

**A comparative analysis of rural and urban household savings behaviour in South  
Africa**

By

**Rememberance Hopeful Chimeri**

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**Supervisor: Dr. P. Chaminuka**

**Co-Supervisor: Mrs C.L. Muchopa**

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## **DECLARATION**

I declare that the mini-dissertation hereby submitted by me to the University of Limpopo for the degree of Master of Science in Agriculture (Agricultural Economics) is my own independent work and has not previously been submitted by me to any other university. It is my own work in design and execution, and that all material contained herein has been duly acknowledged.

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**Chimeri, R.H. (Mr.)**

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**Date**

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No words can explain how grateful I am to my loving parents Henry and Dailes, for their encouragement, persistent help and for taking care of all my financial necessities during my study. Their moral support and monetary help carried me till the completion of the project report. I will forever be indebted to them.

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Above all, I thank God our heavenly father for the wisdom, resources, and vitality in writing the report. My appreciation extends to all my family and friends who contributed to the success of this research project.

## **DEDICATION**

I dedicate this work to my loving parents, Henry and Dailes.

## **ABSTRACT**

Saving is important in the economy as it has linkages with growth, development and sustainability. The poor average saving rate in the rural economy has restricted the capacity of rural development in South Africa. The study focuses on comparing rural and urban household savings behaviour in South Africa, using household data from the Income and Expenditure Survey (IES) for the period 2010/2011. The dynamic linear saving functions originating from the Absolute Income and Permanent Income Hypotheses were estimated separately for the different household types using the Ordinary Least Squares (OLS) method. Panel data analysis was carried out by pooling together the cross-sectional household types over the twelve-month period. The study established that urban households earn higher incomes and have more average savings than rural households in South Africa. A positive significant relationship was found to exist between current saving decisions and income across all household types in South Africa. Another interesting finding was that rural households have more marginal saving rates than urban households in the short-term and in the long-run. The Fixed Effects Model was deemed to be the best estimator in estimating saving functions across all household types in South Africa, as validated by the Hausman and Redundant Fixed Effects tests. Given that rural households have a potential to save, the study recommends increased awareness and education of rural households on the benefits of accessing basic financial services. Policy-wise, the study recommends the government to increase support in agriculture and extend the provision of food and health subsidies to rural households in South Africa.

## **CONTENTS PAGE**

Declaration	i
Acknowledgements	ii
Dedication	iii
Abstract	iv
List of tables	viii
List of figures	ix
List of acronyms	x
<b>CHAPTER 1: INTRODUCTION</b>	<b>1</b>
1.1 Background	1
1.2 Problem statement	2
1.3 Motivation of the study	3
1.4 Purpose of the study	3
1.4.1 Aim	3
1.4.2 Objectives of the study	4
1.5 Hypotheses	4
1.6 Research questions	4
1.7 Structure of the study	4
<b>CHAPTER 2: LITERATURE REVIEW</b>	<b>6</b>
2.1 Introduction	6
2.2 Theoretical framework	6
2.2.1 Absolute income hypothesis	6
2.2.2 Permanent income hypothesis	8
2.2.3 Life cycle hypothesis	10
2.3 Review of relevant studies on household savings	10
2.4 Non-income determinants of household savings	13

2.5 Role of saving in rural development	14
2.6 Conclusion	15
<b>CHAPTER 3: OVERVIEW OF SAVINGS SECTOR IN SOUTH AFRICA</b>	<b>16</b>
3.1 Introduction	16
3.2 General description of the savings sector in South Africa	16
3.2.1 Saving by government	16
3.2.2 Saving by corporate sector	16
3.2.3 Personal saving	17
3.3 Saving trends	19
3.4 Distinction between rural and urban household sectors	20
3.5 Conclusion	22
<b>CHAPTER 4: RESEARCH METHODOLOGY</b>	<b>23</b>
4.1 General description of the study area	23
4.2 Data collection	23
4.3 Analytical technique	24
4.3.1 Conceptual framework for analyzing rural and urban household savings	25
4.3.2 The savings function	26
4.3.3 Savings variable (dependent variable)	27
4.3.3.1 Panel data regression models	28
4.3.3.1.1 Constant coefficients model	28
4.3.3.1.2 Fixed effects least-squares dummy variable model	29
4.3.3.1.3 Fixed effects within-group estimator	29
4.3.3.1.4 Random effects model	30
4.3.3.2 Redundant fixed effects test	32
4.3.3.3 Hausman test	33
4.4 Limitations	34
4.5 Conclusions	34
<b>CHAPTER 5: RESULTS AND DISCUSSIONS</b>	<b>36</b>

5.1 Introduction	36
5.2 Descriptive statistics	36
5.2.1 Household expenditures	36
5.2.2 Household incomes	40
5.2.3 Household saving	44
5.3 The effect of current income and past saving on current saving	47
5.4 Dynamic panel regression results	50
5.4.1 Constant coefficients model	50
5.4.2 Fixed effects within-group estimator	51
5.4.3 Fixed effects least-squares-dummy variable model	54
5.4.4 Random effects model	56
5.5 Panel regression tests	59
5.5.1 Redundant fixed effects test results	59
5.5.2 Hausman test results	59
5.6 Conclusion	60
<b>CHAPTER 6: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS</b>	<b>62</b>
6.1 Summary	62
6.2 Conclusions	63
6.3 Recommendations	64
6.4 Areas of further study	65
<b>REFERENCES</b>	<b>66</b>



## LIST OF TABLES

Table	Title	Page
2.1	Non-income determinants of household savings	14
3.1	Gross national, general government and household savings at current Prices from 1990-2013	18
3.2	Classification of household types in accordance to settlement type	21
4.1	Properties of estimated (models) used in the study	32
5.1	Main expenditure groups and respective percentage contribution as per household type	39
5.2	Mean incomes as per household type	43
5.3	Average propensities to save as per household type	44
5.4	Multiple regression results as per household type	47
5.5	Long-run marginal propensities to save	49
5.6	Constant coefficients model results	51
5.7	Fixed effect within group estimator results	52
5.8	Fixed effect least-squares dummy variable results	56
5.9	Random effects model results	57
5.10	Redundant fixed effects test results	59
5.11	Hausman test results	60

## LIST OF FIGURES

Figure	Title	Page
2.1	The poverty cycle	15
3.1	Gross domestic and household saving rates	19
4.1	Conceptual framework for analyzing rural and urban household savings	25
5.1	Main expenditure groups and respective percentage contributions during the period September 2010 to August 2011	36
5.2	Average saving patterns	46

## **LIST OF ACRONYMS**

AIH	Absolute Income Hypothesis
APS	Average Propensity to Save
BENKSETA	Banking Sector Education and Training Authority
CAADP	Comprehensive Africa Agriculture Development Programme
DAFF	Department of Agriculture, Forestry and Fisheries
DFID	Department for International Development
ECM	Error Components Model
FEM	Fixed Effects Model
GDP	Gross Domestic Product
IES	Income Expenditure Survey
IFAD	International Fund for Agricultural Development
KCF	Keynesian Consumption Function
LCH	Life Cycle Hypothesis
LSDV	Least- Squares Dummy Variable
MPS	Marginal Propensity to Save
NEPAD	New Partnership for Africa's Development
OLS	Ordinary Least Squares
PIH	Permanent Income Hypothesis
REM	Random Effects Method
SARB	South African Reserve Bank
Stats SA	Statistics South Africa
WG	Within-Group

## **CHAPTER1: INTRODUCTION**

### **1.1 Background**

The role of savings in any economy is of extreme importance as it has linkages with growth, development and sustainability. Saving can be defined as the residual of current income that is not transferred as part of household current expenditure after the payment of direct taxes (Cronjé and Roux, 2010). Saving involves intertemporal reallocation of resources by individuals and households to smooth consumption expenditures over time (Gaisina, 2013). At household level, savings can directly be invested in wealth and other assets, and indirectly, indicate repayment ability of households, increase credit rating, serve as collateral in the credit market and can be used as a protection tool to mitigate against risk and adversity of income (Brata, 1999; Mkpado and Arene, 2010; Obayelu, 2012)

Approximately 58 percent of adults in South Africa do not save and about 5.7 million people in South Africa are excluded from financial services (FinScope, 2013). Of these, 1.9 million people are in urban formal areas, 700,000 are in urban informal areas, 400,000 in rural formal areas and 2.6 million in tribal areas (FinScope, 2013). A majority of the low income households are located in rural areas and rely on subsistence farming but however, suffer from inadequate support, exclusion in macro, trade and industrial policies (Ashley and Maxwell, 2001). Challenges faced by low income and rural households due to regulations in the formal economy makes it complicated for these households to access formal financial services (Skowronski, 2010). For rural households to overcome poverty there is need for them to be able to borrow, save and invest, and to protect their families against adversity (Bage). This gave rise to the development of the microcredit sector that aimed at developing an accessible credit market focused on the needs of historically deprived, poor and low density communities to reduce poverty (Kirsten, 2006b).

The less formal (informal) financial institutions came in as a wedge to form linkages between formalized financial institutions and delivery of microfinance to the poor (Pagura and Kirsten, 2006). Informal financial institutions are more flexible and can

outreach more rural clients better than formal financial institutions as they are more informed about rural markets (Kirsten, 2006a). Microfinance institutions in South Africa have to some extent achieved in advancing small loans and extending credit but have however failed to mobilize savings. There is need to widen the participation of rural financial markets by proposing diverse financing services with an emphasis on savings mobilization (DAFF, 2009). Savings mobilization is a key development activity as it allows for the expansion of the financial institutions in rural areas (DAFF, 2009).

## **1.2 Problem statement**

The national saving rate in South Africa has deteriorated since 1984, reaching approximately 13.2 per cent of GDP in the second quarter of 2014 (Simleit et al., 2011; SARB, 2014). According to the World Bank (2011) declining savings rate in South Africa are of material concern. Prinsloo (2000) postulates that a country would require an aggregate saving of approximately 20 per cent of GDP or more in order to sustain at least 3 per cent growth rate in real GDP.

According to Odhiambo (2009a) increasing economic growth escalates the rate of financial sector development and reduces poverty in South Africa. Financial sector development allows for increased efficiency and competitiveness of less formal financial institutions in serving potential rural clients (DFID, 2004). The increased access of financial services to rural areas (through financial sector development) allows rural communities to draw down accumulated savings and/or borrow funds to finance more income generating projects, creation of employment opportunities, resulting in more incomes and hence reduces poverty (DFID, 2004; Odhiambo, 2009a; Odhiambo, 2009b).

However, on one hand, rural households in South Africa have found it relatively difficult to save and invest in formal financial institutions in comparison to urban households due to stringent requirements and increased costs associated with lack of proximity to banks (Robinson, 2001; Demirguc-Kunt and Klapper, 2012). On the other hand, although more informed about rural communities, less formal financial institutions lack infrastructure and resources to serve poor clients beyond minor geographical areas (Pagura and

Kirsten, 2006; Kirsten, 2006a). This necessitates extension of financial services to the poor through financial sector development (DFID, 2004) . Traditionally, rural households preferred saving through purchasing livestock, land and lending money to companions. Contrary to rural households, urban households would prefer saving in demand deposits and invest in purchasing stocks and other financial assets. However, rural households are gradually participating in formalized financial intermediation through micro-financing (BANKSETA, 2013). An acknowledgement of the possible existence of different saving types and patterns between rural and urban households is therefore vital.

Most empirical work in South Africa has been done on assessing the national and household saving rates (Prinsloo, 2000; Odhiambo, 2007; Cronje, 2011; Simleit *et al.*, 2011; Chauke, 2012). However, limited work has been accomplished on the distinction of household savings patterns with regard to household types in South Africa. Exploring the ability of rural households to save is the core of the study, and thereafter, a comparison is made with urban household savings in South Africa.

### **1.3 Motivation of the study**

The study was motivated by two aspects, the declining trend in household savings and exploring the ability of rural households to save. Knowledge of the ability of rural households to save is expected to aid policy makers in formulating a well-designed and sustainable framework targeted at promoting savings and reducing poverty in South Africa (DAFF, 2009; Skowronski, 2010). Within the context of agricultural and rural development, it is important to foster growth in rural markets and this can be achieved by saving mobilization strategies. Despite promoting growth, increased savings are expected improve the food security position of rural households.

### **1.4 Purpose of the study**

#### **1.4.1 Aim**

The aim of the study was to analyze and compare rural and urban household savings in South Africa.

### **1.4.2 Objectives of the study**

The objectives of the study were to:

- i. Analyze and compare income and expenditure patterns of urban and rural households in South Africa.
- ii. Estimate savings and assess patterns of savings behaviour across urban and rural households in South Africa.
- iii. Determine the effect of income on rural and urban households' savings.

### **1.5 Hypotheses**

- Rural and urban households in South Africa have similar income and expenditure patterns.
- Rural households are less capable of saving than urban households in South Africa.
- Income does not have any effect on rural households' ability to save.

### **1.6 Research questions**

- i. Do rural and urban households in South Africa have the same income and expenditure patterns?
- ii. To what extent does rural household saving deviate from urban household saving in South Africa?
- iii. What is the effect of income on rural and urban household saving levels in South Africa?

### **1.7 Structure of the study**

Chapter two provides a review of the literature on household saving, starting with the theoretical framework followed by a review of relevant studies, an outline of the determinants of household saving and the role of savings in rural development. Chapter three gives an overview of the savings sector in South Africa. The research methodology followed in the study is outlined in chapter four. The research results and

analysis of findings within the context of the literature explored in Chapter two are presented in Chapter five. Chapter six provides a summary of the study, concludes the research report, gives policy recommendations and suggests further avenues of research.



## CHAPTER 2: LITERATURE REVIEW

### 2.1 Introduction

The literature reviewed in this section gives an understanding of how household savings decisions are made. Different approaches of explaining savings behaviour are acknowledged with an attempt to build a conceptual framework and model for analyzing households' saving.

### 2.2 Theoretical framework

#### 2.2.1 Absolute income hypothesis

According to Alimi (2013) efforts made by Ramsey (1928) and Fisher (1930) contributed to the Absolute Income Hypothesis (AIH) which was later proposed and popularized by Keynes (1936). The AIH states that consumption expenditures made by households are determined by the level of income and if income rises, consumption will also increase but not necessarily proportional to the increase in income (Wojcik and Rosiak-Lada, 2007; Tsenkwo, 2011; Alimi, 2013). Mathematically, the AIH is stated as:

$$C_t = \alpha + \beta Y_t + \varepsilon_t, \quad 0 < \beta < 1; \quad \alpha > 0 \quad (2.1)$$

where:

$C_t$  = consumption of the household measured in real terms at time t,

$\alpha$  = autonomous consumption,

$\beta$  = is the proportion of current income that is transferred to consumption expenditure,

$Y_t$  = income of the household measured in real terms at time t,

$\varepsilon_t$  = is the error term.

Equation (2.1) is also known as the Keynesian Consumption Function (KCF) which states that consumption expenditures made by households will depend mainly on the level of income and this relationship is given by the marginal propensity to consume ( $\beta = \frac{\partial C}{\partial Y}$ ). However, regardless of current income, a household would need to

make certain subsistence expenditures simply to survive (Chamberlin and Yueh, 2006). This can be achieved through credit or consumption out of other forms of wealth such as cattle and crop produce. The consumption undertaken independent of the level of income is referred to as autonomous consumption( $= \alpha$ ).

Given that all income is either consumed or saved by the household, it follows that saving is the difference between income and consumption (Chamberlin and Yueh, 2006; Strydom, 2007). The savings function will be derived from equation (2.1):

$$\begin{aligned}
 S_t &= Y_t - C_t \\
 &= Y_t - (\alpha + \beta Y_t) \\
 &= Y_t - \alpha - \beta Y_t \\
 &= -\alpha + (1 - \beta)Y_t \\
 &= -\alpha + \gamma Y_t + \mu_t, \quad \gamma = (1 - \beta); \quad 0 < \gamma < 1 \quad (2.2)
 \end{aligned}$$

where:

$S_t$  = saving by the household measured in real terms at time t,

$-\alpha$  =amount of negative saving at zero income,

$\gamma$  = is the proportion of current income that is transferred to saving,

$Y_t$  = income of the household measured in real terms at time t,

$\mu_t$ = is the error term.

The proportion an individual or household is willing to save (forgo current consumption) out of current income is given by the marginal propensity to save ( $\gamma = \frac{\partial S}{\partial Y}$ ) in equation (2.2). When the household earns zero income, it is assumed that the household will consume out of their stock of wealth or by borrowing (dissaving), the value of negative savings equal to( $-\alpha$ ).

### 2.2.2 Permanent income hypothesis

The Permanent Income hypothesis was contended by Friedman (1957), twenty years later after the AIH (Aron and Muellbauer, 2000; Chamberlin and Yueh, 2006; Wojcik and Rosiak-Lada, 2007). In its simplest form, the PIH states that despite current income influencing households' consumption decisions (and eventually saving), households would also take into consideration their longer-term view of income expectations (Friedman, 1957; Lung, 2002). Friedman argued that it would be more practical for households to use current income, but also form expectations of future income and relative amount of risk (Friedman, 1957; Wojcik and Rosiak-Lada, 2007). Moreover, it is more sensible for households to make predictions about future income based on current income (Chamberlin and Yueh, 2006).

According to Friedman (1957) measured income contains a permanent component (anticipated and planned, so that permanent income comprises past income and expected future income) and a transitory portion (unexpected additional income earned, perceived as an unexpected windfall). As a result, consumption will also be divided into two elements; one dependent on permanent income and the other on transitory income (Fernandez-Corugedo, 2004). Friedman concluded that a household would base their consumption decisions on permanent income, so that the marginal propensity to consume out of permanent income will be greater than the marginal propensity to consume out of measured income (Chamberlin and Yueh, 2006). Other conclusions made by Friedman (1957) as cited in Wojcik and Rosiak-Lada (2007) are that low income earners have a higher propensity to consume (low propensity to save), whereas higher income earners have a higher transitory element to their income and a lower than average propensity to consume (higher propensity to save). Mathematically, the PIH in its simplest form is stated as:

$$C_t = \beta_1 C_{t-1} + \beta_2 Y_t + \varepsilon_t \quad (2.3)$$

where:

$C_t$  = current consumption of the household measured in real terms,

$C_{t-1}$  = consumption made by the household in the previous period based on past income, measured in real terms,

$Y_t$  = current income of the household in real terms,

$\beta_1$  = marginal propensity to consume based on previous consumption expenditure,

$\beta_2$  = is the short-run marginal propensity to consume.

Since households can as well either save out of past and current income, it follows that the savings function is stated as:

$$S_t = \gamma_1 S_{t-1} + \gamma_2 Y_t + \mu_t \quad (2.4)$$

where:

$S_t$  = current saving made by the household measured in real terms,

$S_{t-1}$  = saving made by the household in the previous period based on past income, measured in real terms,

$Y_t$  = current income of the household in real terms,

$\gamma_1$  = marginal propensity to save based on past saving,

$\gamma_2$  = is the short-run marginal propensity to save.

In order to obtain the long-run marginal propensity to save (marginal propensity out of permanent income), the long-run saving function given by equation (2.4) is solved by letting  $S^* = S_t = S_{t-1}$  (Choudhury, 1968; Wojcik and Rosiak-Lada, 2007) since in the long-term saving is assumed to be equal to zero ( $S_t - S_{t-1} = 0$ ).

$$S_t = \gamma_1 S_{t-1} + \gamma_2 Y_t \quad (2.4)$$

will be re-written as;

$$S^* = \gamma_1 S^* + \gamma_2 Y_t$$

$$S^* - \gamma_1 S^* = \gamma_2 Y_t$$

$$S^*(1 - \gamma_1) = \gamma_2 Y_t$$

$$\frac{S^*}{Y_t} = \frac{\gamma_2}{1 - \gamma_1} \quad (2.5)$$

The relationship between savings and income ( $\frac{S^*}{Y_t}$ ) in the long-term is given by equation (2.5). It follows that the long-run marginal propensity to save is given by the value  $\frac{\gamma_2}{1 - \gamma_1}$ .

### 2.2.3 Life-cycle hypothesis

The life-cycle theory by Modigliani and Ando (1957) hypothesizes that individuals and households would consume a constant percentage of their present value of their income, dictated by income, preferences and tastes (Wojcik and Rosiak-Lada, 2007; Romer, 2011). According to the LCH, the average propensity to save is very low in households dominated by young and old aged people, who will either borrow against future income or run down accumulated savings (Modigliani and Brumberg, 1954; Modigliani and Ando, 1957; Ando and Modigliani, 1963).

### 2.3 Review of relevant studies on households savings

Several studies especially in developing countries have not only analyzed the determinants of household savings, but have also made an attempt to distinguish patterns of savings behaviour across income levels, household locations, various sources of income and at regional level. Most of these studies found income to be the main and significant factor in determining savings behaviour. Some of these studies are discussed next.

Choudhury (1968) determined the savings potential of urban and rural households in India by estimating long-run and short-term marginal propensities to consume and save. Four different possible savings functions were used in shaping savings behaviour of the households at aggregate and at per capita level. A conclusion drawn was that rural households in India had a very low saving rate, with an income elasticity of less than unity. On the other hand, urban households had a very high income elasticity of

savings. Another inference made was that rural households' decisions to save were however influenced more by permanent income, contrary to urban households' saving and consumption decisions that were influenced greatly by transitory income and other household factors (household assets and prices).

Bautista and Lamberte (1990) estimated linear saving functions for households that were differentiated between rural and urban households, by region and by income group in a bid to test the Permanent Income Hypothesis (PIH) in the Philippines. Three basic conclusions were drawn; first, income was deemed the most important determinant of household saving in the Philippines: secondly, the marginal propensity to save for all households averaged across all regions and income groups was not statistically different and: thirdly, rural households had higher average and marginal saving rates than urban households at the same income level.

Kibet et al. (2009) adopted a microeconomic approach in investigating determinants of savings among rural households of Nakuru District in Kenya. The sample composed 359 teachers, entrepreneurs and farmers. The Ordinary Least Squares (OLS) procedure was applied to estimate results by carrying out multiple regression analysis. The findings were that non-income determinants such as type of occupation, level of education, dependency ratio, age and gender of household head were important factors in determining rural household saving behaviour. Further, the results obtained indicated that income was not only an important factor of household saving, but was to be significant across all cross-sectional types (i.e. teachers, entrepreneurs and farmers).

In analyzing microeconomic factors affecting household saving in Morocco, Arestoff et al. (2009) estimated household saving functions in order to verify households' saving decisions in relation to income, wealth (monetary and in non-monetary form) and socio-economic variables in urban and rural households. The Ordinary Least Squares (OLS) procedure was applied based on the sample size of 352 households. The study concluded that current income strongly affected saving levels regardless of the household geographical location.

Ajayi (2011) adopted three non-linear saving functions attributed to Keynes (1936), Klein (1951) and Landau (1971) in modeling savings behavior for rural and urban households in Nigeria using the Ordinary Least Square (OLS) technique. The study deduced that average incomes and savings for urban households were relatively higher than those of rural households in Nigeria. However, the propensity to save for rural households was found to be greater than urban households' propensity to save. The findings suggest that rural households are more willing to save as compared to urban households due to relatively low earnings of rural household heads.

ur Rehman et al. (2011) examined rural-urban saving differentials in the Multan district of Pakistan. The study employed multivariate regression analysis based on cross-sectional data with 113 respondents from urban areas and 180 from rural areas. The findings made were that on average, mean savings for urban households were greater than those of rural households. However, although unexpected, the marginal propensity to save for rural households (0.68) was found to be higher than that of the urban counterparts (0.55). This was attributable to the view that average rural households in Multan district earned lower incomes in comparison to their urban counterparts.

Nayak (2013) analyzed the determinants and patterns of savings behaviour of rural households in Western Odisha. The study was based on a sample of 300 households drawn from rural villages of Sundergarh district of Western Odisha. The study concluded that the average and marginal propensities to save varied with distribution of income and occupation (agricultural and non-agricultural laborers) and that the lowest income groups had the lowest average and marginal propensities to save.

A study done in Ethiopia using the Tobit model in a bid to investigate the causes of low rural household saving levels by Teshome et al. (2013) concluded that rural households were saving irrespective of their low incomes, but preferred saving through informal saving institutions. The study was based on rural households situated in East Hararghe Zone, Oromia and it was found that approximately 79.2 percent of the 700 sample households had savings during the survey time.

A micro-econometric analysis of rural household saving determinants in Kazakhstan was done by Gaisina (2013), which was based on the Absolute Income Hypothesis (AIH) using the Bivariate Probit Model. The cross-sectional data used in the study was collected from 704 respondents from the thirty-eight villages of the eight districts in Pavlodar region. Important inferences made were that savings in monetary form were positively and significantly related to income. Although in-kind savings (savings in non-monetary form such as livestock) were insignificantly influenced by income, however, the relationship stood to be positive. Furthermore, possessing an asset such as a house and car was found to have a positive and significant influence on the saving decision of rural households in Kazakhstan.

#### **2.4 Non-income determinants of household savings**

The traditional and conventional theories of consumption and saving (Keynes, 1936; Modigliani and Ando, 1957; Friedman, 1957) concur on income as a major determinant of savings behavior among rural and urban households. However, there are several other socio-economic elements (non-income determinants) elements that influence planned savings per household.

Studies on household savings behaviour in South Africa (Prinsloo, 2000; Aron and Muellbauer, 2000; Odhiambo, 2007; Strydom, 2007; Cronjé and Roux, 2010; Cronje, 2011; Simleit et al., 2011) indicate that determinants of household savings are a combination of immediate circumstances faced by households and external influences resulting from national or regional policies. Despite determining the factors of saving, limited work has been done on comparing saving patterns between rural and urban households in South Africa. Determinants of household saving can be categorized as either micro or macro-economic factors, which are outlined in Table 2.1.



Table 2.1: Determinants of household savings

Micro-economic factors	Macro-economic factors
<ul style="list-style-type: none"> <li>• After tax income of the household</li> <li>• Age and gender of the household head</li> <li>• Education level of the household head</li> <li>• Household location</li> <li>• Household size</li> <li>• Assets owned by the household</li> <li>• Culture of the household to save or not.</li> </ul>	<ul style="list-style-type: none"> <li>• Growth in per capita income</li> <li>• Government expenditure</li> <li>• Real interest rates</li> <li>• Terms of trade</li> <li>• Inflationary expectations</li> <li>• Foreign savings</li> </ul>

Source: Author's design

## 2.5 Role of savings in rural development

The role of saving in rural development and poverty reduction emanates from the linkages with growth of the real economy and financial sector development (Odhiambo, 2009a). The level of saving sets the frontier to which growth and investment can be improved in an economy over a period of time (Kazmi, 2004; Odhiambo, 2007).

According to Mago and Hofisi (2012) growth in real per capita income in an economy should also increase average incomes of rural people, thereby improving their food security status. Based on the AIH and PIH, increased incomes of rural people would be expected to increase savings of rural communities. An increase in rural savings enhances capital accumulation and improves the productivity of rural people. Improved productivity is a necessary condition for rural people to break out the poverty cycle (Mago and Hofisi, 2012; Ndari and Mukura, 2012). The poverty cycle is illustrated in Figure 2.1. Rural people are poor mainly due to inadequate access to capital and this limits growth in income and savings (Mago and Hofisi, 2012; Ndari and Mukura, 2012).

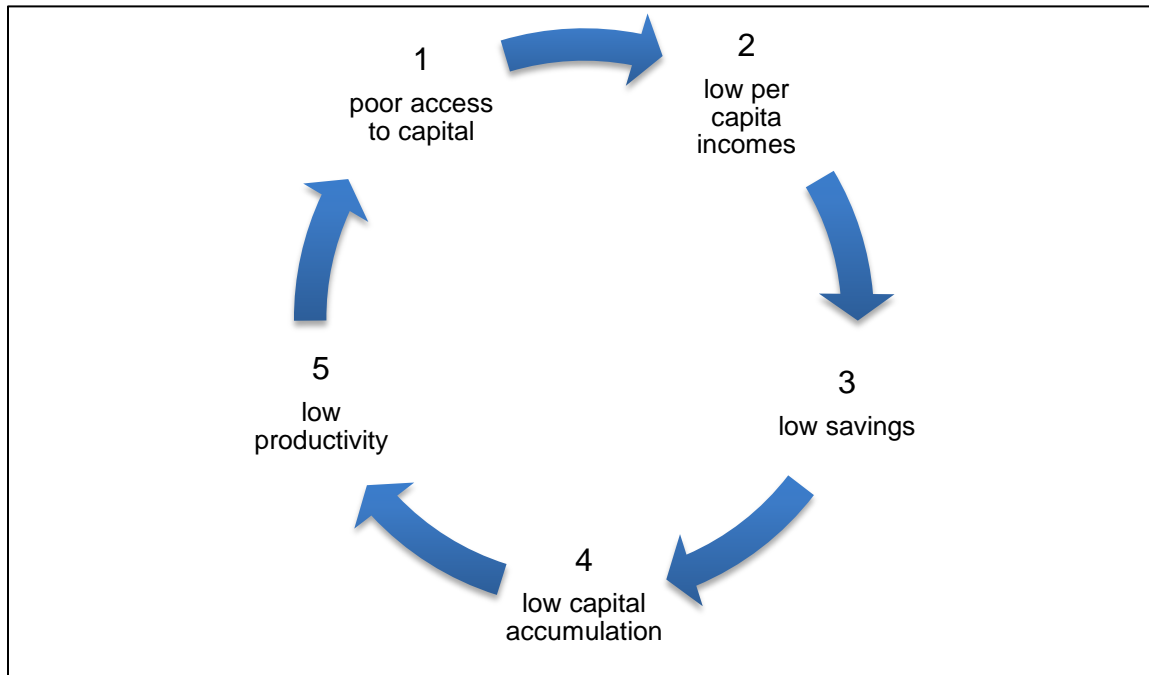


Figure 2.1: The poverty cycle

Source: Mago and Hofisi (2012)

## 2.6 Conclusion

This chapter reviewed literature on household savings by first recognizing the major theories on consumption and saving. A discussion of relevant studies was made thereafter followed by an outline of the determinants of household saving in South Africa. The role of savings in rural development was also briefly discussed. Based on the literature reviewed, it is inconclusive as to which household sector (type) has more average and marginal saving rates than the other.

## **CHAPTER 3: OVERVIEW OF SAVINGS SECTOR IN SOUTH AFRICA**

### **3.1 Introduction**

This chapter provides a framework of the domestic savings sector in South Africa. A brief description of the savings sector was made, followed by a representation of saving patterns that have trended over the past few years.

### **3.2 General description of the savings sector in South Africa**

The savings sector has earned great interest and has been an issue under significant debate especially in developing countries (Odhiambo, 2007). The Comprehensive Africa Agriculture Development Programme (CAADP) recommended that developing countries including South Africa should progressively increase domestic support to agricultural investment from a base estimated at 35 percent to around 55 percent by 2015 (NEPAD, 2002). The greater part of the required funding was to be obtained from domestic resource mobilization. According to Prinsloo (2000), the domestic savings sector in South Africa is divided into three subsectors; namely personal savings, corporate saving and saving by the government.

#### **3.2.1 Saving by government**

Income of the general government is a summation of retained profits of public enterprises, retained taxes and other current receipts not expended on current outlays (Prinsloo, 2000). The expenditure items of the general government include current government expenditure for goods and services, outlays for wages and salaries of government employees, interest payments on public debt, discounts on issuing government stock, subsidies, expenditure on non-capital products and other transfers to the household sector and the rest of the word (Prinsloo, 2000). The difference between retained income and expenditure outlays yields government saving.

#### **3.2.2 Saving by corporate sector**

Gross saving by the corporate sector is estimated as sum of gross operating surpluses of companies, less payable dividends, interests, taxable income and other transfer

payments made to the general government, the household sector and the rest of the world (Prinsloo, 2000). The difference between gross savings and the provision for consumption of fixed capital and inventory valuation adjustment yields net corporate savings.

### **3.2.3 Personal saving**

Strydom (2007) defined savings by the household sector as the residual part of current income that is not spent after payment of direct taxes on income and wealth. According to Prinsloo (2000), saving by the household sector includes total retained income of unincorporated businesses and non-profit institutions serving households. Personal saving also comprises consistent and repetitive employee contributions to pension and insurance funds and other disbursements out of current income that would reduce household liabilities, such a payment of mortgages (Prinsloo, 2000; Strydom, 2007). Savings by the household sector contribute a greater part of total national savings in both industrialized and developing countries (Schmidt-Hebbel et al., 1992; Ajayi, 2011; Oladipo and Akinbobola, 2011).

Table 3.1 shows the amount of saving at current prices made by the general government and household sector from 1990 to 2013. Exhibiting a declining trend, saving by households became negative (dissaving) during the period 2005-2006 and has been negative till 2013, with the exception of the year 2012 when the amount was temporarily positive. Negative saving implies the sector was consuming (spending) more than what they earn which was mostly experienced by the general government. The gross saving is the total saving by households, the general government and the corporate sector. Although not shown in Table 3.1, corporate saving is estimated by taking the difference between gross national saving and the total of saving by the government and household sector.

Table 3.1: Gross national, general government and household savings at current prices from 1990-2013

Year	Gross saving (R millions)	Government saving (R millions)	Net household saving (R millions)
1990	54,864	-6,774	4,281
1991	60,742	-10,162	4,770
1992	61,207	-27,249	14,173
1993	68,794	-28,593	11,455
1994	81,118	-28,330	8,281
1995	90,462	-23,112	5,761
1996	98,831	-31,330	7,443
1997	104,101	-31,352	8,780
1998	113,126	-22,827	6,801
1999	127,794	-17,481	6,475
2000	143,560	-20,585	6,097
2001	156,332	-8,386	2,532
2002	195,556	-13,049	5,380
2003	199,307	-22,907	4,960
2004	212,860	-25,770	3,351
2005	227,635	-5,816	1,142
2006	254,196	14,155	-9,229
2007	287,680	43,999	-14,855
2008	350,469	40,170	-16,903
2009	373,236	-68,252	-10,478
2010	456,932	-98,206	-9,510
2011	491,856	-89,584	-4,398
2012	444,546	-128,848	135
2013	458,340	-136,574	-635

Source: Quantec

### 3.3 Saving trends

In contrast to many developing countries like China and India, South Africa has a culture of debt rather than one of saving, with the national savings rate manifesting a declining trend for the past two decades (Cronjé and Roux, 2010; Cronje, 2011). The South African government set a target of a national saving rate of 23 percent of the national income so as to sustain at least 4 percent in growth (Cronjé and Roux, 2010). South Africa's national saving rate has worsened reaching 14.2 percent and 13.5 percent of GDP in 2012 and 2013 respectively (Quantec).

The average domestic saving rate during the period 1980-1989 was about 24.1 percent, which dropped to roughly 16.51 percent in the decade 1990-1999. The average rate fell again by approximately 1.2 percent in the subsequent 14 years (2000-2013) to an estimated 15.3 percent, with the minimum rate at 13.5 percent in 2013 and a peak of 17.1 per cent in 2010.

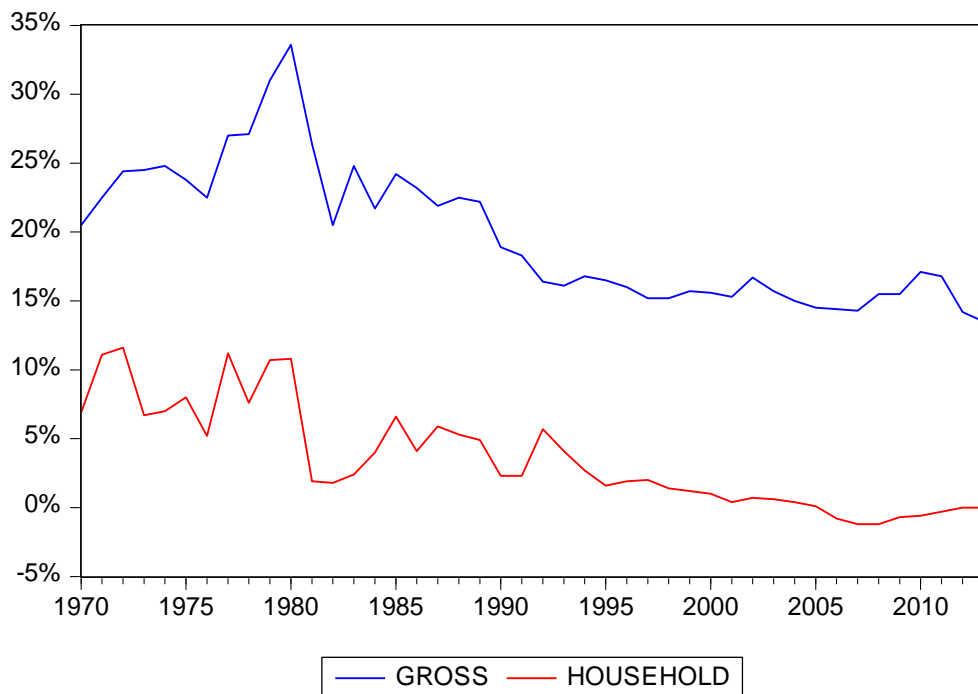


Figure 3.1: Gross domestic and household saving rates

Source: Quantec

With reference to the household sector, savings as a ratio of national income have been less than 1 percent since 2001 as shown in Figure 3.1. The vertical distance between gross and household saving in Figure 3.1 is the portion of saving by the general government and corporate sector (not adjusted for fixed capital formation and inventory valuation).

According to Cronjé and Roux (2010) , the black middle class in South Africa has considerably been empowered for the past decade and has been viewed as the rising source of consumer spending. However, the same cannot be said among the poor population of the nation who are more vulnerable to fluctuations in economic activity and have not been absorbed by the industrial sector. Poor households are unlikely to save much as they already find it hard to earn income that sustains minimum consumption requirements. Regardless, less emphasis has been put on gearing a savings culture among rural and urban households (Cronjé and Roux, 2010; Cronje, 2011; Chauke, 2012).

### **3.4 Distinction between rural and urban household sectors.**

Households can be classified as either rural or urban depending on the occupation and source of income (agricultural or non-agricultural income) or by geographical location. The study adopted and followed the classifications given by Statistics South Africa (Stats SA, 2009) outlined in Table 2.2, which are based on geographical location of households. Households are classified broadly as either rural or urban. Additionally, within the rural sector, households can be categorized as either rural formal or traditional area settlements. Similarly with urban households, division is made between households situated in well-structured residential areas and those households located in the periphery of cities.

Table 3.2: Classification of household types in accordance to settlement type

Settlement type	Characteristics
Urban formal	<ul style="list-style-type: none"> <li>• Urban formal settlements are regarded structured and organized.</li> <li>• The land in which these households are situated has been proclaimed as residential.</li> <li>• Development in these areas is controlled by local or district councils with very good infrastructure.</li> <li>• Households are also exposed to high economic activity.</li> </ul>
Urban informal	<ul style="list-style-type: none"> <li>• Well known as squatter camps or spontaneous settlements.</li> <li>• Located in the outskirts of cities.</li> <li>• Household settlements in these areas are typically disorganized and crowded.</li> <li>• Housing material is of poor quality such as zinc, plastics mud, wood, etc.</li> </ul>
Rural Formal	<ul style="list-style-type: none"> <li>• Households located in farms with low population densities, low levels of economic activity and low levels of infrastructure.</li> <li>• Most households in this settlement type are engaged in commercial farming</li> </ul>
Traditional area	<ul style="list-style-type: none"> <li>• Households located in communally owned land under the jurisdiction of a traditional or tribal leader.</li> <li>• Subsistence farming is common in this settlement type</li> </ul>

Source: Stats SA, 2009



### **3.5 Conclusion**

This chapter was based on the overview of the savings sector in South Africa. The main contributors in the domestic saving sector were identified followed by a depiction of the declining trend of savings in South Africa. The last section of the chapter distinguished household types (sectors) in South Africa based on their geographical locations.

## **CHAPTER 4: RESEARCH METHODOLOGY**

This chapter covers the research method adopted to answer research questions raised. It provides details of the study area, data sources, structure of the data and approach to data analysis.

### **4.1 General description of the study area**

The population of relevance in this study is the rural and urban households located in South Africa. South Africa, measuring 1,600 kilometres from north to south and approximately the same distance from east to west is roughly an eighth of the size of United States, almost twice the size of France more than three times the size of Germany (South Africa.info). Neighbouring Namibia, Botswana and Zimbabwe to the North, and Mozambique and Swaziland to the east; South Africa is located far south of the African continent (South Africa.info). South Africa is regarded as a medium-sized developing country occupying 1.2 million square kilometres and is divided into nine provinces (South Africa.info). The study deliberately selected the target population due to the declining domestic savings rate, in which personal savings (rural and urban household savings) constitute a greater proportion.

### **4.2 Data collection**

The data on income and expenditure was obtained from the Income and Expenditure Survey (IES) conducted by Statistics South Africa during the period September 2010 to August 2011, the latest period for which such data are available. This twelve-month data report presents information collected from 25,328 households across the country showing mean incomes, mean expenditure outlays, socio-economic, demographics characteristics and living standards of individuals and households.

The rationale for using this data is based on the fact that there is no other source of micro-data for examining household saving behaviour at national level. Moreover, other international studies have used similar data sources: Family Income and Expenditure Survey in the Philippines (Bautista and Lamberte, 1990); Consumer and Expenditure Survey in the United States (Attanasio, 1993); Family Expenditure Survey in the United

Kingdom (Attanasio and Banks, 1998); Household Economic Survey in New Zealand (Gibson and Scobie, 2001); Household Income and Expenditure Survey in Nigeria (Ajayi, 2011); Household Living Standard Survey in Vietnam (Thi Minh et al., 2013); Household Economic Survey in Malaysia (Murugasu et al., 2013).

### **4.3 Analytical technique**

There is a consensus of income being a major determinant of savings in micro and macro-economic theory. According to Keynes (1936), the precautionary motive of saving would be to safe-guard one's self of uncertainty with regard to future income. Most rural households rely on subsistence farming for their livelihoods and would sell any surplus of their produce to local markets to earn income. The earnings of these households are at times supplemented by in-kind cash income and from government and donor agencies. Based on the constraints given, it is essential for these poor households to save at least a part of their current incomes as a way of mitigating risk against crop failure, protect food security status, increase productivity and enhance asset formation.

Most existing work has been done on measuring the responsiveness of national and household savings to growth in income and other non-income determinants. This study made an effort to investigate the impact of income on rural household savings in South Africa and made a comparison with urban household savings in South Africa by estimating average and marginal propensities to save. Percentages, means and regression analysis are the methods used to find results and answers to the research questions and objectives of the study, with Econometric views (Eviews) version 7.1 being the statistical package used for data analysis.

### 4.3.1 Conceptual framework for analyzing rural and urban household savings

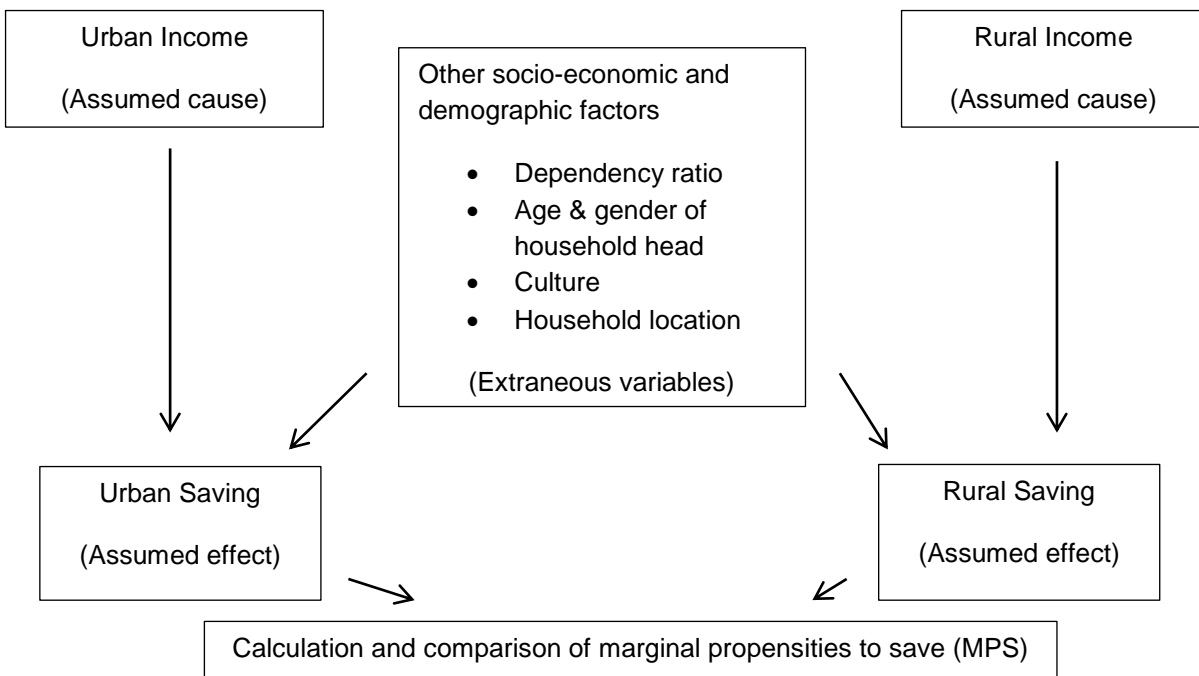
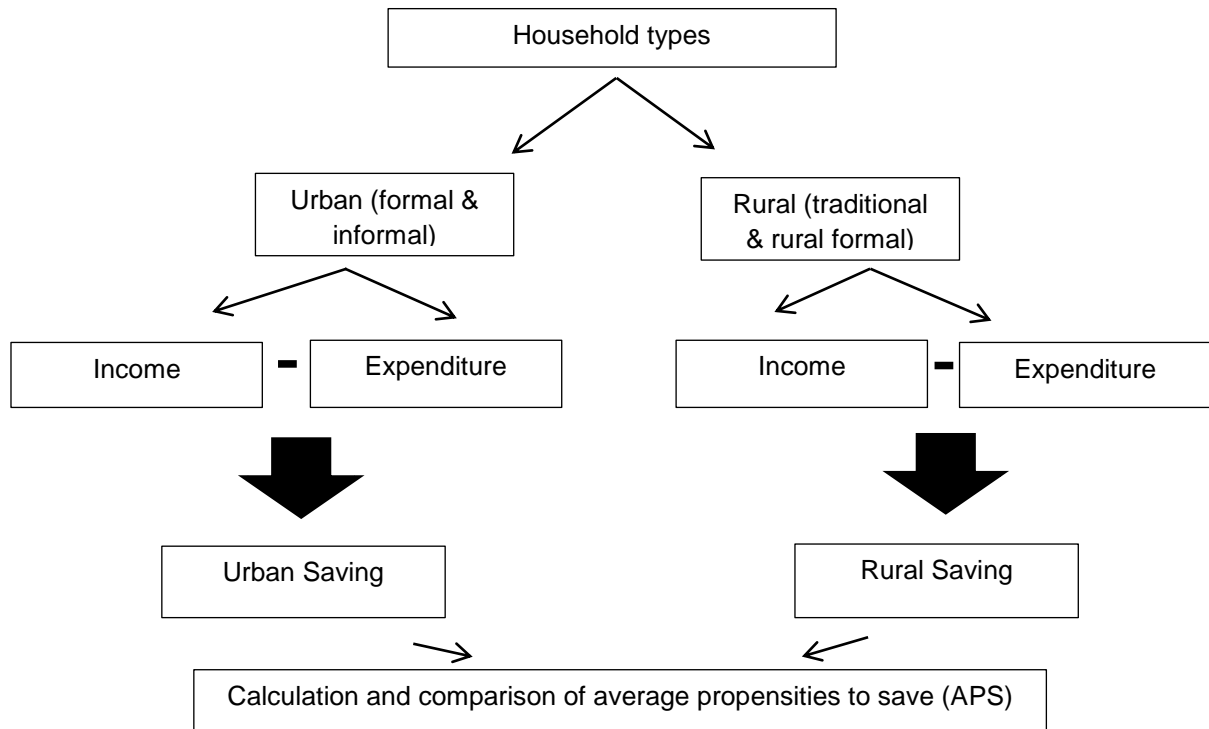


Figure 4.1: Framework for estimating savings functions

Source: Author's design

Figure 4.1 shows the conceptual framework for analyzing and comparing rural and urban household savings in South Africa. First, household types were disaggregated mainly into either urban or rural. Secondly, the mean monthly current savings were calculated as a residual of mean monthly income less mean monthly current consumption expenditures by each household type. Thirdly, the derived mean monthly savings were expressed as a proportion of mean monthly incomes to obtain monthly average propensities to save and thereafter, a comparison was made between rural and urban households' average propensities to save.

The second part of the conceptual framework involved finding the relationship between estimated savings (dependent variable) and income (explanatory variable), with socio-economic factors (extraneous variables) in this study considered to affect the relationship. This was done using the OLS procedure. The estimated savings functions were attained with the objective of finding marginal propensities to save which were compared for the diverse household types.

#### **4.3.2 The savings function**

In order to estimate the savings function, the study adopted a dynamic linear model emanating from the propositions of the Absolute Income and Permanent Income Hypotheses:

$$Y_t = \beta_1 + \beta_2 X_t + \beta_3 Y_{t-1} + \mu_t \quad (4.1)$$

where:

$Y_t$  = savings at time t,

$X_t$  = income at time t,

$Y_{t-1}$  = savings in the previous period t-1,

$\mu_t$  = is the error term.

Of greater interest to this study, are the coefficients of current income and past savings. The coefficient of current income ( $\beta_2$ ) indicates the marginal effect on current savings

as a result of a Rand change in current income; while the coefficient of past savings ( $\beta_3$ ) specifies the marginal effect of previous saving (based on past incomes) on the mean value of current savings.

#### **4.3.3 Savings variable (dependent variable)**

There is a debate of which expenditure items that should be included as current household expenditures in order estimate current savings (Gibson and Scobie, 2001; Ajayi, 2011). To overcome the problem associated with the residual approach of computing savings, the study estimated four measures of household savings (Gibson and Scobie, 2001; Ajayi, 2011). This was done to compare average savings based on the various measures and to cater for households that preferred saving in other forms of wealth.

Sav<sup>1</sup> = total income less total consumption expenditures; consumption expenditures including durable and non-durable goods and services.

Sav<sup>2</sup> = total income less consumption expenditures on non-durables; durables including durable goods such as appliances, machinery, equipment, motor vehicles etc.

Sav<sup>3</sup> = total income less consumption expenditures on non-durables; durables including investment expenditures on education expenses, life and health insurance, etc.

Sav<sup>4</sup> = total income less consumption expenditures on non-durables; durables including purchase of durable goods (appliances, machinery and equipment, e.tc) and investment expenditures (education expenses, life and health insurance, etc.).

However, in computing current saving, it is more appropriate to derive saving by subtracting current consumption expenditures from current income (Gibson and Scobie, 2001; Ajayi, 2011; ur Rehman et al., 2011) . As a result, the study used the fourth measure of saving (Sav<sup>4</sup>) for further analysis. The fourth measure of saving was obtained by first estimating current consumption expenditures. This was done by

removing expenses on education, life and health insurance, purchase of durables goods, medical expenses and other expenditures classified for investment purposes, from the total household consumption expenditures.

#### **4.3.3.1 Panel data regression models**

Panel data is also known as pooled data as it is a combination of cross-section and time series data (Verbeek, 2008; Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011). Merging time series of cross-sectional observations yields more informative data, more variability, less collinearity among variables, allows for more degrees of freedom and parameters are estimated with higher precision (Baltagi, 1995; Baltagi, 2008; Gujarati and Porter, 2009)

Although the data used was not a true panel, the study employed the four methods of panel regression techniques which are applicable to pooled data analysis, in an attempt to approximate an almost exact model of the savings function incorporating urban and rural households in South Africa.

##### **4.3.3.1.1 Constant coefficients model**

The Constants Coefficients Model assumes the regression coefficients are the same for all household types. The model was estimated by pooling together all observations regardless of the heterogeneity of household types. The dynamic model was stated as follows:

$$Y_{it} = \beta_1 + \beta_2 X_{it} + \beta_3 Y_{i,t-1} + \mu_{it} \quad (4.2)$$

where:

$i = 1, 2, \dots, N,$

$t = 1, 2, \dots, T$

The second assumption in estimating this model is that the explanatory variables are nonstochastic, or if they are stochastic, they are uncorrelated with the white noise (Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011). However, the

problem with this model is that it does not distinguish rural and urban households nor does it indicate whether the response of savings to explanatory variables is the same for all household types over time. By lumping together rural and urban households at different times, the heterogeneity or individual uniqueness that may exist among household types is concealed; the individuality of each household type is subsumed in the error term  $\mu_{it}$  and as a result, the error term might be correlated to some of the regressor variables in the model (Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011).

#### 4.3.3.1.2 Fixed effect least-squares dummy variable model

According (Gujarati and Porter, 2009) the least-squares dummy variable (LSDV) permits for heterogeneity among rural and urban households by allowing each household type to have its own intercept value as shown in the model:

$$Y_{it} = \beta_{1i} + \beta_2 X_{it} + \beta_3 Y_{i,t-1} + \mu_{it} \quad (4.3)$$

where:

$$i = 1, 2, \dots, N,$$

$$t = 1, 2, \dots, T$$

Although the individual intercepts may vary across household types as shown in equation (4.3), the intercepts are time-invariant and are referred to as fixed effects (Verbeek, 2008; Gujarati and Porter, 2009). The differential intercept dummy technique was used to allow for fixed effects among households by adding  $(N-1)$  dummy variables to the model.

#### 4.3.3.1.3 Fixed effect within-group estimator

An alternative way to estimate pooled regression is to remove the fixed effect ( $\beta_{1i}$ ); by expressing the values of the explained and independent variables for each household type as deviations from their respective mean values (Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011). The resulting values are referred to as mean-corrected values (Gujarati and Porter, 2009). After the sample mean values ( $\bar{Y}$ ,  $\bar{X}$ ) have



been subtracted from the individual values  $(Y, X)$  of the variables for each household type, the mean-corrected values are then pooled and OLS procedure will be applied to obtain regression results (Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011). Letting  $y_{it}$ ,  $x_{it}$ , and  $y_{i,t-1}$  represent the mean-corrected corrected values, the regression model estimated was:

$$y_{it} = \beta_2 x_{it} + \beta_3 y_{i,t-1} + \mu_{it} \quad (4.4)$$

where:

$$i = 1, 2, \dots, N,$$

$$t = 1, 2, \dots, T$$

Equation (4.4) takes into account heterogeneity among household types, not by dummy variable technique method, but eliminating it by differencing sample observations around their sample means (Gujarati and Porter, 2009). Although WG estimator produces consistent estimates, however, WG estimates are inefficient as they have larger variances in comparison to ordinary pooled regression results (Gujarati and Porter, 2009).

#### 4.3.3.1.4 Random effects model

The Random Effects Model was estimated in case the LSDV model and WG estimator failed to reflect the true model. The Random Effects Model (REM) also known as the Error Components Model (ECM), expresses the ignorance made by LSDV model and WG estimator through the disturbance term (Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011). Instead of treating  $\beta_{1i}$  as fixed in equation (4.2), the REM assumes that it is a random variable with a mean value of  $\beta_1$  (Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011). The intercept value for an each household type could be expressed as:

$$\beta_{1i} = \beta_1 + \varepsilon_i \quad (4.5)$$

where:

$\varepsilon_i$  = is a random error term with mean  $E(\varepsilon_i) = 0$  and variance  $Var(\varepsilon_i) = \sigma_\varepsilon^2$ .

Equation (4.5) implies that the rural and urban households in the sample are extracted from a larger universe of such households and have a common mean value for the intercept ( $= \beta_1$ ). The individual discrepancies in the intercept values of each household type are reflected in the error term  $\varepsilon_i$ . Substituting equation (4.5), the following equations were obtained:

$$\begin{aligned} Y_{it} &= \beta_1 + \beta_2 X_{it} + \beta_3 Y_{i,t-1} + \varepsilon_i + \mu_{it} \\ &= \beta_1 + \beta_2 X_{it} + \beta_3 Y_{i,t-1} + w_{it} \end{aligned} \quad (4.6)$$

where:

$$w_{it} = \varepsilon_i + \mu_{it} \quad (4.7)$$

The composite error term  $w_{it}$  consists of the cross-section error component  $\varepsilon_i$  and the combined time series and cross-section error term  $\mu_{it}$ . It is also assumed that the individual error terms are not correlated with each other and are not serially correlated across cross-section and time-series units:

$$\varepsilon_i \sim N(0, \sigma_\varepsilon^2)$$

$$\mu_{it} \sim N(0, \sigma_\mu^2)$$

$$E(\varepsilon_i \mu_{it}) = 0; \quad E(\varepsilon_i \varepsilon_j) = 0 \quad (i \neq j)$$

$$E(\mu_{it} \mu_{is}) = E(\mu_{ij} \mu_{ij}) = E(\mu_{it} \mu_{is}) = 0 \quad (i \neq j; t \neq 0)$$

While the study estimated various savings functions by employing panel data methods, namely; pooled estimators, fixed estimators (including LSDV and WG estimators) and random effects estimators, it was essential to carry out tests that would recommend the best (true) model by verifying consistency of estimates and statistical properties of each model. Table 4.1 provides the properties as outlined by Woolridge (2002), Greene (2003), Cameron and Trivedi (2005) and Were et al. (2012).

Table 4.1: Properties of estimators (models) used in the study

Model	Property of Estimators
Fixed Estimators (FEM)	Always consistent whether the true model is pooled or REM.
Random Effects Estimators (REM)	Consistent if the true model is pooled; inconsistent if the appropriate model is FEM.
Constant Coefficients (Pooled OLS)	Consistent if error terms are uncorrelated with regressor variables, but assumes slope coefficients are the same for all cross-sectional units.

The likelihood ratio test for redundant fixed effects was carried to check if the fixed estimator would be preferred to the Constant Coefficients Model. The Hausman test was also carried out to verify if there was any substantial deviation between the estimates obtained in the FEM and the REM.

#### 4.3.3.2 Redundant fixed effects test

The essence of the redundant fixed effects test is to confirm if the distinction between intercepts (cross section specific effects) among household types exists and that there is no heterogeneity bias (Allison, 2009). The F-statistic for this test is given as:

$$F_{N-1, NT-N-K} = \frac{(R_{LSDV}^2 - R_{OLS}^2)/(N-1)}{(1-R_{LSDV}^2)/(NT-N-K)} \quad (4.8)$$

where:

$N$  = number of household types,

$T$  = number of time periods,

$K$  = number of independent variables,

$R_{LSDV}^2$  = value of  $R^2$  from the LSDV model,

$R_{OLS}^2$  = value of  $R^2$  from the constant coefficients model

The null hypothesis is that all differential intercepts are equal to zero. Rejection of the null hypothesis would imply at least one of the differential intercepts is not equal to zero. In this case, fixed estimator is more appropriate to pooled estimator.

#### 4.3.3.3 Hausman test

The purpose of conducting the Hausman test was to confirm if either of the cross-section error terms is uncorrelated with the regressor variables. According to Greene (1997) if the correlation exists, then the fixed effect model would be the appropriate model. The test statistic is given by:

$$\chi_K^2 \approx [\beta_{FE} - \beta_{RE}]' [Var(\beta_{FE}) - Var(\beta_{RE})]^{-1} [\beta_{FE} - \beta_{RE}] \quad (4.9)$$

where:

$\beta_{FE}$  = estimates of coefficients in the fixed estimator,

$\beta_{RE}$  = estimates obtained by the random effects estimator,

$K$  = number of independent variables

The null hypothesis of the Hausman test is that the estimates of random effects estimator are not only consistent, but are efficient (have a smaller variance in comparison to fixed effect estimates). Rejection of the null hypothesis implies that there is possibility of the regressor variables being correlated with the cross-section error terms thereby producing biased estimates. The random effect estimates will be rendered inconsistent; the FEM would be more appropriate as it produces unbiased estimates (Clark and Linzer, 2012). According to Gujarati and Porter (2009), the Hausman test also supports preference of FEM over REM if  $T$  (number of time series data) is larger than  $N$  (number of cross-sectional units) and the opposite is true if  $N$  is larger than  $T$ .

#### **4.4 Limitations**

According to Gibson and Scobie (2001) care is needed in making comparisons of income with expenditures since in most cases income and expenditure surveys do not provide consistency at individual respondent level. As a result, comparisons made between total incomes and total expenditure outlays are valid at national level but not at household level. A possibility that some households might have underestimated their incomes due to fear of being cross-examined by tax authorities is accepted. Another possibility is that if non-monetized consumption expenditures are underestimated, saving rates are overestimated, but not necessarily the saving levels (Bautista and Lamberte, 1990). Further, the data obtained and released was based on private dwelling units and availability of respondents. A proportion of full time employees, scholars at tertiary institutions, patients treated in hospitals, aged people in old age homes and other potential respondents from public institutions could not be surveyed during the period September 2010 to August 2011 (Stats SA, 2012).

Based on the limitations above, the results presented are only as good as the survey data from which they are attained. The study acknowledges that if the data from the Income and Expenditure Survey (IES) is not providing a genuine picture of household saving, then the findings may not be meaningful.

#### **4.5 Conclusion**

This chapter gave details of the methodology that was followed in this study. The chapter began by explaining the study population, sources and structure of the data. The various average savings measures were outlined, which were mainly for the comparative motive. For the purpose of the study, the ideal measure of computing current saving would be to take the difference between household current incomes and current consumption expenditures. The savings functions to be estimated are based on the Absolute Income and Permanent Income Hypotheses. The OLS procedure will be carried out to measure the impact of current income and past savings on current savings. The pooling of cross-sectional household types enabled panel data analysis. The Redundant Fixed Effects test is to be employed for the purpose of comparing

consistency of estimates between the Constant Coefficients Model and FEM. The Hausman test will be carried out to evaluate appropriateness of the REM over FEM. The probable limitations of the methodology used in the study were also recognized and acknowledged to affect the quality of results obtained.

# CHAPTER 5: RESULTS AND DISCUSSIONS

## 5.1 Introduction

This chapter provides the results and discussion of the key findings of the study. First, descriptive statistics on mean expenditures, mean incomes and mean savings are outlined to show the statistical properties of the data used. Secondly, the saving function was estimated for each household type, followed by a comparison of the short-run and long-term propensities to save. Application of panel data techniques was the third aspect covered in this chapter which was evaluated by appropriate tests stipulated in chapter four.

## 5.2 Descriptive statistics

### 5.2.1 Household expenditures

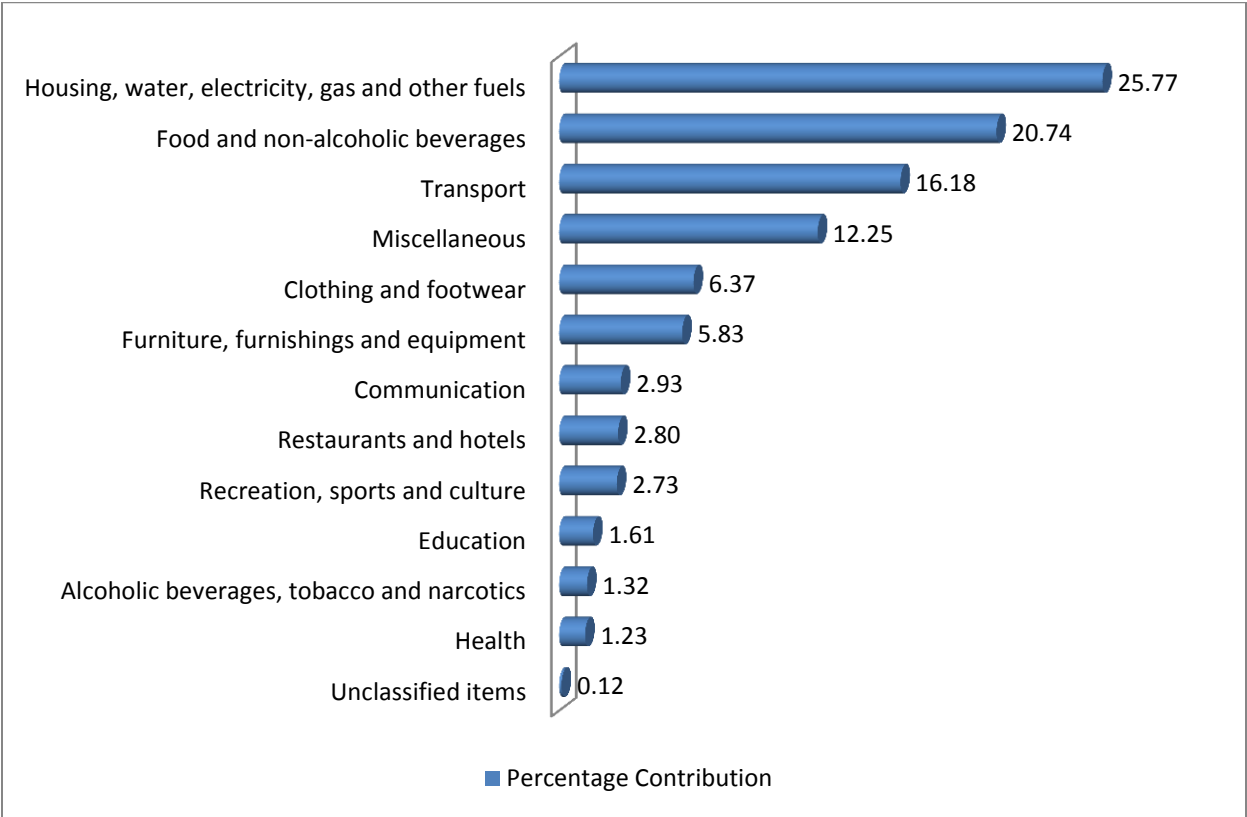


Figure 5.1: Main expenditure groups and respective percentage contributions during the period September 2010 to August 2011

Source: Authors' computations

According to Stats SA (2012) total household consumption expenditures would be classified into thirteen main expenditure groups which are shown in Figure 5.1 with their corresponding percentage contributions. The composition of household expenditures and their respective weights is based on the survey data collected during the period September 2010 to August 2011.

Across all households, expenses on housing, water, electricity, gases and other fuels contributed to the largest expenditure item, accounting to roughly 25.77 percent of total household consumption expenditures. Actual and imputed rentals for housing, water supply expenses, electricity bills and routine maintenance of dwellings are included in this section. On average, households spent approximately one in every four Rand on this expenditure group.

Expenditure on food and non-alcoholic beverages contended to be the second largest expenditure item, contributing about 20.74 percent of total household consumption expenditures. All households on average spent roughly one in every five Rand on this expenditure group.

Transport, being the third largest expenditure item accounted for around 16.18 percent of total household consumption expenditures. This expenditure group includes expenses relating to procurement of new and used vehicles, travelling costs, maintenance and repairs of transport equipment and other related expenditures. On average, about four in every twenty-five Rand was spent on this expenditure group.

Expenditure on miscellaneous goods and services occupied the fourth position in the ranking of main expenditure items. This expenditure group pertains to expenses linked with personal effects, social protection, insurance (related to property, health and transport), financial services and other services included in other expenditure groups. On average, across all household sectors, 12.25 percent of total household consumption expenditures were committed to this expenditure group.

Clothing and footwear expenditures contributed to about 6.37 percent, followed by expenditures on furniture, furnishings and housing equipment which accounted for 5.83 percent of total household expenditures. Outlays on household furniture, furnishings,



carpets other types of floor covering, household textiles and appliances, glassware, tableware, tools and equipment for garden were the sub items included in the furniture, furnishings and equipment category.

Approximately 2.93 percent of total household expenditures were devoted to communication. This expenditure group covers expenses relating to procurement and running of communication devices such as telephones, cellphone devices, telefax and use of postal services.

Across all household sectors, on average, expenditures made away from home in restaurants and hotels (2.80 percent) did not deviate much with costs related to recreation, sports and cultural events which accounted for about 2.73 percent of total household consumption expenditures.

Education expenses accounted for about 1.61 percent of household expenditures. This expenditure group includes pre-primary, primary, secondary, tertiary and other education disbursements not included by other levels of education, such as training overheads.

A proportion of 1.32 percent of household expenditures was allocated on consumption of alcoholic beverages, tobacco and narcotics.

Out-of-pocket expenditures on health accounted for roughly 1.23 percent of household consumption expenditures. This expenditure group includes medical products purchased, payment of hospital services, out-patient services and other items related to the functional wellbeing of people. This expenditure group accounts for a very low proportion of consumption expenditures since in most cases, households are expected to provide for health insurance included in the miscellaneous goods and services expenditure group.

Other expenditures that could not be classified in either of the aforementioned expenditure groups; such as purchasing seeds and fertilizer for home produce, accounted for about 0.12 percent of total household expenditures. Table 5.1 displays shares of total household consumption expenditures made by each household type.

Table 5.1: Main expenditure groups and respective percentage contribution as per household type

Expenditure Group/Item	Mean ( % )	Urban sector		Rural Sector	
		Urban Formal ( % )	Urban Informal ( % )	Traditional areas ( % )	Rural formal ( % )
Housing, water, electricity, gas and other fuels	25.77	33.98	20.87	23.30	24.92
Food and non-alcoholic beverages	20.74	10.33	24.15	26.71	21.76
Transport	16.18	17.50	15.39	14.65	17.17
Clothing and Footwear	6.37	3.98	9.35	7.50	4.64
Furnishing and Equipment	5.83	4.93	5.96	6.81	5.63
Communication	2.93	2.94	3.62	2.55	2.59
Restaurants and Hotels	2.80	2.49	3.94	1.87	2.89
Recreation, sports and culture	2.73	3.29	1.95	1.98	3.71
Education	1.61	2.75	1.27	1.33	1.09
Alcoholic beverages, tobacco and narcotics	1.32	1.09	2.20	0.83	1.17
Health	1.23	1.43	1.41	1.15	0.94
Miscellaneous	12.25	15.18	9.83	11.03	12.97
Unclassified items	0.12	0.10	0.07	0.29	0.01
TOTAL	100	100	100	100	100

Source: Authors' computations

Note: totals in the last column are rounded to the nearest percentage

### Housing, water, electricity, gas and other fuels

Urban formal households (33.98 percent) contributed the largest proportion in this expenditure group, followed by rural formal households (24.92 percent). A possible explanation why urban formal households have the largest contribution in this expenditure group is that, they relatively have better infrastructure, improved sanitation facilities and access to electricity in comparison to the other household types. Traditional households allocated 23.3 percent of their consumption expenditures on this expenditure group. Urban informal households (20.87 percent) contributed the least in this expenditure group. This is probably due to less costly and poor housing material used as compared to other household types.

### Food and non-alcoholic beverages

Households located in traditional areas distributed 26.71 percent of their consumption expenditures on this expenditure group, followed by urban informal households (24.15 percent). Rural formal and urban households allocated 21.76 percent and 10.33 percent of their consumption expenditures on this expenditure group, respectively.

### Transport

Urban formal households devoted 17.5 percent of their household consumption expenditures, followed by rural formal households who allotted 17.17 percent of their consumption expenditures on this group. Urban informal households and households located in traditional areas apportioned 15.39 percent and 14.65 percent of their consumption expenditures on this expenditure group. However, collectively, urban households spent more on transport than rural households.

### Clothing and Footwear

Urban informal households and households located in traditional areas spent 9.35 percent and 7.5 percent of their consumption expenditures on this expenditure group, respectively. Urban formal and rural formal households, however, allocated 3.98 percent and 4.64 percent of their consumption expenditures on this expenditure group, respectively.

### Miscellaneous

Urban formal (15.18 percent) and rural formal (12.97 percent) households appeared to afford social protection and insurance services more than urban informal households (9.83 percent) and households located in traditional areas (11.03 percent).

### Health

There were slight discrepancies of the proportions devoted to this expenditure group by the various household types. Urban formal (1.43 percent) and urban informal households (1.41 percent) allocated nearly similar proportions, whereas households located in traditional areas and rural formal households contributed 1.15 percent and 0.94 percent, respectively. Collectively, it appeared that urban households spent more on out-of-pocket health expenditures than rural households.

### Furnishing and Equipment

Rural households collectively had a greater proportion of their consumption expenditures in this expenditure group as compared to urban households. Urban informal households (5.96 percent) allocated a similar proportion with rural formal households (5.63 percent). While households located in traditional areas (6.81 percent) contributed the largest proportion, however, urban formal households (4.93 percent) apportioned the least fraction in this expenditure group.

### Education

Urban formal households (2.75 percent) appeared to spend more on education, with rural formal households spending the least (1.09 percent). Urban informal households and households located in traditional areas allocated 1.27 percent and 1.33 percent respectively.

### Communication

Urban informal households (3.62 percent) apportioned a greater fraction in this expenditure group, followed by urban formal households (2.94 percent). Rural formal

and households located in traditional areas allotted approximately similar proportions in this expenditure group, which were 2.59 percent and 2.55 percent, respectively.

Urban formal households appeared to have prioritized spending more housing, water and other related expenses, which accounted for about 34 percent of their household consumption expenditures. The order of priority continues to expenditures on transport (17.5 percent), miscellaneous items (15.18 percent) and food (10.33 percent).

Unlike urban formal households, urban informal households preferred allocating much of their household expenditures on food and non-alcoholic beverages (24.15 percent). This was tailed by housing, water and other related expenses (20.87 percent), transport (15.39 percent) and miscellaneous items (9.83 percent).

Households located in traditional areas allocated a greater proportion of their expenses to food and non-alcoholic beverages (26.71 percent), followed by housing expenses (23.3 percent). Transport expenses accounted for 14.65 percent whereas miscellaneous items received 11.03 percent of the budget. This order of importance in making expenditure outlays is similar to that of urban informal households.

Similar to urban formal households, rural formal households spent more on housing, water and other related expenses (24.92 percent). Food and non-alcoholic beverages accounted for 21.76 percent, whereas transport and miscellaneous items received 17.17 percent and 12.97 percent of the household budget, respectively.

## 5.2.2 Household incomes

Table 5.2: Mean incomes as per household type

Measure (per annum)	Urban Sector		Rural Sector	
	Urban formal (Rand)	Urban informal (Rand)	Traditional areas (Rand)	Rural Formal (Rand)
Mean	161,378.60	46,385.11	43,854.30	99,632.78
Median	164,503.40	44,003.68	44,652.46	70,672.53
Maximum	186,925.40	81,685.97	50,803.26	364,434.60
Minimum	144,505.10	27,461.76	31,766.46	33,661.77
Std. Dev.	14,385.81	13,107.34	5,036.929	90,566.48

Source: Authors' computations

The mean household incomes as per household/settlement type are presented in Table 5.2. An average urban formal household anticipates/earns more income (Rand 161,378.60) than any household type per annum. An average household situated in traditional areas earns the least income (Rand 43,854.30), which is approximately a quarter of the income earned by an average urban formal household in a year. Rural formal households proved to be the second high-income earners anticipating an annual income of approximately Rand 99,632.78. Although, urban informal households anticipate a yearly income of Rand 46,385.11, there was a slight discrepancy of their earnings with the income of households located in the traditional areas. An unpredicted finding was that urban formal households earned a maximum income of about Rand 187,000 per year, which was lower than the maximum amount of income earned by rural formal households (Rand 364,434.60 per year). This could be attributable to error or bias associated with data collection during the survey period, or the way in which the households are categorized.

However, as expected, urban households collectively earn more incomes than rural households in South Africa. This coincides with the findings made by Ajayi (2011) in analyzing household savings behaviour in Nigeria and the work done by ur Rehman et al. (2011) in examining rural-urban saving differentials in the Multan district of Pakistan.

### 5.2.3 Household saving

The average propensities to save as per household type are displayed in Table 5.3. The average savings were computed based on different savings measures. An observation made is that if durable goods and/or investment expenditures are included as current consumption household expenditures, then the average rate of saving is underestimated. As a result, an optimal approximation of average saving was based on the fourth measure of savings (Sav<sup>4</sup>) where durable goods and investment expenditures are excluded from current consumption expenditures when deriving savings.

Table 5.3: Average propensities to save as per household type

Saving definitions	Urban Sector		Rural Sector	
	Urban Formal (%)	Urban Informal (%)	Traditional area (%)	Rural Formal (%)
<b>Sav<sup>1</sup></b>				
Mean (12 months)	20.6	22.3	7.6	6.1
Maximum	27.2	34.2	20	45.5
Minimum	12.8	3.8	-6.9	-112.9
Std Deviation	4.6	9.7	8.1	41.9
<b>Sav<sup>2</sup></b>				
Mean (12 months)	30.2	28.0	16.5	16.7
Maximum	35.9	43.0	27.3	56.8
Minimum	26.6	9.8	2.5	-83.6
Std Deviation	2.6	9.8	7.1	35.4
<b>Sav<sup>3</sup></b>				
Mean (12 months)	31.4	26.5	13.9	13.9
Maximum	37.6	37.9	25.0	54.5
Minimum	24.3	7.4	-0.2	-98.9
Std Deviation	4.1	9.9	8.2	40.4
<b>Sav<sup>4</sup></b>				
Mean (12 months)	41.1	32.2	22.8	24.5
Maximum	44.6	46.7	32.7	65.8
Minimum	38.2	13.2	9.2	-69.6
Std Deviation	2.0	10.2	7.0	34.1

Source: Authors' computations

Table 5.3 displays average propensities to save for the different household sectors as per household type. The subsequent findings of the study are based on the fourth measure of saving in which only current consumption expenditures are subtracted from current income to arrive at current savings. On average, urban formal households save around 41.1 percent of their incomes with a standard deviation of 2 percent per annum, followed by urban informal households who on average save approximately 32.2 percent of their incomes with a standard deviation of 10.2 percent. On the other hand, within the rural sector; on average, rural formal households saved about 24.5 percent of their incomes and households located in traditional areas had mean savings of around 22.8 per annum, with standard deviations of 34.1 percent and 7.0 percent respectively.

Collectively, urban households had more mean savings as compared to households located in the rural sector and this was also observed when considering the other three measures of saving. Rural households in South Africa relatively save a lesser proportion of their incomes due to lower incomes in comparison to urban households who earn higher incomes. This is not surprising as similar inferences were made by Choudhury (1968) in India, ur Rehman et al. (2011) in the Multan district of Pakistan and Ajayi (2011) in Nigeria, who computed and compared average savings for rural and urban households.

Figure 5.2 displays the patterns of average propensities to save for urban formal, urban informal, traditional and rural households over the period of twelve months. Urban formal households exhibit relatively steady average saving patterns in comparison to other household types. Conversely, there is great instability in the average saving rates of rural formal households with evidence of dissaving. The volatility in average saving patterns of rural formal households can be attributed to the adversity in income anticipated, as shown by the highest standard deviation of the mean incomes in Table 5.2. Average saving patterns of households located in traditional areas are almost as stable as those of urban formal households, but more unwavering as compared to the saving patterns of urban informal households.



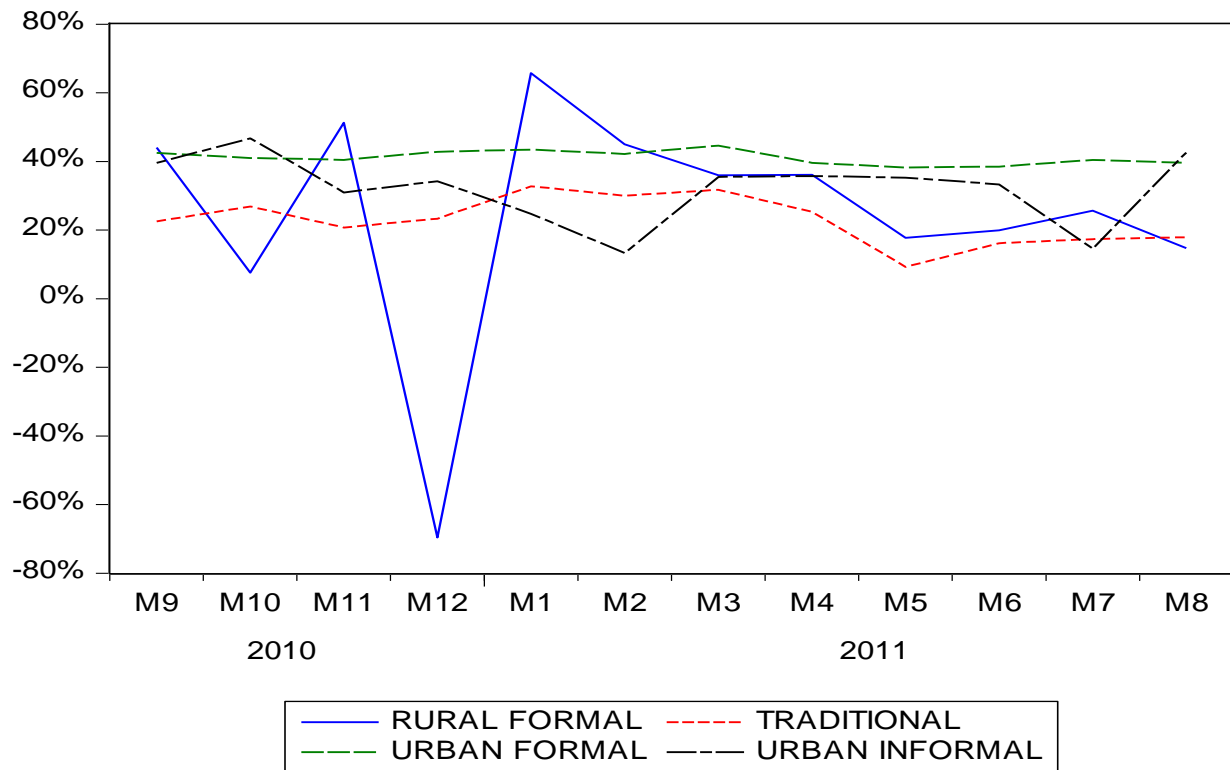


Figure 5.2: Average saving patterns

Source: Authors' computations

The sharp dip in the average saving rate for rural formal households in December 2010 (M12) is due to a reported sharp increase in consumption of food and beverages, without a corresponding increase in income of these households. A plausible explanation is that rural formal households have many social gatherings and engage more in recreation events at the end of the year. Catering for such events is expected to inflate consumption on food and beverages. In addition, most households in rural areas experience an increase in household size as family and extended family members who have migrated to the cities return home in December for the holidays. Furthermore, retailers also experience an increase in sales of consumer goods at this time of the year, which would indirectly result in a decrease in household savings.

### 5.3 The effect of current income and past saving on current saving

The savings model hypothesized in Chapter four was estimated for each household type. The regression results are presented in Table 5.4.

Table 5.4: Multiple regression results as per household type

	Urban Sector		Rural Sector	
	Urban formal	Urban informal	Traditional areas	Rural formal
Income ( $X_t$ )	0.47336*** (6.6130)	0.59101*** (6.4692)	0.63824*** (5.8726)	0.74333*** (8.3398)
Past savings ( $Y_{t-1}$ )	0.15551 (1.0817)	0.1111 (0.525)	0.26885* (1.879)	0.020695 (0.17787)
Constant	-1,718.3 (-1.4193)	-1,131.5* (-2.2694)	-4,097.6*** (-4.3608)	3,245.7** (-2.8204)
R-squared	0.85225	0.84689	0.84921	0.91257
Adj R-squared	0.81531	0.80861	0.81151	0.89071
F-statistic	23.072***	22.125***	22.527***	41.75***
Durban-Watson	1.8256	2.181	1.7273	2.0923
Initial observations	12	12	12	12
Observations After adjustment	11	11	11	11

Note: Estimates are rounded off to 5 significant figures,

\*\*\*, \*\*, \* indicate 1%, 5% and 10% significance levels respectively,

Figures in parentheses are t-ratios for the corresponding coefficients.

The constants given indicate the estimated amount of negative saving per month if an average household earns no current income. On average, a Rand increase in current incomes of urban formal households increases current saving by approximately Rand 0.47, with the coefficient of current income statistically significant at 1 percent. Although there is an insignificant positive relationship between past and current savings, however, a Rand increase in past savings induces urban formal households to increase current saving by Rand 0.16. The model estimated is of a good fit as the F-statistic (= 23.072) is statistically significant at 1 percent, with about 81.5 percent of the variation in current saving being explained by the explanatory variables in the model.

With reference to urban informal households, on average, a Rand increase in current income stimulates household current saving by Rand 0.59, the coefficient estimate being significant at 1 percent. A Rand increase in past savings motivates urban informal households to increase current saving by Rand 0.11. However, there is an insignificant relationship between past saving and current saving decisions made by urban informal households. A robust saving model was estimated, with a reasonably high adjusted coefficient of determination (= 80.9 percent) and the F-statistic (= 22.125) statistically significant at 1 percent.

On average, a Rand increase in the current incomes of traditional households prompts traditional households' current saving by Rand 0.64, the coefficient of current income significant at 1 percent. A significant positive relationship does exist between past saving and current saving decisions of traditional households; a Rand increase in past saving encourages a rise in current saving by Rand 0.27, the coefficient of past saving statistically significant at 10 percent. The adjusted coefficient of determination indicates that approximately 81.2 percent of the variation of current savings is explained by the relevant predictor variables in the estimated model. Further, the model is of a good fit, as shown by the F-statistic (= 22.527) statistically significant at 1 percent.

On average, rural formal households are eager to increase current saving by Rand 0.74 for every Rand gain in current income; the coefficient of current income statistically significant at 1 percent. Even though the relationship is insignificant, a Rand increase in current saving generates about 2 percent of savings made by rural formal households in

the next period. Given an acceptable high adjusted coefficient of determination (= 89.1 percent) and an F-statistic (= 41.75) statistically significant at 1 percent, the estimated model was deemed to be of good-fit.

Based on the short-run marginal propensities to save, it seems rural formal households would be more willing to save out of current income than any other household type, having a marginal propensity to save of 0.74. The order of marginal saving rates continues with households located in traditional areas being second, followed by urban informal households and lastly urban formal households; having short-run marginal propensities to save of 0.64, 0.59 and 0.47 respectively. Similarly to the findings of Ajayi (2011) in Nigeria and ur Rehman et al. (2011) in Multan, rural households collectively have higher marginal saving rates out of current income than urban households in South Africa. Rural households in South Africa have more marginal saving rates as compared to their urban counterparts. This is probably due to low and unstable incomes earned by rural households who mostly rely on subsistence farming. Saving would be a strategy of safeguarding themselves against adversity in income. The estimated marginal effects on current saving due to changes in current income and past saving enables the calculation of the long-run marginal propensities to save, by applying the formula  $\frac{\gamma_2}{1-\gamma_1}$ , where,  $\gamma_1$  is the marginal propensity to save based on past saving and  $\gamma_2 =$  is the short-run marginal propensity to save. The computed marginal propensities to save are presented in Table 5.5.

Table 5.5: Long-run marginal propensities to save

Computed value	Urban Sector		Rural Sector	
	Urban Formal (%)	Urban Informal (%)	Traditional area (%)	Rural Formal (%)
Long-run MPS	56.053	66.488	87.293	75.904

Source: Authors' computations

Households located in traditional areas are willing to save about 87.3 percent of their permanent income whereas rural formal households plan on saving around 75.9 percent of their permanent incomes. Urban informal households target on saving 66.5 percent of their permanent incomes, contrary to urban formal households that have the least intention of long-term saving, having a long-run marginal propensity to save of 56.1 percent. Based on a longer-term view of income expectations, on average; households within the rural sector collectively have the highest marginal saving rate out of permanent income as compared to urban households. A credible explanation is that rural households are more willing to save in the long-term in order to improve capital accumulation (and increased productivity) as way of breaking out of poverty. Another plausible reason could be the fact that rural households are generally less consumption oriented and indebted than urban households. This finding is important in guiding priorities for rural development policy.

#### **5.4 Dynamic panel regression results**

The pooling of four cross-sectional household household/settlement types based on the twelve-month period generated forty-eight observations. The results of the dynamic savings model were estimated using the panel data methods outlined in chapter four.

##### **5.4.1 Constant coefficients model**

The results of the Constant Coefficients Model are displayed in Table 5.6. On average, across all household types in South Africa; a Rand increase in current income is expected to encourage household saving by Rand 0.60. The coefficient of income is statistically significant at 1 percent. A negative significant relationship was found to exist between past and current savings; a decrease of current saving by a Rand encourages dissaving in the next period by approximately Rand 0.13. Based on the coefficient estimates above, it follows that the long-run marginal propensity to save across all household types is approximately 53.2 percent. The model estimated is of a good-fit since the F-statistic (= 185.6) is statistically significant at 1 percent and about 89.6 percent of the variation in saving is explained by the predictor variables. The results of the Constant Coefficients Model indicate that income is a significant factor in

determining current saving decisions across all household types in South Africa. The positive and significant relationship reported coincides with the AIH and the findings by Odhiambo (2007) and Simleit et al. (2011) in South Africa. A faster rate in rural and economic development can be achieved through increased savings from the growth in incomes of rural and urban communities in South Africa. However, the reported negative relationship between past and current saving suggests that households will save less in the future if current saving increases. The weakness of the Constants Coefficients Model in detecting uniqueness of household types in determining saving decisions necessitated the estimation of the Fixed Effects and Random Effects Models.

Table 5.6: Constant coefficients model results

Observations	Initial	After adjustment
Periods included	12	11
Total pool (balanced)	48	44
Dependent variable: Saving		
Variable	Coefficient	Adj R-squared =0.895681 F-statistic= 185.5981*** Durbin-Watson =1.884345
Income ( $X$ )	0.600009*** (19.26323)	
Lagged saving ( $Y_{t-1}$ )	-0.127097*** (-2.561242)	
Constant	-1,373.9*** (-4.569792)	

\*\*\*, \*\*, \* indicate 1%, 5% and 10% significance levels respectively,

Figures in parentheses are t-ratios for the corresponding coefficients.

#### 5.4.2 Fixed effect within-group estimator

The results of the WG estimator are presented in Table 5.7. On average, the short-run marginal propensity to save was estimated to be approximately 73.3 percent across all household types; households will be willing to save Rand 0.73 for every Rand they earn in the short-term. Although insignificant, a Rand increase in past savings is expected to

motivate households to save around Rand 0.02 in the short-term. It follows that the long-run marginal propensity to save is estimated to be 74.6 percent (after applying the formula  $\frac{\gamma_2}{1-\gamma_1}$ ). With approximately 92.4 percent of the variation in the dependent variable being explained by the predictor variables and an F-statistic (=105.3) significant at 1 percent, the estimated model was deemed to be a good-fit.

Table 5.7: Fixed effect within-group estimator results

Observations	Initial	After adjustment
Periods included	12	11
Total pool (balanced)	48	44
Dependent variable: Saving		
Variable	Coefficient	
Income ( $X$ )	0.732704*** (17.63449)	Adj R-squared = 0.923804 F-statistic=105.2675*** Durbin-Watson =2.296241
Lagged saving ( $Y_{t-1}$ )	0.017815 (0.323958)	
Urbf-Constant	-4,420.423*** (-5.561958)	
Urbinf- Constant	-1,572.719*** (-4.471919)	
Trad- Constant	-1,833.26*** (-5.371311)	
Rur- Constant	-3,146.649*** (-5.814714)	

Note: Urbf, Urbinf, Trad and Rur denote urban formal, urban informal, traditional area and rural formal settlements respectively,

\*\*\*, \*\*, \* indicate 1%, 5% and 10% significance levels respectively,

Figures in parentheses are t-ratios for the corresponding coefficients.

Despite the mean marginal propensity to save out of current income and past saving, total estimated savings per settlement type differ in accordance to the distinct household characteristics subsumed in the intercept terms (Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011):

$$Y_t^{\text{Urbf}} = -4,420.423 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.1)$$

$$Y_t^{\text{Urbinf}} = -1,572.719 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.2)$$

$$Y_t^{\text{trad}} = -1,833.26 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.3)$$

$$Y_t^{\text{rur}} = -3,146.649 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.4)$$

where:

$Y_t^{\text{Urbf}}$ ,  $Y_t^{\text{Urbinf}}$ ,  $Y_t^{\text{trad}}$  and  $Y_t^{\text{rur}}$  are estimated savings functions for urban formal, urban informal, traditional area and rural formal settlements respectively. Comparing rural and urban household sectors collectively yields the following equations:

$$Y_t^{\text{Urban}} = -5,993.14 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.5)$$

$$Y_t^{\text{Rural}} = -4,979.91 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.6)$$

where:

$Y_t^{\text{Urban}}$  and  $Y_t^{\text{Rural}}$  are estimated saving functions for urban and rural household sectors respectively.

The relative magnitudes of the intercepts are displayed from equations (5.1) to (5.6). Given a certain level of current income and past savings, it is expected to have more savings from rural households than urban households due to distinct features (such as average household size, household head and level of education) per average household type.

The WG estimator reported a positive relationship between past and current savings, contrary to the prediction made by the Constant Coefficients Model. Growth in incomes of households is expected to increase current saving. An increase in current saving is



expected to affect positively, the saving position of households in the future. This matches with the prediction made by the PIH by Friedman (1957).

### 5.4.3 Fixed effect least-squares dummy variable model

The estimated coefficients of the LSDV model presented in Table 5.8 are similar to the estimates obtained by the WG estimator, since both models are based on fixed effects.

The amount of total saving as per settlement type depends on the distinct characteristics absorbed in the individual intercept terms. From the intercept with the greatest value to the least, at a given level of income; we would expect more saving from urban informal households, followed by households located in traditional areas, while less saving is expected from rural formal and urban formal households respectively. This order of saving is similar to that of the WG estimator.

The common intercept term (= -2,743.26) shows the Rand amount of dissaving; assuming no current income is earned across all households in South Africa. This level of dissaving is sustained through credit or other forms of wealth. The actual values of the intercepts for the various household types are obtained by adding the differential intercept values to the common intercept term of the model:

$$Y_t^{Urbf} = -2,743.26 + (-1,677.16) + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.7)$$

$$Y_t^{Urbinf} = -2,743.26 + 1,170.54 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.8)$$

$$Y_t^{trad} = -2,743.26 + 910 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.9)$$

$$Y_t^{rur} = -2,743.26 + (-403.39) + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.10)$$

to give the following the equations:

$$Y_t^{Urbf} = -4,420.42 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.11)$$

$$Y_t^{Urbinf} = -1,572.72 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.12)$$

$$Y_t^{trad} = -1,833.26 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.13)$$

$$Y_t^{rur} = -3,146.65 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.14)$$

where:

$Y_t^{Urbf}$ ,  $Y_t^{Urbinf}$ ,  $Y_t^{trad}$  and  $Y_t^{rur}$  are estimated savings functions for urban formal, urban informal, traditional area and rural formal settlements respectively.

We observe that equations (5.11), (5.12), (5.13) and (5.14) of the LSDV model are equivalent to equations (5.1), (5.2), (5.3) and (5.4) respectively estimated by the WG estimator. Comparing rural and urban household sectors collectively yields the following equations:

$$Y_t^{Urban} = - 5,993.14 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.15)$$

$$Y_t^{Rural} = - 4,979.91 + 0.732704 X_t + 0.017815 Y_{t-1} \quad (5.16)$$

where:

$Y_t^{Urban}$  and  $Y_t^{Rural}$  are estimated saving functions for urban and rural household sectors respectively.

Contrary to the Constants Coefficients Model and consistent with the estimates obtained by the WG estimator, the LSDV model reported a positive correlation between current and past savings. As a result, the LSDV model predicts that an increase in current savings is expected to induce more saving in the future (Friedman, 1957). The LSDV also postulates that an average household will be willing to save Rand 0.73 for every Rand they earn in the short-term, identical to the prediction made by the WG estimator.

Further, the estimated model was deemed to be a good-fit since approximately 92.4 percent of the variation in the dependent variable is explained by the predictor variables and the F-statistic (=105.3) was found significant at 1 percent level.

Table 5.8: Fixed effect least-squares dummy variable results

Observations	Initial	After adjustment
Cross-sections	12	11
Total pool (balanced)	48	44
Dependent variable: Saving		
Variable	Coefficient	Adj R-squared = 0.923804 F-statistic=105.2675*** Durbin-Watson =2.296241
Income ( $X$ )	0.732704*** (17.63449)	
Lagged saving ( $Y_{t-1}$ )	0.017815 (0.323958)	
Constant	-2,743.26*** (-6.563463)	
Fixed effects (Cross)		
Urbf-Constant	-1,677.16	
Urbinf- Constant	1,170.54	
Trad-Constant	910	
Rur-Constant	-403.39	

Note: Urbf, Urbinf, Trad and Rur denote urban formal, urban informal, traditional area and rural formal settlements respectively,

\*\*\*, \*\*, \* indicate 1%, 5% and 10% significance levels respectively,

Figures in parentheses are t-ratios for the corresponding coefficients.

#### 5.4.4 Random effects model

The default method of estimating the error components by Swamy and Arora was used to obtain the panel results displayed in Table 5.9.

Table 5.9: Random effects model results

Observations	Initial	After adjustment
Cross-sections	12	11
Total pool (balanced)	48	44
Dependent variable: Saving		
Variable	Coefficient	
Income ( $X$ )	0.600009*** (22.53962)	
Lagged saving ( $Y_{t-1}$ )	-0.127097*** (-2.996871)	
Constant	-1,373.90*** (-5.347046)	
Random effects (Cross)		
Urbf-Constant	0.0000	
Urbinf-Constant	0.0000	
Trad-Constant	0.0000	
Rur-Constant	0.0000	
Effects Specification		
	S.D.	Rho
Cross-section random	0.0000	0.0000
Idiosyncratic random	967.71	1.0000
Weighted Statistics		Unweighted Statistics
R-squared = 0.900533		R-squared= 0.900533
Adj R-squared = 0.895681		Durbin-Watson = 1.884345
F-Statistic = 185.5981***		
Durbin-Watson = 1.884345		

Note: Urbf, Urbinf, Trad and Rur denote urban formal, urban informal, traditional area and rural formal settlements respectively,

\*\*\*, \*\*, \* indicate 1%, 5% and 10% significance levels respectively,

Figures in parentheses are t-ratios for the corresponding coefficients.

The intercept (average) value was found to be -1,373.90 and surprisingly, no existence of random effects across all household types. The implication is that savings do not vary across household types and over time. This matches with the assumptions made by the Constant Coefficients Model (Gujarati and Porter, 2009; Gujarati and Handelshøyskolen, 2011). More so, the estimates obtained by the REM are similar to the results of the Constant Coefficients estimator. On average, across all household types in South Africa; a Rand increase in current income stimulates household saving by Rand 0.60, the coefficient of income being statistically significant at 1 percent. An adverse significant relationship was found to exist between past and current savings; a decrease of past saving by a Rand encourages dissaving in the short-term by approximately Rand 0.13. The long-run marginal propensity to save across all household types was computed to be approximately 53.2 percent. The model estimated is of a good-fit since the F-statistic (= 185.6) is statistically significant at 1 percent and the adjusted coefficient of determination (=89.6 percent) explains the greater part of the variation in the dependent variable.

The REM confirms the positive impact of income on current household savings decision across all household types in South Africa, which is consistent with the AIH by Keynes (1936). However, the reported negative relationship between current and lagged (past) savings contradicts with the estimates obtained by the FEM.

The panel models estimated produced different results. The estimates obtained from the REM are similar to the approximations of the Constant Coefficients Model. As expected, the estimated coefficients of the WG estimator would be similar to those of the LSDV approach since the two models are based on fixed effects. The Redundant Fixed Effects and Hausman tests were employed in a bid to choose an appropriate model which provided more consistent estimates.

## 5.5 Panel regression tests

The Hausman and Redundant Fixed Effects tests were used to evaluate the different approaches of panel data analysis in estimating saving functions.

### 5.5.1 Redundant fixed effects test results

The Redundant Fixed Effects test was employed to confirm if fixed effects are necessary; if the estimates obtained from the fixed estimators would be more consistent than the estimates obtained from the Constant Coefficients Model.

Table 5.10: Redundant fixed effects test results

Effects Test	Test Statistic	Degrees of freedom	P-value
Cross section F-value	6.044356	(3,38)	0.0018
Cross section Chi-square ( $\chi^2$ )	17.166113	3	0.0007

The results of the test are presented in Table 5.10. The null hypothesis of the test ( $H_0$ ) is that all differential intercepts are equal to zero.

The null hypothesis was rejected since the cross-section F-statistic was found to be statistically significant at 1 percent level. We can conclude from the test that fixed cross-section effects are appropriate in the modeling of the saving function, and that saving behaviour differs across all household types in South Africa.

### 5.5.2 Hausman test results

Despite the REM producing similar results with those obtained from the Constant Coefficients Model, a formal test was carried to verify if the REM would be preferred to the FEM based on efficiency of estimates. The Hausman Test results are displayed in Table 5.11.

Table 5.11: Hausman test results

Test Summary	Chi-square Statistic	Degrees of freedom	P-value
Cross section random	17.83252	2	0.0001

The null hypothesis ( $H_0$ ) of the Hausman Test is that the FEM does not differ substantially with the REM.

The computed chi-square ( $\chi^2$ ) statistic was found to be statistically significant at 1 percent level as shown by the probability value (=0.0001). As a result, the null hypothesis was rejected as the cross-section error components  $\varepsilon_i$  are probably correlated with one or more regressors. Additionally, Gujarati and Porter (2009) states that Hausman test supports the FEM if  $T$  (number of time series data) is greater than  $N$  (number of cross-sectional units). In this case, the estimates produced by the FEM are more consistent than the estimates produced by the REM in modeling savings behaviour across all household types in South Africa.

## 5.6 Conclusion

This chapter attempted to model dynamic saving functions for the different household sectors as per household/settlement type. The results are based on the Income and Expenditure Survey (IES) conducted by Statistics South Africa during the period September 2010 to August 2011. The following inferences were made based on the findings of the study:

- Urban households have more incomes and average savings than rural households in South Africa.
- Rural households have more marginal saving rates than urban households in South Africa. This finding was found to be valid in the short-term and in the long-run. A logical explanation is that rural households are generally less consumption oriented and indebted than urban households.

- Income is a significant factor in determining savings decisions across all household types in South Africa. However, with the exception of traditional households, an insignificant relationship exists between current savings and future household savings decisions.
- The estimation of dynamic panel saving models using the Constant Coefficients, FEM and REM generated different results. Although the REM produced similar estimates with the Constant Coefficients Model, the FEM was deemed to be the best estimator as validated by the Redundant Fixed Effects and Hausman tests.



## **CHAPTER 6: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **6.1 Summary**

Despite the importance of saving in agricultural growth and rural development saving rates remain low in South Africa. The study was stirred by the declining saving rate in South Africa, of which household savings constitute the greatest proportion. The focus of the study was to examine household savings behaviour by making a comparative analysis between rural and urban households in South Africa, using the data from the Income and Expenditure Survey (IES) for the year September 2010 to August 2011. In South Africa, rural households can further be categorized as either households located in traditional areas or households located in rural formal settlements, whereas urban households can be classified as either formal or informal. The working definition and measure of saving used in this study is the difference between current income and current consumption expenditures.

The dynamic linear savings functions originating from the Absolute Income and Permanent Income Hypotheses were estimated for urban formal, urban informal, traditional and rural formal households respectively, using the Ordinary Least Squares (OLS) method. The variables used in the study include household current saving (dependent variable), while household income and past savings were the explanatory variables. Thereafter, pooling of four cross sectional household/settlement types enabled panel data analysis by the common panel data techniques.

The research results concur with the findings made by other relevant studies on household savings. On average, urban households earn more income than rural households in South Africa. Additionally, urban households collectively have more average savings than rural households; with average saving rates of 41.1 percent, 32.2 percent, 22.8 percent and 24.5 percent for urban formal, urban informal, traditional and rural formal households respectively. Conversely, rural households were found to have greater marginal savings than urban households; with short-run marginal propensities to save of 47.3 percent, 59.1 percent, 63.8 percent and 74.3 percent for urban formal, urban informal, traditional and rural formal households respectively. It follows those rural

households are more willing to save in the long-term than urban households; with long-run marginal propensities to save of 56.1 percent, 66.5 percent, 87.3 percent and 75.9 percent for urban formal, urban informal, traditional and rural formal households respectively. Further, with the exception of households located in traditional areas, results indicate that an insignificant relationship exists between current saving and saving in the previous period.

The Redundant Fixed Effects and Hausman tests justified preference of the FEM for estimating savings over the REM and Constant Coefficients Model. The implication is that saving behaviour differs across household types due to different household characteristics as per settlement type subsumed in the individual intercept terms. The distinct individualities incorporated in the intercept terms are attributable to non-income determinants of saving such as household location, wealth, household size and dependency ratios.

## **6.2 Conclusions**

The following conclusions were drawn based on the findings of the study:

First and foremost, the study established that rural households are able to save as indicated by the positive difference between mean anticipated incomes and mean current expenditures outlays. Secondly, an average urban household earns more income than an average rural household in South Africa. Consequently, amongst other things, this gives rise to differences in expenditure patterns for the diverse household types in South Africa. Since urban households earn more income than rural households, it follows that urban households have more average savings than rural households in South Africa. This matched with the findings obtained by Choudhury (1968) in India, Ajayi (2011) in Nigeria and ur Rehman et al. (2011) in the Multan District of Pakistan.

Thirdly, there is a systematic relationship between current income and current saving across all household types in South Africa. However, with the exception of traditional households, although positive, an insignificant correlation exists between past saving and current household saving decisions.

Fourthly, corresponding with the findings of Ajayi (2011) in Nigeria and ur Rehman et al. (2011) the Multan District of Pakistan, rural households have more marginal saving rates as compared to urban households in South Africa. On average, for every Rand earned either in the short-run or in the long-term, rural households are more willing to postpone current consumption than urban households in South Africa.

Fifthly, the estimation of saving functions using the different panel techniques generated different results. The FEM was considered the most appropriate model for estimating savings as validated by the Redundant Fixed Effects and Hausman tests.

### **6.3 Recommendations**

In terms of policy strategy, it is vital to encourage and educate rural households to participate in the formal monetary sector of the economy. Increased participation of rural households in accessing basic financial services entices microfinance institutions to open more branches and outreach more clients beyond remote geographical areas. Microfinance institutions should offer a mix of financial services that include not only credit provision, but collecting savings of rural people with increased transparency of the benefits receivable to clients. Further, credit at low cost should be granted to the extremely impoverished. The provision of credit at cheaper interest rates can possibly be sustained by funds from donor organisations.

The study recommends the government to intervene in rural development by increased support in agriculture, provision of infrastructure, extension of health and food subsidies to rural and urban informal households in South Africa. Support in agriculture can be increased through augmented investment in research on how to improve productivity and competitive edge of subsistence and small-scale farmers. Subsidizing health and food expenditures improves the food security status of rural and urban informal households. Furthermore, subsidies reduce the burden of spending on basic goods and services and improve the savings position of rural and urban informal households.

#### **6.4 Areas of further study**

The study was based on aggregated cross-sectional data from households in South Africa. Several aspects are worth pursuing for further research.

First, narrowing down the analysis to household level would yield more convincing results when analyzing household saving behaviour. Constricting down the analysis to household level permits fitting of demographic variables into the saving models such as gender, age and education level of the household head, value of wealth held by the household, desire to bank in formal financial institutions, household size and dependency ratios.

Secondly, the analysis can also be narrowed down to regional or income level. This enables comparison of rural and urban household savings behaviour at various income quantiles and at provincial, regional, district or municipal level in South Africa.

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