. (2010). Similar to Ling and Kollamparambil (2016), in this study, we use age squared in order to adequately represent the expectations of non-linear savings so as to make an attempt to capture the outcome of the lifecycle hypothesis (Zwane et al, 2016). To some extent, the results presented by the fixed effects regression indicate that individuals of older ages are dis-savers (Ahmad and Asghar, 2004). Nonetheless, the 2SLS estimates show that age has an insignificant effect on household savings.

It is important to mention that age and income are pertinent factors in savings behaviours of individuals as older individuals will be more inclined to save toward retirement savings. However, as dis-savers (portrayed by the results), relative to younger members of the population, the older generation have spent a majority of their working years creating an income base for their retirement years and therefore may no longer make contributions to savings once the retirement age has been reached. The younger population in the sample are inclined to save more, as a direct reflection of their life-stage, towards motor vehicles, houses as well as education. Savings patterns found by the age relationship prove to be sensible as younger individuals begin to experience the incidence of

dependent children or family members while making headway on improving their life satisfaction and having more reason to increase their precautionary as well as retirement savings. Age plays an important role in saving as it logically defines the attitude an individual adopts towards planning and control of savings, which grows over time.

**Table 6: Fixed-effects and 2SLS panel data estimates of household savings in South Africa:**

| | **Fixed effects** | | **2SLS** | |
|---|---|---|---|---|
| **Variable** | **Coeff.** | **p-value** | **Coeff.** | **p-value** |
| **Income** | 1.43 | (0.00) | 1.35 | (0.00) |
| **Age** | 0.05 | (0.00) | 0.00 | (0.96) |
| **Age squared** | -0.00 | (0.12) | -0.00 | (0.58) |
| **Employment** | 0.03 | (0.34) | 0.02 | (0.17) |
| **White** | - | - | 0.16 | (0.04) |
| **Coloured** | - | - | -0.03 | (0.70) |
| **Indian/Asian** | - | - | -0.16 | (0.04) |
| **Female** | - | - | -0.01 | (0.35) |
| **Primary school** | -0.01 | (0.89) | 0.09 | (0.00) |
| **Secondary school** | -0.02 | (0.84) | -0.03 | (0.24) |
| **Tertiary school** | -0.03 | (0.80) | -0.12 | (0.01) |
| **Household size** | -0.01 | (0.07) | -0.00 | (0.06) |
| **Type of dwelling** | -0.01 | (0.63) | -0.02 | (0.17) |
| **Expenditure** | -0.00 | (0.00) | -0.00 | (0.00) |
| **Household asset holding (Vehicle* and home**)** | 0.08 | (0.02) | 0.07 | (0.00) |
| | -0.01 | (0.91) | -0.10 | (0.01) |
| **Relative income (Above average, average, below average)** | 0.05 | (0.07) | 0.061 | (0.02) |
| | -0.04 | (0.04) | -0.042 | (0.02) |
| | -0.00 | (0.85) | 0.00 | (0.92) |
| **Western Cape** | -0.11 | (0.63) | -0.15 | (0.00) |

| | | | | |
|---|---|---|---|---|
| **Eastern Cape** | -0.24 | (0.18) | -0.13 | (0.00) |
| **Northern Cape** | -0.05 | (0.85) | -0.11 | (0.00) |
| **Free State** | -0.15 | (0.64) | -0.07 | (0.02) |
| **Kwa-Zulu Natal** | -0.09 | (0.67) | -0.11 | (0.00) |
| **North West** | 0.00 | (0.98) | 0.01 | (0.70) |
| **Mpumalanga** | 0.16 | (0.50) | 0.01 | (0.82) |
| **Limpopo** | 0.07 | (0.64) | - 0.15 | (0.00) |

Notes: *Vehicle ownership is in the first household asset row, **Home ownership indicated in the second household asset row. No schooling and Gauteng are base categories for education and provinces.
Source: Own calculations based on 2008-2015 NIDS dataset

Additionally, the employment status of each household head put forth a positive impact on household savings. As expected, households are unable to save when the household head is unemployed, as it is only possible to save when an income is being generated in the household (Zwane *et al*, 2016; Issahaku, 2011). However, the coefficient presents an insignificant influence of household saving at a 10% level.

The 2SLS estimation results present statistically significant and positive results for white headed households, showing that white households have a privilege to save when compared to black households. In contrast, and as unexpected Indian/Asian households are presented as less likely to save than black households, this finding is most likely an artefact of their very small number in the dataset which could have affected degrees of freedom in the regressions. Coloureds are shown to have a statistically similar chance of saving as blacks. The relationship with saving that these household racial groups display may be greatly linked to the social demographics of present South Africa. Cronje and Roux (2010) highlight the characterisation of the South African economy has one that has a high prevalence in income inequality which affects savings. With the majority of the population of colour earning a very little income, the propensity to consume is higher than the propensity to save for the future (Cronje and Roux, 2010).

Findings for education levels in both the fixed effects and 2SLS regressions are largely unexpected. The 2SLS model shows that household heads with primary (tertiary) education are more (less) likely to save than those with no-schooling, while the variables are generally insignificant in the fixed effects model. That a head with tertiary education is less likely to save than that without education is unexpected as their higher education is supposedly associated with higher income which should impact positively on savings. To a limited extent this scenario can be rationalised by consumerism among some educated middle income earners which mitigates their chances of saving,

while those with no schooling are compelled to save for precautionary purposes. Household heads with higher education levels are more likely to understand the importance of saving and future financial planning but are more inclined to live in the now, making poor financial decisions due to their closer proximity to a consumerist culture in complementing their higher societal status.

In relation to economic theory, it is unsurprising that the coefficient of the household size variable, an important determinant of household savings as it measures the dependency ratio, indicates that household size presents a negative effect on South African household savings. Le Roux (2017) asserts that slow economic growth may be a significant reason for the youth dependency ratios rising over time. As stated previously, household budgets are largely determined on consumption expenditure which is highly dependent on the number of dependents a household has, which thus affects household savings (Nigus, 2015). Our fixed effects regression results show that as the household size increases by 1%, the household savings will decrease by 0.009%, with a statistically significant influence at the 10% level. It is evident that the larger the household size, the higher the burden a household has on consumption expenditure, thus the more difficult it becomes for a household to make an attempt to save. Evidently, the result related to household size found in our study is in line with the research findings of Nigus (2015), Akpan *et al*. (2011) and Zwane *et al*. (2016).

The findings presented by the expenditure variable depict that an increase in expenditure exerts a negative and significant impact on household savings in both the fixed effects and 2SLS models, which therefore increases the difficulty of saving as expected. The consumption expenditure variable is largely affected by household budgets, which (as was stated by Nigus, 2015) are highly dependent on the number of dependents in each household. With the South African social demographic, many black household heads are supporting their own children, their parents as well as children of other dependents or family members which inevitably creates a financial strain. It is expected that a larger proportion of the household heads will have a proportionally higher dependence rate than those in other racial categories, due to previously disadvantaged members of society facing economic hardships currently.

Concerning proxies for wealth, the vehicle ownership presents a positive and significant relationship with household savings, while the reverse is the case for home ownership. Linked to this are the results for dwelling type (formal vs. informal) which are also statistically insignificant. Nonetheless, the finding for home ownership is unsurprising given that many South Africans own

informal dwellings which may not necessarily be an indicator of wealth. Hence car ownership gives a better sense of asset ownership.

In relation to well-being, relative income is an important proxy variable of life satisfaction for our study (as discussed earlier). According to Koçkesen (2008), it has been argued that life satisfaction levels and wellbeing declared by individuals is more dependent on relative income, instead of absolute income. As stated by Duesenberry (1949), relative income plays an important role as a household's consumption expenditure is not only dependent on their present level of income, but on their income relative to the households in the reference group within which it identifies itself (Parker, 2010). The proxy for life satisfaction produces differing results on the impact on household savings depending on one of the three categories under observation: income below average, income at the average level and income below the average level. Estimates for the fixed effects and 2SLS regressions show that individuals who classify their income as above average compared to the reference group, produce a positive and significant influence on household savings, at a 10% level. The fixed effects results reveal that individuals with an income which sits at the average level relative to the income of the reference group would exert a negative and significant relationship to savings. Similarly, an income level classified as below the reference group income yields a negative relationship on savings and but does not prove to be statistically significant. This is an interesting finding as relative income significantly affects an individual's life satisfaction, and therefore their savings habits. Those who prove to be less satisfied with their current income status are less likely to save, which may be due to the inability to generate enough income to match their peers.

Duesenberry (1949) asserts that households make attempts to align their consumption expenditure habits with the habits of those in their reference group. Therefore, households with lower income relative to the reference group are more likely to consume a larger portion of their income in order to match the standards of the households above them, thus saving less (Parker, 2010). Households with income above the reference group will save more relative to the groups lower than them and consume less (Parker, 2010). Individuals who view themselves as above average income earners are likely to depict this behaviour due to their current satisfaction with their standard of living. This may be an imperative indicator of the source of the consumerist culture adopted by many, as many display consumption patterns not fit for their income levels in order to match their reference group, thus inhibiting improved savings discipline.

*Comparison of determinants of household saving for black and white households*

Table 7 presents the results of the fixed effects and 2SLS regression results for black South Africans while Table 8 presents the same for white South Africans. With the South African history, which plays an important and determining factor of many of the characteristics of differing racial groups, it is important to identify whether there are any similarities or differences in determinants of savings faced by black South Africans (the previously marginalised majority of the population) and those of white South Africans (the previously systematically economically advanced minority of the population).

As expected, the income variable presents a positive and significant influence on household savings for black headed households. As the income level increases by 1%, the household savings will increase by 1.43%. Similar to the abovementioned results, the household savings are positively significantly affected by the age variable in the fixed effects model. The relationship between age and savings indicates a positive relationship, with a statistically significant p-value of 0,00. The results suggest that household savings should increase as the household head's age increases, as was previously found in Rehman *et al*. (2010). This may be due to increased knowledge in financial management as individuals grow older as well as an increasing need to create increased retirement base funds for the near future.

**Table 7: Fixed-effects and 2SLS panel data estimates of household savings for black South Africans**

| | **Fixed effects** | | **2SLS** | |
|---|---|---|---|---|
| **Variable** | **Coeff.** | **p-value** | **Coeff.** | **p-value** |
| **Income** | 1.43 | (0.00) | 1.36 | (0.000) |
| **Age** | 0.05 | (0.00) | 0.0003 | (0.924) |
| **Age squared** | -0.00 | (0.12) | -0.00 | (0.622) |
| **Employment** | 0.03 | (0.34) | 0.03 | (0.072) |
| **Female** | - | - | -0.01 | (0.324) |
| **Primary school** | -0.01 | (0.89) | 0.06 | (0.014) |
| **Secondary school** | -0.02 | (0.84) | -0.00 | (0.988) |
| **Tertiary school** | 0.03 | (0.80) | 0.04 | (0.210) |
| **Household size** | 0.01 | (0.07) | -0.01 | (0.01) |
| **Type of dwelling** | -0.01 | (0.63) | -0.02 | (0.16) |
| **Expenditure** | -0.00 | (0.00) | -0.00 | (0.00) |

| | | | | |
|---|---|---|---|---|
| **Household asset holding (Vehicle* and home**)** | 0.08 | (0.02) | 0.06 | (0.01) |
| | -0.01 | (0.91) | -0.11 | (0.01) |
| **Relative income (Above average, average, below average)** | 0.05 | (0.07) | 0.06 | (0.02) |
| | -0.04 | (0.04) | -0.04 | (0.02) |
| | -0.00 | (0.85) | 0.00 | (0.92) |
| **Western Cape** | -0.11 | (0.63) | -0.06 | (0.06) |
| **Eastern Cape** | -0.24 | (0.18) | -0.02 | (0.34) |
| **Northern Cape** | -0.05 | (0.85) | -0.01 | (0.61) |
| **Free State** | -0.15 | (0.64) | 0.03 | (0.37) |
| **Kwa-Zulu Natal** | -0.089 | (0.671) | -.0000761 | (0.998) |
| **North West** | 0.005 | (0.982) | 0.119 | (0.000) |
| **Mpumalanga** | 0.16 | (0.503) | 0.118 | (0.000) |
| **Limpopo** | 0.0721 | (0.637) | 0.112 | (0.000) |

Notes: *Vehicle ownership are in the first household asset row, **Home ownership indicated in the second household asset row. No schooling and Gauteng are base categories for education and provinces.
Source: Own calculations based on 2008-2015 NIDS dataset

In relation to the employment variable, the relationship presented by the black household heads shows a positive and statistically significant relationship between employment and household savings in the 2SLS model. As employment increases by 1%, household savings increases by 0.03%. Almost similarly, white household savings increase by 0.02% when employment increases by 1%. These results show that employment has a slightly greater on household savings for black South African households than it does for white South African households. The result presented could possibly be in relation to the wealth gap between black and white South African households. Black South African households are gaining further knowledge on the dynamics of financial freedom and how to achieve it, which possibly results in aspirations to better improve their standard of living over time when able to do so. Black South Africans also seem to be developing a better understand the benefits of employment and its use in increasing life satisfaction in the long run, thus improving their savings habits to match future expectations.

Additionally, the household size has differing effects on household savings for black and white South African households. Household size is both negative and statistically significant for both fixed effects and 2SLS regression results for both black and white South Africans. For better analytical perspective, we note that white South Africans portray a household savings decrease of 0.0049% (0.01% presented in Table 8) for every percentage increase in household size, whereas

black South African households' savings decrease by 0.0065% (0.01% presented in table 7) for every 1% increase in the number of dependents in the household. This leads us to believe that the household dependency ratio has a relatively bigger influence on black South Africans' savings than white South Africans'. This result is unsurprising as many black South African households are concentrated by social grant recipients who rely more on family members to get by. In addition, it has been found that many black South African households are less reluctant to request additional financial contributions from family members in their households to make ends meet (Old Mutual, 2017). The "sandwich generation", who are identified as individuals between the ages of 31 and 49 caring financially for their elders as well as children, are less inclined to save because of their high dependency ratios (Old Mutual, 2017). This portion of the population is most prevalent in the black South African population grouping who experience what is often referred to as "black tax"[6], which increases their chances of spending their disposable income on current financial responsibilities instead of saving. This further exacerbates the burden black households experience from dependents within their households, making it more difficult to reach savings goals over time.

Findings for asset ownership are also similar for both races. Vehicle (home) ownership is positively (negatively) related with household savings in both the fixed effects and 2SLS model results. increase in home ownership. Thus, home ownership negatively impacts household savings in South African households, regardless of background.

Lastly, in relation to relative income, the results show that both black and white South Africans who view themselves as households with above average income when compared to households around them induce a positive and significant impact on their savings, whereas households who regard themselves as average income have a negatively and significantly impacted relationship with household savings. These findings show that a deeper understanding of underpinning factors of different saving levels between white and black households is beyond the current analysis.

**Table 8: Aggregated Fixed-effects and 2SLS panel data estimates of household savings for white South Africans:**

| | **Fixed effects** | | **2SLS** | |
|---|---|---|---|---|
| **Variable** | **Coeff.** | **p-value** | **Coeff.** | **p-value** |
| **Income** | 1.43 | (0.00) | 1.356215 | (0.000) |

[6] A term used to refer to a non-formal tax burden experienced by black South Africans.

| | | | | |
|---|---|---|---|---|
| **Age** | -0.05 | (0.00) | -.0003715 | (0.889) |
| **Age squared** | 0.00 | (0.12) | 0.00 | (0.724) |
| **Employment** | 0.03 | (0.34) | 0.02 | (0.164) |
| **Female** | - | - | -0.01 | (0.298) |
| **Primary school** | -0.01 | (0.89) | 0.06 | (0.011) |
| **Secondary school** | -0.02 | (0.84) | -0.01 | (0.793) |
| **Tertiary school** | 0.03 | (0.80) | 0.05 | (0.130) |
| **Household size** | -0.01 | (0.07) | -0.00 | (0.057) |
| **Type of dwelling** | -0.01 | (0.63) | -0.02 | (0.150) |
| **Expenditure** | -0.00 | (0.00) | -0.00 | (0.000) |
| **Household asset holding (Vehicle* and home**)** | 0.08 | (0.02) | 0.07 | (0.001) |
| | -0.01 | (0.91) | -0.11 | (0.007) |
| **Relative income (Above average, average, below average)** | 0.055 | (0.073) | 0.062 | (0.016) |
| | -0.045 | (0.041) | -0.042 | (0.023) |
| | -0.0015 | (0.849) | 0.0005 | (0.909) |
| **Western Cape** | -0.10644 | (0.626) | -0.069 | (0.015) |
| **Eastern Cape** | -0.243 | (0.180) | -0.025 | (0.364) |
| **Northern Cape** | -0.052 | (0.846) | -0.015 | (0.627) |
| **Free State** | -0.147 | (0.637) | 0.034 | (0.304) |
| **Kwa-Zulu Natal** | -0.089 | (0.671) | -0.00064 | (0.980) |
| **North West** | 0.0053 | (0.982) | 0.1208 | (0.000) |
| **Mpumalanga** | 0.1613 | (0.503) | 0.116 | (0.000) |
| **Limpopo** | 0.0723 | (0.637) | 0.114 | (0.000) |

Notes: *Vehicle ownership are in the first household asset row, **Home ownership indicated in the second household asset row. No schooling and Gauteng are base categories for education and provinces.
Source: Own calculations based on 2008-2015 NIDS dataset

## 6. DISCUSSION

Our results show a positive relationship between household savings and total household income, meaning that individuals are more inclined to save when they are receiving an income. Although this remains economically correct, developing countries are unique with regard to their economic dynamics. Deaton (1989) asserts that household income in developing countries remains uncertain, in most cases, and cyclical in its nature which therefore makes it difficult to estimate long-term circumstances and therefore induce better savings habits.

In addition, the SARB (2016) indicated a trend related to the compensation of employees, acting as the largest component of household disposable income, which increases over time but is concurrently coupled with a slower increase in consumption expenditure by households. The relationship between the two resulted in the lower savings rate reported in the 2016 Q3 SARB quarterly bulletin. Households increased expenditure negatively impacts household savings and acts as a significant contributor to lower savings rate. As stated by Cronje and Roux (2010), the proportion of households spending large portions of their monthly income on short-term gratification grows larger by the day.

The positive relationship found between income and household savings strongly relates to the relationship found in the Keynesian theory, mentioned earlier in the paper. The results prove the theory which states that, as an individual's level of income rises, their average propensity to save will move in the same direction (Du Plessis, 2008). A number of motives to save have been identified, in conjunction with this theory, by authors such as Browning and Lusardi (1996: 1797). As mentioned previously, these motives include: a *precautionary* motive where households reserve funds against unforeseen future circumstances, *a life-cycle motive* where individuals seek to ensure that their needs at different stages in their lives are able to be met, and an *improvement motive* where individuals have a desire to improve their lives by gradually increasing their expenditure, and the *down payment motive* where households accumulate funds to make deposits for houses, cars and other durables.

More importantly, income plays an important role in all motives to save an unfortunately, in a South African context, the economy is strongly characterised by high inequality which translates directly into income inequality. A large portion of South Africans, particularly black South Africans, are living on a very little income (Cronje and Roux, 2010). As a result of this, many households focus their monetary concerns on immediate survival, which thus results in a lower propensity to save but

a higher propensity to consume immediately. The results presented by the black and white household analyses are in agreement with such statements, where it is evident that black households are in less enticing positions to save, with larger negative influences in determinants of household savings.

Unlike developing countries such as China and India, saving is not inherent in the South African culture (Nga, 2007; Cronje and Roux, 2010). Instead, South Africans are a consumer driven society, a characteristics now largely driven by the black middle class (Cronje and Roux, 2010). Saving and expenditure have a negative relationship in our results above, which means that factors that increase consumption expenditure will result in the reduction of savings. It has previously been found that inequality in developing countries plays an important role in the consumption habits of the individuals in society, as "greater inequality fosters higher spending on visible goods" (Chai and Kaus, 2013). The issue of consumption is one that may require further research as consumption is said to be the reason is thought to impede the growth of household savings among low income group households in developing economies (Moav and Neeman, 2012). In addition, in South Africa, savings is also largely an issue of self-control (over and above the issues inherited through the Apartheid regime), where individuals are driven by an over powering bias towards consumption today (National Treasury, 2012).

Another important result to discuss was those put forward by the relative income variables. The relative income variables act as a proxy for life satisfaction. Individuals are highly concerned with their status in relation to the status of those around them Duesenberry (1949). The 2SLS model results show a positive relationship between household savings and individuals who rank their income level as above average in comparison to the households in their reference group. The results also show that individuals who rank themselves above average are more inclined to save their earnings. Individuals who remain above the average group are more likely to save more as they are more likely higher income earners making them more persuaded to save. Individuals who view themselves as part of the average income group level have a negative relationship with saving. This could be due to the fact that the extremes of either below or above average do not apply, and the individual is therefore comfortable in their current setting and do not feel the need to save. However, Chai and Kaus (2013) highlight the fact that households in areas where the gaps between income groups are greatly noticeable may experience a large increase in their consumption expenditure related to visible goods. With regard to our income groups positioned at average level, the negative relationship with saving may also be as a result of increased spending, in order to demonstrate a higher up position to their reference group.

In addition, the multivariate results reveal that black households are less likely to save compared to white households. This could be partly linked to the negative effects of the Apartheid on the income and expenditure patterns of black South Africans. It is often stated that individuals of lower income groups are faced with the dilemma of a smaller fraction of their income, compared to their higher income counterparts, because their incomes are merely in place to support a minimum and basic standard of living where many live hand-to-mouth and therefore, do not have the luxury to save. It is clear that accumulated human capital related characteristics of the household head, such as income and employment status significantly influence household savings behaviour.

## 7. CONCLUSION

The Republic of South Africa is characterised by extremely low household saving rates which has continued to increase worry as South Africans adopt a consumerist culture despite the importance of long term savings. Currently, the microeconomic determinants of household saving have only been explored by a few studies, despite the importance of saving for a country's socioeconomic development process. Extant literature has overlooked the racial differential in determinants of household saving, yet understanding this is crucial, in light of the South African history and its impact on the current socioeconomic setting. Also, available panel data studies have not yet delved into the relationship between individuals' life satisfaction and household saving despite a link between the two depicting a significantly impactful relationship. There are many unexplored factors, which are engraved in the spending and savings culture of South Africans, which shift households into modes of saving and dissaving over the years. The savings patterns depicted by South African households prompt the need for far more impactful policy measures and techniques to encourage increased household saving.

In this study, we conducted a dynamic panel data analysis of the economic, demographic and socioeconomic determinants of household savings, using the fixed effects and 2SLS models on the panel data presented by the South African NIDS 2008 to 2015 dataset. To summarize our main findings, we found that households in South Africa showed support for the life-cycle hypothesis theory, through the evidence of the relationship presented by the age structure and income relationships to household savings where individuals begin to save less as they grow older. The results revealed the *life-cycle* motive for saving to be true, and one that is visible in a South African context. However, black households proved to increase their savings as they aged further which leads us to believe that inherent negative effects of apartheid have driven this behaviour as means to rectify their economic standing in the future as well as secure higher retirement returns.

In relation to income and life satisfaction, the proxy for life satisfaction – relative income – revealed that the income gap between a household's income and that of a determined reference group could partially explain the savings behaviour of an individual over time. Individuals who view themselves as above average income earners compared to the reference group depicted a positive relationship with household savings, whereas individuals who fell in the average group of income earners were less likely to save. The proxy for life satisfaction reveals that individuals who are "more satisfied" with their overall income level, when compared to the reference group, are more inclined to save with the motive of improving or remaining in that position in the future. Individuals who rank themselves as average could be characterised as "less satisfied" with their livelihoods and are

therefore more inclined to increase their expenditure, in hopes of matching the social status of those above them. In order to appropriately address the consumerist culture that trumps smart savings behaviour, nudging measures and financial incentives should be put in place by policymakers as well as savings institutions.

The savings culture of South Africans is worrisome, however, with that of blacks posing a number of questions and presenting itself as a topic for further research. The socio-demographic profiles of households drive savings e.g. income, relative income and population group, to name a few, whereas household size, expenditure and home ownership remain plausible arguments for household dissaving in South Africa

In addition, the paper found that white South Africans and their relationship with household savings was more appealing. Whereas, in contrast, black headed households do not enjoy the same characteristics since their relationship with households saving is slightly less appealing. However, the study could not dig deeper into sources of this disparity; instead we recommend a broader analysis into behavioural, economical and policy-related determinants of household saving among South African races. To further address the disproportion of savings between racial groups as well as the impact of age on saving, we suggest incorporating financial education as a compulsory component of secondary education as a means of encouraging savings habits at a younger age thus encouraging financial responsibility at a later stage.

An increase in the savings rate plays an important part in the economic policy agenda of the South African government. Higher levels of household savings are encouraged in order to relieve households of the financial vulnerability they face. Employers, government policy makers, departments of education and private sector institutions are all able to make use of mechanisms to encourage savings across all population groups and ages. These include automatic enrolment into retirement savings by employers in accordance with income levels and individual comfortability, tax incentivised savings measures, increased access to free and comprehensive financial education and social marketing and encouragement. Higher savings enhance the welfare of the family and increases the chances of a higher life satisfaction, which we have identified as a determinant of increased savings behaviour. Policy decisions and products offered to encourage saving, should be informed by the underlying and important determinants of household savings, which affect not only those who are unable to save, but those who make efforts to save but save too little.

## 8. Reference List

Abu, N. Zaini, M. Karim, A. & Aziz, M. (2013). Low savings rate in the Economic Community of West African States: the role of political instability-income integration. *South East European Journal of Economics and Business*, 8 (2), p. 53-63.

Akpan, B. Udoh, E. Aya Aya, E. (2011). Analysis of savings determinants among Agro-based firm workers in Nigeria: a simultaneous equation approach. *Research on Humanities and Social Sciences*, 1 (3), pp. 1-11.

Ardington, C. and Case, A. (2010). Interactons between mental health and socioeconomic status in the South African National Income Dynamic Study. *Studies in Econometrics*, 34(3), p 69-85.

Banerjee, A., Meng, X., Porzio, T. and Qian, N. *(*2014) Aggregate Fertility and Household Savings: A General Equilibrium Analysis Using Micro Data. Yale University. Online. Available: http://aida.wss.yale.edu/~nq3/NANCYS_Yale_Website/resources/papers/savings_20140504.pdf. [Accessed: 9/07/2017].

Biyase, M. (2014). Poverty and remittances in South Africa: an instrumental variables Analysis. Environmental Economics, 5(4), pp. 40-47.

Browning, M. and Lusardi, A. (1996). Household Savings: Micro Theories and Micro Facts. *Journal of Economic Literature*. 34 (4), p 1797-1855.

Bautista, R. M., and Lamberte, M. B. (1990). Comparative Saving behaviour of Rural and Urban Households in the Philippines. *Journal of Philippines Development*, 17(2), p. 149-181.

Carter, M. R. and May, J. (2001). One kind of freedom: Poverty dynamics in post-apartheid South Africa. *World development, Elsevier*, 29 (12). P. 1987-2006.

Case, K.E., Quigley, J.M. and Shiller, R.J. (2012). Wealth Effects Revisited. *National Bureau of Economic Research*. Working Paper 18667.

Chai, A. and Kaus, W. (2013). Exploring the link between the income distribution and visible spending: Evidence from South Africa. Online. Available: https://www.google.co.za/url?sa=t&source=web&rct=j&url=https://pdfs.semanticscholar.org/1198/781ab5273d608f9ad45dd65ae6da6f078b9a.pdf&ved=2ahUKEwi_me6M_o_aAhVjDMAKHYzjA40QFjAAegQIBxAB&usg=AOvVaw0j7RR3RHWggW4fnl6nEUlp. [Accessed: 05-11-2017]

Chinhema, M., Brophy, T., Brown, M., Leibbrandt, M., Mlatsheni, C., & Woolard, I., eds. (2016). "National Income Dynamics Study Panel User Manual", Cape Town: Southern Africa Labour and Development Research Unit

Chipote, P. and Tsegaye, A. (2014) Determinants of Household Savings in South Africa: An Econometric Approach (1990-2011). *Mediterranean Journal of Social Sciences*, 5 (15), p 183-190.

Cronje, M. and Roux, A. (2010). Creating a savings culture for the black middle class in south Africa-policy guidelines and lessons from China and India, *Usb Leaders' Lab*, 4 (2), University of Stellenbosch.

Dlomo, Z., 2012. A microeconomic analysis of household saving: a specific focus on the lower income categories and prospects of formalising informal saving in South Africa (Doctoral dissertation, University of the Western Cape).

Dubois, F. and Muller, C. (2017). Decomposing well-being measures in South Africa: The contribution of residential segregation to income distribution. Working paper – Aix-Marseille School of Economics WP 2017 no. 19.

Du Plessis, G (2008). An Exploration of the Determinants of South Africa's personal savings rate: Why do South Africans households save so little? MBA Dissertation, University of Pretoria. Online. Available: http://repository.up.ac.za/handle/2263/23126 [Accessed: 20/07/2017].

Duesenberry, J. S. (1949). Income, Saving and the theory of consumer behavior. Harvard University Press, Cambridge, Mass.

Gokdemir, O. (2014). Factors influencing life satisfaction of women living in the Northern Cyprus. *Social Indicators Research*, 115(3), p 1071 – 1085.

Govender, P. 2017. South African Savings Institute 2017 Savings Month Launch. Online. Available: https://www.savingsinstitute.co.za/category/savings-campaigns/. [Accessed: 20-09-2018].

Greene, W. H. (2008). Econometric analysis. Chapter 9, 6th ed. Upper Saddle River, N.J.: Prentice Hall.

Greene, W. H. (2010) Chapter 11: Models for Panel Data. Online. Available: http://people.stern.nyu.edu/wgreene/Lugano2013/Greene-Chapter-11.pdf. [Accessed: 01/08/2017].

Harjes, T. and Ricci, L.A. (2005). What Drives Saving in South Africa? Post-Apartheid South Africa: The First Ten Years, 48. Online. Available: https://www.imf.org. [Accessed: 05-07-2017].

Horioka, C. Y. & Wan, J. (2007). The determinants of household saving in China: a dynamic panel analysis of provincial data. *Journal of Money, Credit and Banking*, 39(8), p. 2077– 2096.

Hurlin, C. (2018). Advanced Econometrics II. University of Orleans. Online. Available: https://www.google.co.za/url?sa=t&source=web&url=http:www.univ-orleans.fr/deg/masters/ESA/CH/Geneve_Chapitre0.pdf&ved=2ahUKEwjEkqKQgpDaAhXrAMAKHfN4AcgQFjAAegQIBxAB&usg=AOvVaw2nVEXulf97hMjOLhOdBe6q. [Accessed: 08-03-2018].

Hsiao, C. (2003). Panel Data Analysis – Advantages and Challenges. *Sociedad de Estad´ıstica e Investigaci´on Operativa*. Test (0000) 00 (0). P 1 – 63.

Juster, F.T., Lupton, J.P., Smith, J.P. and Stafford, F. (2004). The Decline in Household Saving and the Wealth Effect.

Kannemeyer, C. (2016). Subjective well-being: Adult South Africans' Life Satisfaction (2008 – 2014). Cape Town: SALDRU, University of Cape Town. SALDRU Working paper no. 117/NIDS Discussion paper 2016/4.

Kazmi, A. (1993). National savings rates of India and Pakistan: A macro-econometric analysis. *The Pakistan Economic Development Review* 32:4 (2), p 1313-1324.

Koçkesen, L. (2007) Relative Income Hypothesis, in William A. Darity (Ed.), International Encyclopedia of the Social Sciences, 2nd edition (2008).

Kraay, A. (2000) "Household Saving in China." *World Bank Economic Review*, 14:319 (September), p 545-570.

Kransdorrif, M. (2018). Savings Tips for Savings Month: Switch to a higher savings interest account. Online. Available: http://insight.mytreasury.co.za/money-saving-tip/. [Accessed 10 September 2018].

Kudaisi, B.V. (2013). Savings and its determinants in West Africa countries. *Journal of Economics and Sustainable Development*, 18(18), p. 107-119.

Le Roux, R. (2017). Savings: A Micro Economic View. Old Mutual Investment Group. Available: https://www.oldmutual.co.za/docs/default-source/personal-solutions/financial-planning/savings-and-monitor/latest-research-results/rianleroux_-2017-savings-monitor_july.pdf. [Accessed: 13/03/2018].

National Treasury. (2012). Incentivising non-retirement savings. Technical Discussion Paper D for public comment. Available: http://www.treasury.gov.za/comm_media/press/2012/Incentivising%20non-retirement%20savings.pdf. [Accessed: 15/02/2018].

Mahlo, N. (2011). The determinants of household savings in South Africa. University of Johannesburg.

Mankiw, N.G. (2001). Principles of economics. 2nd Ed: Harcart College publishers.

Moav, O., & Neeman, Z. (2010). Saving rates and poverty: The role of conspicuous consumption and human capital. Online. Available: http://portal.idc.ac.il/He/schools/economics/about/Documents/Omer%20Moav.pdf. [Accessed: 13/07/2017].

Modigliani, F. and Ando, A. (1963). The Life Cycle Hypothesis of Saving; Aggregate Implications and Taste. *American Economic Review*, 53 (1), p. 55-84.

Modigliani, F. & Bumberg, A. (1954). Test of the life cycle hypothesis of saving. Bulletin of the Oxford Institute of Statistics, 19, p. 99-124.

Nerlove, M. (2002). Essays in Panel Data Econometrics. Cambridge University Press. Online. Available:http://assets.cambridge.org/97805218/15345/frontmatter/9780521815345_frontmatter.pdf. [Accessed: 08-03-2018]

Nga, M. (2007). An investigative analysis into saving behaviour of poor households in developing countries: with specific reference to South Africa. Research report for the degree of Masters in Economics, University of Western Cape.

Nigus, H. (2015). Determinants of Household Saving in Gedeo Zone, Southern Ethiopia. *Journal of Economics and Sustainable Development*. 6 (7), p. 93 – 102.Nwachukwu, T. Egwaikhide, F. (2007). An error-correctional model of the determinants of private savings in Nigeria. University of lbadan, Nigeria.

Nwachukwu, T. Egwaikhide, F. (2007). An error-correctional model of the determinants of private savings in Nigeria. University of lbadan, Nigeria.

Njobeni, S. (2017). Maria Ramos' analysis of SA's savings culture. Online. Available: https://www.iol.co.za/business-report/maria-ramoss-analysis-of-sas-savings-culture-10025687. [Accessed: 02-07-2017].

Old Mutual. 2017. Key Savings and Investment trends. Online. Available:https://www.oldmutual.co.za/docs/default-source/personal-solutions/financial-planning/savings-and-monitor/latest-research-results/l10719-omsim-report-2017.pdf. [Accessed: 20-09-208].

Orbeta Jr., A. C. (2006). Children and Household Savings in the Philippines. Philippines Institute for development studies, *Discussion Paper Series No*: 2006-14, p. 1-22.

Ozcan, M. Gunay, A. Ertac, S. (2012). Macro and socioeconomic determinants of Turkish private savings. *Journal of Economic and Cooperation and Development*, 33(2), pp. 93-130.Parker, J. (2010). Macroeconomic theory: Theories of consumption and saving. Reed College. Online. Available: http://www.reed.edu/economics/parker/s11/314/book/Ch16.pdf. [Accessed: 20-03-2018].

Pillai, V. N. (2016). Panel data analysis with Stata Part 1: Fixed effects and Random Effects Models. *Munich Personal RePEcArchives*, MPRA paper no. 76869. Online. Available: https://mpra.ub.uni-muenchen.de/76869/. [Accessed: 02-03-2018].

Prinsloo, J. (2000). The saving behaviour of the South African economy. South African Reserve Bank Occasional Paper 14, pp. 1-34.

Reserve Bank of India. (2016). Annual Report. Online. Available: https://rbi.org.in/Scripts/AnnualReportPublications.aspx?Id=1188. [Accessed: 23-07-2017].

Rehman, H., Bashir, F. and Faridi, M. Z. (2011). Saving behaviour among different income groups in Pakistan: A micro study. *International Journal of Humanities and Social Science*, 1 (10), pp. 268-276.

Rehman, H., Faridi, Z and Bashir, F. (2010). Household saving behaviour in Pakistan: a case of Multan district. *Pakistan Journal of Social Sciences*, 30 (1), pp. 17-29.

Samuelson, P. and Nordhaus, W. 1995. *Economics*. Fifteenth Edition. McGraw-Hill, Inc. Schmidt-Hebbel, K.1992. Household Saving in Developing Countries: First Cross-Country Evidence. *The World Bank Economic Review*, 6 (3), p. 529-47.

Saqib, S. Panezai, S., Ullah, H., Ali, U. and Usman, H. (2016). Determinants of household savings in rural and urban areas: The case of Chitral District, Pakistan. *International journal of academic research in business and social sciences*, 6(3), p.54–64.

Semykina, A. and Wooldridge, J. (2008). Estimating panel data models in the presence of endogeneity and selection. Online. Available: http://myweb.fsu.edu/asemykina/selectionPS.pdf [Accessed: 01-08-2017].

Sheytanaova, T. (2004). The accuracy of the Hausman Test in Panel data: A Monte Carlo Study. Online. Available: http://oru.diva-portal.org/smash/get/diva2:805823/FULLTEXT01.pdf [Accessed: 01-08-2017].

Simleit, C. Keeton, G. and Botha, F. (2011). The determinants of household saving in South Africa. *Studies in Economics and Econometrics*, 35 (3), pp. 1-20.

Southern Africa Labour Development Research Unit (SALDRU) (2009). National Income Dynamics Study Wave 1: User document. Cape Town: Southern Africa Labour and Development Research Unit, University of Cape Town.

Southern Africa Labour and Development Research Unit. National Income Dynamics Study 2008, Wave 1 [dataset]. Version 6.1. Cape Town: Southern Africa Labour and Development Research Unit [producer], 2016. Cape Town: DataFirst [distributor], 2016.

Southern Africa Labour and Development Research Unit. National Income Dynamics Study 2010 - 2011, Wave 2 [dataset]. Version 3.1. Cape Town: Southern Africa Labour and Development Research Unit [producer], 2016. Cape Town: DataFirst [distributor], 2016.

Southern Africa Labour and Development Research Unit. National Income Dynamics Study 2012, Wave 3 [dataset]. Version 2.1. Cape Town: Southern Africa Labour and Development Research Unit [producer], 2016. Cape Town: DataFirst [distributor], 2016.

Southern Africa Labour and Development Research Unit. National Income Dynamics Study 2014 - 2015, Wave 4 [dataset]. Version 1.1. Cape Town: Southern Africa Labour and Development Research Unit [producer], 2016. Cape Town: DataFirst [distributor], 2016. Pretoria: Department of Planning Monitoring and Evaluation [commissioner], 2014.

South African Reserve Bank. (2015). Historical Macroeconomics Time series Information. Online. Available: https://www.resbank.co.za/publications/quarterlybulletins/Pages/QBOnlinestatsquery.aspx . [Accessed: 01-07-2017].

South African Reserve Bank. (2017). Quarterly Economic Review – March 2017. Online. Available: https://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/7718/02Quarterly%20Economic%20Review%20%E2%80%93%20March%202017.pdf. [Accessed: 29-07-2017].

Torres-Reyna, O. (2007). Panel data analysis: Fixed effects and random effects using Stata (v.4.2). Princeton University. Online. Available: https://www.google.co.za/url?sa=t&source=web&rct=j&url=https://www.princeton.edu/~otorres/Panel101.pdf&ved=2ahUKEwjGkKrZhZDaAhVBa8AKHfEQAc4QFjAAegQICRAB&usg=AOvVaw2urGdw2dB635zqtH5x5P0R. [Accessed: 27-01-2018].

Ting, L. and Kollamparambil, U. (2015). Nature and Determinants of household retirement savings behaviour in South Africa. *Development Southern Africa*. 32 (6), p. 675-695.

Woolard, I. 2002. A comparison of wage levels and wage inequality in the public and private sectors 1995 and 2000. University of Cape Town. Development Research Unit.

Zwane, T., Greyling, L. and Maleka, M. (2016). The Determinants of Household Savings in South Africa: A panel data approach. *International Business and Economics Research Journal*, 15 (4), p. 209 - 218.