UNIVERSITY OF KWAZULU-NATAL

STYLE INVESTING EFFECTS ON THE PERSISTENCE AND PERFORMANCE OF SOUTH AFRICAN UNIT TRUSTS

Mbuso Clement Simelane

211505804

This thesis was submitted in fulfilment of the requirements for the Degree of Master of Commerce in Finance by research.

School of Accounting, Economics and Finance

College of Law and Management Studies

Westville

Supervisor: Dr Mabutho Sibanda

2016

DECLARATION

I, Mbuso Clement Simelane, declare that:

a) the research reported in this dissertation, except where otherwise indicated, is my original research;
b) this thesis has not been submitted for any degree or examination at this university or any other university;
c) this thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged;
d) this thesis does not contain other persons' writing, unless specifically acknowledged as being sourced from other researchers;
e) where other written sources have been quoted, then:
    (i) their words have been re-written but the general information attributed to them has been referenced;
    (ii) where their exact words have been used, their writing has been placed inside quotation marks, and referenced;
f) where I have reproduced a publication of which I am author, co-author or editor, I have indicated the part of the work I wrote alone and have fully referenced such publications;
g) this thesis does not contain text, graphics or tables copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the bibliography section.

Signed: …… Date:……

ACKNOWLEDGEMENTS

Firstly, I would like to express my heartfelt and utmost gratitude to my supervisor, Dr Mabutho Sibanda, for his unparalleled wisdom and immense knowledge in his supervision. His matchless inspiration and guidance throughout the writing of this thesis was nothing short of perfection. I could not have imagined having a better advisor and mentor for my Masters study. I would also like to sincerely thank Mrs Faeezah Peerbhai and Mr Sandiran Pillay, not only for their insightful comments, quantitative intuition and encouragement, but also for the inspiring questions and contributions which triggered me to widen my research from various perspectives, especially during the early stages of this project. Furthermore, I would like to thank my wonderful family and also colleagues at the School of Accounting, Economics and Finance for their moral support and motivation as I worked through this project. Finally, and most importantly, I acknowledge the loving guidance from my Dear Lord as well as the opportunity he has afforded me to be able to carry out this research. To my Lord Jesus Christ, thank you for the privilege of it all. May your name be exalted God.

ABSTRACT

Style investing is considered the holy grail of investment finance and portfolio management, as it avails numerous options to the portfolio manager to simply and persistently beat the market. This research investigates the impact of style investing on the performance of South African unit trusts, from the view of funds which remain true to their investment styles (consistent funds) against funds which drift their styles (drifters) over the period 2005 to 2014. The study examines the extent to which South African unit trusts drift from, or maintain, the styles stated in their mandates, and also explores which set of unit trusts deliver superior and persistent returns between the style consistent funds and the drifters. The Returns Based Style Analysis (RBSA) model is employed on a sample of 42 South African unit trusts, from seven of the most significant style-based strategies (style indices) on the JSE, to establish the true styles of the funds, that is, whether the funds are correctly classified as stated in their titles. The extent of drift amongst the unit trusts is then ascertained using the Style Drift Score (SDS) method, which derives its existence from the RBSA model. The Style Drift Score is calculated as the square root of the sum of the variances of style weights obtained from the RBSA model. Subsequently, the risk adjusted performances of the funds are evaluated using three models, which are, the Capital Asset Pricing Model (CAPM), Fama-French 3 factor (FF3F) model and also the Sharpe ratio, whereas market timing ability is examined using the Treynor-Mazuy model. Furthermore, performance persistence of the funds is tested using contingency tables over 6 months, one year, two years and three years holding periods and, lastly, the chi-square test is employed to test predictability of future performances based on past performances.

The study finds that the styles of the funds are, on average, correctly classified. With respect to the extent of drift, 62 percent of the funds are found to remain true to their styles (consistent), whereas 38 percent of the funds drift their styles. In evaluating performance, the consistent funds are found to outperform the drifters on two of the three models used (namely, the CAPM and FF3F). However, neither the consistent funds, nor the drifters, are able to successfully time the markets. Additionally, the drifters exhibit a higher relative performance persistence, albeit a negative one (that is, loser-loser persistence), over the short term period (6 months) which diminishes

considerably as the holding period lengthens to one year. Persistence disappears completely at two years and three years holding periods. The study does not find any conclusive evidence of the predictability of future returns based on past performances.

It is observed from the results that drift causes an undesirable utility loss to investors as the drifters underperform the consistent funds and also exhibit negative performance persistence. This research finds similar results to the majority of studies done in style investing and concurs with most literature on the South African market. Therefore, the results have implications to both policy makers and the investment industry. Policy makers may have to regulate the unit trust industry more vigilantly to identify drift and also propose regulations to the investment industry for periodic disclosures of funds' stock holdings in order to curb drift in those funds which claim to be following consistent investment strategies yet stray from their mandates. Likewise, plan sponsors may have to liaise more frequently with portfolio managers to swiftly root out drift and ensure that portfolio managers meet the pre-set investment targets. Regulators of the unit trust industry may also need to advise investors to be more careful, when investing in drifting funds, since drifting is also an investment strategy that is considered profitable under variable economic cycles in the investment industry.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Background

It is widely believed, in the investment sphere, that the magic potion of investment finance could be described as a technique that enables an investor to plainly and persistently outperform the market. Fund managers and investors globally invest extraordinary amounts of resources and time in their search for such formulas and programs, aided by the discoveries of academic research. In this quest, it is very common for fund managers to categorise the numerous available investment options into classifications according to their preferences. The classification of a variety of objects and observations into different categories is a mechanism that is prevalent throughout the world, in all facets of life. Equivalently, the classification of objects into categories is also prevalent in the financial industry and this is especially true in the case of making portfolio allocations and investment decisions.

According to (Chen and Wermers, 2005, Muller and Ward, 2013), investors and fund managers, in the process of making portfolio allocation decisions, begin by classifying the assets available to them for investment into a few broad classes. These broad asset classes used by investors are often referred to as ‘styles’, and the process by which investors allocate capital among different styles, rather than individual securities, has come to be known as ‘style investing’ (Strugnell et al., 2011). This technique can be utilised as a tool to uncover the true on goings of a unit trust, and may hold useful predictive powers.

Christopherson et al. (1998) and Wahal and Yavuz (2013) describe an equity style as an opinion of investing prevalent within a faction of fund managers who presume that going after a specific style will enhance returns. Predictably, the appeal of easy money has endowed an inventory of candidate styles; some with alluring theoretical grounding. Examples of such styles, or asset classes, would be value stocks, growth stocks, stocks of varying capitalization levels, and government bonds (Hoffman, 2012). The investors then decide how to allocate their capital amongst assets within these specific broad categories. However, as with any model, there are inherent weaknesses, and these will be detailed in the study.

Pioneered by researchers such as Basu (1977), Fama and French (1992), Lakonishok et al. (1994) and a few others, studies on equity style strategies such as Korteweg (2010), Hoffman (2012) and Hsu (2014) have confirmed that firms with certain fundamental characteristics, such as low market capitalization or low price-to-earnings, systematically outclass the market. These characteristics are described as anomalies to the widely known hypothesis of markets being efficient. The results of such studies have spurred increased interest from practitioners as equity style management is deemed to be as essential as asset allocation in determining the return of equity portfolios (Gulen et al., 2011). Additionally, it avails a priceless instrument for enhancing the portfolio performance of mutual funds. In South Africa, mutual funds are referred to as unit trusts, hence these two phrases will be used interchangeably throughout this investigation.

The recognition of such anomalies to the efficient market hypothesis (EMH) has sparked rigorous debate among scholars on the validity and possible explanations of these style premiums. Despite numerous contributions on the subject that apply either traditional finance measures or behavioural finance, the academic literature has not yet reached a consensus. Furthermore, recent empirical data, for example, Jame & Tong (2014) and Fama & French (2015), has documented substantial discrepancies in style premiums since the original studies. These unexplained appearances and disappearances in style premiums have questioned the continued existence of these style factors and their effects on the performance of unit trusts (Auret and Cline, 2011).

In response, it has been hypothesized that systematic patterns exist in these fluctuations of style premiums, which may be explained by the investment style strategies employed by fund managers (Cumming et al., 2009). In this regard, managers can either choose to remain consistent with their investment style or alternate funds between different asset classes, which is known as style drifting (Eraslan, 2013). Such strategies require a fair amount of investment skill on the part of the fund managers. On occasions where genuine skill and expertise are essential to recognize investment opportunities, such as in a comprehensive examination of an intricate derivative product, it may be probable that such value creation possibilities persist over time. However, it is anticipated, in an efficient market, that straightforward trading rules, such as investing in shares with low price/earnings

ratios or investing in small capitalisation shares, would yield only momentary advantages. This study examines several of the more notable style-based strategies on the JSE to evaluate the magnitude of the potential benefit of the style investing on unit trusts and its persistence.

The aim of this quantitative analysis is to determine what portion of variation in specific unit trusts are attributable to asset allocation – style – and what portion can be described by security selection, that is, the skill of the managers. Using Sharpe (1992)'s method of style analysis, the Returns Based Style Analysis (RBSA), this research seeks to detect patterns in return series that are inherent to style factors. In short, the study seeks to find out whether South African portfolio managers are able to add value after adjusting for style exposure. Employing the RBSA method together with statistical tools, this allows for the return series of unit trusts to be characterised by some combination of these factors - in order to assert the most apt combination that describes the portfolio's constituents. The study, therefore, investigates the extent of style drift amongst South African unit trusts, the performance of unit trusts in South Africa and whether these performances persist over different time periods or not.

1.2 The Mutual Fund Industry

In recent decades, there has been rapid global growth in mutual funds (Pojanavatee, 2013). According to Statista's worldwide statistics portal, there were approximately 79 669 mutual funds in the world by end 2014 with a combined total net worth of assets of approximately $31.38 trillion dollars under management. The advantages and benefits offered by mutual funds over other investment vehicles are believed to be the biggest drivers of the significant growth of this industry in recent times (Dawe et al., 2014).

Mutual funds are open- ended, pooled investments in nature. They issue or redeem their shares at net asset value. In addition to that, they provide benefits related to liquidity, tax, administration, diversification and professional expert management of funds to their investors (Utz et al., 2014). Specifically, these benefits include the ability to liquidate the investment on demand, the spread of risk across a broad portfolio of shares, low initial investment amounts, tax effectiveness and the

professional management of mutual funds to its investors (Bodie et al., 2013). Mutual funds also charge low transaction costs relative to other investment vehicles (Cabello et al., 2014). It is these kinds of advantages that enable mutual fund investors to enjoy economies of scale while gaining access to well diversified portfolios of securities (Cuthbertson et al., 2008).

Mutual funds are often differentiated by their mandates or core objectives. These mandates determine the unique strategy that the fund follows, which is referred to as its style. According to Porter and Trifts (2014), styles are defined in relation to the type of stocks that the mutual funds buy and incorporate in their portfolios. Cuthbertson et al. (2010) allude that most often, the aim of the fund is to diversify its portfolio as much as possible in order to be efficient, that is, to minimize risk as much as possible, while maximizing returns. Therefore, fund managers choose their preferred style according to a variety of factors. Congruently, the prevalent set of factors managers choose from are the size factor, value factor and past returns of the stocks they wish to include in their portfolios. Hereil et al. (2010) clarifies that under the size and value factors are small capitalisation stocks, large capitalisation stocks, value stocks and growth stocks. However, Enaw (2011) points out, correctly, that the risk to reward of any individual stock remains an important factor when selecting which stocks to invest into.

According to the Association of Savings and Investments South Africa (ASISA), the South African mutual fund industry, also known as the Unit Trusts industry, is part of a large industry of pooled investments called Collective Investment Schemes. ASISA documents the South African mutual fund industry to be worth around R1 744 billion as at 30 June 2015 (ASISA, 2015). Oldert (2005) records that the first unit trust that launched in South Africa in 1965, the Sage fund, had assets in the region of R600 000 under management on commencement. The growth in the industry over the years has indeed been meteoric (STATISTA, 2015). In profiling the development of the unit trust industry in South Africa, Oldert (2005) postulates that, by the end of 1965, two funds had already come into existence with a joint value of R3 million in assets. However, between 1965 and 1980, ten more new funds were established, although growth was subdued around the late 1960's owing to the stock market collapse in 1969. Nonetheless, by 1990 the industry's growth had picked up momentum with 36 funds, worth R7.5 billion, in existence (Viviers et al., 2009).

The deregulation of the industry in 1998 encouraged huge inflows of investments which propagated a huge upsurge in the industry. In the opinion of Meyer-Pretorius and Wolmarans (2006), this deregulation was indeed a highly significant turning point in the growth that was to follow. By the end of the year 2000, there were 334 funds which grew to 943 funds in 2010 (ASISA, 2015, Saini et al., 2011). Currently around 1211 unit trusts exist in South Africa, which are broken down into global funds, regional funds, funds of funds, and general domestic equity funds. Precisely, ASISA (2015) reports that its database contains 157 global funds, 357 fund of funds, 1028 general domestic equity funds, and 26 regional funds. The acceptance, recognition and embracing of mutual funds amongst South African households clearly demonstrates the funds' popularity as one of the most preferred savings channels (Hoepner et al., 2011a). Such observation evokes the curiosity of whether investing in mutual funds is worthwhile or not and also the inquiry into how fund managers invest their clients' monies. Mutual funds are actively managed by fund managers who attempt to outperform the market index and achieve higher returns relative to the market for their investors (Massa et al., 2010).

Schiff (2011) asserts that investors have expectations that this relative outperformance of funds should persist in order for them to continue investing with that fund, otherwise they will change funds and invest with winning funds. In short, they expect persistence in performance, obviously good performance. Fund managers, thus, have to ensure they meet these expectations or else they may experience huge outflows of investment from their funds. In pursuit of persistent top performances some managers, therefore, choose to stick to a certain style of investing and remain consistent with it. This is termed being style consistent (Idzorek et al., 2012). Others resort to altering their style according to prevailing market conditions and this is called style drifting (Glode, 2011). It is of huge interest to determine the extent to which South African unit trusts drift or maintain their styles. More importantly, investors would like to know which set of unit trusts deliver persistent and superior returns between the style consistent ones and those which drift their styles.

The most common motivations for drifting among fund managers can be broadly categorized into the following: the agency problem, tournament effect (where managers compete against each other), changes in stocks held in the portfolio and

the rebalancing of portfolios as some stocks change characteristics, for example, a value stock changing into a growth stock (Sensoy, 2009). Other reasons may be that fund managers are seeking better opportunities in their areas of expertise, economies of style, neutrality element, acting on arbitrage opportunities and the continual search for different returns over time (Cici, 2012). Style drifting, therefore, is the exercise of purposely diverging from the stated plan to accomplish excessive relative performance.

Bodson et al. (2010) allude that diverse opinions and postulations exist with respect to outperformance and persistence of mutual funds, however, with no obvious agreement in most of these studies undertaken. Yu (2008) attributes these discrepancies to the different methods and market benchmarks used in the various studies. This study, therefore, sought to analyse the South African Mutual fund industry and, hopefully, shedding some light on the underpinnings of this rising industry and also the possibility of predicting future market movements by investors. In this regard, Hereil et al. (2010) points out vividly that investors are typically dependant on managers' past risk-adjusted performances in order to evaluate their potential to produce excess returns above the risk-free rate of return.

1.3 Problem Statement

Mutual funds in South Africa (sometimes referred to as Unit trusts) are growing very fast. Households and institutions are buying into them due to their pooling and diversification effects. However, some funds have a tendency to drift from their stated mandates, or styles, while others consistently maintain theirs. From these two alternative fund management methods it remains unclear which one delivers superior and persistent returns relative to the other. Most literature on style investing postulate a positive relation between style consistency and investment performance. However, contemporary studies such as Walkshausl & Lobe (2012) and Van Heerden (2014) advance the perception that changes in market conditions can positively affect style drift to flourish and earn positive returns in variable economic cycles. Therefore, investors seek clarity as to which of these two strategies is more advisable to adopt in order to persistently outperform the markets and earn positive abnormal returns.

1.4 Research Objectives

The objective of this research was to:

1. Establish the extent to which South African unit trusts drift or maintain their stated mandates or styles.
2. Ascertain which set of unit trusts delivers superior returns between the style consistent funds and those that drift their styles.
3. Ascertain which set of unit trusts between the style consistent funds and the drifters deliver persistent results relative to the benchmark index

1.5 Research Questions

The research sought to provide answers to the following questions:

1. To what extent do South African unit trusts drift from their stated styles?
2. Which of the two alternative fund management approaches (style consistent and style drifting) produce superior results relative to each other?
3. Which of the two alternative fund management approaches (style consistent and style drifting) deliver persistent results relative to the benchmark index?

1.6 Significance of the research

The study intends to investigate South African unit trusts' performance from the perspective of the Returns Based Style Analysis (RBSA) investment technique crafted by Sharpe (1992). This model deals with the analysis of managed portfolios, in terms of asset allocation (also known as style) and asset selection, which is also known as the skill of the manager.

Asset allocation, or style analysis methods, are extremely useful tools for consultants, plan sponsors and investors for various reasons. Investors want to know the investment style so they can construct an effective combination of diversified assets that fits their preferences. Consultants and plan sponsors are concerned with how well the portfolio manager meets the pre-set investment targets. Investors, in general, are also interested in sifting the winning funds from loser funds in order to astutely invest their hard earned monies. The RBSA model is called upon to solve the puzzle.

The RBSA model proposes an equitable style model based on asset factors or classes. It presumes that a mutual fund's return is surmised to be a function of several diverse factor exposures and firm-specific risks (Bodson et al., 2010). The sensitivities to these factor exposures determine the style or asset allocation of the fund (Domian and Reichenstein, 2009). Hence, from employing this model together with other performance measurement models, this research will be able to establish if managers are able to add value after adjusting for style exposure.

The study aimed also to clarify whether future returns can be predicted based on the persistence of performances. The outcome of this investigation will aid in shaping the investors' choice for the appropriate fund to invest with from the thousands of funds available in the investment universe. It also strives to bring clarity on whether investing passively, e.g. in Exchange Traded Funds (ETFs), is more preferable to investing actively, that is, if there is less value or utility derived from investing actively.

1.7 Scope of the study

The study focused on investigating the true on-goings in the operations of unit trusts in South Africa and assess whether investors are rewarded fair value for their money with respect to the risks undertaken in such investments. Keeping in mind the pervasive practice of style drifting amongst fund managers, it was of interest to determine the magnitude of drift in the South African unit trust industry and whether this drift is justifiable or not, based on the performances (and performance persistence) of the drifting funds relative to consistent funds. More importantly, the study sought to uncover whether South African fund managers are able to predict future returns based on past performances, since most investors choose funds to invest with based on the funds' past performances. Most unit trusts have the disclaimer that past performance should not be used to gauge future performance, yet at the same time they use their past records to lure investors into investing with them. The study clarified if there is any basis in such claims, and advised accordingly, based on the results that were obtained.

1.8 Limitations of the study

The study employed historical data in all its analyses, which is more retrospective than predictive in nature, and may not fully project what the future holds for South African fund managers. Some of the funds sampled did not have complete data for the whole duration of the 10-year observation period, due to the fledgling nature of the South African market. Additionally, studies covering style investing in the South African market were not that much relative to international studies, that is, there was not enough literature which one could use to thoroughly compare the findings of this research against.

1.9 Structure of the research

The research design flows chronologically in the following format:

Chapter 2 - Literature Review: this section details the advent of style investing, the Returns Based Style Analysis model as a broadly embraced analytical tool, a discussion of style drift and style consistency, and a review of the most commonly applied performance evaluation measures in investment and portfolio management. The section also analyses market timing and its pertinent measurement models, the style analysis and stock selection ability of fund managers and the strengths and weaknesses of style analysis. It closes off by reviewing an empirical analysis of the performances of unit trusts, the persistence of unit trusts' performances and also an account of the prevalent phenomenon called survivorship bias.

Chapter 3 - Data and Research Methodology: the chapter introduces the various data sets to be analysed, the econometric models used for analysing the data, the specific unit trusts to be analysed and details of how the different returns will be calculated. It also covers the methods to be used and a description of the portfolio data inputs into the models.

Chapter 4 - Results and Analysis: the chapter presents results obtained from utilising the models in chapter 3 and a detailed analysis of the results.

Chapter 5 – Conclusion and Recommendations: the chapter summarizes all the findings, draws conclusions from these findings and also offers recommendations for further research in this area of study.

1.10 Chapter summary

The chapter explored the aims and objectives of this study, as well as the grounds on which the inquiry is based. It profiled the background of the South African mutual fund industry and its phenomenal growth over the years. This chapter also highlighted the problem statement regarding the reason why the study was undertaken, what the study hopes to achieve, the significance of its inquiry, the scope of the study and the limitations of the study. Additionally, the chapter laid the foundation for how the presentation of the subsequent chapters will flow from one another. The next chapter (chapter 2) presents the home of the study, that is, it's theoretical grounding and reviews the literature that has been reviewed on style investing in the international scene, as well as in the South African sphere, and a discussion of the pertinent issues around performance analysis.

CHAPTER 2

LITERATURE REVIEW

2.1 Theoretical Framework

The study is based on the Financial Intermediation Theory, which derives its roots from the economic perspectives of classical and neoclassical economics. The theory postulates that the presence of financial intermediaries can stimulate robust economic activity and benefits to an economy (Mehra et al., 2011). A financial intermediary is, typically, an institution that facilitates the channelling of funds between lenders and borrowers indirectly (Philippon, 2015). This is basically an institution or individual that serves as a middleman for different parties in a financial transaction. In common terms, financial intermediaries generally refer to private sector intermediaries, such as banks, private equity, venture capital funds, leasing companies, insurance and pension funds, and micro-credit providers. As such, Farhi et al. (2009) alludes that financial intermediaries channel funds from people who have extra money, or surplus savings (savers), to those who do not have enough money to carry out a desired activity (borrowers).

Financial intermediaries are meant to bring together those economic agents with surplus funds who want to lend (invest) and those with a shortage of funds who want to borrow. In doing this, they offer the benefits of maturity and risk transformation (Greenwood et al., 2013). Therefore, specialist financial intermediaries ostensibly enjoy a related cost advantage in offering financial services, which not only enables them to make profit, but also raises the overall efficiency of the economy (Woodford, 2010). The financial intermediaries' existence and services are explained by the "information problems" associated with financial markets. Sadorsky (2010) alludes that current theories of the economic role of financial intermediaries build on the economics of imperfect information that began to emerge during the 1970s. Financial intermediaries, thus, exist because they can reduce information and transaction costs that arise from an information asymmetry between borrowers and lenders (Mehra et al., 2011).

It, therefore, follows that financial intermediaries assist in the efficient functioning of markets, as any factors that affect the amount of credit channelled through financial

intermediaries can have significant macroeconomic effects. Amaral and Quintin (2010) suggest that financial intermediation can reduce the cost of channelling funds between borrowers and lenders, leading to a more efficient allocation of resources through the provision of liquidity and their ability to transform the risk characteristics of assets.

Accordingly, the home of the study is based on the financial intermediation theory, which builds on the notion that intermediaries serve to reduce transaction costs and informational asymmetries. Hence, practitioners view financial intermediation as value-creating economic processes (Scholtens, 2013). Bean (2010) allege that Joseph Schumpeter proposed in 1911, that the services provided by financial intermediaries, which are; mobilizing savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions; can stimulate technological innovation and economic development. In his presentation, Schumpeter presumed that various measures of financial development are strongly associated with both current and later rates of economic growth.

Hassan et al. (2011) allege that Schumpeter's views are strongly shared by Gurley and Shaw who in the 1950s and 1960s postulated that, at low levels of development, most investment is self-financed. Gurley and Shaw (1954) allude that, as per capita income rises, bilateral borrowing and lending becomes more important. With further increases in per capita income, Gurley and Shaw (1954) propose that banks and similar financial intermediaries become prominent in financing investment. Eventually, more sophisticated financial markets, such as equity markets, arise. Kar et al. (2011) observe that, in the Gurley and Shaw view, rising per capita income and increasing financial depth reinforce each other. Therefore, Gurley and Shaw (1954) argue that a model of the joint evolution of per capita income and the banking system must allow usage of banks to be endogenous, and the level of per capita income and usage of banks must be determined simultaneously (Hassan et al., 2011, Sadorsky, 2010). Mutual funds are an important part of financial intermediaries in any economic system, since they accept funds from investors and invest them on their behalf, making the economy robust (Woodford, 2010). The study, therefore, appreciates the increasing economic importance of financial intermediaries in a financial system, and subsequently focuses on how mutual funds, specifically South African based funds, invest their assets.

2.2 Style Investing

Most portfolio managers distinguish themselves as advocating for a particular style. Institutional investors often employ multiple domestic equity managers and select managers that provide superior performance within a particular “style” category. Chen and De Bondt (2004) allude that an investment style is the distinct, most significant, ingredient of success in active equity portfolio management and the investment community is well aware of, and appreciates, this fact. Investing with style, therefore, refers to a manager's selection of some pre-defined and definite asset allocation strategy. The popularity of style investing is seen in the conception of multiple style indices (Ahmed and Nanda, 2000). Portfolio managers assert style investing to be a useful tool for product differentiation that enables the fund management universe to better organise their investment activities.

Investors and portfolio managers alike, are of the opinion that, style investing holds potent powers for diversification and prediction of future returns. This begs the question whether a stipulated number of risk factors can explain the dynamics and structure of asset returns, or whether these are attributable to economy wide systemic factors (Froot and Teo, 2008). Fama and French (1992) and Massa and Zhang (2009) propose that cross sectional discrepancies in anticipated stock returns is explained by three prevalent factors, each with its own related risk premium. These factors suggested are the portfolio representing the market (also known as the market-oriented investment style), the portfolio simulating for value (HML) which is also known as the value/growth style of investing and also the portfolio mimicking for size (SMB), also known as the size style factor. Jegadeesh and Titman (1993) adds the momentum strategy or style of investing as another possible explanatory variable for the discrepancies observed in anticipated stock returns. These variables are also known as anomalies, and they will be detailed in the following subsections.

Fundamental models for pricing assets, like the Capital Asset Pricing Model, have postulated for a long time that returns to a stock are attributable to systemic wide factors in the market and the risk of the stock, proxied by its beta (Qian and Shi, 2010). However, a large amount of financial literature examining stock market anomalies has come forth to dispute such claims. Hsu (2014) describes anomalies as empirical results that seem to be contradictory with sustained theories of asset pricing behaviour.

2.2.1 Value Style Investing

The value factor is one such anomaly, which was first documented by Basu (1977). The value investor focuses on identifying companies that have the potential and fundamentals to increase in price, due to having a current, lower than expected, price only because of adverse investor sentiment surrounding the company. Du Toit (2012) states that such investors pick on underrated stocks using contrarian strategies and factors like high dividend yields and low price multiples.

In accordance with valuation metrics, securities within the value factor usually possess higher dividend yields and low price ratios, like price-to-book values (P/B), price-to-earnings (P/E), price-to-sales (P/S) and price-to-cash flow (P/CF) ratios (Jame and Tong, 2014). Such stocks are commonly linked to firms operating in a mature industry, experiencing strenuous operating conditions or conditions that negatively affect such firms' performance. In numerous studies of the mutual fund industry, researchers have confirmed that anomalies, like the value factor and the size factor, are indeed valuable descriptors of style (Jame and Tong, 2014). The value factor compares the value/growth characteristics of a stock, measured by fundamental ratios like Book value to market value of equity, the P/E ratio, etc. whereas the size factor is measured through market capitalization.

Basu (1977) conducted a study of the New York Stock Exchange (NYSE), between April 1957 and March 1971, and finds that over a long period of time, portfolios with low Price-Earnings (PE) ratios tend to outperform portfolios with high PE ratios. The study finds that this outperformance is in both absolute and risk adjusted terms.

2.2.2 Growth Style Investing

Growth investors, on the other hand, emphasize the growth prospective of the underlying investment, therefore making use of stable earnings growth and momentum strategies (Cronqvist et al., 2015). These investors identify firms with above-average prospects for growth, and pay a premium for these growth prospects (Du Toit, 2012). Therefore, growth shares may even appear costly at current levels, but they can still be bought if the likelihood of considerable future growth is present.

When categorizing growth shares with respect to valuation metrics, they are on the other side of the scale when compared to value stocks, with high price ratios

Schneeweis et al., (2012). They possess higher P/B (price-to- book), P/E (price-to-earnings), P/S (price- to-sales) and P/CF (price-to-cash flow) ratios. Growth shares regularly have reasonable profit margins and higher than average cash reserves to protect them in unfavourable times (Swamy, 2013). Swamy (2013) adds that these shares, generally, function in aggressive industries with above average profiles and they attract considerable institutional following, research and investment. Ahmed and Nanda (2000) suggest that value and growth investing strategies can supplement each other in choosing top quality stocks, instead of being mutually exclusive. Ahmed and Nanda (2000) present evidence that increases in Earnings per Share (EPS) present a more relevant way to capture growth than utilising a measure of low Earnings to Price (E/P) ratio.

In attempting to find out exactly which variable proxies for growth, Ahmed and Nanda (2000) and Walkshäusl and Lobe (2012) suggest that a strategy concentrating on investing in shares that possess the paired attributes of a high Earnings to Price (E/P) ratio and high growth in Earnings per Share (EPS) outperforms a strategy of high E/P alone. Their studies present some proof of persistence in performance for shares having the dual quality of high growth in EPS and high E/P ratio. Bertolis and Hayes (2014) analyse the South African market and observe that a favourable outcome from investing in value and growth strategies is subject to aggregate business and economic states at that point in time. However, Chen and De Bondt (2004), in an earlier study, contrasts such kinds of approaches, advocating their susceptibility to deceptive, ex-post relationships that may be a product of the data employed. Chen and De Bondt (2004), therefore, propose utilising stock attributes such as spread in earnings yields and earnings growth rates between value and growth firms as benchmarks for the appeal of any certain style strategy.

2.2.3 Market Oriented Investing

The market-oriented style category of investing encapsulates those investors with no overriding preference for either of the growth or value styles, preferring instead to hold diversified portfolios consistent with prevailing market averages (Idzorek et al., 2012). Early evidence supports the popular Capital Asset Pricing Model (CAPM), as well as the Efficient Market Hypothesis (EMH) theories, pioneered by Sharpe (1964), Lintner (1965) and Mossin (1966). The CAPM presumes that various stocks have

varying anticipated rates of return due to their differing non-diversifiable risks (betas). Nonetheless, Hodnett et al. (2012) contrasts this on the grounds that the evidence of anomalies casts uncertainty on the soundness of the dual (EMH-CAPM) hypothesis.

2.2.4 Size Style Investing

With respect to the size style, managers base their investment decisions on the market capitalization rate of firms. Banz (1981), Chan and Chen (1991) and Jegadeesh (1992) are some of the early researchers who first documented the size anomaly on the US market, although contemporary studies have added more impetus on this factor like those of Bender et al. (2013) and Van Gelderen and Huij (2014). They all note that small capitalisation firms tend to outperform large capitalisation firms and post superior returns. Mutooni and Muller (2007) argue that the most popular size based stocks among unit trusts are the small cap shares, as it is believed that there is lesser emphasis placed on these shares which results in a greater potential to outperform.

Strugnell et al. (2011) analysed the effects of beta, size and value factor on the JSE between 1994 and 2007, continuing on the previous work of Rensburg and Robertson (2003). Rensburg and Robertson (2003) had found unrelenting size and price-earnings effects in the cross-section of returns on the JSE and had, surprisingly, also found that beta is inversely related to returns. In the updated analysis, Strugnell et al. (2011) adds weight to the earlier findings by Rensburg and Robertson (2003) and deduce that beta has no forecasting power for returns on the JSE. Both researchers' findings invalidate the CAPM based on a market proxy of the JSE All Share Index. Interestingly, they further unearthed that the size premium is concentrated in the small-scale stocks on the JSE and also find provisional proof that this premium has been diminishing over time.

Barberis and Shleifer (2003) emphasize the usefulness of investing with style within the mutual fund industry. They suggest that style benchmarks aid in performance appraisal and in controlling for risk. However, they warn that no solitary style, or mix of styles, is perfect for all periods and conditions. Researchers like Jansson et al. (2011) and Dickson (2016) have well documented that the different types of styles perform differently over time. In this regard, it is ordinary practice among investors to pursue investment styles that have functioned well over the recent past. Since

money managers rival each other for fund flows, they have strong motivation to adjust their investment strategies, regardless of future return and risk (Ye, 2012).

2.2.5 Momentum Style of Investing

Style momentum strategies, as documented by Carhart (1997) and Asness et al. (2014), are a type of style rotation that can perform this objective. Fund managers purchase stocks with attributes that are currently trending and sell those whose characteristics are out of favour. Therefore, these factors, namely; market, value, size and momentum, form the basis of most studies on style investing. Style investing can, thus, be classified into these discrete strategies; size, value, growth and market-oriented investing (Israel and Maloney, 2014). The advent of investing with style has shook core financial theories that have been religiously followed among investors for decades, one of those being the Efficient Market Hypothesis, which postulates that no investor can earn abnormal returns above the market. With style investing, if one could determine and time a style cycle, it may be feasible to earn superior returns (Vayanos and Woolley, 2013).

Boyer (2004) describes how, in concept, a style sponsor can utilise style cycle knowledge to refine strategic asset allocation. He accounts that style investing explains the returns of a stock from two components; tactical asset allocation and asset selection, which is also referred to as a manager's skill. As managers compete for clients, they will do anything to attract funds flows and stop funds from flowing out of their funds. They will go as far as advertising past superior performance to attract more money, although, it is usually stated that past performances are not reliable predictors of future performance. Wang et al. (2010) allude that some funds even change their names and literature documents that, in such instances, these funds do experience a change of fortunes. However, the most common activity by fund managers to keep funds flowing in, is that of moving money across different styles depending on their performance, which is called style drifting (Bryant and Liu, 2011).

As much as this activity of drifting across styles seems plausible, Barberis and Shleifer (2003) and Eling and Faust (2010), are of the belief that chasing past winners and dumping losers may attract externalities and consequences. Examples of such could be transitional term momentum and lengthy reversals in prices at the style level, since previous style returns help to clarify the cross section of anticipated

returns for individual stocks (Moneta, 2015). While most studies support style investing as an important tool for explaining fund returns and fund flows, some studies contrast these hypotheses. Pomorski (2004) and Cuthbertson and Nitzsche (2013) investigate the influence of style-level information on mutual fund flows, as alluded to in previous studies, and they discovered that the style investing proposition of Barberis and Shleifer (2003) inadequately illustrates the behaviour of mutual fund flows. Pomorski (2004) further asserts that mutual fund investors utilise styles to gauge separate fund returns, while ignoring to account for style-level information which maximizes the convexities in the performance-fund flow connection. From this analysis, Liwei and Peng (2012) conclude that fund flows are more responsive to low returns, which minimizes the convexity, other than equity styles. The next section discusses the links between style investing and asset allocation. It also lays down the proponents of the Returns Based Style Analysis (RBSA) method of investing, which is the principal method used in this study.

2.3 Returns Based Style Analysis

Style analysis can be described as a statistical evaluation which identifies viable investment opportunities in indices that closely replicate the true performance of a fund over a period of time (Gilbert and Strugnell, 2010). This section discusses the dynamics of style analysis, the functions of this technique and the specific types of style analysis available, together with a collective comparison of these types. The primary objective of style analysis is to separate a portfolio manager's returns into two components, namely: style and skill. According to Fung and Hsieh (1996), style is the factor caused by market movements, whereas skill is manger-specific, that is, it relates to the expertise of a manager that contributes to earning a higher return. The different asset classes, or styles, used by investors usually share a dominant common characteristic (Patton, 2009).

These characteristics can be based on things such as, regulation of asset, markets in which asset is traded, or the fundamental characteristics of the asset (Barberis and Shleifer, 2003, Verbeek and Wang, 2013). It has been found that the cash flows emanating from assets that share a common style are highly correlated in some cases, while in other cases, they tend to be largely uncorrelated and unrelated to each other (Weng and Trück, 2011). The styles that are used differ in time frame,

ranging from the relatively permanent government bonds, to the shorter frame small stocks (Cronqvist et al., 2015). New styles are created quite frequently, due to increased levels of financial innovation prevalent in the world today. Mortgage-backed securities, which led to the occurrence of the sub-prime crisis, were one of the more recent styles to garner wide acclaim (Frijns et al., 2013).

When a group of assets are identified as producing superior performance to the market, investors quickly latch on to this fact, and search for other assets that share similar characteristics to these assets. This can lead to the inception of a new style, as is evidenced by the discovery of the small firm effect by Banz (1981), and the subsequent prominence of small stocks as an investment style (Fama and French, 2012). In style analysis, factors are first characterized into market indexes that represent numerous asset classes (styles) of investing. Fletcher and Forbes (2002) define an asset class as a collection of assets which show a degree of economic homogeneity. These assets have similar attributes which distinguish them from alternative assets not included in the class.

The asset class categories are derived by evaluating the characteristics of the assets at hand. For example, financial assets can fall into large, medium or a small-cap category. Barberis and Shleifer (2003) and Cao (2012) contend that, thereafter, investors select the asset class that they wish to invest in, by allocating funds into these classes as opposed to placing funds in individual assets. There are two main approaches taken in conducting a style analysis when investing, as portfolio managers attempt to describe the allocation of funds between different styles. These are the holdings-based and the returns-based approaches. Kaplan (2003) points out that the selection of either approach to use lies on the relative accuracy of each method and the preference of the researcher. In the holdings-based style analysis approach, the features of the portfolio, or fund, in question are derived from those of the individual assets that the portfolio contains over various periods in time (Bodson et al., 2010).

Researchers who have employed this method, such as Kaplan (2003) and Bodson et al., 2010), though, have noted that it is very difficult to analyse assets at the individual security level, due to all the noise in what happens to that particular security. Holmes and Faff (2008), in particular, discovered that the holdings-based

technique requires the upkeep of very costly databases, and the expensive nature of this technique has meant that only a few firms actually perform the holdings-based technique. A more popular, and lower-cost technique to analyse the risk adjusted performance of mutual funds in style analysis, is the aforementioned Returns Based Style Analysis (RBSA) initiated by Sharpe (1992). In this approach, a multi factor asset class model is developed to explain fund returns. The portfolio or fund's historical returns are regressed against a set of passive reference portfolios. The factors of the asset class model are the underlying asset class and style returns, which are derived from benchmark portfolios (Eddy, 2014). These passive reference portfolios are each representative of different styles (Domian and Reichenstein, 2009). The coefficients of the reference portfolios are then taken, and the weighting used to form a custom portfolio, which is used as the benchmark portfolio for the fund in question. Since entire portfolios are analysed, the noise affecting individual securities is reduced substantially (Glode, 2011). The RBSA model measures the fund's exposure to variations in the returns of the factors.

Wahal and Yavuz (2013) posits that the returns-based approach is much cheaper and easier to perform, only limited by having to source historical information on the passive portfolios and the portfolio being analysed. RBSA has grown to be a broadly embraced analytic tool, by both practitioners and academics. Apart from diagnosing mishaps related to misclassification as observed by Brown and Goetzmann (1995) and Otten and Bams (2000), RBSA has other very useful purposes. The model can also be engaged in addressing issues related to performance assessment and the style drifting of portfolios. Sharpe (1992) contends this model to be equally useful in the construction of diversified portfolios.

Researchers, like Fung and Hsieh (1996) and Kurniawan et al. (2011), ascertain that the RBSA model is convenient when constructing well organized portfolios of mutual funds with defined factor loadings. They assert that its usefulness in assessing short term risk of portfolios and hedge funds, as well as in evaluating their styles, is paramount. This research, thus, consequently focused on Sharpe (1992)'s concept of returns based style analysis. A key assumption of factor models, such as the RBSA, is that the error term, or rather the non-factor return, for one asset is assumed to be uncorrelated with the error term of every other asset (Walkshäusl and Lobe, 2012). This leaves the asset factors themselves as the only source of

correlation among returns. The asset class factor model, as used by Sharpe (1992), can be considered a special case of a factor model, where the factor loadings, or the coefficients, need to sum to one as representative of a market portfolio. The return to a fund is then represented as the return to the portfolio of underlying asset classes and styles plus a residual error (Fuerst and Marcato, 2009).

For the purpose of style analysis, Sharpe (1992) and Braga (2016) describe the return to the portfolio of underlying asset classes and styles, as the return characterised by style and market exposures. The error term component of return is viewed as the return attributable to stock selection or the manager's skill. The practical functionality of an asset class factor model is heavily reliant on the asset classes selected for its implementation. While not obligatory, McDermott (2009) alludes that it is recommendable that the asset classes are 1) mutually exclusive, 2) exhaustive and 3) have returns that have low correlations with one another or, if not, then differing standard deviations. Otten and Bams (2000) state that the appropriate choice of benchmarks is a critical element that may heavily impact the results of a return based style analysis.

2.4 Style Drift and Style Consistency

'Do fund managers remain true to their stated mandates on their prospectuses?' Style classification is very important for every fund in attracting fund flows and is highly dependent on the extent to which fund managers comply with self-reported fund indicators (Ainsworth et al., 2008). As the fund's active stock holdings are huge determinants of its actual style inclination, the variation between actual and self-stated investment style is of great significance. This ensures that the rewards of any given fund accrue to its investors. A fund style gives an account of the stock holding attributes of the fund and has, thus, turned into an important feature for investors in choosing a fund. Therefore, style drift can also be described as a situation where a mutual fund deviates from its stated investment style on its prospectus, or from its objective, and shifts towards another investment style (Kurniawan et al., 2011).

Literature such as Wang et al. (2010) and Jansson et al. (2011), has on record noted that the movement between styles is based on the belief that diversification across styles presents a critical control of manager-specific risk, that is, the alpha forecast accuracy. Hence, this activity of moving finds between styles is concerned with the

objective of guaranteeing that the aggregate portfolio achieves its required risk-return target. Evidence of fund managers straying from their declared investment style has been documented in several studies. Brown and Harlow (2002) propose that the motivation behind style drift is driven by fund managers' desire to chase short-term outperformance over their rivals and to attract new asset flows and earn greater income for themselves.

Although fund aggregation or drift presumes that separate fund managers hold superior stock-picking skills in their specific areas of expertise, this method comes with its own perils. Dawe et al. (2014) argue that since the portfolio of the drifting fund is now weighted with assets belonging to other styles, the portfolio is exposed to inappropriate levels of risk resulting in an unexpected risk/return trade-off for the fund holders. As a consequence, Dawe et al. (2014) forms the impression that style drift brings about an unexpected utility loss to investors and potentially results in a real economic loss in extreme market conditions.

Kurniawan et al. (2011) observe that the habit of drifting amongst American mutual funds is so severe that investor advocacy groups and financial planning professionals in the US took the stance of petitioning the Securities Exchange Commission (SEC). These groups advocated that the SEC require mutual funds to disclose complete portfolio holdings more frequently with the aim of exposing any style drift in an effort to protect investors. According to DiBartolomeo and Witkowski (1997), style consistency is an important component in enabling a concentrated manager to create a blended portfolio with the ex-ante desired risk-return characteristics. For example, if managers tilt their portfolios away from stocks declared in their self-stated style specialisation, then this may lead to an increase in potentially diversifiable risk in the overall portfolio. Fowler et al. (2010) remark that such actions can lead to the extent that the managers' active positions may correlate highly with other managers.

Frijns et al. (2013) observe that style drift could, thus, have harmful effects on the underlying fund's risk, performance and other fund characteristics. They therefore suggest that a fund manager's self-stated investment mandate should accurately project information to the investor about the actual internal management of the portfolio. The Sharpe (1992) asset class factor (RBSA) model is often prominent in

discussions of consistency, style drift, definition and measurement of a fund's style. In examining style consistency and drift, the R^2 value from a regression of a fund's returns against style benchmarks and the resultant error term from the model are normally used. However, some studies, e.g. Grinblatt and Titman (1992), (Andreu et al., 2009), Wermers (2000), Chan et al. (2002) and Baker et al. (2010) employ holdings based multi factor models (highlighted in the previous section) in measuring drift and these methods make use of rolling window graphs. These graphs aid in observing the change in composition of the portfolio over time, through adding subsequent returns as they accrue while dropping the same number of earlier data points.

The main drawback, though, of the holdings based approach is that, in most cases, information on actual mutual fund holdings is not readily available (Andreu et al., 2009). In addition to that, mutual fund portfolio holdings are ordinarily only available on a quarterly basis, hence, timely information on holdings may prove burdensome to obtain (Das and Uma Rao, 2013). Therefore, Kaplan (2003) argues that, if mutual fund managers carry out window dressing practices, inferences from reported portfolio holdings might be deceptive. As an alternative, Idzorek and Bertsch (2004) propose a different model for measuring drift called the Style Drift Score (SDS) whose premises are grounded on Sharpe's (1992) style analysis model. From the resultant regression of Sharpe's (1992) RBSA model, the square root of the sum of the average variances of each asset class coefficient defines measure of drift of any fund.

Wermers (2000) investigates style drift from the holdings based portfolio management perspective, through breaking down drift into both passive and active constituents. He found that more consistent managers (style-disciplined) were outperformed by their less style-consistent counterparts (drifters). However, the findings note that the managers as a grouping permit the portfolio's composition to drift over time rather than engage in active trading to preserve a given style orientation. Wermers (2000), and Herrmann and Scholz (2013), confirm the widely held opinion that funds' active trading, in reality, increases a portfolio's drift. Chan et al. (2002) show that funds can display constancy in their stated styles through using the correlation among factor loadings over time from the Fama and French (1992) three-factor model. From separate comparisons of the size and value-growth

dimensions, Chan et al. (2002) and Jansson et al. (2011) observe that those funds that appear to drift away from their stated styles are the underperforming funds. Consequently, this has notable implications for multiple manager portfolio structures. From their discovery that managers are largely unsuccessful in timing their styles, Chan et al. (2002) recommend that style drift is an inevitable fund trait that requires monitoring.

Contrary to this, Lau (2007) and Hsu (2014) observe that style consistency is not primarily a necessity for a portfolio manager for delivering performance, but rather suggests style rotation as a viable alternative that can improve returns. Cao (2012) examined hedge funds in the US for consistency and discovered that style consistent funds do not necessarily beat funds that exhibit less style consistency. The theoretical work of Barberis and Shleifer (2003) and Massa and Zhang (2009) contributes some intuition on whether style drift indeed enhances value to investors or not. They initiate a model of style investing with implications that stocks which change styles frequently are more probable to display price behaviours comparable to their new style cohorts. Therefore, Massa and Zhang (2009) allege that, if fund managers do not modify their holdings timeously and appropriately, then their portfolios will start drifting away from their present style orientation.

Chen and Wermers (2005) and Van Gelderen and Huij (2014), support the notion of enhancing returns based on the style drift perspective of investing. In examining the style movement of individual stocks, that is, the shifting of stocks between style categories, Chen and Wermers (2005) report that such stocks attain superior returns in relation to their style-matched benchmarks. From a consistency point of view, their finding is very significant, since style migration gives rise to drift. Thus, Verbeek and Wang (2013) deduce that the style of a fund will tilt if fund managers do not adjust their portfolio on time. Style drift may, therefore, be considered reasonable on such grounds, in order to realize the superior yields exhibited by these high style-shifting stocks. Style drift may also be considered plausible under variable economic cycles since different stocks perform differently with any slight or marked variation in the economy (Lai and Lau, 2010)

2.5 Traditional Measures of Portfolio Performance

The following models in this section are the most commonly applied performance evaluation measures in investment and portfolio management:

2.5.1 The Capital Asset Pricing Model (CAPM)

The conventional theory of performance measurement prescribes that returns must be adjusted for risk before they can be meaningfully compared. An effortless, and the most common way, to adjust returns for the portfolio risk is to compare rates of return with those of other investment funds with similar attributes (Bodie et al., 2013). Absolute measures of performance are not adequate when measuring portfolio performance and, more specifically, manager performance (Eling and Faust, 2010). The establishment of the Capital Asset Pricing Model (CAPM) by Sharpe (1964), Lintner (1965) and Mossin (1966) set the foundation for modern finance and forms the basis of many traditional performance measures. It is set out as:

$$R_{it} = \alpha_i + \beta_i(RM_t - R_{ft}) + \varepsilon_{it} \qquad (1)$$

Where;

R_{it} = the return of the fund in excess of the risk free rate

α_i = Abnormal return of the stock,

β_i = beta of the fund

RM_t = the return of the market

R_{ft} = the risk free rate

ε_{it} = the error term

The model postulates that, in an efficient market, all of the variations in share returns can be explained by one single factor - the returns of the market portfolio (Džaja and Aljinović, 2013). This gives rise to the notion of the Efficient Market Hypothesis which states that market security prices fully reflect all available information on the value of an asset (Brown, 2011). Yu (2008) posits that this then implies that the market

portfolio is mean-variance efficient and an average investor cannot consistently outperform a simple buy-and-hold strategy of the market portfolio in the long term. Empirical tests on the validity of the CAPM, such as Asness et al. (2012) and Clark (2013), however, have identified numerous 'anomalies', which are variables other than the market beta that have displayed evidence of the ability to predict security returns beyond that explained by the market portfolio. This is one of the criticisms of the Capital Asset Pricing Model.

2.5.2 Jensen's alpha

Jensen's alpha, developed by Jensen (1968), evaluates the average return of the portfolio over and above that predicted by the CAPM, given the portfolio's beta and the average market return. Basically it is a risk-adjusted performance measure that computes the average return on a portfolio or investment, above or below, that predicted by the capital asset pricing model (CAPM) given the portfolio's, or investment's beta and the average market return. This metric is frequently referred to as Jensen's alpha, or simply alpha. It is expressed as follows;

$$Alpha = R_{it} - \left[R_{ft} + \beta_i \left(RM_t - R_{ft}\right)\right] \quad (2)$$

Where;

R_{it} = the realized return of the portfolio

RM_t = the realized return of the appropriate market index

R_{ft} = the risk free rate

β_i = the beta of the portfolio of investment with respect to the chosen market index.

A positive alpha value denotes a portfolio whose returns are above those suggested by its level of systematic risk and, thus, superior performance (Lai and Lau, 2010). In a similar manner, negative or zero values designate inferior or neutral performances respectively. In essence it can be inferred that, if Jensen's alpha is significantly positive, it signals evidence of a genuinely skilled fund manager, whilst a

significantly negative Jensen's alpha signals evidence of a poorly performing fund manager making investment decisions to the detriment of fund value (Capelle-Blancard and Monjon, 2014).

Hence, investors are looking for positive alpha funds where it infers that fund managers are making positive investment decisions that are adding value to the fund. Akinjolire and Smit (2003) suggest that the alpha parameter is of noteworthy value, since its sampling distribution is inferred from the least-squares regression theory. This then enables conclusions to be drawn regarding the statistical significance of any specific alpha estimate. Le Sourd (2007) criticizes the Jensen's Alpha in that its results are dependent on the choice of reference index. Additionally, Le Sourd (2007) and Ho et al. (2014), allude that alpha only accounts for systematic risk and, therefore, is only appropriate when ranking portfolios within peer groups, since these are managed in a homologous manner and, thus, have comparable levels of risk.

2.5.3 The Sharpe Ratio

Sharpe (1966) presents a risk-adjusted measure commonly used for performance evaluation known as Sharpe's ratio. It computes the quotient of the average portfolio excess return over the observation period divided by the standard deviation of returns over that period. It measures the reward to total volatility trade-off, or sometimes termed as the reward to variability ratio. It is expressed as follows;

$$Sharpe\ ratio = \frac{(R_p - R_f)}{\sigma_p} \qquad (3)$$

Where;

R_p = expected return of the portfolio

R_f = risk free rate

σ_p = standard deviation of the portfolio.

Basically, the Sharpe ratio is a measure for calculating a risk-adjusted return, and has become the industry standard for such calculations (Bailey and Lopez de Prado, 2012). The Sharpe ratio is the average return earned in excess of the risk-free rate per unit of total risk or volatility. The risk-free rate is subtracted from the mean return, and, therefore, the performance related to risk-taking activities can be identified. The intuitiveness associated with this calculation, is that a portfolio engaging in “zero risk” investment, like an investment in U.S. Treasury bills (for which the expected return is the risk-free rate), will have a Sharpe ratio of exactly zero (Homm and Pigorsch, 2012). In general, the larger the value of the Sharpe ratio, the more appealing the risk-adjusted return.

However, the Sharpe ratio has been criticized as being unreliable when implemented in portfolios whose expected returns do not have a normal distribution. Homm and Pigorsch (2012) contend that most portfolios are found to have a high degree of kurtosis, or negative skewness. Bayraktar et al. (2009) criticizes the Sharpe ratio on the grounds that it falls short in the analysis of portfolios possessing significant non-linear risks, such as warrants or options. Different risk-adjusted return methodologies have surfaced over time to fill this rift, and these include the Treynor Ratio, Sortino Ratio and the Return over Maximum Drawdown (RoMaD).

The Modern Portfolio Theory, proposed by Harry Markowitz, proclaims that adding assets that have correlations of less than one with each other to a diversified portfolio can lower the overall portfolio risk without forfeiting return (Swamy, 2013). Therefore critics argue that such kinds of diversification may serve to inflate the Sharpe ratio of a portfolio. Another observation noted by critics of the Sharpe ratio, is that it can also be manipulated by portfolio managers and hedge funds seeking to improve their risk-adjusted returns history. Low (2012) contends that managers can manipulate the Sharpe ratio by extending the evaluation interval, which results in a lesser estimate of volatility. An example of such, is the annualized standard deviation of daily returns which is ordinarily excessive compared to that of weekly returns, which is, in turn, higher than that of monthly returns. Bai et al. (2011) remarks that fund managers can also exploit the Sharpe ratio by compounding the monthly returns, then, however, computing the standard deviation from the non-compounded monthly returns.

Additionally managers may influence the ratio by writing out-of-the-money calls and puts on a portfolio (Chen et al., 2011a). This tactic can probably inflate the return by accumulating the option premium without paying off for several years. Strategies involving undertaking huge risks (e.g. liquidity risk, default risk, or other forms of catastrophic risk) have similar potential to disclose an upward biased Sharpe ratio. Studies like those of Schuster and Auer (2012) and Rapach et al. (2013) put forward the 1998 liquidity crisis as an example of such occurrences, where the Sharpe ratios of market-neutral hedge funds changed drastically, pre- and post the crisis. Their studies find that managers were utilising particular derivative instruments to smooth returns and were also employing pricing models that downplay monthly gains or losses. Asness et al. (2012) adds that the irregular marking to market of illiquid assets can greatly decrease reported volatility. From their study they discover that getting rid of extreme returns can influence the Sharpe ratio, since such returns inflate the reported standard deviation of a hedge fund. Thus, a manager may choose to eliminate the top and the least monthly returns yearly to lessen the total volatility.

2.5.4 The Treynor Ratio

Treynor (1965) proposed his own risk adjusted measure, which evaluates excess return per unit of risk. The measure utilises systematic risk instead of total risk and is called the Treynor ratio. The Treynor ratio, also known as the reward-to-volatility ratio, presents returns above those that might have been gained on a riskless investment, per each unit of market risk (Le Sourd, 2007). It is calculated as follows:

$$Treynor\ ratio = \frac{(R_p - R_f)}{\beta_p} \qquad (4)$$

Where:

R_p = expected return of the portfolio

R_f = risk free rate

$\beta_p =$ beta of the portfolio.

This measure makes use of the relation that exists between risk and annualized risk-adjusted return. Essentially, the ratio seeks to evaluate how successful an investment is in delivering compensation to investors, considering the risk level for the investment. The Treynor ratio is dependent on beta, which is, the sensitivity of an investment to movements in the market to measure risk. This metric is grounded on the premise that risk characteristic to the entire market, as represented by beta, must be penalized, since diversification will not remove it (Rahman and Uddin, 2009). Whenever the value of the Treynor ratio is high, it is indicative that an investor has produced high returns on each of the market risks undertaken. Meyer-Pretorius and Wolmarans (2006) allude that the Treynor ratio enables an awareness of how each investment within a portfolio is performing. More so, it clarifies to the investor how efficiently capital is being utilised.

However, critics have argued that the Treynor ratio does not incorporate any added value obtained from active portfolio management, saying that it is merely a ranking criterion. Le Sourd (2007) contends that a list of portfolios, ranked based on the Treynor ratio, is convenient only when regarded miniature portfolios, which are actually sub-portfolios of a bigger, fully diversified portfolio. Otherwise, portfolios with differing total risk, but similar systematic risk, will be rated or ranked exactly the same. Another weakness pointed out about the Treynor ratio, is its backward-looking nature (Dhanda et al., 2012). Therefore, investments will inevitably perform differently in the future than they did in the past.

2.5.5 The Arbitrage Pricing Theory (APT)

Subsequently, Ross (1976) introduced the Arbitrage Theory of Capital Asset Pricing, which is commonly known as the Arbitrage Pricing Theory (APT) model. The theory became instantly popular in estimating asset prices due to its inherent assumptions. It assumes that the return of an asset is dependent on various macroeconomic, market and security-specific factors.

Specifically, the theory states that a particular security's returns may have statistically significant sensitivities to a number of factors and, hence, exposure to

most of these factors can be eliminated through the process of diversification (Sadorsky, 2010). The factors that cannot be diversified away, result in investors requiring a risk premium in the form of higher expected returns. Since the number and nature of the systematic factors are not specified, the APT has stimulated numerous investigations attempting to identify potential variables that have predictive powers over share prices. The model is expressed as follows:

$$E(r_j) = r_f + b_{j1}RP_1 + b_{j2}RP_2 + b_{j3}RP_3 + b_{j4}RP_4 + \cdots + b_{jn}RP_n \quad (5)$$

Where:

$E(r_j)$ = the asset's expected rate of return

r_f = the risk-free rate

b_{jn} = the sensitivity of the asset's return to the particular factor n

RP_n = the risk premium associated with the particular factor n.

The conventional idea behind the APT is that two things can capture the anticipated return on a financial asset: 1) macroeconomic/security-specific influences and 2) the asset's sensitivity to those influences (Hillier et al., 2011). This relation takes the form of a linear regression formula, as shown above. An unlimited number of security-specific factors may influence any given security at any point in time. These factors include exchange rates, Gross National Product (GNP), inflation, production measures, investor confidence, market indices and changes in interest rates. It is the analyst's discretion to decide which influences are pertinent to the asset being analysed.

Ruf (2013) asserts that once the analyst obtains the expected rate of return of the asset from the APT model, he can establish what the "correct" price of the asset should be by inserting the rate into a relevant discounted cash flow model. The APT model is thus applicable to portfolios, as well as specific securities, since a portfolio can have exposures and sensitivities to certain kinds of risk factors as well. Ross

(1976) explains that, at the time, the APT was a revolutionary model because it allows the user to adapt the model to the security being analysed. He further asserts that, as with other pricing models, it enables the user to decide whether a security is undervalued or overvalued so he can profit from this information. Basu and Chawla (2012) add that the APT is also very useful for building portfolios, because it enables managers to examine the exposures of their portfolios to particular factors.

Various studies like those of Shaw et al. (2008) and Gromb and Vayanos (2010) have argued that although the APT may be more customizable than the CAPM, it is also more strenuous to apply, because ascertaining which factors impact a stock or portfolio takes a substantial amount of research. Barberis and Shleifer (2003) hypothesize that it can be extremely impractical to identify every influential factor, much less discern how sensitive the security is to a certain factor. However, Gromb and Vayanos (2010) add that getting "close enough" is often good enough, since, in fact, some studies note that about four or five factors will generally explain the bulk of a security's return. The commonly suggested factors are investor confidence, shocks in inflation, GNP, and shifts in the yield curve, that is, the term structure of interest rates (Blitz et al., 2012).

2.5.6 The Fama-French 3 Factor Model

Building on this perspective, Fama and French (1993) proposed a 3 factor model to describe fund returns. Their model incorporates the market factor, value factor, size factor and an error term that proxies for returns not attributable to the model. The generally accepted interpretation of the market and Fama and French (1993) factor model, particularly based on US data, is that it represents risk factors, or proxies to risk factors, and its use justifies a risk based interpretation. It is expressed as follows;

$$R_{it} = \alpha_i + \beta_{1i}(RM_t - R_{ft}) + \beta_{2i}SMB_t + \beta_{3i}HML_t + \varepsilon_{it} \qquad (6)$$

Where;

R_{it} = return of fund i at time t in excess of the risk free rate

α_i = abnormal return of the fund

β_{1i} = beta of the fund

RM_t = the return of the market measured by the relevant market index

R_{ft} = the risk free rate

β_{2i} = sensitivity of the funds returns to the size factor

SMB_t = the small capitalization portfolio less the large capitalization portfolio (size factor)

β_{3i} = sensitivity of the fund's returns to the value factor

HML_t = the high book-to-market funds less the low book-to-market funds (value factor)

ε_{it} = the error term or residual term

Basically the Fama and French 3 Factor Model expands on the capital asset pricing model (CAPM) by adding size and value factors to the market risk factor in CAPM. The model takes into account the assertion that small-cap and value stocks outperform markets on a frequent basis. With the inclusion of these two additional factors, the model adjusts for the outperformance trend, which is perceived to make it a better tool in assessing manager performance (Das and Uma Rao, 2013). However, there is plenty of debate about whether the outperformance trend is due to market efficiency or market inefficiency.

On the efficiency side of the debate, the outperformance is predominantly described by the excess risk that small-cap and value stocks encounter as a result of their higher cost of capital and greater business risk (Chen and Zhang, 2010) . On the inefficiency side, the outperformance is explained by market players incorrectly pricing the value of these companies, which gives the excess return in the long run as the value adjusts (Eraslan, 2013). Literature notes that investors who subscribe to the body of evidence ascribed by the Efficient Markets Hypothesis (EMH), are more likely to side with the efficiency side.

However, Fama and French (1993) are quick to point out that, while value outperforms growth and small stocks outperform large ones, over the long term, investors should be able to withstand the excess short-term volatility and periodic underperformance that may transpire in a given short-term time frame. Investors with a long-term time horizon of 15 years or more, will be compensated for any pain they

might suffer in the short term. Fama and French (1993) conducted numerous studies to test their model, using thousands of random stock portfolios. They discovered that, when size and value factors are merged with the market factor, these could then explain as much as 95% of returns in a diversified holding of stock portfolio.

Hence, the three factor model developed by Fama and French (1993) has been widely accepted to explain the performance of mutual funds more efficiently. In addition to the market proxy, the further two influences which are used to capture the risk premium (size and value) have been found to be very significant in explaining asset returns. However, critics like Taneja (2010) have argued that, while the Fama and French (1993) three factor model already enhances the average pricing errors experienced by the CAPM model, it is incapable of determining the cross-sectional disparities in momentum sorted portfolio returns. Carhart (1997) updated this model with the addition of a fourth factor, the momentum factor to proxy for momentum strategies employed by fund managers in buying recent past winners and selling recent past losers.

2.5.7 The Carhart 4 Factor Model

Consequently, the four factor model developed by Carhart (1997) improves the Fama and French (1993) three factor model by including an additional factor that incorporates the momentum variance captured by Jegadeesh and Titman (1993). The resultant model incorporates four risk factors which is a consistent market balanced model. In addition, this four factor Carhart (1997) model can be construed as a performance attributive model shown as follows:

$$R_{it} = \alpha_i + \beta_{1i}(RM_t - R_{ft}) + \beta_{2i}SMB_t + \beta_{3i}HML_t + \beta_{4i}MOM_t + \varepsilon_{it} \qquad (7)$$

Where

R_{it} = is the return of the fund in excess of the risk free rate

R_{ft} = the risk free rate measured by the yield on a 3 month (91 day) Treasury bill

α_i = abnormal return of the stock

β_{1i} = beta of the fund

RM_t = the return of the market measured by the relevant market index

β_{2i} = sensitivity of the fund's returns to the size factor

SMB_t = the small capitalization portfolio less the large capitalization portfolio (size factor)

β_{3i} = sensitivity of the fund's returns to the value factor

HML_t = the high book-to-market funds less the low book-to-market funds (value factor)

β_{4i} = sensitivity of the fund's returns to the momentum factor

MOM_t = the returns of a portfolio with past winners less the returns of a portfolio with past losers

ε_{it} = the error term

2.5.8 The Fama-French 5 Factor Model

More recently, Fama and French (2015) have introduced a five factor model, adding two more factors into their original 1993 model, with the hope of better performance in capturing variability patterns in stock returns, although it is still a work in progress. Their reasoning behind this move is from the criticism of the three factor model.

Critics had been complaining about the three factor model, saying that it is an insufficient model for measuring expected returns, since all three factors fail to account for much of the variation in average returns associated with profitability and investment. Inspired by such reasoning, Fama and French (2015) add the profitability and investment variables to the original three factor model and their new look five factor model can be expressed as follows;

$$R_{it} = \alpha_i + \beta_{1i}(RM_t - R_{ft}) + \beta_{2i}SMB_t + \beta_{3i}HML_t + \beta_{4i}RMW_t + \beta_{5i}CMA_t + \varepsilon_{it} \quad (8)$$

Where

R_{it} = is the return of the fund in excess of the risk free rate

R_{ft} = the risk free rate measured by the yield on a 3 month (91 day) Treasury bill

α_i = abnormal return of the stock

β_{1i} = beta of the fund

RM_t = the return of the market measured by the relevant market index

β_{2i} = sensitivity of the fund's returns to the size factor

SMB_t = the small capitalization portfolio less the large capitalization portfolio (size factor)

β_{3i} = sensitivity of the fund's returns to the value factor

HML_t = the high book-to-market funds less the low book-to-market funds (value factor)

β_{4i} = sensitivity of the fund's returns to the profitability factor

RMW_t = difference between the returns on diversified portfolios of stocks with robust and weak profitability (profitability factor)

β_{5i} = sensitivity of the fund's returns to the investment factor

CMA_t = difference between the returns on diversified portfolios of the stocks of low and high investment firms, usually called conservative and aggressive (Investment factor)

ε_{it} = the error term

Since their model is relatively new, it is still being subjected to thorough scrutiny and investigation of its applicability by scholars and practitioners alike. However, Fama and French (2015) themselves have made it clear that their model is far from perfect. They highlight that the five-factor model's biggest challenge is its inefficacy to express accurately the low average returns on small stocks, whose returns act like

those of firms that invest a lot in spite of low profitability. Fama and French (2015) further add that the model's performance is not sensitive to the way its factors are defined. Hence, with the inclusion of the profitability and investment factors, the value factor of the three-factor model becomes redundant in explaining average returns in the sample they investigated.

Critics have already been weighing in with thorough analyses of the model, most of which are fault-finding. Opinions on the main implications of the model are divided, with most voicing their discontent that the addition of the two quality factors is still premature. Other critics point out that the new model still ignores low volatility and momentum. However, as the authors have highlighted, their work is still in progress, hence, improvements on this model might be effected soon.

Nonetheless, it should be noted that the effectiveness of all the traditional performance models highlighted in this section is benchmark dependant. Researchers Researchers like Cici (2012) and Braga (2016) have noted, over time, that the outcomes of any regression are highly conditional on the choice of benchmark indices used. The divergence in most results is often due to the differing proxies for the market benchmark and the risk free rate employed in that specific study. Von Wielligh and Smit (2000) lends weight to this view by adding that conclusions reached in any one study of performance are model and benchmark dependent.

In a South African context, Van Rensburg (2001) found out that, when accounting for market risk, two individual factors, as opposed to one general market factor, better describes this risk. Van Rensburg (2001) builds on prior research by Van Rensburg and Slaney (1997) which had found that, using the Arbitrage Pricing Theory (APT) model, two factors most appropriately describe market risk in the JSE. These two factors were said to be the JSE All Gold and Industrial Indices. Van Rensburg (2001) updated these two factors to the Resources and Financial-Industrial Indices.

2.6 Market Timing

Market timing is generally viewed as the ability of the fund manager to profitably move from one asset class to another. The original Jensen technique to calculate alpha, whether from the market model or from multi-factor models, does not

distinguish between market timing and fund manager skill in security selection (Moneta, 2015). Skilled fund managers, in addition to trying to select the most under-priced stocks given the risk objective of the fund, can also increase returns by timing the market based on their expectations of future market movements. Clark (2013) posits that fund managers can exhibit market timing skills by switching into defensive, low beta stocks in bear markets and aggressive, high beta shares in bull markets. If fund managers can successfully time the market, then returns to the fund will be high in bull markets due to investment in aggressive stocks and still relatively high in bear markets due to switching to defensive stocks.

Various performance measurement models endeavour to distinguish security selection capability from market timing ability, or the ability to forecast the market returns. Although alpha ordinarily measures both, market-timing models were developed to distinguish between these two aspects of performance. The two most common tests for market timing used in the literature are those of Treynor and Mazuy (1966) and Henrikson and Merton (1981). These have been used extensively in recent studies like those of DeAngelo et al. (2010), Kostakis et al. (2011) and Bolton et al. (2013). However, it has been noted that most fund managers are not able to successfully time the markets, and thus, such actions may have dire consequences since investors are now exposed to a higher level of risk per unit of return than they were willing to take initially (Qian and Shi, 2010).

2.6.1 The Treynor-Mazuy Model

The Treynor and Mazuy (1966) test of market timing imposes a quadratic term in the factor model to capture market timing and is famously referred to as the Treynor-Mazuy model. Numerous studies on market timing ability, such as Patton (2009), Kostakis et al. (2011) and Hoffman (2012), normally boost standard factor model regressions with a term that captures the convexity of fund returns derived from market timing. In the single factor model the quadratic term attempts to capture the nonlinear relation between excess fund returns and excess market returns. With regard to the Treynor-Mazuy model, the sign on the estimated coefficient of the quadratic term, and whether it is statistically different from zero, captures market-timing ability. Kostakis et al. (2011) asserts that if the market timing coefficient is significantly positive then it represents a convex, upward sloping regression line and

indicates a confirmation of successful market timing by the portfolio manager. Thus, the coefficient will be positive if the manager raises beta upon acquiring a positive signal about the market. The hypothesis of no timing ability suggests that the coefficient 'Ɣ' on the quadratic term is zero or negative. The model is expressed as follows;

$$R_{it} = \alpha_i + \beta_{1i}(RM_t - R_{ft}) + \Upsilon(RM_t - R_{ft})^2 + \varepsilon_{it} \quad (9)$$

Where the formula follows the same format as the CAPM model, with the only exception being the addition of the squared market risk premium term preceded by the coefficient 'Ɣ' for market timing.

2.6.2 Henrikson - Merton Model

Henrikson and Merton (1981) developed an identical model (popularly known as the Henrikson-Merton model) of market timing by capturing the convex association between the return of a successful market timer's portfolio and the market return. However, their model allows the portfolio's beta (risk) to oscillate between two levels conditional on the size of the market's excess return.

The Henrikson-Merton model tests for market timing ability using a similar regression to the Treynor-Mazuy model, with the only difference in the quadratic term being a + sign for the superscript instead of the 2 for the squared term. This term represents the maximum eigenvalue between zero and the market risk premium, and, thus, if its coefficient (δ) is significantly positive then it indicates evidence of successful market timing by the fund manager (Bodnaruk et al., 2015). The model is expressed as follows;

$$R_{it} = \alpha_i + \beta_{1i}(RM_t - R_{ft}) + \delta(RM_t - R_{ft})^+ + \varepsilon_{it} \quad (10)$$

Where $(RM_t - R_{ft})^+$ = Max (0,$RM_t - R_{ft}$) (11)

In essence, both market timing methods try to capture the non-linearity of fund managers performing better than expected in bull markets and not performing as bad as expected in bear markets. Expression (11) above can also be written as $(RM_t - R_{ft})^+ = (RM_t - R_{ft})D$ where D is a dummy variable that is equal to 1 when $(RM_t - R_{ft})$ positive and 0 otherwise. The magnitude of δ computes the disparity between the target betas, and will be positive for a portfolio manager that successfully times the market.

In other words, Henrikson and Merton (1981) advocates that the beta of the portfolio takes only 2 values. If the excess return on the market is positive, $(RM_t - R_{ft})^+$ will be 1, otherwise it will be zero. Hence the beta of the portfolio is $\beta_{1i} + \delta$ in bull markets and β_{1i} in bear markets from equation (10).

A large body of evidence such as Blitz et al. (2012), Clark (2013) and Philippon (2015), exists which corroborates the EMH in reference tests of the market timing capability of portfolio managers. Accordingly, literature has it on record that future market movements are implicitly uncertain and, thus, investors who do not precisely forecast the market would face grave consequences (Malhotra, 2012).

2.7 Style Analysis and Stock Selection Ability

Several researchers, such as Taneja (2010), Thomas (2012) and Keywood (2015), have come out in support of the value added by active mutual fund management through proper stock selection. Wermers (2000) conducted a study on mutual fund performance on the US markets to find out whether mutual fund managers who actively traded stocks do add value or not after adjusting for style exposure. He decomposes returns into style, stock-picking talent, transaction costs and talent. The study finds that the stocks held in most of the funds outperform the market by 1.3 percent annually, however, their net returns underperform the market by one percent. Wermers (2000) adds that, out of the 2.3 percent difference between these results, 0.7 percent is attributed to the underperformance of non-stock holdings, whereas 1.6 percent is due to expenses and transaction costs. In his conclusion he noted that the funds under study select stocks well enough to conceal their costs and

that high-turnover funds consistently beat the Vanguard Index 500 fund on a net return basis.

Bodson et al. (2010) make two important distinctions in identifying the main uses of the style investing technique, which are performance analysis and style analysis. They identify style investing as a key means of evaluating the performance of different professional fund managers. Their method is based on the premise that the creation of a style automatically created a peer group of managers who also pursue that particular style. The performances of the managers within that group can thus be compared to each other, in order to ascertain which managers were outperforming the market and which were not.

This observation has led to managers increasingly being evaluated relative to a particular relevant performance benchmark index. Muller and Ward (2013) adds that style analysis may also be used to determine the relevant factor exposures of a particular fund. This deals with issues such as identifying the type of assets that are being invested in by the fund manager, what style of asset the particular fund behaves like overall, and whether a fund-specific benchmark could be established.

2.7.1 Strengths of Style Analysis

Lau (2007) provides support for and advocates using Sharpe's return-based style analysis technique, in an attempt to pursue more useful and suitable performance information. Using this technique, one is able to perform a more effective peer comparison of manager performance than would otherwise not be the case. Funds that display discrepancies between the stated investment style objectives and the actual investment style of the fund can be identified easier (Schneeweis et al., 2012). The only data needed to perform style analysis is historical return data, which is much easier to collect than holding data, a requirement of the alternative holdings-based analysis (Lucas and Riepe, 1996, Domian and Reichenstein, 2009). This results in the style analysis being able to be performed without access to data that is only available to insiders of the company, as return data can be sourced from a number of outside sources. Fowler et al. (2010) add that Sharpe's method is less costly than other methods, and much quicker, since it is based on timely information. Due to its simplistic nature, in circumstances in which a manager's style is stable and

consistent, this style analysis can be very useful if applied correctly as alluded to by Christopherson et al. (1998) and Wahal and Yavuz (2013).

2.7.2 Weaknesses of Style Analysis

The return-based style analysis, proposed by Sharpe, also poses a few problems for investors looking to undertake it. There are problems arising from the classes of asset styles chosen, including the makeup of the style indices used to represent a particular style, as well as the extent of correlation that exists between the different indices (Pattarin et al., 2004, Weng and Trück, 2011). This multicollinearity in the index's data may result in inconsistent factor weightings, as well as results that are insignificant. Using this regression-based technique to classify manager style, implies that the future behaviour of the fund manager will be consistent with their historical performance (Christopherson, 1995, McDermott, 2009). This is not necessarily always the case, and the style analysis is flawed in that sense.

The inherent assumption in the style analysis, that the exposures to the different styles stay constant over time for the portfolio, or in other words, that the obtained results from the analysis are representative of the average allocation of funds across the various styles over a certain period, creates problems due to this not being the case in the real world (Annaert and Van Campenhout, 2007). Issues exist with the limitations placed on the coefficients by the non-negativity and sum to one clauses, as these are very often violated in the real world.

DiBartolomeo and Witkowski (1997) and Schwindler and Oehler (2011) identify the use of an arbitrary cut-off point for determining when a fund's style is misclassified as being a pitfall in the usage of style analysis for classification. This cut-off point is highly subjective, and is greatly open to bias by the analyst. Style analysis is based on the assumption that a linear relationship exists in the investment strategy of the fund being analysed. Brown and Goetzmann (1997), Ainsworth et al. (2008) and Wahal and Yavuz (2013) assert that, while it is often the case that funds follow non-linear strategies, this usually creates misclassifications in the results of the analysis.

2.8 Unit Trusts Performance

Numerous researchers have noted varying patterns in average stock returns when profiling the performance of unit trusts relative to their benchmark indices. Since

these patterns in average returns, apparently, are not captured by the CAPM, they are often referred to as anomalies. Additionally, they are perceived to play a huge role in determining mutual funds' performances (Fama and French, 1996, Norma et al., 2010). In profiling outperformance of the index benchmark by mutual funds, differing opinions and conclusions arise with no clear consensus. Various studies attribute this to different factors, such as, the location where the study was conducted, the performance evaluation measures used, proxy for market benchmark, and the type of the risk free rate employed in the analysis.

Literature has proposed varying postulations and methods that could possibly help explain the performance of mutual funds. Most studies have employed the standard performance evaluation measures in evaluating performance, which are the Sharpe ratio, Jensen alpha, Fama and French 3-factor model, Carhart 4- factor model, the Capital Asset Pricing Model and also the Arbitrage Pricing theory model. Cuthbertson et al. (2008) argue that market timing, luck or manager skill, type of data used, size, power, false discoveries, benchmark portfolio etc., play a role in determining performance. Using the Carhart 4-factor model, they conclude that 0-5% of funds, in the UK and US, do record positive alphas whereas about 20% of funds record extremely poor alpha performance. Cuthbertson et al. (2008) postulates the key drivers of performance to be load fees, expenses and turnover.

Hassan (2005) applied the CAPM, and Fama and French 3 factor model, in evaluating the performance of a sample of 470 UK unit trusts between 1986 and 2001. His analysis yields that fund managers underperform the market after controlling for risk factors and suggests investing in a passive index as a better option. Following on this work, Clark (2013) examined UK equity unit trusts between 1980 and 2007 using the CAPM and Fama-French model too. He also finds little evidence that UK equity unit trusts produce abnormal returns, which adds weight to the earlier reasoning by Hassan (2005) that passive investing is better than active investing. Fletcher and Marshall (2005), Gregory and Tonks (2004), Giles et al. (2002), Bashir and Nawang (2011) find similar results of underperformance of UK unit trusts relative to the market.

Low (2012) analysed unit trusts performance in the Malaysian market using the Net Asset values of 65 unit trusts, the 91 day Malaysian Treasury bill for risk free proxy

and the Kuala Lumpur Composite Index for the market. Applying the market timing model of Henrikson and Merton (1981), Low's (2012) analysis discovered that large funds, in essence, enhance managers' timing returns, reflecting the efficiencies of large funds in responding to market-wide movements. However, Low (2012) attests that, as the size of the fund gets larger, managers find it more challenging to identify worthwhile investments which results in poor selectivity performance. In South Africa, the picture is not vividly clear whether mutual funds underperform or outperform the market. Akinjolire and Smit (2003) analysed the South African mutual funds' performance and their strategies in a changing economic climate from 1989-2002. As per the trend in most studies, they found no conclusive evidence of outperformance. Akinjolire and Smit (2003) applied the Ferson and Schadt (1996) model to a sample of 7 general equity unit trusts, the lagged dividend yield of the FTSE/JSE ALSI, and the term structure of interest rates as market factors in their analysis.

In a recent actuarial society publication paper, Bertolis and Hayes (2014) investigated 92 South African general equity unit trusts, during different economic periods, between 1994 and 2012. Employing the CAPM and Jensen's alpha techniques, they report that unit trusts are shown to have underperformed in economic downturns and outperformed in periods of robust growth, while no conclusions could be made about unit trust performance during periods of average growth. Overall, their finding is that unit trusts showed slight outperformance, but this was not found to be persistent. These contrasting findings motivated this study in order to fill in the gaps in vital information that investors need for formulating their investment decisions.

2.9 Evidence of Persistence

Wessels and Krige (2005) studied the performance persistence of equity funds in the South African Unit Trust Industry against the ALSI index benchmark over the period 1988 to 2003. They found that few funds exhibited extraordinary persistence - either in out-performing or under-performing. In general, they found that, over the short term, i.e. month-to-month and quarter-to-quarter basis, there is a tendency that the current performance of a fund would be repeated. That is, there is a greater tendency among the top performing funds to remain top performers. Interestingly,

Wessels and Krige (2005) discovered that, when the persistence of fund performance is measured on a year-to-year basis, there is less consistency identified among the funds. They, hence, warn investors of the danger of placing their trust in only one active manager in that, in the long run, the performance ranking of managers can assume a random nature if manager skill is not persistent.

Von Wielligh and Smit (2000) used the CAPM model, a two factor APT model and a three factor APT model, to analyse the performance persistence in South African unit trusts from 1988 to 1997. They found evidence of both short term and long term persistence, however, they noticed that the APT models were more powerful than the single factor CAPM model in explaining the relative returns of the portfolios. This is on account of the APT models explaining almost all the cross-sectional variations in expected returns. In their study, Von Wiellligh and Smit (2000), unearthed that the worst performing unit trusts tend to stay worst performers, average performers had the potential of becoming top performers while top performers over time tended to become average performers. Viviers et al. (2009) arrived at a similar conclusion in their study of performance persistence amongst South African mutual funds.

Nana (2012) examined a sample of 151 South African domestic equity unit trusts from 2001 to 2010, to investigate whether these unit trusts are able to outperform the market and if such performance persists. Using six different models, Nana (2012) found no conclusive evidence of outperformance by the unit trusts, although evidence of short run persistence was found. This persistence seemed to decrease over the long run and diminishing completely in some cases. With respect to European markets, Eriksson and Persson (2012) found that performance persistence on the Swedish market did actually exist when they tested 8 Swedish mutual fund categories for one-year persistence on the risk- neutral returns. Their study used both an auto-regression of present returns on past returns, and a cross product ratio test between 1992 and 2011. They asserted that notable proof of persistence was found in funds investing in Sweden, Europe and globally.

In the South African context, Keywood (2015) examines the potential for outperformance and persistence among South African unit trusts using the Recursive Portfolio Approach to test for persistence. Results from his study are largely in line with South African literature findings, as short term persistence is

established for equity, balanced, and fixed-income funds, but not for property funds or other funds. Keywood's (2015) findings also confirm the South African phenomenon, that persistence is observed to diminish over longer investment horizons. Thomas (2012) improves on an earlier study by Collinet and Firer (2003), in which they had investigated the characteristics of performance persistence amongst South African general equity unit trust funds. Thomas (2012) focused on testing whether the performance of a fund in one period can be used to predict the performance of that fund in a subsequent period. He made the interesting discovery that results for performance persistence studies over longer time periods are highly sensitive to the beginning and ending dates selected in the test being performed. Thus, from his analysis, no conclusive evidence is found that performance persists over the 1, 2 and 3 year holding periods tested.

Using a sample free of survivorship-bias covering the period 2000-2010, Schiff (2011) found strong evidence of persistence when examining performance persistence of US mutual funds investing in Latin America. The study observed that Latin American funds performing poorly (or well) in any quarter, tend to underperform (or outperform) the market in the subsequent month to a much higher degree than reported for US and alternative emerging market funds. Schiff (2011) suggested that this positive persistence in abnormal returns of formerly well performing funds could be an indicator of the relative inefficiencies in the Latin American equity markets. This would, in turn, present fund managers with ample opportunities to take advantage of market inconsistencies. However, some South African studies find contrasting results. Scher and Muller (2005) are of the opinion that South African funds are incapable of outperforming the market, when exposure to market, size and value were considered. Their study investigated 106 funds from all equity categories from January 1990 to December 2002, with regard to equity style and persistence of performance.

In particular, Scher and Muller (2005), Hoepner et al. (2011b) found that value funds, and small caps, exhibit negative performance persistence which extends for, at least, two years, whereas small stocks unit trusts are consistently the worst performers, followed by value funds. Their findings imply that portfolio managers are unable to exploit inefficiencies of small cap and value shares and thus a passive portfolio investment would be better.

2.10 Survivorship Bias

The mutual fund industry has, over time, been suspected of methodically and substantially overstating portfolios' performances in a way that deceptively portrays actively managed mutual funds as competitive, relative to the indexes. According to Barret and Brodeski (2006), survivorship bias is a type of grade inflation for mutual funds that happens when the worst performing portfolios are made to disappear from the database while robust performers are put forward. This results in skewed performance figures that make the prevailing active managers seem superior. Poor performers are made to fade away before they can pull down the overall performance figures for the indices (Ruf, 2013). Only a handful of investors are aware of survivor bias, but it is indeed a serious issue.

In a study conducted by Barret and Brodeski (2006) on 42 US domestic equity funds, they found that, when the survivor bias factor is taken into account, actively managed mutual funds lagged their related indexes from 1995-2004. Barret and Brodeski (2006) observed that the survivor bias effect worked to inflate fund returns in all but one of the 42 narrower Morningstar fund categories. Their analysis shows that the purging of the poorest funds from the Morningstar database improved ostensible returns by 1.6 percent per year on average over the 10-year period.

In profiling this (survivorship) phenomenon in detail, Gilbert and Strugnell (2010) examined the effects of survivorship bias by conducting an analysis on the mean reversion of share returns on the JSE, from 1984 to 2007. They updated the previous work by Bailey and Gilbert (2007), which had established the existence of mean reversion of relative returns on the JSE. Bailey and Gilbert (2007) had found that share portfolios which had tended to outperform recently (being those with high P/E ratios), significantly underperformed over five years against low P/E ratios share portfolios. The results of their study validated the presence and actuality of the effects of survivorship bias within the JSE. Correspondingly, Gilbert and Strugnell (2010) observed that the returns earned on funds chosen from presently listed shares were notably higher than the matching returns on funds chosen from all shares. From this analysis they advised that, while survivorship bias does not certainly influence the inference of mean reversion patterns revealed in earlier

studies, it is a potentially important issue in any empirical financial research, and efforts need to be made to avoid it.

2.11 Chapter Summary

This chapter introduces the theoretical grounding of this research and explores the pertinent financial theories on which this investigation is based. The home of the study is the financial intermediation theory, which builds on the notion that intermediaries serve to reduce transaction costs and informational asymmetries, and thus practitioners view financial intermediation as a value-creating economic processes. Therefore, the study appreciates the increasing economic importance of financial intermediaries and subsequently focuses on how mutual funds (specifically South African based funds) invest. The chapter highlights the advent of investing with style as adopted by an increasing number of fund managers and further expands on the Returns Based Style Analysis technique. It then touches on the perspectives of style drift and style consistency approaches of investing, and discusses the strengths and weaknesses of style analysis. The traditionally widely used performance evaluation measures are elaborated upon, with the evidence of performance and persistence in different markets presented. Finally, the chapter closes off with discussing the pervasive phenomenon of survivorship bias which is prevalent in unit trust performance evaluations. The next chapter introduces the research methodologies and the data to be utilised in the study and a detailed description of the techniques to be applied.

CHAPTER 3

DATA AND RESEARCH METHODOLOGY

3.1 Introduction

This section details how the proposed objectives are to be achieved. The main purpose of this study is to investigate the performance, and also performance persistence, of unit trusts in South Africa from the Returns Based Style Analysis perspective. This will enable one to establish if fund managers are able to add value after adjusting for style exposure or not. It will also clarify whether future returns can be predicted based on the persistence of performances. More importantly, the section details the methodologies employed to test the proposed objectives, whose robustness and validity were verified by the nature of the results of the study.

This chapter introduces the dataset that is analysed and discussed in Chapter 4, from which the benchmark indices in the methodology section are derived. The dataset used in this study consists of (1) share returns of JSE listed unit trusts, (2) total returns of JSE published indices, and lastly the (3) portfolio return data for the portfolios to be constructed, based on the value (HML) and size (SMB) style factors. These three datasets are described separately in this chapter.

Microsoft excel, Stata and the Econometrics Views (E-Views) statistical software packages are used conjunctively in performing the analyses for this research, although E-views was mostly used for the more detailed regressions analyses throughout the study. The data was first subjected to the usual diagnostics of proper cleaning in order to avoid phenomena prevalent in financial time series data. Before interpreting the results, diagnostic tests were performed to ensure all econometric properties are met. The results passed all these stability tests, which were the tests for stationerity, heteroscedasticity, autocorrelation, and normality. This step was very important in order to avoid getting results which are spurious and also uninterpretable statistics. For stationerity, the study conducted the Augmented Dickey-Fuller (ADF) test together with the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test. For Autocorrelation, the Durbin-Watson tests was conducted, and for heteroscedasticity, the White-test was conducted. Lastly to check for normality, the Jaque-Bera test was conducted. The E-views software was able to take care of all

these tests and the results from these tests were obtained with the summaries from the regression outputs. Basically the software package used to estimate the models took care of all the robustness tests. Subsequently, a time series data analysis approach was employed as done in most studies of this nature.

3.2 Unit Trust Data and Sample Selection

The required data for the study is retrieved from McGregor BFA library and Bloomberg terminal. Monthly returns and interest rates are continuously compounded, unless stated otherwise. The unit trust data consists of 42 South African domestic equity style (or sector) unit trusts over the period of the evaluation that does not suffer from survivorship bias. The justification of these choices is given below.

These unit trusts are carefully selected from seven significant categories of style indices provided by the JSE. These categories of funds, by sector index in the JSE, were verified using McGregor BFA, Bloomberg and also Fundsdata South Africa. The style categories of South African unit trusts are formally arranged in their respective indices or industry sectors in these financial portals. From each of these seven core style indices (which are the Large Caps, Small Caps, Growth, Value, Financials, Resources and Industrials), six unit trusts were selected based on a balanced overview of their most recent performances. Of the six selected unit trusts per style index, two are poor performers, two are average performers and the last two are top performers, based on the most recent performance rankings provided by Morningstar South Africa for South African unit trusts. This was done to get a balanced and as normally distributed portfolio as possible, without running the risk of skewness on the data.

In line with previous studies conducted on the persistence and performance of unit trusts in South Africa, such as Thomas (2012), Muller & Ward (2013) and Keywood (2015), this study utilizes a database of purely domestic equity unit trusts listed on the Johannesburg Stock Exchange. Monthly performances of these South African domestic equity unit trusts are acquired and these figures are all-inclusive of re-invested dividends as alluded in the studies of Gill et al. (2010) and Korteweg (2010). The study covers a 10-year period and uses monthly closing share prices from

January 2005 to December 2014, which are converted into continuous compounded returns. As suggested in previous studies, e.g. (Collinet and Firer, 2003), the period under review should be as lengthy as possible for sufficient observations and a satisfactory amount of data points.

The beginning date of the study is chosen on the basis that the JSE introduced two important indices, the Value (J330) and the Growth (J331) style benchmarks in August 2004, hence the beginning of the year 2005 is viewed as a proper time to start analysing their performances. Most literature on style analysis documents studies are done for a period of 60 months, like the original style analysis study by Sharpe (1992). Hence, the 120 months used in this study is deemed to be a sufficient period for a thorough analysis.

For persistence to be observed, the period of observation should be broken into two equal parts, being the formation period (also called evaluation period) of the fund and then the holding period (also called ranking period) (Scher and Muller, 2005; Cuthbertson and Nitzsche, 2013; Porter and Trifts, 2014). Therefore, the study utilizes 6 months, 1 year, 2 years and 3 years formation and holding periods to test for persistence of performance between the formation and holding periods as done in the studies of Collinet and Firer (2003) and also Thomas (2012). In selecting the funds, only unit trusts with a performance history of more than one year at the end of December 2014 are included in the sample. This allows the observation of at least a 6-month formation period and a 6 month holding period. It should be noted that not all the funds have the complete data for the entire 10-year evaluation period, since some of them only came into existence as late as 2009, while other funds were discontinued. These were also included to eliminate survivorship bias in our sample as much as possible.

In order to utilize the Returns Based Style Analysis approach, Sharpe (1992) original study advocates that 60 months is an adequate period for a proper examination. This study has gone a step further and utilized a longer period to thoroughly test the phenomenon of drift, performance and persistence. Hence, all of the funds in the study have at least 6 years of available data to test for persistence, using a 3-year formation- and a 3 year holding period. The databases used encompass all data, even for discontinued funds and fledgling funds, which are still relatively new and

have incomplete data for the whole 10-year period. These funds were included in the study's sample to eliminate survivorship bias as much as possible. Funds of funds were removed from the sample to avoid the issue of double counting and, similarly, index tracking funds were excluded, since their performances are highly correlated with benchmark indices (Blitz et al., 2012).

Due to the relative infancy of some of the JSE sector indices and the blurred demarcation between them, some stocks may be found to overlap between two or three different indices. This unclear distinction between indices is sometimes attributed to the characteristics of a stock changing over time, e.g. value stock changing into growth or a small cap stock growing into a large cap stock. Examples of such occurrences are Standard Bank and Anglo American shares, which are found in more than one style index (Bertolis and Hayes, 2014).

Thus, from these seven style indices, six unit trusts under each index are chosen to give us the sample of 42 funds for the study. The sample chosen for the study is highly representative, from a general equity style index perspective, on the JSE. This is because most of the unit trusts in South Africa have various holdings in their portfolios, for example, blended funds, global funds, fund of funds and bond funds, as fund managers attempt to diversify risk.

Table 3-1 below shows the full list of the unit trusts to be used for the study, their JSE codes and the respective sectors from which they were sampled. For simplicity of inputting data to the spreadsheets used for the analyses, these funds were categorised using the letters from A to F (the six funds in each category), since some of them have very long names. Hence Table 3-1 will be constantly referred to for the actual names of the funds. This approach of grouping funds according to their style orientations follows other studies like Bender et al. (2013) and Cronqvist et al. (2015).

TABLE 3-1: List of full names of unit trusts to be used

	FINANCIALS FUNDS			RESOURCES FUNDS	
	FULL NAME	**JSE CODE**		**FULL NAME**	**JSE CODE**
FUND A	Coronation Financial Fund	CNFG	FUND A	Investec Commodity Fund Class R	INVC
FUND B	Momentum Financials Fund A	RMFS	FUND B	Momentum Resources Fund A	SAGR
FUND C	Nedgroup Investments Financials Fund A	UALA	FUND C	Nedgroup Investment Mining & Resource R	SYMR
FUND D	Sanlam Financial Fund	SANF	FUND D	Old Mutual Mining & Resources Fund R	OMTM
FUND E	Sanlam Financial Fund B1	SAFB	FUND E	Old Mutual Gold Fund R	OMTG
FUND F	ABSA Select Equity Fund	ASEF	FUND F	Stanlib Resources Fund R Class	GDBR
	GROWTH FUNDS			**SMALL CAP FUNDS**	
FUND A	FNB Momentum Growth Fund A	FNBG	FUND A	Coronation Smaller Companies Fund	COSG
FUND B	Foord Equity Fund	FEQF	FUND B	Investec Emerging Companies R	INVE
FUND C	Investec Growth Fund Class A	FGGA	FUND C	Momentum Small Mid-Cap A	RMEC
FUND D	Nedgroup Investments Growth Fund A	SYGA	FUND D	Nedgroup Investment Entrepreneur Fund R	NDBE
FUND E	Marriot Dividend Growth Fund Class R	HLMK	FUND E	Old Mutual Mid & Small-Cap Fund R	OMSC
FUND F	Old Mutual Growth Fund R	OMGR	FUND F	Stanlib Small Cap Fund A Class	GDSC
	INDUSTRIALS FUNDS			**VALUE FUNDS**	
FUND A	Coronation Industrials Fund Class A	CNCG	FUND A	Cadiz Mastermind Fund Class A	AHMF
FUND B	Momentum Industrial Fund A	RMCF	FUND B	Element Islamic Equity Fund A	FIEU
FUND C	Old Mutual Industrial Fund A	OMCF	FUND C	Investec Value Fund Class R	INVF
FUND D	Sanlam Industrial Fund A	SIFA	FUND D	Stanlib Value Fund A Class	LIVA
FUND E	Stanlib Industrial Fund R Class	GDKI	FUND E	Momentum Value Fund A	RMVF
FUND F	Stanlib Industrial Fund A Class	LIIA	FUND F	Nedgroup Investments Value Fund A	BOVA
	LARGE CAP FUNDS				
FUND A	Absa Large Cap Fund	ABRF			
FUND B	ABSA Large Cap Fund B Class	ARPCB			
FUND C	Momentum Top 40 Index Fund	RMBT			
FUND D	Old Mutual Top 40 Fund A	OMSA			
FUND E	Prescient Equity Top 40 A1	PEQF			
FUND F	Stanlib ALSI 40 Fund Class A	LBFT			

Source: Author's own. Constructed based on the selected unit trusts used for this study.

3.3 Share Return Data

The study utilizes monthly data, since it reduces noise and volatility considerably when compared to daily data (Petajisto, 2011). In order to construct the portfolios for the style analysis, the following data for each fund was collected for the prior and selected sample period (Rapach et al., 2013);

- Monthly closing prices (or the Net Asset Value) – for calculating percentage monthly returns for the funds,
- Monthly market capitalisation values, and
- Monthly Price-to- book ratios.

The monthly total return indices computed by McGregor BFA are utilized throughout this study. A total return index (TRI) takes into account both changes in share prices (that is, capital gains) and any distributions, such as, dividends (Lizieri et al., 2012). Whenever a company announces a distribution, the dividend declared is assumed to be reinvested in the share in question on the ex-dividend date. In other words, the TRI is equivalent to share prices adjusted for dividends.

In the calculations of a fund's returns for every other month *t*, Thomas (2012) and Willenbrock (2011) assert that the respective monthly returns (R_t) are calculated using the Net Asset Value (NAV) price at the end of each month as follows:

$$R_t = \frac{P_t}{P_{t-1}}\left(1 + \frac{d_t}{P_{tr}}\right) - 1 \qquad (1)$$

Where;

R_t = monthly return of the fund

P_t = NAV price at the end of the month

P_{t-1} = NAV price at the end of the previous month

d_t = Distribution per unit paid during the month

P_{tr} = Price at which the distribution was reinvested.

All the fund returns are computed using the net asset value (NAV) price, which is net of portfolio expenses like audit and management fees. These monthly returns are then converted into continuous returns by taking the log of the value relatives, that is, the natural log of (1+R_t). The return for one or more holding periods can be computed by taking the inverse of the log of the sum of the continuous monthly returns minus 1 (Rehkugler et al., 2012). The formula for this return is:

$$R_h = e^{\sum_{t=1}^{n} \ln(1+R_t)} - 1 \qquad (2)$$

Where;

R_h = return of a holding period

3.4 Benchmark Return Data

Most empirical studies in the South African context have used the JSE All Share Index as the market proxy. However, the bulk of recent literature on fund performance, such as Hsieh et al. (2012) and Yu (2008) suggest that, if the market proxy can be represented by the specific sector index of a fund, then the results would be more meaningful and high in precision. In this regard, the market proxy for each fund used would be its specific sector or style index. For example, when evaluating performance for a fund under the financials, the proxy for the market used was the Financials index.

However, the study performed two sets of regressions; one with the ALSI benchmark and the other one with the specific style benchmark. The motivation for this move is that the study sought to compare the results of the models when a style benchmark is used and also when the general market index is utilised in order to properly observe the effects of style investing. The compounded monthly total returns for the indices was calculated from their monthly closing prices as follows:

$$R_{mt} = \left(\frac{V_t - V_{t-1}}{V_{t-1}}\right) \qquad (3)$$

Where;

R_{mt} = the monthly return of the market benchmark

V_t = closing value of the index at time t

V_{t-1} = value of the index at period t-1 or previous month.

These returns will be logged for the effect of compounding in returns.

3.4.1 Description of the Selected JSE Indices

Seven published JSE indices' data is collected over a 10-year period from 1st January 2005 to 31st December 2014, from McGregor BFA, to be used as sector proxies for the market benchmark when evaluating performances of the various unit trusts. As mentioned before, this is on the basis that the JSE introduced two important style indices, the Value (J330) and the Growth (J331) style benchmarks in August 2004, hence the beginning of the year 2005 is viewed as a proper time to start analysing their performances. The seven indices are selected on the basis of being dominant JSE sectors, or style indices, under which most stocks are housed. The selected indices will be used to proxy for Large caps, Small caps, Value stocks, Growth stocks, Industrials stocks, Financials stocks and also Resources (Gladysek and Chipeta, 2012).

The J200- Top 40 index is used to proxy Large Caps, J202 index- Small Caps, J330 index- Value stocks, J331 index- Growth stocks, J210- Resource 10 index to proxy for Resources, J211- Industrial 25 index to proxy for Industrials and, lastly, the J212- Financial 15 index to proxy for Financials. These indices are in line with top industry benchmark indices, as published by the Stock Exchange News Service (SENS), the issuer services division of the JSE that deals with communication to investors.

3.4.2 Risk Free Rate

The study utilized the South African government 91 day Treasury Bill (R203) to proxy for the risk free rate of return as done in most studies on South African unit trusts, such as Thomas (2012), Van Heerden (2014) and Yu (2008). The data for the risk free rate was obtained from the Reserve Bank of South Africa.

3.5 Portfolio Data

In constructing the portfolios for the size factor and the value factor, the study follows the method used in the original study of Fama and French (1993) for their 3 factor model. The size factor measures the returns difference between small capitalization and large capitalization stocks (Chen et al., 2011b). The JSE has organised and sorted indices for both these types of stocks. All small capitalization stocks are listed under the Small Caps index (J202). Large capitalization stocks are listed under the Large Caps index, that is, the JSE Top 40 (J200). Thus, the size factor was

constructed from subtracting these two indices. Similarly, for the value factor, it is defined as the difference between high book-to-market stocks and low book-to-market stocks. The JSE also has indices for both high- and low- book-to-market stocks. High book-to-market stocks are termed as value stocks and their index is the Value index (J330). Low book-to-market stocks are termed as growth stocks and their index is the Growth index (J331). Therefore, the difference between these two indices was calculated to construct the value factor. Published South African studies, which have followed similar approaches in constructing their portfolios, include for instance Viviers et al. (2008) and Muller and Ward (2013).

3.6 Methodology

This section covers the methods to be used in achieving the proposed objectives. The research design and theoretical underpinnings to support the selected methodology is also detailed in this section.

3.6.1 Establishing Fund Style

The basis of this study is to establish the style of the funds, the extent to which mutual funds in South Africa drift from their stated styles, an analysis of their performances and whether these performances persist. Various pieces of literature have documented that multifactor models can be useful in this regard (Fowler et al., 2010, Vayanos and Woolley, 2013). Two models are predominantly used; the holdings based method and the return based style analysis approach. However, the bulk of literature documents that the return based style analysis (RBSA) models performs better in explaining the sources of returns of the funds (Norma et al., 2010, Schneeweis et al., 2012, Braga, 2016). This is, of course, with respect to the style it is most exposed to (asset allocation) as compared to the holdings based approach. Consistent with previous studies, like those of Eddy (2014), Holmes and Faff (2007) and Brown and Harlow (2002), the study adopted the RBSA model to establish the style factors responsible for the funds' returns, that is, to which most returns of the funds could be attributed.

3.6.1.1 Returns Based Style Analysis (RBSA) - The Model and its Associated Constraints

Sharpe's RBSA model:

Sharpe (1988) established a model that provides an objective analysis of the manager's actual style, as opposed to the style classification reported by the manager. This method is known as return-based style analysis (RBSA) which he also updated in his famous (Sharpe, 1992) study. It is expressed as follows:

$$R_i = [b_{i1}F_1 + b_{i2}F_2 + \cdots + b_{in}F_n] + e_i \quad (4)$$

Where;

R_i= excess return (net of fees) of a given portfolio or fund i

F_n = excess return in relation to each benchmark index n

b_{in} = unit trusts i sensitivity to benchmark index n

e_i = error term or random disturbance term.

The error term is usually the residual component of the equation return for unit trust i that is not explained by unit trust i exposures to the returns on the benchmarks indices. It is the difference between the return on the fund (actual values) and that of a passive portfolio with the same style (fitted values). It is also regarded as returns accrued from the manager's skill, that is, those returns which are not explained by the style attribute (Jame and Tong, 2014).

3.6.1.1(a) Constraints on the Portfolio

Even though style analysis is a specific example of a multiple linear regression, it is, however, distinguished by the imposition of specific constraints on the coefficients b_{ij} such that they can be directly construed as factor loadings or weights (McDermott, 2009). These are also known as style factor sensitivities that define a given fund. The coefficients $b_{ij,}$ or passive mix of underlying assets of each unit trust, are determined by normal constrained least squares methods, with at least two constraints generally imposed:

(i) Portfolio weighting constraint: the estimated factor loadings need to sum to one, that is, the sum of the coefficients b_{ij} must be equal to one;

(ii) Positivity constraint: the coefficients b_{ij} must be positive, that is, all of the loadings must be non-negative.

3.6.1.2 Quantitative Analysis of the RBSA Factor Model

The objective of this quantitative analysis is to determine (1) what portion of variation in specific unit trusts are attributable to asset allocation, that is, style and (2) what portion can be described by security selection. Sharpe's method of style analysis is able to detect patterns in return series that are inherent to style factors (Dickson, 2016). Using statistical tools, this allows for the return series of unit trusts to be characterised by some combination of these factors - in order to assert the most apt combination that describes the portfolio's constituents (Frijns et al., 2013). Furthermore, by implementing the Style Drift Score method, (3) the study was able to detect the existence of a "style drift" (Idzorek et al., 2012). The three aforementioned applications allude to the practical value of Sharpe's Style analysis – which are further elaborated.

Sharpe's Style analysis is relatively simple to calculate compared to other factor models. The data used to achieve the study's objectives consists of monthly returns of the unit trusts, as well as the monthly returns that are representative of the twelve style factors. For this reason, it is often deemed an "external" analysis, as opposed to an internal analysis, which may make use of data that is not freely available. The returns were obtained by using the closing share prices over a 120-month period, from January 2005 – December 2014.

The choice of period was as a result of requiring current and relevant information, as well as finding out the trends in the unit trust industry over the past 10 years, therefore, 120 months of data held obvious validity. Furthermore, the model is designed as a tool to facilitate prediction, despite being backward-looking and hence, with more recent data inputs, it is more likely to yield greater predictive power. The Sharpe's Style Analysis method presents an aggregate view of the portfolio's style component over the chosen period. Consequently, a period duration of 120 months is likely to capture relevant trends, without neglecting any significant return

movements in the less recent past. As alluded to, emphasis is placed on choosing data parameters that would yield insightful and predictive results that are not heavily biased by the distant past.

Yet, the research also seeks to mirror the phenomenal growth of the South African unit trust industry and its performance through the financial crisis of 2008 and beyond. This period duration for the study is in line with other academic studies on the topic, but more so as an extension to the period of the original paper by Sharpe (1988) for a proper examination of style analysis when the time frame is doubled.

The research acknowledges the commentary given by Sharpe himself in 1994, in an interview dubbed “Setting the record straight on Style Analysis” to determine that monthly returns were a superior measure as opposed to daily returns. During this interview, Sharpe advocates the use of monthly data as a means of noise reduction. Daily data is too detailed to give an aggregate overview of a portfolio’s components, as the inherent noise results in poor estimates. As alluded before, the research selected 42 unit trusts that are suspected to be conducive to insightful analyses. These funds have been studied in previous research, with some of them being deemed past consistent top performers in their categories, for example, Foord Equity Fund. Others are deemed to be average performers from unit trust rankings while some are categorised as weak, for example, ABSA Select Equity Fund. Of particular interest, for example, are the constituents of these funds, such as those in ABSA’s portfolio, as this fund is usually ranked as poorly performing under a risk-adjusted analysis like the Sharpe ratio.

These are some of the additional motivating factors for the inclusion of some funds. If the study acknowledges that fund performance is largely determined by its asset exposures, then a Style Analysis may prove insightful in determining what exposures resulted in these funds’ performances, that is, their styles. Most of the funds chosen have style assertions inherent in their titles, such as FNB Growth Fund and Sanlam Financial Fund, and these allow for priori expectations to be formed and to confirm if such assumptions are fulfilled. Literature supports suspicions that the titles of mutual funds may be misleading, as the funds may follow objectives that are inconsistent with their titles, for example, the studies by Barberis and Shleifer (2003), (Schiffres and Parmelee, 1995). This is reinforced by the views of Brown and Goetzmann

(1997), who found that sometimes investors do not get what they think they are paying for. This investigation uncovers if such claims are valid for the unit trusts under consideration.

Furthermore, past studies like those of Jansson et al. (2011) and Ye (2012), have suggested that unit trusts should have the majority of their funds invested in assets that yield returns that are of a similar nature to the returns of the style factors. This is necessary so that the regression accurately estimates what style factors are responsible for returns and also for the results to be statistically significant. Consequently, this research attempts to widen the exposure to all factors, that is, even those that are not encompassed by the twelve style factors. This has been done by selecting unit trusts that invest primarily in South African based assets.

3.6.1.3 Selected Style Factors for the RBSA Model

This sub-section elaborates on the much mentioned twelve style factors. Sharpe's principle of style analysis differs from the underpinnings of factor analysis models, in that it neglects designating asset classes to specific sectors of the economy such as industrials or resources. Sharpe (1992) purports that if a fund is adequately diversified in industries and economic sectors then the inclusion of sector return factors will not contribute any descriptive power to a model that explains fund returns (Low, 2012).

However, the South African market is heavily influenced by sectors like the Industrials, Financials and the Resources. Van Rensburg (2001), in his study of decomposing style based risk on the JSE, reinforces this notion by using the FINDI (combination of financials and industrials) and Resource 10 (for resources) indices as market proxies in his 2 factor model. Therefore, the classes chosen for this study differs substantially from Sharpe's original study, since it was done in a different market with dissimilar characteristics from the South African market.

Accordingly, Sharpe (1992) asserts that the applicability of an asset class factor model relies on the asset classes chosen for its implementation. In order for this model to be of any significant power, while not necessary it is desirable that the asset classes are;

1) Mutually exclusive,

2) Exhaustive, and

3) Have returns that have low correlations with one another and, if not, then different standard deviations.

These above mentioned 3 conditions mean that the factors must completely describe investable options available to the funds, without any areas of overlap. To achieve this, the study follows the RBSA method as it is set out. The purpose of using the RBSA model is to test, or check, the direction of each fund so that the funds can be separated accordingly, that is, growth stocks, value stocks, low cap, mid cap, large cap, and real estate stocks. Once portfolio managers are certain of which asset class they are going to invest in, it is crucial that they determine the rate of exposure of each component so that they can gauge the movements in their portfolios' returns.

Since the study is based on domestic general equity unit trusts, the asset classes chosen constitute JSE listed indices only. Some studies on style analysis like Mutooni and Muller (2007) and Du Toit (2012), used balanced funds which employ international equity indices (for example, MSCI World) and bond indices (such as, the STEFI index) to proxy for the diversified holdings. The seminal study of Sharpe (1988) also employs a bond index as one of its factors. However, adjustments in this research were made due to the analysis being of general domestic equity South African funds, unlike mixed asset funds like those studied in the US research on style. As previously mentioned, the unit trusts under consideration should hold a majority of assets whose returns are adequately described by the style factors. This means that a shift of focus from US mutual funds to SA unit trusts warranted a different set of investable asset class factors. Some of style factors have remained the same, with only the relevant indices used to proxy them having changed in relation to Sharpe's style analysis.

Twelve factors or style indices are therefore selected for the right side of equation (4) that is, $(F_{1,\ldots\ldots\ldots}, F_n)$ as per Sharpe (1992) model and their monthly returns were regressed against past monthly returns of the unit trusts on the left side of the equation, that is, Ri. The style indices or factors are selected from the FTSE/JSE indices list according to the exposure of most unit trusts to them. Keeping in mind that the study's sample is purely South African domestic equity funds and not balanced funds or funds of funds which Sharpe (1992) used in his original study,

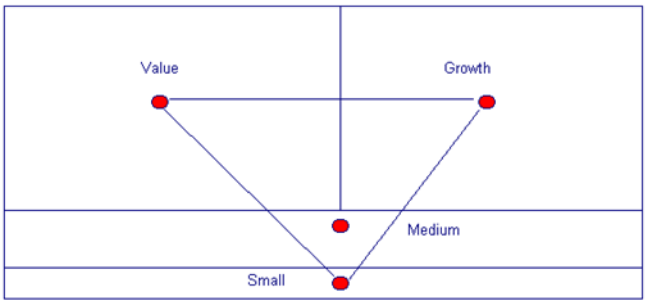
bond indices were not used in this study. The equity indices used in this study and their justifications are as follows:

1. Short term treasury bills (SA Govt. 91-day T-bill, R203): with maturities of less than 3 months: The study uses the South African 91-day Treasury Bill rates obtained from the South African Reserve Bank. Whilst an index of this style factor is recommended, the study justifies its deviation from Sharpe's recommendation by citing the fact that the unit trusts are South African and their investments are largely purported to comprise of SA assets (Viviers et al., 2009). Furthermore, this factor is often given weight when the funds under analysis hold cash on reserve to meet regulatory requirements and liquidity needs, and hence they invest in money market instruments (Van Heerden, 2014). The most accurate weighting will thus be obtained when limiting this factor to characteristics inherent to South African Bills, as movements in international interest rates are only likely to convolute the calculation of weightings (Saini et al., 2011). This data was obtained from the Reserve Bank of South Africa.

Consequently, a portfolio's composition in relation to what type of stocks it includes is pivotal to any analysis on returns (Lau, 2007). The study continues to follow Sharpe's guidelines, recognising that domestic stocks can fall into one of four categories. Initially, stocks are divided into three groups by market capitalisation – creating three distinct categories: large capitalization (cap), medium cap and small cap stocks.

The large cap stocks are further deconstructed into one of two categories, based on their book to market ratio. High book to market ratio stocks are deemed Value stocks, whilst stocks with lower book to market ratios are growth stocks. Any positive holding of all four categories of domestic stock falls into the area of Sharpe's triangle:

FIGURE 3-1: Sharpe's triangle



SOURCE: Sharpe (1988) pp27.

2. Large Cap stocks: J200 Top 40 index - the Top 40 stocks in the JSE by market capitalization

3. Value stocks: J330 index - Large capitalisation stocks from the JSE Top 40 with high book to market ratios are grouped into the value index, J330.

4. Growth Stocks: J331 index - Large capitalisation stocks from the JSE Top 40 with low book to market ratios are grouped into the growth index, J331.

5. Mid Cap Stocks: J201 index - The J201, is a Mid Cap Index that consists of the next 60 largest stocks by market capitalization which are not in the JSE Top 40, but are in the All Share Index.

6. Small Cap Stocks: J202 index - The J202, is an index of equity stocks that forms part of the ALSI, but with market capitalisation values smaller than that of the mid and large capitalization stocks.

In order to fulfil the requirements of creating an exhaustive list of potential investment options available to the unit trusts, the study considered the dominant sector indices on the JSE in which most stocks are invested. These included:

7. Resources stocks: J210 Resource 10 index - JSE index that benchmarks the top 10 resources stocks.

8. Industrials stocks: J211 Industrial 25 index - benchmark index for the top 25 industrial stocks in the JSE.

9. Financials stocks: J212 Financials 15 index - index that benchmarks the top 15 financial stocks in the JSE.

10. Property stocks: J253 SA Listed Property index - index of property based unit trust returns, it proxies the returns earned from property investments.

11. Consumables stocks: J530 Consumer Goods index - JSE index for consumer goods.

12. Technology stocks: J590 Technology index - The index comprising technology stocks listed in the JSE.

The R^2 values, obtained from the regression, measures the part of the variance of returns explained by the style factors, or the extent of accuracy with which the Sharpe model replicates return exposures. The statistical significance of the coefficients contributes in explaining the probable style to which those returns can be attributed (Cuthbertson et al., 2010).

The returns across these twelve style factors selected above, were compiled and the returns for each fund for the 120-month period sorted into tables. This served as the data input for the study's regressions. The regression's independent variable was the monthly return of a single unit trust, whilst there are twelve dependent variables which are the returns of each style factor for the monthly period. The study illustrates the Sharpe RBSA factor model again from equation 4 (repeated for ease of reference).

$$R_i = [b_{i1}F_1 + b_{i2}F_2 + \cdots + b_{in}F_n] + e_i \qquad (4)$$

Where R_i represents the monthly return on the i^{th} unit trust; F_n represents the return of the n^{th} style factor and b_{in}, which is the coefficient to the n^{th} style factor, indicates the weighting/exposure of the unit trust to this factor. The error term (e_i) is used to denote the tracking error of the funds. If the study assumes that this error term is uncorrelated with the factors, then a claim can be made that this term denotes the portion of return due to selection (or skill), whilst the sum of the factor weightings is the return attributable to style (Kurniawan et al., 2012).

A more implicit characteristic that can be seen in this regression is the omission of an intercept term (Dickson, 2016). This ensures that the portfolio weightings are fully accounted for by the style weightings from the regressions. This is equivalent to controlling for non-style factors, in the sense that now only the weightings can be varied to represent a unit trust's composition – subject to the restrictions imposed on the model (Eddy, 2014).

The initial regression is termed the unconstrained regression, as the weights of the factors do not sum to one and some of these weights are negative (Froot and Teo, 2008). Negative weightings indicate that the fund has taken a short position to these asset factors – which is often prohibited in terms of their mandates. Consequently, the study must constrain these regressions in excel with the use of the solver function, which was done. In order to derive feasible weightings to the twelve asset classes that provide significant results with out-of-sample data, the study must impose the following constraints which have already been highlighted earlier:

- The first is that the individual weightings must fall into the range of zero and one;
- The second constraint is that the sum of all twelve weightings must equal one;
- A further, more implicit, constraint is the minimisation of the residual sum of squares, which is not automatically done by an Excel regression. This is achieved by using the solver function on a cell that has summed up the squared residuals, in order for it to be manually minimised.

The results of the constrained regression will be grouped by their return and risk profiles, and discussed in the next chapter.

3.6.2 Determining Style Drift

After confirming which funds respond to which asset class (styles), the study then further investigates the extent of style drift amongst these chosen funds. This section addresses objective number one of the study, which deals with determining the extent of drift amongst South African unit trusts. The following three methods were used to ascertain the extent of drift:

3.6.2.1 The R^2 Statistic

The R^2 statistic usually measures the goodness of fit for the model, that is, how well the model explains the variable of interest being researched (Gromb and Vayanos, 2010). With respect to Sharpe's (1992) Returns Based Style Analysis, [1-R^2] captures the portion of the fund's return variability that is not systematically related to co-movements in the returns to the style benchmarks. Accordingly, [1-R^2] serves as a proxy for the extent to which the manager is unable to produce returns consistent with a tractable investment style. Therefore, a high R^2 value designates a style consistent fund, whereas a low R^2 value infers style inconsistent investing (Brown and Harlow, 2002, Hoffman, 2012)

3.6.2.2 Tracking Error

Calculation of the tracking error can also clarify the style consistency of a fund. Accordingly, the tracking error can be estimated as the volatility of the difference between the fund's returns and those of a corresponding benchmark portfolio summarizing the style universe. Simply put, it is the return not explained by the style benchmark. Re-arranging Equation 4, it can be observed that the excess return is the deviation between the actual unit trust returns and its style benchmark returns:

$$e_i = R_i - [b_{i1}F_1 + b_{i2}F_2 + \cdots + b_{in}F_n] \quad (5)$$

Therefore style consistent funds will have a low tracking error, while style inconsistent funds will have a high tracking error (Chen and De Bondt, 2004). The objective of Returns Based Style Analysis is to select the set of asset class exposures which minimise the variance of the difference in Equation 5, which is known as the Ordinary Least Squares (OLS).

3.6.2.3 Style Drift Score

Following the work of Holmes and Faff (2007), the extent of style variation over time is ascertained using the Style Drift Score (SDS) method, proposed by Idzorek and Bertsch (2004), and has been used extensively in studies like Kurniawan et al. (2011), Holmes and Faff (2007) and Ainsworth et al. (2008). Their model quantitatively measures the variability of a fund's asset mix over time as established by (Sharpe, 1992, Fuerst and Marcato, 2009)'s returns-based style analysis, around the fund's average effective asset mix or style allocation. Idzorek and Bertsch (2004) assert that their Style Drift Score liberates a researcher from being compelled to scrutinize numerous rolling window style maps and rolling window asset allocation graphs, both of which illustrate the evolution of a portfolio's investment style. Rolling window style maps and rolling window asset allocation graphs are known to be excellent tools for developing an intuitive understanding of a portfolio's style consistency, which have been employed thoroughly in most style studies, but they do not replace the need for a quantitative measure of style drift (Holmes et al., 2010).

The Style Drift Score measures style drift by quantifying the style drift of a portfolio in a single statistic. Kurniawan et al. (2011) adds that the SDS method is perfect for observing a large number of portfolios, monitoring the drift in a portfolio's style and also contrasting the style consistency of these portfolios. Therefore, this study utilizes the SDS method as the principal method for measuring drift, above the aforementioned R^2 and tracking error methods. The SDS is calculated as the square root of the sum of the variances of the asset class coefficients (or style weights) derived from Equation (4) as demonstrated by Equation (6);

$$\text{SDS} = \sqrt{var(b_{i1}) + var(b_{i2}) \ldots\ldots\ldots\ldots\ldots + var(b_{in})} \qquad (6)$$

Where $b_{i1}, b_{i2} \ldots\ldots b_{in}$, represent the style weights obtained from the style analysis process in Equation (4). Idzorek and Bertsch (2004) suggest that the SDS is an effective, time-efficient way to compare style consistency and eliminates the need to examine rolling window style graphs. The SDS's for all the funds were obtained and ranked whereupon an average SDS was found. A fund with a high SDS, relative

to the mean SDS, indicates considerable style inconsistency (that is, a drifter), whereas a portfolio with an inferior SDS, below the mean SDS, is deemed a style consistent fund (Israel and Maloney, 2014).

For the cross-analysis, SDS was used as the primary measure of style drift as it avails an average value of the variation in style index coefficients for each fund. In the fund management sphere, it is believed style consistency can be indicative of a skilful portfolio manager and a successful risk management system (Bolton et al., 2013). Hence, it is an advisable distinction, when searching for and retaining managers, in addition to the obvious benefits in the fund's portfolio construction process. Actually, Brown and Harlow (2002) infer that there is a direct positive relationship between investment style consistency and performance. Therefore, the SDS method is the primary technique employed for testing drift and subsequently separating the funds into drifters and consistent funds.

3.6.3 Performance Measurement Models

This section addresses the second objective of the study, which was, to find out which fund management approach, between style consistent investing and style drifting, produces superior risk adjusted results relative to each other. Therefore, after establishing the style consistent funds and drifting funds using the style drift score, the next mission was to find out which set of funds produce superior performances. When evaluating the risk adjusted performance of a portfolio, the single factor Capital Asset Pricing Model, the Fama and French (1992) 3-factor model and the Carhart (1997) 4-factor models, are some of the most prominent models that are widely used (El Khamlichi et al., 2014a). The alpha from these models determines whether the portfolio outperformed or underperformed the market by being significantly positive or negative. Predominantly, the Fama and French 3-factor model and the Carhart 4- factor model have been used extensively in previous studies both in South Africa and internationally.

The Carhart model is an extension of the Fama and French model, since it has an additional 4^{th} factor, the momentum term, which adds more explanatory power. According to studies done on the South African market, the challenge with this model, though, is its inaccuracy in capturing the momentum factor in the JSE with

precision, since this variable can alter the results of the performances considerably. Additionally, the South African market fluctuates wildly at times, due to the volatility of the ZAR (South African Rand) currency relative to major world currencies. This could potentially exaggerate the momentum factor of stocks in the markets. Hence, for this analysis, the study will do away with the momentum factor altogether, and employ the widely used Fama and French (1992) 3-factor model to measure fund performances of the South African unit trusts selected.

However, before the Fama-French model is applied, the study firstly engaged the widely used Capital Asset Pricing model in order to compare the changes in alpha when additional factors are included with the Fama-French 3-factor model, as done in most studies of this nature (Eraslan, 2013). For a thorough analysis of performance with all the models used, two sets of regressions were performed for each model across all the funds. The specific sector index was used for the market proxy in the first regressions and then the JSE ALSI index was used as a market proxy in the second set of regressions. This allowed a thorough evaluation of the effect of investing in style indices as compared to the general market. Changes in the models' resultant R^2 values and their log likelihood ratios were also be observed. As alluded previously, performance is measured by examining the amount of alpha and the associated statistical significance. The explanatory power of the models is observed through the adjusted R-squared values.

3.6.3.1 The Capital Asset Pricing Model (CAPM)

Performances of the funds under study will first be evaluated using the CAPM model. As highlighted in the above section, the study sought to examine whether style models have more explanatory power, relative to general market benchmark models. Hence, this test was run twice for all the funds, first with the relevant sector index as a market proxy and the second test with the JSE All Share Index, which represents the whole market. The model for the CAPM is expressed as follows;

$$R_{it} = \alpha_i + \beta_i(RM_t - R_{ft}) + \varepsilon_{it} \qquad (7)$$

Where;

R_{it} = the return of the fund in excess of the risk free rate

α_i = Abnormal return of the stock

β_i = beta of the fund

RM_t = the return of the market

R_{ft} = the risk free rate

ε_{it} = the error term.

3.6.3.2 Fama - French 3 Factor Model (FF3F)

The second model used, for performance evaluation, is the Fama-French 3 factor model. Similarly, to the CAPM, regressions under this model were run twice using the same reasoning as above. The FF3F model is expressed as follows:

$$R_{it} = \alpha_i + \beta_{1i}(RM_t - R_{ft}) + \beta_{2i}SMB_t + \beta_{3i}HML_t + \varepsilon_{it} \quad (8)$$

Where;

R_{it} = return of fund i at time t in excess of the risk free rate

α_i = abnormal return of the fund

β_{1i} = beta of the fund

RM_t = the return of the market measured by the JSE relevant market index

R_{ft} = the risk free rate

β_{2i} = sensitivity of the fund's returns to the size factor

SMB_t = the small capitalization portfolio less the large capitalization portfolio (size factor)

β_{3i} = sensitivity of the fund's returns to the value factor

HML_t = the high book-to-market funds less the low book-to-market funds (value factor)

ε_{it} = the error term or residual term.

3.6.3.3 Sharpe ratio

In addition to the above model, the Sharpe ratio was used to compare performances of the mutual funds against themselves and the market, adjusted for risk. It is expressed as follows;

$$Sharpe\ ratio = \frac{(R_p - R_f)}{\sigma_p} \quad (9)$$

Where;

R_p = return of the portfolio

R_f = risk free rate

σ_p = standard deviation of portfolio.

3.6.3.4 Market Timing: Treynor- Mazuy model (TM model)

Over and above measuring the performances of these funds, the study also sought to find out whether South African fund managers are able to time the market as they engage in active investing. In other words, the study also sought to examine the funds' performances when market timing ability was considered. This process remained a quest to measure the funds' performances, which was part of objective two of the study. Various performance measures try to distinguish security selection, or share-picking ability, from market timing ability, or the ability to predict the market returns.

Although alpha normally measures both, market-timing models were developed to distinguish these two aspects of performance. The Treynor- Mazuy traditional market-timing model assumes the approach that any information, correlated with future market returns, is superior information which makes it unconditional. The

study utilizes the classic market timing regression of Treynor and Mazuy (1966), which expresses the regression in a quadratic form as below;

$$R_{it} = \alpha_i + \beta_{1i}(RM_t - R_{ft}) + \Upsilon(RM_t - R_{ft})^2 + \varepsilon_{it} \quad (10)$$

Where;

R_{it} = return of fund i at time t in excess of the risk free rate

α_i = abnormal return of the fund

β_{1i} = beta of the fund

RM_t = return of the market

R_{ft} = the risk free rate

Υ = market timing coefficient

ε_{it} = the error term.

The sign on the estimated coefficient Υ of the quadratic term, and whether it is statistically different from zero, evaluates market-timing ability. If it is significantly positive, then it represents a convex upward sloping regression line and indicates evidence of successful market timing by the fund manager. Thus, the coefficient will be positive if the manager increases beta when receiving a positive signal about the market. The hypothesis of no timing ability, implies that the coefficient Υ on the quadratic term is zero or negative. The market proxy for this model is the funds' specific equity style benchmarks.

3.6.4 Persistence of Performance

In addition to evaluating performances for these different sets of funds, the study then tests whether these performances persist or not. This section addresses the third objective of the study, which sought to uncover which of the two approaches, between style consistency and style drifting, deliver persistent results relative to the benchmark index. Persistence of performance can be defined as a positive

relationship between rankings of performance on those of initial periods over subsequent periods (Carhart, 1997, Huij and Lansdorp, 2012).

Performance persistence is therefore very important in portfolio management, since it differentiates the winners from the losers over a given time period, a key element in explaining the flow of funds from underachieving to skilled fund managers (Barberis and Shleifer, 2003). The study of persistence is to determine whether managers can systematically beat the market over time. To do so, after choosing and applying the performance measurement methods, one has to classify or rank the funds. Using statistical tools, it suffices to study the distribution of these rankings to reach a conclusion about the persistence of this performance (El Khamlichi et al., 2014b). To analyse the persistence of performance, two types of tests are conventionally used:

1. Parametric tests: using time series (Goetzmann and Ibbotson, 1994) or regression (Christopherson et al., 1998); and

2. Nonparametric tests (based on contingency tables) which are proposed for use in this analysis. This method has been widely used, throughout relevant literature, to assess performance persistence of portfolios, for example, Firer et al. (2001), Fletcher and Forbes (2002) and also Clark (2013).

3.6.4.1 Contingency Table

Formally, the contingency table approach is defined as a method used to establish the frequency with which funds are described as winners and losers over consecutive time periods (Thomas, 2012). For each classification of the funds respectively, contingency tables are applied on the basis of performance assessment results, or alphas, to determine the degree of persistence. The funds are apportioned into two classes, Winner (W) or Loser (L), based on the median abnormal return over the relevant ranking period. Over two consecutive time periods P1 and P2, a two by two table is formed so a fund can have one of four outcomes or quartiles, (WW), (WL), (LW) or (LL).The contingency table displays the probability of a portfolio in one quartile being in the exact same quartile in the subsequent period (Eling, 2009).

Supposing pure random performance, one would envisage these probabilities to be a quarter, that is, 25%. This means that, there is an identical prospect of a top quartile portfolio winding up in any of the four quartiles in the following investment period. Such occurrence is based on the premise that the previous evaluation period does not have an effect on the future period (Hereil et al., 2010). Winner (or loser) designation mainly defines a fund that achieved a rate of return, across the calendar year, that exceeds (or falls short of) the median fund return. Therefore W (winner) represents returns above the median abnormal return, whereas L (Loser) represents returns below the median abnormal return (Clark, 2013). WW refers to a fund being a winner this period and the next; LL is a loser fund this period and the next period; WL is a winner this period followed by being a loser the next period and LW is a loser this period, then a winner next period. For two subsequent sub-periods (P1 and P2), a contingency table like the following one is obtained:

TABLE 3-2: Contingency table for testing performance persistence

P2 **P1**	**Performance above the median value**	**Performance below the median value**	**Tests to be conducted**
Performance above the median value	Winners funds (WW)	Variable Performance (WL)	Chi-square
Performance below the median value	Performance variable (LW)	Losers Funds (LL)	CPR, Z-test and Chi-square

Source: (Brooks, 2014) pp 287

To analyse the robustness of the phenomenon of persistence, several statistical tests are used. The following two statistical procedures are most commonly found in the literature used, together with contingency tables, to test for performance persistence and robustness of the contingency table method. They are the Cross Product Ratio and the Chi-squared test (Norma et al., 2012).

3.6.4.2 Cross Product Ratio

The Cross Product Ratio (CPR), also known as Odds ratio, is a non-parametric method established by Brown and Goetzmann (1995). The fundamental idea is based on performance evaluation; hence the CPR outlines the odds ratio of the number of repeat performers against those that do not repeat. In detail, the Cross Product Ratio calculates the ratio of 'Persistence' (WW & LL) versus 'reversal' (WL & LW) using the formulae:

$$CPR = \frac{(WW \times LL)}{(WL \times LW)} \tag{11}$$

Where;

WW = number of winner funds in both formation and holding periods

LL = number of losers in both periods

WL = number of winners then losers

LW = number of losers then winners.

The significance of the deviations of Cross Product Ratio from unity is then tested. If the test statistic is significantly positive, then it provides evidence of persistence in performance. A significantly negative test statistic provides evidence of reversals in performance. In other words, the study observes whether the CPR is above or below one. If the CPR is significantly higher than one (equivalent to a positive t-statistic), it indicates persistence, that is, winners followed by winners, or losers followed by losers (Joaquim and Moura, 2011). Conversely, a CPR lower than one (equivalent to a negative t-statistic) indicates a reversal, that is, winners followed by losers, or

losers followed by winners. A reversal, in essence, refers to a 'return reversal' situation where WW*LL is less than WL*LW in Equation (11) above.

Therefore, a Cross Product Ratio above one signifies evidence of persistence, a CPR of one means no evidence of persistence is observed and a CPR below one signifies reversals of performance. The study, hence, tests the null hypothesis that there is no significant persistence, which must be equivalent to a CPR of one. This is on the basis that under the null hypothesis, the probability of winning or losing in each period equals one-half and does not depend on the return horizon (Liwei and Peng, 2012). In that sense, the four quartiles; Winner-Winner (WW), Loser-Loser (LL), Winner-Loser (WL) and Loser-Winner (LW), each has 25% of the funds. Basically the test is as follows:

$$H_0: \quad CPR = 1 \quad \text{Or} \quad \ln CPR = 0 \tag{12}$$

The statistical significance of the Cross Product ratio was tested using the Z-test, which follows a standard normal distribution. This test allows the significance of the deviations of Cross Product Ratio from unity to be tested. A Z-statistic test can be implemented as outlined:

$$Z = \frac{\frac{\ln(CPR)}{\sigma_{\ln(CPR)}}}{\sqrt{n}} \sim N(0,1) \tag{13}$$

Where the standard error of the natural logarithm of the CPR is given by:

$$\sigma_{\ln(CPR)} = \left(\frac{1}{WW} + \frac{1}{WL} + \frac{1}{LW} + \frac{1}{LL}\right)^{\frac{1}{2}} \tag{14}$$

A Z-statistic of 1.96 corresponds to a 5 percent significance level, that is, when the Z-statistic is higher than 1.96, the null hypothesis of no persistence is rejected at the 5 percent significance level. If the Z- test statistic is significantly positive, then it

provides evidence of persistence in performance. A significantly negative test statistic provides evidence of reversals in performance.

3.6.4.3 Chi-Square Test

In fulfilment of the last objective of the study, which tests for performance persistence, the study further tests the predictability of future returns based on past performances. The chi-squared test will be used for this purpose. Since the study follows the non-parametric approach of employing contingency tables, similar to the studies of Yu (2008), Clark (2013), it will conduct the chi-squared test with 1 degree of freedom as follows:

$$\text{CHI} = \frac{\left(\text{WW-}\frac{\text{N}}{4}\right)^2 + \left(\text{WL-}\frac{\text{N}}{4}\right)^2 + \left(\text{LW-}\frac{\text{N}}{4}\right)^2 + \left(\text{LL-}\frac{\text{N}}{4}\right)^2}{\left(\frac{\text{N}}{4}\right)} \qquad (15)$$

Where N represents the number of observations in the analysis. A positive, statistically significant chi-squared statistic supports the hypothesis that abnormal past performance can be used to predict future abnormal performance. Contrastingly, a negative, or statistically insignificant statistic, suggests that future returns cannot be predicted from past performances. Prediction of future performances is of interest to portfolio managers and investors alike, since they anticipate future market movement in order to earn positive returns, hence the result from the chi-square statistic is of paramount importance. It should be noted that the chi- squared statistic is premised on the persistence of performances and thus the chi-squared test completes the study's last objective.

3.7 Chapter Summary

The chapter introduces the specific data and research methodologies to be used in attaining the objectives of the study. It provides details on the unit trust data and the sample selection criterion, the benchmark return data, which entails the description of the JSE style indices to be used, the risk free rate and the models' portfolio data. It then further explores how the styles of the funds are going to be established using the RBSA model, and touches on the model's constraints, its analysis and its selected style factors. The chapter then proposes the methods to be used in

determining the extent of style drift, which are the R^2 statistic, tracking error and, most importantly, the style drift score (SDS), which is the primary method used for separating the funds into consistent funds or drifters. It details the performance measurement models and also the market timing model to be used. The chapter concludes with detailing how performance persistence is measured using the contingency table approach and also highlights the use of the chi-squared measure to predict future returns based on past performances. The next chapter presents the results from employing the models highlighted in this section and a thorough analysis of the results.

CHAPTER 4

EMPIRICAL RESULTS AND ANALYSIS

4.1 Introduction

The chapter commences with the analysis of results from examining the first objective, which is the extent of drift of the funds selected. However, the study first ascertained the true styles of the funds using the Returns Based Style Analysis (RBSA) method in order to determine whether South African unit trusts are correctly classified as stated in their titles. The study then tested whether these funds stick to their styles or if they drift from their stated mandates. The data analysis in this section is supported with material from the literature review.

4.1.2 Styles of the Funds (RBSA model)

The following illustration shows the overall objective of this section:

Research Focus (Investment style consistency) – Approach (RBSA) – Technique (Quadratic programming) – Style exposure (Inferred style exposure) – Style consistency measure method (Total inter-period distances) – Style consistency measure (Style Drift Score)

4.1.2.1 Style Factors Selected

The study turns its attention to the RBSA model, and its constraints, in terms of the relationship between the 12 selected factors for the model. One of the constraints is that, while not necessary, it is desirable that the asset classes should have returns that have low correlations with one another or, if not, then different standard deviations. Therefore, a correlation table, Table 4-1 is constructed on the Stata software to check for the correlations between the asset classes chosen and their significance.

To recap, the 12 factors chosen for the RBSA model were as follows;

1. J200- JSE Top 40 (Large cap)
2. J201- Mid cap
3. J202- Small cap

4. J330- Value
5. J331- Growth
6. J210- Resource 10
7. J211- Industrial 25
8. J530- Consumer Goods
9. J253- SA Listed Property
10. J212- Financials 15
11. J590- Technology
12. Short term treasury bills (SA Government 91-day T-bill).

The results from analysing their correlations against each other are presented in the correlation table that follows.

TABLE 4-1: Correlation table

	daytbill	resou~10	indus~25	finan~15	growth	salist~p	consgo~s
daytbill	1.0000						
resource10	0.0290	1.0000					
	0.7539						
industrial25	-0.0562	0.5364	1.0000				
	0.5437	0.0000					
financials15	-0.0278	0.3550	0.7543	1.0000			
	0.7644	0.0001	0.0000				
growth	0.0055	0.8925	0.7849	0.5670	1.0000		
	0.9530	0.0000	0.0000	0.0000			
salistprop	-0.0503	-0.0020	0.4055	0.6052	0.1771	1.0000	
	0.5867	0.9831	0.0000	0.0000	0.0541		
consgoods	-0.0609	0.5149	0.8310	0.5231	0.7025	0.2700	1.0000
	0.5105	0.0000	0.0000	0.0000	0.0000	0.0030	
largecap	0.0014	0.9017	0.8199	0.6481	0.9737	0.2214	0.7136
	0.9878	0.0000	0.0000	0.0000	0.0000	0.0155	0.0000
midcap	-0.0668	0.3941	0.7780	0.7926	0.5780	0.6970	0.5503
	0.4703	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
smallcap	-0.0653	0.4318	0.7318	0.7618	0.5895	0.6683	0.5387
	0.4806	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
value	-0.0225	0.7804	0.8247	0.7629	0.8421	0.4148	0.6549
	0.8083	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
technology	-0.0947	0.3835	0.5565	0.5452	0.4836	0.3881	0.4098
	0.3058	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	largecap	midcap	smallcap	value	techno~y
largecap	1.0000				
midcap	0.6359	1.0000			
	0.0000				
smallcap	0.6510	0.8980	1.0000		
	0.0000	0.0000			
value	0.9292	0.7971	0.7852	1.0000	
	0.0000	0.0000	0.0000		
technology	0.5312	0.6068	0.5728	0.5930	1.0000
	0.0000	0.0000	0.0000	0.0000	

.

The correlations between the twelve factors chosen for the Returns Based Style Analysis are given in Table 4-1 above with their corresponding P-values below them

reflecting statistical significance. Accordingly, Sharpe (1992) asserts that the applicability of an asset class factor model relies on the asset classes chosen for its implementation. In order for this model to be of any significant power, while not necessary, it is desirable that the asset classes should have returns that have low correlations with one another, in addition to being mutually exclusive and exhaustive. Therefore, an examination of the correlation coefficients among the twelve asset classes provided robustness in the validation of proposed proxies, as measures of style attribution of the funds. Table 4-1 reports the correlation coefficients among the proxies for asset classes chosen for the RBSA model. The correlations between the SA Government 91-day T-bill and the Resource 10, Industrial 25, Financials 15, Growth, SA Listed property, Consumer goods, Large cap, Mid Cap, Small cap, Value and Technology were quite low, ranging from only 0.02 to as low as -0.02 in absolute terms. Such low coefficients were indicative of a stronger mutually exclusive relationship among these variables and, accordingly, pointed to their suitability as asset class proxies for the model.

Surprisingly, however, the coefficients between the large caps with any other factor were quite high and this can be attributable to the fledgling nature of the South African market which does not have clear demarcations between asset classes. For example, both value stocks and growth stocks are housed under the large caps, and also a lot of stocks in the JSE are found under more than one asset class. Had it been the case that the choice of the proxies to be employed was purely based on their correlation with other variables, some of the proxies would have been considered unsuitable for inclusion in the construction of the RBSA model. Nevertheless, given the satisfaction of the other validation constraint imposed on the model (that is, exhaustive), the asset class variables chosen for the RBSA model were rendered suitable proxies, with very minimal possibilities of multicollinearity.

4.1.2.2 Establishing Styles of the Funds

As alluded to earlier, the study established the true styles of the funds from which the extent of drift could then be ascertained, which was the first objective of the study. The styles were established from the Returns Based Style Analysis model through the return attribution of the funds, that is, the style factor that accounts for the

majority of the funds' returns. The following tables present a summary of the different style estimations of the funds, based on constrained regressions on the funds, as required by the Returns Based Style Analysis model. The full regression outputs are presented in the Appendices section, at the end of the report. The summarized version, presented in these tables, include the weights of the twelve style factors, the adjusted R square values and the accompanying P-values, for statistical significance purposes for all the funds under review. Accompanying style diagrams are included for graphical representation of returns due to asset allocation (style of the funds), versus asset selection (skill) of the fund managers in selecting the winning assets for their portfolio. Justifications of the style weights presented in the tables are detailed in the analyses that follows.

The study commences its analysis with the presentation of Returns Based Style Analysis constrained regression results. As with all the regressions done for this analysis, before interpreting the results, diagnostic tests were performed to ensure all econometric properties are met. The results passed all these stability tests, which were the tests for stationerity, heteroscedasticity, autocorrelation, and normality. This step was very important in order to avoid getting results which are spurious and also uninterpretable statistics. Results from the Financials funds style factor, are presented in Table 4-2 as follows:

TABLE 4-2: Style weights for Financials funds

				FINANCIALS FUNDS						
	FUND A			**FUND B**			**FUND C**			
	Coronation Financial Fund			Momentum Financials Fund A			Nedgroup Investments Financials Fund A			
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		
Intercept	0	#N/A		0	#N/A		0	#N/A		
90 DAY T-bill	8,33244E-07	0,64809636		0	0,161750354		0	0,0570958		
RESOURCE 10	0	0,72036175		0	0,379658946		0	0,673578203		
INDUSTRIAL 25	0,042924223	0,83900818		0	0,223702369		0,25078886	0,503077796		
FINANCIALS 15	0,580078184	1,1856E-14		0,901463704	2,37499E-20		2,39885E-05	2,2405E-14		
GROWTH	0	0,71434522		0	0,930079878		0	0,359843808		
SA LISTED PROPERTY	0,037315358	0,75126599		0	0,405362369		0,152692281	0,787302361		
CONSUMER GOODS	0,003786028	0,23748986		0	0,010503375		5,96272E-07	0,012544896		
LARGE CAP	7,32009E-07	0,90071556		4,54521E-07	0,843633239		0	0,583901113		
MID CAP	0,130385027	0,24131785		0	0,887659324		0,192945376	0,164100864		
SMALL CAP	0,205269911	0,01134005		0	0,05185498		0,231422583	0,035983132		
VALUE	0	0,89552796		0,098772651	0,142721239		0,171576632	0,933210606		
TECHNOLOGY	0	0,6861126		0	0,880279784		1,58464E-05	0,897985064		
Sum of Factor Weights	1			1			1			
Adjusted R Square	0,88427006			0,925006516			0,915234892			

Source: Author's own. Constructed based on the RBSA regressions' results.

In the above table, the statistics mentioned are presented for the Financial Funds A, B and C, together with the full names of the funds. It can be inferred from the table, using the adjusted R- square measure, that 88 percent of the returns of Coronation Financial Fund is associated with asset allocation (style) with only 12 percent due to skill or asset selection of the managers. It is also observed, from the results in the table, that style forms the primary factor in influencing returns, with Momentum Financials Fund A owing 93 percent of its variation in return to concurrent variation of style factors, while Nedgroup Investments Financials Fund A relies on style for 92 percent of its return variations, as observed from the adjusted R^2 values.

Relatively, the study can reconcile the atypically high selection portion of returns by considering Coronation Financial Fund (with 12 percent, compared to the 7 percent and 8 percent of its peers), and their profitable contrarian investment style. This means that the fund's managers are involved in selecting securities that perform well, despite the performances of their relevant sector. Consequently, the returns owing to asset allocation are low and there is an increased percentage of returns caused by asset selection.

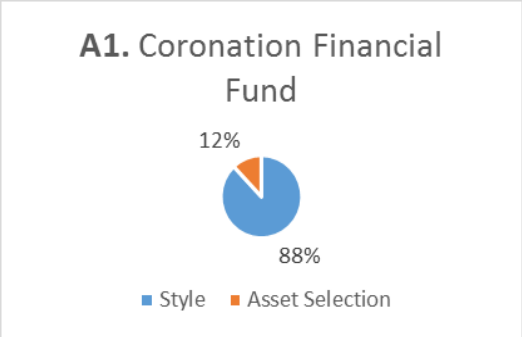
The same analysis also holds for the funds in Table 4-3, such as Sanlam Financial Fund, where 91 percent of its returns is attributable to style, with only 9 percent due to skill. Sanlam Financial Fund B1 attributes 88 percent of its returns to style with 12 percent due to skill, whereas ABSA Select Equity Fund attributes 89 percent of its returns to style, with only 11 percent due to manager skill or style selection. For all these funds, it can be observed that the largest statistically significant coefficients correspond to the Financials 15 style factor, which confirms that the funds are correctly classified with respect to their style factors.

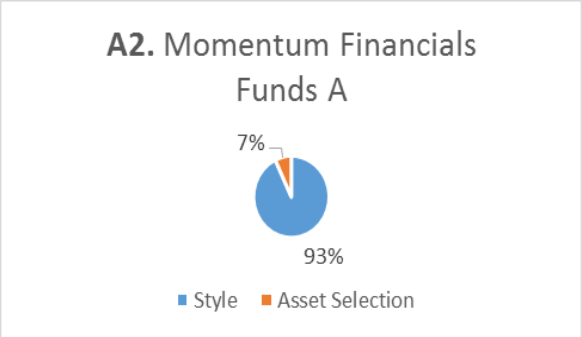
TABLE 4-3: Style weights for Financials funds continued

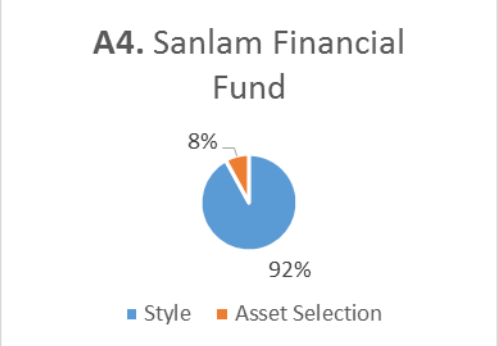
		FINANCIALS FUNDS CONTINUED						
	FUND D			FUND E			FUND F	
	Sanlam Financial Fund			Sanlam Financial Fund B1			ABSA Select Equity Fund	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0,004873742	0,76234471		0,01465773	0,496371604		4,17788E-07	0,606216512
RESOURCE 10	1,15144E-06	0,15214138		0,015629871	0,440250241		0,062269304	0,719894214
INDUSTRIAL 25	0,172043827	0,09506396		0,02885208	0,114126089		0,053570965	0,836392312
FINANCIALS 15	0,636763169	4,8505E-16		0,791662879	1,15031E-07		0,065067469	0,615665352
GROWTH	5,26291E-07	0,24966167		9,61429E-07	0,623570003		0,091750842	0,672259908
SA LISTED PROPERTY	0,092570303	0,30708649		6,27252E-07	0,149370691		0	0,095273087
CONSUMER GOODS	0,004454139	0,17021563		0,028355693	0,057375216		0,082120336	0,133191745
LARGE CAP	1,45996E-05	0,18225989		0	0,950652817		1,15051E-05	0,998577404
MID CAP	8,55663E-05	0,0079891		0,120517181	0,444598336		0,257203069	0,03233962
SMALL CAP	0,000140359	0,02349739		5,58006E-07	0,51046724		5,44546E-07	0,447477048
VALUE	0,08840996	0,58067664		1,72242E-07	0,535920101		0,387770284	0,089311406
TECHNOLOGY	0,000178753	0,90416889		8,63841E-07	0,978422856		0,00030536	0,803935424
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,917317118			0,88238168			0,89164536	

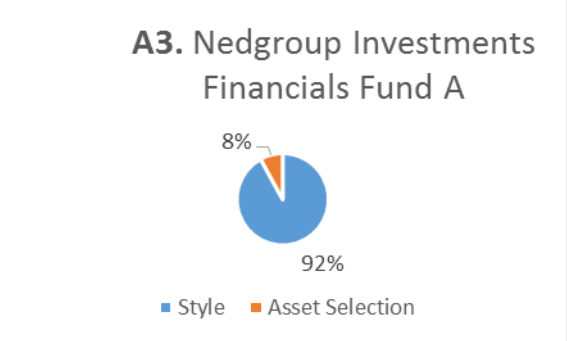
Source: Author's own. Constructed based on the RBSA regressions' results.

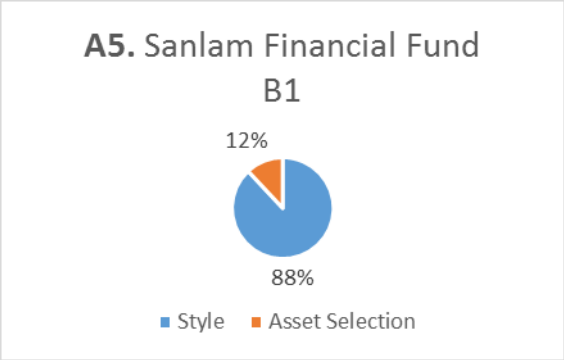
To create a clearer picture of the information presented in the tables above, the information is also depicted in the style diagrams below as follows;

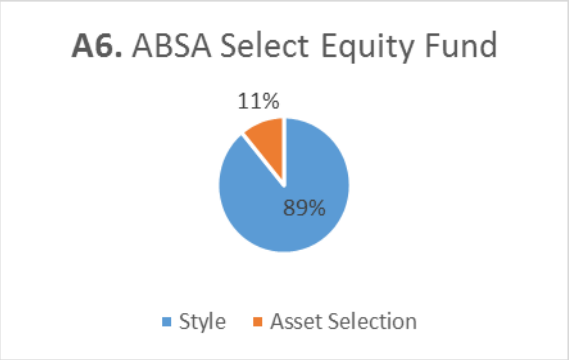












It can be observed from the style diagrams, that a bigger portion of the funds' returns is attributable to the style of investing that the fund follows, or asset allocation, as compared to asset selection. This information consolidates the claim that style investing holds some power in explaining the returns of South African unit trusts as observed above, with respect to funds invested in the financial sector. From the regression results it is also observed that the financials' funds are correctly classified with respect to their styles as the largest statistically significant coefficient belongs to the financials style factor. Thus, the style of the financials funds has been confirmed and the extent of drift of these funds from their style is measured in the next section to find out whether these funds stick to their style or if they drift.

The study next analyses funds invested under the Growth style factor, by investigating their return attributes in terms of style orientation (asset allocation) and skill (asset selection). The results are shown in Table 4-4 and Table 4-5.

When looking at Table 4-4, the FNB Momentum Growth Fund, like the Foord Equity fund and Investec Growth fund, conforms to academic literature (Du Toit, 2012) in that the majority, that is, 91 percent of variation in the fund returns can be explained by the twelve style factors, with asset selection being responsible for only 9 percent of the variation in the fund's returns.

TABLE 4-4: Style weights for Growth funds

		GROWTH FUNDS						
	FUND A		FUND B		FUND C			
	FNB Momentum Growth Fund (A)		Foord Equity Fund		Investec Growth Fund Class A			
STYLE FACTORS	**WEIGHTING**	**P-VALUE**	**WEIGHTING**	**P-VALUE**	**WEIGHTING**	**P-VALUE**		
Intercept	0	#N/A	0	#N/A	0	#N/A		
90 DAY T-bill	9,74812E-07	0,7489493	0,009247913	0,50696595	0,012554306	0,278061281		
RESOURCE 10	2,99706E-08	0,34236089	0,056272511	0,892747923	0,147052645	0,968670245		
INDUSTRIAL 25	0,232734418	0,21997329	0,159249807	0,29943681	0,289129912	0,291292267		
FINANCIALS 15	8,13464E-07	0,80984024	6,87239E-07	0,47225988	3,05962E-07	0,103006128		
GROWTH	0,13081512	0,15050709	2,01955E-07	0,371727218	0,05957238	0,287557941		
SA LISTED PROPERTY	8,73992E-07	0,00032888	7,74014E-07	0,811938421	3,02434E-07	0,727069989		
CONSUMER GOODS	0,057033287	0,19074142	0,018841567	0,803383973	9,44261E-07	0,756939571		
LARGE CAP	0,014958695	0,61479846	0,173569732	0,226682316	9,79792E-07	0,149468586		
MID CAP	0,099715502	0,38249073	0,355307596	0,000646533	0,15440912	0,02953517		
SMALL CAP	0,117209566	0,01148107	0,203064242	0,020462954	0,22376514	0,016824443		
VALUE	0,3258887	0,02247922	0	0,563259713	0,082131526	0,367602399		
TECHNOLOGY	0,021045656	0,26784279	0,024312935	0,321385705	0,030747947	0,360605903		
Sum of Factor Weights	1		1		1			
Adjusted R Square	0,905923005		0,890565751		0,867270859			

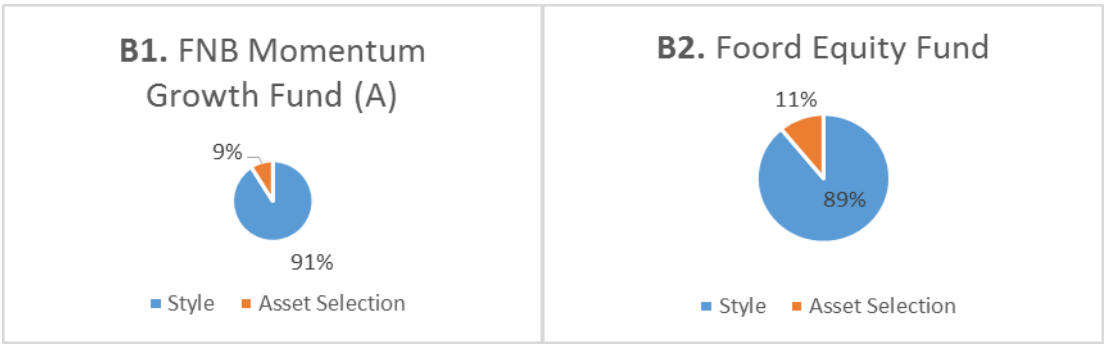
Source: Author's own. Constructed based on the RBSA regressions' results.

The FNB Momentum Growth Fund's target is to attain maximum growth for its investors by beating the JSE ALSI over time and, thus, has a moderate to high level of risk. The primary reason for analysing this fund is due to its extreme fluctuations in returns over the period of observation. The FNB Momentum Growth Fund invests across all sectors of the JSE in chosen shares. It can be observed from Table 4-4, above, that the fund invests in order to yield returns identical to those attainable with a portfolio holding of 13.08 percent in growth stock holdings. However, such estimates should be interpreted with caution as the estimate is statistically insignificant. The fund's fact sheet states that shares selected are primarily "blue chip" and span the three main equity investment sectors: industrial, financial and mining stocks. Therefore, these types of component stocks may explain the wide fluctuations observed. Although this fund targets to be completely invested in general equities, fixed-interest instruments are sometimes used to protect the fund when considered appropriate.

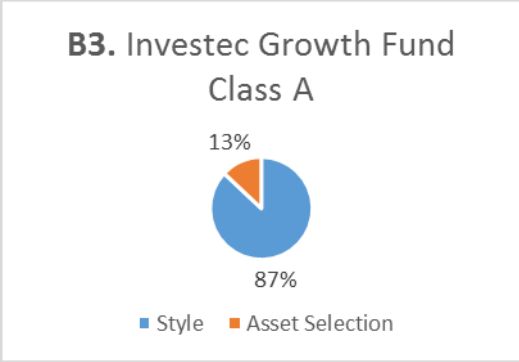
A noteworthy insight, provided by the regression results of the FNB Momentum Growth Fund, is the surprising weighting given to exposures that can be proxied by the value style factor. This exposure averages 32.58 percent for the 10-year period and is statistically significant. Since growth and value attributes are on opposite

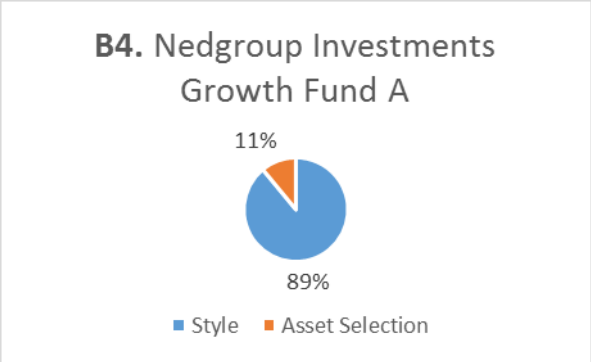
scales, this might suggest a possible movement in the fund's stock composition over time. When looking at the trend fluctuation of the fund, a possible reason for such volatility may be the inclusion of fixed instruments, which are characterised as being relatively illiquid and inefficient in their pricing, and, therefore, are consequently deemed risky. The period under analysis includes that of the sub-prime crisis and its adverse effects.

Foord Equity fund has returns that are proxied by a portfolio with holdings in eleven of the twelve asset classes chosen, which is indicative of a diversified portfolio. Furthermore, the two statistically significant asset factors (small cap and mid cap) have a cumulative weighting of 55.84 percent, which presents robust grounds for statistical inference. Consistent with the fund's title, is the large exposure to returns that are best described by various equity classes, with the only exception being the 0.9 percent exposure to treasury bills. It should be noted that exposures to Treasury bill type returns may be indicative of the fund's regulatory requirement to hold cash, which is specified in Foord's fund fact sheet as a liquidity requirement. Since the return exposure is heavily weighted towards stocks, it is hypothesised that this fund may be sensitive to the business cycle.



A noteworthy excerpt from most of these funds' objectives includes the fact that the funds employ active asset allocation strategies through investing mostly in JSE listed shares, then least on fixed assets, money market and international assets. This is, in addition, to compliance with Regulation 28 of the Pension Fund Act, stating that the funds should maintain an equity content of certain bounds. Further diagrams explaining the funds' returns are presented;





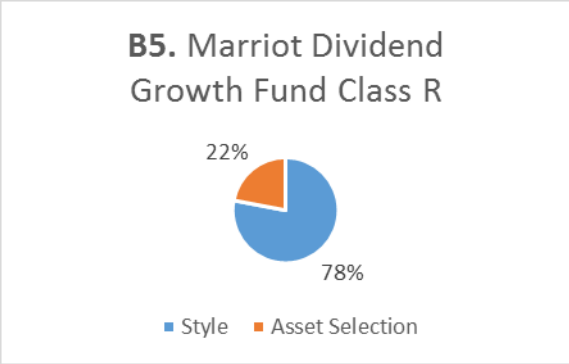
Further, it can be noted from the regression results presented in the tables so far, some of the funds do not really conform to their stated style, as most of these coefficients are not significant. This discrepancy can be explained by one of two facts:

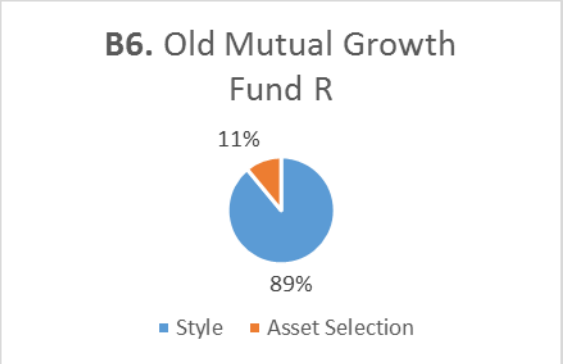
1. The return series of the selected 12 style factors do not accurately describe the fund's exposure. This is feasible given the non-equity holdings of some of the funds as highlighted above, and the statistical insignificance of their current style return exposure.
2. Alternatively, the fund may be in breach of their mandate and investing in assets with exposures that are best proxied by the return series of exposures to other styles, which is termed as drift.

TABLE 4-5: Style weights for Growth funds continued

		GROWTH FUNDS CONTINUED						
	FUND D			FUND E			FUND F	
	Nedgroup Investments Growth Fund A			Marriot Dividend Growth Fund Class R			Old Mutual Growth Fund R	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0,001911037	0,99312098		0,013772909	0,484112744		2,77405E-06	0,76208412
RESOURCE 10	0,050159522	0,92159538		6,02194E-07	0,16642141		0,093873251	0,05867797
INDUSTRIAL 25	0,102998287	0,21585887		0,231652405	0,208236367		0,071244129	0,012580236
FINANCIALS 15	0,002891322	0,7810458		0,021333412	0,562393941		0,113491509	0,230705744
GROWTH	0,06428942	0,32630402		5,02962E-07	0,714877621		0,020220284	0,001792849
SA LISTED PROPERTY	0	0,04896025		0,065216667	0,510698116		0	0,232784014
CONSUMER GOODS	0	0,14553444		0,044200788	0,69722342		0,084570118	0,323682662
LARGE CAP	8,76116E-05	0,23232045		0	0,705458328		0	0,055658117
MID CAP	0,13688851	0,14337609		0,475098332	0,005924817		0,099082275	0,138188802
SMALL CAP	0,398355339	2,7256E-06		0,148182514	0,875950702		0,217757129	0,000378777
VALUE	0,176275867	0,83845497		6,41294E-07	0,82646134		0,196025127	0,184154188
TECHNOLOGY	0,06570041	0,02273389		7,30976E-07	0,270916542		0,103319117	0,04820463
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,888693577			0,776359498			0,88982534	

Source: Author's own. Constructed based on the RBSA regressions' results.





Marriot Dividend Growth Fund Class R had the highest ratio of skill (asset selection) to style, relative to other funds in its sector, with only about 78 percent of its returns due to asset allocation and a relatively huge 22 percent due to asset selection. This may be due to the fund's unique strategy which, predominantly, targets the dividend yield as stated in its fact sheet. The fund's goal is to supply investors with a reasonable dividend yield and an increasing level of dividend income, which differentiates it from other funds. The Marriot Dividend Growth fund invests in stable JSE listed companies, which presently pay dividends and have prospects for constant and sustainable dividend growth in the future. The fund target is to achieve a dividend yield for its unit-holders in excess of the dividend yield of the Financial and Industrial index. It also intends to grow distributions above the dividend growth attained by the Financial and Industrial index, calculated over rolling two-year periods.

Style weightings of the Marriott Dividend Fund highlight another important aspect of the fund, that is, a portion of the fund's returns act like a cash exposure. This is observable on the coefficient on the 91 Day T-Bill which is greater than zero at 1.38 percent. It is not that the fund holds that much cash, general equity unit trusts in South Africa are only allowed to hold 25 percent cash, but rather that the high dividend yielding shares' constant income stream act like a cash return. Hence, its strategy of targeting growth in dividends justifies its growth style of investing, whose level of drift was established in the next section.

A similar analysis follows for Industrials funds style returns and the RBSA regression results are presented in Table 4-6 and Table 4-7 as follows:

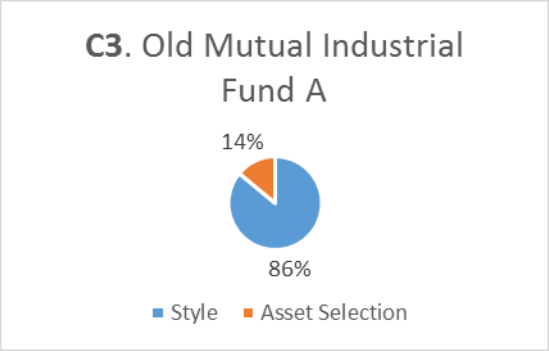
TABLE 4-6: Style weights for Industrials funds

		INDUSTRIALS FUNDS						
	FUND A			FUND B			FUND C	
	Coronation Industrials Fund Class A			Momentum Industrial Fund A			Old Mutual Industrial Fund A	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	6,31063E-07	0,51867675		6,26144E-07	0,21966659		2,4139E-07	0,885462245
RESOURCE 10	1,33427E-07	0,54042239		0	0,279478665		0,00755884	0,781630222
INDUSTRIAL 25	0,279609491	0,00302566		0,664105046	2,40389E-05		0,09718143	3,15624E-06
FINANCIALS 15	0	0,0458397		2,36395E-05	0,003085974		5,54933E-05	0,422081808
GROWTH	1,92225E-07	0,03846696		0	0,93167694		0,016368311	0,547087924
SA LISTED PROPERTY	0	0,32921522		0,001505813	0,000957685		0,034480182	0,252085556
CONSUMER GOODS	0,048862565	0,63601059		2,66994E-06	0,986010008		0,213880284	0,439193303
LARGE CAP	9,2223E-07	0,11750101		0	0,815872724		3,00171E-06	0,8086117
MID CAP	0,300949228	0,00016839		0,181696901	0,005746602		0,517890342	0,056482317
SMALL CAP	0,336571482	1,7956E-06		0,079904482	0,002105126		0	0,181658223
VALUE	3,41919E-07	0,0457415		0,072749418	0,914084683		0,042938206	0,785566293
TECHNOLOGY	0,033981376	0,07240195		2,5365E-05	0,242770223		0,069356078	0,008974437
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,890125256			0,884818765			0,85978305	

Source: Author's own. Constructed based on the RBSA regressions' results.

The returns of Coronation Industrial Fund more closely resemble a portfolio with greater weight placed on size style investment. Their returns are identical to those that can be achieved with a portfolio holding a 30.09 percent investment in mid-caps, 33.66 percent holding in small caps and 27.96 percent invested in the industrials sector.

Once more, these estimates are found to be significant – indicating the robustness of the analysis. It should be noted that the coefficients under the Industrials 25 index, for all the funds, are significant. The proportion of returns variations, due to style and asset allocation, are presented in the following style diagrams:



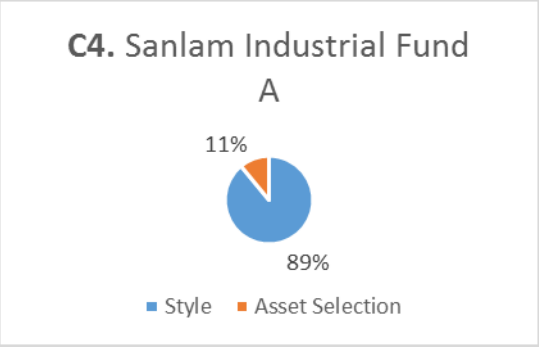
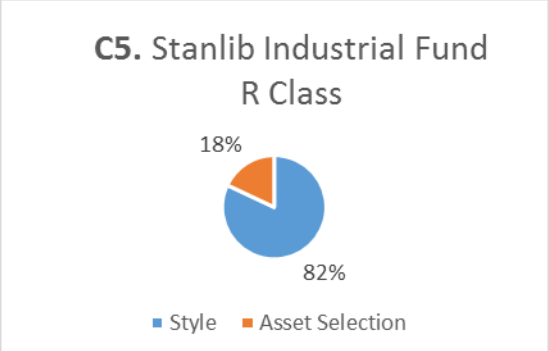
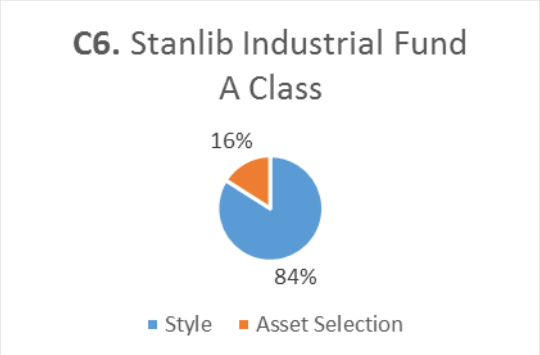


TABLE 4-7: Style weights for Industrials funds continued

		INDUSTRIALS FUNDS CONTINUED						
	FUND D			**FUND E**			**FUND F**	
	Sanlam Industrial Fund A			Stanlib Industrial Fund R Class			Stanlib Industrial Fund A Class	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0,027773228	0,61927852		0	0,717094405		3,88908E-07	0,901733385
RESOURCE 10	0,0121284	0,0227863		0	0,450934353		0	0,542966556
INDUSTRIAL 25	0,75921324	0,00468103		0,061150513	0,000787		0,59379581	9,00258E-05
FINANCIALS 15	0	0,00068801		2,33587E-06	0,085087827		1,49733E-06	0,107373063
GROWTH	0	0,019076		0,021246349	0,389430752		9,14336E-07	0,561521699
SA LISTED PROPERTY	0,116992648	0,00220655		0,10195244	0,73780138		0,07294105	0,953112543
CONSUMER GOODS	0,028153904	0,7785671		0,108918584	0,151158654		0	0,161951978
LARGE CAP	0,055353522	0,00817313		9,36524E-07	0,430991546		3,91527E-07	0,628678306
MID CAP	1,27123E-05	0,00026733		0,443485825	0,002952545		1,17642E-05	0,001392564
SMALL CAP	2,26712E-05	1,6956E-07		0,142371151	0,452907496		0,302592679	0,170324282
VALUE	4,38606E-09	0,02225455		0,051739841	0,497603097		0,030641977	0,631539109
TECHNOLOGY	1,5821E-05	0,09945518		0,069209216	0,463052144		1,24392E-05	0,17183294
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,891407575			0,002581415			0,844597381	

Source: Author's own. Constructed based on the RBSA regressions' results.





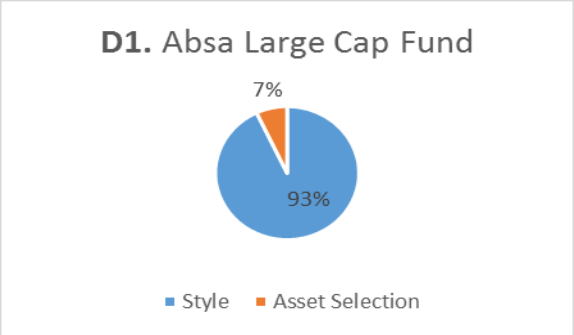
The results from analysing the Large cap funds are presented next, in Table 4-8 and Table 4-9.

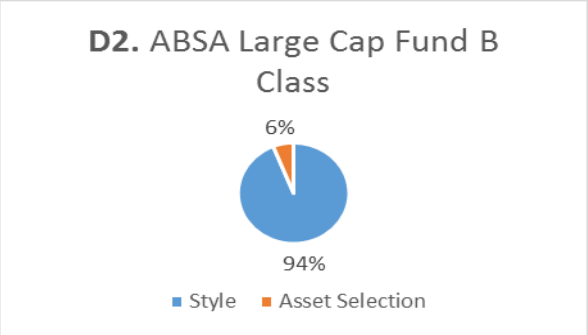
TABLE 4-8: Style weights for Large Caps

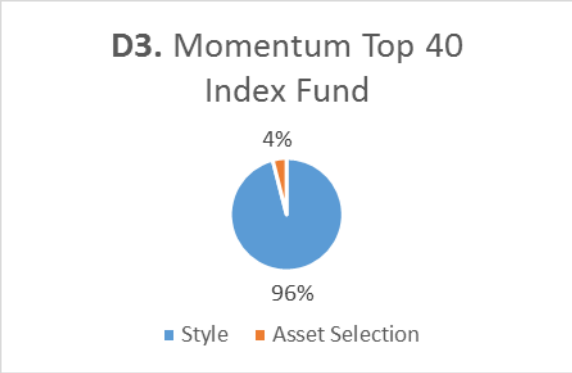
		LARGE CAP FUNDS						
	FUND A			**FUND B**			**FUND C**	
	Absa Large Cap Fund			ABSA Large Cap Fund B Class			Momentum Top 40 Index Fund	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0	0,89419183		0	0,898777955		0	0,089358411
RESOURCE 10	0,216506931	0,05364956		0,126105131	0,553882005		0,181127699	0,547791998
INDUSTRIAL 25	0,054414463	0,01524496		5,05747E-06	0,818696577		0,041948608	0,290282877
FINANCIALS 15	0	0,58698879		0,025857268	0,439214882		5,08572E-07	0,513195621
GROWTH	0,370454279	0,24709672		0,559352414	0,61147255		0,398246429	0,626144777
SA LISTED PROPERTY	0	0,06576612		0	0,145410944		0	0,943544334
CONSUMER GOODS	0,146623115	0,05092352		0,045118554	0,179041362		1,36553E-06	0,406494716
LARGE CAP	4,54521E-07	0,89199067		0,145901629	0,560384314		9,32267E-07	0,006904377
MID CAP	0	0,16542132		0	0,486060841		0	0,190100255
SMALL CAP	1,22215E-07	0,56901379		0	0,148050144		8,60033E-07	0,105716791
VALUE	0,212247274	0,11098555		0,097688934	0,74939071		0,378399378	0,538951214
TECHNOLOGY	0	0,87341496		4,56267E-06	0,338207395		0	0,760938731
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,925024562			0,944028686			0,958031469	

Source: Author's own. Constructed based on the RBSA regressions' results.

The large caps funds are standout performers when it comes to evaluating returns due to style. All of them had style attributions above 90 percent, with the only exception being Prescient Equity Top 40 A1 fund which had 87 percent. The results offered by Absa Large Cap fund are more aligned to the academic literature (such as Thomas, 2012), with 93 percent of variation in Absa's returns, owing to style, and the remaining 7 percent attributable to asset selection. A similar analysis goes for all the funds and the accompanying style diagrams are presented below for graphical representation.







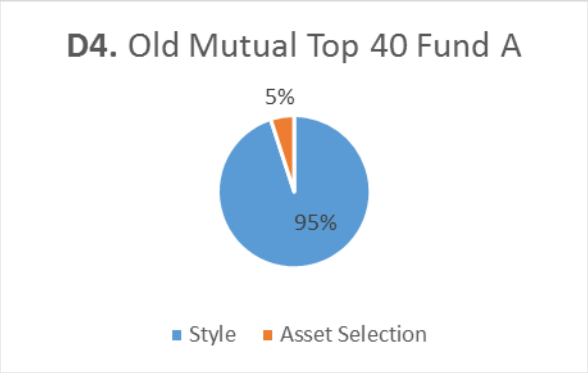
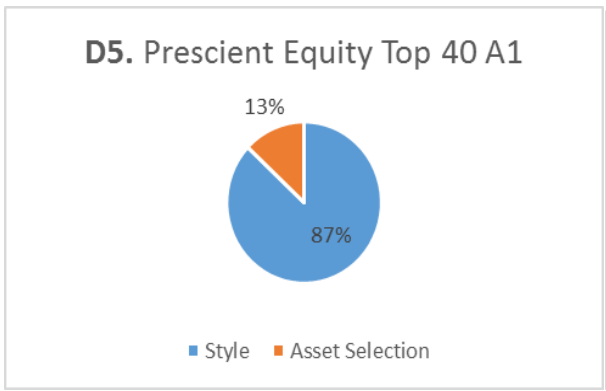
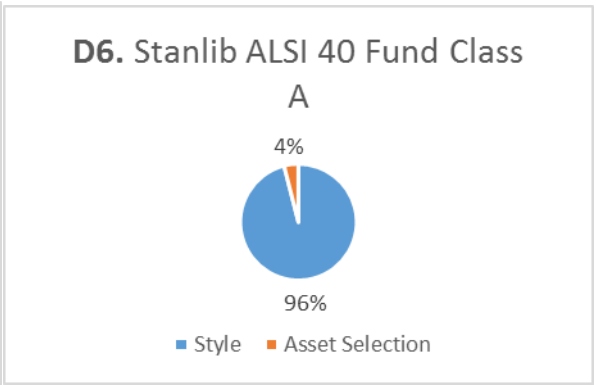


TABLE 4-9: Style weights for Large Caps continued

		LARGE CAP FUNDS CONTINUED						
	FUND D			**FUND E**			**FUND F**	
	Old Mutual Top 40 Fund A			Prescient Equity Top 40 A1			Stanlib ALSI 40 Fund Class A	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0	0,40307503		2,3592E-07	0,709039966		0	0,090749131
RESOURCE 10	0,246322845	0,80797898		0,194273841	0,939463342		0,240825771	0,565509462
INDUSTRIAL 25	0,083133139	0,6929711		0,042227684	0,500765659		0,038786332	0,088889434
FINANCIALS 15	0	0,0217491		0	0,878284521		0	0,037130011
GROWTH	0,207074813	0,01682881		0,515672292	0,992606618		0,37719886	0,604230701
SA LISTED PROPERTY	4,73898E-07	0,66628341		0	0,631002421		0	0,811669002
CONSUMER GOODS	0,112637493	0,15635522		0,079383705	0,40037493		0,039546527	0,113053301
LARGE CAP	3,57854E-05	0,00020137		2,74671E-06	0,239237636		0	0,002523745
MID CAP	0	0,40990181		4,38534E-07	0,992380145		0	0,905108779
SMALL CAP	0	0,03028604		3,77762E-07	0,784077501		1,22215E-07	0,231540839
VALUE	0,300213126	0,22871975		0,168154829	0,637733637		0,303413514	0,926826415
TECHNOLOGY	0,050211322	0,06473047		7,85375E-07	0,774888266		2,60219E-06	0,606170466
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,952162253			0,872874058			0,955061708	

Source: Author's own. Constructed based on the RBSA regressions' results.





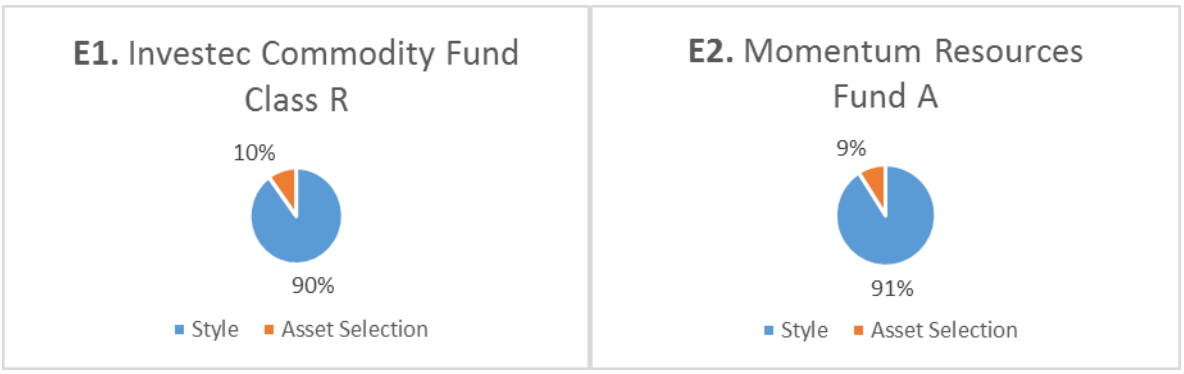
The study analyses funds invested in the Resources index next and the results are presented below:

TABLE 4-10: Style weights for Resources funds

		RESOURCES FUNDS					
	FUND A		**FUND B**		**FUND C**		
	Investec Commodity Fund Class R		Momentum Resources Fund A		Nedgroup Investment Mining & Resource R		
STYLE FACTORS	**WEIGHTING**	**P-VALUE**	**WEIGHTING**	**P-VALUE**	**WEIGHTING**	**P-VALUE**	
Intercept	0	#N/A	0	#N/A	0	#N/A	
90 DAY T-bill	0,013378932	0,270619205	9,90748E-07	0,039669982	5,48666E-07	0,057777791	
RESOURCE 10	0,835063607	7,13937E-06	0,764437607	8,72384E-07	0,783900029	1,89388E-13	
INDUSTRIAL 25	0,029393318	0,61224726	0	0,827656804	0,031069406	0,848151931	
FINANCIALS 15	0	0,006830189	2,84309E-07	0,898320469	0	0,524935537	
GROWTH	0	0,112464272	9,00801E-07	0,479144658	0,026809857	0,028753393	
SA LISTED PROPERTY	0	0,032212372	0	0,036577092	0	0,642591438	
CONSUMER GOODS	0	0,201298152	0	0,036635029	0	0,129541098	
LARGE CAP	0	0,159323861	9,37825E-07	0,699252626	0	0,077733731	
MID CAP	0	0,195890395	5,32615E-07	0,981668312	0	0,876457007	
SMALL CAP	0,090332405	0,003212841	0	0,00442334	0,046209971	0,01086627	
VALUE	0,029977413	0,201001495	0,220934818	0,715091762	0,098787575	0,213031523	
TECHNOLOGY	0,002054272	0,745920633	0,014402334	0,214705238	0,013327434	0,426535576	
Sum of Factor Weights	1		1		1		
Adjusted R Square	0,903031331		0,911962906		0,961404617		

Source: Author's own. Constructed based on the RBSA regressions' results.

Style, or asset allocation, accounts for 90 percent of the Investec Commodity Fund Class R fund variation in returns, with 10 percent due to asset selection, such as the active stock picking strategies. This fund is concentrated in its holdings to six style factors which represents increased risk. It can be noted that the largest, statistically significant coefficients for all the funds, belongs to the resources style factor which confirms correct classification of the funds' style.



It is noted that most of these funds in the Resources sector are concentrated in their holdings, as can be seen by the zero weightings in most style factors. This, partly,

explains the losses incurred by funds investing in this sector since they exhibit minimal diversification.

Old Mutual Gold Fund R has holdings concentrated in only five of the twelve style factors, hence the heavy underperformance it exhibited over the evaluation period. The fund posted the least monthly average returns compared to its peers and also had a very low style attribution in its returns (60 percent) with 40 percent due to asset selection.

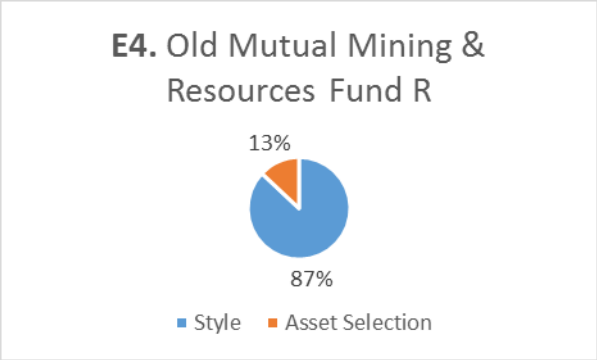


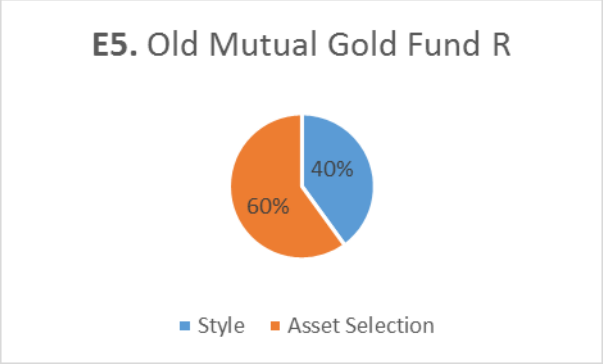
TABLE 4-11: Style weights for Resources funds continued

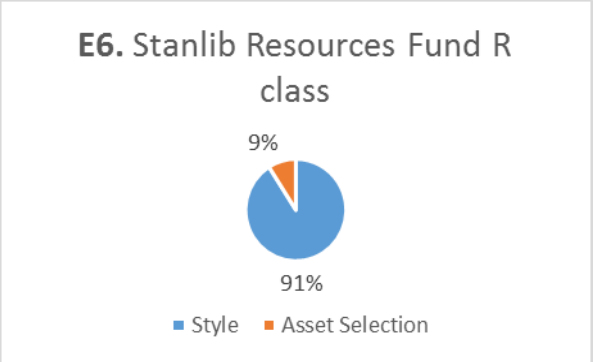
		RESOURCES FUNDS CONTINUED						
	FUND D			FUND E			FUND F	
	Old Mutual Mining & Resources Fund R			Old Mutual Gold Fund R			Stanlib Resources Fund R class	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0,033560167	0,778141629		0,011977743	0,187511704		0	0,508803769
RESOURCE 10	0,505916111	9,16245E-09		0,853427848	0,003404746		0,735996567	4,2853E-06
INDUSTRIAL 25	0,043288175	0,012109928		0	0,553253125		0,025171592	0,552831457
FINANCIALS 15	0	0,195879303		0	0,883213861		3,02757E-07	0,090389506
GROWTH	0,058510628	0,737878577		0	0,14043036		0,023525543	0,248357874
SA LISTED PROPERTY	8,19349E-07	4,14193E-05		0	0,79506053		0	0,04542129
CONSUMER GOODS	0,057917387	0,366975875		0,048437016	0,535011501		2,53662E-07	0,044033193
LARGE CAP	2,08298E-06	0,377923959		0	0,391584112		3,47328E-07	0,356739026
MID CAP	0	0,863929645		0,047641716	0,276274985		1,70856E-07	0,547669583
SMALL CAP	0,133874561	0,025234399		0,037585327	0,900933965		0,113652463	0,001740644
VALUE	0,102407599	0,696266968		0	0,079610621		0,101109658	0,666355685
TECHNOLOGY	0,064041835	0,028209164		0	0,316794513		7,97891E-07	0,771321613
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,872849806			0,401091472			0,905917011	

Source: Author's own. Constructed based on the RBSA regressions' results.

Consistent with a priori expectation of high tracking error, the Old Mutual Gold Fund R indicates that 60 percent of variation in fund return is explained by the fund's style, with the remaining 40 percent deemed attributable to "asset selection". The low

adjusted R^2 value may suggest that the managers of the fund engage in active asset selection and shifting of the funds across different assets, much to the detriment of the fund. The suspicion that the fund may be a drifter is confirmed in the next section, where the extent of drift of the funds is tested. However Stanlib Resources Fund attributes 91 percent of its returns to style with the remaining 9 percent due to asset selection, which suggests that the bulk of the fund's returns are due to asset allocation.





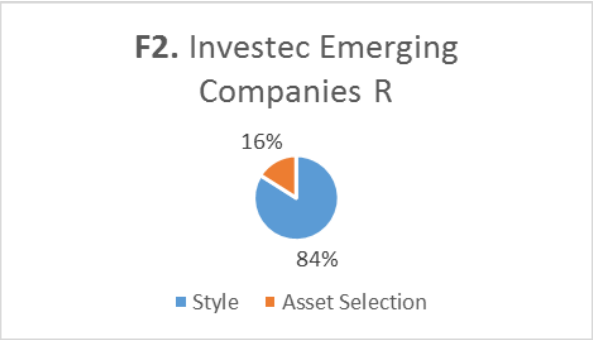
Results for funds invested in the Small caps index style sector are presented next.

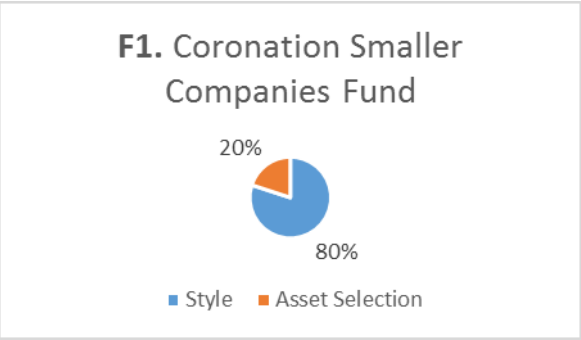
TABLE 4-12: Style weights for Small Caps

		SMALL CAP FUNDS						
	FUND A			**FUND B**			**FUND C**	
	Coronation Smaller Companies Fund			Investec Emerging Companies R			Momentum Small Mid-Cap A	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0	0,919828037		8,50852E-07	0,478665576		1,32762E-05	0,433485498
RESOURCE 10	0	0,983797305		0,004157331	0,088753036		0,029636278	0,636103562
INDUSTRIAL 25	3,73151E-07	0,460920316		0,023599719	0,587137545		0,030351736	0,936713777
FINANCIALS 15	0	0,267826829		0	0,000195698		0	0,067663244
GROWTH	0	0,075555058		0	0,295502356		0,021999144	0,426239895
SA LISTED PROPERTY	0	0,001036154		8,46545E-07	0,00028991		0	2,04723E-05
CONSUMER GOODS	0,024676073	0,066323684		0,00858074	0,230637082		2,73952E-08	0,548956081
LARGE CAP	1,93433E-07	0,305465142		0	0,150019343		0	0,753036058
MID CAP	0,125384119	0,019165877		0,155931543	0,000466682		0,341508361	0,000340135
SMALL CAP	0,849481892	4,07733E-15		0,469787868	3,13002E-10		0,455939163	6,81887E-06
VALUE	0	0,193917509		0,265385032	0,52545764		0,081676784	0,951170411
TECHNOLOGY	1,1794E-05	0,355971352		0,072379353	0,039849413		0,038808053	0,430832379
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,803364013			0,839114628			0,758191918	

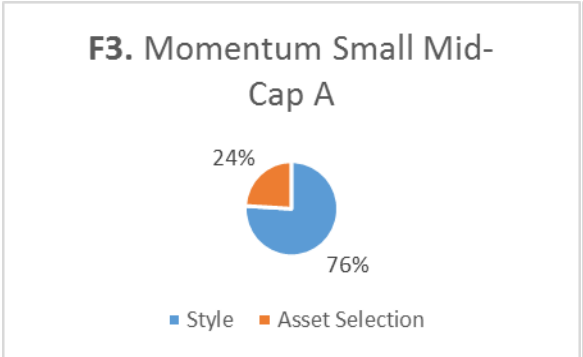
Source: Author's own. Constructed based on the RBSA regressions' results.

Momentum Small Mid-Cap fund posted a higher monthly average return in this category followed by the Nedgroup fund, whereas Stanlib Small Cap fund posted the least. However, with respect to style attribution, style was responsible for 75.8 percent of its returns, which may suggest that the fund's managers are actively involved in stock selection that accounts for approximately 24.2 percent of the fund's returns. This information is of interest, since it may suggest the possibility of the fund being a drifter, an assertion that is confirmed in the next section. However, style is found to be responsible for 80.3 percent and 83.9 percent for Coronation and Investec funds, respectively, meaning the funds' returns are largely due to asset allocation. For all the funds in this sector, the coefficients on the Small Cap style are large and statistically significant, which confirms appropriate classification.





The Old Mutual Mid and Small Cap fund has the highest portion of returns attributable to variations in its style factor, with 88.9 percent, followed by Nedgroup Investment Entrepreneur Fund R with 84.9 percent. Value funds are known to have gradually changing characteristics as they try to move towards Growth status. Hence, the study will be on the lookout for the possibility of drift amongst these funds as the analysis continues.



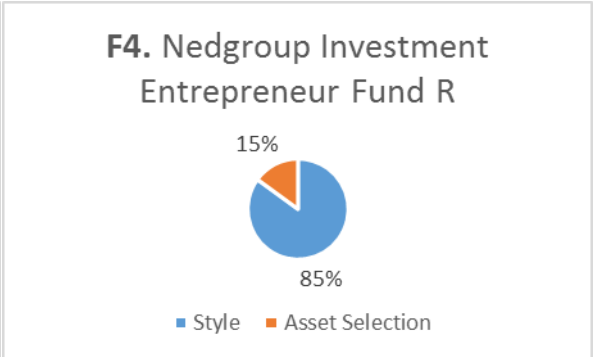
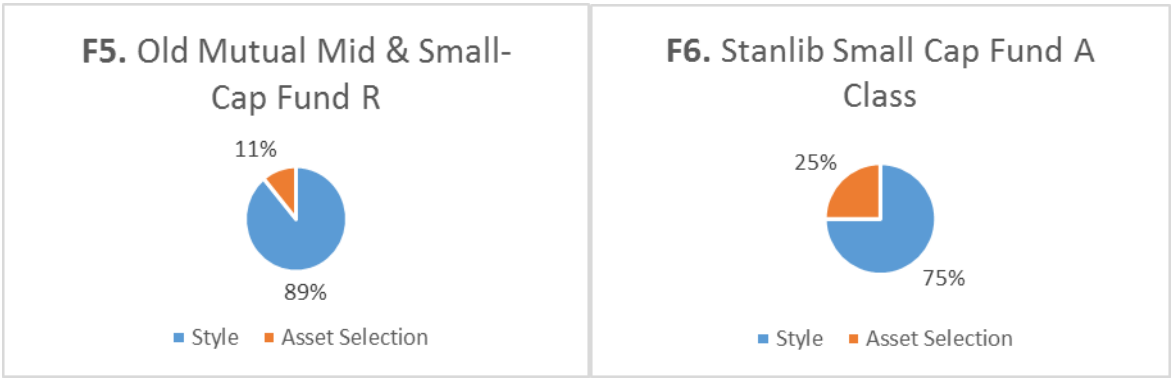


TABLE 4- 13: Style weights for Small Caps continued

		SMALL CAP FUNDS CONTINUED						
	FUND D			FUND E			FUND F	
	Nedgroup Investment Entrepreneur Fund R			Old Mutual Mid & Small-Cap Fund R			Stanlib Small Cap Fund A Class	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0	0,573129911		6,31435E-07	0,946171484		0	0,05078452
RESOURCE 10	0	0,00169679		0,000775889	0,324862684		0	0,661568896
INDUSTRIAL 25	0,103572787	0,972895072		0,041101833	0,879839716		0	0,454241209
FINANCIALS 15	9,25535E-07	1,63136E-05		4,3837E-07	0,116988689		0	0,371704636
GROWTH	0,004132109	0,559653824		9,6017E-07	0,436829519		0	0,444413388
SA LISTED PROPERTY	4,30684E-07	0,002431739		1,07744E-05	8,50225E-06		0	0,000254997
CONSUMER GOODS	0	0,075299184		1,96906E-07	0,979890812		0	0,104621825
LARGE CAP	6,2565E-07	0,112614047		3,30394E-07	0,71038108		8,63357E-08	0,659093176
MID CAP	0,40949431	4,2333E-05		0,337450669	0,000694681		0	0,964016893
SMALL CAP	0,237816454	1,70252E-05		0,472140176	5,92522E-13		0,704976622	1,01665E-12
VALUE	0,21232613	0,811968505		0,081270432	0,598844893		0,28597338	0,56481994
TECHNOLOGY	0,032776544	0,314476153		0,067004391	0,008388482		0,007456836	0,234703313
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,849988313			0,889042129			0,749865413	

Source: Author's own. Constructed based on the RBSA regressions' results.

It is observable from the style diagrams that some of the funds in this sector have high asset allocation portions. For example, 25 percent of the variation in the returns of Stanlib Small Cap Fund are explained by asset allocation. Momentum Small Mid-Cap A, and Coronation Smaller companies' fund, attribute 24 percent and 20 percent variation in their returns to asset selection which is, somehow, high. This may suggest a significant level of active investing and possibly drift.



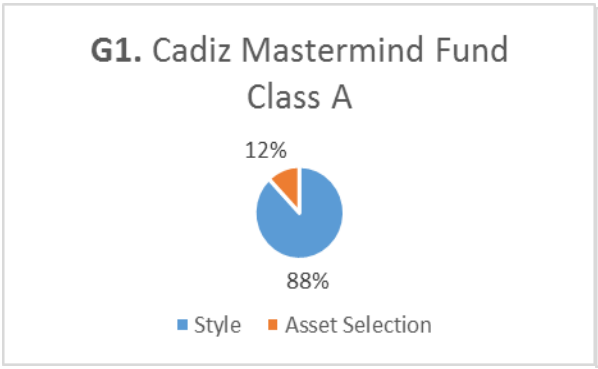
Lastly, results for funds invested in the Value index style factor are presented in the tables that follow.

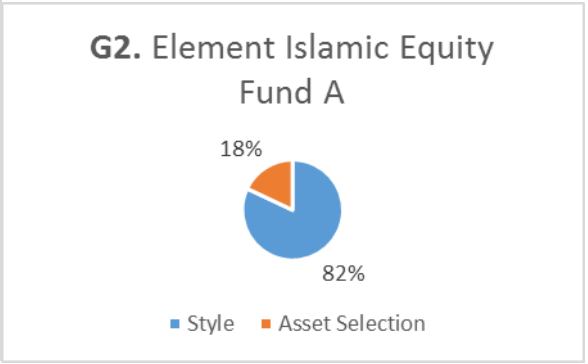
TABLE 4-14: Style weights for Value funds

		VALUE FUNDS						
	FUND A			**FUND B**			**FUND C**	
	Cadiz Mastermind Fund Class A			Element Islamic Equity Fund A			Investec Value Fund Class R	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	0	0,447560773		3,48463E-07	0,494529349		0	0,449892629
RESOURCE 10	0,041923442	0,00094954		0,501629437	0,000110165		0,104162856	2,20526E-09
INDUSTRIAL 25	0,034942554	0,069665532		0,091906151	0,097694522		0,054407864	0,003862947
FINANCIALS 15	0,165522115	0,000793896		0,014724463	0,681033685		0,270082048	2,32849E-06
GROWTH	0,055493256	0,514696426		1,48843E-06	0,453185643		0	0,068995594
SA LISTED PROPERTY	8,71469E-07	0,083433638		0	0,055309629		0,032512267	0,21512764
CONSUMER GOODS	0	0,437354007		0	0,152777077		0,170408801	0,01107455
LARGE CAP	3,1201E-07	0,668972551		0	0,8197818		0	0,39656912
MID CAP	0,00012509	0,178500976		1,62678E-05	0,067515786		1,22466E-05	0,004261056
SMALL CAP	1,42063E-05	0,000137079		0,26303543	0,070418237		0,243460862	0,07512851
VALUE	0,679683803	0,765491957		0,128735857	0,455778684		0,095252535	0,08220226
TECHNOLOGY	0,022081973	0,77260392		9,90232E-08	0,488718878		0,029214029	0,911711584
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,878421259			0,816493834			0,768555772	

Source: Author's own. Constructed based on the RBSA regressions' results.

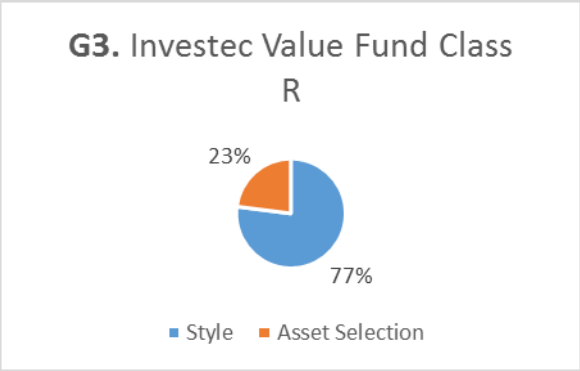
In the analysis, standout funds which either posted highest returns, least returns or showed distinctive volatility, are examined.

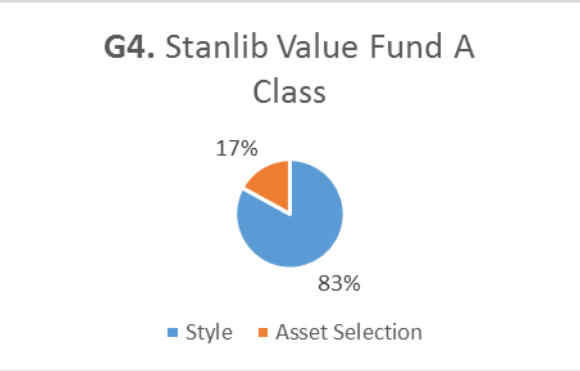




Shifting the analysis to the Cadiz Mastermind Fund Class A, the study forms a priori expectation of a variety of different equity level investments. Once again, the study's expectations are satisfied by the use of Sharpe's Style analysis. According to Cadiz (2015), the Mastermind Fund is an active stock picking, long equity portfolio, which targets preservation of capital through equity portfolio protection.

The fund aims to provide investors with a superior level of dividend income over the short term and maximum capital growth over the medium to long term. It does this through seeking ‘deep value' opportunities, such as, stocks trading significantly below their intrinsic market value. The analysis finds that this description holds. The stated protection comes in the form of the statistically significant exposures to South African listed property, small caps and the good performing industrials. However, the Value coefficient is statistically insignificant, as also observed in some of the funds analysed. This fund is concentrated in its holdings which represents increased risk, much like that described for FNB Growth Fund earlier.





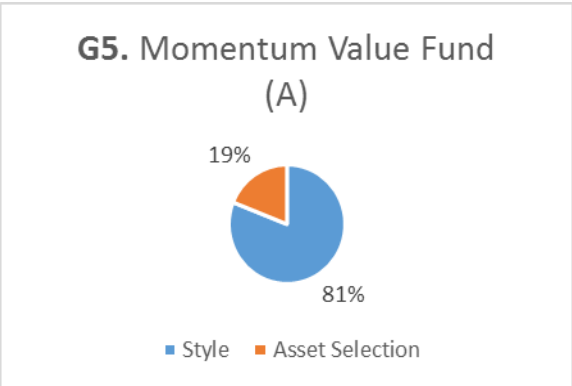
The Investec Value Fund shows a superior asset selection return (23 percent), compared to peer funds, which suggests that a sizeable portion of the returns is attributable to stock picking skills of the manager. The portfolio targets the provision of investors with capital growth over the long-term and, thus, invests in equities trading at a discount to their fair value, such as value shares. From its fact sheet, the value is achieved by picking South African stocks with inferior ratings, relative to their net asset value, historic performance, earnings potential, or the ratings of peer stocks in the same sector. The fund also prefers high dividend yielding equities and solid cash flows that are undervalued by the market. Hence, the value style assertion in its title is justified.

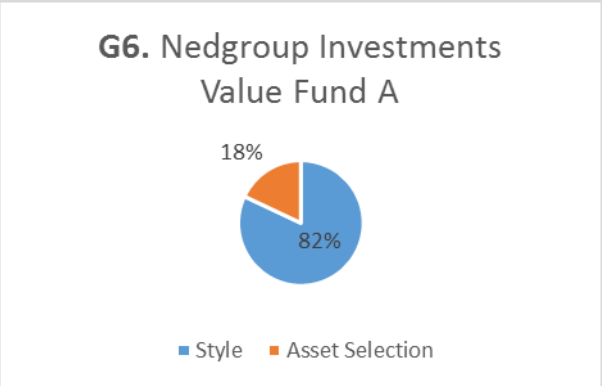
TABLE 4-15: Style weights for Value funds continued

		VALUE FUNDS CONTINUED						
	FUND D			FUND E			FUND F	
	Stanlib Value Fund A Class			Momentum Value Fund (A)			Nedgroup Investments Value Fund A	
STYLE FACTORS	**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**		**WEIGHTING**	**P-VALUE**
Intercept	0	#N/A		0	#N/A		0	#N/A
90 DAY T-bill	2,27475E-07	0,928977366		0	0,304046471		0,005061562	0,269812688
RESOURCE 10	0,085309523	0,481214066		0,406271243	9,73581E-06		0,103869616	0,804409733
INDUSTRIAL 25	0,132275131	0,247491167		0	0,132457404		0,092895265	0,88218817
FINANCIALS 15	0	0,107062537		1,3895E-07	0,082798881		0,082031347	0,222175852
GROWTH	0,026796646	0,313864947		0	0,496623344		0,004486985	0,960912464
SA LISTED PROPERTY	0	0,018584556		0	0,015604026		0,008506697	0,326527797
CONSUMER GOODS	0	0,800123925		0	0,811668235		0,100360189	0,211949067
LARGE CAP	0	0,437308001		6,19291E-07	0,12398705		0,025848799	0,775848251
MID CAP	0,350482242	0,000584184		0,273328884	0,247948213		0,470786992	0,000836722
SMALL CAP	0,120499856	0,012638289		9,21406E-07	0,124641608		0,08399246	0,952626244
VALUE	0,278113349	0,905351668		0,294911691	0,206654653		1,56253E-06	0,858473306
TECHNOLOGY	0,006082748	0,922473316		0,024925005	0,498850782		0,021748542	0,960488239
Sum of Factor Weights	1			1			1	
Adjusted R Square	0,83245237			0,809302471			0,823281426	

Source: Author's own. Constructed based on the RBSA regressions' results.

STANLIB Value Fund targets medium to long-term capital growth, with income generation as a secondary objective. Stocks that the fund purchases have higher intrinsic values, relative to those reflected by their share prices in the relevant market. Coupled with the fact that this portfolio may have indirect foreign exposure of up to 10 percent, this helps explain the fund's superior monthly average returns in this category as observed in the graphs presented earlier.





Worth noting with the Value funds is the relatively high asset selection portion, as compared to funds in the other styles, which suggest a high level of active investing and a possible indication of drift. Stanlib has 17 percent skill attribution, Momentum has 19 percent and Nedgroup investments has 18 percent. These assertions of drift

are investigated in detail in the next section. This section has detailed, demonstrated and analysed what portion of a unit trust's returns can be attributed to style factors and what can be deemed attributable to asset selection. The next consideration is that of style drift. The style or asset allocation of a unit trust may change markedly over a period. This could happen as active fund managers respond to changes in their external environment, or there is a change in the fund management.

4.1.2.3 Style Analysis Summary

Style analysis, like most proliferated financial models, holds some degree of practical usage, underpinned by theoretical validity (Froot and Teo, 2008). This theoretical validity has been exhausted in the literature review and been critically evaluated by presenting some of the weaknesses of this technique, for example, by studies like Auret and Cline (2011), Cao (2012) and Dickson (2016). This included the fact that the analysis is retrospective and relies heavily on past data. The degree of style analysis' practical usefulness also provides an inherent weakness, as its value is constrained by the quality of the data obtained (Boyer, 2015). Furthermore, whilst some data may be considered as high quality in some applications, the same data may be considered poor when evaluating a different unit trust. The study found this to be the case as some of the proxies chosen in this quantitative study proved to be of minimal statistical significance for some funds, yet highly significant for others.

This argument is inherent to the interpretation of the adjusted R^2 value, as it is indicative only to the degree to which a specific model fits the data at hand. In the quantitative analysis, the weightings of style factors that would cause a hypothetical portfolio to yield the same returns as that of the 42 selected unit trusts have been thoroughly analysed. It is noted that, whist the Style analysis lends weight to some factors such as Treasury bills, it may be detecting the presence of cash. This links back to a potential weakness inherent to its assumptions, where detection of styles is based on return characteristics. Common conclusions from the quantitative analysis show that funds with more active management tend to exhibit greater portions of return attributable to asset selection. Furthermore, it was found that the titles of unit trusts may, sometimes, be misleading as they expose the investor to style factor returns that are against their mandates, or the investor is unaware of. This forms the

principal edge of this technique, as it is able to lift the veil of secretive mutual funds – even if to a limited extent – using only easily accessible public information.

However, in most cases, it was found that these funds comply with their mandates and relevant regulation. This is in addition to the funds often fulfilling a priori expectations formed by looking at their risk and return profiles – with funds with greater returns investing in growth type stocks and safer funds taking minimum risks. This was observable when the 12 factors could not accurately proxy the returns of the funds, which led to the assumptions that an inherent inclusion of a bond proxy may have better explained some part of the returns. The Style analysis tool was also able to detect the presence of a style drift, which is important as investors want to have adequate knowledge of their investments.

4.1.2.4 Results of Fund Drift

After establishing the styles to which the funds belong in the previous section, the study then assessed how true these funds stayed to their styles. In other words, the study undertook to find out the extent of style drift amongst the funds sampled, which is a fulfilment of the first objective of the study. The three most prevalent methods found in literature for measuring style drift are the R^2 statistic, the tracking error method and, most significantly, the style drift score. All three these methods have been employed in this study, however, the style drift score is the primary technique used for measuring the extent of style drift of the funds. The three methods are detailed next and the results from their analysis follow. In this section the funds are separated into two categories, that is, Style consistent funds and style drifting funds, using the style drift score.

From here the study then contrasts the performances of these two groups in the following section and then also investigates whether these performances persist in the subsequent section. The results from analysing the extent of style drift of the funds, using these three methods, are presented summarily in Table 4-16 below. Their analysis follows after the table.

TABLE 4-16: Separating consistent funds from drifters: SDS, R^2 and Tracking Error

			FUND DRIFT				
	FUND SECTORS	**STYLE DRIFT SCORE**		**ADJUSTED R-SQUARED**		**TRACKING ERROR**	
		Mean SDS = 0,9814		Mean Adj.R-squared=0,8621		Mean Tracking error=0,002467	
	FINANCIALS	**SDS**	**RANKING**	**ADJ.R-SQUARED**	**RANKING**	**TRACKING ERROR**	**RANKING**
FUND A	Coronation Financial Fund	**0,7648913**	**C**	0,88427006	C	0,001972815	C
FUND B	Momentum Financials Fund A	**0,9707935**	**C**	0,925006516	C	0,00250388	D
FUND C	Nedgroup Investments Financials Fund A	**0,6278492**	**C**	0,915234892	C	0,001619355	C
FUND D	Sanlam Financial Fund	**0,5816421**	**C**	0,917317118	C	0,001658315	C
FUND E	Sanlam Financial Fund B1	**1,194669**	**D**	0,88238168	C	0,001446609	C
FUND F	ABSA Select Equity Fund	**0,7831952**	**C**	0,89164536	C	0,002232962	C
Overall Drift=			**17%**		0%		17%
	GROWTH						
FUND A	FNB Momentum Growth Fund A	**0,7501074**	**C**	0,905923005	C	0,001934685	C
FUND B	Foord Equity Fund	**0,5725278**	**C**	0,890565751	C	0,00163233	C
FUND C	Investec Growth Fund Class A	**0,8200536**	**C**	0,867270859	C	0,002112317	C
FUND D	Nedgroup Investments Growth Fund A	**0,6464316**	**C**	0,888693577	C	0,001843036	C
FUND E	Marriot Dividend Growth Fund Class R	**0,7354794**	**C**	0,776359498	D	0,001896956	C
FUND F	Old Mutual Growth Fund R	**0,7211102**	**C**	0,88982534	C	0,001859895	C
Overall Drift=			**0%**		17%		0%
	INDUSTRIALS						
FUND A	Coronation Industrials Fund Class A	**0,5919021**	**C**	0,890125256	C	0,00152664	C
FUND B	Momentum Industrial Fund A	**0,8130271**	**C**	0,884818765	C	0,002096968	C
FUND C	Old Mutual Industrial Fund A	**0,9090402**	**C**	0,85978305	D	0,002344606	C
FUND D	Sanlam Industrial Fund A	**0,5410129**	**C**	0,891407575	C	0,001542478	C
FUND E	Stanlib Industrial Fund R Class	**1,000855**	**D**	0,819702391	D	0,002581415	D
FUND F	Stanlib Industrial Fund A Class	**0,8365522**	**C**	0,844597381	D	0,002385088	C
Overall Drift=			**17%**		50%		17%
	LARGE CAP						
FUND A	Absa Large Cap Fund	**0,8025997**	**C**	0,925024562	C	0,002288286	C
FUND B	ABSA Large Cap Fund B Class	**1,1952927**	**D**	0,944028686	C	0,001447365	C
FUND C	Momentum Top 40 Index Fund	**0,6472081**	**C**	0,958031469	C	0,001669286	C
FUND D	Old Mutual Top 40 Fund A	**0,5827785**	**C**	0,952162253	C	0,001661556	C
FUND E	Prescient Equity Top 40 A1	**1,5339151**	**D**	0,872874058	C	0,003037933	D
FUND F	Stanlib ALSI 40 Fund Class A	**0,6276007**	**C**	0,955061708	C	0,001789348	C
Overall Drift=			**33%**		0%		17%
	RESOURCES						
FUND A	Investec Commodity Fund Class R	**1,055822**	**D**	0,903031331	C	0,002723187	D
FUND B	Momentum Resources Fund A	**1,0787146**	**D**	0,911962906	C	0,002782232	D
FUND C	Nedgroup Investment Mining & Resource	**0,6286401**	**C**	0,961404617	C	0,001621395	C
FUND D	Old Mutual Mining & Resources Fund R	**0,9737689**	**C**	0,872849806	C	0,002511555	D
FUND E	Old Mutual Gold Fund R	**3,3064722**	**D**	0,401091472	D	0,008528087	D
FUND F	Stanlib Resources Fund R Class	**0,9912351**	**D**	0,905917011	C	0,002556604	D
Overall Drift=			**67%**		17%		83%
	SMALL CAP						
FUND A	Coronation Smaller Companies Fund	**0,8426732**	**C**	0,803364013	D	0,002173431	C
FUND B	Investec Emerging Companies R	**1,0939741**	**D**	0,839114628	D	0,002821589	D
FUND C	Momentum Small Mid-Cap A	**1,085863**	**D**	0,758191918	D	0,003095896	D
FUND D	Nedgroup Investment Entrepreneur Fund	**1,010565**	**D**	0,849988313	D	0,002606459	D
FUND E	Old Mutual Mid & Small-Cap Fund R	**0,8043923**	**C**	0,889042129	C	0,002074697	C
FUND F	Stanlib Small Cap Fund A Class	**2,2856114**	**D**	0,749865413	D	0,005004025	D
Overall Drift=			**67%**		83%		67%
	VALUE						
FUND A	Cadiz Mastermind Fund Class A	**1,2443943**	**D**	0,878421259	C	0,003209554	D
FUND B	Element Islamic Equity Fund A	**1,2091954**	**D**	0,816493834	D	0,003122059	D
FUND C	Investec Value Fund Class R	**1,3170472**	**D**	0,768555772	D	0,003396942	D
FUND D	Stanlib Value Fund A Class	**0,9659978**	**C**	0,83245237	D	0,002754149	D
FUND E	Momentum Value Fund A	**1,3274511**	**D**	0,809302471	D	0,003423775	D
FUND F	Nedgroup Investments Value Fund A	**0,7465884**	**C**	0,823281426	D	0,002128593	C
Overall Drift=			**67%**		83%		83%
	CONSISTENT	26	62%	27	64%	25	60%
	DRIFTERS	16	38%	15	36%	17	40%
	TOTAL	42	100%	42	100%	42	100%
	C - Consistent Funds	D - Drifters					

Source: Author's own. Constructed based on the style drift measures' results.

4.1.2.4(a) R^2 Statistic Results

The R^2 statistic usually measures the goodness of fit for the model used, that is, how well the model explains the variable of interest being researched. With respect to Sharpe's (1992) Returns Based Style Analysis, [1-R^2] captures the portion of the fund's return variability that is not systematically related to co-movements in the returns to the style benchmarks. Accordingly, [1-R^2] serves as a proxy for the extent to which the manager is unable to produce returns consistent with a tractable investment style. Therefore, a high R^2 value designates a style consistent fund, whereas a low R^2 value infers style inconsistent investing or a style drifter. Adjusted R^2 values for all the funds in the sample were taken and ranked, upon which the mean value was obtained, that is, the average R^2 value. This value was then compared to the individual values of the funds. Funds which were found to have higher R^2 values, relative to the mean, were deemed to be style consistent funds, whereas funds which had lower R^2 values were deemed to be drifters.

When using the R-squared method to analyse drift, it can be observed from Table 4-16, that the highest drift was found in Value Funds and the Small Cap Funds, both with 83 percent. Of the sample selected, 5 out of 6 funds were found to be drifters which equates to the 83 percent observed. The same group of funds consistently recorded a higher drift percentage across all the methods used. This validates the assertion that small caps and value funds change their characteristics more frequently as they grow in size and improve their fundamental ratios towards growth funds. Large Caps and Financials exhibit consistency, that is, they have 0 percent drift, whereas Resources and Growth Funds posted a relatively low level of style drift at 17 percent. Overall, the R-Squared method depicts the style drift among the sample to be at 36 percent, whereas style consistency is found to be 64 percent.

4.1.2.4(b) Tracking Error Results

The tracking error can be expressed as the volatility of the difference between the fund's returns and those of a corresponding benchmark portfolio summarizing the style universe (Muller and Ward, 2013). Simply put, it is the return not explained by the style benchmark. The tracking errors of the funds were obtained from the regression outputs (standard errors) from establishing the style of the funds using the RBSA method. These were ranked and a mean Tracking Error was found.

Relative to the mean tracking error, style consistent funds have a lower tracking error while style inconsistent funds (drifters) have a higher tracking error.

The results in Table 4-16 demonstrate the overall extent of drift amongst our sample to be 40 percent, while style consistency is proposed to be 60 percent when using the tracking error method. The overall drift figures are almost consistent throughout the three methods used, which may help validate the reliability of the results obtained. Using the tracking error method, the highest drift was observed in the Value and Resources funds at 83 percent, followed by the Small Cap Funds at 67 percent. This observation concurs with the assertion that Value fund and Small Cap funds' characteristics are constantly changing, relative to the other styles. The high drift amongst the Resources funds can be traced back to the volatile nature of the South African commodity prices, which fluctuate wildly, as does the Rand currency itself. Hence, fund managers invested in mining stocks are constantly moving their assets in and out of funds in pursuit of a better alpha which leads to the high level of inconsistency. Growth Funds exhibit complete style consistency, whereas Financials, Industrials and Large Caps display a very low level of drift at 17 percent each.

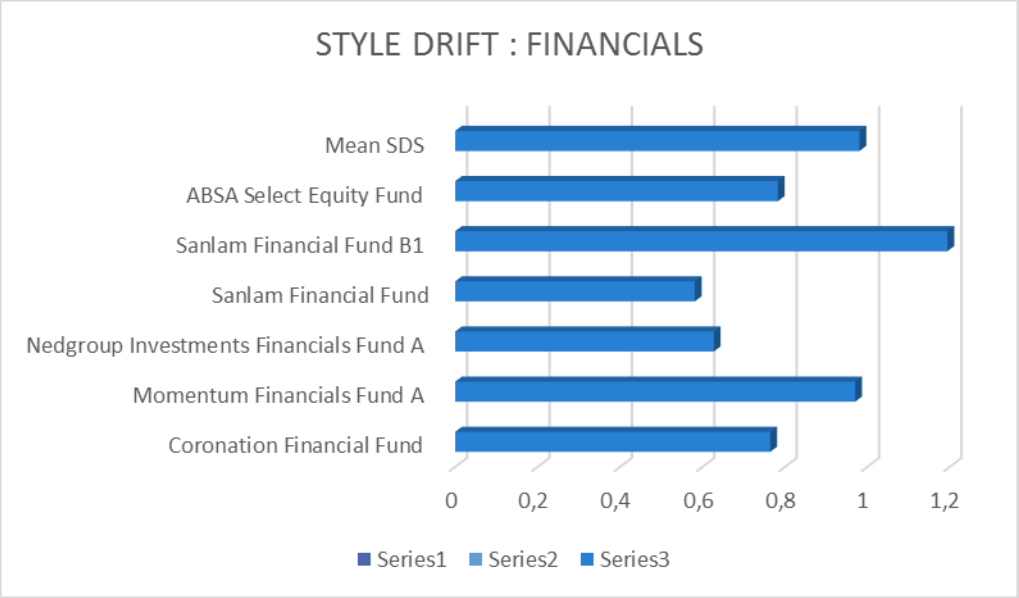
4.1.2.4(c) Style Drift Score Results

Instead of examining rolling window graphs, that have been predominantly used in past studies, to examine style drift, Idzorek and Bertsch (2004) propose the Style Drift Score (SDS) method of measuring drift. They assert that it liberates a researcher from scrutinizing numerous rolling window style maps and rolling window asset allocation graphs, both of which illustrate the evolution of a portfolio's investment style. The SDS quantitatively measures style drift of a portfolio by computing it as a single statistic. This research utilizes the SDS method as the principal method for measuring drift, above the aforementioned R^2 and tracking error methods. It is computed as the square root of the sum of the variances of the asset class coefficients (or style weights) derived from the RBSA regressions.

The SDS's for all the funds were obtained and ranked, whereupon an average SDS was found. A fund with a high SDS, relative to the mean SDS, demonstrates higher style inconsistency (that is, a drifter), whereas a fund with an inferior SDS, below the mean SDS, is deemed a style consistent fund.

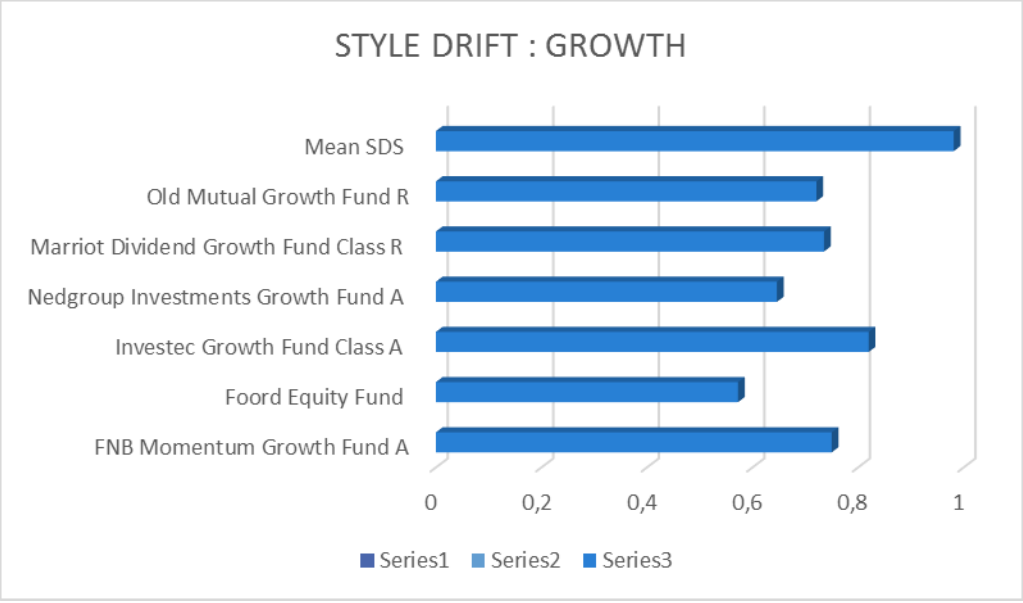
The results in Table 4-16, demonstrate that, overall, a modest 38 percent of the funds were found to be drifters, with 62 percent of the funds demonstrating style consistency. As had been observed from the previous two methods, the funds invested in the Value, Small Cap and Resources sectors demonstrated a higher style drift relative to the others with 67 percent drift. Growth Funds, again, recorded perfect style consistency with 0 percent drift, whilst Financials and Industrials, again, recorded low style drift at 17 percent. Large Caps funds displayed a moderate amount of drift at 33 percent. The extent of drift for all these funds is presented in the graphs that follow. These were derived from the style drift score calculated earlier. The average style drift score (mean SDS) is presented first as a benchmark for all the funds. Funds with a higher drift than the mean SDS are considered drifters whereas funds with a lower drift than the mean SDS are considered consistent funds.

FIGURE 4-1: Style drift for Financials funds



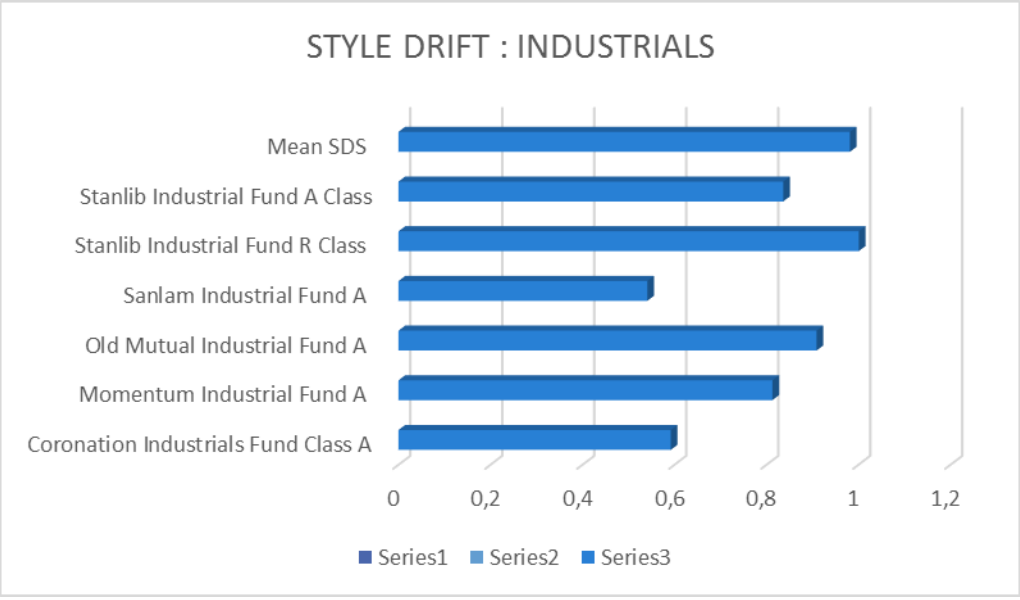
Sanlam Financial Fund B1 exhibits the highest drift among the financials funds, which is 1.097 deviations higher than the mean style drift score. In fact, it is the only fund that demonstrates drift amongst the financials as all the other funds are found to be consistent with their investment philosophies.

FIGURE 4-2: Style drift for Growth funds



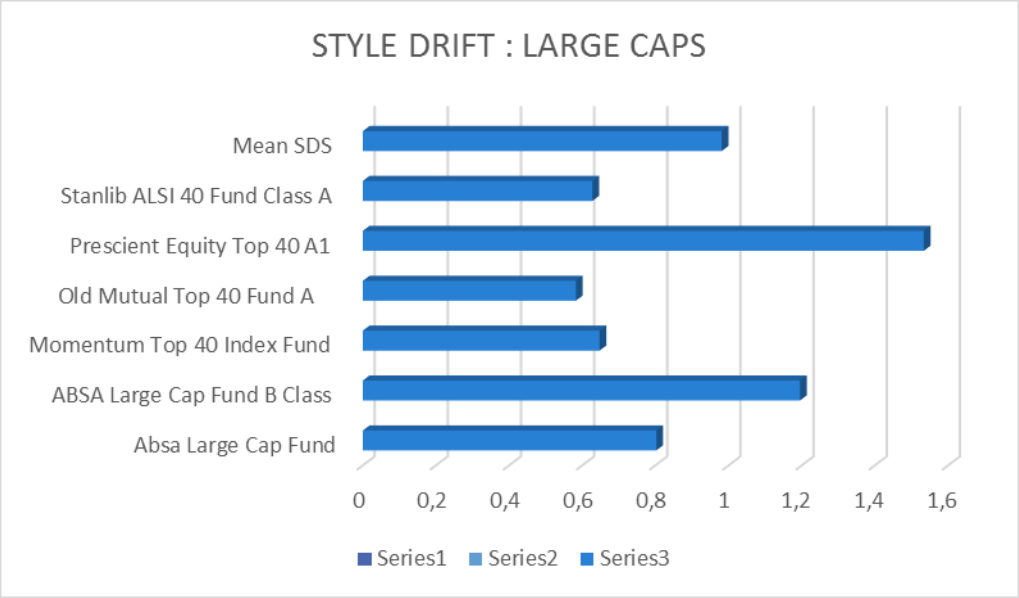
The Growth funds all demonstrate consistency in their investment strategies, as observable from the graph above. Foord Equity Fund is found to be the most consistent with the least style drift score of 0.57, which is 0.41 deviations below the mean style drift score. The fund attained the highest monthly average return over the evaluation period, which adds weight to the claim that consistent funds produce better results than drifters.

FIGURE 4-3: Style drift for Industrials funds



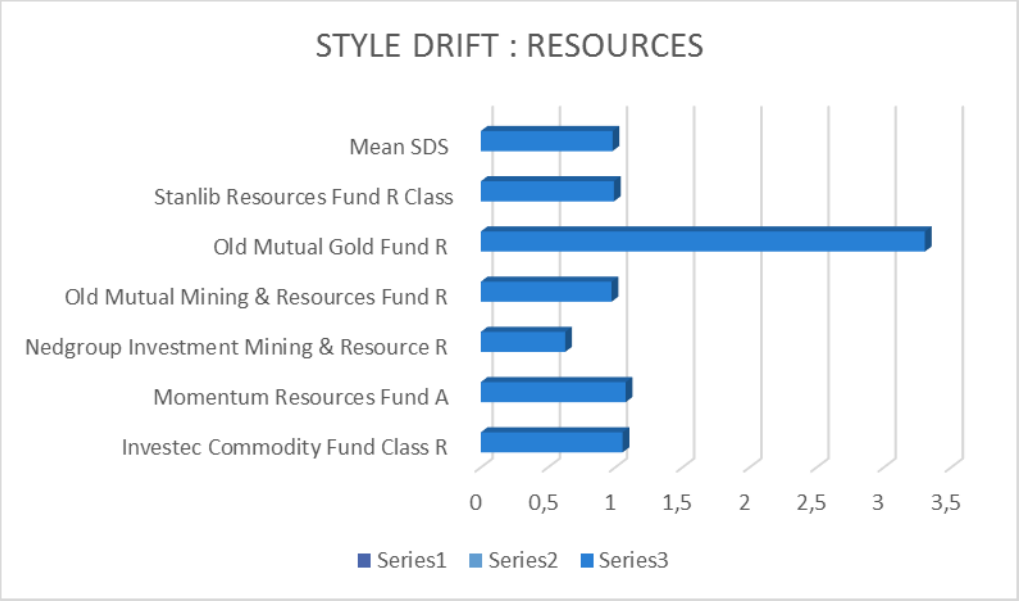
All the Industrial funds exhibit a substantial level of consistency, except for Stanlib Industrial Fund R Class, which is the only fund exhibiting drift amongst the funds. Its drift score is 0.019455 deviations above the mean style drift score. Its lacklustre performance is even highlighted in its fact sheet of 31 August 2016, where it is rated last in its sector (7 out of 7), whilst its general ranking in the South African unit trust universe stands at 655 out of 1033 funds (ASISA, 2015).

FIGURE 4-4: Style drift for Large Caps



Within the Large Cap style factor only two funds are found to be drifters, with the remaining two thirds being consistent. Prescient Equity Top 40 A1 fund exhibits the highest drift, followed by Absa Large Cap Fund B Class. This observation concurs with the assertion of underperformance by drifters, as the Prescient fund posted the least overall monthly average return in its sector over the evaluation period.

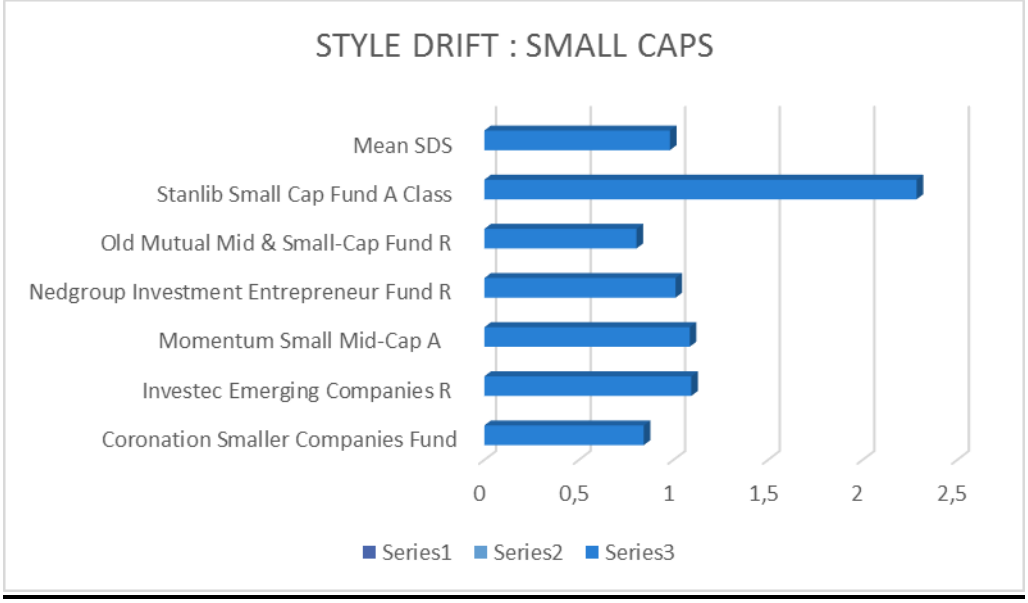
FIGURE 4-5: Style drift for Resources funds



Old Mutual Gold Fund R exhibits the highest overall style drift score throughout all the funds sampled for this research. The fund's drift score has the largest deviation from the mean score, at 2.33 points above the mean. It follows that the fund posted the least monthly average return in its sector throughout the period of observation.

The resources sector has been facing tough economic conditions in South Africa for quite a while, which may explain the overall drift of the funds in this sector at 67 percent, that is, 4 out of 6 funds. This may suggest that resources funds' managers have been shifting funds from one asset to another in search of better performances.

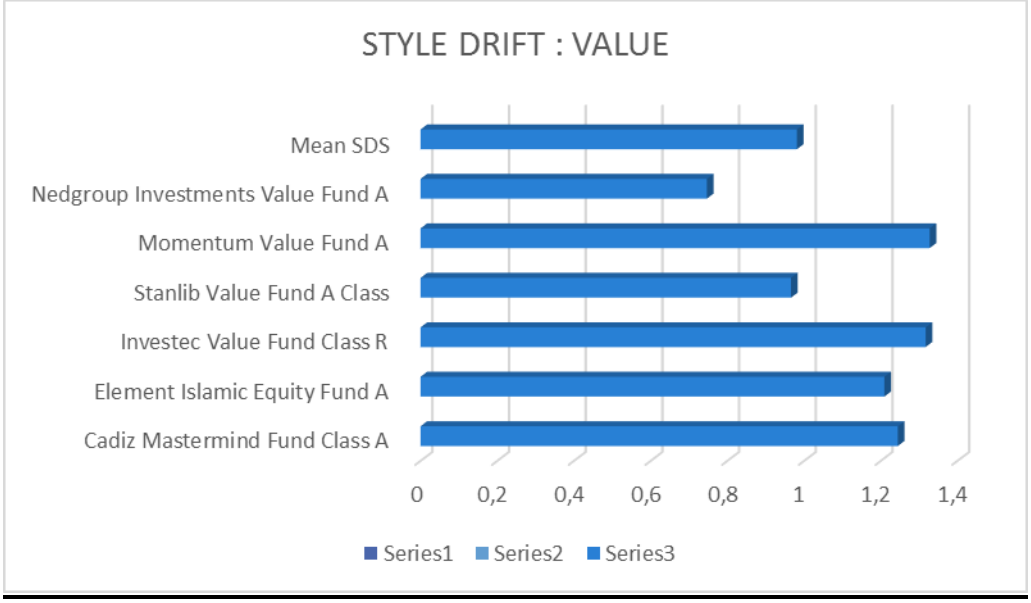
FIGURE 4-6: Style drift for Small Caps



Stanlib Small Cap Fund A Class exhibits a standout drift from its peer funds in the small caps style. In fact, the fund has the second highest overall style drift score in the whole sample after Old Mutual Gold Fund R. As can be expected, the fund posted the lowest monthly average return in its sector over the evaluation period. 67 percent (4 out of 6) of the funds in this sector are drifters. A possible justification may be that the characteristics of shares in this sector are constantly changing as the companies evolve and grow into bigger entities. Hence, drift may be justifiable on the grounds that a change in the stock characteristics is inevitable as the stocks grow from small caps to bigger entities.

Lastly, the study observed drift amongst the Value funds and discovered that it is also as high as that observed in the Resources and the Small cap styles. 67 percent (4 out of 6) value funds are found to be drifters. This can be justifiable on the basis that value shares are constantly trying to grow into growth shares over time. Momentum Value Fund exhibits the highest drift among the value funds with a deviation of 0.3460511 above the mean drift score. Nedgroup Investments Value Fund A displays the most consistency with 0.2348116 deviations below the mean style drift score. This seems to be in agreement with its performance as the fund posted the second highest average monthly return in the observation period, after Stanlib Value Fund A Class fund which also exhibits consistency.

FIGURE 4-7: Style drift for Value funds



4.1.2.5 Fund Drift Summary

This section has unearthed that returns to South African unit trusts can be mostly attributed to the style of the fund, rather than the skill of the manager. The Industrials sector posted the highest average returns for the period of analysis, followed closely by the Large Caps index. The Resources sector posted the least average monthly returns over the evaluation period.

It is also established, from the Returns Based Style Analysis, that most of the funds are correctly classified, since the largest statistically significant style weights confirmed their style attribution. However, some of the style coefficients are found to be statistically insignificant which maybe be due to inappropriate style factors used as proxies for the style analysis. From the above analysis, it can be observed that, on average, South African fund managers stick to their prescribed style more often than not. All the methods for measuring drift exhibited at least 60 percent style consistency. It can also be inferred that fund managers invested in Value stocks, Small Cap stocks and Resources stocks display a higher level of drift compared to the other indices.

This can be attributable to the nature of the South African economy which is heavily weighted towards the Basic Materials index, more precisely the mining sector. Commodity prices are very volatile within the South African economy, coupled with

the wild fluctuations of the South African Rand (ZAR) currency. Hence, fund managers invested in these kinds of stocks may be tempted to chase outperformance of the market at the slightest positive news, which may lead to a deviation from their mandates. Financials and Growth sectors are found to be the most consistent with low levels of style drift throughout the three methods used. Van Heerden (2014) asserts that the financial sector is very stable in South Africa, which was observed in its ability to withstand the 2008 financial crisis. These may help explain the consistency phenomenon of such funds.

In the fund management sphere, it is believed that style consistency can be indicative of a skilful portfolio manager, a successful risk management system, and is an advisable distinction when searching for and retaining managers, in addition to the obvious benefits in the portfolio construction process. Actually, Brown and Harlow (2002) infer that a positive relationship exists between performance and investment style consistency. The following sections will test whether this hypothesis holds or not. The Style Drift Score method has been primarily used in this study to formally separate the funds in our sample into two groups, that is, the consistent funds and the drifters. In the subsequent sections, the study analyses the relative performances of these two categories of funds and further investigates the possibility of persistence in their performances.

4.2 Performances of the Funds

The study now turns its attention to addressing the second objective of the research, which is the measurement of performance of the funds. This section also compares the performances of the consistent funds and the drifters, peer-wise, in outperforming the benchmark index. Three performance measurement models, namely, the CAPM, FF3F and Sharpe ratio, are utilized to thoroughly analyse the performances of the funds. This was done to check whether the findings are consistent throughout the models, or whether there are any discrepancies observed. The study also wanted to observe changes in the variables of interest like Alpha, beta, R-squared and the log likelihood of the funds, by generating two sets of results using the ALSI benchmark and the style equity benchmarks for the funds as the market proxy. This will allow an analysis of whether there is an observed change in the funds' returns when adjusting for style, that us, investing in a style index. Most of

the funds invest by utilising the JSE ALSI as their market benchmark, as stated in their fact sheets. Hence, the study seeks to find out if their returns could be better off after adjusting for style exposure or not. The two categories of funds (consistent versus drifters) are thoroughly compared throughout this performance evaluation section to find out which set of funds outperform the markets on a risk adjusted basis. The study commences the analysis of performance with the results from the Capital Asset Pricing Model (CAPM).

4.2.1 Capital Asset Pricing Model (CAPM) Results

Results for the Capital Asset Pricing model, with the JSE ALSI employed as the market proxy, are presented in Table 4-17. The analysis of the performance of consistent funds against the drifters follows in Table 4-18. Table 4-19 presents results from the CAPM model, this time with the specific equity style indices used as the market proxies. Alphas from these results are analysed in Table 4-20 with respect to the two categories of funds, that is, the consistent funds versus the funds that drift their style (drifters).

The Jensen alpha tests are therefore summarised in Tables 4-18 and Table 4-20 for the two categories. Forty-two alphas are estimated for the 10-year period (one for each unit trust). The alphas are divided into four categories, either positive and statistically significant, negative and statistically significant, positive and statistically insignificant or negative and statistically insignificant. Once again as done for all the regressions in this analysis, before interpreting the results, diagnostic tests were performed to ensure all econometric properties are met. The results passed all these stability tests, which were the tests for stationerity, heteroscedasticity, autocorrelation, and normality. This step was very important in order to avoid getting results which are spurious and also uninterpretable statistics. The results in the tables present the following statistics; the alphas for the funds, the beta for the market, the adjusted R-squared values, the log-likelihood statistic and the Durbin-Watson statistic from the regressions.

TABLE 4-17: CAPM results from JSE ALSI benchmark

			CAPM RESULTS 1 - ALL SHARE INDEX BENCHMARK						
FUNDS SECTORS									
					MARKET BENCHMARK : JSE ALSI				
FINANCIALS					**ALPHA (α)**	**MARKET (β)**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Coronation Financial Fund					-0.000207	0.976124***	0.905503	408.6147	1.914162
					(-0.422462)	(31.58420)			
Momentum Financials Fund A					8.41E-05	1.050795***	0.855685	375.7066	2.006005
					(0.125623)	(24.85252)			
Nedgroup Investments Financials Fund A					-0.000232	0.994269***	0.927519	421.8544	2.037862
					(-0.538290)	(36.49470)			
Sanlam Financial Fund					-0.000327	0.973791***	0.922742	479.5213	1.971422
					(-0.810874)	(37.55470)			
Sanlam Financial Fund B1					8.71E-05	0.943797***	0.947054	275.0668	2.165728
					(0.230762)	(33.04710)			
ABSA Select Equity Fund					0.000358	1.027489***	0.970934	534.3007	1.972786
					(1.407435)	(62.79062)			
GROWTH					**MARKET BENCHMARK : JSE ALSI**				
FNB Momentum Growth Fund A					-0.000243	1.015002***	0.973197	474.4134	2.368422
					(-0.928418)	(61.45879)			
Foord Equity Fund					-1.72E-05	0.968670***	0.966058	531.7920	2.404074
					(-0.066054)	(57.96132)			
Investec Growth Fund Class A					-0.000475*	0.981562***	0.971885	527.8163	2.042280
					(-1.958145)	(63.05838)			
Nedgroup Investments Growth Fund A					-0.000235	0.987988***	0.965521	528.4752	2.282965
					(-0.878849)	(57.49221)			
Marriot Dividend Growth Fund Class R					-0.000248	0.951620***	0.914249	416.8828	1.661046
					(-0.548093)	(33.31394)			
Old Mutual Growth Fund R					-0.000256	0.998945***	0.967524	465.7049	2.265347
					(-0.901349)	(55.67232)			
INDUSTRIALS					**MARKET BENCHMARK : JSE ALSI**				
Coronation Industrials Fund Class A					0.000247	0.973710***	0.931116	426.9218	1.979803
					(0.601418)	(37.50727)			
Momentum Industrial Fund A					0.000431	0.992965***	0.934941	428.0774	2.243504
					(1.060501)	(38.67222)			
Old Mutual Industrial Fund A					4.92E-05	1.003014***	0.924816	418.8605	2.350111
					(0.110939)	(35.78078)			
Sanlam Industrial Fund A					0.000113	0.959650***	0.943545	501.2416	2.171886
					(0.336693)	(44.42017)			
Stanlib Industrial Fund R Class					0.000353	0.998398***	0.918164	414.5192	2.394589
					(0.763811)	(34.17357)			
Stanlib Industrial Fund A Class					0.000330	0.988262***	0.918674	474.4520	2.351709
					(0.785719)	(36.52331)			
	t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively								

Source: Author's own. Constructed based on the CAPM regressions' results.

TABLE 4-17 CONTINUED

LARGE CAP	MARKET BENCHMARK : JSE ALSI			LOG L.	D-W Stat.
Absa Large Cap Fund	0.000519*	1.051662***	0.959751	511.4829	2.371462
	(1.684218)	(53.05418)			
ABSA Large Cap Fund B Class	0.000104	1.070418***	0.975403	291.9262	2.434804
	(0.362051)	(49.19303)			
Momentum Top 40 Index Fund	-0.000140	1.062675***	0.971879	467.0034	2.030873
	(-0.497632)	(59.96105)			
Old Mutual Top 40 Fund A	-0.000154	1.047886***	0.980289	555.6378	2.184310
	(-0.723869)	(76.61299)			
Prescient Equity Top 40 A1	-0.000511	1.056764***	0.954406	332.5382	2.160558
	(-1.202149)	(40.41949)			
Stanlib ALSI 40 Fund Class A	-4.29E-05	1.072853***	0.969698	526.6073	2.144499
	(-0.158078)	(61.45834)			
RESOURCES	**MARKET BENCHMARK : JSE ALSI**				
Investec Commodity Fund Class R	-0.000471	1.007337***	0.907109	406.3021	1.689953
	(-0.941175)	(31.88411)			
Momentum Resources Fund A	-0.000867*	1.073032***	0.911836	402.6803	1.464306
	(-1.675117)	(32.81196)			
Nedgroup Investment Mining & Resource R	-0.000503	1.036732***	0.935647	424.1604	1.857971
	(-1.191259)	(38.89831)			
Old Mutual Mining & Resources Fund R	-0.000766**	1.001064***	0.943597	435.1986	1.651949
	(-2.015737)	(41.72359)			
Old Mutual Gold Fund R	-0.001541	0.985158***	0.675634	327.7142	2.330854
	(-1.457273)	(14.75214)			
Stanlib Resources Fund R Class	-0.001117**	1.030763***	0.927395	417.9723	1.570208
	(-2.495650)	(36.46096)			
SMALL CAP	**MARKET BENCHMARK : JSE ALSI**				
Coronation Smaller Companies Fund	-0.000370	0.957391***	0.901176	408.0501	2.092082
	(-0.752593)	(30.81192)			
Investec Emerging Companies R	-4.00E-05	0.998909***	0.908032	407.7609	2.310310
	(-0.080983)	(32.05968)			
Momentum Small Mid-Cap A	7.33E-05	0.971968***	0.907847	468.2946	2.238482
	(0.165461)	(34.10974)			
Nedgroup Investment Entrepreneur Fund R	0.000287	1.000166***	0.918927	414.8685	2.246959
	(0.621936)	(34.34816)			
Old Mutual Mid & Small-Cap Fund R	-0.000153	0.998437***	0.917349	413.9489	1.929128
	(-0.327980)	(33.98978)			
Stanlib Small Cap Fund A Class	-0.001523*	0.982940***	0.794722	345.8027	1.344373
	(-1.910043)	(19.70135)			
VALUE	**MARKET BENCHMARK : JSE ALSI**				
Cadiz Mastermind Fund Class A	-5.88E-05	1.050550***	0.909365	403.3113	1.623061
	(-0.114237)	(32.31812)			
Element Islamic Equity Fund A	-0.000294	1.024877***	0.949559	442.8451	2.278272
	(-0.801898)	(44.47044)			
Investec Value Fund Class R	-0.000333	0.981502***	0.887166	397.6648	1.782076
	(-0.613239)	(28.61314)			
Stanlib Value Fund A Class	-0.000256	1.010524***	0.947438	499.5892	2.065136
	(-0.750667)	(46.13004)			
Momentum Value Fund A	-0.000836**	1.049902***	0.939917	426.6764	1.801031
	(-2.028427)	(40.34774)			
Nedgroup Investments Value Fund A	-0.000311	0.984210***	0.955398	512.9924	2.434911
	(-1.021533)	(50.28520)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively					

Source: Author's own. Constructed based on the CAPM regressions' results.

It can be inferred, from the results in Table 4-17, that most of the funds underperformed the JSE ALSI market benchmark, as observed by the number of negative alphas. Under the financial funds, half of the funds recorded positive alphas, but these were found to be statistically insignificant. These funds are Momentum Financials Fund A, Sanlam Financial Fund B1 and ABSA Select Equity Fund.

Under the growth style, none of the funds were able to outperform the market as they all recorded negative alphas. Funds under the Industrial style all recorded positive alphas, although these were found to be statistically insignificant. This confirms earlier findings using absolute returns that the Industrials sector was the best performer, relative to all the other indices, in terms of the average monthly return, although these had not been adjusted for risk. In the large caps style factor, two out of the six funds obtained positive alphas, although only one of these was statistically significant at the 10 percent level. This is the ABSA Large Cap Fund, which falls under the groups of consistent funds as shown in Table 4-17. Ideally, this fund is the only one in the whole sample that obtained a positive, and statistically significant, alpha from which we can infer that its fund manager is able to beat the market with 90% confidence. As would be expected, none of the funds under the Resources style factor were able to outperform the market. Three funds from this sector recorded statistically significant alphas although these were negative. Two funds from the Small Cap style factor exhibited positive alphas which were, however, insignificant, whereas no Value fund was able to beat the market.

If a unit trust, or mutual fund, investment portfolio contained precisely the same proportions of assets as those the JSE ALSI is composed of, a CAPM estimate would show an R-squared of 100 percent, a beta of unity and an alpha of zero (Lizieri et al., 2012). A fund manager who tracks the market will not, of course, be able to achieve superior performance according to Jensen's alpha test. The achievement of a significantly positive alpha requires a portfolio biased towards those sectors which experience above average returns. As a consequence, the CAPM estimates should yield a relatively low R-squared and beta. The selection of the JSE ALSI as a benchmark, by the unit trusts in the sample, reflects an intention to beat the market. The more defensive a fund manager is, and the more the

manager mimics the JSE ALSI, the less likely it is that the fund's performance will meet the alpha test.

Table 4-17 demonstrates the Jensen's alphas for the two categories of funds being analysed. 8 out of the 26 (30.8 percent) consistent funds exhibit outperformance of the index, however, only one alpha value is statistically significant from zero. With respect to the drifters, 5 out of 16 (31.3 percent) funds show positive outperformance, however, none of it is statistically significant. Hence, it can be inferred from this model that the consistent funds exhibit slightly better performance, based on that one statistically significant outperformer, as compared to the drifters who have none. The results are presented below.

TABLE 4- 18: CAPM analysis using JSE ALSI benchmark

CAPM RESULTS 2 - ALPHAS FROM ALL SHARE INDEX MARKET BENCHMARK			
CONSISTENT FUNDS	**ALPHAS**	**DRIFTERS**	**ALPHAS**
Coronation Financial Fund	-0.000207	Sanlam Financial Fund B1	8.71E-05 #
Momentum Financials Fund A	8.41E-05 #	Stanlib Industrial Fund R Class	0.000353 #
Nedgroup Investments Financials Fund A	-0.000232	ABSA Large Cap Fund B Class	0.000104 #
Sanlam Financial Fund	-0.000327	Prescient Equity Top 40 A1	-0.000511
ABSA Select Equity Fund	0.000358 #	Investec Commodity Fund Class R	-0.000471
FNB Momentum Growth Fund A	-0.000243	Momentum Resources Fund A	-0.000867
Foord Equity Fund	-1.72E-05	Old Mutual Gold Fund R	-0.001541
Investec Growth Fund Class A	-0.000475	Stanlib Resources Fund R Class	-0.001117
Nedgroup Investments Growth Fund A	-0.000235	Investec Emerging Companies R	-4.00E-05
Marriot Dividend Growth Fund Class R	-0.000248	Momentum Small Mid-Cap A	7.33E-05 #
Old Mutual Growth Fund R	-0.000256	Nedgroup Investment Entrepreneur Fund R	0.000287 #
Coronation Industrials Fund Class A	0.000247 #	Stanlib Small Cap Fund A Class	-0.001523
Momentum Industrial Fund A	0.000431 #	Cadiz Mastermind Fund Class A	-5.88E-05
Old Mutual Industrial Fund A	4.92E-05 #	Element Islamic Equity Fund A	-0.000294
Sanlam Industrial Fund A	0.000113 #	Investec Value Fund Class R	-0.000333
Stanlib Industrial Fund A Class	0.000330 #	Momentum Value Fund A	-0.000836
Absa Large Cap Fund	0.000519 #*		
Momentum Top 40 Index Fund	-0.000140	# Positive alphas = 5	
Old Mutual Top 40 Fund A	-0.000154	*Positive statistically significant alphas = 0	
Stanlib ALSI 40 Fund Class A	-4.29E-05		
Nedgroup Investment Mining & Resource R	-0.000503		
Old Mutual Mining & Resources Fund R	-0.000766		
Coronation Smaller Companies Fund	-0.000370		
Old Mutual Mid & Small-Cap Fund R	-0.000153		
Stanlib Value Fund A Class	-0.000256		
Nedgroup Investments Value Fund A	-0.000311		
# Positive alphas = 8			
*Positive statistically significant alphas = 1			

Source: Author's own. Constructed based on the CAPM regressions' results.

Instead of benchmarking the JSE ALSI, a unit trust managing a portfolio that specialised in sector investment could benchmark sector indices. A specific style market proxy model would show that a fund specialising in industrial, mining and financial shares, and arranging its portfolio to track the Industrial, Mining and Financial indices, has a zero alpha, statistically significant betas for all three sectors and a R^2 close to unity.

Portfolio theory posits that, if a unit trust focuses its investment strategy on a few sectors, then the style model is appropriate and sector indices should be used as benchmarks (Eddy, 2014). The style model is appropriate for sector specialisation but a fund manager can only achieve a positive significant alpha by arranging a portfolio in such a way that its composition differs from that of the indices. A positive significant alpha should be accompanied by lower R^2 and beta coefficients. Hence, the study tested this assertion with the inclusion of the specific equity style indices as the market benchmark, instead of the ALSI into the CAPM model, and the results obtained are presented in Table 4-19.

Using the CAPM, a tracker fund, as expected, would have a R^2 close to unity. The beta coefficient is highly significant and also close to unity. This shows a very close behavioural relationship between index fund returns and those of the JSE ALSI. A similar conclusion would be reached in terms of a style model. All of the funds deemed to be superior performers, should have much lower R^2 values and betas. This is true in this study's case, as it can be observed in Table 4-19, with the Growth funds. These were all found to be consistent funds and thus it has been noted so far that consistent funds outperform the drifters from Table 4-18.

The Growth funds' CAPM beta values are less than the market beta (below one) and are all statistically different from unity. However, one may argue that if the funds have large cash holdings, as may be the case in bear markets, their beta would also be expected to be below one. In this case it is assumed that the funds take on less risk relative to their market benchmark. The values of the style beta coefficients that are statistically significant are relatively lower than those from the CAPM ALSI benchmark estimates. These results confirm the proposition that superior performance is associated with relatively low R^2 values and betas. The low beta and

R^2 values show that risk adjusted unit trust returns behaved differently from the market benchmark because of relatively low systematic risk.

The above average performance attributed to these funds was achieved by taking on more unsystematic risk. A fund manager intending to beat the market must invest in assets that do not follow the market trend. This increases the risk of over or under performance. The adjusted R-squared figures of the CAPM style regressions for the portfolios indicate the proportion of the variance in the portfolio returns explained by the variation in the returns on their style indices over the sample period. As can be noted in Table 4-19, the R^2 values for the funds are predominantly high, meaning that the monthly returns of the funds follow the motion of the index fairly closely.

One can, therefore, argue that over the sample period analysed, South African fund managers do not properly invest actively in order to capitalize on the inefficiencies in the markets. They could have either over weighted under-priced stocks, or underweighted overpriced stocks, relative to the market index, to which the effect would be far lower adjusted R-squared values. Then again, the manifested high correlation of equity prices in emerging market economies, like the South African market, may also result in the high R-squared figures for the funds. These high correlations among stocks in a market causes variations from the market index weights to less likely result in sufficiently lower R-squared values.

The effect of using the style indices market benchmark in the model, to better explain the variation in the results of the portfolios, is made clearer by observing the Log Likelihood measure. Compared to the CAPM ALSI, the results from the style CAPM show that the model's probability of estimating the portfolio returns improves substantially. Table 4-19 below details this analysis.

TABLE 4- 19: CAPM results from equity style benchmarks

CAPM RESULTS 3 - EQUITY STYLE INDICES BENCHMARKS					
FUNDS SECTORS					
FINANCIALS	**MARKET BENCHMARK : FINANCIALS 15**				
	ALPHA (α)	**MARKET (β)**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Coronation Financial Fund	-0.000121	0.982967***	0.976409	481.4684	2.414957
	(-0.495219)	(65.61551)			
Momentum Financials Fund A	0.000140	1.081716***	0.964705	449.6406	1.944001
	(0.423592)	(53.32566)			
Nedgroup Investments Financials Fund A	-0.000128	0.990268***	0.978122	484.7421	2.690388
	(-0.540346)	(68.19628)			
Sanlam Financial Fund	-0.000160	0.982121***	0.980164	560.4212	2.404508
	(-0.784813)	(76.36667)			
Sanlam Financial Fund B1	-0.000397*	0.999314***	0.985204	314.5896	2.397099
	(-1.974973)	(63.73981)			
ABSA Select Equity Fund	0.000675	0.975233***	0.912421	468.6747	2.397012
	(1.531693)	(35.07639)			
GROWTH	**MARKET BENCHMARK : GROWTH INDEX**				
FNB Momentum Growth Fund A	-0.000615	0.918672***	0.916818	414.9562	2.261032
	(-1.331174)	(33.87147)			
Foord Equity Fund	-0.000294	0.850791***	0.878129	455.7328	2.307513
	(-0.594716)	(29.17602)			
Investec Growth Fund Class A	-0.000747*	0.870914***	0.904033	456.6092	2.188449
	(-1.658460)	(32.92908)			
Nedgroup Investments Growth Fund A	-0.000523	0.869754***	0.881724	455.1318	2.243758
	(-1.053316)	(29.67607)			
Marriot Dividend Growth Fund Class R	-0.000527	0.829672***	0.798451	372.0169	1.817375
	(-0.757466)	(20.32250)			
Old Mutual Growth Fund R	-0.000595	0.891912***	0.886725	400.1149	2.294849
	(-1.118704)	(28.55024)			
INDUSTRIALS	**MARKET BENCHMARK : INDUSTRIAL 25**				
Coronation Industrials Fund Class A	-0.000306	0.977243***	0.968145	467.4102	2.293194
	(-1.089922)	(56.22939)			
Momentum Industrial Fund A	-0.000134	0.997014***	0.972999	474.2476	2.500381
	(-0.509084)	(61.22689)			
Old Mutual Industrial Fund A	-0.000532	1.012053***	0.972045	470.8019	2.433434
	(-1.959265)	(60.14403)			
Sanlam Industrial Fund A	-0.000287	0.966068***	0.973481	546.1999	2.529360
	(-1.240376)	(65.82334)			
Stanlib Industrial Fund R Class	-0.000222	1.005677***	0.961734	454.4271	2.467503
	(-0.698501)	(51.13511)			
Stanlib Industrial Fund A Class	-0.000102	1.001937***	0.961461	518.8863	2.395182
	(-0.349436)	(54.26637)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively					

Source: Author's own. Constructed based on the CAPM regressions' results.

TABLE 4-19 CONTINUED:

LARGE CAP	MARKET BENCHMARK : JSE TOP 40				
	ALPHA (α)	MARKET (β)	$ADJ.R^2$	LOG L.	D-W Stat.
Absa Large Cap Fund	0.000540**	1.046522***	0.968814	526.6617	2.441205
	(1.992384)	(60.55334)			
ABSA Large Cap Fund B Class	0.000159	1.057202***	0.983585	304.4646	2.465285
	(0.676235)	(60.46668)			
Momentum Top 40 Index Fund	-0.000117	1.058317***	0.980463	486.1246	2.015471
	(-0.502083)	(72.25164)			
Old Mutual Top 40 Fund A	-0.000126	1.040219***	0.984677	570.6203	2.356809
	(-0.674447)	(87.08489)			
Prescient Equity Top 40 A1	-0.000372	1.047369***	0.963339	341.1518	2.128575
	(-0.977808)	(45.28338)			
Stanlib ALSI 40 Fund Class A	-2.04E-05	1.067296***	0.978272	546.3984	2.161725
	(-0.088914)	(72.89605)			
RESOURCES	**MARKET BENCHMARK : RESOURCE 10**				
Investec Commodity Fund Class R	0.000359	0.967734***	0.965944	458.9815	2.312826
	(1.189458)	(54.32124)			
Momentum Resources Fund A	1.89E-05	1.027820***	0.965225	451.5205	2.251705
	(0.058400)	(53.73669)			
Nedgroup Investment Mining & Resource R	0.000356*	0.990353***	0.984989	500.5812	2.484437
	(1.753352)	(82.61632)			
Old Mutual Mining & Resources Fund R	8.42E-05	0.931658***	0.942365	434.0643	2.432083
	(0.220213)	(41.24858)			
Old Mutual Gold Fund R	-0.000742	0.961532***	0.743081	339.9526	2.311383
	(-0.792157)	(17.37231)			
Stanlib Resources Fund R Class	-0.000259	0.979391***	0.965801	457.4969	2.423377
	(-0.846521)	(54.20376)			
SMALL CAP	**MARKET BENCHMARK : SMALL CAP INDEX**				
Coronation Smaller Companies Fund	-0.000421*	1.006156***	0.977350	485.3922	1.984745
	(-1.788168)	(66.99709)			
Investec Emerging Companies R	-5.94E-05	1.028898***	0.945592	435.3202	1.897120
	(-0.156493)	(42.52641)			
Momentum Small Mid-Cap A	3.29E-05	1.002024***	0.941692	495.5291	1.837567
	(0.093336)	(43.66634)			
Nedgroup Investment Entrepreneur Fund R	0.000275	1.025493***	0.948134	438.3199	1.952539
	(0.745434)	(43.61401)			
Old Mutual Mid & Small-Cap Fund R	-0.000185	1.036539***	0.970603	468.2198	1.867246
	(-0.667199)	(58.60693)			
Stanlib Small Cap Fund A Class	-0.001496**	1.028018***	0.854604	363.2205	0.929452
	(-2.230507)	(24.26473)			
VALUE	**MARKET BENCHMARK : VALUE INDEX**				
Cadiz Mastermind Fund Class A	-0.000333	1.007557***	0.941772	426.5416	1.718983
	(-0.806405)	(41.02557)			
Element Islamic Equity Fund A	-0.000524	0.951242***	0.924690	421.6026	2.448857
	(-1.168318)	(35.91980)			
Investec Value Fund Class R	-0.000545	0.918888***	0.875039	392.3054	2.019020
	(-0.951898)	(27.00487)			
Stanlib Value Fund A Class	-0.000672*	0.936479***	0.938666	490.4054	2.259540
	(-1.817619)	(42.50747)			
Momentum Value Fund A	-0.001069**	0.986213***	0.933355	421.2346	2.106437
	(-2.459381)	(38.17731)			
Nedgroup Investments Value Fund A	-0.000681*	0.900839***	0.923127	480.6024	2.184158
	(-1.696462)	(37.65631)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively					

Source: Author's own. Constructed based on the CAPM regressions' results

A comparison of the R^2 values, over the full sample of 42 funds, shows the style model to have, on average, higher adjusted R-squared values than those from the CAPM. In terms of goodness of fit, the style model is found to be more appropriate for measuring superior performance. For funds that give additional weight to certain sectors, in order to pursue exceptional returns, a benchmark consisting of at least the Industrial, Financial and the Mining indices is, therefore, observed to be preferable to the JSE ALSI from the study's results.

TABLE 4- 20: CAPM analysis using equity styles benchmarks

CAPM RESULTS 4 - ALPHAS FROM SPECIFIC EQUITY STYLES MARKET BENCHMARKS			
CONSISTENT FUNDS	**ALPHAS**	**DRIFTERS**	**ALPHAS**
Coronation Financial Fund	-0.000121	Sanlam Financial Fund B1	-0.000397
Momentum Financials Fund A	0.000140 #	Stanlib Industrial Fund R Class	-0.000222
Nedgroup Investments Financials Fund A	-0.000128	ABSA Large Cap Fund B Class	0.000159 #
Sanlam Financial Fund	-0.000160	Prescient Equity Top 40 A1	-0.000372
ABSA Select Equity Fund	0.000675 #	Investec Commodity Fund Class R	0.000359 #
FNB Momentum Growth Fund A	-0.000615	Momentum Resources Fund A	1.89E-05 #
Foord Equity Fund	-0.000294	Old Mutual Gold Fund R	-0.000742
Investec Growth Fund Class A	-0.000747	Stanlib Resources Fund R Class	-0.000259
Nedgroup Investments Growth Fund A	-0.000523	Investec Emerging Companies R	-5.94E-05
Marriot Dividend Growth Fund Class R	-0.000527	Momentum Small Mid-Cap A	3.29E-05 #
Old Mutual Growth Fund R	-0.000595	Nedgroup Investment Entrepreneur Fund R	0.000275 #
Coronation Industrials Fund Class A	-0.000306	Stanlib Small Cap Fund A Class	-0.001496
Momentum Industrial Fund A	-0.000134	Cadiz Mastermind Fund Class A	-0.000333
Old Mutual Industrial Fund A	-0.000532	Element Islamic Equity Fund A	-0.000524
Sanlam Industrial Fund A	-0.000287	Investec Value Fund Class R	-0.000545
Stanlib Industrial Fund A Class	-0.000102	Momentum Value Fund A	-0.001069
Absa Large Cap Fund	0.000540 #**		
Momentum Top 40 Index Fund	-0.000117	# Positive alphas = 5	
Old Mutual Top 40 Fund A	-0.000126	*Positive statistically significant alphas = 0	
Stanlib ALSI 40 Fund Class A	-2.04E-05		
Nedgroup Investment Mining & Resource R	0.000356 #		
Old Mutual Mining & Resources Fund R	8.42E-05 #		
Coronation Smaller Companies Fund	-0.000421		
Old Mutual Mid & Small-Cap Fund R	-0.000185		
Stanlib Value Fund A Class	-0.000672		
Nedgroup Investments Value Fund A	-0.000681		
# Positive alphas = 5			
*Positive statistically significant alphas = 1			

Source: Author's own. Constructed based on the CAPM regressions' results.

Table 4-20, above, validates the study's finding so far - that consistent funds exhibit better performance as compared to drifters. Although both sets of funds had the

same number of positive alphas, only the consistent funds recorded a statistically significant alpha compared to none from the drifters. Therefore, from the CAPM model, the study observes that consistent funds outperform the drifting funds on a risk adjusted level using either the ALSI or the equity style indices to proxy the market. However, the study notes that the number of positive alphas decreases within the consistent funds when equity style indices are used. The alphas decreased from 8 to 5 (an 11.5% decrease), which may exhibit a stricter performance measure imposed by style benchmarks than the ALSI benchmark.

4.2.2 Fama- French 3 Factor (FF3F) Model Results

Still on the measurement of performance, which is the second objective of the study, the study presents the results of the Fama-French 3 factor model commencing with results obtained using the JSE ALSI as the market benchmark index similar to that done for the CAPM analysis. Table 4-21 presents the results of the intercepts obtained from the regressions, whereas Table 4-22 analyses the performance of the consistent funds against the drifting funds. When observing Table 4-21, it is noted that the Financials funds exhibit average performance, that is, half the funds produced negative alphas, whereas the other half are positive. However, none of the positive alphas are significant at all the levels.

The Financial funds show a high level of sensitivity to variations in returns of small capitalisation stocks, as compared to large capitalisation stocks. This is shown by the betas of the size factor (SMB) which are positively statistically significant at all levels for all the funds, except for one fund. Returns of the funds also show a positive correlation with variations in high book-to-market stocks' returns compared to the low book-to-market ones. The returns of the financials funds show a higher sensitivity to movements in the returns of value stocks than those of growth stocks.

The Financial funds' betas for the value factor (HML) are all positive and statistically significant, at 1 percent and 5 percent significance levels. Compared to the CAPM ALSI model, the FF3F ALSI model shows better explanatory power, as observed with the relatively higher R^2 values and higher log likelihood values. Growth funds underperformed the market benchmark on a risk-adjusted basis as they all possess negative alphas over the evaluation period. The funds show sensitivity to variations in small capitalisation stocks compared to large caps as observed by the positive

significant size betas. This is rather strange as the opposite was expected, the reasoning being that growth stocks are domiciled under large caps as shown by the Sharpe (1992) model, illustrated by Figure 3-1, in the methodology section. All the coefficients for the size factor are positive and significant. These funds' returns also show positive correlations with value stocks, as seen by the coefficients on the value premium. The researcher is not surprised by this finding, since South African stocks have been found to sometimes overlap between different indices like value, growth and large caps. Standard Bank and Anglo American stocks are examples of such phenomena and literature attributes this to the fledgling nature of the JSE market, as there are no clear demarcations between some of the indices (Hodnett et al., 2012).

Industrials funds exhibit positive alphas against the ALSI, but none of those alphas are significant. The returns of these funds also show sensitivity towards variations in small stocks' returns. However, the study obtains mixed results in terms of the value premium, as two of the funds exhibit negative coefficients (Coronation Industrial Fund and Sanlam Industrial Fund). All the other value betas are positive although none are significant. Three large caps funds managed to outperform the ALSI, although only one fund exhibits significant outperformance (ABSA Large Cap Fund).

As expected, the large caps are more sensitive to variations in returns of big stocks than small stocks, as observed by the negative statistically significant coefficients towards small stocks in the size factor. The Large Caps have mixed results in terms of the value premium as both value and growth stocks are part of the large caps. 4 out of 6 (67 percent) of the value coefficients (betas) are positive, although only two of these are significant. The Resources Funds, Small Cap funds and Value funds performances are all shown in the last part of Table 4-21, and similar analysis also applies to them.

TABLE 4-21: Fama-French results from JSE ALSI benchmark index

FAMA - FRENCH RESULTS 1 - ALL SHARE INDEX MARKET BENCHMARK							
FUNDS SECTORS							
	MARKET BENCHMARK : JSE ALSI						
FINANCIALS	**ALPHA (α)**	**MARKET (β)**	**SMB**	**HML**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Coronation Financial Fund	-0.000204	1.011548***	0.668980***	0.216004***	0.960550	455.5053	2.282596
	(-0.644678)	(49.80139)	(8.494378)	(2.832024)			
Momentum Financials Fund A	0.000198	1.073696***	0.362094***	0.621531***	0.908724	400.7865	2.117672
	(0.370938)	(31.39149)	(2.730333)	(4.839212)			
Nedgroup Investments Financials Fund A	-0.000219	1.024959***	0.572840***	0.233341***	0.971714	472.2833	2.070975
	(-0.812104)	(59.20488)	(8.533904)	(3.589410)			
Sanlam Financial Fund	-0.000385	1.005888***	0.538385***	0.240687***	0.967396	531.8793	2.237538
	(-1.471810)	(58.49329)	(8.334912)	(3.811709)			
Sanlam Financial Fund B1	1.40E-05	0.983840***	0.264987**	0.237756**	0.959950	284.7712	2.268566
	(0.042193)	(37.31780)	(2.639606)	(2.344953)			
ABSA Select Equity Fund	0.000352	1.033430***	0.079657	0.217280***	0.977025	549.3188	2.098408
	(1.554473)	(69.57988)	(1.427829)	(3.984112)			
GROWTH	**MARKET BENCHMARK : JSE ALSI**						
FNB Momentum Growth Fund A	-0.000224	1.024311***	0.164598***	0.133472**	0.978711	487.5336	2.438211
	(-0.960308)	(68.41638)	(2.835406)	(2.374103)			
Foord Equity Fund	-6.70E-05	0.993768***	0.438244***	0.039221	0.986537	587.8369	2.489064
	(-0.409408)	(92.48271)	(10.85782)	(0.994030)			
Investec Growth Fund Class A	-0.000495**	0.997745***	0.282067***	0.017538	0.979812	548.0519	2.013593
	(-2.406005)	(74.08888)	(5.537933)	0.349238			
Nedgroup Investments Growth Fund A	-0.000277	1.010384***	0.382982***	0.104866**	0.984135	575.6881	2.126418
	(-1.530247)	(84.90328)	(8.567761)	(2.399848)			
Marriot Dividend Growth Fund Class R	-0.000290	0.989997***	0.752840***	0.041732	0.968260	470.0903	1.630256
	(-1.051657)	(56.00341)	(10.98365)	(0.628680)***			
Old Mutual Growth Fund R	-0.000226	1.013598***	0.258422***	0.214550	0.982499	499.1912	2.114942
	(-1.080908)	(75.65046)	(4.974371)	(4.264384)			
INDUSTRIALS	**MARKET BENCHMARK : JSE ALSI**						
Coronation Industrials Fund Class A	0.000191	1.012170***	0.763532***	-0.020393	0.980679	494.6903	2.024012
	(0.873498)	(72.37402)	(14.08056)	(-0.388322)			
Momentum Industrial Fund A	0.000401	1.018494***	0.501970***	0.019709	0.956490	450.2277	2.432862
	(1.204456)	(47.68528)	(6.061318)	(0.245738)			
Old Mutual Industrial Fund A	3.38E-05	1.030023***	0.520948***	0.090121	0.951181	442.5607	2.431256
	(0.094217)	(44.82921)	(5.847525)	(1.044528)			
Sanlam Industrial Fund A	4.05E-05	0.994696***	0.624956***	-0.057363	0.977699	557.5323	2.254858
	(0.191726)	(71.75768)	(12.00269)	(-1.126992)			
Stanlib Industrial Fund R Class	0.000330	1.030414***	0.620818***	0.084343	0.954476	446.3390	2.529512
	(0.953781)	(46.48936)	(7.223869)	(1.013384)			
Stanlib Industrial Fund A Class	0.000260	1.024055***	0.623478***	0.069068	0.957203	513.6764	2.492202
	(0.850840)	(51.10313)	(8.283173)	(0.938664)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively							

Source: Author's own. Constructed based on the FF3F regressions' results.

TABLE 4-21 CONTINUED:

LARGE CAP	**MARKET BENCHMARK : JSE ALSI**						
	ALPHA (α)	**MARKET (β)**	**SMB**	**HML**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Absa Large Cap Fund	0.000567**	1.027785***	-0.421630***	0.003199	0.973812	538.0799	2.334739
	(2.282064)	(62.96338)	(-6.876519)	(0.053378)			
ABSA Large Cap Fund B Class	0.000237	1.031215***	-0.368922***	-0.082840	0.985702	309.7951	2.376566
	(1.069903)	(58.56353)	(-5.502186)	(-1.223287)			
Momentum Top 40 Index Fund	-8.60E-05	1.040855***	-0.446692***	0.103988**	0.983972	497.5455	1.967462
	(-0.404993)	(76.47672)	(-8.464681)	(2.034712)			
Old Mutual Top 40 Fund A	-0.000123	1.033547***	-0.261907***	0.077108**	0.984518	571.0325	2.390939
	(-0.651343)	(83.51751)	(-5.634374)	(1.696899)			
Prescient Equity Top 40 A1	-0.000173	1.022882***	-0.413222***	-0.093506	0.967935	347.4827	2.111034
	(-0.478597)	(44.80452)	(-4.760323)	(-1.103122)			
Stanlib ALSI 40 Fund Class A	6.24E-06	1.049250***	-0.422026***	0.048289	0.982061	558.8260	2.115431
	(0.029899)	(76.52056)	(-8.193891)	(0.959087)			
RESOURCES	**MARKET BENCHMARK : JSE ALSI**						
Investec Commodity Fund Class R	-0.000448	0.982689***	-0.481039***	-0.043791	0.926248	419.4444	1.750378
	(-1.002419)	(34.31768)	(-4.332575)	(-0.407253)			
Momentum Resources Fund A	-0.000789*	1.043858***	-0.601539***	0.168445	0.930545	416.2320	1.741168
	(-1.712726)	(35.35546)	(-5.254632)	(1.519335)			
Nedgroup Investment Mining & Resource R	-0.000462	1.010954***	-0.513650***	0.026502	0.954277	443.1333	2.046167
	(-1.295415)	(44.23989)	(-5.797133)	(0.308845)			
Old Mutual Mining & Resources Fund R	-0.000737**	0.989373***	-0.239059**	0.053748	0.946468	438.9713	1.864425
	(-1.988525)	(41.61289)	(-2.593202)	(0.602020)			
Old Mutual Gold Fund R	-0.001632	0.980244***	-0.035583	-0.421629*	0.682458	329.8600	2.335862
	(-1.557125)	(14.58488)	(-0.136544)	(-1.670630)			
Stanlib Resources Fund R Class	-0.001079**	1.009653***	-0.423611***	0.042034	0.938901	428.0602	1.784566
	(-2.621860)	(38.27456)	(-4.141610)	(0.424344)			
SMALL CAP	**MARKET BENCHMARK : JSE ALSI**						
Coronation Smaller Companies Fund	-0.000435*	1.004570***	0.933706***	-0.004771	0.977270	486.2365	2.011725
	(-1.840059)	(66.27408)	(15.88681)	(-0.083819)			
Investec Emerging Companies R	-5.61E-05	1.032522***	0.646406***	0.125425	0.949755	440.5280	1.956913
	(-0.153586)	(44.07639)	(7.116644)	(1.425839)			
Momentum Small Mid-Cap A	6.31E-06	1.006617***	0.596928***	0.124176	0.948182	503.5760	1.884249
	(0.018994)	(46.14525)	(7.285105)	(1.550279)			
Nedgroup Investment Entrepreneur Fund R	0.000272	1.031418***	0.600984***	0.116693	0.955319	447.1772	1.946196
	(0.792257)	(46.90761)	(7.049122)	(1.413303)			
Old Mutual Mid & Small-Cap Fund R	-0.000194	1.038720***	0.788292***	0.057047	0.972467	472.6885	1.730987
	(-0.719845)	(60.23179)	(11.78901)	(0.880936)			
Stanlib Small Cap Fund A Class	-0.001497**	1.024789***	0.805600***	0.144514	0.851780	363.2796	0.878441
	(-2.209028)	(23.76329)	(4.769906)	(0.877235)			
VALUE	**MARKET BENCHMARK : JSE ALSI**						
Cadiz Mastermind Fund Class A	3.39E-05	1.054476***	0.016131	0.421103***	0.922409	412.4987	1.712249
	(0.071145)	(34.46755)	(0.135984)	(3.665583)			
Element Islamic Equity Fund A	-0.000283	1.020707***	-0.083320	0.034103	0.948988	443.2781	2.284412
	(-0.766381)	(43.21311)	(-0.908575)	(0.383898)			
Investec Value Fund Class R	-0.000329	1.007650***	0.492419***	0.169032	0.915572	413.9197	1.871556
	(-0.698844)	(33.38575)	(4.207750)	(1.491423)			
Stanlib Value Fund A Class	-0.000287	1.028087***	0.289781***	0.173281**	0.961687	519.4297	2.110890
	(-0.985539)	(53.84568)	(4.040568)	(2.471618)			
Momentum Value Fund A	-0.000783*	1.046221***	-0.102655	0.204427**	0.941249	428.8830	1.832657
	(-1.918305)	(39.97284)	(-1.011547)	(2.079991)			
Nedgroup Investments Value Fund A	-0.000361	1.009750***	0.442582***	0.069200	0.976870	553.0899	2.449642
	(-1.645836)	(70.17448)	(8.188616)	(1.309736)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively							

Source: Author's own. Constructed based on the FF3F regressions' results.

The analysis of the performances of the consistent funds against the drifters, with the ALSI employed as the market benchmark, follows in Table 4-22. For the consistent funds, 9 out of 26 (34.6 percent) funds produced positive alphas, although only one of these was statistically significant. With respect to the drifters, 6 out of 16 (37.5 percent) funds produced positive alphas, however, not even a single one of those was statistically significant.

TABLE 4- 22: Fama-French analysis using JSE ALSI benchmark

FAMA - FRENCH RESULTS 2 - ALPHAS FROM ALL SHARE INDEX MARKET BENCHMARK			
CONSISTENT FUNDS	**ALPHAS**	**DRIFTERS**	**ALPHAS**
Coronation Financial Fund	-0.000204	Sanlam Financial Fund B1	1.40E-05 #
Momentum Financials Fund A	0.000198 #	Stanlib Industrial Fund R Class	0.000330 #
Nedgroup Investments Financials Fund A	-0.000219	ABSA Large Cap Fund B Class	0.000237 #
Sanlam Financial Fund	-0.000385	Prescient Equity Top 40 A1	-0.000173
ABSA Select Equity Fund	0.000352 #	Investec Commodity Fund Class R	-0.000448
FNB Momentum Growth Fund A	-0.000224	Momentum Resources Fund A	-0.000789*
Foord Equity Fund	-6.70E-05	Old Mutual Gold Fund R	-0.001632
Investec Growth Fund Class A	-0.000495**	Stanlib Resources Fund R Class	-0.001079**
Nedgroup Investments Growth Fund A	-0.000277	Investec Emerging Companies R	-5.61E-05
Marriot Dividend Growth Fund Class R	-0.000290	Momentum Small Mid-Cap A	6.31E-06 #
Old Mutual Growth Fund R	-0.000226	Nedgroup Investment Entrepreneur Fund R	0.000272 #
Coronation Industrials Fund Class A	0.000191 #	Stanlib Small Cap Fund A Class	-0.001497**
Momentum Industrial Fund A	0.000401 #	Cadiz Mastermind Fund Class A	3.39E-05 #
Old Mutual Industrial Fund A	3.38E-05 #	Element Islamic Equity Fund A	-0.000283
Sanlam Industrial Fund A	4.05E-05 #	Investec Value Fund Class R	-0.000329
Stanlib Industrial Fund A Class	0.000260 #	Momentum Value Fund A	-0.000783*
Absa Large Cap Fund	0.000567 #**		
Momentum Top 40 Index Fund	-8.60E-05	# Positive alphas = 6	
Old Mutual Top 40 Fund A	-0.000123	*Positive statistically significant alphas = 0	
Stanlib ALSI 40 Fund Class A	6.24E-06 #		
Nedgroup Investment Mining & Resource R	-0.000462		
Old Mutual Mining & Resources Fund R	-0.000737**		
Coronation Smaller Companies Fund	-0.000435*		
Old Mutual Mid & Small-Cap Fund R	-0.000194		
Stanlib Value Fund A Class	-0.000287		
Nedgroup Investments Value Fund A	-0.000361		
# Positive alphas = 9			
*Positive statistically significant alphas = 1			

Source: Author's own. Constructed based on the FF3F regressions' results.

The study analysed the performances with the FF3F model again. However, this time, employing the relevant equity style indices as the market benchmark. The study's aim was to check whether there is an improvement in the performances of the funds if the relevant sector indices are employed, as literature suggests. If found

to hold, this will validate the claim that style investing indeed has some effects on the performances of unit trusts in South Africa. Table 4-25 presents these results which are interpreted similarly to the ones in Table 4-23.

Worth noting is the increase in the value of the R^2 and Log Likelihood, which implies that the style model performs much better relative to the market (JSE ALSI) model in explaining the variations in the returns of the funds. It is observed that the style model properly mirrors the true performance of the funds as compared to the general market model. For example, the Resources funds produce 4 positive alphas, with one of those alphas being significant, whereas they produced all negative alpha values when measured against the ALSI benchmark. Table 4-24 offers the analysis of the consistent funds against the drifters from their performances using the FF3F style benchmark model.

TABLE 4-23: Fama-French results from equity style benchmarks

	FAMA - FRENCH RESULTS 3 - SPECIFIC EQUITY STYLE INDICES MARKET BENCHMARKS						
FUNDS SECTORS							
	MARKET BENCHMARK : FINANCIALS 15						
FINANCIALS	**ALPHA (α)**	**MARKET (β)**	**SMB**	**HML**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Coronation Financial Fund	-0.000140	0.985262***	0.215702***	-0.079953	0.979053	488.7392	2.497633
	(-0.607305)	(68.99373)	(3.813732)	(-1.426243)			
Momentum Financials Fund A	0.000225	1.070297***	-0.112603	0.292916***	0.968759	457.0749	1.894268
	(0.720892)	(55.43634)	(-1.472573)	(3.864844)			
Nedgroup Investments Financials Fund A	-0.000144	0.992334***	0.111981*	-0.063001	0.978494	486.6700	2.609041
	(-0.613119)	(68.13303)	(1.941245)	(-1.101907)			
Sanlam Financial Fund	-0.000163	0.983819***	0.082872*	-0.042339	0.980302	561.8631	2.399338
	(-0.801864)	(75.75353)	(1.679240)	(-0.854570)			
Sanlam Financial Fund B1	-0.000423**	1.001355***	0.054442	-0.041045	0.984925	315.0612	2.410447
	(-2.067077)	(61.61092)	(0.895093)	(-0.663516)			
ABSA Select Equity Fund	0.000656	0.978189***	-0.398295***	-0.053389	0.927751	481.1499	2.437900
	(1.638483)	(38.22480)	(-4.095869)	(-0.546891)			
GROWTH	**MARKET BENCHMARK : GROWTH INDEX**						
FNB Momentum Growth Fund A	-0.000637***	0.986706***	0.470542***	0.521290***	0.977922	485.6233	2.543327
	(-2.668458)	(67.15605)	(7.827800)	(9.128108)			
Foord Equity Fund	-0.000551**	0.941946***	0.739274***	0.410889***	0.972023	544.3181	2.291911
	(-2.321091)	(63.68936)	(12.45951)	(7.251439)			
Investec Growth Fund Class A	-0.000978***	0.947802***	0.589330***	0.387794***	0.970961	526.9663	2.062699
	(-3.940168)	(61.49772)	(9.460264)	(6.464591)			
Nedgroup Investments Growth Fund A	-0.000777***	0.960236***	0.691874***	0.482887***	0.974929	548.4593	2.305629
	(-3.391034)	(67.22528)	(12.07357)	(8.823867)			
Marriot Dividend Growth Fund Class R	-0.000661*	0.941256***	1.035636***	0.415326***	0.942036	438.4722	1.601793
	(-1.769698)	(40.88666)	(10.99575)	(4.641588)			
Old Mutual Growth Fund R	-0.000623**	0.971350***	0.555925***	0.597811***	0.971510	473.6086	2.390762
	(-2.328921)	(58.96288)	(8.248280)	(9.336224)			
INDUSTRIALS	**MARKET BENCHMARK : INDUSTRIAL 25**						
Coronation Industrials Fund Class A	-0.000311	0.984145***	0.385410***	0.018916	0.981952	498.2699	2.506917
	(-1.469129)	(74.93146)	(7.450316)	(0.372969)			
Momentum Industrial Fund A	-0.000123	0.998881***	0.124401**	0.057109	0.974819	478.9410	2.563744
	(-0.482334)	(63.26624)	(2.000453)	(0.936680)			
Old Mutual Industrial Fund A	-0.000504**	1.013717***	0.140303**	0.127059**	0.976283	480.4629	2.434555
	(-2.010179)	(65.14335)	(2.289117)	(2.114387)			
Sanlam Industrial Fund A	-0.000299	0.972574***	0.266788***	-0.015648	0.979829	563.5058	2.581417
	(-1.482580)	(75.53213)	(5.468097)	(-0.323563)			
Stanlib Industrial Fund R Class	-0.000197	1.009163***	0.238352***	0.122535*	0.969937	468.1242	2.386523
	(-0.699183)	(57.66066)	(3.457673)	(1.813035)			
Stanlib Industrial Fund A Class	-0.000107	1.007245***	0.257130***	0.110303*	0.970915	536.6593	2.352494
	(-0.423140)	(62.42618)	(4.205772)	(1.820153)			
LARGE CAP	**MARKET BENCHMARK : JSE TOP 40**						
Absa Large Cap Fund	0.000582**	1.027055***	-0.286285***	0.021078	0.974514	539.6980	2.420007
	(2.371601)	(63.85020)	(-4.697427)	(0.356616)			
ABSA Large Cap Fund B Class	0.000247	1.030706***	-0.229044***	-0.048888	0.987141	313.0837	2.415862
	(1.177453)	(61.80616)	(-3.569587)	(-0.760508)			
Momentum Top 40 Index Fund	-6.53E-05	1.040973***	-0.306508***	0.121016**	0.985451	502.6295	1.993590
	(-0.322791)	(80.33471)	(-6.054926)	(2.486173)			
Old Mutual Top 40 Fund A	-0.000109	1.032934***	-0.125697***	0.095050**	0.985467	574.7982	2.460865
	(-0.595777)	(86.24625)	(-2.770040)	(2.159874)			
Prescient Equity Top 40 A1	-0.000136	1.021825***	-0.270893***	-0.072707	0.968843	348.6179	2.126933
	(-0.382038)	(45.47703)	(-3.132717)	(-0.870469)			
Stanlib ALSI 40 Fund Class A	2.03E-05	1.048675***	-0.283705***	0.066489	0.983068	562.2634	2.176020
	(0.100200)	(78.80654)	(-5.627051)	(1.359816)			
	t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively						

Source: Author's own. Constructed based on the FF3F regressions' results.

TABLE 4-23 CONTINUED:

RESOURCES	MARKET BENCHMARK : RESOURCE 10						
	ALPHA (α)	MARKET (β)	SMB	HML	$ADJ.R^2$	LOG L.	D-W Stat.
Investec Commodity Fund Class R	0.000346	0.990076***	0.214178***	0.014043	0.968888	464.7584	2.253722
	(1.198791)	(54.13165)	(2.840551)	(0.201304)			
Momentum Resources Fund A	5.52E-05	1.051015***	0.135987*	0.230031***	0.971983	463.8950	1.898817
	(0.189721)	(56.99287)	(1.788769)	(3.270545)			
Nedgroup Investment Mining & Resource R	0.000359**	1.013697***	0.194761***	0.087078**	0.989361	519.6809	2.293950
	(2.099189)	(93.50998)	(4.358109)	(2.106112)			
Old Mutual Mining & Resources Fund R	7.59E-05	0.980952***	0.438675***	0.115500	0.961569	456.3699	2.112757
	(0.242617)	(49.51476)	(5.371252)	(1.528589)			
Old Mutual Gold Fund R	-0.000867	1.017567***	0.699860***	-0.370599*	0.758844	344.3062	2.357910
	(-0.952955)	(17.66603)	(2.947355)	(-1.686948)			
Stanlib Resources Fund R Class	-0.000259	1.012429***	0.283940***	0.102524	0.974059	473.0363	2.030721
	(-0.969530)	(59.89439)	(4.074677)	(1.590263)			
SMALL CAP	**MARKET BENCHMARK : SMALL CAP INDEX**						
Coronation Smaller Companies Fund	-0.000414*	1.003935***	0.064440	0.011863	0.977370	486.4679	2.005560
	(-1.754375)	(66.42367)	(1.116409)	(0.208950)			
Investec Emerging Companies R	-3.29E-05	1.031059***	-0.246916***	0.142737	0.948335	439.0656	2.012424
	(-0.088912)	(43.43486)	(-2.723667)	(1.600726)			
Momentum Small Mid-Cap A	2.40E-05	1.004372***	-0.276240***	0.142153*	0.946008	501.1307	1.945164
	(0.070798)	(45.15545)	(-3.369367)	(1.739331)			
Nedgroup Investment Entrepreneur Fund R	0.000296	1.029196***	-0.291259***	0.134190	0.952454	443.9147	2.025886
	(0.837197)	(45.40561)	(-3.364658)	(1.576001)			
Old Mutual Mid & Small-Cap Fund R	-0.000170	1.037145***	-0.110376	0.074492	0.970817	469.6335	1.857298
	(-0.614458)	(58.45578)	(-1.628966)	(1.117688)			
Stanlib Small Cap Fund A Class	-0.001482**	1.024698***	-0.082509	0.163255	0.853111	363.7352	0.907727
	(-2.196519)	(23.88914)	(-0.498616)	(0.995840)			
VALUE	**MARKET BENCHMARK : VALUE INDEX**						
Cadiz Mastermind Fund Class A	-0.000421	1.029753***	0.345641***	-0.208020**	0.946970	432.4794	1.842173
	(-1.063831)	(42.24936)	(3.466225)	(-2.139811)			
Element Islamic Equity Fund A	-0.000697*	0.979724***	0.220759**	-0.561934***	0.942986	437.3831	2.372751
	(-1.780596)	(40.74392)	(2.237331)	(-5.837096)			
Investec Value Fund Class R	-0.000729	0.967853***	0.790470***	-0.417590***	0.909454	410.2475	1.890774
	(-1.489614)	(32.13230)	(6.414480)	(-3.475891)			
Stanlib Value Fund A Class	-0.000809***	0.981518***	0.609047***	-0.423351***	0.961497	519.1342	2.366548
	(-2.759375)	(53.70686)	(8.306850)	(-5.870707)			
Momentum Value Fund A	-0.001206***	1.008418***	0.210464**	-0.407817***	0.941624	429.2186	2.052940
	(-2.953325)	(40.10884)	(2.046077)	(-4.066762)			
Nedgroup Investments Value Fund A	-0.000848***	0.955754***	0.746961***	-0.508980***	0.959781	520.1729	2.291867
	(-2.917374)	(52.75555)	(10.27720)	(-7.120031)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively							

Source: Author's own. Constructed based on the FF3F regressions' results

As noted previously, once the style benchmarks are employed, the number of positive alphas produced declines. The study purports style investing to mirror the true reflection of the funds' performance, not inflated ones. From Table 4-24, both sets of funds produce the same number of positive alphas, but it is the consistent funds that exhibit superior performance with two statistically significant alphas to

their name. However, the study has noted that the funds, on average, underperform their market benchmarks with the models employed so far, which leads to the impression that the investor is better off investing in an index fund rather than active management. With that mentioned, the study forms the opinion that when investing in the style indices, the models yield more explanatory power with respect to the variations in the returns series of the funds.

TABLE 4- 24: Fama-French analysis using equity style benchmarks

FAMA - FRENCH RESULTS 4 - ALPHAS FROM SPECIFIC EQUITY STYLES MARKET BENCHMARKS			
CONSISTENT FUNDS	**ALPHAS**	**DRIFTERS**	**ALPHAS**
Coronation Financial Fund	-0.000140	Sanlam Financial Fund B1	-0.000423
Momentum Financials Fund A	0.000225 #	Stanlib Industrial Fund R Class	-0.000197
Nedgroup Investments Financials Fund A	-0.000144	ABSA Large Cap Fund B Class	0.000247 #
Sanlam Financial Fund	-0.000163	Prescient Equity Top 40 A1	-0.000136
ABSA Select Equity Fund	0.000656 #	Investec Commodity Fund Class R	0.000346 #
FNB Momentum Growth Fund A	-0.000637	Momentum Resources Fund A	5.52E-05 #
Foord Equity Fund	-0.000551	Old Mutual Gold Fund R	-0.000867
Investec Growth Fund Class A	-0.000978	Stanlib Resources Fund R Class	-0.000259
Nedgroup Investments Growth Fund A	-0.000777	Investec Emerging Companies R	-3.29E-05
Marriot Dividend Growth Fund Class R	-0.000661	Momentum Small Mid-Cap A	2.40E-05 #
Old Mutual Growth Fund R	-0.000623	Nedgroup Investment Entrepreneur Fund R	0.000296 #
Coronation Industrials Fund Class A	-0.000311	Stanlib Small Cap Fund A Class	-0.001482
Momentum Industrial Fund A	-0.000123	Cadiz Mastermind Fund Class A	-0.000421
Old Mutual Industrial Fund A	-0.000504	Element Islamic Equity Fund A	-0.000697
Sanlam Industrial Fund A	-0.000299	Investec Value Fund Class R	-0.000729
Stanlib Industrial Fund A Class	-0.000107	Momentum Value Fund A	-0.001206
Absa Large Cap Fund	0.000582 #**		
Momentum Top 40 Index Fund	-6.53E-05	# Positive alphas = 5	
Old Mutual Top 40 Fund A	-0.000109	*Positive statistically significant alphas = 0	
Stanlib ALSI 40 Fund Class A	2.03E-05		
Nedgroup Investment Mining & Resource R	0.000359 #**		
Old Mutual Mining & Resources Fund R	7.59E-05 #		
Coronation Smaller Companies Fund	-0.000414		
Old Mutual Mid & Small-Cap Fund R	-0.000170		
Stanlib Value Fund A Class	-0.000809		
Nedgroup Investments Value Fund A	-0.000848		
# Positive alphas = 5			
*Positive statistically significant alphas = 2			

Source: Author's own. Constructed based on the FF3F regressions' results.

4.2.3 Sharpe Ratio Results

The Sharpe ratio is widely utilised in the unit trust industry for risk-adjusted performance measurement. The Sharpe ratios for all the portfolios or funds in the study's sample were calculated from which the mean Sharpe ratio was computed, to compare the peer-wise performances of the funds. When evaluating whether a fund outperformed the market or not, the Sharpe ratio of the fund is compared against the Sharpe ratio of the market. Therefore, the next step involved calculating the Sharpe ratios of the different market proxies used for this study, which are the style indices benchmarks and also the JSE ALSI benchmark.

In order to perform a fair analysis on each fund versus the market, the study ensured that the data points of the funds match exactly the data points of the market proxy, since not all the funds had data available for the entire evaluation period. Therefore, adjustments were made such that the exact dates of returns of the funds matches exactly those for the market. Hence, the Sharpe values under the JSE ALSI and Market in Table 4-25 sometimes differ, since these are subject to that specific fund being analysed and the length of the time period its data is available for. Table 4-25 presents the analysis of the consistent funds, whereas Table 4-26 presents the analysis of the drifters.

In analysing the results from the consistent funds in Table 4-25, it is found that only 19 percent of the funds are able to outperform both the style market proxies and the JSE ALSI benchmark. ABSA Large Cap Fund is the star performer in this group as it is the only fund that outperforms all the three benchmarks used for analysis (i.e. overall mean, style benchmark and JSE ALSI). Its Sharpe ratio is above its style market proxy, above the JSE ALSI benchmark and also above the average Sharpe ratio for all the funds in the sample. 54 percent of the funds managed to get a Sharpe ratio which is above the overall mean Sharpe ratio for the funds. Therefore, it can be seen from Table 4-25 that when utilizing the Sharpe ratio performance measure, the consistent funds underperformed the market on a huge basis, since only 19 percent of the funds were able to beat the market. These performances are contrasted with those of the drifters from Table 4-26. The performances of the consistent funds are presented in Table 4-25.

TABLE 4-25: Sharpe ratio analysis for consistent funds

SHARPE RATIOS : FOR THE FUNDS, THEIR STYLE MARKET BENCHMARKS AND THE JSE ALSI			
OVERALL FUNDS MEAN SHARPE RATIO =	0,375515455		
CONSISTENT FUNDS	**FUND**	**MARKET**	**JSE ALSI**	
Coronation Financial Fund	0,297650834	0,327326985	0,359002982	
Momentum Financials Fund A	0,348579004	0,327326985	0,359002982	*
Nedgroup Investments Financials Fund A	0,296621042	0,327326985	0,359002982	
Sanlam Financial Fund	0,466225034	0,506709322	0,560636881	#
ABSA Select Equity Fund	0,629696467	0,506709322	0,560636881	*#
FNB Momentum Growth Fund A	0,302543925	0,452486858	0,359002982	
Foord Equity Fund	0,547207032	0,655173473	0,560636881	#
Investec Growth Fund Class A	0,462949085	0,663577124	0,578138316	#
Nedgroup Investments Growth Fund A	0,49846882	0,655173473	0,560636881	#
Marriot Dividend Growth Fund Class R	0,288868407	0,452486858	0,359002982	
Old Mutual Growth Fund R	0,297973512	0,452486858	0,359002982	
Coronation Industrials Fund Class A	0,400191146	0,474112241	0,359002982	#$
Momentum Industrial Fund A	0,439184298	0,474112241	0,359002982	#$
Old Mutual Industrial Fund A	0,355717716	0,474112241	0,359002982	
Sanlam Industrial Fund A	0,570457028	0,64423464	0,560636881	#$
Stanlib Industrial Fund A Class	0,60964542	0,64423464	0,560636881	#$
Absa Large Cap Fund	0,658042368	0,553507429	0,560636881	*#$
Momentum Top 40 Index Fund	0,325604953	0,352884077	0,359002982	
Old Mutual Top 40 Fund A	0,522435626	0,553507429	0,560636881	#
Stanlib ALSI 40 Fund Class A	0,543297496	0,553507429	0,560636881	#
Nedgroup Investment Mining & Resource R	0,244660206	0,173239878	0,359002982	*
Old Mutual Mining & Resources Fund R	0,186117836	0,173239878	0,359002982	*
Coronation Smaller Companies Fund	0,260568504	0,356046956	0,359002982	
Old Mutual Mid & Small-Cap Fund R	0,311947385	0,356046956	0,359002982	
Stanlib Value Fund A Class	0,490464036	0,656241059	0,560636881	#
Nedgroup Investments Value Fund A	0,478691777	0,656241059	0,560636881	#
* Funds with Sharpe ratios which are above their relative style market benchmark = 5				19%
$ Funds with Sharpe ratios which are above the JSE ALSI benchmark = 5				19%
# Funds with Sharpe ratios which are above the overall mean Sharpe ratio = 14				54%

Source: Author's own. Constructed based on the Sharpe ratio results.

Next the study analyses the results from the drifters, which are presented in Table 4-26. It is observed that 25 percent of the funds are able to outperform both their equity style market benchmarks and the JSE ALSI benchmark. This performance is better than that of the consistent funds with only 19 percent of the funds being able to

outperform the markets. With respect to the drifters, two of the funds are standout performers as they have Sharpe ratios which are above their style market proxy, the JSE ALSI benchmark and also the overall mean Sharpe ratio for the funds. These are ABSA Large Cap Fund B Class and also Nedbank Investment Entrepreneur Fund R Class. However, the overall ratio of drifting funds which attained a Sharpe ratio above the overall mean Sharpe ratio for the funds is 38 percent. This is 16 percent lower than the ratio achieved by the consistent funds.

TABLE 4- 26: Sharpe ratio analysis for drifters

SHARPE RATIOS : FOR THE FUNDS, THEIR STYLE MARKET BENCHMARKS AND THE JSE ALSI							
		OVERALL FUNDS MEAN SHARPE RATIO =			0,375515455		
DRIFTERS				**FUND**	**MARKET**	**JSE ALSI**	
Sanlam Financial Fund B1				0,711128364	0,825857974	0,70590723	#$
Stanlib Industrial Fund R Class				0,418414247	0,474112241	0,359002982	#$
ABSA Large Cap Fund B Class				0,722818172	0,689531359	0,70590723	*#$
Prescient Equity Top 40 A1				0,821412842	0,913592019	0,946723258	#
Investec Commodity Fund Class R				0,244593315	0,173239878	0,359002982	*
Momentum Resources Fund A				0,173916755	0,173239878	0,359002982	*
Old Mutual Gold Fund R				0,013674175	0,173239878	0,359002982	
Stanlib Resources Fund R Class				0,117291728	0,173239878	0,359002982	
Investec Emerging Companies R				0,333915592	0,356046956	0,359002982	
Momentum Small Mid-Cap A				0,550569645	0,559740215	0,560636881	#
Nedgroup Investment Entrepreneur Fund R				0,404478279	0,356046956	0,359002982	*#$
Stanlib Small Cap Fund A Class				-0,679800965	0,360346744	0,379489304	
Cadiz Mastermind Fund Class A				0,330822128	0,409035621	0,359002982	
Element Islamic Equity Fund A				0,327106989	0,453139023	0,398180936	
Investec Value Fund Class R				0,268335586	0,409035621	0,359002982	
Momentum Value Fund A				0,179163285	0,409035621	0,359002982	
* Funds with Sharpe ratios which are above their relative style market benchmark = 4							25%
$ Funds with Sharpe ratios which are above the JSE ALSI benchmark = 4							25%
# Funds with Sharpe ratios which are above the overall mean Sharpe ratio = 6							38%

Source: Author's own. Constructed based on the Sharpe ratio results.

It is observed that the consistent funds outperformed the drifting funds in a peer-wise comparison, as a higher percentage of funds attained an above average Sharpe ratio compared to the drifters (that is, 54 percent for the consistent funds compared

to 38 percent for the drifters). However, on absolute risk-adjusted basis, the drifters attained a higher number of funds that outperformed both the equity style market proxies and the JSE ALSI benchmark, as 25 percent of the drifters were able to outperform the markets compared to only 19 percent from the consistent funds. The study, therefore, concludes that the drifters outperformed the consistent funds with respect to the Sharpe ratio. However, neither the consistent funds, nor the drifters, were able to outperform the market benchmarks. This finding may suggest that passive investing may be better than active investing on the observation that the fund managers, for both style consistent funds and drifting funds, are not able to outperform the markets. The study next analyses if SA fund managers are able to time the markets, or not, in search of better performances.

4.2.4 Market Timing: Treynor-Mazuy Model Results

Still on fulfilling the second objective of the study which examines performance, the study embarked on testing whether South African fund managers are able to time the markets or not. Literature documents that it is a known practice amongst fund managers to increase risk, that is, beta during bull markets and, alternatively, decrease it during bear markets (Bolton et al., 2013). The study employs the classical unconditional Treynor-Mazuy (1966) model to test whether South African fund managers are successful in timing the markets in pursuit of outperformance.

The model follows the structure of the CAPM model, however, with some convexity induced with the inclusion of a quadratic term. The coefficient on the quadratic term determines successful market timing by the manager, if it is positive statistically significant, otherwise the converse is true. Table 4-27 presents the results from the market timing regressions. It should be noted here that these regressions were performed using the equity style market benchmarks as the market proxies, since the study is only interested in finding out if the funds are able to time their specific style benchmarks. The results are presented next.

TABLE 4-27: Treynor-Mazuy model results

TREYNOR - MAZUY RESULTS 1 : MARKET TIMING MODEL						
FUNDS SECTORS						
	MARKET BENCHMARK : FINANCIALS 15					
FINANCIALS	**ALPHA (α)**	**MARKET (β)**	**Y (MARKET TIMING)**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Coronation Financial Fund	1.02E-05	0.987565***	-0.519951	0.976381	481.9198	2.429506
	(0.036187)	(62.62374)	(-0.938505)			
Momentum Financials Fund A	0.000483	1.093754***	-1.361265*	0.965500	451.3483	1.951544
	(1.283469)	(51.83759)	(-1.836406)			
Nedgroup Investments Financials Fund A	-0.000180	0.988440***	0.206770	0.977940	484.8178	2.690847
	(-0.657573)	(64.43321)	(0.383662)			
Sanlam Financial Fund	-0.000177	0.981480***	0.074417	0.979997	560.4333	2.401912
	(-0.759386)	(72.31444)	(0.153657)			
Sanlam Financial Fund B1	-0.000363	1.002783***	-0.267885	0.984990	314.6649	2.413147
	(-1.643408)	(54.92924)	(-0.378731)			
ABSA Select Equity Fund	0.000408	0.965272***	1.155723	0.912594	469.3028	2.364966
	(0.812572)	(33.06812)	(1.109556)			
GROWTH	**MARKET BENCHMARK : GROWTH INDEX**					
FNB Momentum Growth Fund A	-0.000463	0.927913***	-0.595075	0.916293	415.1379	2.223685
	(-0.874095)	(29.61476)	(-0.594677)			
Foord Equity Fund	9.88E-05	0.876888***	-1.653313	0.879435	456.8843	2.213181
	(0.177375)	(25.95170)	(-1.505543)			
Investec Growth Fund Class A	-0.000426	0.892673***	-1.346802	0.904726	457.5407	2.150158
	(-0.839952)	(28.91286)	(-1.352598)			
Nedgroup Investments Growth Fund A	-0.000297	0.884771***	-0.951362	0.881454	455.5068	2.188007
	(-0.528087)	(25.88365)	(-0.856361)			
Marriot Dividend Growth Fund Class R	-0.000263	0.845699***	-1.032053	0.797409	372.2583	1.778747
	(-0.329899)	(17.94157)	(-0.685575)			
Old Mutual Growth Fund R	-0.000417	0.902765***	-0.698834	0.886025	400.3038	2.242101
	(-0.683112)	(25.01608)	(-0.606356)			
INDUSTRIALS	**MARKET BENCHMARK : INDUSTRIAL 25**					
Coronation Industrials Fund Class A	-0.000307	0.977181***	0.006087	0.967832	467.4103	2.293209
	(-0.963262)	(52.51989)	(0.009718)			
Momentum Industrial Fund A	-0.000126	0.997363***	-0.034114	0.972735	474.2493	2.500286
	(-0.420624)	(57.21231)	(-0.058132)			
Old Mutual Industrial Fund A	-0.000487	1.013995***	-0.189548	0.971798	470.8522	2.437304
	(-1.577999)	(56.31459)	(-0.312712)			
Sanlam Industrial Fund A	-0.000420	0.959941***	0.610338	0.973550	546.8645	2.488168
	(-1.623934)	61.49570)	(1.141430)			
Stanlib Industrial Fund R Class	-0.000306	1.002064***	0.352681	0.961452	454.5547	2.467551
	(-0.848136)	(47.65098)	(0.498194)			
Stanlib Industrial Fund A Class	-0.000151	0.999657***	0.227127	0.961167	518.9442	2.394004
	(-0.462403)	(50.64719)	(0.335932)			
LARGE CAP	**MARKET BENCHMARK : JSE TOP 40**					
Absa Large Cap Fund	0.000455	1.040953***	0.403040	0.968640	526.8414	2.425862
	(1.478308)	(52.79514)	(0.592406)			
ABSA Large Cap Fund B Class	9.01E-06	1.044601***	1.015328	0.983805	305.4030	2.494442
	(0.034900)	(52.95225)	(1.346554)			
Momentum Top 40 Index Fund	-0.000247	1.050417***	0.560459	0.980461	486.6315	1.987304
	(-0.923549)	(63.04026)	(0.994812)			
Old Mutual Top 40 Fund A	-0.000102	1.041829***	-0.116534	0.984553	570.6517	2.357344
	(-0.477689)	(76.35662)	(-0.247520)			
Prescient Equity Top 40 A1	-0.000324	1.052039***	-0.248322	0.962897	341.1945	2.149772
	(-0.778606)	(37.04686)	(-0.286887)			
Stanlib ALSI 40 Fund Class A	-0.000158	1.058291***	0.651623	0.978326	547.0556	2.097784
	(-0.610094)	(63.61218)	(1.135116)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively						

Source: Author's own. Constructed based on the Treynor-Mazuy regressions' results

TABLE 4.27 CONTINUED:

RESOURCES	MARKET BENCHMARK : RESOURCE 10					
	ALPHA (α)	MARKET (β)	ϒ (MARKET TIMING)	$ADJ.R^2$	LOG L.	D-W Stat.
Investec Commodity Fund Class R	0.000255	0.962319***	0.377564	0.965716	459.1440	2.293914
	(0.720057)	(47.39725)	(0.562338)			
Momentum Resources Fund A	-0.000120	1.020574***	0.505227	0.965052	451.7731	2.248724
	(-0.315085)	(46.85885)	(0.701465)			
Nedgroup Investment Mining & Resource R	0.000278	0.986275***	0.284346	0.984901	500.7849	2.480279
	(1.165661)	(72.22115)	(0.629632)			
Old Mutual Mining & Resources Fund R	0.000107	0.932866***	-0.084253	0.941805	434.0693	2.427034
	(0.238579)	(36.18604)	(-0.098828)			
Old Mutual Gold Fund R	-0.000594	0.969260***	-0.538839	0.740732	339.9869	2.306488
	(-0.539319)	(15.34702)	(-0.257997)			
Stanlib Resources Fund R Class	-0.000238	0.980477***	-0.075704	0.965470	457.5033	2.425625
	(-0.661802)	(47.54284)	(-0.111004)			
SMALL CAP	**MARKET BENCHMARK : SMALL CAP INDEX**					
Coronation Smaller Companies Fund	-0.000443	1.005222***	0.096626	0.977135	485.4081	1.985117
	(-1.652282)	(62.84140)	(0.175854)			
Investec Emerging Companies R	0.000196	1.039601***	-1.107442	0.945902	436.1318	1.890575
	(0.456168)	(40.64780)	(-1.2605670			
Momentum Small Mid-Cap A	-4.61E-05	0.998505***	0.372055	0.941285	495.6257	1.836454
	(-0.116051)	(40.90094)	(0.434128)			
Nedgroup Investment Entrepreneur Fund R	0.000175	1.021304***	0.433479	0.947756	438.4507	1.933997
	(0.417007)	(40.82410)	(0.504433)			
Old Mutual Mid & Small-Cap Fund R	8.24E-05	1.047762***	-1.161215*	0.971252	469.9034	1.891234
	(0.265015)	(56.50891)	(-1.823230)			
Stanlib Small Cap Fund A Class	-0.001009	1.048743***	-2.079805	0.855842	364.1651	0.929937
	(-1.331466)	(23.38180)	(-1.360251)			
VALUE	**MARKET BENCHMARK : VALUE INDEX**					
Cadiz Mastermind Fund Class A	-0.000196	1.015144***	-0.538121	0.941394	426.7133	1.720765
	(-0.410117)	(36.36360)	(-0.578122)			
Element Islamic Equity Fund A	-0.000196	1.015144***	-0.538121	0.941394	426.7133	1.720765
	(-0.410117)	(36.36360)	(-0.578122)			
Investec Value Fund Class R	-0.000219	0.936911***	-1.278199	0.875026	392.8118	1.978119
	(-0.331725)	(24.30053)	(-0.994297)			
Stanlib Value Fund A Class	-0.000590	0.941282***	-0.344522	0.938222	490.4871	2.256178
	(-1.391691)	(37.39478)	(-0.399195)			
Momentum Value Fund A	-0.001304	0.973237***	0.920291	0.933283	421.6898	2.121480
	(-2.601378)	(33.23378)	(0.942511)			
Nedgroup Investments Value Fund A	-0.000592	0.906040***	-0.373157	0.922570	480.6837	2.180641
	(-1.286533)	(33.14828)	(-0.398183)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively						

Source: Author's own. Constructed based on the Treynor-Mazuy regressions' results

The study's main focus is on the market timing coefficients of the funds and, of course, their associated statistical significance. Throughout all the funds in the analysis, it is noted that not even a single fund attained a positive statistically significant market timing coefficient, which signals the inability by South African fund managers to successfully time the market. Table 4-28 analyses the consistent funds against the drifters in terms of market timing. 42 percent (11 out of 26) of the

consistent funds have positive market timing coefficients, but none is significant. 44 percent (7 out of 16) of the drifting funds have positive market timing coefficients, but none of them is significant at any level.

When reviewing the market timing results, no statistically significant conclusions can be drawn. However, this does not mean that the above technique adds no value when analysing a manager's performance. As only general equity unit trusts are examined, there is not that much room for the fund managers to manoeuvre with regard to market timing. In addition, the majority of managers themselves do not subscribe to market timing and, by their own admission, they are focussed stock selectors. The alphas from this model do not show any outperformance, either, as most of them are negative. The few that are positive are not statistically significant. This demonstrates that South African fund managers do not, on average, possess 'hot hands' for investing. 11 of 26 consistent funds (42.3 percent) showed positive timing coefficients whilst 7 of 16 drifters (43.8 percent) also did, however, all these were statistically insignificant.

While the results are not statistically significant, the economic implications of investing in any one of these funds, with superior managers, cannot be understated, since both market and style risk is taken into account when evaluating these performances. Table 4-28 is presented below, where timing abilities of the consistent funds are contrasted against those of the drifters.

TABLE 4-28: Treynor- Mazuy analysis

TREYNOR - MAZUY RESULTS 2 : ALPHAS AND MARKET TIMING COEFFICIENTS FROM SPECIFIC EQUITY STYLE MARKET BENCHMARKS				
CONSISTENT FUNDS	**ALPHAS**	**MKT TIMING**	**DRIFTERS**	**ALPHAS**	**MKT TIMING**
Coronation Financial Fund	1.02E-05*	-0.519951	Sanlam Financial Fund B1	-0.000363	-0.267885
Momentum Financials Fund A	0.000483*	-1.361265*	Stanlib Industrial Fund R Class	-0.000306	0.352681 #
Nedgroup Investments Financials Fund A	-0.000180	0.206770 #	ABSA Large Cap Fund B Class	9.01E-06*	1.015328 #
Sanlam Financial Fund	-0.000177	0.074417 #	Prescient Equity Top 40 A1	-0.000324	-0.248322
ABSA Select Equity Fund	0.000408*	1.155723 #	Investec Commodity Fund Class R	0.000255*	0.377564 #
FNB Momentum Growth Fund A	-0.000463	-0.595075	Momentum Resources Fund A	-0.000120	0.505227 #
Foord Equity Fund	9.88E-05*	-1.653313	Old Mutual Gold Fund R	-0.000594	-0.538839
Investec Growth Fund Class A	-0.000426	-1.346802	Stanlib Resources Fund R Class	-0.000238	-0.075704
Nedgroup Investments Growth Fund A	-0.000297	-0.951362	Investec Emerging Companies R	0.000196*	-1.107442
Marriot Dividend Growth Fund Class R	-0.000263	-1.032053	Momentum Small Mid-Cap A	-4.61E-05	0.372055 #
Old Mutual Growth Fund R	-0.000417	-0.698834	Nedgroup Investment Entrepreneur Fund R	0.000175*	0.433479 #
Coronation Industrials Fund Class A	-0.000307	0.006087 #	Stanlib Small Cap Fund A Class	-0.001009	-2.079805
Momentum Industrial Fund A	-0.000126	-0.034114	Cadiz Mastermind Fund Class A	-0.000196	-0.538121
Old Mutual Industrial Fund A	-0.000487	-0.189548	Element Islamic Equity Fund A	-0.000196	-0.538121
Sanlam Industrial Fund A	-0.000420	0.610338 #	Investec Value Fund Class R	-0.000219	-1.278199
Stanlib Industrial Fund A Class	-0.000151	0.227127 #	Momentum Value Fund A	-0.001304	0.920291 #
Absa Large Cap Fund	0.000455*	0.403040 #			
Momentum Top 40 Index Fund	-0.000247	0.560459 #	# Positive market timing coefficients = 7		
Old Mutual Top 40 Fund A	-0.000102	-0.116534	*Positive alphas = 4		
Stanlib ALSI 40 Fund Class A	-0.000158	0.651623 #	*# Positive timing coefficient and positive alpha = 3		
Nedgroup Investment Mining & Resource R	0.000278*	0.284346 #	Positive statistically significant market timing coefficient = 0		
Old Mutual Mining & Resources Fund R	0.000107*	-0.084253			
Coronation Smaller Companies Fund	-0.000443	0.096626 #			
Old Mutual Mid & Small-Cap Fund R	8.24E-05*	-1.161215*			
Stanlib Value Fund A Class	-0.000590	-0.344522			
Nedgroup Investments Value Fund A	-0.000592	-0.373157			
# Positive market timing coefficients = 11					
*Positive alphas = 8					
*# Positive timing coefficient and and posotive alpha = 3					
Positive statistically significant market timing coefficient = 0					

Source: Author's own. Constructed based on the Treynor-Mazuy regressions' results

While the results of this analysis infer that managers do not add value through market timing, the reality, as stated above, is that general equity managers do not have that much scope to try and time the market. Therefore, it may be slightly unfair to measure a manager using this metric. One needs to consider this when analysing the results. Regardless of the above, 6 funds in the sample have both positive alphas and market timing returns.

Three of them are consistent funds and the other three are drifters. The consistent funds are; ABSA Select Equity Fund, ABSA Large Cap Fund and Nedgroup Investment Mining & Resource Fund R. The drifters are ABSA Large Cap Fund B Class, Investec Commodity Fund Class R and Nedgroup Investment Entrepreneur Fund R.

4.3 Persistence of Performance

This section explores the last objective of the research, which is to find out whether the performances documented in the previous section persist or not. The section also investigates whether future performances can be predicted using past performances of the funds over different time horizons. The contingency table approach is employed for this analysis and the results are documented in the tables presented in this section. These performances were evaluated using the Sharpe ratio. Adopting the style of Kahn and Rudd (1995), Brown and Goetzmann (1995) and Dawe et al. (2014), the winning and losing funds are traced over the evaluation period, employing different holding periods and ending months, and detailed in the 2×2 contingency tables. The tables show the number of funds that were winners in both periods (WW), losers in both periods (LL), winners then losers (WL) and losers then winners (LW). The extent of positive persistence is established by the extent to which the WW and LL cells outnumber the WL and LW cells.

A summary of the results from the contingency table tests is presented in the tables. In all the tests, the lengths of the formation period and holdings period are varied for robustness of the results. For each length of period studied, different ending points were utilised to assess the sensitiveness of the results to the specific test period chosen. The analysis was replicated utilising four different holding periods and different ending months for successive 6, 12, 24 and 36 month periods.

Therefore, contingency tables of 4 different holding periods (that is, 6, 12, 24 and 36 months) are presented. In constructing each of these tables, such as, for the 6 months holding period table, the holding period was fixed at 6 months and the formation period varied from 6, 12, 24 to 36 months. In a similar manner, the tables for 1 year, 2 years and 3 years holding periods were constructed in order to ensure consistency and comparability with previous studies. Table 4-31 presents the results from analysis of the 6 months holding period for all the funds. The cross product ratio (CPR) is utilised to test if the relationship between winners and losers in subsequent periods is positive or negative, whereas the x^2 statistic is utilised in evaluating the degree of independence of this relationship. All the tests run were extremely sensitive to the number of observations available, time period chosen, and the selected ending dates. Altering these can have a remarkable impact on the results of an analysis test being run.

Table 4-29 also shows that over the sampling period, winner–winner and loser–loser persistence is strongest over successive 6-month periods. The test has a fairly comprehensive amount of observations, making the results quite robust. The highest persistence was found in Small Caps with 4 out of 6 (67 percent) funds recording persistence, whereas the least was found in Resources with only one fund (17 percent) showing persistence. The overall persistence at 6 months holding period is 43 percent, with 18 out of the 42 funds showing persistence. Table 4-30 shows the results from a holding period of 1 year. Worth noting is that only two funds showed persistence in the whole sample which brings down the overall persistence to a mere 5 percent. These funds are Marriot Dividend Growth Fund and Investec Value Fund. The analysis shows that persistence diminishes over time as the holding period lengthens.

Table 4-31 and Table 4-32 show results from holding periods of 2 years and 3 years. It is observed that persistence has diminished completely in these two holding periods and only reversals in performance dominate. The test results over longer periods are highly susceptible to the amount of observations available and, hence, may be unreliable. Based on the statistics presented in these tables, there is no conclusive evidence that performance replicates itself over holding periods of 1 year or longer.

Results from this study, based on of the Chi-square statistic values, find that for any of the holding periods tested, independence cannot be rejected at the 1 percent level. No evidence of prolonged winner-winner or loser-loser persistence is established. None of the Chi – square statistics is statistically significantly across all the holding periods tested. On the basis of the chi-square statistics, there is no conclusive evidence that future performance can be predicted from past performance over any of the holding periods analysed, that is, 6 months, 1, 2 and 3 years. The following tables detail the persistence results and the analysis of persistence with respect to the consistent funds and the drifters follows subsequently.

TABLE 4-29: Persistence results at 6 months holding period

	PERSISTENCE RESULTS : 6 MONTHS HOLDING PERIOD								
FUNDS SECTORS									
FINANCIALS	**End.Month**	**No. of Obs.(n)**	**% WW**	**% LL**	**% Persistance**	**Chi-Sq.stat.**	**CPR**	**CPR Z-stat.**	**Conclusion**
Coronation Financial Fund	31-Dec-14	41	34.15%	17.07%	51.22%	2.41	0.9800	-0.0781	REVERSAL
Momentum Financials Fund A	31-Dec-14	41	31.71%	17.07%	48.78%	1.83	0.8273	-0.0592	REVERSAL
Nedgroup Investments Financials Fund A	31-Dec-14	41	31.71%	14.63%	46.34%	2.61	0.6446	-0.1101	REVERSAL
Sanlam Financial Fund	31-Dec-14	42	33.33%	19.51%	52.84%	2.00	1.1313	-0.4835	PERSISTENCE
Sanlam Financial Fund B1	31-Dec-14	23	21.74%	34.78%	56.52%	1.52	1.6667	0.1810	PERSISTENCE
ABSA Select Equity Fund	31-Dec-14	42	33.33%	19.05%	52.38%	2.00	1.1313	-0.5815	PERSISTENCE
GROWTH									
FNB Momentum Growth Fund A	31-Dec-14	41	34.15%	19.51%	53.66%	2.02	1.2444	-0.3155	PERSISTENCE
Foord Equity Fund	31-Dec-14	42	33.33%	16.67%	50.00%	2.38	0.8909	-0.5888	REVERSAL
Investec Growth Fund Class A	30-Sep-14	42	30.95%	16.67%	47.62%	1.81	0.7521	-0.2452	REVERSAL
Nedgroup Investments Growth Fund A	31-Dec-14	42	30.95%	19.05%	50.00%	1.62	0.9630	-0.4383	REVERSAL
Marriot Dividend Growth Fund Class R	31-Dec-14	41	39.02%	21.95%	60.97%	4.37	2.2500	0.0741	PERSISTENCE
Old Mutual Growth Fund R	31-Dec-14	41	31.71%	19.51%	51.22%	1.44	1.0505	-0.1362	PERSISTENCE
INDUSTRIALS									
Coronation Industrials Fund Class A	31-Dec-14	41	36.59%	12.20%	48.79%	5.34	0.6944	-0.1928	REVERSAL
Momentum Industrial Fund A	31-Dec-14	41	34.15%	12.20%	46.35%	4.36	0.5833	-0.4824	REVERSAL
Old Mutual Industrial Fund A	31-Dec-14	41	31.71%	17.07%	48.78%	1.83	0.8272	-0.4954	REVERSAL
Sanlam Industrial Fund A	31-Dec-14	42	33.33%	11.90%	45.23%	4.29	0.5303	-0.6986	REVERSAL
Stanlib Industrial Fund R Class	31-Dec-14	41	56.10%	12.20%	68.30%	21.73	2.8750	-0.2866	PERSISTENCE
Stanlib Industrial Fund A Class	31-Dec-14	42	54.76%	11.90%	66.66%	20.86	2.5556	-0.7309	PERSISTENCE
LARGE CAP									
Absa Large Cap Fund	31-Dec-14	42	26.19%	21.43%	47.62%	0.29	0.8181	-0.9442	REVERSAL
ABSA Large Cap Fund B Class	31-Dec-14	23	17.39%	34.78%	52.17%	1.52	1.0667	0.8094	PERSISTENCE
Momentum Top 40 Index Fund	31-Dec-14	41	26.83%	24.39%	51.22%	0.073	1.1000	-0.4965	PERSISTENCE
Old Mutual Top 40 Fund A	31-Dec-14	42	26.19%	23.81%	50.00%	0.095	1.0000	-0.8584	NO PERSISTENCE
Prescient Equity Top 40 A1	31-Dec-14	33	30.30%	24.24%	54.54%	2.03	1.6000	0.8147	PERSISTENCE
Stanlib ALSI 40 Fund Class A	31-Dec-14	42	26.19%	23.81%	50.00%	0.095	1.0000	-0.8557	NO PERSISTENCE
RESOURCES									
Investec Commodity Fund Class R	31-Dec-14	41	21.95%	26.83%	48.78%	0.66	0.9167	-0.07846	REVERSAL
Momentum Resources Fund A	31-Dec-14	41	17.07%	29.27%	46.34%	3.20	0.7500	0.06530	REVERSAL
Nedgroup Investment Mining & Resource R	31-Dec-14	41	21.95%	26.83%	48.78%	0.66	0.9167	0.0640	REVERSAL
Old Mutual Mining & Resources Fund R	31-Dec-14	41	26.83%	24.39%	51.22%	1.83	1.2088	0.2321	PERSISTENCE
Old Mutual Gold Fund R	31-Dec-14	41	9.76%	41.46%	51.22%	8.46	0.6869	0.1419	REVERSAL
Stanlib Resources Fund R Class	31-Dec-14	41	14.63%	26.83%	41.46%	4.17	0.4889	0.09836	REVERSAL
SMALL CAP									
Coronation Smaller Companies Fund	31-Dec-14	41	26.83%	24.39%	51.22%	0.27	1.1111	0.04461	PERSISTENCE
Investec Emerging Companies R	31-Dec-14	41	39.02%	14.63%	53.65%	6.32	1.1429	-0.4463	PERSISTENCE
Momentum Small Mid-Cap A	31-Dec-14	42	50.00%	16.67%	66.67%	17.05	4.4545	-0.4090	PERSISTENCE
Nedgroup Investment Entrepreneur Fund R	31-Dec-14	41	48.78%	14.63%	63.41%	15.26	2,1429	-0.5228	PERSISTENCE
Old Mutual Mid & Small-Cap Fund R	31-Dec-14	41	26.83%	19.51%	46.34%	1.44	0.7521	-0.0748	REVERSAL
Stanlib Small Cap Fund A Class	31-Dec-14	41	9.75%	36.59%	46.34%	6.31	0.500	0.1156	REVERSAL
VALUE									
Cadiz Mastermind Fund Class A	31-Dec-14	41	24.39%	24.39%	48.78%	0.073	0.9090	-0.4388	REVERSAL
Element Islamic Equity Fund A	31-Dec-14	41	29.27%	21.95%	51.22%	1.24	1.1250	0.1519	PERSISTENCE
Investec Value Fund Class R	31-Dec-14	41	21.95%	24.39%	46.34%	0.46	0.7500	-0.01917	REVERSAL
Stanlib Value Fund A Class	31-Dec-14	42	30.95%	19.05%	50.00%	13.62	0.9630	-0.3574	REVERSAL
Momentum Value Fund A	31-Dec-14	41	29.27%	31.71%	60.98%	2.02	2.4375	0.1470	PERSISTENCE
Nedgroup Investments Value Fund A	31-Dec-14	42	30.95%	19.05%	50.00%	1.62	0.9630	-0.2760	REVERSAL
*Chi-square statistic is significant at the 1% level of significance									

Source: Author's own. Constructed based on the performance persistence results.

It is observed from Table 4-29 that persistence exists in the short run period as 42.8 percent of the funds (18 out of 42) exhibit persistence. However on closer analysis, it

is noted that these persistence is predominantly negative, that is, loser-loser persistence.

TABLE 4-30: Persistence results at 1 year holding period

PERSISTENCE RESULTS : 1 YEAR HOLDING PERIOD									
FUNDS SECTORS									
FINANCIALS	**End.Month**	**No. of Obs.(n)**	**% WW**	**% LL**	**% Persistance**	**Chi-Sq.stat.**	**CPR**	**CPR Z-stat.**	**Conclusion**
Coronation Financial Fund	31-Dec-14	23	21.74%	13.04%	34.78%	3.26	0.2778	0.8720	REVERSAL
Momentum Financials Fund A	31-Dec-14	23	17.39%	8.70%	20.09%	6.39	0.1143	0.7068	REVERSAL
Nedgroup Investments Financials Fund A	31-Dec-14	23	21.74%	13.04%	34.78%	3.26	0.2778	0.7757	REVERSAL
Sanlam Financial Fund	31-Dec-14	24	20.83%	12.50%	33.33%	3.52	0.2381	0.3140	REVERSAL
Sanlam Financial Fund B1	31-Dec-14	13	7.69%	23.08%	30.77%	6.38	0.2143	3.1337	REVERSAL
ABSA Select Equity Fund	31-Dec-14	24	20.83%	12.50%	33.33%	3.33	0.2381	0.5090	REVERSAL
GROWTH									
FNB Momentum Growth Fund A	31-Dec-14	23	17.39%	13.04%	30.43%	3.96	0.1905	0.6743	REVERSAL
Foord Equity Fund	31-Dec-14	24	41.67%	12.50%	54.17%	4.33	1.0000	0.2150	NO PERSISTENCE
Investec Growth Fund Class A	30-Sep-14	24	33.33%	8.33%	41.66%	4.00	0.3333	-0.2682	REVERSAL
Nedgroup Investments Growth Fund A	31-Dec-14	24	16.67%	16.67%	33.34%	2.67	0.2500	0.2068	REVERSAL
Marriot Dividend Growth Fund Class R	31-Dec-14	23	47.83%	17.39%	65.22%	6.39	2.7500	1.2150	PERSISTENCE
Old Mutual Growth Fund R	31-Dec-14	23	17.39%	17.39%	34.78%	2.22	0.2857	0.7664	REVERSAL
INDUSTRIALS									
Coronation Industrials Fund Class A	31-Dec-14	23	47.83%	8.70%	56.53%	7.78	0.9167	0.7115	REVERSAL
Momentum Industrial Fund A	31-Dec-14	23	43.48%	4.35%	47.83%	7.43	0.2857	0.6671	REVERSAL
Old Mutual Industrial Fund A	31-Dec-14	23	39.13%	8.70%	47.83%	4.30	0.5000	0.7687	REVERSAL
Sanlam Industrial Fund A	31-Dec-14	24	41.67%	8.33%	50.00%	5.33	0.5556	0.2043	REVERSAL
Stanlib Industrial Fund R Class	31-Dec-14	23	43.48%	4.35%	47.83%	7.43	0.2857	0.7642	REVERSAL
Stanlib Industrial Fund A Class	31-Dec-14	24	41.67%	4.17%	45.84%	7.00	0.2381	0.3101	REVERSAL
LARGE CAP									
Absa Large Cap Fund	31-Dec-14	24	20.83%	12.50%	33.33%	3.33	0.2381	0.4776	REVERSAL
ABSA Large Cap Fund B Class	31-Dec-14	13	7.69%	23.08%	30.77%	6.38	0.2143	3.2021	REVERSAL
Momentum Top 40 Index Fund	31-Dec-14	23	17.39%	13.04%	30.43%	3.96	0.1905	0.8078	REVERSAL
Old Mutual Top 40 Fund A	31-Dec-14	24	16.67%	12.50%	29.17%	4.33	0.1667	0.3586	REVERSAL
Prescient Equity Top 40 A1	31-Dec-14	18	22.22%	16.67%	38.89%	3.78	0.5000	2.2989	REVERSAL
Stanlib ALSI 40 Fund Class A	31-Dec-14	24	16.67%	12.50%	29.17%	4.33	0.1667	0.4885	REVERSAL
RESOURCES									
Investec Commodity Fund Class R	31-Dec-14	23	8.70%	30.43%	39.13%	4.65	0.3111	1.0878	REVERSAL
Momentum Resources Fund A	31-Dec-14	23	8.70%	30.43%	39.13%	4.65	0.3111	1.0951	REVERSAL
Nedgroup Investment Mining & Resource R	31-Dec-14	23	13.04%	30.43%	43.47%	2.57	0.5250	1.0951	REVERSAL
Old Mutual Mining & Resources Fund R	31-Dec-14	23	13.04%	30.43%	43.47%	2.57	0.5250	1.0076	REVERSAL
Old Mutual Gold Fund R	31-Dec-14	23	4.35%	34.78%	39.13%	5.70	0.1667	0.8914	REVERSAL
Stanlib Resources Fund R Class	31-Dec-14	23	8.70%	30.43%	39.13%	4.65	0.3111	1.0418	REVERSAL
SMALL CAP									
Coronation Smaller Companies Fund	31-Dec-14	23	17.39%	21.74%	39.13%	1.17	0.4082	0.5711	REVERSAL
Investec Emerging Companies R	31-Dec-14	23	39.13%	8.70%	47.83%	4.30	0.5000	0.3187	REVERSAL
Momentum Small Mid-Cap A	31-Dec-14	24	41.67%	12.50%	54.17%	4.33	1.0000	0.2740	NO PERSISTENCE
Nedgroup Investment Entrepreneur Fund R	31-Dec-14	23	43.48%	8.70%	52.18%	5.70	0.6667	0.3959	REVERSAL
Old Mutual Mid & Small-Cap Fund R	31-Dec-14	23	17.39%	13.04%	30.43%	3.96	0.1905	0.3508	REVERSAL
Stanlib Small Cap Fund A Class	31-Dec-14	23	13.04%	13.04%	26.08%	5.35	0.1250	0.3681	REVERSAL
VALUE									
Cadiz Mastermind Fund Class A	31-Dec-14	23	17.39%	13.04%	30.43%	3.96	0.1905	1.1240	REVERSAL
Element Islamic Equity Fund A	31-Dec-14	23	21.74%	17.39%	39.13%	1.52	0.4167	0.8497	REVERSAL
Investec Value Fund Class R	31-Dec-14	23	17.39%	30.43%	47.82%	3.96	1.0370	1.1918	PERSISTENCE
Stanlib Value Fund A Class	31-Dec-14	24	16.67%	12.50%	29.17%	4.33	0.1667	0.4318	REVERSAL
Momentum Value Fund A	31-Dec-14	23	17.39%	21.74%	39.13%	1.17	0.4082	0.9800	REVERSAL
Nedgroup Investments Value Fund A	31-Dec-14	24	25.00%	8.33%	33.33%	5.33	0.2000	0.7399	REVERSAL
*Chi-square statistic is significant at the 1% level of significance									

Source: Author's own. Constructed based on the performance persistence results.

Persistence diminishes considerably as the holding period lengthens as it can be observed above at the 1 year holding period. Only 4.76 percent (2 out of 42) funds exhibit persistence, down from 42.8% which is a huge drop in persistence.

TABLE 4-31: Persistence results at 2 years holding period

PERSISTENCE RESULTS : 2 YEARS HOLDING PERIOD									
FUNDS SECTORS									
FINANCIALS	**End.Month**	**No. of Obs.(n)**	**% WW**	**% LL**	**% Persistance**	**Chi-Sq.stat.**	**CPR**	**CPR Z-stat.**	**Conclusion**
Coronation Financial Fund	31-Dec-14	11	45.45%	0.00%	45.45%	5.36	0.0000	1.1274	REVERSAL
Momentum Financials Fund A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.8034	REVERSAL
Nedgroup Investments Financials Fund A	31-Dec-14	11	45.45%	0.00%	45.45%	5.36	0.0000	1.0615	REVERSAL
Sanlam Financial Fund	31-Dec-14	11	45.45%	0.00%	45.45%	5.36	0.0000	0.9871	REVERSAL
Sanlam Financial Fund B1	31-Dec-14	6	33.33%	0.00%	33.33%	7.33	0.0000	4.2887	REVERSAL
ABSA Select Equity Fund	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.5394	REVERSAL
GROWTH									
FNB Momentum Growth Fund A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.5951	REVERSAL
Foord Equity Fund	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.1942	REVERSAL
Investec Growth Fund Class A	30-Sep-14	12	25.00%	0.00%	25.00%	4.67	0.0000	-0.4901	REVERSAL
Nedgroup Investments Growth Fund A	31-Dec-14	12	0.00%	0.00%	0.00%	12.67	0.0000	0.1330	REVERSAL
Marriot Dividend Growth Fund Class R	31-Dec-14	11	36.36%	0.00%	36.36%	5.36	0.0000	1.5387	REVERSAL
Old Mutual Growth Fund R	31-Dec-14	11	0.00%	9.09%	9.09%	10.45	0.0000	0.7748	REVERSAL
INDUSTRIALS									
Coronation Industrials Fund Class A	31-Dec-14	11	45.45%	0.00%	45.45%	5.36	0.0000	1.1706	REVERSAL
Momentum Industrial Fund A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.6218	REVERSAL
Old Mutual Industrial Fund A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.9612	REVERSAL
Sanlam Industrial Fund A	31-Dec-14	12	36.36%	0.00%	36.36%	4.00	0.0000	0.3912	REVERSAL
Stanlib Industrial Fund R Class	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.9005	REVERSAL
Stanlib Industrial Fund A Class	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.3338	REVERSAL
LARGE CAP									
Absa Large Cap Fund	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	-0.3948	REVERSAL
ABSA Large Cap Fund B Class	31-Dec-14	6	33.33%	0.00%	33.33%	7.33	0.0000	3.9855	REVERSAL
Momentum Top 40 Index Fund	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.4952	REVERSAL
Old Mutual Top 40 Fund A	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.0186	REVERSAL
Prescient Equity Top 40 A1	31-Dec-14	8	37.50%	0.00%	37.50%	5.00	0.0000	1.9325	REVERSAL
Stanlib ALSI 40 Fund Class A	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.08276	REVERSAL
RESOURCES									
Investec Commodity Fund Class R	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.7232	REVERSAL
Momentum Resources Fund A	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.7582	REVERSAL
Nedgroup Investment Mining & Resource R	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.8438	REVERSAL
Old Mutual Mining & Resources Fund R	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.7682	REVERSAL
Old Mutual Gold Fund R	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	1.0499	REVERSAL
Stanlib Resources Fund R Class	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.6868	REVERSAL
SMALL CAP									
Coronation Smaller Companies Fund	31-Dec-14	11	0.00%	9.09%	9.09%	10.45	0.0000	0.8132	REVERSAL
Investec Emerging Companies R	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.5090	REVERSAL
Momentum Small Mid-Cap A	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.1869	REVERSAL
Nedgroup Investment Entrepreneur Fund R	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.4724	REVERSAL
Old Mutual Mid & Small-Cap Fund R	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.5546	REVERSAL
Stanlib Small Cap Fund A Class	31-Dec-14	11	27.27%	0.00%	27.27%	3.91	0.0000	0.3853	REVERSAL
VALUE									
Cadiz Mastermind Fund Class A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.8857	REVERSAL
Element Islamic Equity Fund A	31-Dec-14	11	0.00%	9.09%	9.09%	10.45	0.0000	0.8447	REVERSAL
Investec Value Fund Class R	31-Dec-14	11	9.09%	9.09%	18.18%	9.00	0.0714	0.2390	REVERSAL
Stanlib Value Fund A Class	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.1717	REVERSAL
Momentum Value Fund A	31-Dec-14	11	0.00%	9.09%	9.09%	10.45	0.0000	0.7727	REVERSAL
Nedgroup Investments Value Fund A	31-Dec-14	12	41.67%	0.00%	41.67%	4.67	0.0000	0.7159	REVERSAL
*Chi-square statistic is significant at the 1% level of significance									

Source: Author's own. Constructed based on the performance persistence results.

At the 2 years holding period, persistence has completely diminished and only reversals dominate at this point.

TABLE 4-32: Persistence results at 3 years holding period

	PERSISTENCE RESULTS : 3 YEARS HOLDING PERIOD								
FUNDS SECTORS									
FINANCIALS	**End.Month**	**No. of Obs.(n)**	**% WW**	**% LL**	**% Persistance**	**Chi-Sq.stat.**	**CPR**	**CPR Z-stat.**	**Conclusion**
Coronation Financial Fund	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.3050	REVERSAL
Momentum Financials Fund A	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.9263	REVERSAL
Nedgroup Investments Financials Fund A	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.3851	REVERSAL
Sanlam Financial Fund	31-Dec-14	8	12.50%	12.50%	25.00%	2.50	0.1111	-1.1752	REVERSAL
Sanlam Financial Fund B1	31-Dec-14	3	0.00%	33.33%	33.33%	3.67	0.0000	n/a	REVERSAL
ABSA Select Equity Fund	31-Dec-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.2444	REVERSAL
GROWTH									
FNB Momentum Growth Fund A	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-1.0808	REVERSAL
Foord Equity Fund	31-Dec-14	8	0.00%	0.00%	0.00%	8.00	0.0000	-1.2111	REVERSAL
Investec Growth Fund Class A	30-Sep-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.8552	REVERSAL
Nedgroup Investments Growth Fund A	31-Dec-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.5495	REVERSAL
Marriot Dividend Growth Fund Class R	31-Dec-14	7	14.29%	0.00%	14.29%	5.00	0.0000	0.7695	REVERSAL
Old Mutual Growth Fund R	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.9443	REVERSAL
INDUSTRIALS									
Coronation Industrials Fund Class A	31-Dec-14	7	14.29%	0.00%	14.29%	5.00	0.0000	0.0520	REVERSAL
Momentum Industrial Fund A	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.7185	REVERSAL
Old Mutual Industrial Fund A	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.4507	REVERSAL
Sanlam Industrial Fund A	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.5146	REVERSAL
Stanlib Industrial Fund R Class	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.4003	REVERSAL
Stanlib Industrial Fund A Class	31-Dec-14	8	0.00%	0.00%	0.00%	8.00	0.0000	-1.0484	REVERSAL
LARGE CAP									
Absa Large Cap Fund	31-Dec-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.7985	REVERSAL
ABSA Large Cap Fund B Class	31-Dec-14	3	0.00%	33.33%	33.33%	3.67	0.0000	n/a	REVERSAL
Momentum Top 40 Index Fund	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-1.3652	REVERSAL
Old Mutual Top 40 Fund A	31-Dec-14	8	0.00%	25.00%	25.00%	4.00	0.0000	-1,891693	REVERSAL
Prescient Equity Top 40 A1	31-Dec-14	5	0.00%	40.00%	40.00%	2.20	0.0000	0.0732	REVERSAL
Stanlib ALSI 40 Fund Class A	31-Dec-14	8	0.00%	25.00%	25.00%	4.00	0.0000	-1.9094	REVERSAL
RESOURCES									
Investec Commodity Fund Class R	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-0.9570	REVERSAL
Momentum Resources Fund A	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-1.1163	REVERSAL
Nedgroup Investment Mining & Resource R	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-0.8878	REVERSAL
Old Mutual Mining & Resources Fund R	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-1.0217	REVERSAL
Old Mutual Gold Fund R	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	0.0874	REVERSAL
Stanlib Resources Fund R Class	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-1.0462	REVERSAL
SMALL CAP									
Coronation Smaller Companies Fund	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.7845	REVERSAL
Investec Emerging Companies R	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.9308	REVERSAL
Momentum Small Mid-Cap A	31-Dec-14	8	0.00%	0.00%	0.00%	8.00	0.0000	-0.8898	REVERSAL
Nedgroup Investment Entrepreneur Fund R	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.6591	REVERSAL
Old Mutual Mid & Small-Cap Fund R	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.9853	REVERSAL
Stanlib Small Cap Fund A Class	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.5932	REVERSAL
VALUE									
Cadiz Mastermind Fund Class A	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-0.9793	REVERSAL
Element Islamic Equity Fund A	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.7787	REVERSAL
Investec Value Fund Class R	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.0575	REVERSAL
Stanlib Value Fund A Class	31-Dec-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.4295	REVERSAL
Momentum Value Fund A	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-0.7940	REVERSAL
Nedgroup Investments Value Fund A	31-Dec-14	8	12.50%	12.50%	25.00%	2.50	0.1111	-0.8082	REVERSAL
*Chi-square statistic is significant at the 1% level of significance									

Source: Author's own. Constructed based on the performance persistence results.

Similarly, persistence has completely disappeared at the 3 years holding period, which may validate the claim of high volatility and trend fluctuations in the South African market with no lasting clear pattern (Van Heerden, 2014).

The study then analysed the two categories of funds (consistent funds and drifters) for persistence over the different holding periods. Table 4-33 below presents the results for the 6 months holding period. It is observed that the drifters exhibit more persistence compared to the consistent funds. The study noted, earlier, that drifting funds underperform consistent funds in terms of both relative and absolute risk adjusted performance.

Hence, the study concludes that the persistence shown by the drifters is more inclined to the Loser-Loser phenomenon than Winner-Winner persistence, as shown by the tables from 6 months and 1 year holding periods. The drifters exhibit a level of drift which is above 50 percent (that is, 56.25 percent) which means that more than half of the time, the drifters' performances will persist over the short term investment period, which is 6 months in our study. The drifters exhibit a 56.25 percent level of drift compared to the consistent funds which show only 36.42 percent level of persistence.

TABLE 4-33: Persistence analysis at 6 months holding period

			PERSISTENCE ANALYSIS : 6 MONTHS HOLDING PERIOD									
CONSISTENT FUNDS				**CONCLUSION**		**DRIFTERS**						**CONCLUSION**
Coronation Financial Fund				REVERSAL		Sanlam Financial Fund B1						PERSISTENCE*
Momentum Financials Fund A				REVERSAL		Stanlib Industrial Fund R Class						PERSISTENCE*
Nedgroup Investments Financials Fund A				REVERSAL		ABSA Large Cap Fund B Class						PERSISTENCE*
Sanlam Financial Fund				PERSISTENCE*		Prescient Equity Top 40 A1						PERSISTENCE*
ABSA Select Equity Fund				PERSISTENCE*		Investec Commodity Fund Class R						REVERSAL
FNB Momentum Growth Fund A				PERSISTENCE*		Momentum Resources Fund A						REVERSAL
Foord Equity Fund				REVERSAL		Old Mutual Gold Fund R						REVERSAL
Investec Growth Fund Class A				REVERSAL		Stanlib Resources Fund R Class						REVERSAL
Nedgroup Investments Growth Fund A				REVERSAL		Investec Emerging Companies R						PERSISTENCE*
Marriot Dividend Growth Fund Class R				PERSISTENCE*		Momentum Small Mid-Cap A						PERSISTENCE*
Old Mutual Growth Fund R				PERSISTENCE*		Nedgroup Investment Entrepreneur Fund R						PERSISTENCE*
Coronation Industrials Fund Class A				REVERSAL		Stanlib Small Cap Fund A Class						REVERSAL
Momentum Industrial Fund A				REVERSAL		Cadiz Mastermind Fund Class A						REVERSAL
Old Mutual Industrial Fund A				REVERSAL		Element Islamic Equity Fund A						PERSISTENCE*
Sanlam Industrial Fund A				REVERSAL		Investec Value Fund Class R						REVERSAL
Stanlib Industrial Fund A Class				PERSISTENCE*		Momentum Value Fund A						PERSISTENCE*
Absa Large Cap Fund				REVERSAL								
Momentum Top 40 Index Fund				PERSISTENCE*		* Number of persistent funds				9.00		
Old Mutual Top 40 Fund A				NO PERSISTENCE		% Persistence				56.25%		
Stanlib ALSI 40 Fund Class A				NO PERSISTENCE								
Nedgroup Investment Mining & Resource R				REVERSAL								
Old Mutual Mining & Resources Fund R				PERSISTENCE*								
Coronation Smaller Companies Fund				PERSISTENCE*								
Old Mutual Mid & Small-Cap Fund R				REVERSAL								
Stanlib Value Fund A Class				REVERSAL								
Nedgroup Investments Value Fund A				REVERSAL								
* Number of persistent funds			9.00									
% Persistence			34.62%									

Source: Author's own. Constructed based on the performance persistence results.

Over a 12 month holding period, drifters still exhibit a relatively higher level of persistence compared to the consistent funds. The same reasoning of loser-loser persistence is applied in analysing this observed trend amongst the drifters. The drifters record a 6.25 percent level of persistence compared to the consistent funds which recorded a modest 3.85 percent.

TABLE 4-34: Persistence analysis at 1 year holding period

			PERSISTENCE ANALYSIS : 1 YEAR HOLDING PERIOD								
CONSISTENT FUNDS				**CONCLUSION**		**DRIFTERS**					**CONCLUSION**
Coronation Financial Fund				REVERSAL		Sanlam Financial Fund B1					REVERSAL
Momentum Financials Fund A				REVERSAL		Stanlib Industrial Fund R Class					REVERSAL
Nedgroup Investments Financials Fund A				REVERSAL		ABSA Large Cap Fund B Class					REVERSAL
Sanlam Financial Fund				REVERSAL		Prescient Equity Top 40 A1					REVERSAL
ABSA Select Equity Fund				REVERSAL		Investec Commodity Fund Class R					REVERSAL
FNB Momentum Growth Fund A				REVERSAL		Momentum Resources Fund A					REVERSAL
Foord Equity Fund				NO PERSISTENCE		Old Mutual Gold Fund R					REVERSAL
Investec Growth Fund Class A				REVERSAL		Stanlib Resources Fund R Class					REVERSAL
Nedgroup Investments Growth Fund A				REVERSAL		Investec Emerging Companies R					REVERSAL
Marriot Dividend Growth Fund Class R				PERSISTENCE*		Momentum Small Mid-Cap A					NO PERSISTENCE
Old Mutual Growth Fund R				REVERSAL		Nedgroup Investment Entrepreneur Fund R					REVERSAL
Coronation Industrials Fund Class A				REVERSAL		Stanlib Small Cap Fund A Class					REVERSAL
Momentum Industrial Fund A				REVERSAL		Cadiz Mastermind Fund Class A					REVERSAL
Old Mutual Industrial Fund A				REVERSAL		Element Islamic Equity Fund A					REVERSAL
Sanlam Industrial Fund A				REVERSAL		Investec Value Fund Class R					PERSISTENCE*
Stanlib Industrial Fund A Class				REVERSAL		Momentum Value Fund A					REVERSAL
Absa Large Cap Fund				REVERSAL							
Momentum Top 40 Index Fund				REVERSAL		* Number of persistent funds			1.00		
Old Mutual Top 40 Fund A				REVERSAL		% Persistence			6.25%		
Stanlib ALSI 40 Fund Class A				REVERSAL							
Nedgroup Investment Mining & Resource R				REVERSAL							
Old Mutual Mining & Resources Fund R				REVERSAL							
Coronation Smaller Companies Fund				REVERSAL							
Old Mutual Mid & Small-Cap Fund R				REVERSAL							
Stanlib Value Fund A Class				REVERSAL							
Nedgroup Investments Value Fund A				REVERSAL							
* Number of persistent funds			1.00								
% Persistence			3.85%								

Source: Author's own. Constructed based on the performance persistence results.

Over a 2 year holding period, there was no persistence observed amongst the funds, only reversals are prevalent. This observation confirms the results of earlier studies on the South African market that performance persistence seems to diminish as the length of evaluation gets longer. In this case, persistence has completely vanished at the 2 years holding period as observed in the table below.

TABLE 4-35: Persistence analysis at 2 years holding period

PERSISTENCE ANALYSIS : 2 YEARS HOLDING PERIOD			
CONSISTENT FUNDS	**CONCLUSION**	**DRIFTERS**	**CONCLUSION**
Coronation Financial Fund	REVERSAL	Sanlam Financial Fund B1	REVERSAL
Momentum Financials Fund A	REVERSAL	Stanlib Industrial Fund R Class	REVERSAL
Nedgroup Investments Financials Fund A	REVERSAL	ABSA Large Cap Fund B Class	REVERSAL
Sanlam Financial Fund	REVERSAL	Prescient Equity Top 40 A1	REVERSAL
ABSA Select Equity Fund	REVERSAL	Investec Commodity Fund Class R	REVERSAL
FNB Momentum Growth Fund A	REVERSAL	Momentum Resources Fund A	REVERSAL
Foord Equity Fund	REVERSAL	Old Mutual Gold Fund R	REVERSAL
Investec Growth Fund Class A	REVERSAL	Stanlib Resources Fund R Class	REVERSAL
Nedgroup Investments Growth Fund A	REVERSAL	Investec Emerging Companies R	REVERSAL
Marriot Dividend Growth Fund Class R	REVERSAL	Momentum Small Mid-Cap A	REVERSAL
Old Mutual Growth Fund R	REVERSAL	Nedgroup Investment Entrepreneur Fund R	REVERSAL
Coronation Industrials Fund Class A	REVERSAL	Stanlib Small Cap Fund A Class	REVERSAL
Momentum Industrial Fund A	REVERSAL	Cadiz Mastermind Fund Class A	REVERSAL
Old Mutual Industrial Fund A	REVERSAL	Element Islamic Equity Fund A	REVERSAL
Sanlam Industrial Fund A	REVERSAL	Investec Value Fund Class R	REVERSAL
Stanlib Industrial Fund A Class	REVERSAL	Momentum Value Fund A	REVERSAL
Absa Large Cap Fund	REVERSAL		
Momentum Top 40 Index Fund	REVERSAL	* Number of persistent funds	0.00
Old Mutual Top 40 Fund A	REVERSAL	% Persistence	0.00%
Stanlib ALSI 40 Fund Class A	REVERSAL		
Nedgroup Investment Mining & Resource R	REVERSAL		
Old Mutual Mining & Resources Fund R	REVERSAL		
Coronation Smaller Companies Fund	REVERSAL		
Old Mutual Mid & Small-Cap Fund R	REVERSAL		
Stanlib Value Fund A Class	REVERSAL		
Nedgroup Investments Value Fund A	REVERSAL		
* Number of persistent funds	0.00		
% Persistence	0.00%		

Source: Author's own. Constructed based on the performance persistence results.

Similarly, the 3 years holding period yielded no evidence of persistence, but only reversals in the performances of the funds. This confirms most literature findings such as Schiff (2011), Malhotra (2012) and Hsu (2014), that persistence diminishes as the length of the holding period increases until it disappears completely in some instances. This phenomenon may lead one to conclude that the South African market is more volatile in nature and any trends or shocks in the economic system do not persist for too long before they die out or change. The mask falls off too quickly before the audience can cheer-on the characters on the stage. The analysis of the 3 years holding period is presented in the table below.

TABLE 4-36: Persistence analysis at 3 years holding period

PERSISTENCE ANALYSIS : 3 YEARS HOLDING PERIOD			
CONSISTENT FUNDS	**CONCLUSION**	**DRIFTERS**	**CONCLUSION**
Coronation Financial Fund	REVERSAL	Sanlam Financial Fund B1	REVERSAL
Momentum Financials Fund A	REVERSAL	Stanlib Industrial Fund R Class	REVERSAL
Nedgroup Investments Financials Fund A	REVERSAL	ABSA Large Cap Fund B Class	REVERSAL
Sanlam Financial Fund	REVERSAL	Prescient Equity Top 40 A1	REVERSAL
ABSA Select Equity Fund	REVERSAL	Investec Commodity Fund Class R	REVERSAL
FNB Momentum Growth Fund A	REVERSAL	Momentum Resources Fund A	REVERSAL
Foord Equity Fund	REVERSAL	Old Mutual Gold Fund R	REVERSAL
Investec Growth Fund Class A	REVERSAL	Stanlib Resources Fund R Class	REVERSAL
Nedgroup Investments Growth Fund A	REVERSAL	Investec Emerging Companies R	REVERSAL
Marriot Dividend Growth Fund Class R	REVERSAL	Momentum Small Mid-Cap A	REVERSAL
Old Mutual Growth Fund R	REVERSAL	Nedgroup Investment Entrepreneur Fund R	REVERSAL
Coronation Industrials Fund Class A	REVERSAL	Stanlib Small Cap Fund A Class	REVERSAL
Momentum Industrial Fund A	REVERSAL	Cadiz Mastermind Fund Class A	REVERSAL
Old Mutual Industrial Fund A	REVERSAL	Element Islamic Equity Fund A	REVERSAL
Sanlam Industrial Fund A	REVERSAL	Investec Value Fund Class R	REVERSAL
Stanlib Industrial Fund A Class	REVERSAL	Momentum Value Fund A	REVERSAL
Absa Large Cap Fund	REVERSAL		
Momentum Top 40 Index Fund	REVERSAL	* Number of persistent funds	0.00
Old Mutual Top 40 Fund A	REVERSAL	% Persistence	0.00%
Stanlib ALSI 40 Fund Class A	REVERSAL		
Nedgroup Investment Mining & Resource R	REVERSAL		
Old Mutual Mining & Resources Fund R	REVERSAL		
Coronation Smaller Companies Fund	REVERSAL		
Old Mutual Mid & Small-Cap Fund R	REVERSAL		
Stanlib Value Fund A Class	REVERSAL		
Nedgroup Investments Value Fund A	REVERSAL		
* Number of persistent funds	0.00		
% Persistence	0.00%		

Source: Author's own. Constructed based on the performance persistence results.

4.4 Summary of Persistence

The contingency tables were used to investigate persistence, splitting the risk-adjusted returns into winners and losers based on the median abnormal return over the relevant ranking period. The results shown in Table 4-29 indicate that persistence is found when the data is tested in the short run period, that is, 6 months holding period. In addition, persistence above and below the median abnormal return exists, regardless of the length of time used to form a portfolio or hold a portfolio, i.e. loser-loser and winner-winner persistence. The 6 months' summary tables were further analysed in order to get additional insight into the origin of the observed persistence.

The percentages shown in the tables give the contribution of the winner-winner and loser-loser categories to the chi-squared statistic. This analysis was examined in conjunction with Table 4-33, which mirrors persistence in terms of the consistent funds and the drifters. It can be observed for the consistent funds that winner-winner persistence accounts for a high proportion of their persistence in the contingency table with figures ranging from 26.83 percent to 54.76 percent.

However, the overall persistence of consistent funds appears lower than those of drifters at 34.62 percent, compared to the 56.25 percent of drifters. Loser-loser persistence appears highest with respect to the drifting funds at the lower formation-holding period combinations, which contributes to the high overall persistence percentage. The range of persistence for the drifters falls within 24.24 percent to 34.78 percent; however, it is the frequency with which the loser-loser phenomenon occurs that makes the overall percentage higher. When tested, it is found that a high proportion of the observed persistence is due to losers remaining losers. When the holding period is increased it is found that persistence diminishes considerably, until it completely disappears. Some previous South African researches, investigating the persistence of equity unit trust performance, resulted in conclusions different to those of this study, although most of them concur. The differences in results may be attributed to the size of the data set used, different methodologies used in testing for persistence and in the risk-adjustment used in this study. Using the chi-squared test, there was no conclusive evidence of the ability to predict future performances based on past performances.

The investment implications of this research are only suggestive. Using historical ranking as a guide, investors appear to be able to improve their chances of relative performance in general equity unit trusts in the short run. Selection of above average funds based on past performance may be possible, but a more detailed analysis, taking switching costs into account, needs to be made. Hence, the study does not have strong conclusive evidence on predictions of future performances. Drifting funds appear to be more persistent than consistent funds, amidst negative performances. In summary, it is found that the results for performance persistence studies over longer time periods are highly sensitive to the beginning and ending dates selected in the test being performed and, more importantly, the sample size and methodologies employed.

4.5 Chapter Summary

The chapter explored in detail how the study went about in achieving its objectives. It commences with the establishment of the true styles of the funds using the Returns Based Style Analysis (RBSA) technique. The RBSA model derives its ability to establish the funds' styles through return attribution, that is, the style factor to which a significant portion of the fund's returns could be attributed. It is found that most of the funds are correctly classified in terms of their styles. Once the styles of the funds were known, the study then embarked on finding out how true the funds are to their styles, that is, the extent of drift of the funds from their styles through employing the Style Drift Score (SDS) as the principal method for separating the funds into consistent funds and drifters. 62 percent of the funds were found to remain consistent to their styles, whereas 38 percent of the funds were found to exhibit drift. These two categories of funds (which are, the consistent funds and drifters) were then analysed, relative to each other in terms of their performances and performance persistence. Three methods were used to analyse performance, namely, the CAPM, FF3F and the Sharpe ratio. The consistent funds outperformed the drifters with respect to the CAPM and FF3F models, however, the drifters triumphed when the Sharpe ratio was considered. None of the funds were able to convincingly outperform the market benchmarks used, which adds some validity into the argument that active investing does not possess significant power of passive investing. Most literature concurs with these findings, both South African and international studies.

Market timing abilities of the consistent funds and the drifters were then analysed using the Treynor-Mazuy model and it was found that none of the funds were able to successfully time the market. The "hot-hands" phenomenon that is prevalent amongst seasoned managers in international markets is nowhere to be found within SA fund managers. The few studies on market timing done on the SA market have mixed results with no clear unanimity in terms of whether SA managers can time the markets. Lastly, the study tested performance persistence of these two categories of funds (which are, the consistent funds and drifters) using contingency tables. Persistence was found to be prevalent among the drifters, however, it was mostly negative persistence (that is, Loser-Loser) over the 6 months holding period. This persistence diminished considerably at 1 year holding periods and disappeared

completely as the holding period was lengthened to 2 years and 3 years holding periods. Most South African literature on persistence finds similar results. Predictability of future returns based on past performances was also evaluated using the chi-squared test and the study found no conclusive evidence of the ability to predict future returns, since all the chi-squared statistics were insignificant.

The next chapter gives an overall closure of the study as it will conclude the study with the summary of the findings, the recommendations and also the limitations of the study.

CHAPTER 5

5.1 Introduction

This chapter presents the curtain call of the study. It details a summary of all the findings from investigating the objectives of the study, and presents a conclusion to the study. The chapter also offers recommendations for future studies along this field of research based on findings from undertaking this study. Lastly, the chapter highlights the challenges encountered during the inquiry of the study's objectives, which are the limitations of the study.

5.2 Summary of Findings

It has been noted in the unit trusts universe that style investing is widespread and prevalent. As individual investors have lessened the proportions of shares held directly, they have resultantly expanded their investments in unit trusts, most of which are categorised on account of their investment styles. In the same way, a greater number of institutional investors' allocations to stock holdings are also grounded on equity investment styles. It is very common in the investment universe to use size and value-growth metrics in comparing different investments. However, scholarly research into the effects of style investing on asset prices, performance and persistence of unit trusts does not appear to correspond with its perceptible significance to investors.

This study examined the impact of style based investing on the performance, and persistence, of South African unit trusts from the view of consistent funds against drifting funds. The motivation for this pursuit was the astonishing simple belief in the fund management sphere, that style consistency can be indicative of a skilful portfolio manager and a successful risk management system. Hence, it forms an advisable distinction when searching for and retaining managers, in addition to the obvious benefits in the portfolio construction process. Actually, the vast majority of academic research infers that there is a positive relationship between investment style consistency and performance.

Consistent with this, the study embarked on investigating the first objective, which was the extent to which unit trusts in South Africa maintain or drift from their styles stated in their mandates. However, the study firstly examined the return attribution of

the funds in order to determine whether they ascribe to their stated titles or not, that is, the possibility of misclassifications. In other words, the study probed the true styles of the funds using the Returns Based Style Analysis model initiated by Sharpe (1992), where detections of styles are based on return characteristics. It was found that, in most cases, these funds comply with their mandates and relevant regulations and, hence, they are correctly classified. However, in a few cases some of the titles of unit trusts may be misleading as they expose the investor to style factor returns that are against their mandates, or the investor is unaware of. This forms the primary advantage of this technique, as it is able to lift the veil on secretive mutual funds – even if to a limited extent – using only easily accessible public information.

Through employing the Style Drift Score analysis, proposed by Idzorek and Bertsch (2004), the study was also able to detect the presence and extent of style drift, which is important as investors want to have adequate knowledge of their investments. 62 percent of the funds in the study's sample were found to be consistent, whereas 38 percent of the funds exhibited drift. The level of drift in the sample was verified with two other methods, which are, the R-squared and Tracking error methods, and approximately similar figures were obtained. Growth funds and the Financials funds were found to be the most consistent funds, whereas the Small Caps and the Value funds exhibited the highest drift. The few studies that have been done on style investing in the South African market found similar results to this study, such as Mutooni and Muller (2007) Collinet and Firer (2003) and Muller and Ward (2013). The funds were then subsequently separated into two categories, which are, consistent funds and drifters, using the style drift score for a thorough comparative analysis of their performances.

The study further investigated its second objective, which was the analysis of performances of the two categories mentioned above, relative to each other, using three methods, namely, the Capital Asset Pricing model (CAPM), the Fama-French 3 factor model (FF3F) and the Sharpe ratio. The consistent funds were found to outperform the drifting funds with respect to CAPM and FF3F models. However, the drifters triumphed over the consistent funds when the Sharpe ratio was considered. These findings confirm most of the literature in that consistent funds outperform drifters. However, it was also observed that, when the Sharpe ratio was used, the drifters outperform consistent funds which contrasts some of the literature. The

Sharpe ratio is one of the most utilised performance measures in the asset management industry, hence, one would have expected the consistent funds to be triumphant over the drifters when using it.

The study further employed the Treynor-Mazuy model to further test the funds' market timing ability, as it sought to deepen its investigation on the performances of the funds in order to fulfil the second objective. It was found that neither the consistent funds, nor the drifters, were able to successfully time the market. Literature has mixed results in terms of the market timing abilities of SA funds, with some studies suggesting it is possible for fund managers to time the JSE, for example Hsieh and Hodnett (2011) whilst others like Cubbin et al. (2006) contrast it.

Lastly, the study embarked on fulfilling its third objective, which entailed finding out whether these funds' risk adjusted performances, obtained using the Sharpe ratio, were able to persist over different investment holding periods or not. Over six months, the drifters exhibited higher persistence and ability to repeat performance, albeit it was found to be overall negative performance. That is, more Loser-Loser persistence was observed compared to Winner-Winner persistence. Persistence declines considerably as the holding period is increased to one year until it diminishes completely at two years and three years holding periods. However, the study could not find any evidence of predictability in returns across all the time periods for the different holding periods. Literature on persistence in the South African market that found similar results include Wessels and Krige (2005), Thomas (2012) and Eddy (2014).

5.3 Conclusion

The study therefore concludes that, on average, South African unit trusts are correctly classified. From these findings, the study can also infer that unit trusts in South Africa exhibit more consistency as compared to drift. That is, South African unit trusts stick to their mandates more often than not. The study was also able to discern that consistent funds exhibit higher performances than drifters on a style adjusted basis. Funds invested in the Growth and Financials stocks were found to exhibit the highest consistency. Unit trusts invested in Small Cap stocks and Value stocks were found to exhibit the highest level of drift, that is, style inconsistency.

When style benchmarks were used, compared to the general market benchmark (JSE ALSI), the performance models proved to be better in capturing more variability in returns patterns of the funds. This shows the huge impact of style investing on the funds' expected returns. With respect to market timing ability, since none of the funds were able to successfully time the markets, the study can thus deduce that South African fund managers do not possess the 'hot hands' phenomenon. More so, in general, active management of funds in the South African unit trusts universe does not seem to yield significant outperformance of the markets, since most of the funds underperformed the markets across all three performance measures used. Therefore, an investment in a passive fund would be recommended based on results of this study, for example, index trackers and Exchange Traded Funds (ETF's).

5.4 Recommendations

The researcher recommends a more detailed analysis in this area with forward-looking data to be conducted in the future. A different approach for forecasting persistence of performance would also be recommended, since it may yield insightful strategies with which investors could exploit market inefficiencies and earn positive results. Further studies detailing a comparison of South African unit trusts with those of other emerging markets would be also recommended.

5.5 Limitations of the Study

Some of the funds' data had different starting points and, thus, not all the funds had complete data for the full period of analysis. The data was backward-looking as only historical returns were used. Furthermore, the South African market is not fully grown yet, hence, some of the stocks held by the funds were found in more than one index, which show the blurred lines demarcating these indices. Another limitation encountered with the RBSA model was the possibility of overfitting of the chosen variables for the model. However this concern was taken care of and addressed by the solver function of the Excel software, which was used in the quadratic programming of the RBSA regressions. Interestingly, the study found that more new funds are being formed yearly, which may present a great platform to further test objectives similar to this study's, with a much larger and contemporary sample in further studies.

REFERENCES

AHMED, P. & NANDA, S. 2000. Style Investing: Incorporating Growth Characteristics in Value Stocks. *Social Science Research Network, Working paper*, 1-35.

AINSWORTH, A. B., FONG, K. & GALLAGHER, D. R. 2008. Style Drift and Portfolio Management for Active Australian Equity Funds. *Australian Journal of Management*, 32, 387-418.

AKINJOLIRE, A. & SMIT, E. 2003. South African Unit Trust Performance and Strategy in a Changing Economic Climate (1989-2002). *Investment Analysts Journal*, 32, 41-50.

AMARAL, P. S. & QUINTIN, E. 2010. Limited Enforcement, Financial Intermediation, and Economic Development: A Quantitative Assessment. *International Economic Review*, 51, 785-811.

ANDREU, L., SARTO, J. L. & GIMENO, L. V. 2009. Evaluating the Style Portfolio Performance of Spanish Equity Pension Plans. *Spanish Journal of Finance and Accounting/Revista Española de Financiación y Contabilidad*, 38, 545-578.

ANNAERT, J. & VAN CAMPENHOUT, G. 2007. Time Variation in Mutual Fund Style Exposures. *Review of Finance,* 11, 633-661.

ASISA. 2015. *Local Fund Statistics*. [Online]. Available from: www.asisa.org.za [Accessed 23 September 2015].

ASNESS, C. S., FRAZZINI, A., ISRAEL, R. & MOSKOWITZ, T. J. 2014. Fact, Fiction and Momentum Investing. *Journal of Portfolio Management,* 5, 91-112.

ASNESS, C. S., FRAZZINI, A. & PEDERSEN, L. H. 2012. Leverage Aversion and Risk Parity. *Financial Analysts Journal,* 68, 47-59.

AURET, C. & CLINE, R. 2011. Do the Value, Size and January Effects Exist on the JSE*? Investment Analysts Journal,* 40, 29-37.

BAI, Z., WANG, K. & WONG, W.K. 2011. The Mean–Variance Ratio Test—A Complement to the Coefficient of Variation Test and the Sharpe Ratio Test. *Statistics & Probability Letters,* 81, 1078-1085.

BAILEY, D. H. & LOPEZ DE PRADO, M. 2012. The Sharpe Ratio Efficient Frontier. *Journal of Risk,* 15, 13-25.

BAKER, M., LITOV, L., WACHTER, J. A. & WURGLER, J. 2010. Can Mutual Fund Managers Pick Stocks? Evidence from their Trades Prior to Earnings Announcements. *Journal of Financial and Quantitative Analysis,* 45, 111-127.

BANZ, R. 1981. The Relationship between Return and Market Value of Common Stocks. *Journal of Financial Economics,* 9, 3-18.

BARBERIS, N. & SHLEIFER, A. 2003. Style Investing. *Journal of Financial Economics,* 68, 161-199.

BARRET, A. L. & BRODESKI, B. R. 2006. Survivor Bias and Improper Measurement: How the Mutual Fund Industry Inflates Actively Managed Fund Performance. [Online]. Available at: http://www.etf.com/docs/sbiasstudy.pdf [Accessed 15 October 2015].

BASHIR, M. S. & NAWANG, W. R. W. 2011. Islamic and Conventional Unit Trusts in Malaysia: A Performance Comparison. *Journal of Islamic Economics, Banking and Finance,* 7, 9-22.

BASU, D. & CHAWLA, D. 2012. An Empirical Test of the Arbitrage Pricing Theory—The Case of Indian Stock Market. *Global Business Review,* 13, 421-432.

BASU, S. 1977. Investment Performance of Common Stocks in Relation to their Price- Earnings Ratios: A Test of the Efficient Market Hypothesis. *Journal of Finance,* 34, 663-682.

BAYRAKTAR, E., MILEVSKY, M. A., PROMISLOW, S. D. & YOUNG, V. R. 2009. Valuation of Mortality Risk via the Instantaneous Sharpe Ratio: Applications to Life Annuities. *Journal of Economic Dynamics and Control,* 33, 676-691.

BEAN, C. 2010. Joseph Schumpeter Lecture the Great Moderation, the Great Panic, and the Great Contraction. *Journal of the European Economic Association,* 8, 289-325.

BENDER, J., BRIAND, R., MELAS, D. & SUBRAMANIAN, R. A. 2013. Foundations of Factor Investing. *Social Science Research Network, Working paper*, 12-28.

BERTOLIS, D. & HAYES, M. 2014. An Investigation into South African General Equity Unit Trust Performance during Different Economic Periods. *South African Actuarial Journal,* 14, 73-99.

BLITZ, D., HUIJ, J. & SWINKELS, L. 2012. The Performance of European Index Funds and Exchange-Traded Funds. *European Financial Management,* 18, 649-662.

BODIE, Z., KANE, A. & MARCUS, A. 2013. *Essentials of Investments*. 9th ed. Cambridge, United Kingdom: McGraw Hill.

BODNARUK, A., CHOKAEV, B. & SIMONOV, A. 2015. Downside Risk Timing by Mutual Funds. *Social Science Research Network, Working paper,* 19-32.

BODSON, L., COËN, A. & HÜBNER, G. 2010. Dynamic Hedge Fund Style Analysis with Errors-in-Variables. *Journal of Financial Research,* 33, 201-221.

BOLTON, P., CHEN, H. & WANG, N. 2013. Market Timing, Investment, and Risk Management. *Journal of Financial Economics,* 109, 40-62.

BOYER, B. H. 2012. Style Investing and the Book-to-Market Factor. *EFA Maastricht Meetings, Working Paper,* 1-43.

BRAGA, M. D. 2016. Returns-Based Style Analysis. Asset Management and Institutional Investors. *New York Meetings, Working Paper,* 23-31.

BROOKS, C. 2014. *Introductory Econometrics for Finance.* 9th ed. Cambridge, United Kingdom: Cambridge University Press.

BROWN, K. C. & HARLOW, W. V. 2002. Staying the Course: The Impact of Investment Style Consistency on Mutual Fund Performance. *Social Science Research Network*, *Working paper,* 1-45.

BROWN, S. J. 2011. The Efficient Markets Hypothesis: The Demise of the Demon of Chance? *Accounting & Finance,* 51, 79-95.

BROWN, S. J. & GOETZMANN, W. N. 1995. Performance Persistence. *Journal of Finance,* 50, 679-698.

BROWN, S. J. & GOETZMANN, W. N. 1997. Mutual Fund Styles. *Journal of financial Economics,* 43, 373-399.

BRYANT, L. L. & LIU, H.C. 2011. Mutual Fund Industry Management Structure, Risk and the Impacts to Shareholders. *Global finance journal,* 22, 101-115.

CABELLO, J. M., RUIZ, F., PÉREZ-GLADISH, B. & MÉNDEZ-RODRÍGUEZ, P. 2014. Synthetic Indicators of Mutual Funds' Environmental Responsibility: An Application of the Reference Point Method. *European Journal of Operational Research,* 236, 313-325.

CAO, S. 2012. China's Open-end Fund Investment Style Drift and Fund Performance Empirical Analysis. *Business Computing and Global Informatization (BCGIN), IEEE Second International Conference. Working Paper,* 64-67.

CAPELLE-BLANCARD, G. & MONJON, S. 2014. The Performance of Socially Responsible Funds: Does the Screening Process Matter? *European Financial Management,* 20, 494-520.

CARHART, M. M. 1997. On Persistence in Mutual Fund Performance. *Journal of Finance,* 52, 57-82.

CHAN, K. C. & CHEN, N. 1991. Structural and Return Characteristics of Small and Large Firms. *Journal of Finance,* 40, 451 – 471.

CHAN, L. K., CHEN, H. L. & LAKONISHOK, J. 2002. On Mutual Fund Investment Styles. *Review of financial studies,* 15, 1407-1437.

CHEN, H.L. & DE BONDT, W. 2004. Style Momentum within the S&P-500 Index. *Journal of Empirical Finance,* 11, 483-507.

CHEN, H. & WERMERS, R. 2005. Style Migration and the Cross-Section of Average Stock Returns. *University of Illinois at Chicago, Working paper,* 15-33.

CHEN, L., HE, S. & ZHANG, S. 2011a. When All Risk-Adjusted Performance Measures Are the Same: In Praise of the Sharpe ratio. *Quantitative Finance,* 11, 1439-1447.

CHEN, L., NOVY-MARX, R. & ZHANG, L. 2011b. An Alternative Three-Factor Model. *Social Science Research Network, Working paper,* 18-28.

CHEN, L. & ZHANG, L. 2010. A Better Three-Factor Model That Explains More Anomalies. *Journal of Finance,* 65, 563-595.

CHRISTOPHERSON, J. A. 1995. Equity Style Classifications. *Journal of Portfolio Management,* 21, 32-43.

CHRISTOPHERSON, J. A., FERSON, W. E. & GLASSMAN, D. A. 1998. Conditioning Manager Alphas on Economic Information: Another Look at the Persistence of Performance. *Review of Financial Studies,* 11, 111-142.

CICI, G. 2012. The Prevalence of the Disposition Effect in Mutual Funds' Trades. *Journal of Financial and Quantitative Analysis,* 47, 795-820.

CLARK, J. P. 2013. *Performance, Performance Persistence and Fund Flows: UK Equity Unit Trusts/Open-Ended Investment Companies vs. UK Equity Unit-Linked Personal Pension Funds.* PhD thesis, University of Exeter.

COLLINET, L. & FIRER, C. 2003. Characterizing Persistence of Performance amongst South African General Equity Unit Trusts. *Omega,* 31, 523-538.

CRONQVIST, H., SIEGEL, S. & YU, F. 2015. Value versus Growth Investing: Why Do Different Investors Have Different Styles? *Journal of Financial Economics,* 117, 333-349.

CUBBIN, E., EIDNE, M., FIRER, C. & GILBERT, E. 2006. Mean Reversion on the JSE. *Investment Analysts Journal,* 35, 39-47.

CUMMING, D., FLEMING, G. & SCHWIENBACHER, A. 2009. Style Drift in Private Equity. *Journal of Business Finance & Accounting,* 36, 645-678.

CUTHBERTSON, K. & NITZSCHE, D. 2013. Performance, Stock Selection and Market Timing of the German Equity Mutual Fund Industry. *Journal of Empirical Finance,* 21, 86-101.

CUTHBERTSON, K., NITZSCHE, D. & O'SULLIVAN, N. 2008. Investment Funds: What Next? *Quantitative and Qualitative Analysis in the Social Sciences,* 2, 45-62.

CUTHBERTSON, K., NITZSCHE, D. & O'SULLIVAN, N. 2010. Mutual Fund Performance: Measurement and Evidence. *Financial Markets, Institutions & Instruments,* 19, 95-187.

DAS, P. K. & UMA RAO, S. 2013. Performance Evaluation of Socially Responsible Mutual Funds using Style Analysis. *Social Responsibility Journal,* 9, 109-123.

DAWE, M. S., POKHARIYAL, G. P. & MWAURA, M. F. 2014. The Performance Persistence of Equity and Blended Mutual Funds in Kenya. *International Journal of Economics and Finance,* 6, 153-160.

DEANGELO, H., DEANGELO, L. & STULZ, R. M. 2010. Seasoned Equity Offerings, Market Timing, and the Corporate Lifecycle. *Journal of Financial Economics,* 95, 275-295.

DHANDA, S. K., BATRA, G. & ANJUM, B. 2012. Performance Evaluation of Selected Open Ended Mutual Funds in India. *International Journal of Marketing, Financial Services & Management Research,* 1, 102-110.

DIBARTOLOMEO, D. & WITKOWSKI, E. 1997. Mutual Fund Misclassification: Evidence Based on Style Analysis. *Financial Analysts Journal,* 53, 32-43.

DICKSON, M. 2016. Quantitative Style Investing. *Social Science Research Network, Working paper,* 23-39.

DOMIAN, D. L. & REICHENSTEIN, W. 2009. Returns-Based Style Analysis of Convertible Bond Funds. *Journal of Fixed Income,* 18, 52-71.

DU TOIT, S. G. 2012. *Value Investing Versus Growth Investing in South Africa: Valuation Disparities and Subsequent Performance.* Master's Thesis, Stellenbosch University.

DŽAJA, J. & ALJINOVIĆ, Z. 2013. Testing CAPM Model on the Emerging Markets of the Central and South-Eastern Europe. *Croatian Operational Research Review,* 4, 164-175.

EDDY, C. 2014. *Style Adjusted Performance of South African General Equity Unit Trusts.* Master's Thesis, University of Cape Town.

EL KHAMLICHI, A., AROURI, M. & TEULON, F. 2014a. Persistence of Performance Using the Four-Factor Pricing Model: Evidence from Dow Jones Islamic Index. *Journal of Applied Business Research (JABR),* 30, 917-928.

EL KHAMLICHI, A., LAARADH, K., AROURI, M. & TEULON, F. 2014b. Performance Persistence of Islamic Equity Mutual Funds. *Journal of Applied Business Research,* 31, 876-890.

ELING, M. 2009. Does Hedge Fund Performance Persist? Overview and New Empirical Evidence. *European Financial Management,* 15, 362-401.

ELING, M. & FAUST, R. 2010. The Performance of Hedge Funds and Mutual Funds in Emerging Markets. *Journal of Banking & Finance,* 34, 1993-2009.

ENAW, E. E. 2011. *The Effect of Client Affiliation on the Performance Attributions of Fund Managers in South Africa.* PhD thesis, University of the Western Cape.

ERASLAN, V. 2013. Fama and French Three-Factor Model: Evidence from Istanbul Stock Exchange. *Business and Economics Research Journal,* 4, 11-30.

ERIKSSON, K.-J. H. & PERSSON, H. 2012. Do Winners Keep Winning? A Study of the Performance Persistence in Swedish Mutual Funds. *University of Gothenburg, Research paper,* 1-15.

FAMA, E. F. & FRENCH, K. R. 1992. The Cross-Section of Expected Stock Returns. *Journal of Finance,* 47, 427-465.

FAMA, E. F. & FRENCH, K. R. 1993. Common Risk Factors in the Returns on Stocks and Bonds. *Journal of Financial Economics,* 33, 3-56.

FAMA, E. F. & FRENCH, K. R. 1996. Multifactor Explanations of Asset Pricing Anomalies. *Journal of Finance,* 51, 55-84.

FAMA, E. F. & FRENCH, K. R. 2012. Size, Value, and Momentum in International Stock Returns. *Journal of Financial Economics,* 105, 457-472.

FAMA, E. F. & FRENCH, K. R. 2015. A Five-Factor Asset Pricing Model. *Journal of Financial Economics,* 116, 1-22.

FARHI, E., GOLOSOV, M. & TSYVINSKI, A. 2009. A Theory of Liquidity and Regulation of Financial Intermediation. *The Review of Economic Studies,* 76, 973-992.

FERSON, W. E. & SCHADT, R. W. 1996. Measuring Fund Strategy and Performance in Changing Economic Conditions. *Journal of Finance,* 51, 425-461.

FIRER, C., BEALE, J., EDWARDS, M., HENDRIE, J. & SCHEPPENING, D. 2001. The Persistence of Performance of South African Unit Trusts. *South African Journal of Business Management,* 32, 46-65.

FLETCHER, J. & FORBES, D. 2002. An Exploration of the Persistence of UK Unit Trust Performance. *Journal of Empirical Finance,* 9, 475-493.

FLETCHER, J. & MARSHALL, A. 2005. An Empirical Examination of UK International Unit Trust Performance. *Journal of Financial Services Research,* 27, 183-206.

FOWLER, R., GRIEVES, R. & CLAY SINGLETON, J. 2010. New Zealand Unit Trust Disclosure: Asset Allocation, Style Analysis, and Return Attribution. *Pacific Accounting Review,* 22, 4-21.

FRIJNS, B., GILBERT, A. & ZWINKELS, R. 2013. On the Style Switching Behaviour of Mutual Fund Managers. *Journal of Banking & Finance,* 8, 105-115.

FROOT, K. & TEO, M. 2008. Style Investing and Institutional Investors. *Journal of Financial and Quantitative Analysis,* 43, 883-906.

FUERST, F. & MARCATO, G. 2009. Style Analysis in Real Estate Markets: Beyond the Sectors and Regions Dichotomy. *Journal of Portfolio Management,* 33, 137-154.

FUNG, W. & HSIEH, D. 1996. Performance Attribution and Style Analysis: From Mutual Funds to Hedge Funds*. Duke University, Working Paper,* 1-20.

GILBERT, E. & STRUGNELL, D. 2010. Does Survivorship Bias Really Matter? An Empirical Investigation into its Effects on the Mean Reversion of Share Returns on the JSE (1984-2007). *Investment Analysts Journal,* 39, 31-42.

GILES, T., WILSDON, T. & WORBOYS, T. 2002. Performance Persistence in UK equity funds–A Literature Review. *Charles River Associates, Final Report, CRA. Working Paper,* 32-45.

GILL, A., BIGER, N. & TIBREWALA, R. 2010. Determinants of Dividend Pay-out Ratios: Evidence from United States. *Open Business Journal,* 3, 11-23

GLADYSEK, O. & CHIPETA, C. 2012. The Impact of Socially Responsible Investment Index Constituent Announcements on Firm Price: Evidence from the JSE. *South African Journal of Economic and Management Sciences,* 15, 429-439.

GLODE, V. 2011. Why Mutual Funds "Underperform". *Journal of Financial Economics,* 99, 546-559.

GOETZMANN, W. N. & IBBOTSON, R. G. 1994. Do Winners Repeat? *Journal of Portfolio Management,* 20, 9-18.

GREENWOOD, J., SANCHEZ, J. M. & WANG, C. 2013. Quantifying the Impact of Financial Development on Economic Development. *Review of Economic Dynamics,* 16, 194-215.

GREGORY, A. & TONKS, I. 2004. Performance of Personal Pension Schemes in the UK. *Journal of Business Finance & Accounting,* 30, 980-987.

GRINBLATT, M. & TITMAN, S. 1992. The Persistence of Mutual Fund Performance. *Journal of Finance,* 47, 1977-1984.

GROMB, D. & VAYANOS, D. 2010. Limits of Arbitrage. *Annual Review of Financial Economics,* 2, 251-275.

GULEN, H., XING, Y. & ZHANG, L. 2011. Value versus Growth: Time-Varying Expected Stock Returns. *Financial Management,* 40, 381-407.

HASSAN, A. 2005. *Evaluating the Performance of Managed Funds: The Cases of Equity, Ethical Funds and Islamic Index.* PhD thesis, Durham University.

HASSAN, M. K., SANCHEZ, B. & YU, J.-S. 2011. Financial Development and Economic Growth: New Evidence from Panel Data. *The Quarterly Review of Economics and Finance,* 51, 88-104.

HENRIKSON, R. & MERTON, R. 1981. On Market Timing and Investment Performance. *Journal of Finance,* 33, 1051-1099.

HEREIL, P., MITAINE, P., MOUSSAVI, N. & RONCALLI, T. 2010. Mutual Fund Ratings and Performance Persistence. *Social Science Research Network, Working paper,* 14-26.

HERRMANN, U. & SCHOLZ, H. 2013. Does Style-Shifting Activity Predict Performance? Evidence from Hybrid Mutual Funds. *Social Science Research Network, Working paper,* 23-38.

HILLIER, D., GRINBLATT, M. & TITMAN, S. 2011. *Financial Markets and Corporate Strategy*. 6th ed. Cambridge, United Kingdom: McGraw Hill.

HO, C. S. F., RAHMAN, N. A. A., YUSUF, N. H. M. & ZAMZAMIN, Z. 2014. Performance of Global Islamic Versus Conventional Share Indices: International Evidence. *Pacific-Basin Finance Journal,* 28, 110-121.

HODNETT, K., HSIEH, H.H. & VAN RENSBURG, P. 2012. Payoffs to Equity Investment Styles on the JSE Securities Exchange: The Case of South African Equity Market. *International Business & Economics Research Journal (IBER),* 11, 19-32.

HOEPNER, A. G., RAMMAL, H. G. & REZEC, M. 2011a. Islamic Mutual Funds' Financial Performance and International Investment Style: Evidence from 20 Countries. *European Journal of Finance,* 17, 829-850.

HOEPNER, A. G. F., RAMMAL, H. G. & REZEC, M. 2011b. Islamic Mutual Funds' Financial Performance and International Investment Style: Evidence from 20 Countries. *European Journal of Finance,* 17, 829-850.

HOFFMAN, A. 2012. Stock Return Anomalies: Evidence from the Johannesburg Stock Exchange. *Investment Analysts Journal,* 41, 21-41.

HOLMES, K. & FAFF, R. 2008. Style Drift and Fund Performance in Up and Down Markets: Australian Evidence. *Applied Financial Economics Letters,* 4, 395-398.

HOLMES, K., FAFF, R. & CLACHER, I. 2010. Style Analysis and Dominant Index Timing: An Application to Australian Multi-Sector Managed Funds. *Applied Financial Economics,* 20, 293-301.

HOLMES, K. A. & FAFF, R. W. 2007. Style Drift, Fund Flow and Fund Performance: New Cross-Sectional Evidence. *Financial Services Review,* 16, 55.

HOMM, U. & PIGORSCH, C. 2012. Beyond the Sharpe ratio: An Application of the Aumann–Serrano Index to Performance Measurement. *Journal of Banking & Finance,* 36, 2274-2284.

HSIEH, H.H. & HODNETT, K. 2011. Tests of the Overreaction Hypothesis and the Timing of Mean Reversals on the JSE Securities Exchange (JSE): The case of South Africa. *Journal of Applied Finance and Banking,* 1, 107.

HSIEH, H.-H., HODNETT, K. & VAN RENSBURG, P. 2012. Resilient Market Timing Strategies for Global Equities. *Journal of Applied Business Research (JABR),* 28, 803-814.

HSU, J. C. 2014. Value Investing: Smart Beta vs. Style Indices. *Journal of Indexes, Forthcoming,* 4, 121-133.

HUIJ, J. & LANSDORP, S. D. 2012. Mutual Fund Performance Persistence, Market Efficiency, and Breadth. *Social Science Research Network, Working paper,* 15-25.

IDZOREK, T. M. & BERTSCH, F. 2004. The Style Drift Score. *Journal of Portfolio Management,* 31, 76-83.

IDZOREK, T. M., XIONG, J. X. & IBBOTSON, R. G. 2012. The Liquidity Style of Mutual Funds. *Financial Analysts Journal,* 68, 38-53.

ISRAEL, R. & MALONEY, T. 2014. Understanding Style Premia. *Journal of Investing,* 23, 15-22.

JAME, R. & TONG, Q. 2014. Industry-Based Style Investing. *Journal of Financial Markets,* 19, 110-130.

JANSSON, M., BIEL, A., ANDERSSON, M. & GÄRLING, T. 2011. Investment Style and Perceived Drivers of Adoption of Socially Responsible Investment among Swedish Institutional Investors. *Journal of Investing,* 20, 118-123.

JEGADEESH, N. 1992. Does Market Risk Really Explain the Size Effect? *Journal of Financial and Quantitative Analysis,* 27, 337-351

JEGADEESH, N. & TITMAN, S. 1993. Returns to buying Winners and Selling Losers: Implications for Stock Market Efficiency. *Journal of Finance,* 48, 65-91.

JENSEN, M. 1968. The performance of Mutual Funds in the Period 1945–1964. *Journal of Finance,* 23, 389-416

JOAQUIM, G. P. G. & MOURA, M. L. 2011. Performance and Persistence of Brazilian Hedge Funds during the Financial Crisis. *Brazilian Review of Finance,* 9, 525-548.

KAHN, R. N. & RUDD, A. 1995. Does Historical Performance Predict Future Performance? *Financial Analysts Journal,* 51, 43-52.

KAPLAN, P. D. 2003. Holdings-Based and Returns-Based Style Models*. Frontiers of Modern Asset Allocation,* 3, 71-102.

KAR, M., NAZLıOĞLU, Ş. & AĞıR, H. 2011. Financial Development and Economic Growth Nexus in the MENA Countries: Bootstrap Panel Granger Causality Analysis. *Economic Modelling,* 28, 685-693.

KEYWOOD, T. 2015. *Testing for Persistent Outperformance among South African Unit Trusts.* Honours thesis, University of Stellenbosch.

KORTEWEG, A. 2010. The Net Benefits to Leverage. *Journal of Finance,* 65, 2137-2170.

KOSTAKIS, A., PANIGIRTZOGLOU, N. & SKIADOPOULOS, G. 2011. Market Timing with Option-Implied Distributions: A Forward-Looking Approach. *Management Science,* 57, 1231-1249.

KURNIAWAN, M., HOW, J. C. & VERHOEVEN, P. 2012. Monitoring Style Drift: Evidence from Equity Funds. *Financial Markets & Corporate Governance Conference, Research Paper,* 37-49.

LAI, M.-M. & LAU, S.-H. 2010. Evaluating Mutual Fund Performance in an Emerging Asian Economy: The Malaysian Experience. *Journal of Asian Economics,* 21, 378-390.

LAKONISHOK, J., SHLEIFER, A. & VISHNY, R. W. 1994. Contrarian Investment, Extrapolation, and Risk. *Journal of Finance,* 49, 1541-1578.

LAU, W.-Y. 2007. An Integrated Framework for Style Analysis: How is it useful to Malaysian Equity Trust Investors? *Managerial Finance,* 33, 122-141.

LE SOURD, V. 2007. Performance Measurement for Traditional Investment. *Financial Analysts Journal,* 58, 36-52.

LINTNER, J. 1965. The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *Review of Economics and Statistics,* 47, 13- 37.

LIWEI, S. & PENG, W. 2012. Performance Ranking and Fund Managers' Risk-taking Behaviour. *Review of Investment Studies,* 2, 113-119.

LIZIERI, C., MARCATO, G., OGDEN, P. & BAUM, A. 2012. Pricing Inefficiencies in Private Real Estate Markets using Total Return Swaps. *Journal of Real Estate Finance and Economics,* 45, 774-803.

LOW, S.W. 2012. Market Timing and Selectivity Performance: A Cross-Sectional Analysis of Malaysian Unit Trust Funds*. Prague Economic Papers, Working Paper,* 205-219.

LUCAS, L. & RIEPE, M. W. 1996. The Role of Returns-Based Style Analysis: Understanding, Implementing, and interpreting the Technique. *Financial Analysts Journal,* 53, 29-37.

MALHOTRA, M. 2012. Commodities Derivatives Market in India: The Road Travelled and Challenges Ahead. *Asian Journal of Business and Economics,* 2, 99-114.

MASSA, M., REUTER, J. & ZITZEWITZ, E. 2010. When should Firms Share Credit with Employees? Evidence from Anonymously Managed Mutual Funds. *Journal of Financial Economics,* 95, 400-424.

MASSA, M. & ZHANG, L. 2009. Cosmetic Mergers: The Effect of Style Investing on the Market for Corporate Control. *Journal of Financial Economics,* 93, 400-427.

MCDERMOTT, J. 2009. Returns-Based Style Analysis: An Excel-Based Classroom Exercise. *Journal of Education for Business,* 85, 107-113.

MEHRA, R., PIGUILLEM, F. & PRESCOTT, E. C. 2011. Costly Financial Intermediation in Neoclassical Growth Theory. *Quantitative Economics,* 2, 1-36.

MEYER-PRETORIUS, M. C. & WOLMARANS, H. P. 2006. The Unit Trust Industry in South Africa from 1965 to June 2005: Are Investors Better Off*? Meditari Accountancy Research,* 14, 49-67.

MONETA, F. 2015. Measuring Bond Mutual Fund Performance with Portfolio Characteristics. *Journal of Empirical Finance,* 33, 223-242.

MOSSIN, J. 1966. Equilibrium in a Capital Asset Market. *Econometrica: Journal of the Econometric Society,* 34, 768-783

MULLER, C. & WARD, M. 2013. Style-Based Effects on the Johannesburg Stock Exchange: A Graphical Time-Series Approach*. Investment Analysts Journal,* 42, 1-16.

MUTOONI, R. & MULLER, C. 2007. Equity Style Timing. *Investment Analysts Journal,* 36, 15-24.

NANA, M. 2012*. Unit Trust Performance in South Africa: An Empirical Investigation of the Outperformance and Performance Persistence over the Period 2001 to 2010.* Master's thesis, University of Witwatersrand.

NORMA, SAAD, M., SHABRI ABD. MAJID, M., KASSIM, S., HAMID, Z. & YUSOF, R. M. 2010. A Comparative Analysis of the Performance of Conventional and Islamic Unit Trust Companies in Malaysia. *International Journal of Managerial Finance,* 6, 24-47.

OLDERT, N. 2005. Profile's Unit Trusts & Collective Investments in South Africa. *Profile Media,* 3, 17-24.

OTTEN, R. & BAMS, D. 2000. Statistical Test for Return-Based Style Analysis. *Maastricht University, Working Paper,* 36-51.

PATTARIN, F., PATERLINI, S. & MINERVA, T. 2004. Clustering in Financial Time Series: An Application to Mutual Funds Style Analysis. *Computational Statistics & Data Analysis,* 47, 353-372.

PATTON, A. J. 2009. Are "Market Neutral" Hedge Funds Really Market Neutral? *Review of Financial Studies,* 22, 2495-2530.

PETAJISTO, A. 2011. The Index Premium and Its Hidden Cost for Index Funds. *Journal of Empirical Finance,* 18, 271-288.

PHILIPPON, T. 2015. Has the US Finance Industry Become Less Efficient? On the Theory and Measurement of Financial Intermediation. *The American Economic Review,* 105, 1408-1438.

POJANAVATEE, S. 2013. The Price Linkage between Stock Market and Equity Mutual Funds of Thailand. *Macrotheme Review,* 2, 128-137.

POMORSKI, L. 2004. Style Investing: Evidence from Mutual Fund Flows. *EFA Maastricht Meetings, Working Paper,* 17-38.

PORTER, G. E. & TRIFTS, J. W. 2014. The Career Paths of Mutual Fund Managers: The Role of Merit. *Financial Analysts Journal,* 70, 55-71.

QIAN, Z. & SHI, Z. 2010. Style Investing, Mutual Fund Flows, and Return Comovement. *Citeseer,* 2, 19-40.

RAHMAN, M. L. & UDDIN, J. 2009. Dynamic Relationship between Stock Prices and Exchange Rates: Evidence from Three South Asian Countries. *International Business Research,* 2, 167-170.

RAPACH, D. E., STRAUSS, J. K. & ZHOU, G. 2013. International Stock Return Predictability: What is the Role of the United States? *Journal of Finance,* 68, 1633-1662.

REHKUGLER, H., SCHINDLER, F. & ZAJONZ, R. 2012. The Net Asset Value and Stock Prices of European Real Estate Companies. *Zeitschrift für Betriebswirtschaft,* 82, 53-77.

RENSBURG, P. V. & ROBERTSON, M. 2003. Size, Price-to-Earnings and Beta on the JSE Securities Exchange. *Investment Analysts Journal,* 32, 7-16.

ROSS, S. A. 1976. The Arbitrage Theory of Capital Asset Pricing. *Journal of Economic Theory,* 13, 341-360.

RUF, J. 2013. Hedging Under Arbitrage. *Mathematical Finance,* 23, 297-317.

SADORSKY, P. 2010. The Impact of Financial Development on Energy Consumption in Emerging Economies. *Energy Policy,* 38, 2528-2535.

SAINI, Y., BICK, G. & ABDULLA, L. 2011. Consumer Awareness and Usage of Islamic Banking Products in South Africa. *South African Journal of Economic and Management Sciences,* 14, 298-313.

SCHER, N. & MULLER, C. 2005. Equity Style and Performance Persistence in South African Unit Trusts. *Investment Analysts Journal,* 34, 5-16.

SCHIFF, E. 2011. *On Persistence in Latin American Mutual Fund Performance.* Master's thesis, Erasmus University.

SCHIFFRES, M. & PARMELEE, J. 1995. These Funds Aren't What They Seem. *Kiplinger's Personal Finance Magazine,* 49, 57-61.

SCHNEEWEIS, T., KAZEMI, H. B. & SZADO, E. 2012. Hedge Fund Return-Based Style Estimation: A Review on Comparison Hedge Fund Indices. *Social Science Research Network, Working paper,* 21-35.

SCHOLTENS, L. J. R. 2013. Centralization in International Financial Intermediation: Theory, Practice, and Evidence for the European Community. *PSL Quarterly Review,* 45, 10-23.

SCHUSTER, M. & AUER, B. R. 2012. A Note on Empirical Sharpe Ratio Dynamics. *Economics Letters,* 116, 124-128.

SCHWINDLER, O. & OEHLER, A. 2011. Style Analysis of Funds of Hedge Funds: Measurement of Asset Allocation and Style Drift. *Funds of Hedge Funds: Performance, Assessment, Diversification, and Statistical Properties,* 6, 145-158.

SENSOY, B. A. 2009. Performance Evaluation and Self-Designated Benchmark Indexes in the Mutual Fund Industry. *Journal of Financial Economics,* 92, 25-39.

SHARPE, W. F. 1964. Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *Journal of Finance,* 19, 425-442

SHARPE, W. F. 1966. Mutual Fund Performance. *Journal of Business,* 20, 119-138.

SHARPE, W. F. 1988. Determining a Fund's Effective Asset Mix. *Investment Management Review,* 2, 59-69.

SHARPE, W. F. 1992. Asset allocation: Management Style and Performance Measurement. *Journal of Portfolio Management,* 18, 7-19.

SHAW, D. X., LIU, S. & KOPMAN, L. 2008. Lagrangian Relaxation Procedure for Cardinality-Constrained Portfolio Optimization. *Optimization Methods & Software,* 23, 411-420.

STATISTA. 2015. *Mutual Funds Industry.* [Online]. Available from: www.statista.com [Accessed 26 September 2015].

STRUGNELL, D., GILBERT, E. & KRUGER, R. 2011. Beta, Size and Value Effects on the JSE, 1994-2007. *Investment Analysts Journal,* 40, 1-17.

SWAMY, M. 2013. Modern Portfolio Theory. *Journal of Financial Management & Analysis,* 26, 84.

TANEJA, Y. P. 2010. Revisiting Fama French Three-factor Model in the Indian Stock Market. *Journal of Business Perspective,* 14, 267-274.

THOMAS, S. 2012. *An Investigation into Performance Persistence Amongst South African General Equity Unit Trusts Funds-for the Period 2000 to 2011.* Master's thesis, University of Cape Town.

TREYNOR, J. & MAZUY, K. 1966. Can Mutual Funds Outguess the Market? *Harvard Business Review,* 44, 131-136.

TREYNOR, J. L. 1965. How to Rate Management of Investment Funds. *Harvard Business Review,* 43, 63- 75.

UTZ, S., WIMMER, M., HIRSCHBERGER, M. & STEUER, R. E. 2014. Tri-Criterion Inverse Portfolio Optimization with Application to Socially Responsible Mutual Funds. *European Journal of Operational Research,* 234, 491-498.

VAN GELDEREN, E. & HUIJ, J. 2014. Academic Knowledge Dissemination in the Mutual Fund Industry: Can Mutual Funds Successfully Adopt Factor Investing Strategies? *Journal of Portfolio Management,* 40, 157.

VAN HEERDEN, J. D. 2014. *The Impact of Firm-Specific Factors on the Cross-Sectional Variation in Johannesburg Security Exchange Listed Equity Returns.* PhD thesis, University of Cape Town.

VAN RENSBURG, P. 2001. A Decomposition of Style-Based Risk on the JSE. *Investment Analysts Journal,* 30, 45-60.

VAYANOS, D. & WOOLLEY, P. 2013. An Institutional Theory of Momentum and Reversal. *Review of Financial Studies,* 26, 1087-1145.

VERBEEK, M. & WANG, Y. 2013. Better than the Original? The Relative Success of Copycat Funds. *Journal of Banking & Finance,* 37, 3454-3471.

VIVIERS, S., BOSCH, J., SMIT, E. & BUIJS, A. 2008. The Risk-Adjusted Performance of Responsible Investment Funds in South Africa. *Investment Analysts Journal,* 37, 39-52.

VIVIERS, S., BOSCH, J., SMIT, E. & BUIJS, A. 2009. Responsible Investing in South Africa. *Investment Analysts Journal,* 38, 3-16.

VON WIELLIGH, J. & SMIT, E. 2000. Persistence in the Performance of South African Unit Trusts. *University of Cape Town, Working Paper,* 1-23.

WAHAL, S. & YAVUZ, M. D. 2013. Style Investing, Comovement and Return Predictability. *Journal of Financial Economics,* 107, 136-154.

WALKSHÄUSL, C. & LOBE, S. 2012. Islamic Equity Investing: Alternative Performance Measures and Style Analysis. *Journal of Investing,* 21, 182-189.

WANG, J., BROOKS, R., LU, X. & HOLZHAUER, H. M. 2010. Growth/Value, Market Cap, and Momentum. *Journal of Investing,* 23, 33-42.

WENG, H. & TRÜCK, S. 2011. Style Analysis and Value-at-Risk of Asia-Focused Hedge Funds. *Pacific-Basin Finance Journal,* 19, 491-510.

WERMERS, R. 2000. Mutual Fund Performance: An Empirical Decomposition into Stock-Picking Talent, Style, Transactions Costs, and Expenses. *Journal of Finance,* 55, 1655-1703.

WESSELS, D. & KRIGE, J. 2005. The Persistence of Active Fund Management Performance. *South African Journal of Business Management,* 36, 22-30.

WILLENBROCK, S. 2011. Diversification Return, Portfolio Rebalancing, and the Commodity Return Puzzle. *Financial Analysts Journal,* 67, 42-49.

WOODFORD, M. 2010. Financial Intermediation and Macroeconomic Analysis. *Journal of Economic Perspectives,* 24, 21-44.

YE, P. 2012. The Value of Active Investing: Can Active Institutional Investors Remove Excess Comovement of Stock Returns? *Journal of Financial and Quantitative Analysis,* 47, 667-688.

YU, X. 2008. *The Investigation of Style Indices and Active Portfolio Construction on the JSE.* Master's thesis, University of Cape Town.

GLOSSARY OF ACRONYMS

ALSI -	J203 All Share Index
AMEX -	American Stock Exchange
ANOVA -	Analysis of Variance
APT -	Arbitrage Pricing Theory
ASISA -	Association of Savings and Investments South Africa
B/M -	Book-to-Market Ratio
CAPM -	Capital Asset Pricing Model
CPI -	Consumer Price Index
CPR -	Cross Product Ratio
EMH -	Efficient Market Hypothesis
E/P -	Earnings-to-Price Ratio
EPS -	Earnings per Share
ETF -	Exchange Traded Fund
FF3F -	Fama-French 3 Factor Model
FNB -	First National Bank
FTSE -	Financial Times Stock Exchange
GNP -	Gross National Product
HML -	High-Minus-Low
JSE -	Johannesburg Securities Exchange
Log L -	Log Likelihood
MSCI -	Morgan Stanley Capital International
P/B -	Price-to-Book Ratio
P/CF -	Price-to Cash Flow Ratio
P/E -	Price-to-Earnings Ratio
P/S -	Price-to-Sales Ratio
RBSA -	Returns Based Style Analysis
RoMaD -	Return over Maximum Drawdown
SA -	South Africa
SDS -	Style Drift Score
SENS -	Stock Exchange News Service
SML -	Small-Minus-Big
STEFI -	Short Term Fixed Interest

TRI - Total Returns Index

UK - United Kingdom

US - United States (of America)

ZAR - Zuid-Afrikaans Rand (South African Rand)

Appendix A

List of the full names of unit trusts used in the study:

	FINANCIALS FUNDS	
	FULL NAME	**JSE CODE**
FUND A	Coronation Financial Fund	CNFG
FUND B	Momentum Financials Fund A	RMFS
FUND C	Nedgroup Investments Financials Fund A	UALA
FUND D	Sanlam Financial Fund	SANF
FUND E	Sanlam Financial Fund B1	SAFB
FUND F	ABSA Select Equity Fund	ASEF
	GROWTH FUNDS	
FUND A	FNB Momentum Growth Fund A	FNBG
FUND B	Foord Equity Fund	FEQF
FUND C	Investec Growth Fund Class A	FGGA
FUND D	Nedgroup Investments Growth Fund A	SYGA
FUND E	Marriot Dividend Growth Fund Class R	HLMK
FUND F	Old Mutual Growth Fund R	OMGR
	INDUSTRIALS FUNDS	
FUND A	Coronation Industrials Fund Class A	CNCG
FUND B	Momentum Industrial Fund A	RMCF
FUND C	Old Mutual Industrial Fund A	OMCF
FUND D	Sanlam Industrial Fund A	SIFA
FUND E	Stanlib Industrial Fund R Class	GDKI
FUND F	Stanlib Industrial Fund A Class	LIIA
	LARGE CAP FUNDS	
FUND A	Absa Large Cap Fund	ABRF
FUND B	ABSA Large Cap Fund B Class	ARPCB
FUND C	Momentum Top 40 Index Fund	RMBT
FUND D	Old Mutual Top 40 Fund A	OMSA
FUND E	Prescient Equity Top 40 A1	PEQF
FUND F	Stanlib ALSI 40 Fund Class A	LBFT

	RESOURCES FUNDS	
	FULL NAME	**JSE CODE**
FUND A	Investec Commodity Fund Class R	INVC
FUND B	Momentum Resources Fund A	SAGR
FUND C	Nedgroup Investment Mining & Resource R	SYMR
FUND D	Old Mutual Mining & Resources Fund R	OMTM
FUND E	Old Mutual Gold Fund R	OMTG
FUND F	Stanlib Resources Fund R Class	GDBR
	SMALL CAP FUNDS	
FUND A	Coronation Smaller Companies Fund	COSG
FUND B	Investec Emerging Companies R	INVE
FUND C	Momentum Small Mid-Cap A	RMEC
FUND D	Nedgroup Investment Entrepreneur Fund R	NDBE
FUND E	Old Mutual Mid & Small-Cap Fund R	OMSC
FUND F	Stanlib Small Cap Fund A Class	GDSC
	VALUE FUNDS	
FUND A	Cadiz Mastermind Fund Class A	AHMF
FUND B	Element Islamic Equity Fund A	FIEU
FUND C	Investec Value Fund Class R	INVF
FUND D	Stanlib Value Fund A Class	LIVA
FUND E	Momentum Value Fund A	RMVF
FUND F	Nedgroup Investments Value Fund A	BOVA

Appendix B

The 12 factors chosen for the Returns Based Style Analysis (RBSA) model:

1. J200- JSE Top 40 (Large cap)
2. J201- Mid cap
3. J202- Small cap
4. J330- Value
5. J331- Growth
6. J210- Resource 10
7. J211- Industrial 25
8. J530- Consumer Goods
9. J253- SA Listed Property
10. J212- Financials 15
11. J590- Technology
12. Short term treasury bills (SA Government 91-day T-bill)

Appendix C

Correlations between the chosen 12 factors of the RBSA model:

	daytbill	resou~10	indus~25	finan~15	growth	salist~p	consgo~s
daytbill	1.0000						
resource10	0.0290	1.0000					
	0.7539						
industrial25	-0.0562	0.5364	1.0000				
	0.5437	0.0000					
financials15	-0.0278	0.3550	0.7543	1.0000			
	0.7644	0.0001	0.0000				
growth	0.0055	0.8925	0.7849	0.5670	1.0000		
	0.9530	0.0000	0.0000	0.0000			
salistprop	-0.0503	-0.0020	0.4055	0.6052	0.1771	1.0000	
	0.5867	0.9831	0.0000	0.0000	0.0541		
consgoods	-0.0609	0.5149	0.8310	0.5231	0.7025	0.2700	1.0000
	0.5105	0.0000	0.0000	0.0000	0.0000	0.0030	
largecap	0.0014	0.9017	0.8199	0.6481	0.9737	0.2214	0.7136
	0.9878	0.0000	0.0000	0.0000	0.0000	0.0155	0.0000
midcap	-0.0668	0.3941	0.7780	0.7926	0.5780	0.6970	0.5503
	0.4703	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
smallcap	-0.0653	0.4318	0.7318	0.7618	0.5895	0.6683	0.5387
	0.4806	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
value	-0.0225	0.7804	0.8247	0.7629	0.8421	0.4148	0.6549
	0.8083	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
technology	-0.0947	0.3835	0.5565	0.5452	0.4836	0.3881	0.4098
	0.3058	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

	largecap	midcap	smallcap	value	techno~y
largecap	1.0000				
midcap	0.6359	1.0000			
	0.0000				
smallcap	0.6510	0.8980	1.0000		
	0.0000	0.0000			
value	0.9292	0.7971	0.7852	1.0000	
	0.0000	0.0000	0.0000		
technology	0.5312	0.6068	0.5728	0.5930	1.0000
	0.0000	0.0000	0.0000	0.0000	

.

Corresponding P - Values beneath the correlation coefficients reflect statistical significance.

Appendix D

Levels of style drift amongst the funds chosen for the study:

					FUND DRIFT					
	FUND SECTORS		**STYLE DRIFT SCORE**			**ADJUSTED R-SQUARED**			**TRACKING ERROR**	
			Mean SDS = 0,9814			Mean Adj.R-squared=0,8621			Mean Tracking error=0,002467	
	FINANCIALS		**SDS**	**RANKING**		**ADJ.R-SQUARED**	**RANKING**		**TRACKING ERROR**	**RANKING**
FUND A	Coronation Financial Fund		**0,7648913**	**C**		0,88427006	C		0,001972815	C
FUND B	Momentum Financials Fund A		**0,9707935**	**C**		0,925006516	C		0,00250388	D
FUND C	Nedgroup Investments Financials Fund A		**0,6278492**	**C**		0,915234892	C		0,001619355	C
FUND D	Sanlam Financial Fund		**0,5816421**	**C**		0,917317118	C		0,001658315	C
FUND E	Sanlam Financial Fund B1		**1,194669**	**D**		0,88238168	C		0,001446609	C
FUND F	ABSA Select Equity Fund		**0,7831952**	**C**		0,89164536	C		0,002232962	C
Overall Drift=				**17%**			0%			17%
	GROWTH									
FUND A	FNB Momentum Growth Fund A		**0,7501074**	**C**		0,905923005	C		0,001934685	C
FUND B	Foord Equity Fund		**0,5725278**	**C**		0,890565751	C		0,00163233	C
FUND C	Investec Growth Fund Class A		**0,8200536**	**C**		0,867270859	C		0,002112317	C
FUND D	Nedgroup Investments Growth Fund A		**0,6464316**	**C**		0,888693577	C		0,001843036	C
FUND E	Marriot Dividend Growth Fund Class R		**0,7354794**	**C**		0,776359498	D		0,001896956	C
FUND F	Old Mutual Growth Fund R		**0,7211102**	**C**		0,88982534	C		0,001859895	C
Overall Drift=				**0%**			17%			0%
	INDUSTRIALS									
FUND A	Coronation Industrials Fund Class A		**0,5919021**	**C**		0,890125256	C		0,00152664	C
FUND B	Momentum Industrial Fund A		**0,8130271**	**C**		0,884818765	C		0,002096968	C
FUND C	Old Mutual Industrial Fund A		**0,9090402**	**C**		0,85978305	D		0,002344606	C
FUND D	Sanlam Industrial Fund A		**0,5410129**	**C**		0,891407575	C		0,001542478	C
FUND E	Stanlib Industrial Fund R Class		**1,000855**	**D**		0,819702391	D		0,002581415	D
FUND F	Stanlib Industrial Fund A Class		**0,8365522**	**C**		0,844597381	D		0,002385088	C
Overall Drift=				**17%**			50%			17%
	LARGE CAP									
FUND A	Absa Large Cap Fund		**0,8025997**	**C**		0,925024562	C		0,002288286	C
FUND B	ABSA Large Cap Fund B Class		**1,1952927**	**D**		0,944028686	C		0,001447365	C
FUND C	Momentum Top 40 Index Fund		**0,6472081**	**C**		0,958031469	C		0,001669286	C
FUND D	Old Mutual Top 40 Fund A		**0,5827785**	**C**		0,952162253	C		0,001661556	C
FUND E	Prescient Equity Top 40 A1		**1,5339151**	**D**		0,872874058	C		0,003037933	D
FUND F	Stanlib ALSI 40 Fund Class A		**0,6276007**	**C**		0,955061708	C		0,001789348	C
Overall Drift=				**33%**			0%			17%
	RESOURCES									
FUND A	Investec Commodity Fund Class R		**1,055822**	**D**		0,903031331	C		0,002723187	D
FUND B	Momentum Resources Fund A		**1,0787146**	**D**		0,911962906	C		0,002782232	D
FUND C	Nedgroup Investment Mining & Resource		**0,6286401**	**C**		0,961404617	C		0,001621395	C
FUND D	Old Mutual Mining & Resources Fund R		**0,9737689**	**C**		0,872849806	C		0,002511555	D
FUND E	Old Mutual Gold Fund R		**3,3064722**	**D**		0,401091472	D		0,008528087	D
FUND F	Stanlib Resources Fund R Class		**0,9912351**	**D**		0,905917011	C		0,002556604	D
Overall Drift=				**67%**			17%			83%
	SMALL CAP									
FUND A	Coronation Smaller Companies Fund		**0,8426732**	**C**		0,803364013	D		0,002173431	C
FUND B	Investec Emerging Companies R		**1,0939741**	**D**		0,839114628	D		0,002821589	D
FUND C	Momentum Small Mid-Cap A		**1,085863**	**D**		0,758191918	D		0,003095896	D
FUND D	Nedgroup Investment Entrepreneur Fund		**1,010565**	**D**		0,849988313	D		0,002606459	D
FUND E	Old Mutual Mid & Small-Cap Fund R		**0,8043923**	**C**		0,889042129	C		0,002074697	C
FUND F	Stanlib Small Cap Fund A Class		**2,2856114**	**D**		0,749865413	D		0,005004025	D
Overall Drift=				**67%**			83%			67%
	VALUE									
FUND A	Cadiz Mastermind Fund Class A		**1,2443943**	**D**		0,878421259	C		0,003209554	D
FUND B	Element Islamic Equity Fund A		**1,2091954**	**D**		0,816493834	D		0,003122059	D
FUND C	Investec Value Fund Class R		**1,3170472**	**D**		0,768555772	D		0,003396942	D
FUND D	Stanlib Value Fund A Class		**0,9659978**	**C**		0,83245237	D		0,002754149	D
FUND E	Momentum Value Fund A		**1,3274511**	**D**		0,809302471	D		0,003423775	D
FUND F	Nedgroup Investments Value Fund A		**0,7465884**	**C**		0,823281426	D		0,002128593	C
Overall Drift=				**67%**			83%			83%
	CONSISTENT	26	62%			27	64%		25	60%
	DRIFTERS	16	38%			15	36%		17	40%
	TOTAL	42	100%			42	100%		42	100%
	C - Consistent Funds		D - Drifters							

Appendix E

CAPM results from the equity style indices benchmarks:

FUNDS SECTORS			
FINANCIALS	**MARKET BENCHMARK : FINANCIALS 15**		
	ALPHA (α)	**MARKET (β)**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Coronation Financial Fund	-0.000121	0.982967***	0.976409	481.4684	2.414957
	(-0.495219)	(65.61551)			
Momentum Financials Fund A	0.000140	1.081716***	0.964705	449.6406	1.944001
	(0.423592)	(53.32566)			
Nedgroup Investments Financials Fund A	-0.000128	0.990268***	0.978122	484.7421	2.690388
	(-0.540346)	(68.19628)			
Sanlam Financial Fund	-0.000160	0.982121***	0.980164	560.4212	2.404508
	(-0.784813)	(76.36667)			
Sanlam Financial Fund B1	-0.000397*	0.999314***	0.985204	314.5896	2.397099
	(-1.974973)	(63.73981)			
ABSA Select Equity Fund	0.000675	0.975233***	0.912421	468.6747	2.397012
	(1.531693)	(35.07639)			
GROWTH	**MARKET BENCHMARK : GROWTH INDEX**				
FNB Momentum Growth Fund A	-0.000615	0.918672***	0.916818	414.9562	2.261032
	(-1.331174)	(33.87147)			
Foord Equity Fund	-0.000294	0.850791***	0.878129	455.7328	2.307513
	(-0.594716)	(29.17602)			
Investec Growth Fund Class A	-0.000747*	0.870914***	0.904033	456.6092	2.188449
	(-1.658460)	(32.92908)			
Nedgroup Investments Growth Fund A	-0.000523	0.869754***	0.881724	455.1318	2.243758
	(-1.053316)	(29.67607)			
Marriot Dividend Growth Fund Class R	-0.000527	0.829672***	0.798451	372.0169	1.817375
	(-0.757466)	(20.32250)			
Old Mutual Growth Fund R	-0.000595	0.891912***	0.886725	400.1149	2.294849
	(-1.118704)	(28.55024)			
INDUSTRIALS	**MARKET BENCHMARK : INDUSTRIAL 25**				
Coronation Industrials Fund Class A	-0.000306	0.977243***	0.968145	467.4102	2.293194
	(-1.089922)	(56.22939)			
Momentum Industrial Fund A	-0.000134	0.997014***	0.972999	474.2476	2.500381
	(-0.509084)	(61.22689)			
Old Mutual Industrial Fund A	-0.000532	1.012053***	0.972045	470.8019	2.433434
	(-1.959265)	(60.14403)			
Sanlam Industrial Fund A	-0.000287	0.966068***	0.973481	546.1999	2.529360
	(-1.240376)	(65.82334)			
Stanlib Industrial Fund R Class	-0.000222	1.005677***	0.961734	454.4271	2.467503
	(-0.698501)	(51.13511)			
Stanlib Industrial Fund A Class	-0.000102	1.001937***	0.961461	518.8863	2.395182
	(-0.349436)	(54.26637)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively					

LARGE CAP	**MARKET BENCHMARK : JSE TOP 40**				
	ALPHA (α)	**MARKET (β)**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Absa Large Cap Fund	0.000540**	1.046522***	0.968814	526.6617	2.441205
	(1.992384)	(60.55334)			
ABSA Large Cap Fund B Class	0.000159	1.057202***	0.983585	304.4646	2.465285
	(0.676235)	(60.46668)			
Momentum Top 40 Index Fund	-0.000117	1.058317***	0.980463	486.1246	2.015471
	(-0.502083)	(72.25164)			
Old Mutual Top 40 Fund A	-0.000126	1.040219***	0.984677	570.6203	2.356809
	(-0.674447)	(87.08489)			
Prescient Equity Top 40 A1	-0.000372	1.047369***	0.963339	341.1518	2.128575
	(-0.977808)	(45.28338)			
Stanlib ALSI 40 Fund Class A	-2.04E-05	1.067296***	0.978272	546.3984	2.161725
	(-0.088914)	(72.89605)			
RESOURCES	**MARKET BENCHMARK : RESOURCE 10**				
Investec Commodity Fund Class R	0.000359	0.967734***	0.965944	458.9815	2.312826
	(1.189458)	(54.32124)			
Momentum Resources Fund A	1.89E-05	1.027820***	0.965225	451.5205	2.251705
	(0.058400)	(53.73669)			
Nedgroup Investment Mining & Resource R	0.000356*	0.990353***	0.984989	500.5812	2.484437
	(1.753352)	(82.61632)			
Old Mutual Mining & Resources Fund R	8.42E-05	0.931658***	0.942365	434.0643	2.432083
	(0.220213)	(41.24858)			
Old Mutual Gold Fund R	-0.000742	0.961532***	0.743081	339.9526	2.311383
	(-0.792157)	(17.37231)			
Stanlib Resources Fund R Class	-0.000259	0.979391***	0.965801	457.4969	2.423377
	(-0.846521)	(54.20376)			
SMALL CAP	**MARKET BENCHMARK : SMALL CAP INDEX**				
Coronation Smaller Companies Fund	-0.000421*	1.006156***	0.977350	485.3922	1.984745
	(-1.788168)	(66.99709)			
Investec Emerging Companies R	-5.94E-05	1.028898***	0.945592	435.3202	1.897120
	(-0.156493)	(42.52641)			
Momentum Small Mid-Cap A	3.29E-05	1.002024***	0.941692	495.5291	1.837567
	(0.093336)	(43.66634)			
Nedgroup Investment Entrepreneur Fund R	0.000275	1.025493***	0.948134	438.3199	1.952539
	(0.745434)	(43.61401)			
Old Mutual Mid & Small-Cap Fund R	-0.000185	1.036539***	0.970603	468.2198	1.867246
	(-0.667199)	(58.60693)			
Stanlib Small Cap Fund A Class	-0.001496**	1.028018***	0.854604	363.2205	0.929452
	(-2.230507)	(24.26473)			
VALUE	**MARKET BENCHMARK : VALUE INDEX**				
Cadiz Mastermind Fund Class A	-0.000333	1.007557***	0.941772	426.5416	1.718983
	(-0.806405)	(41.02557)			
Element Islamic Equity Fund A	-0.000524	0.951242***	0.924690	421.6026	2.448857
	(-1.168318)	(35.91980)			
Investec Value Fund Class R	-0.000545	0.918888***	0.875039	392.3054	2.019020
	(-0.951898)	(27.00487)			
Stanlib Value Fund A Class	-0.000672*	0.936479***	0.938666	490.4054	2.259540
	(-1.817619)	(42.50747)			
Momentum Value Fund A	-0.001069**	0.986213***	0.933355	421.2346	2.106437
	(-2.459381)	(38.17731)			
Nedgroup Investments Value Fund A	-0.000681*	0.900839***	0.923127	480.6024	2.184158
	(-1.696462)	(37.65631)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively					

Appendix F

FF3F results from the equity style indices benchmarks:

FUNDS SECTORS								
	MARKET BENCHMARK : FINANCIALS 15							
FINANCIALS	**ALPHA (α)**	**MARKET (β)**	**SMB**	**HML**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**	
Coronation Financial Fund	-0.000140	0.985262***	0.215702***	-0.079953	0.979053	488.7392	2.497633	
	(-0.607305)	(68.99373)	(3.813732)	(-1.426243)				
Momentum Financials Fund A	0.000225	1.070297***	-0.112603	0.292916***	0.968759	457.0749	1.894268	
	(0.720892)	(55.43634)	(-1.472573)	(3.864844)				
Nedgroup Investments Financials Fund A	-0.000144	0.992334***	0.111981*	-0.063001	0.978494	486.6700	2.609041	
	(-0.613119)	(68.13303)	(1.941245)	(-1.101907)				
Sanlam Financial Fund	-0.000163	0.983819***	0.082872*	-0.042339	0.980302	561.8631	2.399338	
	(-0.801864)	(75.75353)	(1.679240)	(-0.854570)				
Sanlam Financial Fund B1	-0.000423**	1.001355***	0.054442	-0.041045	0.984925	315.0612	2.410447	
	(-2.067077)	(61.61092)	(0.895093)	(-0.663516)				
ABSA Select Equity Fund	0.000656	0.978189***	-0.398295***	-0.053389	0.927751	481.1499	2.437900	
	(1.638483)	(38.22480)	(-4.095869)	(-0.546891)				
GROWTH	**MARKET BENCHMARK : GROWTH INDEX**							
FNB Momentum Growth Fund A	-0.000637***	0.986706***	0.470542***	0.521290***	0.977922	485.6233	2.543327	
	(-2.668458)	(67.15605)	(7.827800)	(9.128108)				
Foord Equity Fund	-0.000551**	0.941946***	0.739274***	0.410889***	0.972023	544.3181	2.291911	
	(-2.321091)	(63.68936)	(12.45951)	(7.251439)				
Investec Growth Fund Class A	-0.000978***	0.947802***	0.589330***	0.387794***	0.970961	526.9663	2.062699	
	(-3.940168)	(61.49772)	(9.460264)	(6.464591)				
Nedgroup Investments Growth Fund A	-0.000777***	0.960236***	0.691874***	0.482887***	0.974929	548.4593	2.305629	
	(-3.391034)	(67.22528)	(12.07357)	(8.823867)				
Marriot Dividend Growth Fund Class R	-0.000661*	0.941256***	1.035636***	0.415326***	0.942036	438.4722	1.601793	
	(-1.769698)	(40.88666)	(10.99575)	(4.641588)				
Old Mutual Growth Fund R	-0.000623**	0.971350***	0.555925***	0.597811***	0.971510	473.6086	2.390762	
	(-2.328921)	(58.96288)	(8.248280)	(9.336224)				
INDUSTRIALS	**MARKET BENCHMARK : INDUSTRIAL 25**							
Coronation Industrials Fund Class A	-0.000311	0.984145***	0.385410***	0.018916	0.981952	498.2699	2.506917	
	(-1.469129)	(74.93146)	(7.450316)	(0.372969)				
Momentum Industrial Fund A	-0.000123	0.998881***	0.124401**	0.057109	0.974819	478.9410	2.563744	
	(-0.482334)	(63.26624)	(2.000453)	(0.936680)				
Old Mutual Industrial Fund A	-0.000504**	1.013717***	0.140303**	0.127059**	0.976283	480.4629	2.434555	
	(-2.010179)	(65.14335)	(2.289117)	(2.114387)				
Sanlam Industrial Fund A	-0.000299	0.972574***	0.266788***	-0.015648	0.979829	563.5058	2.581417	
	(-1.482580)	(75.53213)	(5.468097)	(-0.323563)				
Stanlib Industrial Fund R Class	-0.000197	1.009163***	0.238352***	0.122535*	0.969937	468.1242	2.386523	
	(-0.699183)	(57.66066)	(3.457673)	(1.813035)				
Stanlib Industrial Fund A Class	-0.000107	1.007245***	0.257130***	0.110303*	0.970915	536.6593	2.352494	
	(-0.423140)	(62.42618)	(4.205772)	(1.820153)				
LARGE CAP	**MARKET BENCHMARK : JSE TOP 40**							
Absa Large Cap Fund	0.000582**	1.027055***	-0.286285***	0.021078	0.974514	539.6980	2.420007	
	(2.371601)	(63.85020)	(-4.697427)	(0.356616)				
ABSA Large Cap Fund B Class	0.000247	1.030706***	-0.229044***	-0.048888	0.987141	313.0837	2.415862	
	(1.177453)	(61.80616)	(-3.569587)	(-0.760508)				
Momentum Top 40 Index Fund	-6.53E-05	1.040973***	-0.306508***	0.121016**	0.985451	502.6295	1.993590	
	(-0.322791)	(80.33471)	(-6.054926)	(2.486173)				
Old Mutual Top 40 Fund A	-0.000109	1.032934***	-0.125697***	0.095050**	0.985467	574.7982	2.460865	
	(-0.595777)	(86.24625)	(-2.770040)	(2.159874)				
Prescient Equity Top 40 A1	-0.000136	1.021825***	-0.270893***	-0.072707	0.968843	348.6179	2.126933	
	(-0.382038)	(45.47703)	(-3.132717)	(-0.870469)				
Stanlib ALSI 40 Fund Class A	2.03E-05	1.048675***	-0.283705***	0.066489	0.983068	562.2634	2.176020	
	(0.100200)	(78.80654)	(-5.627051)	(1.359816)				
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively								

RESOURCES	**MARKET BENCHMARK : RESOURCE 10**						
	ALPHA (α)	**MARKET (β)**	**SMB**	**HML**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Investec Commodity Fund Class R	0.000346	0.990076***	0.214178***	0.014043	0.968888	464.7584	2.253722
	(1.198791)	(54.13165)	(2.840551)	(0.201304)			
Momentum Resources Fund A	5.52E-05	1.051015***	0.135987*	0.230031***	0.971983	463.8950	1.898817
	(0.189721)	(56.99287)	(1.788769)	(3.270545)			
Nedgroup Investment Mining & Resource R	0.000359**	1.013697***	0.194761***	0.087078**	0.989361	519.6809	2.293950
	(2.099189)	(93.50998)	(4.358109)	(2.106112)			
Old Mutual Mining & Resources Fund R	7.59E-05	0.980952***	0.438675***	0.115500	0.961569	456.3699	2.112757
	(0.242617)	(49.51476)	(5.371252)	(1.528589)			
Old Mutual Gold Fund R	-0.000867	1.017567***	0.699860***	-0.370599*	0.758844	344.3062	2.357910
	(-0.952955)	(17.66603)	(2.947355)	(-1.686948)			
Stanlib Resources Fund R Class	-0.000259	1.012429***	0.283940***	0.102524	0.974059	473.0363	2.030721
	(-0.969530)	(59.89439)	(4.074677)	(1.590263)			
SMALL CAP	**MARKET BENCHMARK : SMALL CAP INDEX**						
Coronation Smaller Companies Fund	-0.000414*	1.003935***	0.064440	0.011863	0.977370	486.4679	2.005560
	(-1.754375)	(66.42367)	(1.116409)	(0.208950)			
Investec Emerging Companies R	-3.29E-05	1.031059***	-0.246916***	0.142737	0.948335	439.0656	2.012424
	(-0.088912)	(43.43486)	(-2.723667)	(1.600726)			
Momentum Small Mid-Cap A	2.40E-05	1.004372***	-0.276240***	0.142153*	0.946008	501.1307	1.945164
	(0.070798)	(45.15545)	(-3.369367)	(1.739331)			
Nedgroup Investment Entrepreneur Fund R	0.000296	1.029196***	-0.291259***	0.134190	0.952454	443.9147	2.025886
	(0.837197)	(45.40561)	(-3.364658)	(1.576001)			
Old Mutual Mid & Small-Cap Fund R	-0.000170	1.037145***	-0.110376	0.074492	0.970817	469.6335	1.857298
	(-0.614458)	(58.45578)	(-1.628966)	(1.117688)			
Stanlib Small Cap Fund A Class	-0.001482**	1.024698***	-0.082509	0.163255	0.853111	363.7352	0.907727
	(-2.196519)	(23.88914)	(-0.498616)	(0.995840)			
VALUE	**MARKET BENCHMARK : VALUE INDEX**						
Cadiz Mastermind Fund Class A	-0.000421	1.029753***	0.345641***	-0.208020**	0.946970	432.4794	1.842173
	(-1.063831)	(42.24936)	(3.466225)	(-2.139811)			
Element Islamic Equity Fund A	-0.000697*	0.979724***	0.220759**	-0.561934***	0.942986	437.3831	2.372751
	(-1.780596)	(40.74392)	(2.237331)	(-5.837096)			
Investec Value Fund Class R	-0.000729	0.967853***	0.790470***	-0.417590***	0.909454	410.2475	1.890774
	(-1.489614)	(32.13230)	(6.414480)	(-3.475891)			
Stanlib Value Fund A Class	-0.000809***	0.981518***	0.609047***	-0.423351***	0.961497	519.1342	2.366548
	(-2.759375)	(53.70686)	(8.306850)	(-5.870707)			
Momentum Value Fund A	-0.001206***	1.008418***	0.210464**	-0.407817***	0.941624	429.2186	2.052940
	(-2.953325)	(40.10884)	(2.046077)	(-4.066762)			
Nedgroup Investments Value Fund A	-0.000848***	0.955754***	0.746961***	-0.508980***	0.959781	520.1729	2.291867
	(-2.917374)	(52.75555)	(10.27720)	(-7.120031)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively							

Appendix G

Treynor-Mazuy results from the equity style indices benchmarks:

FUNDS SECTORS					
	MARKET BENCHMARK : FINANCIALS 15				
FINANCIALS	**ALPHA (α)**	**MARKET (β)**	**Y (MARKET TIMING)**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Coronation Financial Fund	1.02E-05	0.987565***	-0.519951	0.976381	481.9198	2.429506
	(0.036187)	(62.62374)	(-0.938505)			
Momentum Financials Fund A	0.000483	1.093754***	-1.361265*	0.965500	451.3483	1.951544
	(1.283469)	(51.83759)	(-1.836406)			
Nedgroup Investments Financials Fund A	-0.000180	0.988440***	0.206770	0.977940	484.8178	2.690847
	(-0.657573)	(64.43321)	(0.383662)			
Sanlam Financial Fund	-0.000177	0.981480***	0.074417	0.979997	560.4333	2.401912
	(-0.759386)	(72.31444)	(0.153657)			
Sanlam Financial Fund B1	-0.000363	1.002783***	-0.267885	0.984990	314.6649	2.413147
	(-1.643408)	(54.92924)	(-0.378731)			
ABSA Select Equity Fund	0.000408	0.965272***	1.155723	0.912594	469.3028	2.364966
	(0.812572)	(33.06812)	(1.109556)			
GROWTH	**MARKET BENCHMARK : GROWTH INDEX**					
FNB Momentum Growth Fund A	-0.000463	0.927913***	-0.595075	0.916293	415.1379	2.223685
	(-0.874095)	(29.61476)	(-0.594677)			
Foord Equity Fund	9.88E-05	0.876888***	-1.653313	0.879435	456.8843	2.213181
	(0.177375)	(25.95170)	(-1.505543)			
Investec Growth Fund Class A	-0.000426	0.892673***	-1.346802	0.904726	457.5407	2.150158
	(-0.839952)	(28.91286)	(-1.352598)			
Nedgroup Investments Growth Fund A	-0.000297	0.884771***	-0.951362	0.881454	455.5068	2.188007
	(-0.528087)	(25.88365)	(-0.856361)			
Marriot Dividend Growth Fund Class R	-0.000263	0.845699***	-1.032053	0.797409	372.2583	1.778747
	(-0.329899)	(17.94157)	(-0.685575)			
Old Mutual Growth Fund R	-0.000417	0.902765***	-0.698834	0.886025	400.3038	2.242101
	(-0.683112)	(25.01608)	(-0.606356)			
INDUSTRIALS	**MARKET BENCHMARK : INDUSTRIAL 25**					
Coronation Industrials Fund Class A	-0.000307	0.977181***	0.006087	0.967832	467.4103	2.293209
	(-0.963262)	(52.51989)	(0.009718)			
Momentum Industrial Fund A	-0.000126	0.997363***	-0.034114	0.972735	474.2493	2.500286
	(-0.420624)	(57.21231)	(-0.058132)			
Old Mutual Industrial Fund A	-0.000487	1.013995***	-0.189548	0.971798	470.8522	2.437304
	(-1.577999)	(56.31459)	(-0.312712)			
Sanlam Industrial Fund A	-0.000420	0.959941***	0.610338	0.973550	546.8645	2.488168
	(-1.623934)	61.49570)	(1.141430)			
Stanlib Industrial Fund R Class	-0.000306	1.002064***	0.352681	0.961452	454.5547	2.467551
	(-0.848136)	(47.65098)	(0.498194)			
Stanlib Industrial Fund A Class	-0.000151	0.999657***	0.227127	0.961167	518.9442	2.394004
	(-0.462403)	(50.64719)	(0.335932)			
LARGE CAP	**MARKET BENCHMARK : JSE TOP 40**					
Absa Large Cap Fund	0.000455	1.040953***	0.403040	0.968640	526.8414	2.425862
	(1.478308)	(52.79514)	(0.592406)			
ABSA Large Cap Fund B Class	9.01E-06	1.044601***	1.015328	0.983805	305.4030	2.494442
	(0.034900)	(52.95225)	(1.346554)			
Momentum Top 40 Index Fund	-0.000247	1.050417***	0.560459	0.980461	486.6315	1.987304
	(-0.923549)	(63.04026)	(0.994812)			
Old Mutual Top 40 Fund A	-0.000102	1.041829***	-0.116534	0.984553	570.6517	2.357344
	(-0.477689)	(76.35662)	(-0.247520)			
Prescient Equity Top 40 A1	-0.000324	1.052039***	-0.248322	0.962897	341.1945	2.149772
	(-0.778606)	(37.04686)	(-0.286887)			
Stanlib ALSI 40 Fund Class A	-0.000158	1.058291***	0.651623	0.978326	547.0556	2.097784
	(-0.610094)	(63.61218)	(1.135116)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively						

RESOURCES	**MARKET BENCHMARK : RESOURCE 10**					
	ALPHA (α)	**MARKET (β)**	**ϒ (MARKET TIMING)**	$ADJ.R^2$	**LOG L.**	**D-W Stat.**
Investec Commodity Fund Class R	0.000255	0.962319***	0.377564	0.965716	459.1440	2.293914
	(0.720057)	(47.39725)	(0.562338)			
Momentum Resources Fund A	-0.000120	1.020574***	0.505227	0.965052	451.7731	2.248724
	(-0.315085)	(46.85885)	(0.701465)			
Nedgroup Investment Mining & Resource R	0.000278	0.986275***	0.284346	0.984901	500.7849	2.480279
	(1.165661)	(72.22115)	(0.629632)			
Old Mutual Mining & Resources Fund R	0.000107	0.932866***	-0.084253	0.941805	434.0693	2.427034
	(0.238579)	(36.18604)	(-0.098828)			
Old Mutual Gold Fund R	-0.000594	0.969260***	-0.538839	0.740732	339.9869	2.306488
	(-0.539319)	(15.34702)	(-0.257997)			
Stanlib Resources Fund R Class	-0.000238	0.980477***	-0.075704	0.965470	457.5033	2.425625
	(-0.661802)	(47.54284)	(-0.111004)			
SMALL CAP	**MARKET BENCHMARK : SMALL CAP INDEX**					
Coronation Smaller Companies Fund	-0.000443	1.005222***	0.096626	0.977135	485.4081	1.985117
	(-1.652282)	(62.84140)	(0.175854)			
Investec Emerging Companies R	0.000196	1.039601***	-1.107442	0.945902	436.1318	1.890575
	(0.456168)	(40.64780)	(-1.2605670			
Momentum Small Mid-Cap A	-4.61E-05	0.998505***	0.372055	0.941285	495.6257	1.836454
	(-0.116051)	(40.90094)	(0.434128)			
Nedgroup Investment Entrepreneur Fund R	0.000175	1.021304***	0.433479	0.947756	438.4507	1.933997
	(0.417007)	(40.82410)	(0.504433)			
Old Mutual Mid & Small-Cap Fund R	8.24E-05	1.047762***	-1.161215*	0.971252	469.9034	1.891234
	(0.265015)	(56.50891)	(-1.823230)			
Stanlib Small Cap Fund A Class	-0.001009	1.048743***	-2.079805	0.855842	364.1651	0.929937
	(-1.331466)	(23.38180)	(-1.360251)			
VALUE	**MARKET BENCHMARK : VALUE INDEX**					
Cadiz Mastermind Fund Class A	-0.000196	1.015144***	-0.538121	0.941394	426.7133	1.720765
	(-0.410117)	(36.36360)	(-0.578122)			
Element Islamic Equity Fund A	-0.000196	1.015144***	-0.538121	0.941394	426.7133	1.720765
	(-0.410117)	(36.36360)	(-0.578122)			
Investec Value Fund Class R	-0.000219	0.936911***	-1.278199	0.875026	392.8118	1.978119
	(-0.331725)	(24.30053)	(-0.994297)			
Stanlib Value Fund A Class	-0.000590	0.941282***	-0.344522	0.938222	490.4871	2.256178
	(-1.391691)	(37.39478)	(-0.399195)			
Momentum Value Fund A	-0.001304	0.973237***	0.920291	0.933283	421.6898	2.121480
	(-2.601378)	(33.23378)	(0.942511)			
Nedgroup Investments Value Fund A	-0.000592	0.906040***	-0.373157	0.922570	480.6837	2.180641
	(-1.286533)	(33.14828)	(-0.398183)			
t statistics in parenthesis *, ** and *** significant at 10%, 5% and 1% respectively						

Appendix H

Performance persistence results at 6 months holding period:

FUNDS SECTORS									
FINANCIALS	**End.Month**	**No. of Obs.(n)**	**% WW**	**% LL**	**% Persistance**	**Chi-Sq.stat.**	**CPR**	**CPR Z-stat.**	**Conclusion**
Coronation Financial Fund	31-Dec-14	41	34.15%	17.07%	51.22%	2.41	0.9800	-0.0781	REVERSAL
Momentum Financials Fund A	31-Dec-14	41	31.71%	17.07%	48.78%	1.83	0.8273	-0.0592	REVERSAL
Nedgroup Investments Financials Fund A	31-Dec-14	41	31.71%	14.63%	46.34%	2.61	0.6446	-0.1101	REVERSAL
Sanlam Financial Fund	31-Dec-14	42	33.33%	19.51%	52.84%	2.00	1.1313	-0.4835	PERSISTENCE
Sanlam Financial Fund B1	31-Dec-14	23	21.74%	34.78%	56.52%	1.52	1.6667	0.1810	PERSISTENCE
ABSA Select Equity Fund	31-Dec-14	42	33.33%	19.05%	52.38%	2.00	1.1313	-0.5815	PERSISTENCE
GROWTH									
FNB Momentum Growth Fund A	31-Dec-14	41	34.15%	19.51%	53.66%	2.02	1.2444	-0.3155	PERSISTENCE
Foord Equity Fund	31-Dec-14	42	33.33%	16.67%	50.00%	2.38	0.8909	-0.5888	REVERSAL
Investec Growth Fund Class A	30-Sep-14	42	30.95%	16.67%	47.62%	1.81	0.7521	-0.2452	REVERSAL
Nedgroup Investments Growth Fund A	31-Dec-14	42	30.95%	19.05%	50.00%	1.62	0.9630	-0.4383	REVERSAL
Marriot Dividend Growth Fund Class R	31-Dec-14	41	39.02%	21.95%	60.97%	4.37	2.2500	0.0741	PERSISTENCE
Old Mutual Growth Fund R	31-Dec-14	41	31.71%	19.51%	51.22%	1.44	1.0505	-0.1362	PERSISTENCE
INDUSTRIALS									
Coronation Industrials Fund Class A	31-Dec-14	41	36.59%	12.20%	48.79%	5.34	0.6944	-0.1928	REVERSAL
Momentum Industrial Fund A	31-Dec-14	41	34.15%	12.20%	46.35%	4.36	0.5833	-0.4824	REVERSAL
Old Mutual Industrial Fund A	31-Dec-14	41	31.71%	17.07%	48.78%	1.83	0.8272	-0.4954	REVERSAL
Sanlam Industrial Fund A	31-Dec-14	42	33.33%	11.90%	45.23%	4.29	0.5303	-0.6986	REVERSAL
Stanlib Industrial Fund R Class	31-Dec-14	41	56.10%	12.20%	68.30%	21.73	2.8750	-0.2866	PERSISTENCE
Stanlib Industrial Fund A Class	31-Dec-14	42	54.76%	11.90%	66.66%	20.86	2.5556	-0.7309	PERSISTENCE
LARGE CAP									
Absa Large Cap Fund	31-Dec-14	42	26.19%	21.43%	47.62%	0.29	0.8181	-0.9442	REVERSAL
ABSA Large Cap Fund B Class	31-Dec-14	23	17.39%	34.78%	52.17%	1.52	1.0667	0.8094	PERSISTENCE
Momentum Top 40 Index Fund	31-Dec-14	41	26.83%	24.39%	51.22%	0.073	1.1000	-0.4965	PERSISTENCE
Old Mutual Top 40 Fund A	31-Dec-14	42	26.19%	23.81%	50.00%	0.095	1.0000	-0.8584	NO PERSISTENCE
Prescient Equity Top 40 A1	31-Dec-14	33	30.30%	24.24%	54.54%	2.03	1.6000	0.8147	PERSISTENCE
Stanlib ALSI 40 Fund Class A	31-Dec-14	42	26.19%	23.81%	50.00%	0.095	1.0000	-0.8557	NO PERSISTENCE
RESOURCES									
Investec Commodity Fund Class R	31-Dec-14	41	21.95%	26.83%	48.78%	0.66	0.9167	-0.07846	REVERSAL
Momentum Resources Fund A	31-Dec-14	41	17.07%	29.27%	46.34%	3.20	0.7500	0.06530	REVERSAL
Nedgroup Investment Mining & Resource R	31-Dec-14	41	21.95%	26.83%	48.78%	0.66	0.9167	0.0640	REVERSAL
Old Mutual Mining & Resources Fund R	31-Dec-14	41	26.83%	24.39%	51.22%	1.83	1.2088	0.2321	PERSISTENCE
Old Mutual Gold Fund R	31-Dec-14	41	9.76%	41.46%	51.22%	8.46	0.6869	0.1419	REVERSAL
Stanlib Resources Fund R Class	31-Dec-14	41	14.63%	26.83%	41.46%	4.17	0.4889	0.09836	REVERSAL
SMALL CAP									
Coronation Smaller Companies Fund	31-Dec-14	41	26.83%	24.39%	51.22%	0.27	1.1111	0.04461	PERSISTENCE
Investec Emerging Companies R	31-Dec-14	41	39.02%	14.63%	53.65%	6.32	1.1429	-0.4463	PERSISTENCE
Momentum Small Mid-Cap A	31-Dec-14	42	50.00%	16.67%	66.67%	17.05	4.4545	-0.4090	PERSISTENCE
Nedgroup Investment Entrepreneur Fund R	31-Dec-14	41	48.78%	14.63%	63.41%	15.26	2,1429	-0.5228	PERSISTENCE
Old Mutual Mid & Small-Cap Fund R	31-Dec-14	41	26.83%	19.51%	46.34%	1.44	0.7521	-0.0748	REVERSAL
Stanlib Small Cap Fund A Class	31-Dec-14	41	9.75%	36.59%	46.34%	6.31	0.500	0.1156	REVERSAL
VALUE									
Cadiz Mastermind Fund Class A	31-Dec-14	41	24.39%	24.39%	48.78%	0.073	0.9090	-0.4388	REVERSAL
Element Islamic Equity Fund A	31-Dec-14	41	29.27%	21.95%	51.22%	1.24	1.1250	0.1519	PERSISTENCE
Investec Value Fund Class R	31-Dec-14	41	21.95%	24.39%	46.34%	0.46	0.7500	-0.01917	REVERSAL
Stanlib Value Fund A Class	31-Dec-14	42	30.95%	19.05%	50.00%	13.62	0.9630	-0.3574	REVERSAL
Momentum Value Fund A	31-Dec-14	41	29.27%	31.71%	60.98%	2.02	2.4375	0.1470	PERSISTENCE
Nedgroup Investments Value Fund A	31-Dec-14	42	30.95%	19.05%	50.00%	1.62	0.9630	-0.2760	REVERSAL
*Chi-square statistic is significant at the 1% level of significance									

Appendix I

Performance persistence results at one year holding period:

FUNDS SECTORS									
FINANCIALS	**End.Month**	**No. of Obs.(n)**	**% WW**	**% LL**	**% Persistance**	**Chi-Sq.stat.**	**CPR**	**CPR Z-stat.**	**Conclusion**
Coronation Financial Fund	31-Dec-14	23	21.74%	13.04%	34.78%	3.26	0.2778	0.8720	REVERSAL
Momentum Financials Fund A	31-Dec-14	23	17.39%	8.70%	20.09%	6.39	0.1143	0.7068	REVERSAL
Nedgroup Investments Financials Fund A	31-Dec-14	23	21.74%	13.04%	34.78%	3.26	0.2778	0.7757	REVERSAL
Sanlam Financial Fund	31-Dec-14	24	20.83%	12.50%	33.33%	3.52	0.2381	0.3140	REVERSAL
Sanlam Financial Fund B1	31-Dec-14	13	7.69%	23.08%	30.77%	6.38	0.2143	3.1337	REVERSAL
ABSA Select Equity Fund	31-Dec-14	24	20.83%	12.50%	33.33%	3.33	0.2381	0.5090	REVERSAL
GROWTH									
FNB Momentum Growth Fund A	31-Dec-14	23	17.39%	13.04%	30.43%	3.96	0.1905	0.6743	REVERSAL
Foord Equity Fund	31-Dec-14	24	41.67%	12.50%	54.17%	4.33	1.0000	0.2150	NO PERSISTENCE
Investec Growth Fund Class A	30-Sep-14	24	33.33%	8.33%	41.66%	4.00	0.3333	-0.2682	REVERSAL
Nedgroup Investments Growth Fund A	31-Dec-14	24	16.67%	16.67%	33.34%	2.67	0.2500	0.2068	REVERSAL
Marriot Dividend Growth Fund Class R	31-Dec-14	23	47.83%	17.39%	65.22%	6.39	2.7500	1.2150	PERSISTENCE
Old Mutual Growth Fund R	31-Dec-14	23	17.39%	17.39%	34.78%	2.22	0.2857	0.7664	REVERSAL
INDUSTRIALS									
Coronation Industrials Fund Class A	31-Dec-14	23	47.83%	8.70%	56.53%	7.78	0.9167	0.7115	REVERSAL
Momentum Industrial Fund A	31-Dec-14	23	43.48%	4.35%	47.83%	7.43	0.2857	0.6671	REVERSAL
Old Mutual Industrial Fund A	31-Dec-14	23	39.13%	8.70%	47.83%	4.30	0.5000	0.7687	REVERSAL
Sanlam Industrial Fund A	31-Dec-14	24	41.67%	8.33%	50.00%	5.33	0.5556	0.2043	REVERSAL
Stanlib Industrial Fund R Class	31-Dec-14	23	43.48%	4.35%	47.83%	7.43	0.2857	0.7642	REVERSAL
Stanlib Industrial Fund A Class	31-Dec-14	24	41.67%	4.17%	45.84%	7.00	0.2381	0.3101	REVERSAL
LARGE CAP									
Absa Large Cap Fund	31-Dec-14	24	20.83%	12.50%	33.33%	3.33	0.2381	0.4776	REVERSAL
ABSA Large Cap Fund B Class	31-Dec-14	13	7.69%	23.08%	30.77%	6.38	0.2143	3.2021	REVERSAL
Momentum Top 40 Index Fund	31-Dec-14	23	17.39%	13.04%	30.43%	3.96	0.1905	0.8078	REVERSAL
Old Mutual Top 40 Fund A	31-Dec-14	24	16.67%	12.50%	29.17%	4.33	0.1667	0.3586	REVERSAL
Prescient Equity Top 40 A1	31-Dec-14	18	22.22%	16.67%	38.89%	3.78	0.5000	2.2989	REVERSAL
Stanlib ALSI 40 Fund Class A	31-Dec-14	24	16.67%	12.50%	29.17%	4.33	0.1667	0.4885	REVERSAL
RESOURCES									
Investec Commodity Fund Class R	31-Dec-14	23	8.70%	30.43%	39.13%	4.65	0.3111	1.0878	REVERSAL
Momentum Resources Fund A	31-Dec-14	23	8.70%	30.43%	39.13%	4.65	0.3111	1.0951	REVERSAL
Nedgroup Investment Mining & Resource R	31-Dec-14	23	13.04%	30.43%	43.47%	2.57	0.5250	1.0951	REVERSAL
Old Mutual Mining & Resources Fund R	31-Dec-14	23	13.04%	30.43%	43.47%	2.57	0.5250	1.0076	REVERSAL
Old Mutual Gold Fund R	31-Dec-14	23	4.35%	34.78%	39.13%	5.70	0.1667	0.8914	REVERSAL
Stanlib Resources Fund R Class	31-Dec-14	23	8.70%	30.43%	39.13%	4.65	0.3111	1.0418	REVERSAL
SMALL CAP									
Coronation Smaller Companies Fund	31-Dec-14	23	17.39%	21.74%	39.13%	1.17	0.4082	0.5711	REVERSAL
Investec Emerging Companies R	31-Dec-14	23	39.13%	8.70%	47.83%	4.30	0.5000	0.3187	REVERSAL
Momentum Small Mid-Cap A	31-Dec-14	24	41.67%	12.50%	54.17%	4.33	1.0000	0.2740	NO PERSISTENCE
Nedgroup Investment Entrepreneur Fund R	31-Dec-14	23	43.48%	8.70%	52.18%	5.70	0.6667	0.3959	REVERSAL
Old Mutual Mid & Small-Cap Fund R	31-Dec-14	23	17.39%	13.04%	30.43%	3.96	0.1905	0.3508	REVERSAL
Stanlib Small Cap Fund A Class	31-Dec-14	23	13.04%	13.04%	26.08%	5.35	0.1250	0.3681	REVERSAL
VALUE									
Cadiz Mastermind Fund Class A	31-Dec-14	23	17.39%	13.04%	30.43%	3.96	0.1905	1.1240	REVERSAL
Element Islamic Equity Fund A	31-Dec-14	23	21.74%	17.39%	39.13%	1.52	0.4167	0.8497	REVERSAL
Investec Value Fund Class R	31-Dec-14	23	17.39%	30.43%	47.82%	3.96	1.0370	1.1918	PERSISTENCE
Stanlib Value Fund A Class	31-Dec-14	24	16.67%	12.50%	29.17%	4.33	0.1667	0.4318	REVERSAL
Momentum Value Fund A	31-Dec-14	23	17.39%	21.74%	39.13%	1.17	0.4082	0.9800	REVERSAL
Nedgroup Investments Value Fund A	31-Dec-14	24	25.00%	8.33%	33.33%	5.33	0.2000	0.7399	REVERSAL
*Chi-square statistic is significant at the 1% level of significance									

Appendix J

Performance persistence results at two years holding period:

FUNDS SECTORS									
FINANCIALS	**End.Month**	**No. of Obs.(n)**	**% WW**	**% LL**	**% Persistance**	**Chi-Sq.stat.**	**CPR**	**CPR Z-stat.**	**Conclusion**
Coronation Financial Fund	31-Dec-14	11	45.45%	0.00%	45.45%	5.36	0.0000	1.1274	REVERSAL
Momentum Financials Fund A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.8034	REVERSAL
Nedgroup Investments Financials Fund A	31-Dec-14	11	45.45%	0.00%	45.45%	5.36	0.0000	1.0615	REVERSAL
Sanlam Financial Fund	31-Dec-14	11	45.45%	0.00%	45.45%	5.36	0.0000	0.9871	REVERSAL
Sanlam Financial Fund B1	31-Dec-14	6	33.33%	0.00%	33.33%	7.33	0.0000	4.2887	REVERSAL
ABSA Select Equity Fund	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.5394	REVERSAL
GROWTH									
FNB Momentum Growth Fund A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.5951	REVERSAL
Foord Equity Fund	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.1942	REVERSAL
Investec Growth Fund Class A	30-Sep-14	12	25.00%	0.00%	25.00%	4.67	0.0000	-0.4901	REVERSAL
Nedgroup Investments Growth Fund A	31-Dec-14	12	0.00%	0.00%	0.00%	12.67	0.0000	0.1330	REVERSAL
Marriot Dividend Growth Fund Class R	31-Dec-14	11	36.36%	0.00%	36.36%	5.36	0.0000	1.5387	REVERSAL
Old Mutual Growth Fund R	31-Dec-14	11	0.00%	9.09%	9.09%	10.45	0.0000	0.7748	REVERSAL
INDUSTRIALS									
Coronation Industrials Fund Class A	31-Dec-14	11	45.45%	0.00%	45.45%	5.36	0.0000	1.1706	REVERSAL
Momentum Industrial Fund A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.6218	REVERSAL
Old Mutual Industrial Fund A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.9612	REVERSAL
Sanlam Industrial Fund A	31-Dec-14	12	36.36%	0.00%	36.36%	4.00	0.0000	0.3912	REVERSAL
Stanlib Industrial Fund R Class	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.9005	REVERSAL
Stanlib Industrial Fund A Class	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.3338	REVERSAL
LARGE CAP									
Absa Large Cap Fund	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	-0.3948	REVERSAL
ABSA Large Cap Fund B Class	31-Dec-14	6	33.33%	0.00%	33.33%	7.33	0.0000	3.9855	REVERSAL
Momentum Top 40 Index Fund	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.4952	REVERSAL
Old Mutual Top 40 Fund A	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.0186	REVERSAL
Prescient Equity Top 40 A1	31-Dec-14	8	37.50%	0.00%	37.50%	5.00	0.0000	1.9325	REVERSAL
Stanlib ALSI 40 Fund Class A	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.08276	REVERSAL
RESOURCES									
Investec Commodity Fund Class R	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.7232	REVERSAL
Momentum Resources Fund A	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.7582	REVERSAL
Nedgroup Investment Mining & Resource R	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.8438	REVERSAL
Old Mutual Mining & Resources Fund R	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.7682	REVERSAL
Old Mutual Gold Fund R	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	1.0499	REVERSAL
Stanlib Resources Fund R Class	31-Dec-14	11	0.00%	18.18%	18.18%	6.82	0.0000	0.6868	REVERSAL
SMALL CAP									
Coronation Smaller Companies Fund	31-Dec-14	11	0.00%	9.09%	9.09%	10.45	0.0000	0.8132	REVERSAL
Investec Emerging Companies R	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.5090	REVERSAL
Momentum Small Mid-Cap A	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.1869	REVERSAL
Nedgroup Investment Entrepreneur Fund R	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.4724	REVERSAL
Old Mutual Mid & Small-Cap Fund R	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.5546	REVERSAL
Stanlib Small Cap Fund A Class	31-Dec-14	11	27.27%	0.00%	27.27%	3.91	0.0000	0.3853	REVERSAL
VALUE									
Cadiz Mastermind Fund Class A	31-Dec-14	11	36.36%	0.00%	36.36%	3.91	0.0000	0.8857	REVERSAL
Element Islamic Equity Fund A	31-Dec-14	11	0.00%	9.09%	9.09%	10.45	0.0000	0.8447	REVERSAL
Investec Value Fund Class R	31-Dec-14	11	9.09%	9.09%	18.18%	9.00	0.0714	0.2390	REVERSAL
Stanlib Value Fund A Class	31-Dec-14	12	33.33%	0.00%	33.33%	4.00	0.0000	0.1717	REVERSAL
Momentum Value Fund A	31-Dec-14	11	0.00%	9.09%	9.09%	10.45	0.0000	0.7727	REVERSAL
Nedgroup Investments Value Fund A	31-Dec-14	12	41.67%	0.00%	41.67%	4.67	0.0000	0.7159	REVERSAL
*Chi-square statistic is significant at the 1% level of significance									

Appendix K

Performance persistence results at three years holding period:

FUNDS SECTORS									
FINANCIALS	**End.Month**	**No. of Obs.(n)**	**% WW**	**% LL**	**% Persistance**	**Chi-Sq.stat.**	**CPR**	**CPR Z-stat.**	**Conclusion**
Coronation Financial Fund	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.3050	REVERSAL
Momentum Financials Fund A	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.9263	REVERSAL
Nedgroup Investments Financials Fund A	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.3851	REVERSAL
Sanlam Financial Fund	31-Dec-14	8	12.50%	12.50%	25.00%	2.50	0.1111	-1.1752	REVERSAL
Sanlam Financial Fund B1	31-Dec-14	3	0.00%	33.33%	33.33%	3.67	0.0000	n/a	REVERSAL
ABSA Select Equity Fund	31-Dec-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.2444	REVERSAL
GROWTH									
FNB Momentum Growth Fund A	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-1.0808	REVERSAL
Foord Equity Fund	31-Dec-14	8	0.00%	0.00%	0.00%	8.00	0.0000	-1.2111	REVERSAL
Investec Growth Fund Class A	30-Sep-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.8552	REVERSAL
Nedgroup Investments Growth Fund A	31-Dec-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.5495	REVERSAL
Marriot Dividend Growth Fund Class R	31-Dec-14	7	14.29%	0.00%	14.29%	5.00	0.0000	0.7695	REVERSAL
Old Mutual Growth Fund R	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.9443	REVERSAL
INDUSTRIALS									
Coronation Industrials Fund Class A	31-Dec-14	7	14.29%	0.00%	14.29%	5.00	0.0000	0.0520	REVERSAL
Momentum Industrial Fund A	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.7185	REVERSAL
Old Mutual Industrial Fund A	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.4507	REVERSAL
Sanlam Industrial Fund A	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.5146	REVERSAL
Stanlib Industrial Fund R Class	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.4003	REVERSAL
Stanlib Industrial Fund A Class	31-Dec-14	8	0.00%	0.00%	0.00%	8.00	0.0000	-1.0484	REVERSAL
LARGE CAP									
Absa Large Cap Fund	31-Dec-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.7985	REVERSAL
ABSA Large Cap Fund B Class	31-Dec-14	3	0.00%	33.33%	33.33%	3.67	0.0000	n/a	REVERSAL
Momentum Top 40 Index Fund	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-1.3652	REVERSAL
Old Mutual Top 40 Fund A	31-Dec-14	8	0.00%	25.00%	25.00%	4.00	0.0000	-1,891693	REVERSAL
Prescient Equity Top 40 A1	31-Dec-14	5	0.00%	40.00%	40.00%	2.20	0.0000	0.0732	REVERSAL
Stanlib ALSI 40 Fund Class A	31-Dec-14	8	0.00%	25.00%	25.00%	4.00	0.0000	-1.9094	REVERSAL
RESOURCES									
Investec Commodity Fund Class R	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-0.9570	REVERSAL
Momentum Resources Fund A	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-1.1163	REVERSAL
Nedgroup Investment Mining & Resource R	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-0.8878	REVERSAL
Old Mutual Mining & Resources Fund R	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-1.0217	REVERSAL
Old Mutual Gold Fund R	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	0.0874	REVERSAL
Stanlib Resources Fund R Class	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-1.0462	REVERSAL
SMALL CAP									
Coronation Smaller Companies Fund	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.7845	REVERSAL
Investec Emerging Companies R	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.9308	REVERSAL
Momentum Small Mid-Cap A	31-Dec-14	8	0.00%	0.00%	0.00%	8.00	0.0000	-0.8898	REVERSAL
Nedgroup Investment Entrepreneur Fund R	31-Dec-14	7	0.00%	0.00%	0.00%	7.29	0.0000	-0.6591	REVERSAL
Old Mutual Mid & Small-Cap Fund R	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.9853	REVERSAL
Stanlib Small Cap Fund A Class	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.5932	REVERSAL
VALUE									
Cadiz Mastermind Fund Class A	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-0.9793	REVERSAL
Element Islamic Equity Fund A	31-Dec-14	7	0.00%	14.29%	14.29%	3.86	0.0000	-0.7787	REVERSAL
Investec Value Fund Class R	31-Dec-14	7	14.29%	14.29%	28.58%	1.57	0.1667	-0.0575	REVERSAL
Stanlib Value Fund A Class	31-Dec-14	8	0.00%	12.50%	12.50%	5.00	0.0000	-1.4295	REVERSAL
Momentum Value Fund A	31-Dec-14	7	0.00%	28.57%	28.57%	2.71	0.0000	-0.7940	REVERSAL
Nedgroup Investments Value Fund A	31-Dec-14	8	12.50%	12.50%	25.00%	2.50	0.1111	-0.8082	REVERSAL
*Chi-square statistic is significant at the 1% level of significance									

Appendix L

Ethical Clearance certificate

Appendix M

Certificate of Proof-reading