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# Determinants of household savings and the effect of household savings on the stock market in South Africa and China: a comparative survey

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# DETERMINANTS OF HOUSEHOLD SAVINGS AND THE EFFECT OF HOUSEHOLD SAVINGS ON THE STOCK MARKET IN SOUTH AFRICA AND CHINA

*A COMPARATIVE STUDY*

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**Dissertation submitted to the Faculty of Commerce, Law and Management at the University of the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for a degree of Master of Management in Finance and Investment.**

**June, 2013**

## DECLARATION

I, Franklin Mutyaba declare that the research work reported in this dissertation is wholly my work, except where otherwise indicated and acknowledged. This dissertation has not either in whole or part, been submitted at any other University or institution for degree purposes.

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Franklin Mutyaba

Johannesburg

June 2013

## DEDICATION

To my Sister Catherine Stella and my classmates Hilda and Yvonne

## Abstract

Savings are vital in the functioning of any economy as the level of savings in an economy determines the resources available for investment. If firms plan to invest more than households save in an open economy, resources will have to be borrowed from overseas. Savings flow into the financial system and help provide funds for investment spending by firms. This study draws a comparison between the determinants of household discretionary savings in South Africa and China. This study as well investigates the effect of household savings on the stock market in South Africa and China. Empirical analysis was performed in-order to determine the relationship between household savings and various variables, and the effect of household savings on the stock market. Money and quasi money (M2) is the only significant variable and having a negative relationship with household savings in South Africa yet in China, inertia is present the lagged household saving rate is significant. In-order to figure out the impact of household savings on the stock market, we regressed household savings against stock market capitalization. The regression results revealed significance of the explanatory variable household saving in South Africa and insignificance in China. Household savings have an effect on the level of stock market capitalization in South Africa but not in China.

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## Table of Contents


Chapter 1 ..... 9

1.1 Introduction ..... 9

1.2 Problem Statement ..... 9

1.2 Purpose of the Study ..... 10

1.3 Questions of the Study ..... 11

1.4 Significance of Study ..... 11

1.5 Background Literature ..... 11

1.6 Methodology ..... 13

1.7 Outline of the Study ..... 14

Chapter 2: Literature Review ..... 15

2.1 Introduction ..... 15

2.2. Definition of Household Savings ..... 15

2.3. Theories of Saving. ..... 16

2.3.1 The life-cycle hypothesis ..... 16

2.3.2 The permanent income hypothesis: ..... 16

2.3.3. The relative income hypothesis ..... 16

2.4. Why do households save? ..... 17

2.5. The importance of household savings for an economy. ..... 18

2.5.1. Mechanism of an open economy and savings ..... 19

2.6. The Trend of Savings in South Africa. ..... 20

2.6.1. An overview of Household Savings in South Africa. ..... 23

2.6.2. Specific determinants of Household Savings in South Africa. ..... 25

2.7. The Trend of Savings in China. ..... 31

2.7.1. An overview of household savings in China ..... 32

2.7.2. Specific Determinants of Household Savings in China ..... 33

2.8. The Impact of Household Savings on Capital Markets ..... 38

2.9. Conclusion ..... 41

Chapter 3: Discussion ..... 42

3.1 Introduction ..... 42

3.2Discussion on South Africa ..... 42

3.3Discussion on China ..... 45

3.4 Conclusion ..... 47

Chapter 4: Data and Empirical Analysis....48
4.1. Introduction....48
4.2 Data....48
4.3. Methodology....49
4.4. Model....50
4.5. Estimation....56
4.5.1. Unit roots....56
4.5.2: Diagnostic Testing....59
4.5.3. Estimation Results....61
4.6. Conclusion....65
Chapter 5: Summary and Policy Recommendations....66
5.1. Summary and Conclusions....66
5.2. Policy Recommendations....67
5.3. Future Research....68
References list....69

## List of Tables

Table 2.1: Ratio of Gross Savings to GDP in South Africa----------22
Table 2.2: Household savings in million Rands in South Africa----------24
Table 3.1: Discussion on South Africa----------44
Table 3.2: Discussion on China----------47
Table 4.0: Expected signs of coefficients for the variables South Africa----------51
Table 4.1: Expected signs of coefficients for the variables China----------53
Table 4.2: Augmented-Dickey fuller test South Africa----------56
Table 4.3: Augmented-Dickey fuller test after differencing South Africa----------57
Table 4.4: Correlation Matrix for South Africa----------57
Table 4.5: Augmented Dickey- Fuller Test China----------58
Table 4.6: Augmented Dickey-Fuller Test after Differencing China----------58
Table 4.7: Correlation Matrix for China----------59
Table 4.8: Beursch- Godfrey Serial Correlation LM Test (South Africa) ----------60
Table 4.9: Heteroskedasticity Test: Breusch-Pagan- Godfrey Test (South Africa) ----------60
Table 4.10: Beursch-Godfrey Serial Correlation Test (China) ----------61

Table 4.11: Heteroskedasticity Test: Breusch-Pagan-Godfrey (China) ----------61
Table 4.12: Estimation Results South Africa----------62
Table 4.13: OLS estimation South Africa----------62
Table 4.14: OLS Estimation results on the stock market South Africa---------- 63
Table 4.15: Estimation Results China---------- 64
Table 4.16: OLS Estimation results on the Stock market China----------64

# List of Figures

Figure 2.1: Graphical illustration of ratio of gross savings to GDP in South Africa----------22
Figure 2.2: A breakdown of Savings by Households, Corporates and Government as Percentages of GDP----------23
Figure 2.3: Graphical illustration of household savings in millions of Rands----------24
Figure 2.4: Saving to disposable income of households in South Africa----------25
Figure 2.6: Gross saving rates by sector in China----------32
Figure 2.7: Direct Flow of Funds----------38
Figure 2.8: Indirect flow of funds----------39
Figure 2.9: Trend of Market Capitalization in South Africa----------40
Figure 2.10: Trend of Market Capitalization in China----------40
Figure 4.1: Normality test using the Jarque-Bera test on South Africa data----------59
Figure 4.2: Normality test using the Jarque-Bera test on China's data----------61

## List of abbreviations

| | |
|---|---|
| ADF | Augmented Dickey Fuller |
| BIS ` | Bank for International Settlements |
| GDP | Gross domestic product |
| IMF | International Monetary Fund |
| M2 | Money and Quasi Money |
| OECD | Organization for Economic Co-operation and Development |
| OLS | Ordinary Least Squares |
| WDI | World Development Indicators |

# Chapter 1

## 1.1 Introduction

This chapter discusses the problem statement, the purpose of the study, the questions guiding the study, the significance of the study and the background literature. It also presents a brief structure of the methodology and an outline of the study.

## 1.2 Problem Statement

Savings are residuals remaining from income after expenditure on consumption. According to Keynes, it is the amount left over after a person's consumption expenditure is subtracted from the amount of disposable income that he or she earns in a given period of time (Davidson 2007). Savings are an important concept in macro-economics as the level of savings in an economy determines the resources available for investment, implying that, if firms plan to invest more than households save in an open economy, resources will have to be borrowed from overseas.

Savings can be categorized into three forms: Savings by Government, Savings by Corporates and Savings by Households (Prinsloo 2000). The main focus of this paper is on discretionary (not contractual) savings by households. Aridas (2006) of Global Finance defines household savings as the difference between a household's disposable income and its consumption. The household savings rate is computed by dividing household savings by household disposable income. A negative savings rate indicates that a household spends more than it receives as regular income and finances some of its expenditure through borrowing or through gains arising from the sale of assets or by running down cash and deposits.

Ozcan, Gunay and Ertac (2011) observed that Chinese households save a large share of their disposable incomes and their average saving rate increased over the last decade and a half. That Chinese save about two-thirds of their national income. According to Chamon, Liu and Prasad (2011) the average saving rate of urban households relative to their disposable incomes rose from 18% in 1995 to nearly 29% in 2009. Guonan and Wang (2010) acknowledged that what really sets China apart from the rest of the world is that the rising aggregate saving is observed in all the three sectors (corporate, household and government).

This paper is a comparative study of South Africa and China. The Chinese people are the world's leading savers (Cristadoro & Marconi, 2012) yet South Africans are at the bottom of the list in saving terms and in negatives (Ojah & Mokoteli 2010). It is intended to establish the factors accounting for the low household saving rate in South Africa and the high saving rate in China, which are both emerging markets. Chiroro (2010) observed in her study that putting money aside for short term emergencies and even for retirement is proving to be too difficult for most South Africans. According to Chiroro, the majority of South Africans in the low income and the middle income groups have no plans to save and no regular savings plans at all. She points out that approximately 72% of adult South Africans are not saving at all. Are there some lessons that can be drawn from China to improve household savings in South Africa? Ojah and Mokoteli (2010) too advocate for increased micro-savings in order to improve the functioning of the micro-finance sector in South Africa. The government of South Africa launched the South African Savings Institute in 2001 to address issues of savings but there is still a lot to be done and savings haven't improved. Household savings have continued to be in negatives since the mid 2000's (Ojah & Mokoteli 2010).

There is a linkage between household savings and capital markets. Davis (2009) wrote an interesting report about the implications of household saving patterns for Capital Markets in New Zealand. He found that the low level of New Zealand household saving meant New Zealand firms had to heavily rely on foreign saving to finance investment. Davis (2009) further contends that, an increase in household saving, if accompanied with development of contractual saving institutions, can uplift the whole financial system in an economy. We therefore intend to examine how trends in household savings impact on capital markets. What is the impact of household savings on Capital markets especially the Stock market in both South Africa and China?

## 1.2 Purpose of the Study

The purpose of the study is to draw a comparison between household savings in China and South Africa. Investigate the difference in the factors shaping the attitudes of individual South Africans and Chinese towards saving. Examine how trends in household savings impact on the stock market in South Africa and China.

## 1.3 Questions of the Study

- What are the determinants of household savings in South Africa and China?
- Why are household savings in South Africa low?
- Why are household savings in China high?
- What is the effect of household savings on the stock market?

## 1.4 Significance of Study

The paper aims to make a significant contribution towards the unappealing situation of household savings in South Africa by drawing lessons from China which has a high saving rate unrivalled by any country in the world. Secondly, the paper intends to examine the impact of the trend in household savings on capital markets especially the stock market in both South Africa and China.

## 1.5 Background Literature

Savings are vital at individual household level. According to Du Plessis (2008), savings act as a shield against unpredicted events and meet the resultant unplanned expenditure. Secondly, Du Plessis acknowledged that, savings are vital in helping a household improve its quality of life. The accumulated savings enable the household to buy durable goods and even undertake investment activities which in turn results into improved standard of living for the household. Du Plessis (2008) says that, household savings enable a household to be financially stable.

Savings are vital for economic growth and development (Hess 2010). According to Hess (2010) the recognition of saving as a driver of economic growth and development is not of recent, it has long been recognized. He quotes Arthur Lewis, who noted half a century ago that, (Hess, 2010; p.591), "the central problem in the theory of economic development is to understand the process by which a community which was previously saving and investing 4 or 5 percent of its national income or less, converts itself into an economy where voluntary saving is running at about 12 to 15 percent of national income or more. This is the central problem because the central fact of economic development is rapid capital accumulation"

Hess (2010) claims that the massive growth and successful development of the East Asian economies over the past few decades can be largely attributed to high domestic savings rates. He goes on to point out that the annual gross domestic saving rates for the East Asian and Pacific economies for the period 2000-2006 averaged 40% compared to an annual growth

rate in gross domestic products of 8.6% for 2000-2006. Guonan and Wang (2010) recognised that Chinese national saving rate is high by international standards far above OECD countries. Guonan and Wang say it clocked 53% of GDP in 2008, they as well established that China has overtaken Singapore which traditionally has been the highest saving country in the world.

Simleit, Keeton and Botha (2011) who did a study on the determinants of household savings in South Africa identified substantial government dissaving, poor household savings to have caused a massive fall in aggregate savings. They stated that somehow government dissaving has been dealt with, well as household savings continue to disappoint. Simleit et al (2011) complain that due to low domestic savings, South Africa has continued to experience a current account deficit. South Africa has to attract large, volatile portfolio capital inflows to finance this deficit. Such expensive volatile inflows constrain economic growth. Simleit et al (2011) agitate for the understanding of the factors responsible for the downward trend of savings and formulation of policies which can help reverse this trend.

Ozcan et al (2003) categorised the potential determinants of household savings into (1) government policies, which are actions by government especially fiscal policy and social security programmes. (2) Income and growth variables: the relationship between income and savings as well as the relationship between savings and growth. (3) Financial variables, the most vital financial variable is the real interest rate. (4) Demographic variables, the age structure of the population is an important factor in savings because the young and old tend to have a low saving rate, whereas the highest saving rate is observed among the working age group. The young and old are dependents in most cases since they don't work to earn, a decline in savings is most likely to be observed with an increase in the dependency ratio since the working group bear the burden of catering for the dependents rendering them ineffective to save adequately. (5) Uncertainty variables, like inflation, political instability. These variables capture the effects of uncertainty about what the future bears on savings through their impact on precautionary savings. (6) External variables, the ones that apply to savings are terms of trade and current account deficit. Ozcan et al (2003), Hess (2010) in their studies included the lagged private saving rate as a potential determinant for Household Savings. Hess argues that, savings are serially correlated meaning they contain inertia. Factors that affect saving rates have a long-run impact.

Boersch-Supan and Winter (2001) explored the triangle of population aging and pension reform, life-cycle saving and portfolio decisions, capital markets, productivity and economic growth. They found that increase in households savings result into more investment on the stock market. Capital markets grow in size, benefit in terms of improved capital efficiency, total factor productivity. Mpavido, Alberto and Thierry (2003) found an increase in assets of contractual savings to have a positive impact on the depth of stock and bond markets on average.

## 1.6 Methodology

We intend to collect the relevant data from the central banks of the two countries, South Africa and China that is the South African Reserve Bank and Peoples' Bank of China respectively. South Africa has the South African Saving Institute. We are optimistic to obtain valuable information from there about household savings in South Africa. We will also use the World Bank, IMF, World savings Bank Institute databases to obtain information. Many studies about household savings on China and South Africa have been done, we intend to read their reports extensively.

The proposed method of analysis will be regression analysis. Regression is an important tool financial researchers use to understand the relationship among two or more variables. The researcher assembles data both on the dependent variable and explanatory variables, and runs a regression to estimate the quantitative effect of explanatory variables on the dependent variable. A researcher is typically interested in measuring the effect of explanatory variables on a dependent variable. We will be working with time series data. This often requires the inclusion of lags. The dependent variable maybe correlated with lags of it-self, suggesting that lags of the dependent variable should also be included in the regression (Koop 2006). We will use econometrics techniques to analyze the data collected. It will require the formulation of a mathematical model.

The model will take the structure below:

$$Y_t = \alpha + \beta_0 Y_{t-1} + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon_t$$

Where:

t denotes time, $Y_t$, Stands for the household savings, $Y_{t-1}$ denotes lagged saving $X_1$ represent Unemployment rate, $X_2$ denotes the inflation rate, $X_3$, denotes the dependency ratio, $X_t$ represent economic growth rate, $X_5$ ,represents Money and quasi money(M2), $X_6$ stands for the urbanization ratio and $\varepsilon_t$ the error term. According to the available literature such as Ozcan et al (2003), Hess (2010), Horioka and Wan (2007), the above variables were found to have an impact and a relationship with household savings. That justifies our choice of this model specification.

This method of analysis is appropriate since other studies on this topic have employed it. For-example Ozcan et al (2003), Hess (2010), Simleit et al (2011)

The problem we may encounter in the process of compiling this research is capturing all the necessary data on the variables. The large amount of data we need on financial variables, income variable, demographic variable, government variable may not be adequately available.

## 1.7 Outline of the Study

-Literature review
-Discussion
-Methodology
-Discussion of results
-Conclusion and policy recommendations

# Chapter 2 Literature Review

## 2.1 Introduction

Household savings are integral not only in economics but in finance as well. In this chapter, we define household savings and discuss the theoretical points of departure on savings that is the various theories which have been developed by economists about consumption and saving. We go on to look at the various motives of savings advanced by scholars. More-still, we discuss the importance of savings to an economy as a whole and how the functioning and mechanisms of an open economy may not require a country to have sufficient savings in-order to invest. We go on to discuss in detail the trend and determinants of household savings in both South Africa and China. The two countries, both emerging economies, provide a very interesting comparative study. South Africa's household savings are too low in negatives yet China's household savings are high. Over the last 20years, China has exhibited tremendous growth in household savings. The average saving rate of urban households relative to their disposable incomes rose from 18% in 1995 to nearly 29% in 2009 according to Ozcan et al (2011). Finally, we discuss how savings flow into the whole financial system and impact on capital markets especially the stock market.

## 2.2 Definition of Household Savings

Keynes refers to savings as residuals remaining from income after expenditure on consumption (Davidson 2007). Savings are an important concept in macro-economics as the level of savings in an economy determines the resources available for investment. If firms plan to invest more than households save in an open economy, resources will have to be borrowed from overseas. Aridas (2006) of Global Finance defines household savings as the difference between a household's disposable income and its consumption. The household savings rate is calculated by dividing household savings by household disposable income. A negative savings rate indicates that a household spends more than it earns as regular income and finances some of its expenditure through credit or through gains from the sale of assets or by running down cash reserves.

## 2.3 Theories of Saving

There are three major theories of consumption and saving behaviour that have been developed by economists

**2.3.1 The life-cycle hypothesis** (Modigliani 1986). In 1954, Modigliani and his student Brumberg developed this theory of spending based on the idea that people make intelligent choices about how much they want to spend at each age, limited only by the resources available to them over their lives. Muradoglu and Taskin (1996) explain that the basic assumption behind this theory is that, individuals spread their lifetime accumulating savings during earning years and maintaining consumption levels during retirement. Deaton (2005) says that, though this theory of consumption and saving has been challenged by Psychologists and Economists. It still remains an outstanding piece of thinking by scholars Modigliani and Brumberg.

**2.3.2 The permanent income hypothesis:** Developed by Friedman (1957), this hypothesis contends that consumers' choices are more influenced by variations in their permanent income than variations in their temporary income. The rationale behind this theory is that, temporary changes in income have minimal effect on consumer spending behaviour, whereas permanent changes can have large effects on consumer spending behaviour. It stresses the importance of long-term income but differs from the life cycle hypothesis by modelling rational consumption and saving decisions upon the simplifying assumption that life is indefinitely long (Modigliani 1986). Friedman (1957) argues that low income earners have a higher propensity to consume and high income earners have a lower propensity to consume.

**2.3.3. The relative income hypothesis** by Dusenberry (1949). The theory states that, one's attitude towards consumption and saving is dictated more by his/her income in relation to others than by abstract standard of living. So an individual is less bothered by the absolute level of consumption than by relative levels. The theory continues to illustrate that, present consumption is not only influenced by current levels of absolute and relative income, but also by levels of consumption attained in the past periods. It is not easy for a family to bring down a level of consumption once attained. According to Dusenberry (1949), the aggregate ratio of consumption to income is assumed to be dependent on the level of current income relative to past peak income. Despite its appealing nature, Duesenberry's theory has not found wide acceptance. It has been overshadowed by the life-cycle by Franco Modigliani and Richard Brumberg and the permanent income hypothesis by Milton Friedman.

## 2.4 Why do households save?

The importance of saving has been recognised not only of recent but even way back during the times of writing of the Bible. We quote chapter 22 verses 6-7 from the book of proverbs (Solomon, Agur & Lamuel, 960BC, p.377) **"**Teach your children to choose the right path, and when they are older, they remain upon it. The rich rules over the poor and the borrower are servant to the lender." The message behind this verse is that, it is vital to in-still in children a culture of saving at an early age. This will enable them grow up financially responsible with discipline of saving instead of running for debt.

Keynes (1936) came up with eight motives which determine the propensity to save and corresponding motives to consumption which turned around the shape of the consumption function. Browning and Lusardi (1996) in their paper reproduced Keynes (1936) eight motives of why people save with an additional ninth.

1. The pre-cautionary motive. Individuals save money to enable them deal with unexpected events.
2. The life-cycle motive. Households save at specific times in life so as to have sufficient funds available to spend on anticipated expenses, like, when starting a family or nearing retirement.
3. The Inter-temporal substitution motive. Individuals save to enjoy the returns on savings.
4. The improvement motive. Individuals save with the aim of becoming better by having more to spend.
5. The independence motive. Households save with the aim of being self-reliant, not to depend on others for their needs. To enjoy a sense of independence and the power to do things on their own without being questioned.
6. The enterprise motive. To have the capacity and readiness to engage in speculative or business projects.
7. The be-quest motive. Intergenerational transfer of wealth. Individuals save so that they can leave behind money when they die. People feel satisfied when they know that their descendants will enjoy their wealth after passing on.
8. The avarice motive. A very strong desire to hold on to what is already yours. Individuals save with a motive of accumulating wealth. Don't want to part with your money. It can be equated to excess greed for wealth.

9. Browning and Lusardi (1996) added a ninth motive, the down payment motive. Ability to pay cash when purchasing a good or service.

## 2.5 The importance of household savings for an economy

Saving is deferred spending, a preference to consume tomorrow rather than today (Strydom 2007). Savings flow into the financial system and help provide funds for investment spending by firms. Tesar (1991) established that, there is a high correlation between savings and investment in the short run and long run. Tesar also found countries with high saving rates to have high investment rates too.

According to Carroll, Overland and Weil (2000) and Feldstein (1982) savings induce investment. Savings can be invested in producer goods such as factories and machinery. Savings facilitate the acquisition of producer goods which stay in existence and benefit the economy for a long-time. Investment in producer goods greatly aids economic growth. Savings are therefore correlated to economic growth through investment (Carroll et al 2000). The South African Minister of Finance is on record to have called for a savings culture among South Africans as a way to help the economy meet its investment goals, depend less on external debt which in turn would boost economic growth and create jobs for millions of South Africans (Mail & Guardian 2012).

Interestingly, Bhatia and Khatkhate (1975) debate that; a surge in savings does not necessarily amount to increased investment because the distribution of savings and investment expenditures does not always match among economic agents. According to Bhatia and Khatkhate (1975), this is where the role of a financial institution is very vital to deal with this mismatch. It should also be noted that, savings not deposited in a financial institution like a bank and kept at home in a safe, suitcase cannot be accessed by a business entity, firm, corporation to be used for investment. To affirm this line of thought, Bhatia and Khatkhate (1975) conceded in their study that financial intermediation is the major propelling force behind economic growth. Savings kept at home in a safe, suitcase without banking or investing them, tantamount to an interest-free loan to the government or central bank.

Furthermore, savings can increase without necessarily bringing about increased investment, instead cause a decline in demand which in-turn results into a fall in production leading to fall in employment and incomes too. The economy is plunged into a recession in the end rather

than have economic growth. Skousen (1988) illustrates this issue by referring to the US during the Second World War (1939 to 1946) when its saving rate rose tremendously like never before and instead was plunged into a recession. In the short term, if savings fall below investment, it can lead to a growth of aggregate demand and an economic boom. In the long term, if savings fall below investment it eventually reduces investment and detracts from future growth (Skousen 1988). More still, according to an Austrian theory future growth is made possible by foregoing present consumption to increase investment (Skousen 1988).

Savings benefit an economy in the following ways:

- Households can easily absorb rising prices and unanticipated income changes.
- Individuals would be capable to pay cash for large assets like homes, hence, wealth accumulation (down payment motive).
- Government bearing the burden of providing for retirees would be reduced.
- Government dependency on external debt would be reduced. (Mail & Guardian July-August 2012).

Therefore, Du Plessis (2008) acknowledged that savings serve an instrumental role as national buffer against international capital fluctuations and act as a major driver of economic growth.

### 2.5.1 Mechanism of an open economy and savings

Thompson (1985) in his book Economics illustrates the circular flow of saving and investment. He illustrates the flow with the equation below; If, Gross Savings are denoted by S, Income by Y, Consumption by C, Then, **S = Y – C** or **Y = S + C** (Thompson 1985). If we bring into play the Keynesian model, the Keynesian equilibrium condition states that savings equal to investment. Keynes assumes a closed economy meaning that only the accumulated savings are the ones used to fund investment in an economy. Therefore, **S = I** (Meade 1937). Narayan (2005) found this condition to hold in China for the period 1952-1994 because it had a fixed exchange regime and capital movement was fairly restricted. Strydom (2007) disputes this, that due to high globalisation and integration of markets the above condition no longer holds in an open economy. Samuelson (1947) analysed the simple Keynesian model and

expressed his reservation about it holding. Strydom continues to prove his case by introducing new variables to the equation that is Exports(X) and imports (M).

**Y = C + I + G + X – M (1)**

If we define total domestic absorption of resources as A = C + I + G. we obtain,

Y = A + X – M or Y – A = X – M (2)

This implies that, if domestic absorption is more than total income, we have

Y – A <0 (3)

This implies that

- **X – M <0 or X <M (Imports are more than exports).**
- **I > S (Investment more than savings) implies use of external debt.**

A saving deficit country, where domestic absorption is more than its income (A >Y), runs a current account deficit implying it is a net borrower (Tesar 1991). Strydom (2007) stresses, a saving surplus country exports its surplus savings by running a current account surplus.

An analysis of both surplus saving countries such as, China, Japan, Germany and deficit saving countries such as, the USA, the UK, South Africa enables us understand the dynamics of the highly integrated markets. Strydom (2007) argues that a country does not necessarily have to depend on its savings to finance investment in this globally integrated world. According to Feldstein and Bacchetta (1991) the USA has continued to expand its investment yet it is a deficit saving country. Strydom (2007) further stresses that an increase in domestic savings without an improvement in the domestic economic environment is not the best, the additional savings will spill out of the economy and enter into the global market. However, Feldstein (1983) challenges this line of thought by arguing that, capital mobility is not perfect. Furthermore, Feldstein (1980) found that 85% to 95% of national savings are invested in the host country. Tesar (1991) affirms this when he found countries with high savings to have high investment rates.

## 2.6 The Trend of Savings in South Africa

Savings in South Africa are of three forms: government, corporate and household savings (Prinsloo 2000). According to Prinsloo (2000), Sub Saharan Africa has the lowest savings rate in the developing world. Dove (2008) says it averaged 18% of GDP in 2005 compared with 26% in South Asia and nearly 43% in East Asia and pacific countries according to

World Bank estimates. South Africa is no exception, South Africa's Finance Minister Gordhan in 2011 said that, compared with its peers internationally, South Africa's savings rate is really low. The 2010/11 Global Competitiveness Report notes that South Africa's gross saving rate was 16 percent of gross domestic product (GDP) in 2009, compared to China's 52 per cent, India's 37 per cent, and Russia's 22 percent in the same year.

South Africa's saving rates have been significantly below the potential suggested by its structural and economic characteristics. Gross savings in South Africa averaged 22.4 per cent of gross domestic product in the period from 1960 to 1999. The average saving rate in the period 1985-1999 fell to 18.5 per cent, compared with 23.5 per cent in 1960-1972 and 25.4 per cent in 1973-1978. During the period 1979-1984, the saving rate was at a higher average level of 26.7 per cent. By contrast, the national saving performance during the 1990s deteriorated substantially to the low average of 16.3 per cent (Prinsloo 2000).

According to Laubscher, an economist with Sanlam, the ratio of savings to GDP declined to its lowest level since 1948 in quarter one 2006 to 13 % (National Saving Barometer 2006). From 2000 to 2008 gross domestic savings of GDP averaged 15%, increased from 15.6% in 2009 to 16.4% in 2010. At the same time the proportion of savings to disposable income of households remained unchanged in 2010 at -0.3% (Dimant 2011). Markus, a senior economist with ABSA bank in 2006 felt concerned about the level of savings, he acknowledged that low levels of savings have an adverse effect on domestic productivity, whereas continued sourcing of external funds from abroad to finance investment activities is unsustainable (National Saving Barometer 2006).

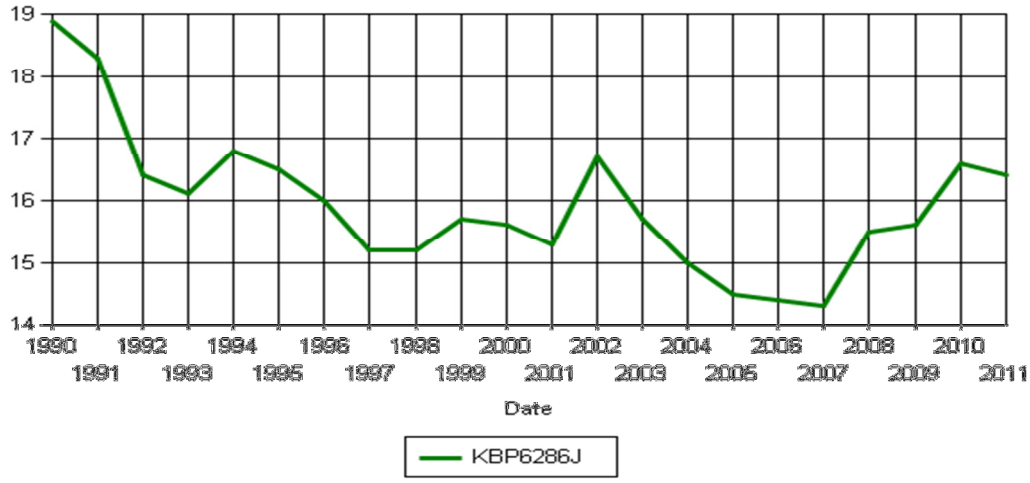
Aron and Muellbauer (2000) established that, one of the explanations for the low growth trap experienced by South Africa since the mid-1980s is due to the persistent decline in national savings. In order to reduce South Africa's dependence on external debt and any default or sovereign risk that may result and break the low growth trap, South Africa needs to take strong measures geared towards reversing the current trend of savings.

## Table 2.1: Ratio of Gross Savings to GDP in South Africa

| | |
|---|---|
| **1990** | 18.9 |
| **1991** | 18.3 |
| **1992** | 16.4 |
| **1993** | 16.1 |
| **1994** | 16.8 |
| **1995** | 16.5 |
| **1996** | 16 |
| **1997** | 15.2 |
| **1998** | 15.2 |
| **1999** | 15.7 |
| **2000** | 15.6 |
| **2001** | 15.3 |
| **2002** | 16.7 |
| **2003** | 15.7 |
| **2004** | 15 |
| **2005** | 14.5 |
| **2006** | 14.4 |
| **2007** | 14.3 |
| **2008** | 15.5 |
| **2009** | 15.6 |
| **2010** | 16.6 |
| **2011** | 16.4 |

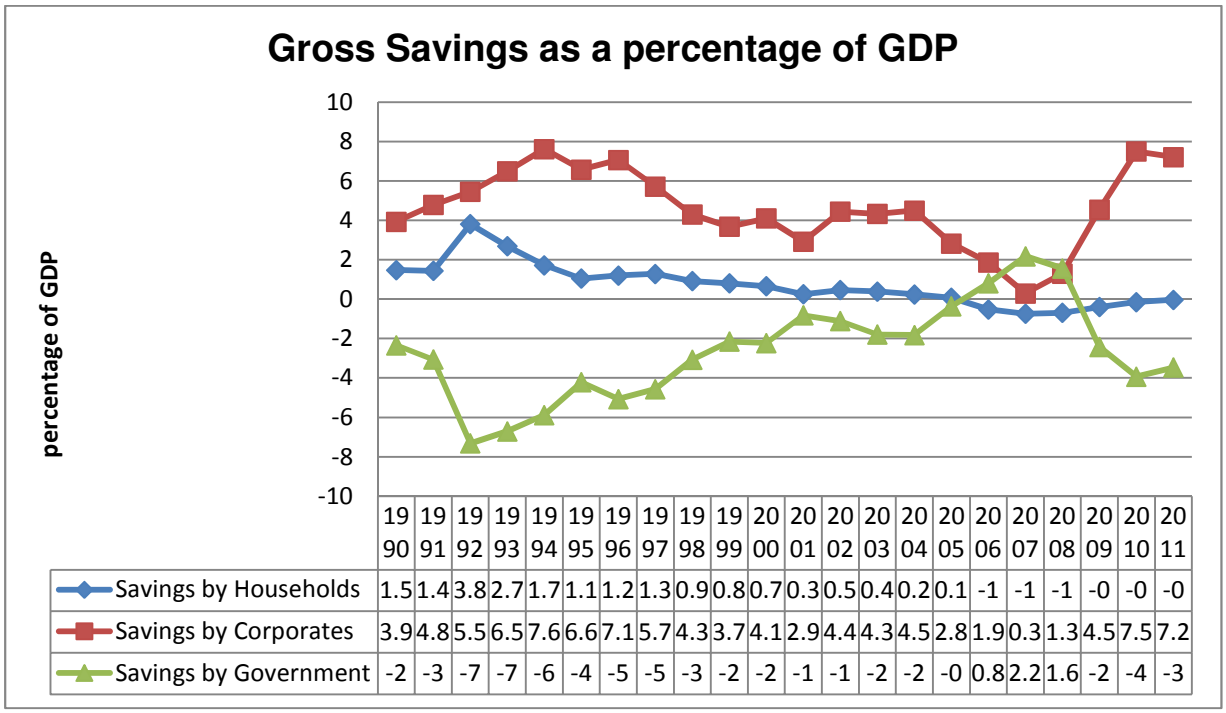
**Source**: *South African Reserve Bank.1990-2011.*

## Figure 2.1: Graphical illustration of ratio of gross savings to GDP




**Source**: *South African Reserve Bank.1990-2011.*

**Figure 2.2: A breakdown of Savings by Households, Corporates and Government as percentages of GDP in South Africa**




| | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Savings by Households | 1.5 | 1.4 | 3.8 | 2.7 | 1.7 | 1.1 | 1.2 | 1.3 | 0.9 | 0.8 | 0.7 | 0.3 | 0.5 | 0.4 | 0.2 | 0.1 | -1 | -1 | -1 | -0 | -0 | -0 |
| Savings by Corporates | 3.9 | 4.8 | 5.5 | 6.5 | 7.6 | 6.6 | 7.1 | 5.7 | 4.3 | 3.7 | 4.1 | 2.9 | 4.4 | 4.3 | 4.5 | 2.8 | 1.9 | 0.3 | 1.3 | 4.5 | 7.5 | 7.2 |
| Savings by Government | -2 | -3 | -7 | -7 | -6 | -4 | -5 | -5 | -3 | -2 | -2 | -1 | -1 | -2 | -2 | -0 | 0.8 | 2.2 | 1.6 | -2 | -4 | -3 |

**Source***: South African Reserve Bank (KBP6200J, KBP6201J, KBP6202J, KBP6006J).*

## 2.6.1 An overview of Household Savings in South Africa

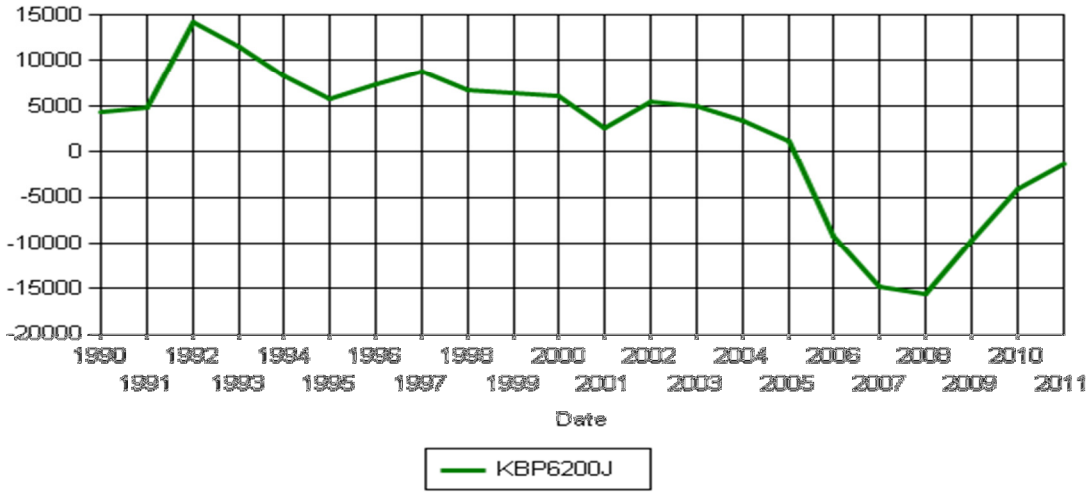
Household savings over the 20 year period from 1990 to 2011 have declined drastically. Household savings turned negative in 2006 according to data from the South African Reserve Bank, while household debt as a percentage of disposable income increased to its highest level ever. Although the savings ratio improved in 2000 and 2001, household savings remained weak.

Household savings declined continuously from 1992 which points to the absence of a savings culture among individual South Africans. Chiroro (2010) says that, putting money aside voluntarily is proving to be to be a challenge to most South Africans. She recognised that, the majority of South Africans in the low income and middle income groups have no plans to save. According to Chiroro (2010) approximately 72% of adult South Africans are not saving at all. Statistics which were published by the South African Institute for Race Relations (SAIRR) obtained from the South African Reserve Bank for the period 1990 to 2010, the savings rate to disposable income of households dropped from 2.4% to -0.3% (Dimant 2012).

**Table 2.2: Household savings in million Rands**

| | |
|---|---|
| **1990** | **4281** |
| **1991** | **4770** |
| **1992** | **14173** |
| **1993** | **11455** |
| **1994** | **8281** |
| **1995** | **5761** |
| **1996** | **7443** |
| **1997** | **8780** |
| **1998** | **6801** |
| **1999** | **6475** |
| **2000** | **6097** |
| **2001** | **2532** |
| **2002** | **5380** |
| **2003** | **4960** |
| **2004** | **3351** |
| **2005** | **1142** |
| **2006** | **-9229** |
| **2007** | **-14855** |
| **2008** | **-15643** |
| **2009** | **-9690** |
| **2010** | **-4037** |
| **2011** | **-1411** |

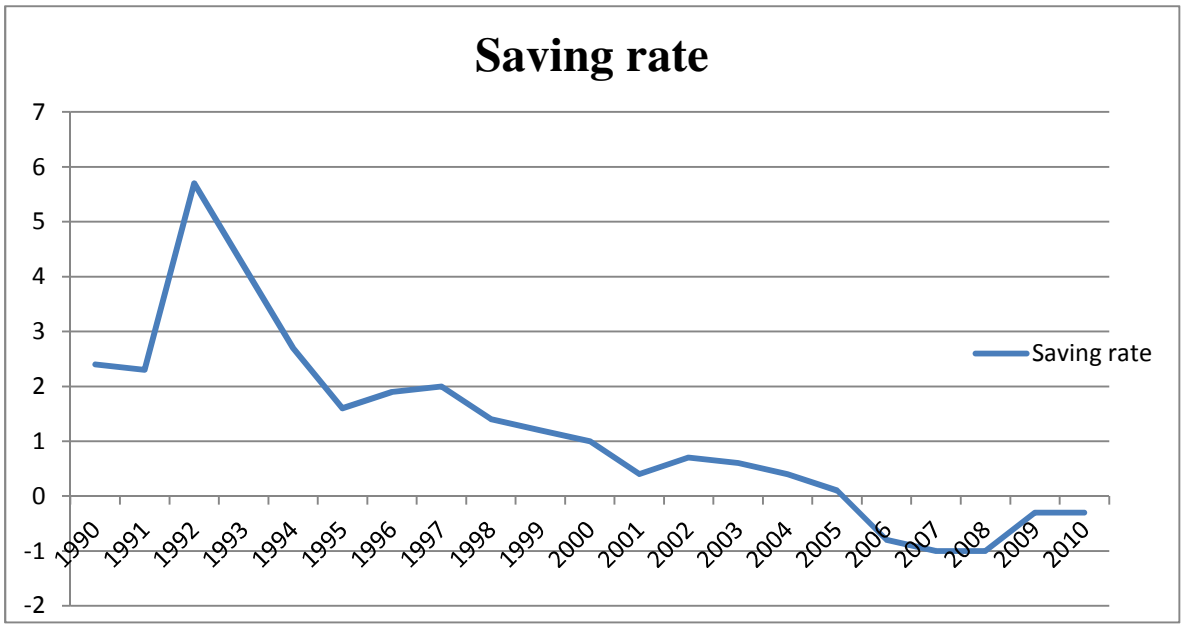
**Figure 2.3: Graphical illustration of household savings in million Rands**




**Source:** *South African Reserve Bank.1990-2011*.

Table 2.2 and figure 2.3 illustrate the worrying trend of household savings in South Africa. The household savings followed a downward trend from 1992, recovering slightly between 1996 to 1997,from then they continued to decline until they fell to negative in 2006,they have kept in negatives for over five years.

**Figure 2.4: Saving to disposable income of households in South Africa**




**Source***: South African Reserve Bank.1990-2010.*

Looking at figure 2.4, the trend of savings to disposable income of households over the 20 year period in South Africa is very worrying. There was a remarkable upward trend for a period of only one year from 1991 to 1992. From then, a downward trend persisted over the years. The saving rate has kept in negatives for over five years now.

## 2.6.2 Specific determinants of Household Savings in South Africa

The potential determinants of household savings in South Africa are categorised as government policies, income and growth variables, financial variables, demographic variables and external variables (Ozcan et al 2003).

**Inertia**

Household saving rates contain inertia. Ozcan et al (2003) argue that they are highly serially correlated even after controlling for other relevant factors. The effects of a change in any determinant of saving thus are fully realized only after a number of years. Loayza, Schmidt-Hebbel and Serven (2000), advocate for the inclusion of the lagged saving rate as a determinant of household savings. This implies that factors that affect saving rates have larger long-term impacts.

## Government policies

These are actions taken by government, especially fiscal policy and social security programmes.

### Taxes

Taxes lower income that an individual could save or invest. A tax confiscates a portion of people's earnings. Momoniat, the head of tax and financial sector policy at the national treasury of South Africa echoed on the issue of using tax incentives as a way of uplifting savings (Mail and Guardian, July-August 2012). Secondly, since taxes on saved money are income tax, individuals look at the tax burden on saved funds as being bore twice, because income is taxed when earned and when it generates investment income. This burden discourages individuals from saving.

### Social Security programmes

Due to the severe poverty and unemployment in South Africa, the government runs social security programmes to support people in dire need for example The State Old Age Pension (SOAP) for the elderly, the disability grant, the Child Support Grant (Social Security Provisions of South Africa 2012). The government passes on income grants to poor people. The Johannesburg Poverty and livelihood study found 14 million people to be dependent on social grants (De Wet 2012). A basic income grant shifts resources from savings to consumption according to Samson (2000). Evans (1983) argues that social security from government if sufficient enough tend to inversely impact on household savings by lessening the need for precautionary or retirement motive. It also entices workers to retire. They save less because they are assured of government support.

### Pension systems

Pension schemes are contractual (forced) savings which inversely impact on voluntary household savings since the money that should have been saved voluntarily is deducted forcibly leaving a smaller portion for an individual and no chance to save voluntarily (Feldstein 1980). Income earners substitute contractual savings for voluntary savings. They therefore see no need for saving voluntarily since they have already saved with the pension funds.

### Government savings

Household savings are responsive to government savings. Empirical research done on the factors that determine savings has found that as government savings increase, households tend to save less. This has to do with taxes, if the government saves for example budget surplus then households' disposable income decreases which leaves them with less disposable income to save from (Lewis 2001). It should be noted that government savings have partly recovered in South Africa yet household savings are far from recovery.

**Level of efficiency of the public sector**

If the public sector is inefficient in its operation, for- example, marred with lots of corruption, it does make South Africans spend more money on things which should have been paid for by the state. Momoniat raised this issue (Mail and Guardian, July-August 2012). Therefore, if the public sector is efficient, service delivery is most likely to be efficient, government services reach out to most of the people. People do not have to incur extra expenses on certain services like private sector school fees, private security companies meaning they can save that money.

## Income and growth variables

**Income**

According to Loayza et al (2000), the influence of income on savings is greater in developing countries than industrialised countries. They argue that a double in per capita income, ceteris paribus, raises the long-run private saving rate by 10 percentage points of disposable income. Prinsloo (2000) lists the slow income growth in South Africa as one of the factors responsible for the low saving rate. Prinsloo (2000) illustrates the deteriorating growth of real household income over a 40 year period as follows: household income adjusted for inflation growth slowed down from 5.5 per cent per annum in the 1960s to 4.1 per cent in the 1970s and then to 2. 8 per cent in the 1980s, 2.3 per cent between 1990 and 1999

**Economic growth**

The puzzle here is whether economic growth follows savings or savings follow economic growth. Which leads to the other? Economic growth results into increased incomes for workers compared to non-workers like children and retirees. Meaning economic growth puts more money in workers' pockets thus enabling them to save. According to Elbadawi and Mwega (2000), causation is two way. Savings increase growth and a virtuous cycle arises which means in turn growth results into increase of household savings. However, which of

the two is dominant. Carroll, Overland and Weil (2000) contend that high growth leads to high savings, not the other way round.

## Financial variables

### The real interest rate

The relationship between interest rates and savings has been studied by a number of scholars who came to different conclusions. Aron and Muellbauer (2000) found that there is a positive relationship between the real interest rate and savings in South Africa. Prinsloo (2000) found the impact of real interest rates on household savings to be minimal because households with low income mainly commit their expenditure on basic needs and what is left as residual is what is saved which in most cases is usually little. According to Loayza et al (2000), there is a negative relationship between savings and real interest rates. Although, Balassa (1989) obtained a positive coefficient in his study on the effect of interest rate on savings in developing countries, he was hesitant to conclude that real interest rates significantly affect savings. Harjes and Ricci (2005) concluded that the effect of interest rates on household savings is not clear.

### Inflation rate

South Africans decry the high transport costs. When inflation increases, it erodes the purchasing power of money meaning that the same amount of money will be used to purchase lesser quantities of goods and services. Therefore, when the inflation rate goes up, it means individuals need more money to buy the same amount of goods or services. They are left with little money to save. Loayza et al (2000) in their paper found inflation to have a significant effect on private savings. However, researchers like Ozcan et al (2003) found the relationship between inflation rate and private savings to be positive. Koskela and Virén (1985) contend that, a rise in inflation does increase savings.

### Financial Market Development

The financial depth and monetisation of the South African economy is backed by a sound regulatory and legal framework. South Africa's financial sector is well developed. Its banking sector compares well with industrialised countries. The developed financial sector makes it easy for individual South Africans to transact in banks and access credit. They don't have to save to consume. Cronje and Roux (2010) identified a culture of debt among South Africans rather than saving.

### Financial Liberalisation

According to Aaron and Muellbauer (2000), financial liberalisation took root in South Africa after the de Kock Commission reports of 1978 and 1985, interest and credit controls were removed in 1980. More South Africans obtained formal employment after 1994 gaining access to credit. Aaron and Muellbauer (2000) claim, financial liberalization had a large effect on the debt to income ratio. South Africans gained more access to credit; they increasingly started to fund their lifestyles through debt meaning less need for saving. Roux, the head of economic research at Old Mutual Investment group asserts that, access to credit is so easy for South Africans that they simply buy what they want on credit (Guardian July-August 2012).

### Corporate savings

Harjes and Ricci (2005) cited Tsikata (1998) and Johnson and Teferra (2001) who argue that households as the ultimate owners of corporations view corporate savings as a full substitute of their own savings, which is phrased as "piercing the veil" Therefore households find no need to adequately save since they have enough savings with corporates which come in form of dividends or capital gains. According to Harjes and Ricci (2005), households tend to offset changes in corporate savings with their own savings, implying that when corporate savings improve, household savings decline.

## Demographic variables

### Dependency ratio

The age structure of the population is an important factor in savings because the young (under 15 years) and old (over 60 years) tend to have a low saving rate, whereas high savings are observed among people at the peak of their earnings. According to the life-cycle model, older people work less and consume out of their savings. Households with more children at home tend to save less (Schmidt, Webb & Corsetti 1992). The age dependency ratio (percentage of working age population) in South Africa was 53.29 in 2010, 53.65 in 2009, 54.09 in 2008 according to world Bank reports. De Wet (2012) in their study found 33million South Africans to be below the age of 35 years and largely unemployed. This implies that a huge number of South Africans are dependents hence unable to save.

### Urbanisation ratio

Increased urbanization reduces the need for precautionary saving. The need for precautionary saving tends to be high among rural dwellers largely because their incomes tend to be volatile

(Ozcan et al 2003). Urban dwellers incomes tend to be less volatile meaning less need for precautionary saving. According to the Central Intelligence Agency World fact book, South Africa's Urbanisation ratio in 2010 was 62% with an annual rate of change of 1.2% estimated between 2012 and 2015. The United Nations (2004) report showed that the rural populations of South Africa experienced negative growth (Kok & Collinson 2006). Johannesburg is predicted to be among the top 15 largest cities in the world by 2015 (De Wet 2012).

### The unemployment rate

High unemployment levels among the youth, Kingdon and Knight (2004) claim it has always been a subject of debate since the 1980s. Philip (2012) cited Stats SA (2011), "formal unemployment stood at 25.7% in the second quarter of 2011 and a rate of 37% when discouraged work seekers are included" Meaning more than a quarter of South Africa's workforce is not employed. A person who is unemployed doesn't earn meaning he/she has nothing to save. According to reported statistics, the unemployment rate has continued to be volatile for the past two decades, 18.7 in 1990, 24.9 in 2010. Unemployment among the black youth stands at over 40 % (De Wet 2012)

## External Variables

### Terms of trade

This is the relationship between a country's exports and imports. Since South Africa is an open economy which trades with other countries, it is vulnerable to external shocks. Loayza et al (2000) found the log of the terms of trade to be statistically significant. Agenor and Aizenman (2003) established that households are sensitive to external shocks. It is difficult for households to maintain a level of consumption in case an economy is faced with unfavourable terms of trade. They will be forced to dis-save. Favourable terms of trade encourage household savings.

### Current Account Balance

According to trading economics, the Current Account averaged negative 15715.1 Million Rands from 1961 to 2012 and a record low of -179311 Million Rands in September of 2008. Trading economics reported that, South Africa in the second quarter of 2012, it reported a deficit of 200 billion Rands.

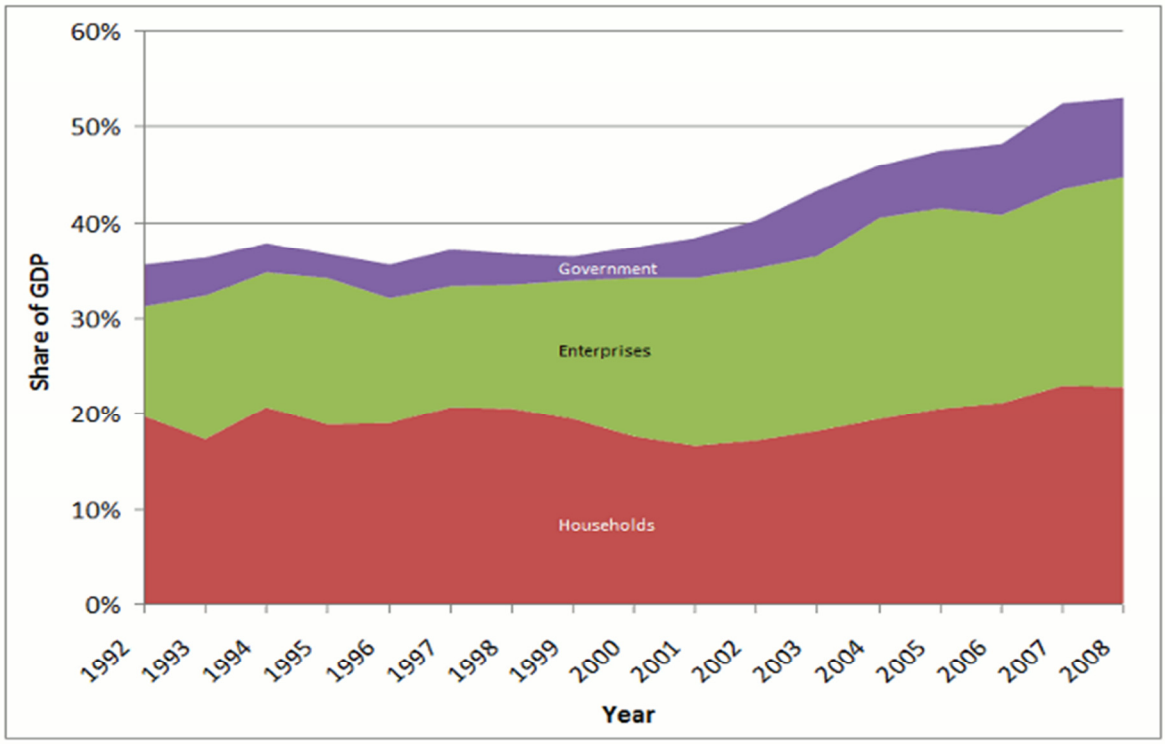
## 2.7 The Trend of Savings in China.

China is the world's top saver. Many writers refer to it as the Chinese' saving puzzle. Yang, Zhang and Zhou (2010) use the following four aspects to describe the Chinese saving puzzle: (1) persistently high saving rates between 34 and 53 percent of the GDP in the past 30 years; (2) an outlier in international comparisons, that is, having one of the highest saving rates since 2000, and an outlier in cross-country regressions of saving determination; (3) surge in gross domestic saving by 11 percentage points between 2000 and 2008 based on the WDI data; (4) household saving as a share of GDP experiencing the highest growth among the three sectors since the inception of reforms in 1978"

What really sets China apart from the rest of the world is that it has exhibited high savings rates in all the three sectors (corporate, household and government). Households are the biggest contributors to China's national savings. According to Yang et al (2010), savings in China as a percentage of GDP were on average around 35 percent in the 1980s, 41 percent in the 1990s, dropped below 38 percent in 2000 and from then accelerated to 53 percent in 2007. China's national saving rates since 2000 have continued to be one of the highest worldwide. The Bank for International Settlement (BIS) and the OECD estimated that Gross National Savings for China between 2005 and 2007 on average were 20% of GDP Household, 20% of GDP Corporate, 10% of GDP Government, total of almost 50% of GDP. These statistics are phenomenal and illustrate that Chinese save half their income.

The Chinese economy has transformed from a closed economy to an open economy, from an agricultural to an industrial economy, and from a socialist to a market-oriented economy. Chamon, Liu and Prasad (2010) contend that these transformations have resulted into rapid growth of incomes. Households seem to be postponing consumption despite the high income. The rate of aggregate saving in China has continued to be above 34 percent of the GDP since 1978, the year when the economic reforms began (Yang et al 2010).

**Figure 2.6 Gross saving rates by sector in China**




**Source: National Bureau of Statistics of China** (Chamon, Kai & Prasad 2011).

Figure 2.6 indicates that households are the biggest savers in relation to Corporates and Government in China. The biggest portion of savings comes from households in China.

### 2.7.1 An overview of household savings in China

The domestic saving rate in China is the highest in the world. According to Cristadoro and Marconi (2012), it is even above the investment share in GDP. Cristadoro and Marconi continued to stress that the investment share in GDP too is also very high by international standards, making China an exceptional example. Chinese households save a large share of their disposable incomes and their average saving rate has increased tremendously over the last decade and a half. It stagnated quite for a while in the early 1990s. The average saving rate of urban households relative to their disposable incomes skyrocketed from 18% in 1995 to 29% in 2009 (Ozcan et al 2011). Hess (2010) partly attributes the rapid growth and development of the East Asian economies to their high domestic savings rates.

### 2.7.2 Specific Determinants of Household Savings in China

China is an export-oriented economy; it experienced a decline in external demand of its product after the 2008 recession in the developed countries. Policy makers were enticed to rethink China's over dependency on external markets by considering the expansion of domestic demand. Though efforts have been made to entice domestic demand, weak consumption and high savings continue to prevail (Deng & Su 2012). Qin (2003) conducted a study of the determinants of household bank deposits in China. He concluded that the expected household savings potential turns out to be the chief determinant of household bank deposits. He also found the interest rate to be a significant long-term determinant of household bank deposits in China. Looking at various studies conducted on household savings in China, the factors shaping individual Chinese towards saving aren't very different.

**Inertia**

The lagged saving rate coefficient was found to be highly significant by Horioka and Wan (2007) implying high presence of inertia. Horioka and Wan (2007) also concur with Wan's findings of the presence of inertia as one of the main determinants of savings in China.

## Government policies

**Pension systems**

The high saving rate in China has been partly attributed to the weak pension system. Beland and Yu (2004) did a study on the pension reform in China and observed that the pension system was highly fragmented and called for a more effective administrative and supervisory infrastructure. Cristadoro and Marconi (2012) found that the lack of adequate social safety nets in China is encouraging savings by households for precautionary reasons. Due to the weakness of the pension sector, people endeavour to achieve self-insurance by saving.

**Taxes**

Taxes confiscate a portion of a worker's income meaning he /she is left with less to save. Taxes tend to have a negative impact on savings. We have not come across studies which have been done on the impact of taxes on household savings in China.

**Economic reforms**

Economic reforms that started in 1978, reforms increased uncertainty about people's income since most of the jobs were no longer government paid. Hence, households were encouraged to save more for their uncertain future. Qin (2003) concluded in his paper that income

uncertainty is a significant motivator for Chinese's households to save especially for precautionary reasons.

**Declining provision of public education, health, and housing services**

This creates a precautionary motive for saving (Chamon et al 2011). Chamon et al (2011) backed with survey evidence, established that younger households endeavour to acquire assets to prepare for future education expenditures and older households prepare for uncertainties especially health expenditures. The motive to save for health reasons accounts for five percentage points, individuals are motivated by the rising costs of seeing a doctor. Cristadoro and Marconi (2012) advocate for improved social service provision as a way of reducing the marginal propensity to save.

**The role of public sector in investment**

Zhong (2010) examined the role of public finance in the high savings rate in China. He found that the continued direct investment by the Chinese government crowds out other public expenditures which motivate private savings. Individuals are not so much involved in investment activities because most of it is done by the state. They only have to save their money since investment activities are largely done by the government.

**Government savings**

Government Savings and household savings are inversely related. This can be seen from the following national income identity $Y = C + I + (G - T) + X - M \Leftrightarrow S = I - (T - G) + X - M$

Here (T-G) are government savings, so we have private savings and government savings inversely related. When government savings rise, household savings tend to fall. He and Cao (2007) pointed out that when the share of household savings in national (gross) savings declined from 52.3 percent in 1992 to 41.6 percent in 2001, the share of government saving increased by 4.9 percentage points between 1992 and 2001 in China.

## Financial Variables

**Financial Liberalisation**

According to Zhang, Wang and Wang (2012), before 1978, there was no market-based financial system in China. It was the People's Bank of China present in China functioning as the central bank and commercial bank. It was only in 1984 that four commercial banks were formed leaving the People's Bank of China to act as the central bank. There was therefore limited competition and access to funds. Serious financial reforms have only been undertaken recently in 2001 upon China joining the World Trade Organisation. Cristadoro and Marconi

(2012) call for increased access to credit in China as a way of reducing the marginal propensity to save.

**Income growth rate**

The rising incomes of the Chinese workers are a factor in their high savings. Horioka and Wan (2007) established that a one percentage point increase in the income growth rate causes a 0.192–0.536 percentage point increase in the household saving rate. Noteworthy, the long-run impact of the income growth rate is 1.91–6.41 times. According to Zhou (2012), household income exhibited an upward trend from 1990 to 2006. Household saving too increased during the same period in China. Zhang, Yang and Wang (2011) in their study found an upward trend in real wages since 2003 in China.

**The level of financial market development**

China's financial markets are relatively underdeveloped. The banking system is still underdeveloped meaning it is quite difficult to borrow funds. Therefore, individuals have to save seriously and for a long time in order to acquire durables such as a home. Zhang et al (2012) stated that, though China has continuously experienced rapid economic growth making it the second largest economy in the world after the US and Japan coming in third position, its level of financial development lags behind developed markets.

**The real interest rate**

Horioka and Wan (2007) found real interest rate to be one of the main determinants of variations over time and over space responsible for the high saving rate in China. Feltenstein, Lebow and Wijnbergen (1990) found real interest rates to have an effect on consumption. Notably, they found the significant impact on saving behaviour to be from nominal interest rate. Pettis (2009) noted that people tend to save less when deposit rates are low in America, but in China, interest rates do not impact on the level of saving.

**Level of economic growth**

Since the start of the economic reforms in 1978, China has exhibited high economic growth rivalled by a few countries in the world making it currently the second world's biggest economy after the US (Zhang et al 2012). Cristadoro and Marconi (2012) suggested that, it is this rapid economic growth that has enabled a drastic increase in people's income in-turn availing them with enough cash to put aside as savings. This therefore partly accounts for the high saving rate among the Chinese people.

### Corporate savings

The profitability of enterprises has been on an increase since the early 1990s according to Yang, Zhang and Zhou (2010). This meant workers' remuneration improved availing them with more money in their pockets to save. Secondly, Tsikata (1998) and Johnson and Teferra (2001) argue that households as the owners of corporates substitute corporate savings for their own which are passed on to households in form of dividends or capital gains. However, one can't tell to what extent this applies to China, one may argue that since most of the corporations are state owned, individuals have no stake in these enterprises hence high personal savings.

## Demographic Variables

### Age structure of the population and dependency ratio

China's young population has fallen over the years because of the one-child policy introduced in 1979 and other population control methods. Horioka and Wan (2007) identified this as one of the reasons for high savings by households in China because of a drastic fall in the young dependency ratio. Horioka and Wan found the age dependency ratio to have declined from 0.89 in 1964 to 0.46 by 2004 largely due to the one-child policy. Since household savings are inversely related to the dependency ratio, this partly explains the high household saving rate in China.

### Urbanisation ratio

An interesting observation was made by Horioka and Wan that since most of the Chinese are farmers and live in rural areas, their incomes are highly volatile, and they therefore save for precautionary reasons. Statistical data also shows that in the period 1995-2004, the saving rate of urban households ranged from 10.7% to 25.7%, whereas for rural households ranged from 10.0% to 43.7%, and that of all households ranged from 13.5% to 35.1% (Horioka and Wan 2007). Households in rural areas tend to have a higher propensity to save than those in urban areas for precautionary reasons.

### Households with a boy child

Households with a boy child tend to save more than households with a girl-child in order to increase their attractiveness for a partner in future. This is so because girls are fewer than boys in china due to the one child policy. Therefore, most households prefer to have a boy child (Wei and Zhang 2009). Wei and Zhang (2009) called it, the competitive savings motive. They found evidence to support this hypothesis in China. Wei and Zhang (2009), claim that

in China, it takes a summation of having a son and facing a scarcity of women for these families to raise their savings rates.

### Unemployment rate

According to Trading Economics (2012), China's unemployment rate averaged 4.15 percent and reached an all-time high of 4.30 percent in December of 2003 and a record low of 3.90 percent in September of 2002. It was reported in the second quarter of 2012 as 4.1 percent. This implies that most people are employed and have money to set aside in form of savings. China's unemployment rate is low by international standards.

## Uncertainty Variables

### Inflation rate

Horioka and Wan (2007) found the inflation rate to be a determinant of household savings in China in some cases. However, their results showed that inflation is not always significant. It is sometimes negative and significant. According to Trading Economics (2012), China's inflation rate since 1994 to 2012 has averaged 4.3%; it even once fell to record lows of negative 2.2 in March of 2009.

### Income uncertainty

Income uncertainty motivates precautionary saving. Due to the economic reforms of 1978, most jobs were no longer government remunerated or guaranteed which meant uncertainty about earnings. Qin (2003), Cristadoro and Marconi (2012), acknowledged that Chinese households were encouraged to save for precautionary reasons. The Bank Governor of The People's Bank of China echoed this issue in his speech explaining the high savings in China. He specified that after the reforms of the 1990's, the iron bowl (lifelong secure job and welfare system) was done away with. Therefore, Chinese were motivated to save for precautionary reasons (Cristadoro & Marconi, 2012).

## External Variables

### Terms of Trade

Han and Zhang (2012) did a study on the impact of terms of trade on economic welfare. They wanted to find out whether China's rise as a major trading nation, its gains obtained from economic growth especially from exporting would be offset by worsening terms of trade leading to fall in incomes and consumption. Although, they couldn't conclusively say that the welfare was improving, they concluded that its welfare is not actually deteriorating. Tyers

and Rod (2012) identified China's export led growth as one of the reasons responsible for high savings.

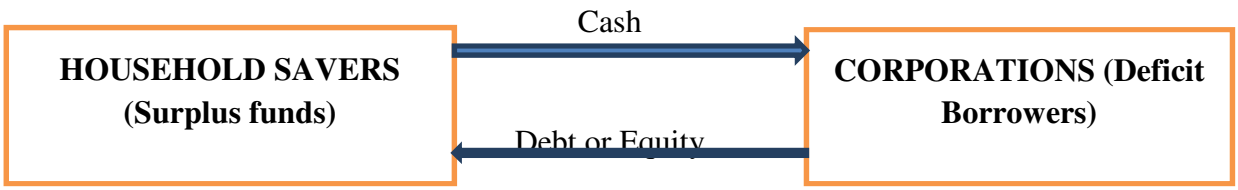
**Current Account Balance**

Trading Economics observed that from 1998 to 2012, China's Current Account averaged a surplus equivalent of 36.93 Million USD and a best surplus of 133.10 Million USD in December of 2008, and the worst deficit at 0.90 Million USD in June of 2001. China has reported a surplus current account balance for over a decade now. Edwards (1995) found the current account balance to have no significant influence on private saving rates.

## 2.8 The Impact of Household Savings on Capital Markets

There is a linkage between household savings and capital markets. Davis (2009) wrote a report about the implications of household saving patterns for capital markets in New Zealand. He found that the low level of household saving in New-Zealand meant that firms in New Zealand heavily relied on foreign saving to finance investment. Davis says an increase in savings can significantly uplift the whole financial system. Boersch and winter (2001), found that increase in household savings results into more assets investment on the stock market. Capital markets grow in size, benefit in terms of improved capital efficiency. Mpavido et al (2003) found an increase in assets of contractual (forced) savings to have a positive impact on the depth of stock and bond markets on average.

### Figure 2.7: Direct Flow of funds




**Source**: Anthony and Cornett (2011).

In figure 2.7, funds flow from households which have surplus funds to corporations which are in deficit and require external funds to invest above the cash flows generated internally. The corporations in turn issue debt contracts to the household savers or rights of ownership in the corporation in the form of equity (Anthony & Cornett 2011).

**Figure 2.8: Indirect Flow of funds**



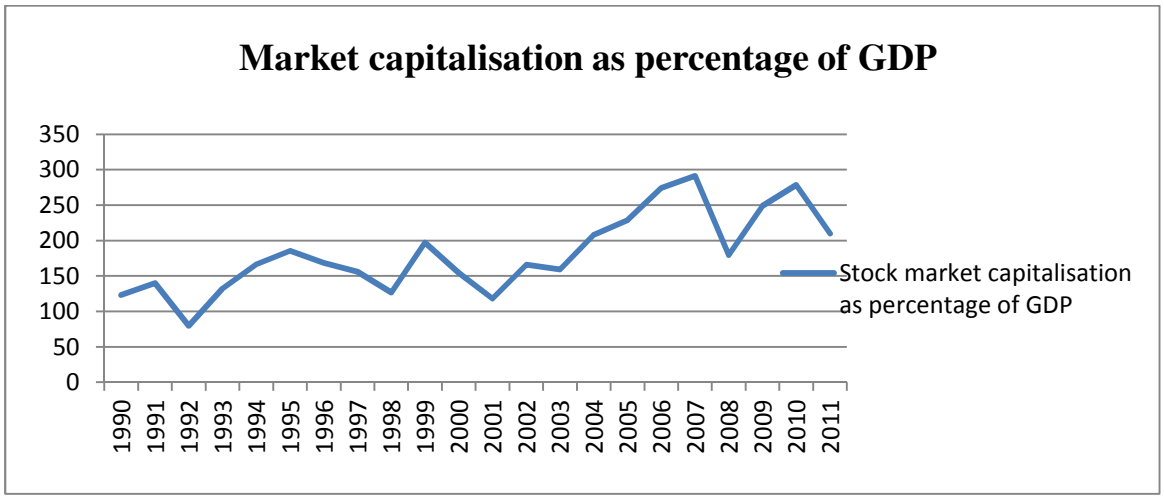

**Source**: Anthony and Cornett (2011).

In Figure 2.8, due to risks of liquidity, price and costs of monitoring involved in directly investing with a corporation, households can decide to invest their surplus funds through a financial intermediary such as a bank, mutual fund, insurance company, pension fund, which in turn invests the funds with the corporation. A financial intermediary would help mitigate the risks and costs (Longhofer & Santos 2000). Financial intermediaries offer more attractive modes of investment to households because of their capacity to undertake investment at a large scale (Anthony & Cornett 2011).

Kuijs (2005) found that the high enterprise investment in China is financed partly by a large excess of saving facilitated through the banking system. The banking sector plays an instrumental role by channelling savings from households to enterprises.

Therefore, the impact of household savings on the stock markets is expected to be positive in this study. We will analyse the impact that household savings have on the stock market in both South Africa and China.

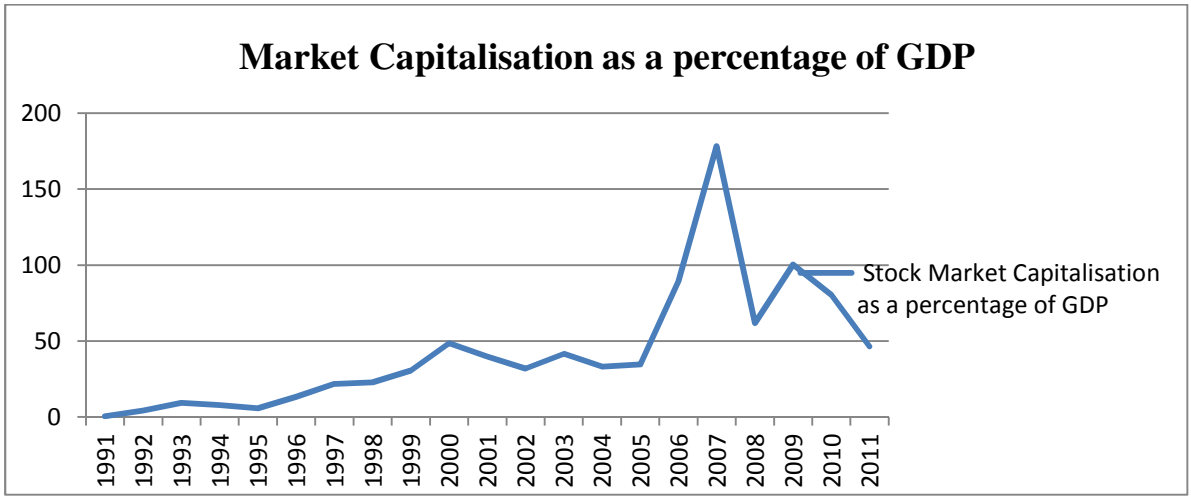
## Figure 2.9: Trend of Market Capitalisation in South Africa




**Source:** World Bank

Figure 2.9 represents the trend of stock market capitalisation in South Africa from 1990 to 2011. It indicates a steady growth in the stock market capitalisation over the period 1990 to 2011.

## Figure 2.10: Trend of Market Capitalisation in China




**Source:** World Bank

Figure 2.10 represents the trend of market capitalisation as a percentage of GDP in China. The growth of the stock market was quite sluggish from 1991 to 2005, a tremendous upward trend was experienced from 2005 to 2009, and then a downward trend was experienced from 2007 to 2009. Generally over the period 1991 to 2011, the stock market has grown.

## 2.9 Conclusion

While reviewing the literature on the determinants of household savings, a number of factors were highlighted by authors in both South Africa and China. However, there were a few factors unique to South Africa, which did not surface in China such as, the level of efficiency of the public sector, social security programs. Similarly, according to the literature, a number of factors were unique to China, for-example; economic reforms, declining provision of public education, health and housing services by government, the role of public sector in investment, household with a boy-child, income uncertainty. The following factors surfaced in both South Africa and China according to the literature; inertia, taxes, pension systems, government savings, income growth, economic growth, the real interest rate, inflation rate, financial market development, financial liberalization, corporate savings, dependency ratio (both old and young), urbanization ratio, unemployment rate, current account balance, terms of trade. With reference to the literature, there are more factors driving individual Chinese towards savings than individual South Africans. In the next chapter (three), we discuss the extent to which Individual South Africans and Chinese undertake saving in- line with the motives advanced by Keynes (1936) and the down payment motive by Browning and Lusardi (1996).

# Chapter 3 Discussion

## 3.1 Introduction

In this chapter, we intend to discuss whether individual South Africans undertake savings in line with the motives advanced by Keynes (1936) and the down payment motive by Browning and Lusardi (1996) basing on the available literature. We also point out to what extent individual South Africans and Chinese undertake saving in-line with those motives.

## 3.2 Discussion on South Africa

Below, we explore whether individual South Africans undertake savings in line with the motives advanced by Keynes (1936) and the down payment motive by Browning and Lusardi (1996). The first question is whether South Africans undertake saving for precautionary reasons? This may be so to a smaller extent. Noteworthy, this is the most outstanding motive for undertaking saving. The need for precautionary saving is more among rural dwellers than urban dwellers because their incomes are more volatile compared to urban dwellers (Ozcan et al 2003). Secondly, it should also be noted that the government of South Africa runs a number of social security programmes which make people hesitant to save for precautionary reasons. A study on poverty and livelihood found 14 million people to be dependent on social grants (De Wet 2012). On the other hand, one cannot conclude negatively because the inefficiency of the public sector motivates individuals to save for precautionary reasons in South Africa. Apparently, service delivery such as health services is inadequate. Thus, individuals cannot rely on government in case of unexpected events like sickness.

Do South Africans undertake saving for life-cycle motive? This may be answered in the affirmative. Not to a large extent. The low incomes for working South Africans combined with the high inflation rate makes it difficult to save in line with this motive. Prinsloo (2000) raised this issue in his paper as one of the factors responsible for low saving rates in South Africa. South Africans can hardly put aside money for future use. It is all used for day today expenses. Furthermore, money can hardly be put aside largely because of dependents. According to World Bank reports, almost half of South Africans are dependents (53.29 per cent in 2010). This means that the working few have to bear the burden of catering for the dependents. More still, Individuals tend to substitute contractual savings for voluntary savings. The pension sector in South Africa is functioning well. Therefore, though, with all the factors mentioned above one can't completely conclude negatively. Apparently, there are

individuals who save with the aim of using their funds during retirement, or to start a family, which is in-line with this life-cycle motive.

Do South Africans undertake saving for inter-temporal substitution motive? Yes. Assuming the interest rate is the return on saved money. The conclusions of studies done on developing economies concerning the effect of interest rate on savings are ambiguous. Aron and Muellbauer (2000) found a positive relationship between savings and real interest rate. Prinsloo (2000) argues that the impact of interest rates is minimal. According to Loayza et al (2000), the relationship is negative. With no clear response of savings to deposit rates in South Africa, one can't conclude that South Africans undertake saving because of this motive. More-still, the return on saved money is too low to really entice saving.

Do South Africans undertake saving for improvement motive? Yes. South Africa is marred by severe poverty. The low incomes for workers coupled with high inflation in South Africa makes saving with the aim of improving one's life quite difficult. Inflation erodes away the purchasing power of money (Loayza et al 2000). An individual would require more money to purchase the same amount of goods or services. Inflation coupled with low incomes makes it difficult for saving with the improvement motive. However, one cannot firmly conclude that South Africans do not save in-line with the improvement motive because individuals especially the working youth save with the aim of improving their lives.

Do South Africans undertake saving for independence motive? Yes. However, not to a large extent. Low incomes, the high unemployment rate coming into play (Kingdon & Knight 2004) especially among the youth, rising inflation make it difficult to undertake saving in-line with this motive. Still you can't completely say NO, because it is natural that individuals like being independent. The working youth are most likely to endeavour to save so that they can be independent from their parents or guardians.

Do South Africans undertake saving for enterprise motive? Yes. However, not to a large extent. Munemo (2012) did a study on entrepreneurship in developing countries, and advocated for reforms in governance to improve entrepreneur activity. South Africa is not an exception. People largely in South Africa are more inclined to involve themselves in entrepreneur activities. Preisendorfer et al (2012) raised concern over the low participation of black people in entrepreneurship activities. They are less likely to save for entrepreneurship purposes. Though, with reasons given above, one can't conclude NO under this motive

because South Africa has witnessed a lot of entrepreneurial activity over the years especially in urban areas, which qualify it as an emerging market (Toerien & Seaman 2012).

Do South Africans undertake saving for be-quest motive? Yes. Although inflation, low incomes, high dependency levels make it hard to save in-line with this motive. Due to rising costs of living in South Africa, households find themselves pre-occupied with meeting basic needs and in no position to put aside wealth for their dependents when they pass-on. However, it should also be noted that South Africans have much attachment to their families and are most likely to save with a motive of passing on the accumulated wealth to their loved-ones.

Do South Africans undertake saving for avarice motive? No. When other factors such as low income, high dependency ratio, unfavourable terms of trade come into play, it becomes difficult for individual South Africans to hold onto what they own. Prices of goods and services are always shifting positions, eroding the purchasing power of income, yet incomes (salaries and wages) are not increasing to match the prices of goods and services making this motive less applicable to South Africa.

Do South Africans undertake saving for down-payment motive? Yes. However, not to a large extent. The financial sector of South Africa is highly developed, it compares well with developed countries. Secondly, the financial market is highly liberalised. Given the two factors, individuals can easily access debt. Cronje and Roux (2010) identified a culture of debt among South Africans rather than saving. Roux, the head of economic research at Old Mutual Investment Group revealed that South Africans easily buy on credit. This makes saving in line with this motive weak. The above discussion is summarised in table 3.1

## Table 3.1: Summary of the discussion on South Africa

| | | |
|---|---|---|
| 1 | Precautionary motive | Yes |
| 2 | Life-cycle motive | Yes |
| 3 | Inter-temporal substitution motive | Yes |
| 4 | Improvement motive | Yes |
| 5 | Independence motive | Yes |
| 6 | Enterprise motive | Yes |
| 7 | Be-quest motive | Yes |
| 8 | Avarice motive | No |
| 9 | Down payment motive | Yes |

## 3.3 Discussion on China

Below is a discussion of whether individual Chinese undertake savings in line with the eight motives forwarded by Keynes (1936) and the down payment motive by Browning and Lusardi (1996). Do Chinese undertake saving for precautionary reasons? Yes, to a large extent, According to Chamon et al (2011), income uncertainty (Qin 2003), reforms of 1990's which did away with the "iron bowl system" (Cristadoro & Marconi, 2012), declining provision of public education, health, and housing services created a precautionary motive for saving among the Chinese people. Beland and Yu (2004) did a study on the pension sector and found it to be weak motivating Chinese to save for precautionary reasons.

Do Chinese undertake savings for Life-cycle motive? Yes, because. The sex of the child comes into play to support the life-cycle motive. Wei and Zhang (2009) did a study and found empirical evidence to support this hypothesis in China. Households with a boy save more to ensure that their boy child has the capacity to attract a partner and start a family in future because there is a surplus of boys. This is mainly due to their one child policy which results into most families preferring a baby boy to a baby girl.

Do Chinese undertake saving for inter-temporal substitution motive? No, because. The issue of real interest rate comes into play as the return on saved money to support this motive. The conclusions of studies done on interest rate have been ambiguous. Feltenstein et al (1990) found nominal interest to have an impact on savings; real interest rate instead impacted on consumption. Pettis (2009) observed that interest rates are very low in China, ruling them out as a motivator for saving. Pettis (2009) illustrated this with an example of Mr. Zhang. Mr. Zhang earns very small returns on his savings, 0.36 per cent a year on demand deposits, 1.71 per cent on three-month CDS but still goes on to save. Meaning how-ever low the interest rate, Chinese people still go on to save.

Do Chinese undertake saving for improvement motive? Yes, According to Yao et al (2004), despite significant strides made by China in economic growth over two decades now, poverty in China is still serious and there is urgent need to reduce it, inequality too is still persistent especially between rural and urban dwellers. One can argue that since China is in transition from low income status to middle/high income country, saving with a motive among households for the improvement of their lives is most likely to be observed.

Do Chinese undertake saving for independence motive? Yes. Backed with survey evidence, Chamon et al (2011) established that younger households endeavour to acquire assets to prepare for future education expenditures and older households prepare for uncertainties especially health expenditures. This argument maybe more in line with the precautionary motive but can as well be used to support the independence motive especially among the young people who strive to attain a certain level of independence in their future lives.

Do Chinese undertake saving for enterprise motive? Yes, not to a large extent. To support this motive, we refer to Xiao and Fan (2002) who conducted a comparative study on saving motives between Americans and Chinese. They found that Chinese are most likely to save for investment purposes which is not the case in America. However, Zhong (2010) examined the impact of public finance on the high saving rates of China and found that the massive direct investment by government crowds out private investment hindering individual investors. One can argue that Chinese are less likely to undertake saving for enterprise purposes since the government is still the dominant investor.

Do Chinese undertake saving for be-quest motive? Yes, Whyte (1996) identified Chinese' preference for joint families which span over generations. They live close to each other, patrilineal in nature and ensure sons have equal claim to inheritance in case of the father's death. Whyte continues to note that the Chinese family model is an engine to growth in a way that an individual is willing to undertake any sacrifices for the prosperity of the family. Parents in China are most likely to save in order to leave behind a fortune for their children because inheritance is deeply rooted in their society.

Do Chinese undertake saving for avarice motive? Yes. The fact that Chinese have much attachment to their families and inheritance is deeply rooted (Whyte 1996), they are therefore most likely to endeavor to hold onto their wealth. Thus, Chinese are motivated to save for this reason largely because of strong family ties.

Do Chinese undertake saving for down-payment motive? Yes, it should be noted that the role of government in provision of services such as health, and education is declining in China (Chamon et al 2011). On the other hand, costs for these services are rising. Therefore, Chinese save so that they can be able to pay cash for such services. Furthermore, China is becoming predominantly a capitalistic economy where cash is the dominant mode of transacting unlike before when it was predominantly a command economy (Boisot & Child

1996). Therefore, “no cash, no transacting”. Chinese are encouraged to save in order to have the capacity to make cash down payments.

The above discussion is summarised in table 3.2

**Table 3.2: Summary of the discussion on China**

| | | |
|---|---|---|
| 1 | Precautionary motive | Yes |
| 2 | Life-cycle motive | Yes |
| 3 | Inter-temporal substitution motive | No |
| 4 | Improvement motive | Yes |
| 5 | Independence motive | Yes |
| 6 | Enterprise motive | Yes |
| 7 | Be-quest motive | Yes |
| 8 | Avarice motive | Yes |
| 9 | Down payment motive | Yes |

## 3.4 Conclusion

The discussion of the motives for saving advanced by Keynes (1935) and Browning and Lusardi (1996) revealed important comparative information. Firstly, whether individual Chinese and South Africans save in-line with the mentioned nine motives. It was noted that both Chinese and South Africans undertake saving in-line with these motives. The only difference is that Chinese households save in-line with the mentioned motives to a larger extent and South Africans households save in-line with the mentioned motives to a lesser extent. In the next chapter, we collect and assemble data on the various determinants (independent variables) of household savings (dependent variable) in both South Africa and China. Secondly, we test to find out the impact of household savings (independent variable) on the stock market (dependent variable) by regressing.

# Chapter 4 Data and Empirical Analysis

## 4.1 Introduction

In this chapter, an ordinary least squares estimation (OLS) will be performed with household savings as the dependent variable and other explanatory variables. The explanatory variables included are in line with the available literature on household savings. The main aim is to assess the relationship between household savings and the various explanatory variables in South Africa and China. OLS estimation will also be performed with stock market capitalization as the dependent variable and household savings as the explanatory variable. The main objective is to examine the effect of household savings on the stock market in South Africa and China. The data and methodology will be discussed in this chapter. Model estimation too will be done in this chapter, time series data will be used in estimating.

## 4.2 Data

### Data on South Africa

Although a number of factors have been identified in the previous chapter as potential determinants of household savings, we did not test all of them due to difficulties in obtaining reliable numerical data. We therefore test the following factors for their effect on household savings by using the household saving rate as the dependent variable. The independent variables are lagged household savings, economic growth, the real interest rate, inflation, the dependency ratio, the urbanization ratio, the unemployment rate, the current account balance, government savings, corporate savings, and GDP per capita growth. Data used in this chapter on South Africa is annual data that has been obtained from various sources covering a twenty two year sample period (1990 to 2011). The analysis makes use of household savings as a percentage of disposable income as the dependent variable obtained from the South African Reserve Bank. Data on the explanatory variables, economic growth (annual percentage), the real interest rate (percentage), the deposit interest rate, inflation (consumer prices), the old and young dependency ratios (percentage of the working population), urbanization ratio (urban population growth, annual percentage), unemployment rate (percentage of total labor force), current account balance (percentage of GDP), money and quasi money (M2) as percentage of GDP as a proxy for credit (financial liberalisation) and income (GDP per capita growth) has been obtained from the World Development Indicators and Global Development Finance database under the World Bank. Data on the savings by corporates and government as percentages of GDP has been obtained from The South African

Reserve Bank database. More-still, in order to analyze the effect of household savings on the stock market, we utilize market capitalization of listed companies as a percentage of GDP obtained from the World Bank database and savings by households as a percentage of disposable income.

### Data on China

The analysis on China is also limited to a few variables for testing due to difficulty in obtaining reliable data. We test the same factors like we did for South Africa for their effect on household savings in order to come up with comparable results between South Africa and China. Data on the explanatory variables; economic growth (annual percentage), the real interest rate (percentage), the deposit interest rate, inflation (consumer prices), the old and young dependency ratios (percentage of the working population), urbanization ratio (urban population growth, annual percentage), unemployment rate (percentage of total labor force), current account balance (percentage of GDP), Income (GDP per capita growth), money and quasi money (M2) as percentage of GDP and market capitalization of listed companies as a percentage of GDP is obtained from the World Bank database of World Development Indicators and the Global Development Finance database. The analysis makes use of the household saving rate as a percentage of disposable income based on calculations by the authors. We obtained data on the annual disposable income per capita and annual living expenditure per capita from the CEIC Global Database, a database for developing and developed markets macroeconomic data, to compute the household saving rate as a percentage of disposable income in China.

## 4.3 Methodology

Since in this paper, we are dealing with time series data, Gujarati (2004) and Koop (2006) agitate to have a test for stationarity done as the first step. The Augmented Dickey –Fuller test is therefore employed to study the presence of unit roots in the various variables as Koop (2006) advises. Koop (2006) asserts that the test is undertaken in-order to do away with the spurious regression problem when one non-stationary time series is regressed on another non-stationary time series. In case a variable is found to be non-stationary, Koop advises for the deployment of the differencing approach in-order to remove this trend and make the data stationary.

## 4.4 Model

Given the potential determinants of household savings as discussed in the literature review section, the general household saving equation including all relevant variables takes the format below:

$$Y_t = \alpha + \beta_0 Y_{t-1} + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \beta_{11} X_{11} + \beta_{12} X_{12} + \varepsilon_t \quad \textbf{(1)}$$

In the equation above, *t* denotes time. The dependent variable for the equation is Yt which denotes the household savings as a percentage of disposable income. *a* is the intercept, The regressors are: **Yt-1** denotes lagged household saving rate, a dependent variable, **X1** defines economic growth, an income and growth variable, **X2** denotes the real interest rate a financial variable**, X3** expresses the inflation rate a financial variable. **X4** represents the age dependency ratio of old people and **X5** is the age dependency ratio of young people both demographic variables, **X6** is the current account balance, **X7** denotes the urbanization ratio, also a demographic variable, **X8** is the unemployment rate, **X9** stands for the GDP per capita growth, **X10** is Money and quasi money as a percentage of GDP taking care of the level of financial development, **X11** is government savings rate as a percentage of GDP and finally **X12** stands for corporate savings rate as a percentage of GDP.

In-order to estimate the effect of household savings in the stock market, the equation takes the following format below;

$$SMK_{t=\alpha+HSDI_1+\varepsilon_t} \quad \textbf{(2)}$$

In the equation above, $SMK_t$ stands for Stock Market Capitalisation of listed companies as a percentage of GDP. $\alpha$ is the intercept, $HSDI_t$ denotes Household Savings as a percentage of disposable income and $\varepsilon_t$ is the error.

**Table 4.0: Expected signs of coefficients for the variables (South Africa)**

| Variable | Theoretical Intuition | Expected Sign |
|---|---|---|
| Inertia(lagged Household Saving rate) | Loayza et al (2000) advocate for the inclusion of the lagged saving rate as a potential determinant of savings in a given year. It has a positive relationship with the household saving rate. | Positive(+) |
| Economic growth | Carroll et al (2000) suggest that high growth leads to high savings. Therefore, an increase in economic growth is likely to be followed by an increase in household savings. | Positive(+) |
| The real interest rate | The expected sign is quite a puzzle because the conclusions of the various studies which have been undertaken to find its effect on household savings are ambiguous. Aron and Muellbauer (2000) found that there is a positive relationship. Prinsloo (2000) found the impact of real interest rates on household savings to be minimal. Loayza et al (2000) found a negative relationship. Harjes and Ricci (2005) concluded that the effect of the real interest rates on household savings is not clear. | (?) |
| Inflation rate | South Africans decry the high food prices, transport costs, and utility costs which leave them no opportunity to put money aside. Scholars Loayza et al (2000) found inflation to have a significant negative effect on private savings in developing countries. | Negative (-) |
| Dependency ratio-old | The old tend to be dependents, the higher this ratio, the fewer savings likely to be observed. According to the life-cycle model, older people work less and consume out of their savings (Schmidt et al 1992). This impacts the savings rate | Negative (-) |

| | | |
|---|---|---|
| | negatively. | |
| Dependency ratio-young | Schmidt et al (1992) established that households with more children at home tend to save less. This implies an inverse relationship between the two variables. | Negative (-) |
| Current account balance | According to Trading Economics, the current account balance averaged negative 15715.1 Million Rands from 1961 to 2012. Low saving rates by households imply a positive relationship between the two variables. | Positive (+) |
| Urbanization ratio | Ozcan et al 2003 argue that the need for precautionary saving is higher among rural dwellers than Urban dwellers because their incomes are more volatile. Therefore, the urbanisation ratio is expected to have a negative impact on household savings. | Negative(-) |
| Unemployment rate | A person who is unemployed doesn't earn meaning he/she has nothing to save. According to Kingdon and Knight (2004), the high unemployment levels have been a subject of debate since the 1980's. The higher the unemployment rate, the lower the saving rate. | Negative(-) |
| GDP per capita | According to Loayza et al (2000), the influence of income on savings is greater in developing countries than industrialised countries. They argue that a double in per capita income, ceteris paribus, raises the long-run private saving rate by 10 percentage points of disposable income. Prinsloo (2000) identified the low income growth as a major factor responsible for the low saving rate in South Africa. | Positive(+) |
| M2 | South Africa has a sound banking industry which compares well with developed economies. This | Negative(-) |

| | | |
|---|---|---|
| | makes the acquisition of debt easy. Aaron and Muellbauer (2000) points out that financial liberalization had a large effect on the ratio of debt to income. Cronje and Roux (2010) noted a culture of debt among South Africans rather than saving. | |
| Government Savings | Lewis (2001) argues that, when government savings increase, households tend to save less. Therefore, household savings are responsive to government savings. | Negative(-) |
| Corporate savings | Tsikata (1998) and Johnson and Teferra (2001) argue that households as the ultimate owners of corporations view corporate savings as a full substitute of their own savings. According to Harjes and Ricci (2005), households tend to offset changes in corporate savings with their own savings implying that when corporate savings improve, household savings decline. | Negative(-) |

**Table 4.1: Expected signs of coefficients for the variables (China)**

| Variable | Theoretical Intuition | Expected Sign |
|---|---|---|
| Inertia(lagged Household Saving rate) | The Lagged saving rate coefficient was found to be highly significant by Horioka and Wan in 2007. It has a long term positive effect on household savings according to Ozcan et al (2003) | Positive (+) |
| Economic growth | Cristadoro and Marconi (2012) contends that, it is rapid economic growth has enabled a drastic increase in people's income in-turn availing them with enough cash to put aside as savings. Statistical data since the start of the 1979 reforms reveals miraculous growth rates as well as a surge | Positive (+) |

| | | |
|---|---|---|
| | in household savings. | |
| The real interest rate | There are differing conclusions on this issue. Pettis (2009) found that it does not impact on savings in China. However, Horioka and Wan (2007) found real interest rate to be one of the main determinants of variations over time and over space responsible for the high saving rate in China. We can't therefore firmly conclude on the sign expected. | (?) |
| Inflation rate | Horioka and Wan (2007) found inflation rate to be a determinant of household savings in China in some cases. Inflation tends to have a negative impact on household savings. | Negative (-) |
| Dependency ratio-old | The old tend to be dependents, the higher this ratio, the less savings are observed among households. According to the life-cycle model, older people work less and consume out of their savings (Schmidt et al 1992). The Chinese dependency ratio is relatively low. | Negative (-) |
| Dependency ratio-young | Horioka and Wan (2007) identified this as one of the reasons for high savings by households in China because of a drastic fall in the young dependency ratio over the past decades. This is largely attributed to their one-child policy. | Negative (-) |
| Current account balance | According to Trading Economics, China has always reported a positive current account balance. Positive and huge household savings are observed too implying a positive relationship between the two. Recall the national income identity:<br>$Y = C + I + G + X - M \Leftrightarrow S = I + G + (X - M)$<br>Thus a higher current account balance implies a domestic savings surplus. | Positive (+) |

| | | |
|---|---|---|
| Urbanization ratio | Statistical data from 1995 to 2004 in China affirms that the saving rate of urban households ranged from 10.7% to 25.7%, whereas for rural households, it ranged from 10.0% to 43.7%, and that of all households ranged from 13.5% to 35.1% (Horioka & Wan 2007). Urbanisation tends to negatively impact on household savings. | Negative (-) |
| Unemployment rate | The negative sign is expected because the more people are unemployed, the lower the saving rate. According to Trading Economics, the unemployment level in China is low by international standards, which partly explains their high saving rate. | Negative (-) |
| GDP per capita | Horioka and Wan (2007) claimed that a one percentage point increase in the income growth rate causes a 0.192–0.536 percentage point increase in the household saving rate. Zhou (2012) recognised that in the period 1990 to 2006, increase in income was observed as well as an increase in the household saving rate. | Positive (+) |
| M2 | Zhang et al (2012) noted that though China has continuously experienced rapid economic growth, making it the second largest economy in the world after the US, its level of financial development, and financial liberalisation lags behind developed markets. The acquisition of credit in China is quite difficult therefore enticing citizens to save hard in-order to acquire durables. The lower the M2, the higher the saving rate. | Negative (-) |

## 4.5 Estimation

### 4.5.1 Unit roots

According to Koop (2006), the main problem with time series data analysis is non-stationarity. An analyst has to ensure that the time series are stationary before regressing. Economists and financial analysts are mainly interested in Unit root non-stationarity which tends to be present in financial time series (Koop 2006). This analysis therefore begins with testing to establish whether the data is stationary or non-stationary. We begin by looking visually at the graphs of the different variables. However, basing on the graphs we cannot not satisfactorily tell whether the time series contain unit root or not. So we went on to undertake an advanced test, the Augmented-Dickey fuller as Koop (2006) recommends. The tables below represent the results obtained after undertaking the Augmented Dickey Fuller test.

**Table 4.2: Augmented-Dickey fuller test (South Africa)**

| Augmented Dickey Fuller Test in levels | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** | **1%** | **5%** | **10%** |
| CAB(-1) | -0.199504 | 0.111317 | -1.92222 | 0.3732 | -3.808546 | -3.020686 | -2.650413 |
| COPR(-1) | -0.382726 | 0.153913 | -2.486646 | 0.1332 | -3.808546 | -3.020686 | -2.650413 |
| DEPO(-1) | 0.003991 | -0.002073 | 1.924776 | 0.9995 | -3.886751 | -3.052169 | -2.666593 |
| DEPY(-1) | 0.004952 | 0.005591 | 0.885811 | 0.9926 | -3.857386 | -3.040391 | -2.660551 |
| ECG(-1) | -0.46362 | 0.18235 | -2.522474 | 0.1203 | -3.78803 | -3.012363 | -2.646119 |
| GOVSR(-1) | -0.284402 | 0.144378 | -1.969846 | 0.2965 | -3.808546 | -3.020686 | -2.650413 |
| HSDI(-1) | -0.142352 | 0.075113 | -1.895166 | 0.3268 | -3.857386 | -3.040391 | -2.660551 |
| **INF(-1)** | **-0.67356** | **0.222567** | **-3.026325** | **0.0524** | **-3.808546** | **-3.052169** | **-2.666593** |
| INT(-1) | -0.255526 | 0.17487 | -1.461232 | 0.5329 | -3.78803 | -3.012363 | -2.646119 |
| M2(-1) | -0.055952 | 0.0606011 | -0.923 | 0.7591 | -3.808546 | -3.020686 | -2.650413 |
| PERK(-1) | -0.376665 | 0.168302 | -2.238038 | 0.1997 | -3.78803 | -3.012363 | -2.646119 |
| UNE(-1) | -0.286851 | 0.14359 | -1.997703 | 0.2854 | -3.78803 | -3.012363 | -2.646119 |
| URNR(-1) | -0.062045 | 0.076356 | -0.812574 | 0.7936 | -3.808546 | -3.020686 | -2.650413 |
| DEPINT | -0.255958 | 0.174953 | -1.463009 | 0.532 | -3.78803 | -3.012363 | -2.646119 |
| SMK(-1) | -0.459647 | 0.191832 | -2.396094 | 0.1546 | -3.78803 | -3.012363 | -2.646119 |

Source: Eviews results

Note: The critical values are; rejection at 1%, 5% and 10%.

Table 4.2 shows the results after testing for stationarity using the Augmented Dickey Fuller test on South African data using the Dickey-Fuller test at levels. The results indicate that only one variable; inflation has no unit root at 10% level of significance. Results indicate that the rest of the variables have unit roots. This necessitated undertaking differencing (so all variables were differenced except the two that were already stationary) on the time series in-order to make them stationary as Gujarati (2004) and Koop (2006) recommend.

## Table 4.3: Augmented-Dickey fuller test after differencing (South Africa)

| Augmented Dickey Fuller Test after differencing | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** | **1%** | **5%** | **10%** |
| D(CAB(-1)) | -0.684272 | 0.224073 | -3.05379 | 0.0469 | -3.808546 | -3.020686 | -2.650413 |
| D(COPR(-1)) | -1.305584 | 0.369222 | -3.536039 | 0.0191 | -3.857386 | -3.040391 | -2.660551 |
| D(DEPO(-1),2) | -0.248683 | 0.073615 | -3.378161 | 0.0261 | -3.857386 | -3.040391 | -2.660551 |
| D(ECG(-1)) | -1.140057 | 0.232328 | -4.907774 | 0.001 | -3.808546 | -3.020686 | -2.650413 |
| D(GOVSR(-1)) | -0.764627 | 0.228647 | -3.344143 | 0.0263 | -3.808546 | -3.020686 | -2.650413 |
| D(HSDI(-1)) | -1.345906 | 0.192901 | -6.977184 | 0 | -3.831511 | -3.02997 | -2.655194 |
| D(INT(-1)) | -1.069274 | 0.235319 | -4.543937 | 0.0021 | -3.808546 | -3.020686 | -2.650413 |
| D(M2(-1),2) | -1.1563 | 0.222266 | -5.202333 | 0.0006 | -3.831511 | -3.02997 | -2.655194 |
| D(PERK(-1)) | -1.118326 | 0.23286 | -4.802569 | 0.0012 | -3.808546 | -3.020686 | -2.650413 |
| D(UNE(-1)) | -1.036655 | 0.234251 | -4.425408 | 0.0027 | -3.808546 | -3.020686 | -2.650413 |
| D(URNR(-1)) | -0.632678 | 0.222987 | -2.837285 | 0.071 | -3.808546 | -3.020686 | -2.650413 |
| D(SMK(-1)) | -1.335106 | 0.227321 | -5.873219 | 0.0001 | -3.808546 | -3.020686 | -2.650413 |
| DEPINT(-1)) | -1.069274 | 0.235319 | -4.543937 | 0.0021 | -3.808546 | -3.020686 | -2.650413 |

Source: Eviews results

Note: The critical values are; rejection at 1%, 5% and 10%

Table 4.3 shows results obtained after testing for stationarity on South African time series using the Dickey-Fuller test after differencing. This is in-line with Gujarati (2004)'s recommendations of having data differenced in-order to do away with the unit roots. Most of the variables became stationary at first difference except for dependency ratio old and money and quasi money (M2) which turned stationary at second difference.

## Table 4.4: Correlation Matrix for South Africa

| | **CAB** | **COPR** | **DEPINT** | **DEPO** | **DEPY** | **ECG** | **GOVSR** | **HSDI** | **INF** | **INT** | **M2** | **PERK** | **SMK** | **UNE** | **URNR** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CAB** | 1 | 0.507 | 0.0455 | -0.75 | 0.77 | -0.5 | -0.677 | 0.78 | 0.4 | 0.05 | -0.9 | -0.62 | -0.74 | -0.08 | 0.732 |
| **COPR** | 0.507 | 1 | -0.077 | -0.21 | 0.33 | -0.3 | -0.872 | 0.5 | 0.1 | -0.1 | -0.5 | -0.33 | -0.49 | -0.32 | 0.37 |
| **DEPINT** | 0.046 | -0.08 | 1 | -0.45 | 0.17 | 0.05 | -0.019 | 0.09 | -0.1 | 1 | -0.3 | -0.06 | -0.06 | -0.08 | 0.467 |
| **DEPO** | -0.755 | -0.21 | -0.45 | 1 | -0.9 | 0.31 | 0.5003 | -0.8 | -0.5 | -0.4 | 0.93 | 0.465 | 0.479 | 0.347 | -0.862 |
| **DEPY** | 0.772 | 0.329 | 0.1659 | -0.9 | 1 | -0.5 | -0.61 | 0.87 | 0.7 | 0.17 | -0.8 | -0.66 | -0.58 | -0.57 | 0.794 |
| **ECG** | -0.513 | -0.27 | 0.054 | 0.31 | -0.5 | 1 | 0.5126 | -0.6 | -0.7 | 0.05 | 0.3 | 0.978 | 0.546 | 0.32 | -0.368 |
| **GOVSR** | -0.677 | -0.87 | -0.019 | 0.5 | -0.6 | 0.51 | 1 | -0.8 | -0.3 | -0 | 0.7 | 0.594 | 0.626 | 0.428 | -0.6 |
| **HSDI** | 0.785 | 0.505 | 0.0897 | -0.78 | 0.87 | -0.6 | -0.835 | 1 | 0.6 | 0.09 | -0.8 | -0.67 | -0.68 | -0.44 | 0.73 |
| **INF** | 0.41 | 0.058 | -0.055 | -0.49 | 0.73 | -0.7 | -0.295 | 0.56 | 1 | -0.1 | -0.4 | -0.66 | -0.47 | -0.54 | 0.389 |
| **INT** | 0.046 | -0.08 | 1 | -0.45 | 0.17 | 0.05 | -0.019 | 0.09 | -0.1 | 1 | -0.3 | -0.06 | -0.06 | -0.08 | 0.467 |
| **M2** | -0.865 | -0.49 | -0.349 | 0.93 | -0.8 | 0.3 | 0.6969 | -0.8 | -0.4 | -0.3 | 1 | 0.463 | 0.62 | 0.294 | -0.884 |
| **PERK** | -0.619 | -0.33 | -0.058 | 0.47 | -0.7 | 0.98 | 0.5938 | -0.7 | -0.7 | -0.1 | 0.46 | 1 | 0.621 | 0.375 | -0.552 |
| **SMK** | -0.735 | -0.49 | -0.064 | 0.48 | -0.6 | 0.55 | 0.6261 | -0.7 | -0.5 | -0.1 | 0.62 | 0.621 | 1 | 0.102 | -0.593 |
| **UNE** | -0.077 | -0.32 | -0.085 | 0.35 | -0.6 | 0.32 | 0.4279 | -0.4 | -0.5 | -0.1 | 0.29 | 0.375 | 0.102 | 1 | -0.417 |
| **URNR** | 0.732 | 0.37 | 0.4665 | -0.86 | 0.79 | -0.4 | -0.6 | 0.73 | 0.4 | 0.47 | -0.9 | -0.55 | -0.59 | -0.42 | 1 |

The Correlation matrix indicates there is a strong relationship between deposit interest rate and real interest rate is one.

## Unit root test on Chinese data

Following the same procedure as with South African time series, we test the Chinese data for stationarity. Table 4.5 shows results obtained after undertaking the advanced Dickey –Fuller test at levels.

### Table 4.5:

| Augmented Dickey Fuller test results at levels | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** | **1%** | **5%** | **10%** |
| **CAB(-1)** | -0.306347 | 0.144561 | -2.120631 | 0.2396 | -3.886751 | -3.052169 | -2.666593 |
| **DEPO(-1)** | 0.005347 | 0.003294 | 1.623035 | 0.9988 | -3.92035 | -3.065585 | -2.673459 |
| **DEPY(-1)** | -0.002656 | 0.005724 | -0.463975 | 0.8733 | -3.959148 | -3.081002 | -2.68133 |
| **ECG(-1)** | -0.3182 | 0.151196 | -2.104554 | 0.2451 | -3.857386 | -3.040391 | -2.660551 |
| **HSDI(-1)** | 0.063416 | 0.069759 | 0.909081 | 0.9929 | -3.886751 | -3.052169 | -2.666593 |
| **INF(-1)** | -0.32541 | 0.182872 | -1.779442 | 0.3777 | -3.857386 | -3.040391 | -2.660551 |
| **INT(-1)** | -0.47214 | 0.21477 | -2.198354 | 0.2133 | -3.857386 | -3.040391 | -2.660551 |
| **M2(-1)** | -0.047108 | 0.07379 | -0.638402 | 0.8383 | -3.857386 | -3.040391 | -2.660551 |
| **PERK(-1)** | -0.312452 | 0.157106 | -1.988792 | 0.2885 | -3.857386 | -3.040391 | -2.660551 |
| **UNE(-1)** | -0.099657 | 0.070049 | -1.422689 | 0.5466 | -3.886751 | -3.052169 | -2.666593 |
| **URNR(-1)** | 0.008169 | 0.007763 | 1.05227 | 0.995 | -3.886751 | -3.052169 | -2.666593 |
| **SMK(-1)** | -0.431865 | 0.203679 | -2.12032 | 0.2395 | -3.857386 | -3.040391 | -2.660551 |
| **DEPINT** | -0.13147 | 0.113453 | -1.158799 | 0.6679 | -3.857386 | -3.040391 | -2.660551 |

**Source**: Eviews results

Note: The critical values are; rejection at 1%, 5% and 10%.

According to the results obtained in table 4.5, all variables contain unit root at levels. There is need for an analyst to have them differenced in-order to do away with non-stationarity. We proceed to difference and table 4.6 shows results obtained after differencing and doing the Augmented Dickey-Fuller test.

### Table 4.6:

| Augmented Dickey Fuller test results after differencing | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **Coefficient** | **Std. Error** | **t-Statistic** | **Prob.** | **1%** | **5%** | **10%** |
| **D(CAB(-1))** | -1.837169 | 0.542208 | -3.388308 | 0.0301 | -4.004425 | -3.098896 | -2.690439 |
| **D(DEPO(-1))** | -0.144905 | 0.044165 | -3.281027 | 0.0364 | -4.004425 | -3.098896 | -2.690439 |
| **D(DEPY(-1))** | -0.094292 | 0.024596 | -3.83358 | 0.0136 | -4.004425 | -3.098896 | -2.690439 |
| **D(ECG(-1))** | -0.893976 | 0.264059 | -3.385512 | 0.0041 | -3.886751 | -3.052169 | -2.666593 |
| **D(HSDI(-1))** | -1.472264 | 0.228023 | -6.456648 | 0.0001 | -3.886751 | -3.052169 | -2.666593 |
| **D(INF(-1))** | -0.927893 | 0.259815 | -3.571353 | 0.0028 | -3.886751 | -3.052169 | -2.666593 |
| **D(INT(-1))** | -1.149102 | 0.272367 | -4.218947 | 0.0007 | -3.886751 | -3.052169 | -2.666593 |
| **D(M2(-1),2)** | -1.799297 | 0.447643 | -4.019491 | 0.0015 | -3.92035 | -3.065585 | -2.673459 |
| **D(PERK(-1))** | -0.896242 | 0.263853 | -3.396742 | 0.004 | -3.886751 | -3.052169 | -2.666593 |
| **D(UNE(-1))** | -1.077922 | 0.282776 | -3.811933 | 0.0019 | -3.92035 | -3.065585 | -2.673459 |
| **D(URNR(-1))** | -1.082488 | 0.267685 | -4.043886 | 0.0012 | -3.92035 | -3.065585 | -2.673459 |
| **D(SMK(-1))** | -1.42334 | 0.237274 | -5.998725 | 0 | -3.886751 | -3.052169 | -2.666593 |
| **D(DEPINT(-1** | -0.700369 | 0.200388 | -3.49507 | 0.0216 | -3.886751 | -3.052169 | -2.666593 |

Source: Eviews results

Note: The critical values are; rejection at 1%, 5% and 10%.

Table 4.6 indicates that the majority of the variables turned stationary at first difference except for quasi money (M2) which became stationary at second difference.

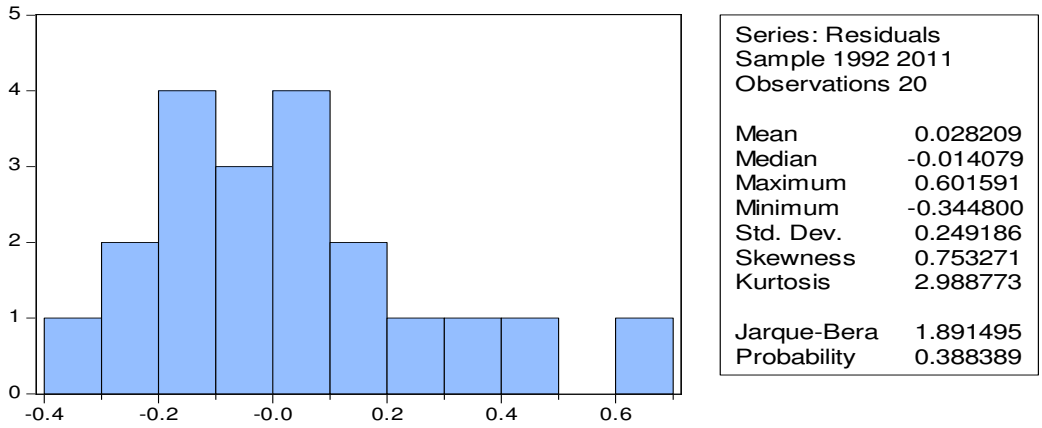
**Table 4.7: Correlation Matrix for China**

| | CAB | DEPINT | DEPO | DEPY | ECG | HSDI | INF | INT | M2 | PERK | SMK | UNE | URNR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CAB | 1 | -0.5408 | 0.712 | -0.779 | 0.091 | 0.777 | -0.259 | 0.05764 | 0.61626 | 0.1919 | 0.7705 | 0.6794 | 0.7644 |
| DEPINT | -0.541 | 1 | -0.795 | 0.6304 | 0.6033 | -0.64 | 0.8547 | -0.6247 | -0.7984 | 0.5121 | -0.426 | -0.7122 | -0.678 |
| DEPO | 0.7118 | -0.7952 | 1 | -0.943 | -0.328 | 0.939 | -0.504 | 0.22834 | 0.97886 | -0.202 | 0.7212 | 0.9279 | 0.9732 |
| DEPY | -0.779 | 0.63038 | -0.943 | 1 | 0.0333 | -0.98 | 0.2928 | -0.0022 | -0.9259 | -0.0956 | -0.772 | -0.9147 | -0.992 |
| ECG | 0.091 | 0.60326 | -0.328 | 0.0333 | 1 | -0.1 | 0.7015 | -0.6832 | -0.315 | 0.9912 | 0.1684 | -0.2117 | -0.142 |
| HSDI | 0.7765 | -0.6397 | 0.939 | -0.977 | -0.098 | 1 | -0.317 | 0.03964 | 0.91315 | 0.0259 | 0.789 | 0.8627 | 0.9825 |
| INF | -0.259 | 0.85472 | -0.504 | 0.2928 | 0.7015 | -0.32 | 1 | -0.9331 | -0.5369 | 0.6567 | -0.225 | -0.3951 | -0.359 |
| INT | 0.0576 | -0.6247 | 0.228 | -0.002 | -0.683 | 0.04 | -0.933 | 1 | 0.26226 | -0.6783 | 0.0621 | 0.1152 | 0.0793 |
| M2 | 0.6163 | -0.7984 | 0.979 | -0.926 | -0.315 | 0.913 | -0.537 | 0.26226 | 1 | -0.1909 | 0.6835 | 0.9191 | 0.951 |
| PERK | 0.1919 | 0.51215 | -0.202 | -0.096 | 0.9912 | 0.026 | 0.6567 | -0.6783 | -0.1909 | 1 | 0.2717 | -0.0863 | -0.014 |
| SMK | 0.7705 | -0.4259 | 0.721 | -0.772 | 0.1684 | 0.789 | -0.225 | 0.06213 | 0.68345 | 0.2717 | 1 | 0.6139 | 0.7687 |
| UNE | 0.6794 | -0.7122 | 0.928 | -0.915 | -0.212 | 0.863 | -0.395 | 0.11517 | 0.91906 | -0.0863 | 0.6139 | 1 | 0.918 |
| URNR | 0.7644 | -0.6778 | 0.973 | -0.992 | -0.142 | 0.983 | -0.359 | 0.07934 | 0.95098 | -0.0135 | 0.7687 | 0.918 | 1 |

## 4.5.2 Diagnostic Testing

Gujarati (2004) further recommends testing for normality, autocorrelation and heteroscedasticity of the residuals in-order to comply with the assumptions of classical linear regression.

**Figure 4.1: NORMALITY TEST USING THE JARQUE-BERA (South Africa)**




Source: Eviews results

The null hypothesis is that the residuals are normally distributed; Ho: Normally distributed. The probability value is > than 0.05 level of significance. According to Gujarati (2004), we therefore do not reject the null hypothesis of normality. They are normally distributed implying compliance with the desirable properties of ordinary least squares.

## Table 4.8

**Breusch-Godfrey Serial Correlation LM Test:**

| | | | |
|---|---|---|---|
| F-statistic | 0.149330 | Prob. F(2,5) | 0.8650 |
| Obs*R-squared | 0.872713 | Prob. Chi-Square(2) | 0.6464 |

Source: Eviews results

The Null hypothesis is Residuals are not serially auto correlated

We test for auto correlation using the Breusch-Godfrey Serial Correlation LM test, the results indicate no presence of serial correlation. Looking at p-value = 0.6464 of the chi-square, it is > than 0.05. We accept the null hypothesis, residuals are not serially correlated.

## Table 4.9

**Heteroskedasticity Test: Breusch-Pagan-Godfrey**

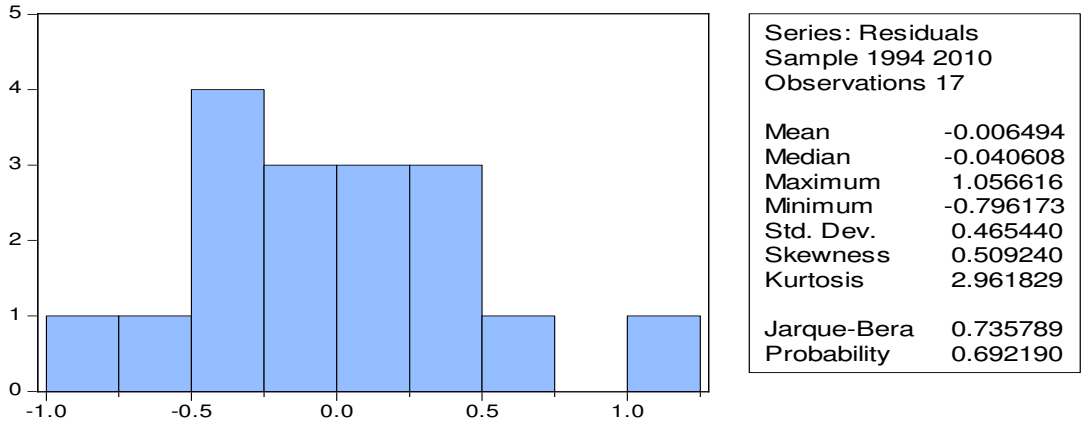
| | | | |
|---|---|---|---|
| F-statistic | 1.018806 | Prob. F(13,6) | 0.5243 |
| Obs*R-squared | 13.76445 | Prob. Chi-Square(13) | 0.3906 |
| Scaled explained SS | 1.963870 | Prob. Chi-Square(13) | 0.9998 |

Source: Eviews results

Alternative Hypothesis: Residuals are homoskedastic

To test if heteroscedasticity is present, we deploy the Breusch-Pagan-Godfrey test. The p-value of the chi-square is 0.9998 which is > than 0.05. We therefore take, the alternative hypothesis, residuals are homoscedastic implying no presence of heteroscedasticity.

**Figure 4.2: NORMALITY TEST USING THE JARQUE-BERA (China)**




Source: Eviews results

The P-value of the Jarque-Bera statistics is greater than 0.05. We therefore do not reject the null hypothesis of normality, we accept it and conclude that, normally distributed.

## Table 4.10

Breusch-Godfrey Serial Correlation LM Test:

| | | | |
|---|---|---|---|
| F-statistic | 0.108533 | Prob. F(1,6) | 0.7530 |
| Obs*R-squared | 0.354383 | Prob. Chi-Square(1) | 0.5516 |

The p-value is greater than 0.05, therefore no presence serial correlation

## Table 4.11

Heteroskedasticity Test: Breusch-Pagan-Godfrey

| | | | |
|---|---|---|---|
| F-statistic | 0.742909 | Prob. F(13,6) | 0.6942 |
| Obs*R-squared | 12.33610 | Prob. Chi-Square(13) | 0.5003 |
| Scaled explained SS | 1.279873 | Prob. Chi-Square(13) | 1.0000 |

Source: Eviews

The Breusch-Pagan –Godfrey test reveals no presence of heteroskedasticity, variables are homoskedastistic

### 4.5.3 Estimation Results

The OLS estimation results are presented in various tables below.

## Table 4.12: Estimation Results (South Africa)

Dependent Variable: DHSDI
Method: Least Squares
Date: 06/09/13 Time: 14:09
Sample (adjusted): 1992 2011
Included observations: 20 after adjustments
White heteroskedasticity-consistent standard errors & covariance

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DHSDI(-1) | -0.059832 | 0.078439 | -0.762783 | 0.4705 |
| DCAB | 0.043636 | 0.051515 | 0.847052 | 0.4250 |
| DDEPY | 0.318105 | 0.221581 | 1.435614 | 0.1943 |
| DCOPR | -0.649620 | 0.091464 | -7.102466 | 0.0002 |
| DGOVSR | -1.001230 | 0.095738 | -10.45806 | 0.0000 |
| DDEPINT | 0.029099 | 0.031565 | 0.921882 | 0.3873 |
| D2DEPO | 6.127053 | 33.19478 | 0.184579 | 0.8588 |
| DECG | -8.366558 | 6.695007 | -1.249671 | 0.2516 |
| DINF | 0.048859 | 0.032795 | 1.489835 | 0.1799 |
| D2M2 | -0.008055 | 0.026793 | -0.300630 | 0.7724 |
| DPERK | 8.680947 | 6.772103 | 1.281869 | 0.2407 |
| DUNE | 0.016598 | 0.030671 | 0.541167 | 0.6052 |
| DURNR | 8.365342 | 6.924487 | 1.208081 | 0.2662 |

| | | | |
|---|---|---|---|
| R-squared | 0.966329 | Mean dependent var | -0.120000 |
| Adjusted R-squared | 0.908606 | S.D. dependent var | 1.018565 |
| S.E. of regression | 0.307926 | Akaike info criterion | 0.732265 |
| Sum squared resid | 0.663730 | Schwarz criterion | 1.379491 |
| Log likelihood | 5.677349 | Hannan-Quinn criter. | 0.858610 |
| Durbin-Watson stat | 1.529084 | | |

Source: Eviews

### Table 4.13

Dependent Variable: DHSDI
Method: Least Squares
Date: 06/09/13 Time: 14:05
Sample (adjusted): 1992 2011
Included observations: 20 after adjustments
White heteroskedasticity-consistent standard errors & covariance

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DHSDI(-1) | -0.049973 | 0.305944 | -0.163342 | 0.8739 |
| DCAB | -0.173394 | 0.188463 | -0.920039 | 0.3816 |
| DDEPY | -0.478477 | 1.110907 | -0.430708 | 0.6768 |
| DDEPINT | 0.023342 | 0.102029 | 0.228775 | 0.8242 |
| D2DEPO | 80.45786 | 91.06709 | 0.883501 | 0.4000 |
| DECG | -19.85491 | 18.66875 | -1.063537 | 0.3152 |
| DINF | -0.031272 | 0.080364 | -0.389135 | 0.7062 |
| D2M2 | -0.142555 | 0.076289 | -1.868603 | 0.0945 |
| DPERK | 20.09000 | 18.90360 | 1.062760 | 0.3156 |
| DUNE | 0.112260 | 0.114308 | 0.982082 | 0.3517 |
| DURNR | 20.94967 | 19.36504 | 1.081830 | 0.3075 |

| | | | |
|---|---|---|---|
| R-squared | 0.473932 | Mean dependent var | -0.120000 |
| Adjusted R-squared | -0.110587 | S.D. dependent var | 1.018565 |
| S.E. of regression | 1.073408 | Akaike info criterion | 3.281047 |
| Sum squared resid | 10.36984 | Schwarz criterion | 3.828699 |
| Log likelihood | -21.81047 | Hannan-Quinn criter. | 3.387954 |
| Durbin-Watson stat | 2.002274 | | |

Source: Eviews

***SOUTH AFRICA***

Although the Beursch-Pagan- Godfrey test was done to establish whether heteroskedasticity exists in the variables, results showed no presence of it, we estimated the equation using heteroscedasticity-robust standard errors in Eviews as recommended by Brooks (2008). Table 4.12 displays the estimation results of the coefficients and P-values of the OLS regression. **The P-values indicate significance for two variables, savings by corporates and government as a percentage of GDP**. The results indicate that savings by corporates and government have a negative relationship with household savings in South Africa. This is in line with arguments by Lewis (2001), Tsikata (1998), Johnson and Teferra. They argue that when government or corporate savings increase, household savings fall. Although the results in table 4.12 reveal corporate savings and government savings as major determinants of household savings in South Africa, we had to leave them out in-order to make the results comparable to China since data on these two variables was not available on China. We therefore went ahead to rerun the regression without them. We obtained results as per the purpose of our study (which is comparing South Africa to China) represented in table 4.13. None of the variables is significant in explaining the trend of household savings.

## Table 4.14: OLS Estimation results on the stock market (South Africa)

Dependent Variable: DSMK
Method: Least Squares
Date: 06/08/13 Time: 16:20
Sample (adjusted): 1991 2011
Included observations: 21 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DHSDI | -21.68934 | 10.09330 | -2.148884 | 0.0441 |

| | | | |
|---|---|---|---|
| R-squared | 0.187558 | Mean dependent var | 0.233659 |
| Adjusted R-squared | 0.187558 | S.D. dependent var | 50.07860 |
| S.E. of regression | 45.13863 | Akaike info criterion | 10.50380 |
| Sum squared resid | 40749.92 | Schwarz criterion | 10.55354 |
| Log likelihood | -109.2899 | Hannan-Quinn criter. | 10.51460 |
| Durbin-Watson stat | 2.679051 | | |

Table 4.14 displays the estimation results of the coefficients and P-value of the OLS regression. The p-value **indicates significance of household savings in explaining the trend of the stock market capitalization in South Africa**. The P-value is less than 0.05. Household savings do have an effect on the stock market in South Africa.

## Table 4.15: Estimation Results (China)

Dependent Variable: DHSDI
Method: Least Squares
Date: 06/09/13 Time: 13:51
Sample (adjusted): 1994 2010
Included observations: 17 after adjustments
White heteroskedasticity-consistent standard errors & covariance

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DHSDI(-1) | -0.536029 | 0.262747 | -2.040095 | 0.0874 |
| DCAB | 0.076140 | 0.365092 | 0.208550 | 0.8417 |
| DDEPY | 0.122444 | 5.222593 | 0.023445 | 0.9821 |
| DDEPINT | -0.176544 | 0.404559 | -0.436386 | 0.6778 |
| DECG | 0.586427 | 39.77603 | 0.014743 | 0.9887 |
| D2DEPO | -3.865050 | 137.3613 | -0.028138 | 0.9785 |
| DINF | 0.141629 | 0.209104 | 0.677314 | 0.5234 |
| D2M2 | 0.042515 | 0.045779 | 0.928696 | 0.3889 |
| DPERK | -0.671639 | 39.69231 | -0.016921 | 0.9870 |
| DUNE | -1.325189 | 3.277143 | -0.404373 | 0.7000 |
| DURNR | 1.081075 | 6.050868 | 0.178664 | 0.8641 |

| | | | |
|---|---|---|---|
| R-squared | 0.444871 | Mean dependent var | 0.670588 |
| Adjusted R-squared | -0.480344 | S.D. dependent var | 1.060522 |
| S.E. of regression | 1.290330 | Akaike info criterion | 3.600337 |
| Sum squared resid | 9.989707 | Schwarz criterion | 4.139475 |
| Log likelihood | -19.60286 | Hannan-Quinn criter. | 3.653928 |
| Durbin-Watson stat | 2.342450 | | |

Source: Eviews results

The estimation results in table 4:15 indicate significance of lagged household savings. This concurs with Horioka and Wan (2007) presence of inertia or persistence in China.

## Table 4.16: OLS Estimation results on the Stock market (China)

Dependent Variable: DSMK
Method: Least Squares
Date: 06/09/13 Time: 13:56
Sample (adjusted): 1993 2010
Included observations: 18 after adjustments
White heteroskedasticity-consistent standard errors & covariance

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DHSDI | 1.980070 | 8.841812 | 0.223944 | 0.8255 |

| | | | |
|---|---|---|---|
| R-squared | -0.008148 | Mean dependent var | 4.221154 |
| Adjusted R-squared | -0.008148 | S.D. dependent var | 39.74252 |
| S.E. of regression | 39.90411 | Akaike info criterion | 10.26479 |
| Sum squared resid | 27069.74 | Schwarz criterion | 10.31425 |
| Log likelihood | -91.38310 | Hannan-Quinn criter. | 10.27161 |
| Durbin-Watson stat | 2.824979 | | |

Source: Eviews results

Table 4.16 presents results of the effect of household savings on the stock market in China. The overall fit (R-squared) indicates that the household saving rate does not fit the model. Household savings do not provide an explanation at all for the trend of stock market capitalization in China.

## 4.6 Conclusion

This chapter investigated the determinants of household savings and the effect of housing savings on the stock market in South Africa and China by using regression analysis, an econometrics technique used by financial and economic researchers to study the relationship between two or more variables. According to results, there was no significant variable in South Africa yet in China, lagged household savings were significant. **The household saving rate as a percentage of disposable income has explanatory power for the level or trend of stock market capitalisation in South Africa. Household savings have an effect on the stock market in South Africa but not in China.**

# Chapter 5 Summary and Policy Recommendations

## 5.1 Summary and Conclusions

The main purpose of the study is to draw a comparison between household savings in China and South Africa, investigate the difference in the factors shaping the attitudes of individual South Africans and Chinese towards saving, and **examine how trends in household savings impact on the stock market in South Africa and China**. Empirical analysis was performed in-order to determine the relationship between household savings and various variables, **and the effect of household savings on the stock market.**

The first chapter contains an outline of the study, spells out the problem statement and explains the methodology and model applied to this research. In the second chapter, we define household savings and discuss the various theories which have been developed by economists about consumption and saving. We also explored the various motives of savings advanced by scholars. These motives revealed vital information about why people save. The need to save for precautionary reasons (unforeseen situations) was identified as the most important motive for saving. We discuss the importance of savings for an economy as a whole and how the functioning and mechanisms of an open economy don't require an economy to have sufficient savings in-order to invest. We also examined the trend and determinants of household savings in both South Africa and China. There were a few factors unique to South Africa, which did not surface in China such as the level of efficiency of the public sector and social security. The following determinants were unique to China: economic reforms, declining provision of public education, health and housing services by government, the role of public sector in investment, the sex of the child, income uncertainty. The following determinants surfaced in both South Africa and China: inertia, taxes, pension systems, government savings, income growth, economic growth, the real interest rate, inflation rate, financial market development, financial liberalization, corporate savings, dependency ratio (both old and young), urbanization ratio, unemployment rate, current account balance and terms of trade. We conclude chapter two with a discussion on how household savings flow into the whole financial system and impact on capital markets especially the stock market.

In the third chapter, an effort was undertaken to discuss whether individual South Africans and Chinese undertake savings in line with the motives advanced by Keynes (1936) and the

down payment motive by Browning and Lusardi (1996) basing on the available literature in order to draw a comparison between the two economies. It was observed that both Chinese and South Africans undertake saving in-line with these motives. The only difference is that Chinese do it to a larger extent than South Africans.

In the fourth chapter, an OLS model estimation of household savings as the dependent variable in South Africa and China was performed with the following explanatory variables: economic growth, the real interest rate, inflation, the old and young dependency ratios, urbanization ratio, unemployment rate, current account balance, income, money and quasi money (M2) as a percentage of GDP. The regression results reveal that savings by corporates and government are significant with a negative relationship with household savings in South Africa. However, for the purpose of this study, we proceeded to run another regression without them; none of the explanatory variables are significant. In China, the lagged household rate is significant. In-order to observe the impact of household savings on the stock market, we regressed household savings against stock market capitalization. The regression results revealed significance of the explanatory variable household saving in South Africa but not China. Household savings lacked the power to explain the level of stock market capitalization in China.

## 5.2 Policy Recommendations

The study revealed that household savings in South Africa are very low and have been negative for over five years, yet household savings in China are high. As per the estimation results obtained, money and quasi money (M2) turned-out to be weakly significant and negatively related to household savings. This implies that a high level of financial liberalization is not good for household savings in an economy. The South African government needs to find ways of how to curb the level of money and quasi money (M2) in the economy in-order to uplift the level of savings, because if it is high, it adversely affects the household saving rate in the economy. Notably, the South African government has tried to monitor the level of financial liberalization through the National Credit Regulator (NCR) in collaboration with private banks by imposing strict lending criteria on borrowers. China's household savings have continued to be at the top of the list largely because of their strong saving culture. Individual Chinese will still undertake saving however low the interest rate is.

The South African Saving Institute needs to embark on aggressive campaigns to encourage and instill a culture of saving into South Africans in-order to uplift the level of savings in the economy, this will also help in uplifting the functioning of the stock market because savings do flow into the stock market. It was noted in China that the state still plays a dominant role in the provision of public services to individuals. This implies that individuals don't have to spend money on services provided by the state thereby saving a lot. Therefore, the South African government needs to improve the level of efficiency and service delivery by the public sector so that individuals don't have to spend money on things which should be paid for by the state such as security, education, health services. This will help uplift the level of household savings.

## 5.3 Future Research

Future research on the issue of savings should be geared towards determining whether gross savings have a significant impact on the stock market. The summation of savings by all entities including corporations and government should be analyzed to determine whether they explain the trend in the stock market capitalization of an economy.

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