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**South African household savings and the influence of financial
liberalisation**

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ABSTRACT

Household savings performance has been of great interest to researchers as a result of its close association with supporting an environment conducive to investment and economic growth. South African savings rates have been declining with household savings showing a significant deterioration over the past two decades. Policymakers are primarily occupied with investigating methods to encourage savings and control consumption levels. However there remains some ambiguity regarding the variables that impact household savings behaviour. Higher domestic savings can assist with improving South Africa's GDP growth rate, which has not realised the expected targets in recent years.

The Vector Error Correction Model approach was applied to determine the long-run impact of certain variables on the household savings rate and household debt ratio. The study employed annual time series data over the 20-year period 1994 to 2013. Variables that were studied in relation to the household savings rate included youth dependency, elderly dependency, financial liberalisation and financial deepening. The impacts of financial liberalisation and financial deepening were also examined against the household debt ratio.

Findings revealed that household savings are negatively impacted by youth dependency. Results for elderly dependency and financial deepening had weak explanatory power on household savings. Financial deepening was found to significantly increase household debt levels whilst the results concerning financial liberalisation were inconclusive for both the household debt and household savings variables.

KEYWORDS: Household Savings; Age Dependency; Financial Liberalisation; Household Debt.

DECLARATION

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Masters of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to perform this research.

Alupheli Sithebe

Date: 10 November 2014

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CHAPTER 1: INTRODUCTION TO THE RESEARCH PROBLEM

1.1 Introduction

Household saving has always been of great interest to researchers and policy makers because of its close association with capital accumulation and economic growth (Ang, 2009). At present, South African policymakers realise that the level of personal savings is far too low and they are investigating ways to encourage savings and control levels of consumption (Cronjé & Roux, 2010). While corporates are saving, individual South Africans are not and the trend appears to be worsening each year (South African Savings Institute, 2014).

Higher savings increase funds available for investment projects (Ang & Sen, 2011). Optimal investment levels thus translate into an increase in available jobs and also serve to enhance living standards, as desired by the South African government (Malumisa, 2013). Romm (2005) referred to the cycle of growth to improve savings, which has been connected to the increase in growth. Investment friendly policies can be successful in addressing unemployment and poverty (Malumisa, 2013). Insights provided by this research study are hoped to contribute to promoting investment, thereby supporting the country's growth objectives.

1.2 Research Title

South African household savings and the influence of financial liberalisation.

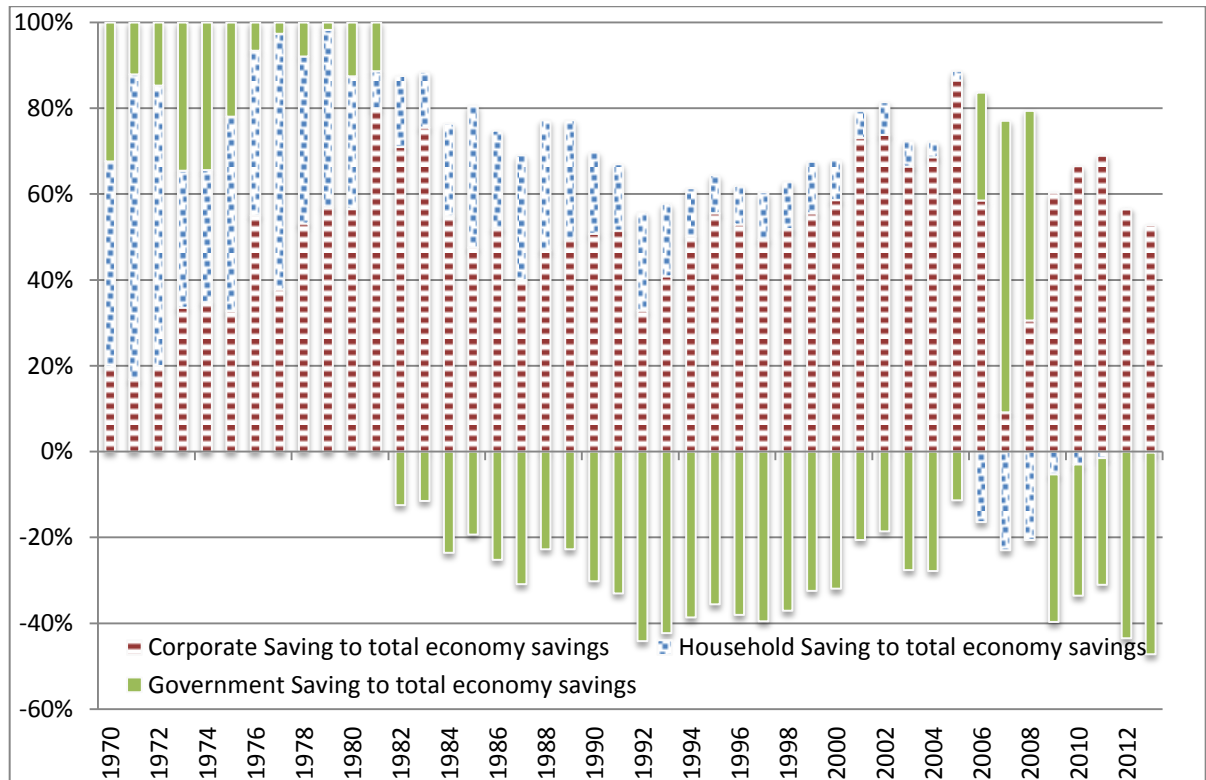
1.3 Research Problem

The South African government's "Growth Employment and Redistribution Strategy" (GEAR) was announced in 1996 and indicated that an average growth rate of more than 4% per year in real income would be required to be supported by a 23% aggregate savings rate

(Prinsloo, 2000). Evidence shows that domestic savings have exhibited a downward trend for the past two decades (Cronjé & Roux, 2010). The South African domestic savings rate amounted to 13.6% of GDP in 2013 (SARB, 2013). The GDP growth rate has averaged approximately 3.16% from 1993 to 2014 (tradingeconomics, 2014). These results are inferior to the aforementioned expected GEAR targets.

Government dissaving and poor household saving performance in South Africa have caused a decline in the gross aggregate saving rate with the concentration of the decline being mainly in the household savings sector (Simleit, Keeton, & Botha, 2011). Figure 1 demonstrates the comparative contributions of government savings and private (household and corporate) savings to total national savings. The recent trend indicates that government savings and household savings have been negative. Corporate savings contribute greatly to the domestic savings position, but key dependencies that impact savings growth are concerned with the saving behaviours of government and households (Cronje, 2009).

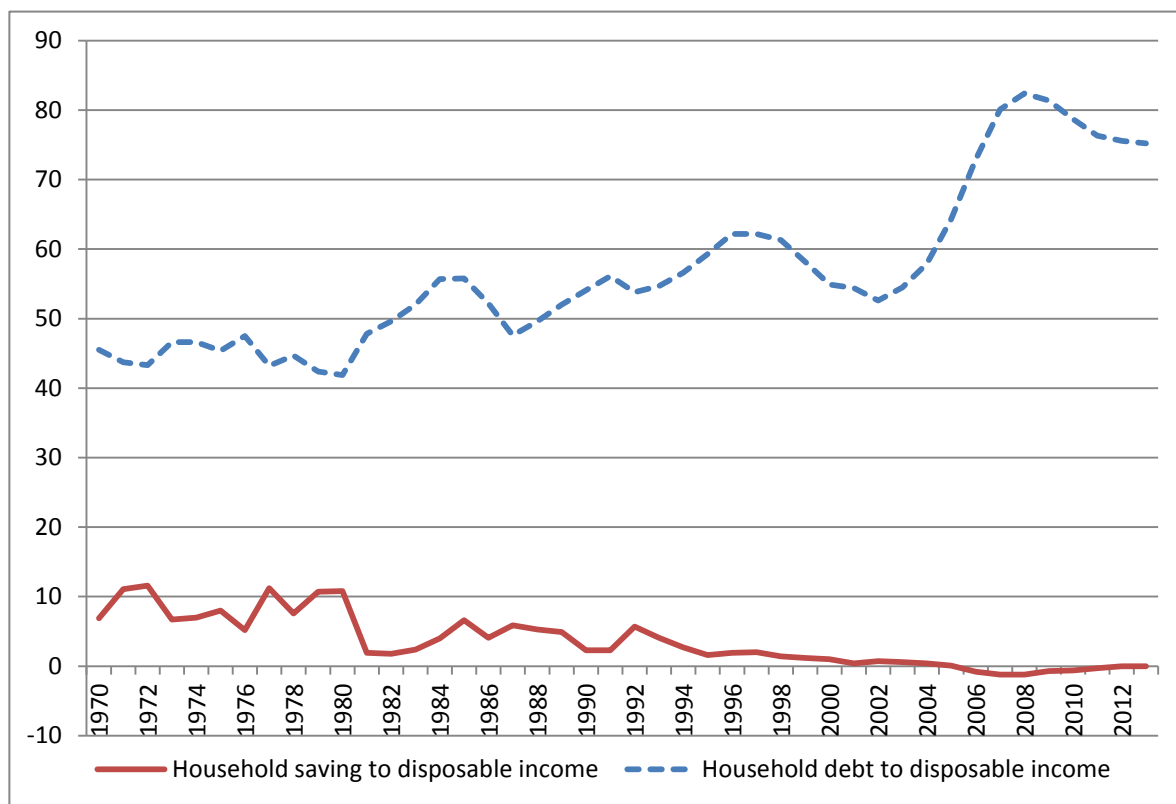
Figure 1: National Savings



Source: SARB

Figure 2 illustrates the movements in the household savings rate. This ratio has plunged significantly since 1980 followed by another drastic decrease in 1993. This rate decreased from 4, 1% in 1993 to 0% in 2013 following a trend of negative saving between 2006 and 2011.

Figure 2: Household Savings and Household Debt



Source: SARB

Household disposable income and financial assets have not accrued to the same extent as household debt since 1995 (Engelbrecht, 2009). An inverse relationship can be expected between increases in households' use of consumer debt and their savings over time (Prinsloo, 2002). Household savings have demonstrated a negative trend due to consumer behaviour that does not promote a savings culture (South African Savings Institute, 2014). Romm (2005) suggested that flexible liquidity policies that are inherent to financial liberalisation have contributed to increased consumer debt.

Hess (2010) stated that the rapid growth and successful development of the East Asian economies over the past few decades has been partly attributed to high domestic savings rates. A particularly important issue is the extent to which fiscal policy affects overall savings

(Harjes & Ricci, 2005). Ndikumana (2008) suggested ways in which macroeconomic policies can be used to induce an investment transition. Uremadu (2009) stated that although the low savings rates have become a major source of concern in recent years, not much attention has been devoted to emphasise the strategic determinants of savings in developing countries. It is of interest to examine the behaviour of private investment activity in African countries because it is a pertinent factor essential for economic growth in these countries (Malumisa, 2013).

Despite extensive studies being available on savings behaviour, various empirical issues have not yet been conclusively resolved (Jongwanich, 2010). Hess (2010) found several variables with contradicting impacts on private savings behaviour between different cross-sectional studies. Hess (2010) attributed the complexity of comparability in existing findings across studies to two primary concerns: firstly, the fact that empirical analysis measures differ across studies and secondly, the grouping of different economies that have varying institutional effectiveness in the same sample raises further concern. Ang (2009) also concluded in his study that results cannot be generalised from cross-sectional estimations because they are only valid in an average sense and consequently provide little policy guidance. It is on the above reasons that this research study was based on South African household savings individually.

1.4 Research Motivation

Low domestic savings have required the country to attract large volatile capital inflows to fund the current account deficit (Simleit, Keeton, & Botha, 2011). Cronjé and Roux (2010) warned against dependence on unstable capital flows from foreign investors due to foreign investors typically drawing their funds at the slightest hints of bad news. The literature reviewed has emphasised the importance of domestic savings, making this study both timely and relevant to the South African economy.

Noteworthy literature exists that has examined the relationship between macroeconomic factors and household savings rates. Although much literature exists in respect of

household savings behaviour, there is considerable ambiguity surrounding the variables that are expected to influence household savings (Simleit, Keeton, & Botha, 2011). Chauke (2011) complemented these positions by stating that saving habits are driven by various variables that differ from country to country and region to region, but there are commonalities. Empirical issues arise due to considerable variations among developing countries meriting analysis of household savings behaviour at individual country level (Jongwanich, 2010). Du Plessis (2008) suggested that the income levels of South African households do not explain the poor savings rate as theory would suggest, but there appears to be a multitude of factors at play.

Authors such as Edwards (1995) and Masson, Bayoumi and Samiei (1998) studied economies on a cross-sectional basis with the aim of understanding private savings determinants within those economies. Du Plessis (2008), Chauke (2011) and Cronje (2009) also conducted qualitative studies on South African household savings behaviour. Simleit, Keeton and Botha (2011) performed a recent quantitative study on the household savings behaviour of South Africa but the age dependency and financial liberalisation variables were not examined. With this research study, the aim was to quantitatively ascertain the specific impact of these two variables on South African household savings over the last two decades.

The Life Cycle Model is a standard model that analyses behaviours of consumption and savings (Modigliani & Brumberg, 1954). The combination of the Life Cycle Model, founded by Modigliani and Brumberg (1954) and the Permanent Income Hypothesis, postulated by Friedman (1957) suggest that household savings primarily depend on lifetime income growth, age, expected returns on savings and are vulnerable to uncertainty. Government policies that bear on any of these variables are expected to impact on savings (Uremadu, 2009).

As discussed above, the impact of age dependency on South African household savings has not been studied. This is relevant because a high ratio of dependents proportionate to the working age population contributes to consumption but not to production, thus imposing a constraint on potential savings (Uremadu, 2009). Uremadu (2009) identified

population structure as an area that warrants further study in the African developing country context due to the costs of endemic diseases like Malaria and HIV/AIDS on Africa's working age population.

As the theories on savings determinants develop, the general model assumptions of the Life Cycle Model and Permanent Income Hypothesis have been modified to investigate other factors that impact savings (Harjes & Ricci, 2005). Jongwanich (2010) ascribed the attractiveness of the Life Cycle Model to its flexibility in incorporating other relevant theoretical features relating to developing countries without changing its basic structure. This model therefore allows for the consideration of variables that may be unique to the country being studied in order to gain further insight into the respective country's household saving behaviour. Cronje (2009) categorises these factors as being of either a policy or non-policy nature.

In this research study, the Life Cycle Model is extended in order to incorporate the effects of financial liberalisation and financial deepening on South African household savings. According to Aron and Muellbauer (2000), consumption and household debt in South Africa has grown substantially since 1980, arguing that the country's extensive financial liberalisation is an essential part of the explanation for this issue. Kotze and Smit (2008) suggested that financial deregulation in South Africa has led to higher consumer debt levels, consequently negatively affecting savings. In view of the fact that personal savings represent the principal source of funding used by entrepreneurs for new venture creation, low savings are problematic because they may limit economic growth prospects driven by entrepreneurship (Kotze & Smit, 2008).

Based on the rising household debt levels in South Africa as identified by several authors, it is justified to extend the Life Cycle Model to include financial liberalisation as an additional factor to gain a more profound understanding of household savings behaviour.

1.5 Research Objectives

The aim of this study was to identify additional macroeconomic determinants of household savings affecting modern day South Africa. This study also sought to add to the current literature that attempts to explain household savings. The research study attempted to close some of the gaps in existing literature regarding the factors that impact South African household savings.

The research sought to determine the following:

- The relationship between the South African household savings rate and youth dependency.
- The relationship between the South African household savings rate and elderly dependency.
- The relationship between the South African household savings rate and financial liberalisation.
- The relationship between the South African household savings rate and financial deepening.
- The relationship between the South African household debt ratio and financial liberalisation.
- The relationship between the South African household debt ratio and financial deepening.

It was hoped that the results from this study would inform strategies on improving investment and growth in South Africa. This may be achieved through enhanced policy formulation plus the generation and implementation of social programmes that encourage higher national saving levels, which in turn will increase investment. This research study

may interest investors, business leaders and academics concerned with household saving determinants.

1.6 Research Scope

The research used the Life Cycle Model as the framework to study household savings behaviour. This framework prescribes standard variables, some of which have been tested in prior literature. This study was limited to examining those variables of the Life Cycle Model not concluded in prior studies, namely age dependency effect on South African household savings. Additionally, the impact of financial liberalisation was investigated with the intention to determine the effects of financial liberalisation on both South African household savings and household debt.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The theory reviewed in this section is divided into three distinct categories: savings and their role in the economy; theory on saving determinants and a summary of findings from the literature reviewed that motivate this research study. Firstly, the concept of saving is defined and its role in the economy is discussed followed by a summary of South African savings history. Secondly, general saving determinants are introduced based on academic theories and existing literature. The association between macroeconomic saving determinants and the household savings rate is discussed with narrations from opposing studies in this section. South Africa's saving literature and findings form part of this discussion. Lastly, debates prominent in the literature reviewed concerning macroeconomic saving determinants are summarised to motivate the suggested areas that were investigated in this research study.

2.2 Savings and their Role in the Economy

2.2.1 Savings Definition

Browning and Lusardi (1996) defined savings as the residual between income and current consumption. This is similar to the definition provided Horioka and Wan (2007) where household saving is determined by subtracting household consumption from disposable income. Gross savings in the national accounts refers to the portion of total income generated during a certain period, which is not consumed during that period (Prinsloo, 2000). It consists of private household saving, corporate saving and general government saving, with household and corporate savings being classified as private saving (Prinsloo, 2000). Dissaving occurs when current consumption exceeds current income (Prinsloo, 2002).

2.2.2 Role of Savings

Modigliani (1986) referred to national saving as the source of the supply of capital, a major factor of production that controls labour productivity and the growth thereof over time. Malumisa (2013) supported this by emphasising the crucial role that investment plays in economic growth. A domestic growth rate that moves faster than the national savings rate may result in an investment-savings gap, which may lead to a persistent current account deficit (Jongwanich, 2010). Low saving levels cause dependence on foreign investment to finance capacity for future growth (Cronjé & Roux, 2010). China is a good example of a country that has experienced accelerated economic growth rates over the recent years (Ang, 2009). Horioka and Wan (2007) stated that China has a favourable capital account surplus from savings exceeding investment. China's high level of saving has contributed to its accelerated growth rate in the recent past with the same being said for India (Ang, 2009). Edwards (1995) recognised this relationship between investment and saving by affirming that there is abundant empirical evidence to suggest that domestic savings are highly correlated to aggregate investment.

In addition to economic growth opportunities that become evident from savings, Du Plessis (2008) suggested that savings provide stability at both household and country level against economic shocks and erratic foreign direct investment flows. At household level, Yuh and Hanna (2010) related the importance of savings to retirement security, for making home purchases and for coping with emergencies.

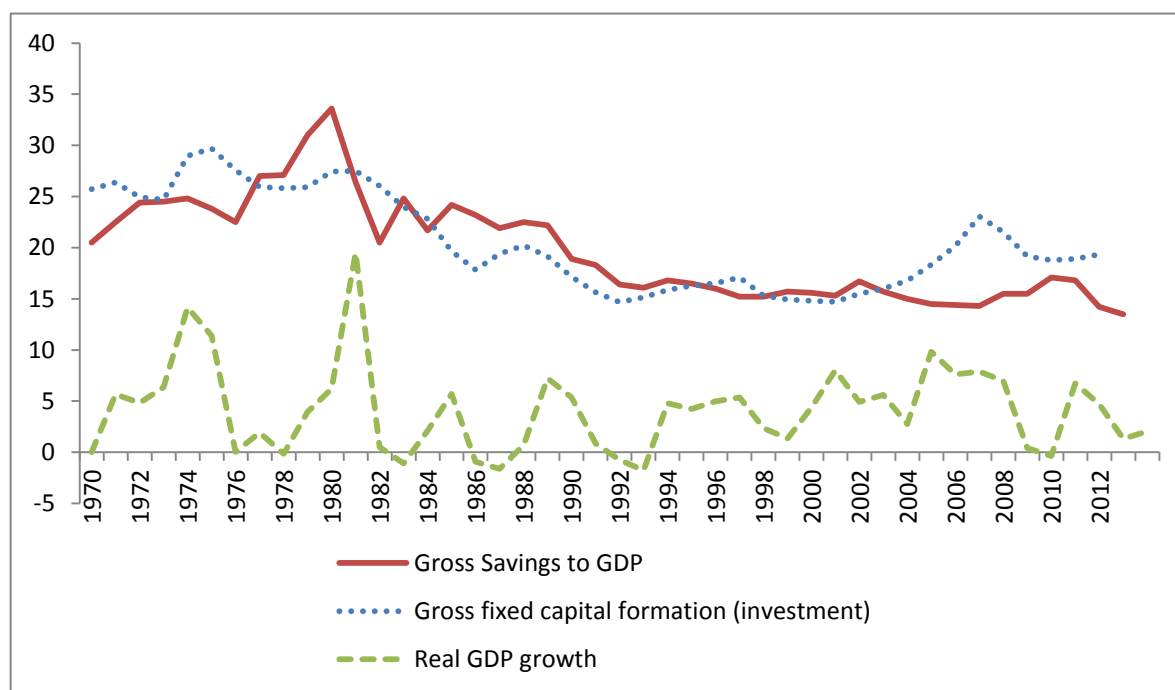
2.2.3 Savings and the South African Economy

To convey the role that savings have played in South Africa, Prinsloo (2000) recounts the history of the South African economy as follows:

The recorded development of South African savings behaviour dates back to the late 1940s. After World War II, investment opportunities in a number of industrial sectors led to a sharp increase in capital outlays, which resulted in a deteriorated balance-of-payments position and low private savings. In 1948, authorities addressed this by introducing

measures such as import controls, which restrained consumer goods spending in order to raise personal savings. The higher personal savings compensated for the effects of declined foreign funds resulting in a gross savings rate of 8% of GDP from 1947 to 19% of GDP in 1950. As depicted by Figure 3, the net effect was the ability for the country to maintain gross capital formation in excess of 20% of GDP. Subsequently, gross national savings averaged 22% of GDP between 1960 and 1999. By contrast, national savings deteriorated to an average of 16, 3% between 1990 and 1999. Until the mid-1980s South Africa's savings relative to GDP compared well to other countries. The national savings rate exceeded average savings of other middle income countries in 1980 (Prinsloo, 2000).

Figure 3: GDP growth, Gross Savings and Fixed Capital Formation to GDP



Source: SARB

Prior to 1984, differences between domestic savings and investment were countered by an inflow of savings from the rest of the world. Between 1985 and 1993, a series of large

capital outflows occurred (Prinsloo, 2000). International sanctions on South Africa led to large foreign capital withdrawals thus deteriorating economic performance rapidly, leaving large government deficits (Chauhan, 2012). Prinsloo (2000) added that government savings progressively declined from the mid-1980s, resulting in a negative ratio from the 1990s. Because of a shortfall in savings, government had to increasingly borrow funds to finance capital spending and a portion of recurrent expenditure (Prinsloo, 2000). Following the new political dispensation in 1994, South Africa once again experienced increased inflows of portfolio capital (Prinsloo, 2000). Substantial increases in government expenditure and rising government debt-servicing costs attributed to the state's funding gap which left the economy vulnerable to foreign capital from the mid-1990s (Prinsloo, 2000).

Savings by corporates have grown since the 1960s (Prinsloo, 2000). Prinsloo (2000) added that between 1979 and 1984 the corporate sector savings ratio rose considerably as a result of profits from the gold price boom. Although the corporate savings rate declined during the 1990s, it remains the backbone to South Africa's national savings (Prinsloo, 2000).

Savings by households averaged 12% of disposable income in the 1960s and 1970s (Prinsloo, 2000). In 1980, this ratio dropped significantly, as shown by Figure 2. During most of the 1970s, household debt rose at a rate that comparatively corresponded with the rate of increase in household disposable income (Prinsloo, 2002). Indebtedness increased more slowly than disposable income between 1978 and 1980, with the trend reversing in the period between 1980 and 1985 as a result of financial deregulation (Prinsloo, 2002). From the beginning of the 1980s, household debt increased at a rate in excess of 30%, followed by a decrease in 1985 from tightened monetary policy measures (Prinsloo, 2002). Debt levels continued to rise again from 1989 with a noticeable acceleration from 1994 until the late 1990s (Prinsloo, 2002). The strong credit demand in the mid-1990s was driven by the introduction of private-label credit cards, the introduction of mortgage equity withdrawals as well as the exponential growth of the micro-lending industry (Prinsloo,

2002). In the late 1990s, prudent monetary policy and increased interest rates caused the demand for debt to decline (Prinsloo, 2002).

After the abolition of apartheid in South Africa, the financial sector was further liberalised with the aim of attracting foreign investment (Chauhan, 2012). Chauhan (2012) added that this involved allowing greater flexibility on exchange controls, which resulted in increased capital flow. The banking regulatory framework also changed as banking activities advanced to maintain international standards (Chauhan, 2012).

2.3 Household Saving Determinants

This section discusses the factors that have been referred to as saving determinants and used to explain saving behaviour. Theoretical points of departure that seek to explain individual savings behaviour are based on three main theories (Du Plessis, 2008):

2.3.1 Keynes' Absolute Income Hypothesis (AIH)

Keynes (1937) viewed savings according to the theory of demand and the consumption function with income was considered the main determinant of savings. As the average household's income level rises, savings should increase because people's marginal propensity to spend increases at a lesser extent than their income increases (Keynes, 1937). The Keynesian model implies that consumption and saving depend on the level of current income (Harjes & Ricci, 2005). This theory is premised on the consumption of current income and ignores potential future income (Cronje, 2009). If the marginal propensity to save rises with income, then higher incomes would be associated with higher average savings. However, increased consumer aspirations may work to reduce or even reverse the rise in the propensity to save with increased income so that the relationship may be nonlinear (Hess, 2010).

2.3.2 Life Cycle Model (LCM) or Life Cycle Hypothesis (LCH)

Modigliani and Brumberg (1954) advance upon Keynes' work by introducing the Life Cycle Model (LCM) which is based on certainty of income and assumes that ideal consumption is related to total lifetime wealth. This model was developed by considering smoothed saving and consumption behaviour by maximising the lifetime budget, which is composed of current income, future income and real interest rates (Jongwanich, 2010). This is unlike the theory propounded by Keynes (1937) who defined savings as being driven by current income. The primary motive for saving in this theory is to accumulate financial resources for retirement (Ang, 2009). According to this LCM model, saving is conducted in such a way that consumption in retirement provides the same marginal utility as consumption earlier in the life cycle with due allowance for any discounting (Browning & Lusardi, 1996). Two important determinants of savings for the LCM are income and age structure (Ang & Sen, 2011). The income growth rate contributes positively to savings and the age dependency ratio contributes negatively because the expectation of lower savings exists when there are more dependents in an economy (Ang, 2009).

Jongwanich (2010) argued that the basic LCM assumes individuals allocate consumption and savings without considering liquidity constraints. However this is unrealistic in the presence of access to borrowing, which decreases the inclination to save. Meniago, Mukuddem-Petersen, Petersen and Mongale (2013) added that under this hypothesis, households may obtain credit when their income is low to finance existing consumption needs with the intention of repaying the debt using expected higher future income.

Many authors, including Ang (2009) and Jongwanich (2010) have found the LCM hypothesis to be a useful vehicle for understanding household savings behaviour in developing economies.

The LCM hypothesis attributes a number of variables to the successful saving behaviour that is aspired. A discussion of LCM variables follows:

Income

In support of both the AIH and LCM theories that emphasise income as a major saving determinant, Horioka and Wan (2007) found a positive relationship between GDP growth and household savings in their study of China. Malumisa (2013) also found a positive relationship between GDP growth and South Africa's private savings rate in his study, thereby supporting the LCM theory at face value. Simleit, Keeton and Botha (2011) argued that the more recent trend suggests that as South Africa's GDP increases, household savings decline. This means that there is a negative relationship between household savings and GDP growth, and further to this end, the positive relationship between GDP and private savings found by Malumisa (2013) is primarily influenced by the high corporate savings rate, as suggested by Cronje (2009).

The AIH and LCM theories propose that income drives household savings. However results from South African studies prove the contrary. This unpredicted outcome warrants further study to distil the factors that are in fact impactful on South Africa's household savings rate (Du Plessis, 2008).

Ang (2009) in his comparative study of China and India also found a positive relationship between income growth and the household savings rate. Both countries' results were in support of the LCM theory regarding income growth. Despite low personal income growth typical of developing economies, improvements in savings rates have been noted in these economies (Cronjé & Roux, 2010). Results in the South African context found by Simleit, Keeton and Botha (2011) opposed the LCM income growth expectation because the recent trend suggests that as South Africa's GDP increases, household consumption increases due to optimism, which in turn drops saving rates. Kotze and Smit (2008) indicated that household savings and household debt display an inverse relationship. Meniago, Mukuddem-Petersen, Petersen and Mongale (2013) supported the hypothesis that higher household consumption expenditure results in higher household debt levels. Meniago, Mukuddem-Petersen, Petersen and Mongale (2013) found that higher GDP, which implies higher economic growth, led to households and creditors respectively being more confident to take on and issue more debt.

Age Dependency

Age is a critical factor to consider in the Life Cycle Model (Yuh & Hanna, 2010). The LCM predicts that a high age dependency ratio will have a negative impact on the savings rate (Horioka & Wan, 2009). At individual levels, it can be expected that individuals will have negative savings when they are young and when they are old but that they have positive savings occurring during their working years (Ang & Sen, 2011). One might expect savings to be lower where an economy or household has more dependents because an economy grows when the aggregate income of those working relative to those not earning income increases (Ang, 2009). A high dependency ratio requires increased spending on health, education and care for dependents, thus lowering savings, investment rates and GDP growth (Uremadu, 2009). Hess (2010) added that increased youth dependency ratios compared to the total population would tend to require higher consumption expenditures in the form of education, health care, food and clothing. Similarly, a high proportion of elderly dependents would also be expected to decrease savings as a result of increased healthcare expenses in mature years (Hess, 2010). Therefore, at the aggregate level it is expected for savings to be lower when there are more dependents in an economy (Ang & Sen, 2011). Masson, Bayoumi and Samiei (1998) supplemented this observation by stating that if a high proportion of the population is of working age then an economy should have high rates of private savings as workers save for retirement, the inverse would apply for economies where lower proportions of the populations are employed.

In Thailand, Jongwanich (2010) found the youth dependency ratio and the elderly dependency ratio to be individually statistically significant, justifying the separation thereof in analysing the dependency impact on savings. Both variables showed a negative impact on Thailand's household savings (Jongwanich, 2010). Ang (2009) had also found the predicted negative relationship between household savings and the age dependency ratio in both China and India in his earlier study. Cronjé and Roux (2010) found the effects of age dependency to be explanatory of India and China's high household savings rates. Loayza, Schmidt-Hebbel and Servén (2000) also found the negative relationship suggested by this theory in their cross-sectional time series study. Masson, Bayoumi and Samiei (1998)

postulated that some individual country studies have not been very successful in finding significant age demographic effects on savings, probably because the variation over time of demographic variables is relatively small. Simleit, Keeton and Botha (2011) noted that the impact of the dependency ratio on South Africa's household savings could not be formally tested due to data limitations for the period they investigated. In the study by Chauke (2011), it was noted that the South African middle class is burdened by a high dependency ratio, which causes difficulty in saving. The alluded importance of the dependency ratio in the LCM justifies further research to measure the significance of its impact on South Africa's household savings rate.

Interest Rate

In addition to current and future income, the lifetime budget proposed by the LCM is also a function of the interest rate (Jongwanich, 2010). Interest rate changes indicate the terms of the trade-off between current and future consumption and are identified as a potential cause of changes in consumer behaviour, which affects savings (Prinsloo, 2000). These changes are ambiguous because the changes can be either negative or positive on household savings, depending on whether the substitution effect or wealth effect is applicable (Jongwanich, 2010). An increase in real interest rates may increase the wealth of individuals and hence make them more prone to consume (Harjes & Ricci, 2005). Alternatively, individuals may save more because of increased returns on investments (Harjes & Ricci, 2005). In support of this, Muradoglu and Taskin (1996) publicised that the effect of interest rates on savings is inconclusive in prior empirical studies.

Horioka and Wan (2007) found a significant positive relationship between interest rates and household savings in China, whilst Uremadu (2009) found a significantly negative relationship between interest rates and savings in Nigeria. Loayza, Schmidt-Hebbel and Serven (2000) also found a negative relationship to private savings in their cross-sectional test of 20 developed and 49 less developed countries. Masson, Bayoumi and Samiei (1998) found an insignificant relationship between interest rates and the private saving rates in their cross-sectional study of developing economies. Jongwanich (2010) noted that insignificant results are more likely to be found in countries that have financial systems

that are not deepened. Prinsloo (2000) supported this view by suggesting that with increased financial liberalisation and the accompanying financial deepening, increased interest rate sensitivity on savings should result. For South Africa, Simleit, Keeton and Botha (2011) found a significant negative relationship between household savings and interest, thereby validating the wealth effect theory.

2.3.3 Permanent Income Hypothesis (PIH)

Following the introduction of the Life Cycle Model in 1954, Friedman proposed another theory in the form of the Permanent Income Hypothesis in 1957 (Du Plessis, 2008). A limitation of the standard LCM is the assumption that an individual is able to predict their lifetime financial needs (Ang, 2009). The PIH differs from the LCM in that it represents the consumption and saving decisions by simplifying the assumption that life is “indefinitely long” (Modigliani, 1986, p. 299). Chauke (2011) suggested that people who operate savings as prescribed in this theory will value precautionary savings since they do not know what the future holds. What appears different about the PIH to the LCM is that the PIH acknowledges the uncertainties associated with the unknown future. Friedman’s PIH complements Modigliani and Brumberg’s Life Cycle Hypothesis (Meniago, Mukuddem-Petersen, Petersen, & Mongale, 2013). This model continues to present similar conclusions as those propounded by the LCM (Harjes & Ricci, 2005).

The PIH provides some variables that require consideration in studying household savings. A discussion of these PIH variables follows:

Inflation

The PIH adds the element of uncertainty in saving (Modigliani, 1986). Precautionary saving theory suggests that greater uncertainty is expected, to increase the incentive of households to save as they seek to protect themselves against adverse future outcomes (Mody, Ohnsorge, & Sandri, 2012). On the contrary, “inflation expectations may encourage expenditures on durables at the expense of savings” (Muradoglu & Taskin, 1996, p. 142). These two possibilities reflect the potential positive and negative impacts inflation can have

on saving behaviours (Muradoglu & Taskin, 1996). Income uncertainty plays a role in saving and inflation is used to capture this uncertainty (Jongwanich, 2010).

Precautionary motive theory would explain the results of the significantly positive relationship found by Ang (2009) between inflation and the private saving rates in his comparative study of China and India. Similarly, Loayza, Schmidt-Hebbel and Serven, (2000) found a significantly positive relationship between private saving rates and inflation in their cross-sectional test of 20 developed and 49 less developed countries. Jongwanich (2010) also found the precautionary motive to be present in Thailand's household savings behaviour. Masson, Bayoumi and Samiei (1998) found an insignificant relationship between private saving rates and inflation in their cross-sectional study of 40 developing economies. Uremadu (2009) found a negative relationship between domestic inflation and the savings rate in Nigeria, concluding his study by making a recommendation to policy makers to pursue anti-inflationary policies. Ndikumana (2008) identified macroeconomic instability arising from inflation rate variability as also having a negative effect on private investment, which implies the need for policy to aim for maintaining inflation within a reasonable range in order to promote private investment. The South African Reserve Bank has an inflation targeting policy which is controlled with interest rates adjustments (Ndikumana, 2008).

2.3.4 Other Saving Determinants

In addition to the saving determinants outlined by the three main saving theories discussed above, others determinants motivated by authors in previous literature are discussed below.

Pension Benefits

In many cases people enter retirement without sufficient savings, hence countries feel the need to establish social welfare systems for the retired (Ang, 2009). Transfers in the form of social pensions and social welfare expenditure tend to result in lower household savings due to the decreased need to provide for the future (Prinsloo, 2000). Edwards (1995) found that the share of social welfare spending in public expenditures had a statistically

significant negative impact on the private savings rate in his cross-sectional study. Ang (2009) studied the impact of pension fund benefits based on the argument that if savers perceive pension benefits at the point of retirement as being high, they will tend to reduce the amount saved during their working lives. Ang (2009) found that expected pension benefits have different effects on household savings with China displaying the predicted negative relationship and India showing a positive relationship. According to Kotze and Smit (2008), South African citizens are experiencing increased life expectancy and thus require more savings for an extended period of retirement. Cronje (2009) suggested that an increase in mandatory retirement programmes may result in higher household saving rates for South Africa.

Government Saving

Total national savings are made up of government savings, household savings as well as corporate savings (Prinsloo, 2000). Higher government budget deficits are likely to induce increased household savings as households anticipate increased taxes in the future, according to the Ricardian Equivalence theorem (Prinsloo, 2000). Simleit, Keeton and Botha (2011) proved the existence of the Ricardian Equivalence theorem in South Africa post-1994, although a total counterbalance in savings was found to be unlikely. Edwards (1995); Masson, Bayoumi and Samiei (1998) as well as Hess (2010) found a significantly negative relationship between government savings and private savings, thus supporting the Ricardian Equivalence theorem.

Corporate Saving

Corporate savings can influence the movement of household savings because individual business owners may use their business organisations to channel their savings (Jongwanich, 2010). Households may save less in a case where a firm does their saving on their behalf meaning that consumption decisions of households 'pierce the corporate veil' (Prinsloo, 2000). Simleit, Keeton and Botha (2011) found a significant negative relationship between household and corporate savings, thus supporting this theory.

Education

Chauke (2011) proposed financial literacy to be an important driver of household saving behaviour (Chauke, 2011). Yuh and Hanna (2010) stated that education has been found to have an impact on household savings, and there remains some ambiguity regarding the direction of this relationship. Kotze and Smit (2008) emphasised the importance of consumer awareness regarding the need to save for future purposes and practice responsible financial decision-making. Chauke (2011) found the lack of financial education to be one of the material factors that negatively affects saving rates in South Africa.

Terms of Trade

In addition to the saving determinants discussed above, Jongwanich (2010) suggested terms of trade changes as another factor that has an impact on household savings. Loayza, Schmidt-Hebbel and Serven (2000) found a statistically significant positive relationship between private saving and terms of trade in their cross-country study. Jongwanich (2010) found a mild statistical significance of a positive relationship between terms of trade changes and the household savings rate in his study of Thailand. Masson, Bayoumi and Samiei (1998) found a statistically insignificant relationship between savings and change in the terms of trade for the developing economies investigated in their research.

Income Inequality

Income inequality is a possible driver of household savings according to Cronje (2009). Cronje (2009) suggested that while income is a vital factor in savings, income inequality is also an important variable which has not been explored in previous South African studies. Normally, saving ratios are expected to rise as income levels rise; however the potential relationship of income inequality and savings remains unexplored (Prinsloo, 2000).

Financial Sector Development

According to Ang and McKibbin (2007), financial liberalisation through removing repressive policies stimulates financial sector development. Financial liberalisation can increase investment returns as a result of expanded investment alternatives (McKinnon, 1973). Financial development offers higher investment returns that normally improve saving levels (Shaw, 1973). Critics argue that a negative relationship could ensue as a result of increased household credit access, which leads to higher spending and consequently a lower household savings rate (Romm, 2005). Likewise, Harjes and Ricci (2005) suggested that South African household debt increased due to the effects of financial liberalisation thus negatively impacting savings.

2.4 Financial Liberalisation

South African household debt has been accruing at a greater rate than income and financial assets of households since 1995 (Engelbrecht, 2009). A negative relationship between movements in household savings and household debt is expected over time (Prinsloo, 2002). In this section we explore financial sector developments that are understood to affect household savings and household debt levels.

Financial development is analysed by referring to two elements, namely financial liberalisation, which indicates the level of restrictions posed on the financial system; and secondly, financial deepening which is indicated by the ease of access to credit in a country (Uremadu, 2009). Fowowe (2008) described financial liberalisation as those policies that are aimed at freeing repressed economies from effects of growth-retarding policies such as interest rates and directed credit policies. McKinnon (1973); Shaw (1973) advocated the liberalisation of repressed financial systems to promote investment and consequently result in economic growth. Furthermore, according to financial liberalisation theory, financial repression through interest rate ceilings keeps interest rates low and this discourages savings, with the consequence that the quantity of investment is constrained (Fowowe, 2008). Financial development and financial liberalisation are expected to be positively

correlated because liberalisation promotes deeper financial markets (McDonald & Schumacher, 2007).

In the 1960s and 1970s the South African government believed it could stimulate economic growth by directly intervening in financial markets through directed lending policies and interest rate controls (Schoombee, 2000). During this period the central bank used credit ceilings and extensive minimum liquid asset requirements to restrain bank credit available to the private sector (Chauhan, 2012). These practices are opposed by financial liberalisation advocates like McKinnon (1973) who proposed that financial markets should be driven by supply and demand in order to lead to efficient capital allocation and more favourable investment returns. Financial liberalisation in South Africa was initiated following the de Kock Commission reports that supported a more market-oriented monetary policy (Aron & Muellbauer, 2000). It commenced in the 1980s by shifting from a non-market to a market-oriented approach on monetary and financial policies (Schoombee, 2000). Free entry into banking and prudential regulation followed in 1983 (Fowowe, 2008). South Africa's prior repressivist financial and monetary policies had resulted in reduced private investment expenditure (Chauhan, 2012).

Table 1: A Summary of South Africa's Financial Sector Development

Date	Description
Before the 1980s	Credit ceilings, deposit interest rates controlled (Schoombee, 2000).
1980	Beginning of financial liberation: Interest rate controls and credit ceilings were removed (Aron & Muellbauer, 2000).
1983 to 1985	Banks' liquidity ratios were reduced substantially (Aron & Muellbauer, 2000).
1989 - 1990	Consolidation and take overs in banking industry intensify credit market competition (Aron & Muellbauer, 2000).
1990	Pensions become increasingly used as collateral for housing loans (Aron & Muellbauer, 2000).
1994	Banks Act is amended to permit foreign banks to open local branches (SARB, 1994). Exchange controls on non-residents were removed resulting in large non-resident capital inflows (Aron & Muellbauer, 2000).
1995	From 1995 access bond accounts allow households to borrow and pay against their housing as collateral (Romm, 2005).
2005	Implementation of the National Credit Act (NCA) to regulate institutions that provide credit and to curb reckless lending by credit providers (Engelbrecht, 2009).
2008	Basel I to Basel II improvements (Chauhan, 2012).
2011	Basel III to be effected (Chauhan, 2012).

When financial policy is liberalised, the central bank intervenes less in foreign capital movements and foreign exchange markets (Shaw, 1973). Higher liquidity from an open market system increases credit availability and competition in the financial services sector (Chauhan, 2012). Financial flows can be read as an indicator for financial deepening (Shaw, 1973). Deepening increases the size and operational effectiveness of financial institutions (Shaw, 1973). Loayza, Schmidt-Hebbel and Serven (2000) mentioned that financial liberalisation generally results in higher interest rates due to free market functioning which

should theoretically encourage saving. Several authors have claimed that the liberalisation of financial markets contributes to market efficiency, which transforms savings to investment and growth (Hermes & Lensink, 2005). In principle, interest rate deregulation allows interest rates to rise (Chauhan, 2012). Edwards (1995) found evidence of a positive relationship between private savings and financial deepening in his sample of 36 countries, thus supporting the hypothesis that financial development provides productive outlets for savings.

In contrast, Ang and Sen (2011) found evidence that financial liberalisation had a negative effect on private saving performance, suggesting that the relaxation of financial restraints had a detrimental effect on the economies tested in their study. Harjes and Ricci (2005) performed a study that analysed the impact of financial liberalisation on South Africa's private saving rate from the period 1970 to 2000 and their results found the relationship to be significantly negative, relating this result to improved access to credit.

Romm (2005) attributed South Africa's declining saving rates to financial liberalisation that heightened further in the mid-1990s. Under the apartheid system that existed until 1994, financial services in South Africa were predominantly available to non-Blacks therefore the end of apartheid signalled the beginning of reversals of discriminatory practices against the Black population, including developments in access to finance (Kostov, Arun, & Annim, 2012). The South African government has since the late 1990s cooperated actively to extend the micro-finance sector (Engelbrecht, 2009). Credit organisations and banks are regarded as essential for the economic development and social welfare of an economy (Meniago, Mukuddem-Petersen, Petersen, & Mah, 2013). Chauhan (2012) added that in order to ensure that the low income market was incorporated into the mainstream economy; the South African regulatory framework was amended to broaden access to finance to meet the needs of the unbanked.

Engelbrecht (2009) found evidence that the culture of saving in South Africa is weaker compared to the level of credit sought. Although financial liberalisation can have benefits in the long-term regarding efficient financial mediation and a stronger banking sector, critics are in agreement that financial liberalisation has played a major part in the low savings rates

in South Africa (Cronjé & Roux, 2010). Cronje (2009) suggested that South Africans display a “buy now, pay later” mentality. South Africans have a culture of debt rather than one of saving, even though income for the middle class continues to improve (Chauke, 2011). Old fashioned budgeting and saving practices are being lost in the pursuit of instant gratification (Kotze & Smit, 2008). Meniago, Mukuddem-Petersen, Petersen and Mah (2013) found that higher household consumption expenditures are related to higher household debt levels and recommended the close monitoring of credit extension to households. In as much, there is a desire of households to maintain higher living standards by compromising savings (Simleit, Keeton, & Botha, 2011).

Harjes and Ricci (2005) concluded that as financial development progresses and banking services become widespread, the impact on savings is unclear since the opportunities for both borrowing and saving increase. Prinsloo (2000) supported this conundrum saying that further research into the area of household saving and consumption can improve the analysis of the associations between monetary policy changes and these variables. This study determined whether financial liberalisation and financial deepening are related to the low South African household savings rate, as suggested by critics. The financial liberalisation study conducted by Harjes and Ricci (2005) revealed the effects of financial policy reforms on savings for the period starting 1970 to 2000. In this particular research paper, the 20-year period between 1994 and 2013 was analysed to determine the effects of financial developments on South African household savings. These past two decades have shown a decline in the household savings rate (Cronjé & Roux, 2010).

2.5 Summary of Findings in the Literature

From the preceding literature, areas requiring further research in respect of household saving behaviour have been indicated. Jongwanich (2010) encouraged studies of household savings for individual countries because of the flawed assumption of homogeneity in countries combined in cross-country studies. Institutions and structural features typically differ significantly across countries aggregated in cross-country studies

(Jongwanich, 2010). This study was completed in the pursuit of garnering a more profound understanding of household saving determinants for South Africa in particular.

In accordance with prior literature, this paper followed the theoretical framework proposed by the Life Cycle Model. The literature review shows that the impact of demographic variables on household savings has not been studied in recent South African studies. Age dependency is a standard variable of the life cycle model and several studies have found its impact to be significant on household savings. It is on this basis that the relationship between age dependency and household savings will be examined in this study. Due to the suggested varied effects of the financial developments that have disseminated in South Africa since 1980, financial liberalisation and financial deepening influences were investigated further by extending the LCM to include these variables. This approach is similar to the approach adopted by Jongwanich (2010) as well as Ang and Sen (2011). Additionally, based on the suggested significant impact of financial liberalisation on household debt, this relationship was also tested together with financial deepening.

In summary, this paper sought to add to the body of knowledge regarding determinants of household savings in the following respects:

- (i) the study analyses South African household savings specifically;
- (ii) the dependent variable is household savings instead of private savings, which has been used widely in existing studies on savings;
- (iii) data used related to the period between 1994 and 2013, which is more recent than existing South African studies;
- (iv) the youth and elderly dependency ratios were examined as part of the standard variables of the Life Cycle Model;
- (v) financial liberalisation and financial deepening variables were added to the standard Life Cycle Model for investigation;

- (vi) the impact of financial liberalisation on household debt levels was examined; and
- (vii) the impact of financial deepening on household debt levels was examined.

CHAPTER 3: RESEARCH HYPOTHESES

Chapter 2 provided the platform upon which the relationship between household savings and the effects of age dependency and financial developments can be investigated. These variables were tested using research hypotheses as formulated in this chapter. Additionally, the impact of financial developments on household debt was examined through research hypotheses five and six listed below.

3.1 Hypothesis 1

The first research objective sought to determine whether a relationship exists between youth dependency and the household savings rate. According to the Life Cycle Hypothesis and related theories discussed in Chapter 2, the youth dependency ratio was expected to negatively affect the household savings rate.

Null hypothesis: There is no relationship between youth dependency and the household savings rate. Alternative hypothesis: There is a negative relationship between youth dependency and the household savings rate.

$$H1_0: r = 0$$

$$H1_A: r < 0$$

3.2 Hypothesis 2

The second research objective pursued whether there exists a relationship between elderly dependency and the household savings rate. According to the Life Cycle Hypothesis and the related theory that was described in Chapter 2, the elderly dependency ratio was expected to negatively affect the household savings rate.

Null hypothesis: There is no relationship between elderly dependency and the household savings rate.

Alternative hypothesis: There is a negative relationship between elderly dependency and the household savings rate.

H₂₀: $r = 0$

H_{2A}: $r < 0$

3.3 Hypothesis 3

The third research objective was to determine whether there is a relationship between financial liberalisation and the household savings rate. According to the theory postulated in Chapter 2, financial liberalisation has had contrasting effects with some studies demonstrating negative results whilst in some cases positive outcomes have been observed.

Null hypothesis: There is no relationship between financial liberalisation and the household savings rate.

Alternative hypothesis: There is a relationship between financial liberalisation and the household savings rate.

H₃₀: $r = 0$

H_{3A}: $r \neq 0$

3.4 Hypothesis 4

The fourth research objective determined whether there exists a relationship between financial deepening and the household savings rate. According to the theory that was reviewed in Chapter 2, financial deepening has had contrasting effects with some studies displaying negative results whilst in some cases positive outcomes have been observed.

Null hypothesis: There is no relationship between financial deepening and the household savings rate.

Alternative hypothesis: There is a positive relationship between financial deepening and the household savings rate.

$H_{4_0}: r = 0$

$H_{4_A}: r <> 0$

3.5 Hypothesis 5

The fifth research objective sought to determine whether there is a relationship between financial liberalisation and the household debt ratio. According to the theory reviewed in Chapter 2, financial liberalisation has been related to higher household debt levels.

Null hypothesis: There is no relationship between financial liberalisation and the household debt ratio.

Alternative hypothesis: There is a positive relationship between financial liberalisation and the household debt ratio.

$H_{5_0}: r = 0$

$H_{5_A}: r > 0$

3.6 Hypothesis 6

The last research objective attempted to determine whether there is a relationship between financial deepening and the household debt ratio. According to the theory provided in Chapter 2, financial deepening has been connected to higher household debt levels.

Null hypothesis: There is no relationship between financial deepening and the household debt ratio.

Alternative hypothesis: There is a positive relationship between financial deepening and the household debt ratio.

$H_{6_0}: r = 0$

$H_{6_A}: r > 0$

CHAPTER 4: RESEARCH METHODOLOGY

4.1 Introduction to the Research Methodology

The aim of the study was to examine the impact of several variables on the household savings rate and the household debt ratio. Harjes and Ricci (2005) stated that no model has successfully encompassed the complexity of factors that influence savings and consumption, hence most empirical studies on saving include variables appearing in various theoretical contributions as determinants, rather than choosing one specific model of saving as a benchmark. It is from this premise that numerous variables were collected based on numerous studies and theories in order to test their impact on household savings.

Household Savings Equation

The Life Cycle Model approach was selected as the analytical framework to study household savings behaviour. Hypotheses one to four are determined by the variables that are presented in this section. The standard LCM model was adjusted to incorporate financial liberalisation and financial deepening as additional variables.

The following empirical savings equation ensued when the standard LCM variables were incorporated with the additional variables (Jongwanich, 2010):

$$S = f(GY, Y, r, YD, OD, FDN, FR)$$

S is the household savings rate for South Africa, determined as the ratio of household savings proportionate to household disposable income (Jongwanich, 2010).

Since the Life Cycle Model predicts that the household savings rate is a function of the growth rate of per capita income and age structure (Horioka & Wan, 2007) as well as real interest rate (Jongwanich, 2010), the following explanatory variables apply:

Y is real per capita household disposable income and GY is income growth rate defined as the real rate of growth of household disposable income (Horioka & Wan, 2007; Jongwanich, 2010). The variable r is the interest rate is represented by the real interest rate on bank deposits (Jongwanich, 2010).

The above listed LCM variables were not tested in the VECM model used in this study because Simleit, Keeton and Botha (2011) studied the impact of these variables on household savings using the VECM approach. These results were referred to as part of the literature review in Chapter 2.

YD is the young dependency rate defined as the ratio of the population aged between 0 and 14 years proportionate to the population aged between 15 and 64 years (Horioka & Wan, 2007; Jongwanich, 2010);

OD is the elderly dependency rate defined as the ratio of the population aged 65 years or older proportionate to the population aged between 15 and 64 years (Horioka & Wan, 2007; Jongwanich, 2010);

FDN represents financial deepening. The following variable measured financial deepening: HCG being the ratio of household credit proportionate to gross national disposable income (Jongwanich, 2010);

FR represents financial liberalisation. The measure for financial liberalisation is referred to as FR in this study. Measuring financial liberalisation is a difficult task (Hermes & Lensink, 2005). To attest to this, Fowowe (2008) stated that several studies have used the financial deepening indicator as a proxy for financial liberalisation but this practice is criticised for not capturing financial policy impacts. Simleit, Keeton and Botha (2011) mentioned the absence of a meaningful financial liberalisation measure and explained this as the reason why the variable was excluded in their study and consequently cited it as an area for future research.

To address this challenge a measure advanced by Ang (2010) was used. This measure considers the joint impact of various financial sector policies including statutory reserve requirements, capital liquidity requirements, directed credit programmes and interest rate controls imposed on the financial systems for the respective country being investigated (Ang & Sen, 2011).

Reserve and capital liquidity requirements are the sum of the minimum capital adequacy ratio and the minimum liquidity ratio (Ang, 2010). The indicator for interest rate restraint is constructed using a method of principal component analysis with six interest control variables (Ang, 2010). Directed credit controls are measured by the percentage share of directed lending proportionate to total lending (Ang, 2010).

Ang and Sen (2011) stated that principally, these financial policy variables can be individually used in assessing the effectiveness of each policy on the financial system, however they are typically reduced to just one financial liberalisation index reflecting their joint influence (Ang & Sen, 2011). Consistent with the sentiments of Ang and Sen (2011), a summary measure was used to investigate the impact of financial liberalisation to the promotion of saving (Ang & Sen, 2011).

The final household savings equation relevant for this study was thus as follows:

$$S = f(YD, OD, FDN, FR) \quad \text{Equation (1)}$$

Household Debt Equation

Hypotheses 4 and 5 were calculated by the variables provided in this section. The following empirical specification was adopted to characterise the causal relationship between household debt levels and the impact of certain financial sector developments:

$$D = f(FR, FDN, FB) \quad \text{Equation (2)}$$

D is the household debt ratio for South Africa determined as the ratio of household debt proportionate to household disposable income (Prinsloo, 2000).

Chapter 1 introduced the suggested inverse relationship between household debt and household savings (Prinsloo, 2002; Romm, 2005). Chapter 2 discussed the possible relationship between the household debt ratio and financial liberalisation together with financial deepening Harjes and Ricci (2005); Engelbrecht (2009). The following explanatory variables were used.

FR represents the financial liberalisation index determined in the same manner as for the preceding savings function.

FDN refers to financial deepening. The following variables were used to measure financial deepening:

FLP is measured by the ratio of M2 (stock of broad money) proportionate to GDP (Ang & McKibbin, 2007; Edwards, 1995; Loayza, Schmidt-Hebbel, & Serven, 2000). The ratio of M2 stock proportionate to GDP is traditionally regarded as a proxy for the depth and sophistication of the financial system (Edwards, 1995). This financial deepening indicator is used to measure financial development in prior studies (Loayza, Schmidt-Hebbel, & Serven, 2000).

FB denotes the financial breadth proxied by banking density (Banks), and is represented by total bank branches in a financial system (Ang, 2010). The use of a banking density indicator is advantageous in that it captures the breadth of a financial system, which reflects access to finance whereas other indicators reflect depth (Ang, 2010). Bank branch data was not obtained for South Africa for periods before 2004. For this study, the measure used was therefore the number of local registered banks in addition to foreign banks with local offices

4.2 Research Design

Saunders and Lewis (2012) defined explanatory studies as those that take descriptive research a stage further by analysing data to retrieve an explanation behind a particular occurrence through the discovery of causal relationships between fundamental variables.

This study was causal in nature and made use of secondary quantitative data aimed at examining the following relationships:

- The household savings rate as the dependent variable with individual independent variables.
- The household debt ratio as the dependent variable with individual independent variables.

4.3 Method of Analysis

The research took the following stages to analyse data that was collected:

1. Annual closing values for all variables were obtained for the period from 1994 to 2013.
2. Statistical analysis was performed to determine the relationships between the two dependent variables selected and individual independent variables.

Two models were constructed. One was for South African household savings and the other for South African household debt by applying the Vector Error Correction Model (VECM). Time series data from the beginning of 1994 to the end of 2013 was applied for the analysis using the EViews statistical software.

4.4 Unit of Analysis

The unit of analysis describes the objects researched and the level at which the research is conducted (Blumberg, Cooper, & Schindler, 2008). The units of analysis for this study were the South African household savings rates and the household debt ratio as published by the South African Reserve Bank for the annual periods starting on January 1994 and ending on December 2013.

4.5 Population of relevance

A population is the total collection of components for which inferences are intended to be made (Blumberg, Cooper, & Schindler, 2008). Individual South African household savings were aggregated to determine the South African household savings rate. The same approach was applied to the household debt ratio. The population consisted of South African households whose savings and debts were included in the calculation of the household savings rate and household debt ratio respectively by the South African Reserve Bank for the periods investigated in this study.

4.6 Sampling Method and Size

The sampling frame of the study constituted all the households included in the household savings rate and debt ratio. The sample size was the number of households used in the computation of the household savings rate and debt ratio for the period from January 1994 to December 2013. Individual households included in the household savings and debt ratio during the aforementioned 20-year period, which acted as sampling elements. Saunders and Lewis (2012) defined a purposive sample as a type of non-probability sampling in which the researcher's judgment is used to select the sample members based on a range of possible reasons and grounds. This study's sample had to conform to the criterion of being included in the household savings rate or debt ratio of South Africa. The purposive sampling technique was used in this study because it was best able to answer the research objectives of the study (Saunders & Lewis, 2012).

4.7 Data Collection

4.7.1 Hypothesis 1 and Hypothesis 2

South African population age data was collected as follows:

Statistics South Africa (StatsSA)

StatsSA provided population data by age for the censuses that were taken in 1996, 2001 and 2011. For non-census periods, StatsSA provided mid-year population estimates from 2002 to 2013. StatsSA could not provide mid-year population estimates prior to the 2001 census. Statistics for census periods were included in the population estimates provided. During the data analysis, differences averaging four% were noticed between the census population data and the population estimates spreadsheet provided by StatsSA for the period between 2001 and 2011. StatsSA provided the following reasons for the discrepancy:

StatsSA Census Data Characteristics:

- A census is a data collection exercise that takes place at one point in time being what is referred to as a cross-sectional study.
- Its advantage is that it allows analysis covering many variables and enables the researcher to create inferences around the relationships between these variables. Being a cross-sectional study it is subject to a set of common biases that the questionnaire or fieldworkers might bring into the picture.
- A major advantage of a census is its ability to drill down to small geographic areas but at the same time its disadvantage is that it does not provide consistent longitudinal indicators.

StatsSA Population Estimates Characteristics:

- A population estimate on the other hand uses the latest demographic data to create a set of assumptions in order to update population numbers to the current year and to adjust preceding years' estimates so that they are consistent with the most recent data-driven assumptions.

- It is not unusual that the age structure from an estimate and census differs, and likewise matching numbers from a census with an estimate based on recent data is not something feasible in scholarly terms.
 - Notwithstanding the time lag, estimates also take into account the impact of HIV as well as of demographic indicators over time.
- (viii) StatsSA recommended that where population numbers alone are what are being considered in a time series, the use of estimates is appropriate. However, when analysing relationships between variables (other than age group and sex) at one point in time, a census is the tool that should be used.

United Nations

In order to close the gap in the missing data provided by StatsSA, population age estimates were obtained from the United Nations. The United Nations data website publishes population statistics including population estimates for non-census years for different countries. The data collected from the United Nations website was for the years 1994, 1995, 1997, 1998, 1999 and 2000.

United Nations Population Estimates Characteristics:

- Population estimates for South Africa are produced by a 5x5 cohort component method. Input parameters for the cohort component method are estimates of the abridged life tables for five-year life tables incorporating the effect of the HIV/AIDS epidemic, five-year estimates of age-specific fertility and migration estimates. The quality of the population estimates depends on the quality of each of the components.
- The resulting 5x5 population estimates are compared with population enumerated in the South African censuses. Empirical estimates of quality of census enumerations from the post-enumeration surveys are incorporated as well.

- The data for single calendar years and single age groups are produced by the interpolation from 5x5 data.

The data collected from the aforementioned sources was divided into three age categories (Jongwanich, 2010) being:

Young age = 0-14 years;

Working age = 15 to 64 years; and

Old age = 65 years and older.

4.7.2 Hypothesis 3

Consistent with Ang and Sen (2011), the following South African data starting from 1994 to 2013 was searched for this hypothesis:

- a) statutory reserve requirements;
- b) capital liquidity requirements;
- c) directed credit programmes; and
- d) interest rate controls in the form of:
 - deposit rate ceiling;
 - deposit rate floor;
 - fixed deposit rate;
 - fixed lending rate;
 - lending rate ceiling; and
 - lending rate floor.

Since the beginning of financial liberalisation in the early 1980s, South Africa removed credit ceilings and interest rate controls (Muellbauer & Aron, 2000). South Africa does not have legislation aimed at directing private sector financial institutions to provide capital to specific sectors of the economy or community (Schoombee, 2000). Minimum statutory ratios

imposed on banks were extracted from the South African Reserve Bank's annual banking supervision reports.

The South African Reserve Bank supervises statutory reserve requirements and capital liquidity requirements by monitoring the liquidity and capital adequacy ratios of banks that operate in South Africa's financial sector. The minimum capital requirement is based on a bank's total risk weighted assets to provide a cushion for depositors and providers of loan finance against losses that a bank might incur (SARB, 1994). The minimum liquidity requirement is based on a bank's total liabilities less capital and reserves in order to manage expected future cash flows (SARB, 1994).

The data search for financial regulation indicators in order to construct the financial liberalisation index yielded the following results:

- (i) The statutory reserve requirement for South Africa is in the form of the minimum statutory capital adequacy ratio. Annual banking supervision reports were obtained for each year starting in 1994 and concluding in 2013. This percentage was extracted from these banking supervision reports.
- (ii) The capital liquidity requirement for South Africa is in the form of the minimum statutory liquidity ratio. Annual banking supervision reports were obtained for each year starting in 1994 and concluding in 2013. This percentage was extracted from these banking supervision reports.
- (iii) In addition d) were captured as zero because the move towards financial liberalisation by South Africa starting in 1980 meant that interest rate restraints and directed credit programmes were removed from the country's financial sector (Table 1). These variables were therefore absent from South Africa's financial regulatory system as at research date.
- (iv) A financial liberalisation index was thus computed by adding the available two primary components a) and b). The inverse of this summary measure is inferred to be the extent of financial liberalisation in a system (Ang & McKibbin, 2007).

Therefore the lower the value for financial repression is, the more financially liberalised a financial system can be considered to be.

4.7.3 Hypothesis 4

Data to test financial deepening was collected as follows:

Annual index data from 1994 to 2013 was obtained from the South African Reserve Bank online statistics database as follows:

GNDI is the ratio of household debt to gross national disposable income which was derived by dividing household debt with gross national disposable income figures obtained from the South African Reserve Bank.

4.7.4 Hypothesis 5

Data to test financial liberalisation was collected as follows:

FR is the financial liberalisation index (FR) for which data obtained in Hypothesis 3 applies.

4.7.5 Hypothesis 6

Data to test financial deepening was collected as follows:

Annual index data from 1994 to 2013 was obtained from the South African Reserve Bank online statistics database as follows:

The M2 to GDP variable was obtained from the South African Reserve Bank's online statistics database annual index.

FB relates to data for locally registered banks and foreign banks with local offices. It was obtained from the South African Reserve Bank's annual banking supervision reports. Attempts were made to collect bank branch numbers on an annual basis however, bank

branch data could not be found for periods earlier than 2004 thus not being sufficient for the inclusion in this time series study. The proxy of locally registered banks and foreign banks with local offices was used as a result.

4.7.6 Other Data Variables

Annual index data from 1994 to 2013 was obtained from the South African Reserve Bank online statistics database for the following variables:

S = Household savings rate

D = Household debt ratio

4.8 Data Analysis

Saunders and Lewis (2012) defined a longitudinal study as the study of a particular subject over an extended period of time. The study contained variables that were studied at equally spaced points over a 20-year period and hence constituted a longitudinal study. The study traced the relationship between variables. The South African household savings rate and the household debt ratio were the two dependent variables examined.

The following data analysis procedure was used for all hypotheses that were tested:

All data collected was tabulated in Microsoft Excel 2010. Thereafter the data was exported to EViews statistical software. This was followed by the statistical tests described below in order to obtain meaningful results regarding the relationships between the variables selected.

Error Correction Models (ECMs) are a category of multiple time series models that directly estimate the speed at which a dependent variable returns to equilibrium after a change in an independent variable. ECMs are useful models when dealing with cointegrated data, but can also be used with stationary data. The Johansen cointegration test can be used where there are more than two variables in a model because there is a possibility of

having more than one cointegrating vector. When cointegration is proven to exist, the VECM can be estimated. (Asteriou & Hall, 2007; Gujarati, 2003). A cointegration test is a prerequisite for determining whether to perform a standard VAR or VECM in studying variables. If cointegration is found among variables, a long-run relationship is implied to exist and thereby granger causality among them in at least one direction (Meniago, Mukuddem-Petersen, Petersen, & Mongale 2013). The data analysis process followed is similar to that of Meniago, Mukuddem-Petersen, Petersen and Mongale (2013) depicted by Appendix 1.

Step 1: Unit root tests

Before VECM estimation was done, cointegration between variables had to be first established. Cointegration between variables was established by making use of unit root tests. The unit root tests revealed the integration order $I(?)$ of the variables. If variables produced residuals that were $I(0)$ at level, it indicated that those variables have a long-term relationship i.e. they move together in the long-term period. To test for integration order of the variables we made use of the Augmented Dickey Fuller (ADF) unit root test. This is consistent with the standard practice in time series econometrics, the time series property of data was tested at the inception of analysis using the Augmented Dickey–Fuller (ADF) test (Jongwanich, 2010). Previous studies done by authors Simleit, Keeton and Botha (2011), as well as Ang and Sen (2011) used ADF test for unit roots in their time series data. The ADF unit root test was computed to establish if the time series variables are integrated in the same order by testing the following three equations:

$$X_t = B_1 + dX_{t-1} + a_i + e_t \quad \text{Intercept only} \quad (3)$$

$$X_t = B_1 + B_{2t} + dX_{t-1} + a_i + e_t \quad \text{Intercept and trend} \quad (4)$$

$$X_t = dX_{t-1} + a_i + e_t \quad \text{No trend, No intercept} \quad (5)$$

Where, X_t is the time series.

Equation (3) was the equation of the ADF test for the intercept only. Equation (4) was the equation of the ADF test for the trend and intercept. Equation (5) represented the ADF test for no trend; no intercept (none of the deterministic components). The tests analysed the null hypothesis that X_t has a unit root (non-stationary) against the alternative hypothesis that X_t does not have a unit root (stationary). The null hypothesis was rejected if the absolute value of the test statistic was greater than the absolute value of the critical value at a 5% significance level. Where variables tested did not have a unit root (stationary) at level then it was integrated to order $I(0)$ and where the variable tested did not have a unit root at first difference then it was integrated to order $I(1)$ and the 2nd difference would be $I(2)$ and 3rd difference would be $I(3)$. Some variables tested showed $I(0)$ while some had a $I(1)$ result therefore the presence of cointegration was suspected for both functions being tested. The presence of a long-run equilibrium relationship among economic variables is considered possible where there is cointegration.

Step 2: Lag Length Structure

Prior to the determination of cointegration among variables, the appropriate lag structure was chosen by estimating a VAR model for both the household savings equation and the household debt equation with HHS and FD_3 (household debt) as the endogenous variables respectively. All other variables were exogenous variables. Consistent with Meniago, Mukuddem-Petersen, Petersen and Mongale (2013), the estimation of the appropriate lag length was based on different information criteria namely AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion. Based on the results, the appropriate lag structure for modelling the equations was determined.

Descriptive Statistics for Equations 1 and 2 were performed on the variables to determine their skewness, kurtosis value as well as the Jarque–Bera test for normality of the distribution of the variables.

Step 3: Johansen Test for Cointegration

The Johansen cointegration test was chosen as the suitable test to use because of its proven ability to deal with multivariate time series data (Meniago, Mukuddem-Petersen, Petersen, & Mongale, 2013). The Johansen Test for Cointegration was done using the variable group, HHS, YD, OD, HCG and FR as variables of interest for Household Savings (Equation 1) and variables FD_3, FLP, BANKS and FR for Household Debt (Equation 2). According to Meniago, Mukuddem-Petersen, Petersen and Mongale (2013), by employing the Johansen cointegration test, both the trace and the max-eigenvalue tests are used to see the number of cointegration equations that exist among variables. The null hypotheses of none cointegration, at most 1 cointegration equation, at most 2 cointegration equation, at most 3 cointegration equation and at most 4 cointegration equations were rejected if both the trace statistic and max-eigen statistic were greater than the 5% critical value or the 1% critical value

Step 4: VECM estimation

After the Johansen's test proved the existence of a long-run relationship between variables, the VECM was estimated using the lag length specifications from Step 2. The VECM models were estimated using one lag specification and two cointegration equations according to the Max-eigen statistic test. Two VECM models were estimated with the dependent variables HHS for household savings and FD_3 for household debt.

Step 5: Stability of the model

The stability of the two models was tested as follows:

- The LM test for serial autocorrelation
- The Normality hypothesis
- Heteroscedasticity test

The null hypothesis test was done at 0.05 significance level.

Table 2: A description of the abbreviations for the variables used in the VECM estimation for Household Savings

Variable	Label/Description
YD	Young Dependency to working age population
OD	Elderly Dependency to working age population
HCG	Household Credit/ GNDI
FR	Financial Regulation Index
HHS	Household Savings Rate

Table 3: A description of the abbreviations for the variables used in the VECM estimation for Household Debt

Variable	Label/Description
FD_3	Household Debt to Disposable income of households
FLP	M2 over GDP
FR	Financial Regulation Index
Banks	Number of locally registered banks and foreign banks with local offices

4.9 Research Limitations

The research had the following limitations:

- Only the South African household savings and debt rates were analysed therefore the results may not be applicable to other economies.
- Only household savings and household debt were analysed, therefore the results may not be applicable to government savings/debt and corporate savings/debt behaviour.
- Other than what was covered in Chapter 2, the research study did not consider the impact of additional factors that may have an influence on the household savings and household debt rates.
- The research study investigated the period starting in 1994 and ending in 2013, meaning that where there are longer-term relationships, the research study did not allow for a reflection of the relationships between the variables over a longer period.
- The research study analysed the overall household savings and debt rate and as such, different household demographics and income groups may yield different distinctive household saving and debt behaviours that were not displayed by the results of this research study.
- Only the households accounted for in the South African Reserve Bank's statistics were represented in this study, unrecorded and/or informal household savings and debt were therefore automatically excluded.

CHAPTER 5: RESULTS

5.1 Introduction

The results of the analysis undertaken on the research hypotheses listed in Chapter 3 are presented in this part of the paper following the analysis method described in Chapter 4. The outcomes of the statistical analysis are revealed and followed by a conclusion of whether the null hypothesis is rejected or not. A detailed discussion of the results is done in Chapter 6. The results firstly present the preliminary tests applicable as a prerequisite to performing the VECM. This is followed by a presentation of the VECM results in the same order as the hypotheses in Chapter 3.

Step 1: Unit Root tests results

The null hypothesis was that a certain variable (X_t) has a unit root (not stationary). The alternative hypothesis would be accepted if the ADF test statistic p-value was less than 0.05 and the conclusion reached would be that X_t does not have a unit root and is stationary. If the variable tested does not have a unit root (stationary) then it is integrated to order $I(0)$. If the variable tested does not have a unit root at first difference then it was integrated to order $I(1)$; the second difference would be $I(2)$ and the third difference would be $I(3)$. Results of the ADF test are displayed in Table 4 and Table 5. According to the ADF results, some variables showed $I(0)$ while some had a $I(1)$ result therefore the presence of cointegration is suspected for both the equations being tested.

Table 4: ADF test statistic P-value report for Household Savings Model

ADF test statistic P-value report

Variable	Level of Test	Model	Number of lags	P-value	Reject/Accept Null hypothesis	Integration order
YD	Level	none	1	0.0651	accept	I(1)
		trend and intercept	1	0.2354	accept	
		intercept	1	0.4245	accept	
	1st difference	none	1	0.0002	reject	
		trend and intercept	1	0.0063	reject	
		intercept	1	0.0012	reject	
OD	Level	none	1	0.8732	accept	I(0)
		trend and intercept	1	0.02	reject	
		intercept	1	0.2114	accept	
	1st difference	none	1	0.0000	reject	I(1)
		trend and intercept	1	0.0004	reject	
		intercept	1	0.0000	reject	
HCG	Level	none	1	0.6292	accept	I(1)
		trend and intercept	1	0.1996	accept	
		intercept	1	0.3365	accept	
	1st difference	none	1	0.0432	reject	
		trend and intercept	1	0.6205	accept	
		intercept	1	0.3039	accept	
FR	Level	none	1	0.9354	accept	I(1)
		trend and intercept	1	0.5869	accept	
		intercept	1	0.2076	accept	
	1st difference	none	1	0.0001	reject	
		trend and intercept	1	0.0083	reject	
		intercept	1	0.0018	reject	
HHS	Level	none	1	0.0002	reject	I(0)
		trend and intercept	1	0.4653	accept	
		intercept	1	0.0196	reject	
	1st difference	none	1	0.001	reject	I(1)
		trend and intercept	1	0.0538	reject	
		intercept	1	0.0192	reject	

Table 5: ADF test statistic P-value report for Household Debt Model

Variable	Level of test	Model	Number of lag	P-value	Reject or accept null hypothesis	Integration order	
FD_3	level	none	1	0.596	accept	I(0)	
		trend and intercept	1	0.007	reject		
		intercept	1	0.220	accept		
	1st different	none	1	0.019	reject		I(1)
		trend and intercept	1	0.387	accept		
		intercept	1	0.155	accept		
FLP	level	none	1	0.848	accept	I(1)	
		trend and intercept	1	0.621	accept		
		intercept	1	0.246	accept		
	1st different	none	0	0.016	reject		
		trend and intercept	0	0.164	accept		
		intercept	0	0.106	accept		
FR	level	none	0	0.935	accept	I(1)	
		trend and intercept	0	0.587	accept		
		intercept	0	0.208	accept		
	1st different	none	0	0.000	reject		
		trend and intercept	0	0.008	reject		
		intercept	0	0.002	reject		
Banks	level	none	1	0.382	accept	I(1)	
		trend and intercept	1	0.111	accept		
		intercept	1	0.111	accept		
	1st different	none	0	0.015	reject		
		trend and intercept	0	0.386	accept		
		intercept	0	0.132	accept		

Step 2: Lag Length Structure

Lag length estimations were performed by estimating a VAR model with HHS and FD_3 as the endogenous variables and all the other variables as exogenous variables. The results for the estimation of the appropriate lag length are given in the Table 4 and Table 5 as well as Figure 4 and Figure 5. According to the results in Table 6 and Table 7, the appropriate lag structure for modelling household savings is one and it is two for household debt. Figure 4 and Figure 5 confirmed the appropriateness of the lag structure by the visual demonstration that all the roots are within the circle.

Table 6: Lag Length Structure for household savings

VAR Lag Order Selection Criteria						
Endogenous variables: HHS						
Exogenous variables: C FR HCG OD YD						
Date: 11/07/14 Time: 01:57						
Sample: 1994 2013						
Included observations: 18						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	80.07005	NA*	2.40E-05	-7.896672	-7.451486	-7.835287
1	84.04980	3.537555	1.80E-05*	-8.227755*	-7.733104*	-8.159550*
2	84.73620	0.533868	1.98E-05	-8.192911	-7.648795	-8.117885
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Figure 4: Roots for household savings

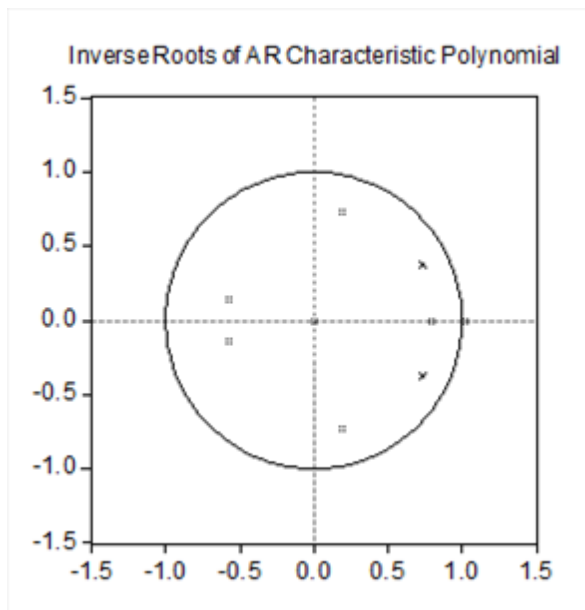
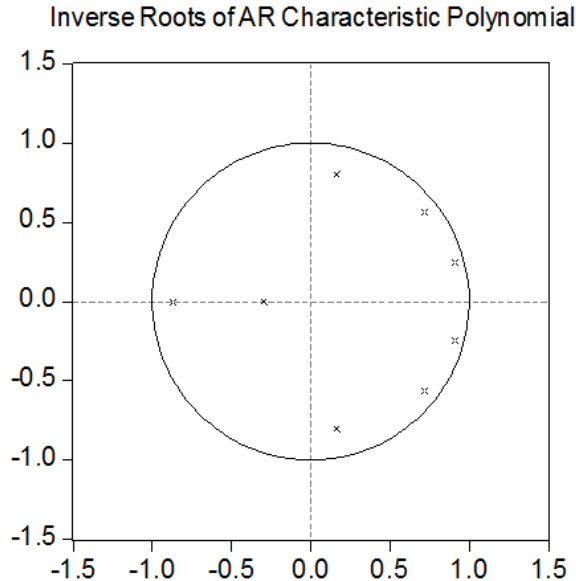


Table 7: Lag Length Structure for household debt

VAR Lag Order Selection Criteria Endogenous variables: FD_3 Exogenous variables: C FLP FR BANKS Date: 11/07/14 Time: 02:01 Sample: 1994 2013 Included observations: 18						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	27.78039	NA	0.004200	-2.642265	-2.444405	-2.614983
1	42.65115	21.47999	0.000906	-4.183461	-3.936136	-4.149358
2	51.68283	12.04223*	0.000375*	-5.075869*	-4.779079*	-5.034946*
* indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level) FPE: Final prediction error AIC: Akaike information criterion SC: Schwarz information criterion HQ: Hannan-Quinn information criterion						

Figure 5: Roots for household debt



The descriptive statistics for the model are shown in Table 8 and Table 9. Results for the household savings model show that all the variables exhibit a positive skewness with values greater than 0 except for FR and OD which indicate a negative skewness. The value of the kurtosis which measures the flatness and peakness of the distribution shows that the variables have values less than 3, except for HHS which indicates a negative skewness; values of 3 indicate normal distribution. The Jarque–Bera test which is used to test whether the variables follow a normal distribution reveals that at the 5% significance level, all the variables show a normal distribution.

Table 8: Descriptive Statistics for household savings

Date: 11/07/14 Time: 02:50	FR	HCG	HHS	OD	YD
Mean	0.142500	0.377434	0.006708	0.070555	0.527035
Median	0.150000	0.365475	0.005077	0.074459	0.527563
Maximum	0.150000	0.463741	0.041340	0.083753	0.611248
Minimum	0.120000	0.293374	-0.012283	0.053977	0.445371
Std. Dev.	0.010699	0.051112	0.013730	0.010927	0.041695
Skewness	-0.777061	0.099826	0.677074	-0.569035	0.052845
Kurtosis	1.876734	1.768425	3.181492	1.681596	2.629050
Jarque-Bera	3.064186	1.297198	1.555545	2.527829	0.123979
Probability	0.216083	0.522778	0.459428	0.282546	0.939893
Sum	2.850000	7.548681	0.134163	1.411091	10.54070
Sum Sq. Dev.	0.002175	0.049637	0.003582	0.002269	0.033032
Observations	20	20	20	20	20

Results for the household debt model indicate that all the variables exhibit a positive skewness with values greater than 0 except for FLP and FR which indicate a negative skewness. The value of the kurtosis which measures the flatness and peakness of the distribution shows that the variables have values less than 3 except FR which shows a negative skewness. The Jarque–Bera test which is used to test whether the variables

follow a normal distribution reveals that at the 5% significance level, all the variables show forms of normal distribution.

Table 9: Descriptive Statistics for household debt

Date: 11/07/14 Time: 02:51				
Sample: 1994 2013				
	FD_3	FLP	BANKS	FR
Mean	0.660500	0.573064	74.40000	0.142500
Median	0.622000	0.577437	64.00000	0.150000
Maximum	0.824000	0.692558	102.0000	0.150000
Minimum	0.526000	0.447654	57.00000	0.120000
Std. Dev.	0.104625	0.073576	17.34298	0.010699
Skewness	0.305350	-0.065478	0.517825	-0.777061
Kurtosis	1.496844	2.125414	1.546754	1.876734
Jarque-Bera	2.193694	0.651708	2.653746	3.064186
Probability	0.333922	0.721911	0.265306	0.216083
Sum	13.21000	11.46129	1488.000	2.850000
Sum Sq. Dev.	0.207981	0.102856	5714.800	0.002175
Observations	20	20	20	20

Step 3: Johansen Test for Cointegration

For the household savings model, the trace statistic test indicated that there were at least 4 cointegrating equations and the Max-Eigen statistic test suggested that there are at least 2 cointegrating equations (Table 10). The Max-Eigen statistic test of at least 2 cointegrating equations to estimate the VECM was used. For the household debt model, the trace statistic test indicated that there are at least 4 cointegrating equations and the Max-Eigen statistic test suggests that there are at least 4 cointegrating equations (Table 11). The Max-Eigen statistic test of at least 2 and 4 cointegrating equations was used to estimate the VECM.

Table 10: Johansen cointegration test for household savings

Date: 11/07/14 Time: 04:37				
Sample(adjusted): 1996 2013				
Included observations: 18 after adjusting endpoints				
Trend assumption: Linear deterministic trend				
Series: HHS YD OD HCG FR				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.964938	137.6201	68.52	76.07
At most 1 **	0.887723	77.30875	47.21	54.46
At most 2 **	0.687838	37.94658	29.68	35.65
At most 3 *	0.598024	16.99038	15.41	20.04
At most 4	0.032023	0.585853	3.76	6.65
<p>(**) denotes rejection of the hypothesis at the 5%(1%) level Trace test indicates 4 cointegrating equation(s) at the 5% level Trace test indicates 3 cointegrating equation(s) at the 1% level</p>				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.964938	60.31132	33.46	38.77
At most 1 **	0.887723	39.36217	27.07	32.24
At most 2	0.687838	20.95620	20.97	25.52
At most 3 *	0.598024	16.40453	14.07	18.63
At most 4	0.032023	0.585853	3.76	6.65
<p>(**) denotes rejection of the hypothesis at the 5%(1%) level Max-eigenvalue test indicates 2 cointegrating equation(s) at both 5% and 1% levels</p>				

Table 11: Johansen cointegration test for household debt

Date: 11/07/14 Time: 04:00				
Sample(adjusted): 1997 2013				
Included observations: 17 after adjusting endpoints				
Trend assumption: Linear deterministic trend				
Series: FD_3 FLP BANKS FR				
Lags interval (in first differences): 1 to 2				
Unrestricted Cointegration Rank Test				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.975651	132.2322	47.21	54.46
At most 1 **	0.921368	69.07292	29.68	35.65
At most 2 **	0.609370	25.84229	15.41	20.04
At most 3 **	0.440181	9.862400	3.76	6.65
*(**) denotes rejection of the hypothesis at the 5%(1%) level				
Trace test indicates 4 cointegrating equation(s) at both 5% and 1% levels				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.975651	63.15932	27.07	32.24
At most 1 **	0.921368	43.23062	20.97	25.52
At most 2 *	0.609370	15.97989	14.07	18.63
At most 3 **	0.440181	9.862400	3.76	6.65
*(**) denotes rejection of the hypothesis at the 5%(1%) level				
Max-eigenvalue test indicates 4 cointegrating equation(s) at the 5% level				
Max-eigenvalue test indicates 2 cointegrating equation(s) at the 1% level				

According to the Johansen cointegration test we established that there is some long-term relationship between the household savings variables HHS, YD, OD, HCG and FR and the household debt variables FD_3, BANKS, FR and FLP. The Johansen test results showed the presence of cointegration.

Step 4: VECM

The use of the Vector Error Correction Model (VECM) to estimate the long and short-run relationships between variables included in this study was deemed appropriate following the Johansen test outcome. For household savings, the Johansen result reflected the existence of 2 cointegration equations with the dependent variables being HHS and YD. For the purposes of this study, the dependent variable of interest was HHS therefore only this VECM was performed for household savings. A separate VECM was also performed for household debt. The VECM results are displayed Table 12 and Table 13 below. The top part of the table depicts the long-run dynamics between the variable and the error correction (bottom part) of the table depicts the adjustment coefficients or speed of adjustment in the short-run. The results tables are followed by their presentation according to each hypothesis.

Step 5: Stability of the model

The results for the tests performed to verify the stability of the model were good as summarised below. The test results are presented in detail in Appendices 2 to 7.

- LM Test for serial autocorrelation, the null hypothesis was accepted therefore there is no serial autocorrelation.
- The Normality hypothesis was accepted. Therefore residuals are normally distributed.
- No Heteroscedasticity was detected.

The model is stable.

Table 12: VECM results for household savings

Vector Error Correction Estimates					
Date: 11/07/14 Time: 12:54					
Sample(adjusted): 1996 2013					
Included observations: 18 after adjusting endpoints					
Standard errors in () & t-statistics in []					
Cointegrating Eq: CointEq1					
HHS(-1)	1.000000				
YD(-1)	-0.048314 (0.01604) [-3.01203]				
OD(-1)	0.013126 (0.07754) [0.16929]				
HCG(-1)	-0.004105 (0.00952) [-0.43140]				
FR(-1)	1.355036 (0.06932) [19.5474]				
C	-0.173359				
Error Correction:	D(HHS)	D(YD)	D(OD)	D(HCG)	D(FR)
CointEq1	0.010178 (0.17950) [0.05670]	0.831606 (0.90955) [0.91431]	-0.023416 (0.52344) [-0.04473]	3.057610 (0.44202) [6.91738]	-0.276456 (0.27630) [-1.00056]
D(HHS(-1))	0.168445 (0.20400) [0.82572]	0.400795 (1.03366) [0.38774]	-0.295622 (0.59487) [-0.49695]	-2.271785 (0.50234) [-4.52244]	0.145604 (0.31401) [0.46370]
D(YD(-1))	0.050215 (0.05494) [0.91392]	-0.172980 (0.27840) [-0.62133]	-0.081891 (0.16022) [-0.51111]	-0.454989 (0.13530) [-3.36286]	0.009992 (0.08457) [0.11814]
D(OD(-1))	0.149194 (0.11058) [1.34918]	0.649250 (0.56032) [1.15872]	-0.722462 (0.32246) [-2.24045]	-0.574110 (0.27230) [-2.10836]	0.018145 (0.17021) [0.10660]
D(HCG(-1))	-0.096273 (0.05055) [-1.90459]	-0.143246 (0.25613) [-0.55928]	0.003883 (0.14740) [0.02634]	0.081480 (0.12447) [0.65461]	0.001472 (0.07781) [0.01892]
D(FR(-1))	-0.524407 (0.24068) [-2.17883]	0.798117 (1.21954) [0.65444]	0.680098 (0.70185) [0.96901]	-3.445039 (0.59267) [-5.81276]	0.137365 (0.37047) [0.37078]
C	0.000413 (0.00101) [0.40818]	-0.008912 (0.00513) [-1.73814]	0.000115 (0.00295) [0.03908]	0.000575 (0.00249) [0.23089]	0.001279 (0.00156) [0.82137]
R-squared	0.584670	0.464296	0.335295	0.897437	0.139392
Adj. R-squared	0.358127	0.172093	-0.027271	0.841493	-0.330030
Sum sq. resids	0.000137	0.003523	0.001167	0.000832	0.000325
S.E. equation	0.003532	0.017896	0.010299	0.008697	0.005437
F-statistic	2.580833	1.588953	0.924783	16.04178	0.296945
Log likelihood	80.51769	51.30818	61.25347	64.29689	72.75434
Akaike AIC	-8.168632	-4.923131	-6.028164	-6.366321	-7.306038
Schwarz SC	-7.822376	-4.576876	-5.681908	-6.020065	-6.959782
Mean dependent	-0.001486	-0.006959	0.001544	0.003365	0.001111
S.D. dependent	0.004408	0.019669	0.010162	0.021845	0.004714
Determinant Residual Covariance	5.69E-23				

Table 13: VECM results for household debt

Vector Error Correction Estimates				
Date: 11/07/14 Time: 09:38				
Sample(adjusted): 1996 2013				
Included observations: 18 after adjusting endpoints				
Standard errors in () & t-statistics in []				
Cointegrating Eq:		CointEq3		
FD_3(-1)	1.000000			
BANKS(-1)	0.014619 (0.00085) [17.2218]			
FLP(-1)	-1.229453 (0.14585) [-8.42954]			
FR(-1)	23.72232 (1.59107) [14.9097]			
C	-4.449605			
Error Correction:	D(FD_3)	D(BANKS)	D(FLP)	D(FR)
CointEq3	-0.046500 (0.06904) [-0.67350]	-66.00388 (8.87548) [-7.43666]	0.039475 (0.07655) [0.51570]	0.009098 (0.01417) [0.64190]
D(FD_3(-1))	0.803008 (0.26042) [3.08353]	-72.70080 (33.4770) [-2.17167]	0.314442 (0.28872) [1.08908]	0.004641 (0.05346) [0.08681]
D(BANKS(-1))	-0.001078 (0.00082) [-1.32065]	0.471976 (0.10490) [4.49936]	0.000135 (0.00090) [0.14879]	9.76E-05 (0.00017) [0.58257]
D(FLP(-1))	-0.097794 (0.33518) [-0.29177]	76.52614 (43.0873) [1.77607]	0.101281 (0.37161) [0.27255]	-0.079129 (0.06881) [-1.14997]
D(FR(-1))	0.039470 (1.43729) [0.02746]	711.1203 (184.765) [3.84878]	-0.072378 (1.59351) [-0.04542]	-0.161462 (0.29507) [-0.54721]
C	1.44E-05 (0.00641) [0.00225]	-1.739078 (0.82341) [-2.11205]	0.004842 (0.00710) [0.68181]	0.002077 (0.00131) [1.57929]
R-squared	0.686761	0.871197	0.247460	0.227417
Adj. R-squared	0.556245	0.817529	-0.066099	-0.094493
Sum sq. resids	0.006925	114.4416	0.008512	0.000292
S.E. equation	0.024023	3.088171	0.026634	0.004932
F-statistic	5.261884	16.23309	0.789198	0.706461
Log likelihood	45.22569	-42.18813	43.36851	73.72543
Akaike AIC	-4.358410	5.354236	-4.152057	-7.525048
Schwarz SC	-4.061620	5.651027	-3.855266	-7.228257
Mean dependent	0.008833	-1.166667	0.008735	0.001111
S.D. dependent	0.036062	7.229433	0.025795	0.004714
Determinant Residual Covariance	1.17E-11			

5.2 Hypothesis 1: Household Savings and Youth Dependency

The null hypothesis stated that there is no relationship between the household savings rate and youth dependency. The alternative hypothesis stated that there is a negative relationship between the household savings rate and youth dependency. It can be observed from the VECM results displayed in Table 12 that the youth dependency ratio (YD) has a negative impact on household savings in the long-run, with a significant t-statistic greater than 2. If YD increases by 1 unit then HHS would decrease by 0.05 units in the long-run. Based on this outcome, the null hypothesis was rejected and the alternative hypothesis was accepted.

5.3 Hypothesis 2: Household Savings and Elderly Dependency

The null hypothesis stated that there is no relationship between the household savings rate and elderly dependency. The alternative hypothesis stated that there is a negative relationship between the household savings rate and elderly dependency.

It can be observed from the VECM results displayed in Table 12 that the elderly dependency variable (OD) demonstrated a positive impact on household savings in the long-run, with a statistically insignificant t-statistic that is less than 2. OD may not have explanatory power over HHS in the long-run. Based on this outcome, the null hypothesis was accepted and the alternative hypothesis could not be accepted.

5.4 Hypothesis 3: Household Savings and Financial Liberalisation

It can be observed from the VECM results displayed in Table 12 that the financial liberalisation variable (FR) showed a significant t-statistic which is greater than 2 and the coefficient of this variable was positive. This VECM result for FR represents the extent of financial regulation. Financial regulation is a form of financial repression and financial liberalisation is the inverse of this. This therefore suggests that there exists a statistically significant negative relationship between household savings and financial liberalisation in

the long-run. If FR increases by 1 unit then HHS would decrease by 1.4 units in the long run. Based on this outcome, the null hypothesis was rejected and the alternative hypothesis could be accepted.

5.5 Hypothesis 4: Household Savings and Financial Deepening

The null hypothesis stated that there is no relationship between the household savings rate and financial deepening. The alternative hypothesis stated that there is a relationship between the household savings rate and financial deepening.

It can be observed from the VECM results displayed in Table 12 that the financial deepening variable (HCG) demonstrated a negative impact on household savings in the long-run, with a statistically insignificant t-statistic that was less than 2. HCG appears to have weak explanatory power over HHS in the long-run. The results thus reveal that there exists a statistically insignificant negative relationship between household savings and financial deepening in the long-run. Based on this outcome, the null hypothesis was not rejected and the alternative hypothesis could not be accepted.

5.6 Hypothesis 5: Household Debt and Financial Liberalisation

The null hypothesis stated that there is no relationship between the household debt ratio and financial liberalisation. The alternative hypothesis stated that there is a positive relationship between the household debt ratio and financial liberalisation.

It can be observed from the VECM results displayed in Table 13 that the financial liberalisation variable (FR) showed a positive relationship with household debt in the long-run, with a statistically significant t-statistic greater than 2. This VECM result for FR represents the extent of financial regulation. Financial regulation is a form of financial repression and financial liberalisation is the inverse of this. This result suggests a statistically significant negative relationship between household debt and financial liberalisation in the long-run. If FR increases by 1 unit then FD_3 would decrease by 23.7

units in the long-run. Based on this outcome, neither the null hypothesis nor the alternative hypothesis could be accepted. Instead, an unexpected significant negative long-run relationship was found.

5.7 Hypothesis 6: Household Debt and Financial Deepening

The null hypothesis stated that there is no relationship between the household debt ratio and financial deepening. The alternative hypothesis stated that there is a positive relationship between the household debt ratio and financial deepening.

It can be observed from the VECM results displayed in Table 13 that the first financial deepening variable (FLP) showed a significant t-statistic of 8.4 and the coefficient for this variable was negative. This suggests a statistically significant negative relationship between household debt and financial deepening in the long-run. The second financial deepening variable (Banks) had a positive relationship with FD_3 in the long-run, with a statistically significant t-statistic of 17.2. Based on the t-statistic of the Banks variable being significantly higher than the FLP variable outcome, this measure was used to reject the null hypothesis and accept the alternative hypothesis of a positive relationship. If the Banks variable increases by 1 unit then FD_3 would increase by 0.02 units in the long-run.

5.8 Short-run dynamics for the household savings

CointEq1 and CointEq2 represent the speed of adjustment back to equilibrium for each period in the variables. Only negative coefficients with statistically significant t-statistics show adjustment back to equilibrium. The estimated coefficient for HHS implies that about 59% of the disequilibrium is corrected between each year, since the data is annual. That is, from any exogenous shock to the system, 50% adjustment takes place each year for HHS to get back to equilibrium. The null hypothesis of weak exogeneity can be rejected.

5.9 Short-run dynamics for the household debt

CointEq1 represent the speed of adjustment back to equilibrium for each period in the variables. Only negative coefficients with statistically significant t-statistics show adjustment back to equilibrium. The estimated coefficient for FD_3 implies that about 4.7% of the disequilibrium is corrected between each year, since the data is annual. That is, from any exogenous shock to the system, 50% adjustment takes place each year for FD_3 to get back to equilibrium. The null hypothesis of weak exogeneity can be rejected.

5.10 Concluding Remarks on the Results

From the results above, youth dependency and financial liberalisation appear to have explanatory power over household savings in the long-run while elderly dependency and financial deepening yielded weak results for long-run dynamics. Both financial liberalisation and financial deepening appear to have explanatory power over household debt in the long-run.

CHAPTER 6: DISCUSSION OF RESULTS

6.1 Introduction

In this chapter the research findings are discussed. Similar to the format adopted in Chapter 5, the results discussed herein are presented in the order of the research hypotheses listed in Chapter 3. The findings are compared and contrasted to the findings of numerous prior studies conducted in South Africa and other countries across varying periods. Explanations for outcomes between the results of this study and previous literature are deliberated. This is followed by concluding remarks on the result discussed.

6.2 Hypothesis 1: Household Savings and Youth Dependency

The VECM findings presented in Table 12 for this hypothesis (YD) revealed a statistically significant negative relationship between household savings and youth dependency in the long-run. Based on this result the null hypothesis was rejected and the alternative hypothesis of a negative relationship was accepted.

The outcome of this hypothesis test is consistent with the expectations of the LCM, which states that age is an important determinant of household savings (Yuh & Hanna, 2010). The LCM suggests that higher age dependency is expected to increase the consumption burden of households thus reducing savings (Uremadu, 2009). Several authors have found evidence in support of the LCM in their studies in respect of this relationship including Jongwanich (2010). Masson, Bayoumi and Samiei (1998) however alluded that some individual country studies have failed to find supporting results for this variable, probably because of the small variation in demographics over time. To illustrate this conundrum, Horioka and Wan (2007) found mixed results in respect of this relationship, where only one of the four samples tested in their Chinese-based study displayed the expected significant negative relationship. The fact that this study has revealed a significant negative relationship over the 20-year period studied implies that substantial

variations have taken place in the South African demographic landscape. Romm (2005) suggested that the impact of HIV/AIDS caused a shift in demographics in South Africa. As a result of HIV/AIDS-related deaths, the working age group has diminished in size, producing dire consequences for saving rates in the country (Romm, 2005). This pandemic may have intensified the financial burden on the remaining economically active population that has had to support the youth in South Africa, thus explaining the results found.

6.3 Hypothesis 2: Household Savings and Elderly Dependency

The finding presented in Table 12 for this hypothesis (OD) concluded that a statistically insignificant positive relationship was evident between household savings and elderly dependency in the long-run. Based on this result the null hypothesis was not rejected and the alternative hypothesis of a negative relationship was not accepted.

The insignificant outcome of this study contradicts the expectations of the LCM, which states that age is an important determinant of household savings (Yuh & Hanna, 2010). Similarly, the suggestion by Loayza, Schmidt-Hebbel and Serven (2000) that private savings are impacted to a larger extent by elderly dependency compared to youth dependency is opposed. The positive coefficient displayed by the results is a *priori* the expectation of a negative relationship. The common theory in respect of the impact of elderly age dependency on household savings does not appear to hold for South Africa.

Kotze and Smit (2008) revealed that South African individuals currently spend an average of 35 years in retirement compared with 20 years of retirement that was experienced in the 1930s. Longer life expectancy requires individuals to have greater savings for retirement years than previously. Kotze and Smit (2008) observed that a large proportion of South African individuals remained without adequate retirement plans. This is why authors such as Cronje (2009) suggest the introduction of mandatory retirement plans for individuals in order to curb against this financial burden. The positive coefficient of the elderly dependency variable found in this study suggests that an improvement in household

savings rates is occurring as the proportion of the elderly population to the working population increases over the period observed in this study. This is a positive indicator for South Africa because authors such as Edwards (1995) caution that inadequate retirement savings may lead to a greater financial burden on the incomes of working age household members in the future. Similarly, at national level, the national budget is burdened towards social welfare distribution for senior citizens (Ang, 2009). Higher savings levels indicated by this study outcome, albeit insignificant can mitigate the abovementioned risks.

Precautionary saving theory suggests that greater uncertainty is expected to increase the incentive of households to save with the aim of shielding themselves against adverse outcomes (Mody, Ohnsorge, & Sandri, 2012). Mody, Ohnsorge and Sandri (2012) found that aggregate savings increased as a precautionary measure against employment uncertainty and financial wealth losses subsequent to the 2008 global recession. The increase in the life expectancy of South Africans as identified by Kotze and Smit (2008) may have had the impact of raising uncertainty regarding the future for individuals thus prompting precautionary saving. Such saving behaviour would be consistent with Modigliani's PIH theory that individuals operate their savings under the assumption that life is indefinitely long thus encouraging precautionary savings. Because the outcome of this hypothesis was insignificant, it is difficult to conclude the presence of the precautionary saving motive however it remains a possibility that South African households have begun saving more prudently in light of the fact that the retirement lifespan has increased. Another possibility may be that owing to longer life expectancy, individuals are healthier lives and may opt to work for extended years as a result of this increase in lifetime thus explaining the unusual positive coefficient found. This result is inconclusive. The LCM theory in respect of elderly dependency for South Africa was deemed to not hold.

6.4 Hypothesis 3: Household Savings and Financial Liberalisation

The findings demonstrated in Table 12 for this hypothesis (FR) proposed that a statistically significant negative relationship between household savings and financial liberalisation

exists in the long-run. Based on this result the null hypothesis was rejected and the alternative hypothesis of a relationship was accepted.

The negative outcome found in this study is contrary to the proposed positive impacts of financial liberalisation according to its supporters. The proposal by financial liberalisation advocates is that financial liberalisation promotes savings (McKinnon, 1973; Shaw, 1973). Ang and McKibbin (2007) interpret that financial liberalisation introduces policy and regulatory changes that stimulate financial deepening which is supposed to lead to efficient financial markets. Jongwanich (2010) argues that this increases capital liquidity and borrowing opportunities for households which diminish their inclination to save (Jongwanich, 2010). The results found in this research are contrary to financial liberalisation advocates. They are consistent with the views of financial liberalisation critics who state that financial liberalisation negatively affects savings (Romm, 2005). The findings of this study are also similar to those garnered by Ang and Sen (2011) in their study of financial liberalisation impacts on the Indian and Malaysian economies.

Romm (2005) suggests that financial liberalisation heightened since the mid-1990s. Table 1 demonstrates that in 1994, liberalisation policies were revised to permit more foreign capital inflows into South Africa and foreign banks were allowed to open local branches thus increasing capital liquidity (Aron & Muellbauer, 2000; SARB, 1994). This was followed by a policy change in 1995 which permitted households to borrow against their housing facilities as collateral (access bonds) for the first time (Romm, 2005). The abovementioned financial regulation policy changes lead to higher credit availability and ease of access thereto by households. In his study of South African households' indebtedness, Engelbrecht (2009) alluded to the fact that the financial services sector appeared to primarily promote debt products more than savings products. The policy amendments mentioned and the results found in this study appear to support the critical view that financial liberalisation impacts are exhibited in higher debt levels by households which discourages savings instead of encouraging them. An inverse relationship between household debt and household savings is therefore expected (Prinsloo, 2002). The results of this hypothesis will be concluded in Section 6.8 following the results discussion of

hypothesis 5 which tests the relationship between household debt and financial liberalisation. Household borrowing is of importance because as defined by Horioka and Wan (2007), savings are the difference between current income and current consumption. Hypothesis 5 results are supplementary to demonstrating the suggested debt impact on savings.

6.5 Hypothesis 4: Household Savings and Financial Deepening

The findings presented in Table 12 for this hypothesis (HCG) concluded a statistically insignificant negative relationship between household savings and financial deepening in the long-run. Based on this result, the null hypothesis was not rejected and the alternative hypothesis of a relationship could not be accepted.

Theory suggests that financial liberalisation leads to financial deepening which affords better financial intermediation (Uremadu, 2009). Ang and McKibbin (2007, p.217) added to liberalisation theory by stating that “a well-developed financial system channels financial resources to the most productive use”. The negative coefficient result for this hypothesis is inconsistent with financial liberalisation supporters who proposed that liberalisation allows for efficient capital allocation, the allocation of which yields investment gains that translate into savings (McKinnon, 1973; Shaw, 1973). According to Engelbrecht (2009), the objective of the South African government in promoting financial policy liberalisation was for the purpose of job creation through improved access to capital for small businesses. In this context, this negative coefficient implies that increased financial access has allowed credit funding to be applied for purposes that appear to not have yielded investment returns which translate into higher savings. Engelbrecht (2009) observed that households mainly used credit to fund consumption expenditure instead of investment. Evidence from this research supports earlier findings by Harjes and Ricci (2005) who suggest that financial liberalisation and financial deepening negatively affect savings. The negative effect of financial deepening on household savings is evident however the insignificant result for this variable questions its explanatory power over household savings. The insignificant outcome found may indicate that the South African financial industry was not

yet deepened during the 20-year period observed. Financial liberalisation started in 1980 and significant financial inclusion initiatives affecting South African household followed in the 1990s. It could be because of these reasons that the significant effects of financial deepening may exhibit themselves in later periods as the financial system deepens over time.

The effectiveness of financial intermediation in providing productive outlets for savings is of great importance (Hess, 2010). Demand side factors that may deter financial deepening from playing a progressive role in an economy include low levels of financial literacy, lack of economic opportunities and lack of trust in financial institutions by the unbanked and under-banked (Kostov, Arun, & Annim, 2012). Kotze and Smit (2008) add that the financial services industry can be complex and confusing; culminating in the negative effect that uneducated individuals may not be able to make effective financial decisions.

6.6 Hypothesis 5: Household Debt and Financial Liberalisation

The findings delineated in Table 13 for this hypothesis (FR) suggested a statistically significant negative relationship between household debt and financial liberalisation in the long-run. The null hypothesis proposed that there is no relationship between household debt and financial liberalisation while the alternative hypothesis proposed that there is a positive relationship between household debt and financial liberalisation. Based on this result the null hypothesis was rejected and the alternative hypothesis of a positive relationship could also not be accepted. This is because of the unexpected result of a significant negative result found between financial liberalisation and household debt. This outcome is not congruent with the supposed rise in South African household debt levels as a result of financial liberalisation (Romm, 2005; Harjes & Ricci, 2005). This result contradicts the understanding that financial liberalisation encourages borrowing. In hypothesis 3, a negative outcome between household savings and financial liberalisation was accepted based on the reasoning that an inverse relationship between household debt and household savings exists as a result of this FR variable. This outcome is therefore unanticipated.

Based on the method recommended by Ang (2010), certain financial policy changes were considered in the construction of the financial liberalisation variable index while some policies fell outside of the input factors selected (as detailed in Section 4.7). This could mean that the financial liberalisation index used for hypotheses 3 and 5 has underestimated some financial policy advancements not captured as part of the construction of the index. Examples of this would be the effects of financial legislation introduced in more recent years such as the National Credit Act no. 34 of 2005 and Basel developments which have imposed restrictions on South Africa's lending environment. These policy changes were not part of the constructs for building the index measure used to test these hypotheses. With the introduction of the National Credit Act, the South African government began the move against predatory lending, consumer abuses and correcting ineffective legislation (Engelbrecht, 2009). Meniago, Mukuddem-Petersen, Petersen and Mah (2013) suggest that the decline in household debt levels in more recent years may indicate the impact of the National Credit Act on consumption behaviour. Based on these mixed results, it was concluded that the measure used for testing financial liberalisation in this study is not entirely meaningful therefore the results related to this variable are inconclusive.

6.7 Hypothesis 6: Household Debt and Financial Deepening

Two variables were tested for financial deepening. The findings delineated in Table 13 for this hypothesis for breadth (Banks) suggested a statistically significant positive relationship between household debt and financial deepening in the long-run. The Banks indicator of financial deepening showed a greater t-statistic than the depth indicator (FLP) which revealed a contradicting negative result. Banks was chosen as the conclusive indicator over FLP as it displayed a higher t-statistic therefore a stronger causal link.

The null hypothesis proposed that there is no relationship between household debt and financial deepening while the alternative hypothesis proposed that there is a positive relationship between household debt and financial deepening. Based on this result the null hypothesis was rejected and the alternative hypothesis of a positive relationship was

accepted. The conclusion of a positive relationship between household debt and financial deepening in the long-run was reached.

These results are consistent with financial liberalisation theory which is said to promote greater capital movement. According to Chauhan (2012), South Africa has seen a rise in foreign capital inflows since 1994 (Chauhan, 2012). The variable used to measure financial breadth is the number of local and foreign banks with bank branches in South Africa. Ang (2010) states that greater banking density represents more financial institutions that enhance financial inclusiveness thereby promoting credit market access as a result of financial deepening. This greater market access principle holds in this case based on this result. Romm (2005) suggested that increased credit access raises consumption. Meniago, Mukuddem-Petersen, Petersen and Mongale (2013) added that higher household expenditure resulted in higher household debt levels. The conclusion reached is congruent with these views. Credit organisations are regarded as important for economic development and the social welfare of an economy (Meniago, Mukuddem-Petersen, Petersen, & Mah, 2013). The intention of the South African government is to broaden credit access through regulatory amendments to include the low income market in the mainstream economy (Chauhan, 2012).

The result of this hypothesis alone does not prove whether debt accessed by households is used for consumption purposes or for investment purposes. What it does prove is that financial deepening indeed promotes higher household debt levels. These results complement the finding in Hypothesis 4 which suggests that financial deepening negatively affects household savings due to increased debt levels. Credit products appear to be the focus of financial inclusion initiatives more so than savings offerings based on the findings of this hypothesis and hypothesis 4.

6.8 Concluding Remarks on the Results Discussion

A contrasting result was found between the demographic variables youth dependency and elderly dependency. The LCM supposes that the household savings rate is negatively affected by movements in both youth and elderly dependency. Loayza, Schmidt-Hebbel and Serven (2000) also suggest that private savings are impacted to a larger extent by elderly dependency as opposed to youth dependency. The outcomes of this research showed youth dependency as having explanatory power over household savings while elderly dependency yielded weak results. Consistent with the LCM, the youth dependency ratio was significant while the elderly dependency ratio revealed an unexpected positive coefficient result. The impact of the HIV/AIDS endemic was considered to have had a material impact on the negative youth dependency result. Increased life expectancy and the precautionary motive were associated with the unexpected results found for elderly dependency.

Household savings have been found to be negatively impacted by financial liberalisation (Ang & Sen, 2011). This is despite financial liberalisation theorists who promote the benefits of financial liberalisation. The negative effect of financial liberalisation is associated with higher household debt levels. According to Romm (2005) and Engelbrecht (2009), the effects of liberalisation in South Africa have displayed themselves through increased household debt levels and lower household savings. The financial liberalisation variable produced indecisive results. The outcomes of this research showed financial liberalisation as having explanatory power over both household savings and household debt based on significant t-statistics. What was irregular about the results is that financial liberalisation had a negative impact on both the household savings rate and the household debt ratio whereas this relationship is expected to be inversely associated. This irregular outcome was attributed to the measure used for the financial liberalisation index which did not incorporate all factors affecting the South African lending environment. The method used was that of Ang (2010) which takes into account certain policy variables however not all financial policy variables are incorporated into this model. Consequently, these results were deemed inconclusive for both tests.

Financial deepening is the next stage of financial development after financial liberalisation policies are introduced (Uremadu, 2009). Romm (2005) suggested that increased credit access raises consumption thus decreasing savings. Jongwanich (2010) found that the inclination for households to save decreases when credit access improves. Similar to financial liberalisation, an inverse relationship was expected between household savings and household debt in respect of financial deepening. Consistent with the theory above, the outcomes of these dependent variables showed the expected relationship with financial deepening. Although the impact of financial deepening was insignificant on household savings; it had significant explanatory power for household debt levels. The impact of supply side factors such as financial literacy and the fact that banking products appear to be more debt focused than savings focused were associated with the negative outcome of financial deepening on savings as a result of higher debt levels.

CHAPTER 7: CONCLUSION

7.1 Background

High domestic savings have been associated with positive economic development. South Africa has experienced declining savings rates over the past two decades. Of particular concern has been the deteriorating household savings rate. This research study sought to investigate the relationship between household savings and certain variables that are considered to influence saving behaviour.

The long-run impact of demographics and financial development on household savings was examined. Demographic variables comprised of the youth and elderly dependency ratios. Financial development comprised of financial liberalisation policy considerations as well as the consequent effects of financial deepening on household savings. The long-run effects of financial liberalisation and financial deepening were tested on both the household savings rate and the household debt rate. Financial liberalisation was determined by taking into account certain financial policy variables while financial deepening considered the extent of financial depth and financial breadth of the financial system. These variables were tested over the timeline 1994 January to 2013 December.

7.2 Findings

The main aim of this study was to investigate causes of household savings and household debt in South Africa. The Johansen cointegration analysis confirmed that the variables tested all move together in the long-run. The results of the VECM analysis demonstrated that household savings are negatively influenced by youth dependency in the long-run. A 1 unit increase in youth dependency would decrease household savings by 0.05 units in the long-run while elderly dependency showed an insignificant impact in the long-run. Although elderly dependency results were found to be insignificant, the unexpected positive coefficient found surprisingly contradicts the LCM postulation of a negative relationship with

savings. This outcome points towards a possible shift in the manner in which individuals manage their lifetime budget. Secondly, financial deepening was found to encourage household borrowing in the long-run by showing a significant positive outcome between these two variables. An increase by 1 unit in financial deepening would increase household debt by 0.02 units. Complementary to this result was the finding that financial deepening discourages household savings in the long-run albeit insignificant.

Overall this research found that household savings displayed a negative relationship with youth dependency while household debt displayed a positive relationship with financial deepening. These outcomes were both successfully related to LCM theory and prior financial liberalisation literature respectively. On the contrary, results of financial liberalisation policy impacts regarding both household savings and household debt were deemed to be inconclusive

7.3 Concluding Remarks

The youth dependency ratio displayed a negative impact on household savings as postulated by the Life Cycle Model. What appears unusual is the positive outcome of the elderly dependency ratio notwithstanding its insignificance. This result suggests that elderly individuals may have more savings available such that they do not pose the expected financial burden on the working population. This is a positive indicator for South Africa especially because the life expectancy of South African has been said to be increasing according to literature referred to in this research. On this basis it is becoming increasingly important for individuals to prepare their financial plans for a longer retirement period to curb the financial burden of supporting the elderly on the working age population and government.

Critics of financial liberalisation are justified in respect of their position that financial liberalisation increases capital liquidity therefore giving households greater credit access. The results of this study supported this view. As far as household savings are concerned, the results demonstrated that as financial markets deepen, savings decrease albeit

insignificantly. These findings support the authors who propose that poor household savings in South Africa are due to rising household consumption which is supported by debt. In this research, financial deepening has been proven to increase debt levels in the long-run thus discouraging savings.

From the findings, it would also appear that credit accessed by households as a result of financial deepening is applied mostly for consumption purposes instead of investment purposes. This contradicts the objectives of financial liberalisation which were to improve credit access in order to increase investment. Additionally, it seems that financial institutions promote loan services more than savings products in their offerings.

For business and investors, the outcomes of this study reveal the need to offer more savings products to the market instead of debt instruments primarily. It is said in the literature referred to in this study that customers at times find financial products complex to understand and because of not wanting to appear ignorant, individuals at times avoid enquiring further about financial products.

For government, this finding presents an opportunity to review investment incentives for individuals. Policy amendments related to debt affordability assessments done by lenders for individuals can also be considered within this context. This could discourage consumption debt thus leading to higher savings. Because South Africa does not follow a directed credit policy, investment incentives for lenders could assist in reducing consumption debt by channelling more capital towards investment projects in preferred industries. For social workers, increased financial literacy programmes may help improve the understanding of financial savings products by ordinary citizens so that investment begins to gain attractiveness in the financial markets. Business can assist in this role by channelling investment information to their employees more articulately.

7.4 Recommendations

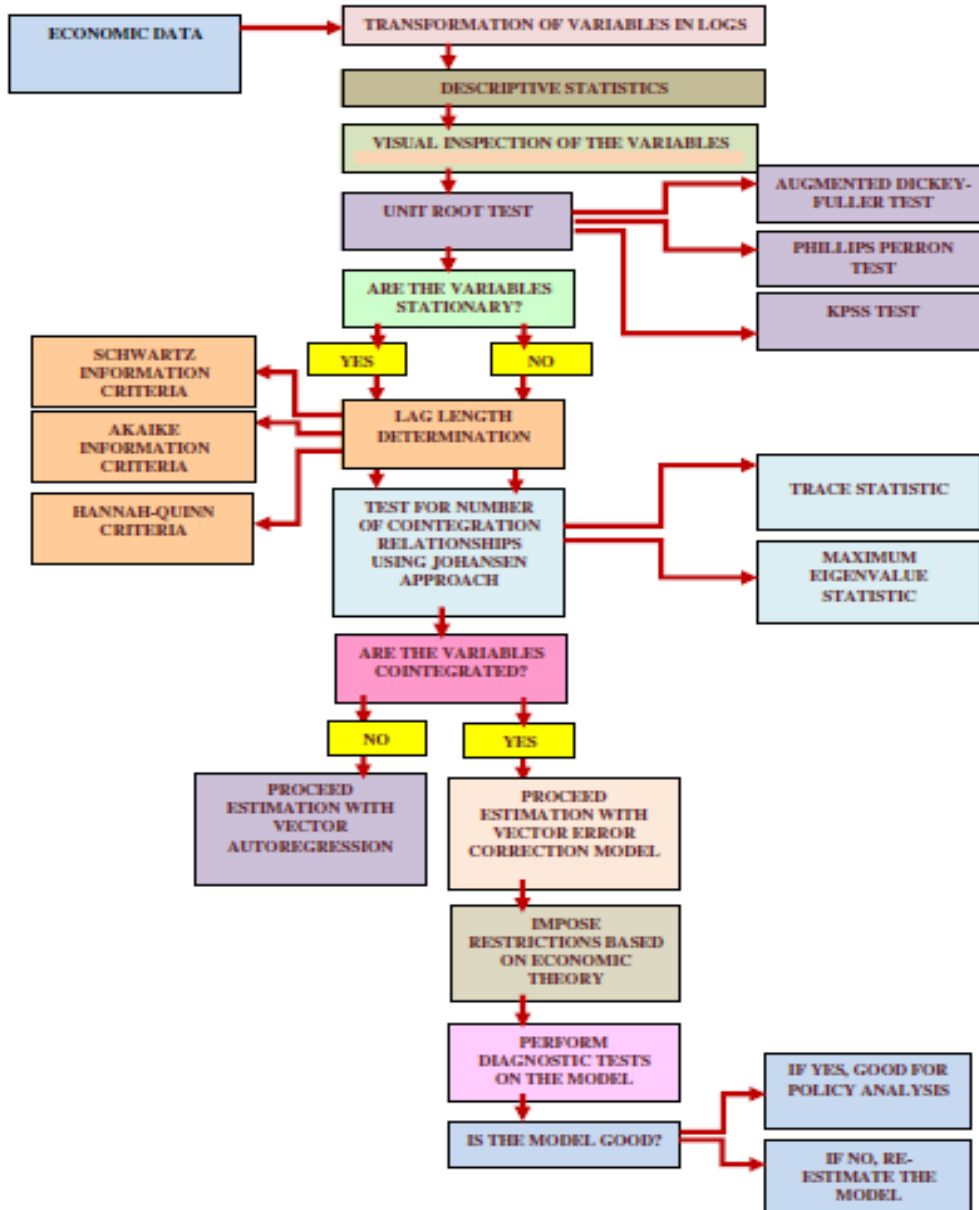
This research study examined the significance of numerous variables on household savings and household debt. Variables studied were demographic and financial in nature. More studies that may enhance and complement the existing body of knowledge in the savings literature and cover unexplored areas are proposed as follows:

- This study examined household savings at a macroeconomic level. It would be insightful to conduct the same study on a different sample based on alternative demographic variables such as rural vs urban households. The sample for such a study could also be categorised according to income groups. This would help in designing more focused savings mobilisation programmes aimed at improving domestic savings. This may prove more effective when the audience for programmes is well-defined.
- This study examined four independent variables, namely youth dependency, elderly dependency, financial liberalisation and financial deepening. Further studies can be performed by using other variables that are suggested to influence household savings behaviour, as detailed in Section 2.3.4 of this research study. The negative relationship Simleit, Keeton and Botha (2011) found between income and household savings in South Africa could be due to the effects of income inequality among individuals. Normally, savings ratios are expected to rise as income levels rise however the potential links of income inequality on savings remain unexplored (Prinsloo, 2000).
- The financial liberalisation index was constructed using the method of Ang (2010). In this study, the results based on this method were not meaningful. Alternative methods by authors such as Demetriades and Luintel (1996, 1997) as well as the method suggested by Abiad and Mody (2005) could be applied to study the relationships between different savings groups and financial liberalisation.

- The relationship between household savings and the variables tested can be performed for other countries for comparative purposes. This may provide insight into the savings behaviour of other economies and their success factors. A research study similar to this that includes developing countries in the rest of Africa would be particularly interesting because changes in financial liberalisation may still be at early stages in some of these economies, thus giving researchers the opportunity to analyse their impact with more lucidity and with recent data. Because the South African financial sector is already well developed, local business may benefit from opportunities identified by studying financial sector developments in other developing economies.

APPENDICES

Appendix 1: VECM Estimation Guideline



Source: Meniago, Mukuddem-Petersen, Petersen, & Mongale (2013)

Appendix 2: LM Autocorrelation test for household savings model

VEC Residual Serial Correlation LM Tests
H0: no serial correlation at lag order h
Date: 11/07/14 Time: 12:56
Sample: 1994 2013
Included observations: 18

Lags	LM-Stat	Prob
1	38.87690	0.0379
2	29.18163	0.2564

Probs from chi-square with 25 df.

Appendix 3: LM Autocorrelation test for household debt model

VEC Residual Serial Correlation LM Tests
H0: no serial correlation at lag order h
Date: 11/07/14 Time: 10:16
Sample: 1994 2013
Included observations: 18

Lags	LM-Stat	Prob
1	24.13551	0.0866
2	14.03554	0.5961

Probs from chi-square with 16 df.

Appendix 4: Normality test for household savings model

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
H0: residuals are multivariate normal
Date: 11/07/14 Time: 13:01
Sample: 1994 2013
Included observations: 18

Component	Jarque-Bera	df	Prob.
1	3.042845	2	0.2184
2	2.434566	2	0.2960
3	1.863169	2	0.3939
4	3.120183	2	0.2101
5	3.621868	2	0.1635
Joint	14.08263	10	0.1693

Appendix 5: Normality test for household debt model

VEC Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
H0: residuals are multivariate normal
Date: 11/07/14 Time: 10:17
Sample: 1994 2013
Included observations: 18

Component	Jarque-Bera	df	Prob.
1	2.977262	2	0.2257
2	3.622947	2	0.1634
3	1.743568	2	0.4182
4	2.472681	2	0.2904
Joint	10.81646	8	0.2123

Appendix 6: Heteroskedasticity tests for household savings model

VEC Residual **Heteroskedasticity Tests**: No Cross Terms (only levels and squares)

Date: 11/07/14 Time: 13:03

Sample: 1994 2013

Included observations: 18

Joint test:

Chi-sq	df	Prob.
188.2471	180	0.3216

Appendix 7: Heteroskedasticity tests for household debt model

VEC Residual Heteroskedasticity Tests: No Cross Terms
(only levels and squares)

Date: 11/07/14 Time: 10:18

Sample: 1994 2013

Included observations: 18

Joint test:

Chi-sq	df	Prob.
88.35273	100	0.7911

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