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The Determinants of Fund Performance: Does Size Really Matter in South Africa?

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ABSTRACT

This research seeks to better understand the determinants of fund performance in a South African context. It will focus extensively on fund size, past performance, fees, and expense ratios and their relationship with performance. While other research has shown an inverse relationship between fees and performance, it seems divided on the relationship between fund size and performance in various markets. Due to the high regulatory environment, asset managers in South Africa face multiple restrictions that have limited their investible universe. The results presented in this research show that funds in South Africa exhibit the "Hot Hands" phenomenon as well as it documents the negative relationship between fees and performance for South African funds. Lastly, results show a positive relationship between fund size and performance where funds in South Africa enjoy economies of scale.

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1 INTRODUCTION

1.1 BACKGROUND

The annual Raging Bull Awards pay tribute to the unit trust fund managers that consistently outperform according to various categories. In 2016, a record number of awards - 24 out of 40, went to asset managers that are not amongst the top 10 ranked by the size of their assets under management (AUM). This is a large increase compared to 2003 where only three out of the 32 awards were to funds not among the top 10.

Smaller managers often argue that size works against you. A large manager may not be able to invest in smaller- or medium-sized companies because once the manager buys a majority stake in a particular company, the fund will only have an insignificant exposure to the stock in his portfolio. If this company happens to top the performance charts in a particular year, the manager will have missed out.

In an empirical study conducted on the Australian market, smaller funds outperformed their peers over time and thus termed the trend: 'The Boutique Advantage'. This study found smaller funds outperformed both their benchmarks and peers net of fees over a three, five, seven, and 10-year basis (Kretschmann & Hamilton, 2017).

In a white paper titled "Compelling reasons to choose a sub-$100 million asset manager", the research outlines reasons why smaller asset managers have an advantage and have outperformed their peers in the US market, (Thomas, 2016).

With many researchers and multi-managers constantly looking for the next up and coming fund, large volumes of research has been dedicated to fund characteristics. In recent times there has been an increase in research to suggest smaller asset managers may outperform their larger counter parts (Pollet & Wilson, 2008). To better understand these driving forces it is important to understand what is the most efficient way for investors to sustainably generate returns over time? When deciding on investment options, broadly speaking, an investor can choose between two types of funds. The first type is an actively managed fund, which in referring to the role the manager, is to explicitly look for opportunities that will create value for his investors. Due to the skill and time required, actively managed funds will generally have higher fees, but also

higher returns to compensate investors for the added costs. The second type is a passive investment vehicle in which the role of the manager is minimal and the mandate is to track an index rather than try to outperform the market. This means there is less intervention and work required from managers and thus, making the fees significantly cheaper than that of their active counter parts.

Swensen (2005) suggests that there are three main portfolio management tools that investors can use to produce returns from investments: market timing, security selection, and asset allocation. Market timing and security selection are active management tools that can be implemented with the aim of producing returns that outperform a defined benchmark such as the FTSE/JSE All Share Index (ALSI).

Assuming that investors aim to outperform a certain market index, active management techniques such as market timing or individual security selection may be applied, however, success in this endeavor can only come at the expense of someone else's loss as it is a zero-sum game (Sharpe 1966). With many embedded derivatives and complex company structures, the financial markets have become both complex and dynamic, requiring one's constant attention to ensure their portfolio reflects the latest information. Understanding the market is a full time job and market timing is critical. For this reason, retail investors or non-professional investment individuals rather hire a professional and pay them a fee to manage their savings or pension. The value of the investment made by retail investors is relatively small compared with the investments made by institutional investors, being large corporate and financial institutions with excess cash. Preferably, investors will give money to a manager to invest on behalf of them in order to benefit from returns as well as diversification. The asset manager will then pool these funds together to form a collective investment scheme (CIS).

The first consideration is the risk profile of the individual, and what returns are they targeting for a particular time period. Treynor (1965) married the two concepts of risk and reward, a relationship which remains important in constructing an efficient frontier for a certain level of risk appetite. For pensions, the mandate is to take limited risks and guarantee reasonable returns over the long run, a 'Long Only Fund' mandate as outlined by regulation 28.

As no CIS and asset manager is the same, a better understanding of these vehicles can be advantageous to any investor. The ability to identify fund characteristics that explain performance can be viewed as the Holy Grail in financial circles. This would be very powerful to the multi-manager industry, which devotes significant resources to identify up and coming asset managers.

1.2 RESEARCH OBJECTIVES

This study seeks to give a definitive answer as to the determinants of fund performance in a South African context. South Africa makes for an ideal market in which to study the role fund size has on the Johannesburg Stock Exchange (JSE) as it is highly skewed and a strong contrast on a large and small asset manager's nimbleness can be drawn. This study will outline how the role of regulations gives a small manager a clear advantage in South Africa. The paper will use fund size, total expense ratios (TER), management fees, and past performance to explain fund performance in the South African Stock Market.

It is to this authors' knowledge, there has been no recent studies conducted on the mutual fund characteristics in a South African context. This study seeks to expand on the most recent work which focused on fund size alone, (Pillay, Muller & Ward, 2010).

This author seeks to further unpack fund performance by using actual fund data as opposed to running hypothetical portfolios. Pillay et al. (2010) conclude that smaller managers outperform larger managers from a theoretical stand point. This research will investigate the drivers of performance from a practical perspective.

This study firstly seeks to investigate the validity and explanatory power of fund characteristics on returns. The efficacy of several measures used in past research by authors such as Chen, Hong, Huang, and Kubik (2004) and Pillay et al. (2010) will be tested in order to establish an appropriate predictor of fund returns in the emerging market of the Johannesburg Stock Exchange (JSE).

Using four regressions, the explanatory power of fund size, past performance, management fees, and total expense ratio (TER) will be tested. This will be tested over a one, three, five, and seven-year period to check the significance of both the short and long-run.
Thus the research has two main objectives:

- To determine the significance and interactions of fund size, fees, past performance, and TER on performance of domestic equity only funds.
- To study the effect and relationship of these variables through time.

1.3 IMPORTANCE AND BENEFITS OF THE STUDY

The purpose of this study is to further contribute to the vast array of literature regarding the determinants of fund performance, specifically relating to the validity of fund size. There has been contrasting evidence arguing if the role fund size plays in funds is redundant (Abbasi, Kalantari & Abbasi, 2012). While fund performance has been extensively studied across the world in various markets, there is lacking literature in a South African context.

Pillay et al. (2010) constructed hypothetical portfolios of varying sizes, using historical data for each of the years 1991 to 2008. Each of these portfolios consisted of 40 randomly selected stocks, chosen from an investment universe of the top 160 JSE listed shares in terms of market capitalisation. Rules were applied to limit the concentration of any particular share and to ensure that trading volumes were practical. A simulation was then run to explore the boundaries of possible returns for each portfolio. The results indicate that fund size is a contributing factor to its performance; liquidity being the underlying reason for this relationship. Performance was found to be affected for fund sizes greater than about R5bn. Large funds are increasingly forced towards large cap securities with a resulting concentration in resource stocks. While their study was extensive, it used stock data and simulated portfolios based on certain rules. Their study did not include other factors that maybe the underlying resons for small funds to out perform larger funds.

This research shows how smaller managers may have an advantage as they have a larger pool of securities to include in their portfolio. By making use of actual fund data, as opposed to creating hypothetical funds, this research will provide deeper insights into the behavior of managers and thus the driving characteristics of performance. The value in understanding the determinants of fund returns on the JSE is immense and will help guide the industry in providing a better understanding of the financial landscape in South Africa.

1.4 STUDY OUTLINE

The rest of the study is set out as follows. Section 2 presents the literature review which is divided in to five sections surveying local and international contributions to fund characteristics. Section 3 outlines the research methodologies for the data sorting and variable classification used for funds in South Africa. Section 4 outlines the empirical results from this study. It begins with the summary statistics for the data gathered on funds within South Africa to address any clear relationships that might be transparent. It then explores the explanatory power of fund characteristics through regression analysis. The results are then interpreted with economic theory and past literature to present the reader with the implications of the results. Lastly, Section 5 concludes and provides recommendations for future research.

2 LITERATURE REVIEW

The following section is divided into four sub-sections. The first section outlines the financial industry in South Africa and its participants. The second section summarizes what previous authors found in relation to fund characteristics and their relation to performance. Section three and four discusses the regulatory environment and the effect of regulation on the determinants and the JSE. This is done to better understand the constraints faced by investment professionals. The final section brings all the previous sections together to give the reader a comprehensive understanding of the South African market, the characteristics affecting performance and how regulation interacts with fund managers.

2.1 THE FINANCIAL INDUSTRY IN SOUTH AFRICA

With the South African stock market being the largest in Africa, in recent years it has seen substantial growth (Jefferis & Smith, 2005; Hearn, Piesse, & Strange, 2010), accommodating foreign investors seeking opportunities through globalization to diversify their portfolios. The financial market is regulated by the Financial Services Board (FSB), which is the regulatory authority responsible for the non-banking financial services industry in South Africa. The FSB was established in 1991 and serves as an independent body responsible for regulating the financial market in South Africa. Its mission and vision is to promote and maintain sound investment in South Africa.

The Association of Savings and Investments South Africa (ASISA), estimates that there are currently 1269 local collective investment schemes managing approx. R1.8 trillion as of Q3 2017. The size of these assets has grown substantially over the years, as can be seen in Figure 1.

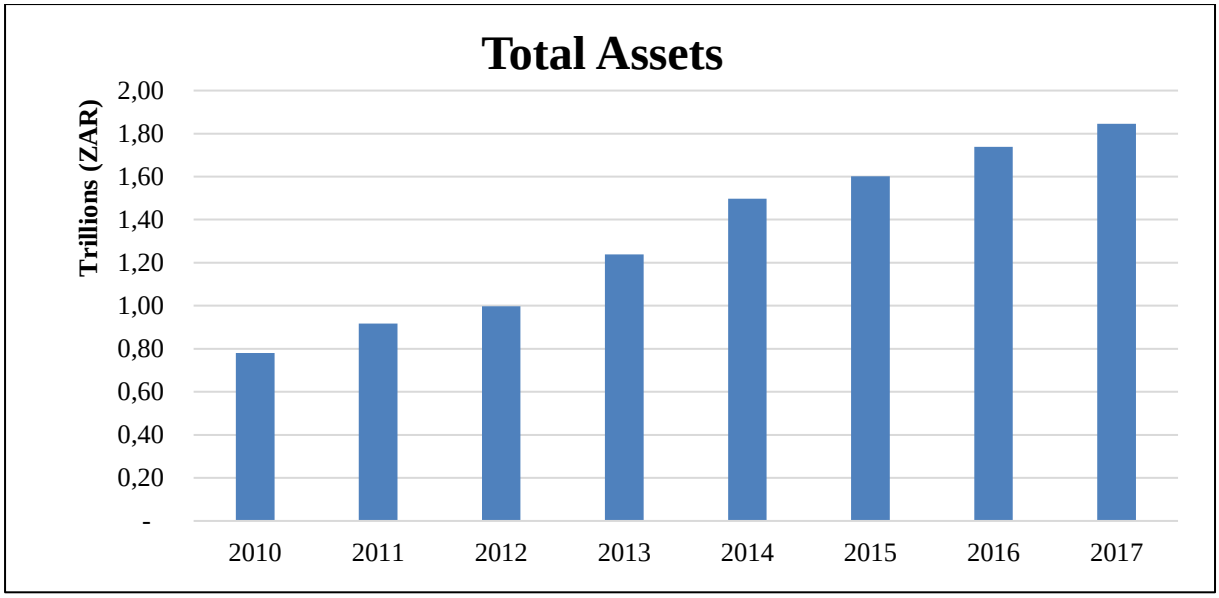


Figure 1, Bar graph showing the grow in assets for local CIS's over time, ASISA (2017)

Collective investment schemes can be categorized as equity only, fixed income or a combination of the two. A closer look at how the industry's AUM is broken down by these categories and shows a large increase in funds that trade both equities and fixed income as seen in Figure 2 below.

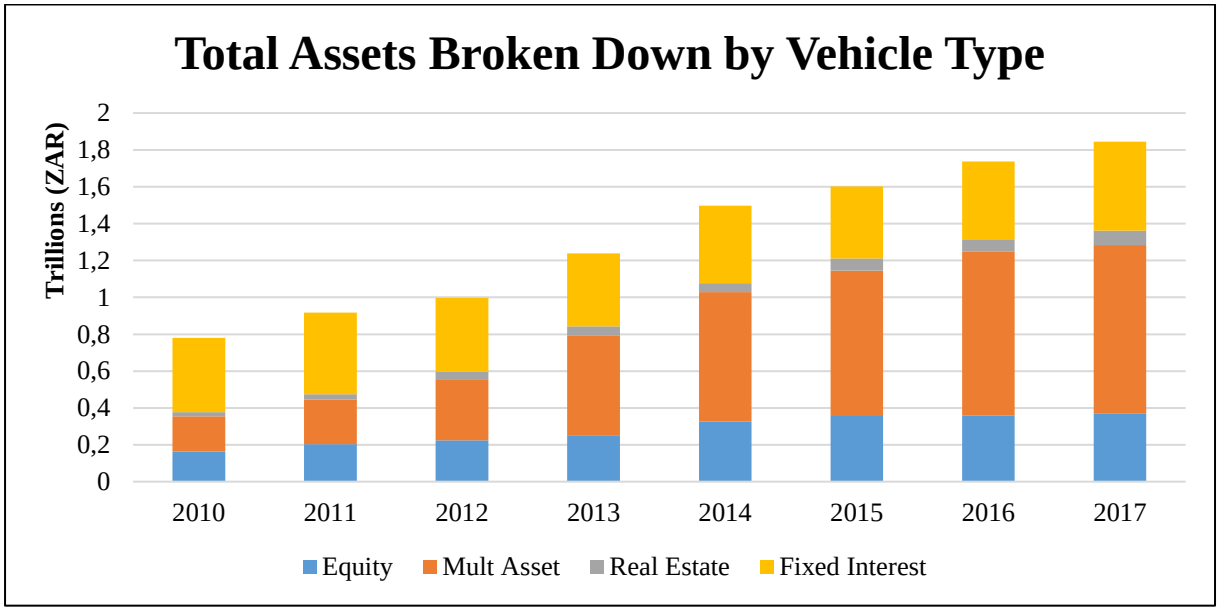


Figure 2, Total assets for the local collective investment scheme industry broken down by vehicle type, ASISA (2017)

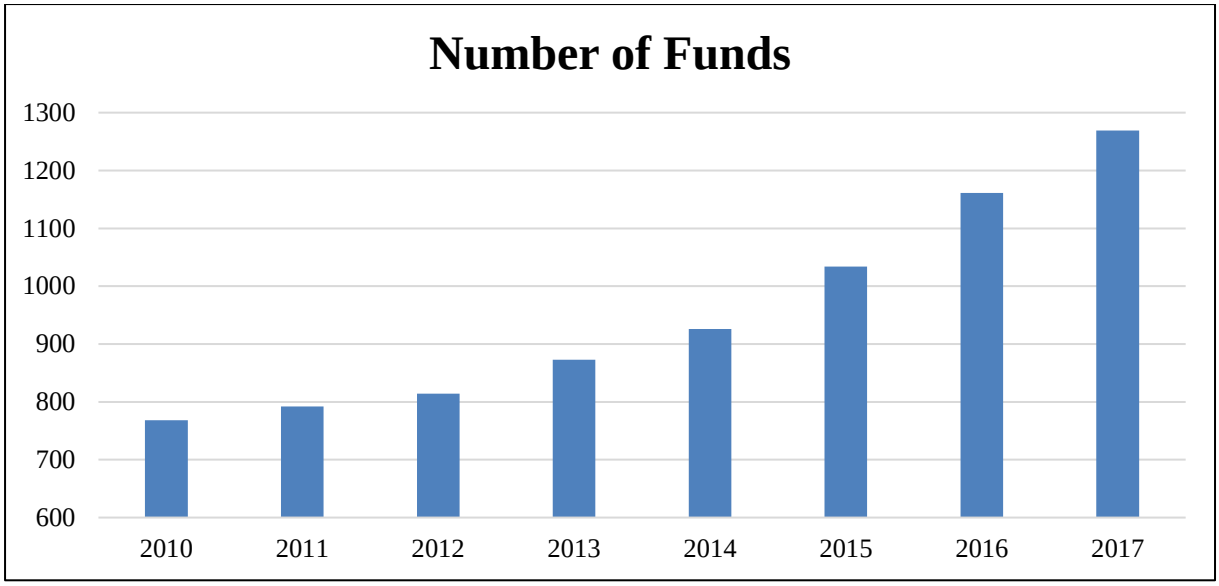


Figure 3, Total Number of Registered CIS's Over Time, ASISA (2017)

Figure 3 above shows that there has been a 65% increase in the number of registered funds since 2010. While that is a large increase, when considering the asset managers in the South African market, there are only few names that dominate the industry.

Table 1 below shows the asset managers with the largest growth over a three-year period and what is noticeable is that the bottom five managers experienced the largest growth despite the fact they are relatively small. This shows that there is significant growth happening among the small to mid-sized managers.

While there has been a significant increase in funds, the top 10 managers ranked by AUM make up approximately 70 % of the total industry as shown in Figure 4 below. Over the past five years, there is a clear trend of assets moving to managers other than the top 10. It is among the boutiques where the rapid growth has taken place. This is both among small managers with their own management companies (manco's), and those firms that white-label or co-brand funds for third party managers. One such manco, Boutique Collective Investments (BCI), which predominantly runs white-labelled funds, has grown into the tenth largest management company in the country. As of 30 September 2017 it had R85.5 billion in AUM, up from R22.8 billion three years ago. While these may not seem like large numbers in the context of the entire market, when grouped together, boutique managers are starting to command a reasonable size of the local market.

Table 1, South African asset managers that experienced the largest growth in assets over a 3-year period, ASISA (2017)

Company	**AUM (ZAR,bn) at September 30 2014**	**AUM (ZAR,bn) at September 30 2017**	**Growth**
Coronation	221.8	250.7	13%
Allan Gray	218.3	278.6	28%
Stanlib	188.4	219.7	17%
Investec	154.0	194.0	26%
Old Mutual	128.0	165.0	29%
Nedgroup Investments	110.8	178.5	61%
Sanlam	88.3	144.4	64%
Prudential	84.2	112.8	34%
ABSA	80.3	108.4	35%
Foord	58.4	77.3	32%

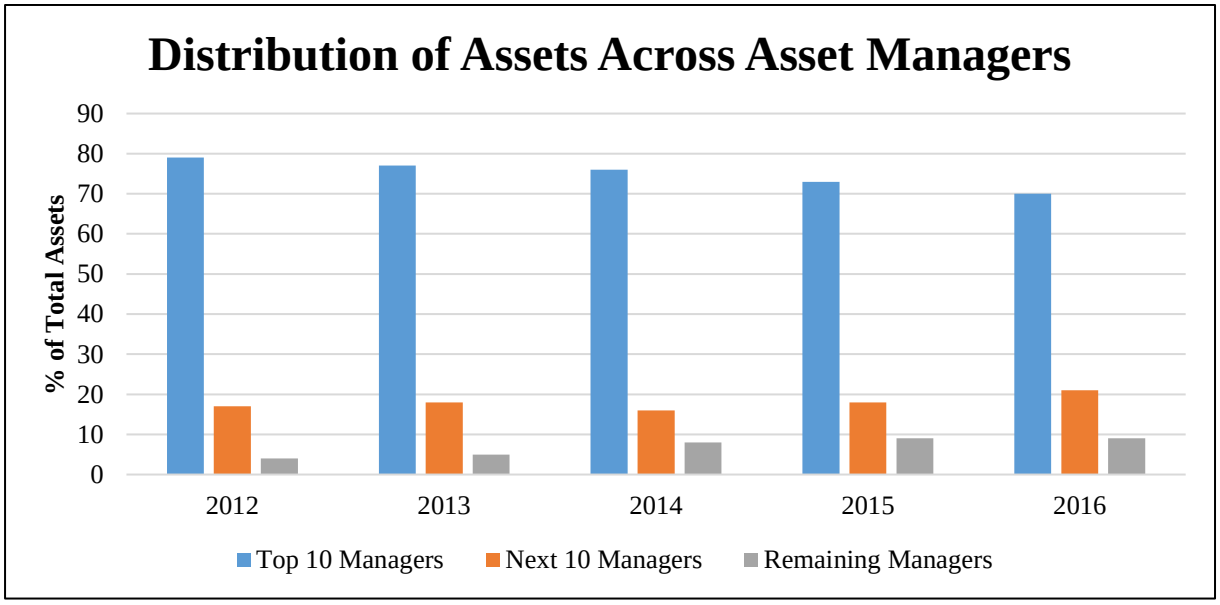


Figure 4, Distribution of assets across asset managers, ASISA (2017)

Large managers have established themselves with a respectable reputation, a good track record and state of the art facilities to provide their clients with the best service posing the question, why wouldn't investors thus put their money with them? The decreasing percentage of assets being invested in asset managers that are in the top 10 has been evidenced as seen above in Figure 4. Supporting this is the recent trend seen in the Raging Bull awards where there has been a 700% increase in awards that went to asset managers not in the top 10.

Table 2, Top 20 asset managers ranked by AUM, ASISA (2017)

Rank by AUM	Asset Manager	AUM (Rmn)
1	Old Mutual Investment Group	631 105
2	Coronation Fund Managers	536 806
3	Investec Asset Management	469 695
4	Allan Gray	461 660
5	Sanlam Investment Management	439 868
6	STANLIB Asset Management	357 627
7	Investment Solutions	279 562
8	Prudential Portfolio Managers	195 315
9	Futuregrowth Asset Management	172 390
10	Sanlam Multi-Manager International	127 592
11	Foord Asset Management	162 679
12	Momentum Asset Managers	141 505
13	Sygnia Asset Management	130 177
14	ABSA Asset Management	115 016
15	Taquanta Asset Managers	105 590
16	Old Mutual Multi-Managers	101 734
17	Momentum Manager of Managers	84 596
18	Ashburton Investments	76 679
19	Prescient Investment Management	76 056
20	ABAX Investments	63 691

There has been a shift in the global paradigm around how investors choose a manager to invest with and how managers run their funds. Active fund managers receive their compensation through a combination of performance fees for outperforming their benchmark and a portion of assets under management. By this logic, it is in the manager's best interests to increase his asset base as much as possible as his compensation is positively correlated with AUM.

Table 3 shows the top 10 global funds that closed their doors to new investors temporarily for the sake of protecting their performance. T Rowe Price Health Sciences fund was closed to new investors effective 1 June 2015 and reopened effective 1 September 2016. The reasons for its closure were "*due to significant purchases and asset growth, which created challenges for the portfolio manager to invest fully in the health sciences industry"*, ("T Rowe closes health sciences fund", 2015).

Table 3: List of top 10 global funds that closed to new investment, ranked by 3 year performance, Financial Planning (March 2016)

Fund Name	AUM (Rbn)	3 Year Return
T. Rowe Price Health Sciences	159.15	21.72%
Franklin Biotechnology Discovery Fund	16.38	16.71%
Primecap Odyssey Aggressive Growth Fund	81.98	16.67%
Vanguard Capital Opportunity Fund	164.3	13.96%
Vanguard Primecap Fund	573.39	13.82%
Vanguard Primecap Core Fund	99.91	13.15%
J Hancock Discipline Value Mid Cap	142.51	11.58%
American Century Mid Cap Value Fund	84.16	11.21%
T. Rowe Price New Horizons Fund	184.63	11.14%
J.P. Morgan Undiscovered Managers Behavioural Value Fund	50.33	11.03%

In South Africa a similar trend was seen by Coronation, one of South Africa's largest asset managers, where in 2012 they closed some of their most successful funds to new investment. In a statement from the Global Head of Institutional Business, Kirshni Totaram said "O*ur South African specialist Equity, Balanced and Absolute Return products were closed in 2012 as a pre-emptive step to protect our ability to deliver on long-term performance objectives for our existing clients. It was an important move at the time, demonstrating our commitment to outperforming the market over meaningful period*," they have since been reopened, (Pelser, 2017, Coronation re-opens strategies to new institutional investors).

This illustrates the fine line a manager must walk in managing the growth in his asset base. If the growth is faster than the rate at which he can invest these funds, it will ultimately hurt performance and be at the cost of the current investors.

Fund size has caused an increase in demand from investors to move away from the larger managers and seek up and coming managers. The number of boutique managers has risen from 8% of asset managers' universe in 1999, to about 38% of the universe in 2015 according to ASISA stats. South Africa still remains a good investment opportunity to offshore investors looking to gain exposure to emerging markets. While they can invest directly into securities, they can also invest into local funds and benefit from diversification. With good governance and the most sophisticated market in Africa, South Africa is a contender for foreign investors, (Asiedu, 2006).

In summary, there are two interesting occurrences happening in the South African financial market. The first is a rapid growth in the number of registered CIS's. The rapid growth can be explained by a demand in the financial market to allocate away from the larger asset managers, as evident from Figure 3 and Figure 4. The second phenomenon is while it is in the asset manager's best interests to grow their base as much as possible to increase their management fee. In practice, managers seem to hold off and even close their funds to new investment as a form of protecting performance, (Pelser, 2017, Coronation re-opens strategies to new institutional investors). The phenomena gives reason to expect that fund size has an effect on performance as managers become too big, they have been noted to close their funds to new investment as an attempt to protect their performance. This gives practical evidence that fund size plays a role in performance and smaller managers may outperform. In the next section, the study further explores the phenomena by analyzing past literature that investigated the role of fund size as well as other fund characteristics and performance.

2.2 FUND CHARACTERISTICS

Chevalier and Ellison (1999) argue that fund performance is a function of managers characteristics. Ferreira, Keswani, Miguel, and Ramos (2013) indicated that the returns of funds can be predicted on the basis of their characteristics. These have been shown to be past performance, expense ratios, fund size, and management fees. In the section below the research will outline the role of each variable has in determining returns by examining the findings of past literature.

2.2.1 PAST PERFORMANCE

'Past performance is not indicative of future performance' - this is a statement that can be found on almost any minimum disclosure document (MDD) or fact sheet disclosing performance. Despite this argument, investors often use past performance as a proxy for future performance. The notion that a fund delivering superior returns in one-year will continue to do so in subsequent years is often referred to the 'Hot Hands' phenomenon.

Research has shown this persistence to be either positive or negative, implying that funds that have done well will continue to do so. Funds that have underperformed will continue to underperform. Sharpe (1966) first examined this by using the past 10-year performance of 34 funds, ranking them from best to worst. By observing their performance over the next 10 years, the results point to a positive relationship with past and future performance. The finding is further corroborated by those of Hendriks, Patel and Zeckhauser (1990), which found the persistence of performance, in the short run (one to eight quarters). The authors went on to create a portfolio that exploited the phenomenon and found that a best-fund strategy with an annual holding period could generate risk-adjusted returns of 10%.

Grinblatt and Titman (1992) investigated the persistence of performance in 279 funds from 1974 to 1984, a 10-year period. The results showed that there is a positive relation between past and future performance. The persistence cannot be explained by any inefficiencies in the benchmark. The authors thus conclude that past performance is useful to investors when considering an investment in funds.

Malkiel (1995) examined the persistence of performance while accounting for any survivorship biases. The study analyzed fund returns from all mutual funds existing each year from 1971 to 1991. The results highlighted the importance of survivorship bias as it is considerably more important than what previous studies had suggested. The authors create an investment strategy exploiting the persistence of performance and find that there is a strong relationship between past returns with future returns in the 1970's, however this relationship falls away in the 1980's. The authors conclude that investors will be better off by purchasing a low expense index fund than trying to identify a fund that possesses the hot hands phenomenon.

Carhart (1997) explained the short-term persistence in equity fund returns with common factors in stock returns and investment costs. The author showed that by buying last year's best funds and selling last year's worst funds, an investor could yield a return of 8% per annum. By increasing the time horizon the return shrinks showing that the hot hands phenomenon exists and is strongest in the short run. The author however concludes that investors should avoid funds with a history of poor performance, the hot hands anomaly is short lived which supports the notion of efficient markets. Lastly expense ratios and transaction costs have a direct and negative impact on performance, which is further explained in the next section.

Bollen and Busse (2004) revisit the issue of persistence in mutual fund performance and focus on a relatively short measurement period of three months. To the extent that superior performance is short-lived, perhaps due to the competitive nature of the mutual fund industry or market efficiency. A short measurement horizon provides a more precise method of identifying consistent top performers as other studies use quarterly or even yearly holding periods. Analysis of quarterly periods is not possible with monthly returns because the short time series of observations precludes efficient estimation. For this reason the authors use daily mutual fund returns. Their findings show that the top decile of fund managers generates statistically significant quarterly abnormal returns that persist for the following quarter. Thus concluding there is sufficient evidence that the relative risk-adjusted performance of funds persists in the short run. The top decile of funds generates, on average, a statistically significant abnormal return of 25–39 basis points per quarter in the following period, thereby providing evidence that funds exhibit the hot hands phenomenon.

Bauer, Otten, and Rad (2006) investigate the performance of New Zealand mutual funds using a sample of 143 funds for the period of 1990–2003. This study documented persistence in performance is mainly driven by 'icy hands', instead of 'hot hands' indicating that funds that underperform in one period are most likely to underperform in the next period arguing that investors should therefore avoid these funds. There is insufficient evidence to suggest there is a hot hands effect. The authors thus suggest that investors should avoid past losers rather than trying to find winners as funds in New Zealand suffer from the icy hands effect.

Using hedge fund data, Jagannathan, Malakhov, and Novikov (2010) investigate if hedge funds in the US experience the hot hands phenomenon. Hedge fund returns are unlike returns from standard asset classes. For example, hedge fund returns exhibit option-like features that have to be taken into account when evaluating performance. Hedge funds invest in illiquid assets; care has to be exercised in measuring their systematic risk. This paper develops a method for evaluating the performance of a hedge fund manager relative to a suitably constructed peer group. The method takes into account option-like features in hedge fund strategies and serial correlation in hedge fund returns possibly caused by investments in illiquid assets. There is evidence of persistence in the performance of funds relative to their style benchmarks. It appears that on average more than 25% of the abnormal performance during a three-year interval will spill over into the following three-year interval. Further, there is strong evidence of performance persistence among top hedge funds, but little evidence of persistence among bottom funds, which provides support to the interpretation of performance persistence as evidence of superior managerial talent. The study concludes by presenting evidence that there is strong persistence in returns for past winners however there is little to no evidence in persistence for past losers.

Huij and Post (2011) investigate persistence in the relative performance of 3,549 bond mutual funds from 1990 to 2003. The study shows that bond funds that display strong or weak performance over a past period continue to do so in future periods. The out-of-sample difference in risk-adjusted return between the top and bottom decile of funds ranked on past alpha exceeds 3.5 percent per year. The study shows that a strategy based on past fund returns earns an economically and statistically significant abnormal return, suggesting that bond fund investors can exploit the observed persistence.

Białkowski and Otten (2011) provides evidence on the performance of mutual funds in a prominent emerging market; Poland. The study presents an overview of the Polish mutual fund industry and investigates mutual fund performance using a survivorship bias controlled sample of 140 funds. The latter is done using the Carhart (1997) 4-factor asset-pricing model. In addition, the study investigates whether Polish fund managers exhibit "hot hands", persistence in performance. The research detects strong persistence in mean returns up to one-year and shows that "winning" funds are able to significantly beat the market, based on their significantly positive alphas.

Arguably one of the first characteristics an investor will look at is the historic performance of a fund. While this is often advised against as past performance is not indicative of future performance, the track record of a manager is important as it shows how the managers' philosophy performed through time. Previous literature has shown that a hot hands phenomenon exists especially in the short run. Pinning down the optimal time period of when this anomaly ceases to exist is more challenging as previous literature has shown conflicting results. Carhart (1997) showed that it is strongest in the short run, that being a year or less. However Elton, Gruber and Blake (1996) and Drooms and Walker (2001) have shown the persistence to go up to three-years. Bauer et al. (2006) argue that investors should be less concerned with finding past winners and more focused on previous losers. What is clear is that a viable strategy could be buy last periods winners and sell last year's losers. However investors should be cognizant of fees and the load fee as this will hurt returns.

2.2.2 FEES

The fee structure of a fund may vary slightly between funds, however an investor can expect to see three main fees on their fact sheet at the end of every quarter. The first is the management fee, this is a fixed percentage of the AUM. The second fee is the TER, which consists of additional expenses, such as trading fees, legal fees, auditor fees, research and other operational expenses. The last fee is the outperformance fee, this is a charge onto investors for managers outperforming their benchmark. Regardless of the type of fee, they play a significant role in any portfolio as its compounded effects can hurt performance. There is an inverse relation between management fees and performance as the higher the fee, the lower the returns realized by investors, (Khorana, Servaes & Tufano, 2008).

For this reason, many academics and investors have advocated to seek funds with the lowest fee structure possible. Hence why exchange traded funds (ETF's) are often so popular, as their fees are normally significantly lower than 1% as they are passive. Figure 6 shows the compounding effects of fees over time. By varying the annual fee, it is apparent the higher the fee the lower the realized return. Had an investor bought R1 of the ALSI (J203) in 2002 his return at the end of September 2017 would have been R6.55. However with a 1% fee, his return would have been R4.54, a R2.01 difference paid away in fees. It is clear that while a 1% fee may not seem substantial, the compounding effect over time is.

Arguably of the most studied and debated topic in asset management and multi-manager industry. Fees form the bedrock for many debates especially between active and passive management, (Jones & Wermers, 2011). This is because active management requires more resources and involvement by the manager as compared to passive management. While ETF's promise to never outperform the market. Their mandate is to merely track the market and match the returns. For this reason, their fees are significantly less than actively managed funds that promise to outperform the market. The debate between active and passive funds then arises as the performance of active funds after adjusting for fees may be less than that of the market, (Jones & Wermers, 2011).

There are some characteristics of active management that highlight a number of issues in defense of active management. These are that certain funds have been found to outperform the market and give above normal returns. Active funds also operate with strict mandates and policies that prohibit investment in certain types of assets. Passive investment does not factor in the inherent risk of the underlying assets which maybe in contravention of the investment mandate the client has.

With the increase in asset managers, there has been very competitive competition pushing down fees. Schonfeld (2009) shows how the expense ratios for equity funds have been brought down considerably in recent years from 2.32 percent in 1980 to 1.02 percent in 2007. The author hypothesizes that this decline in expense ratios for equity funds is due to a multitude of reasons. The main reason is due to a larger fund market, therefore larger economies of scale and greater competition pushing fees and costs down.

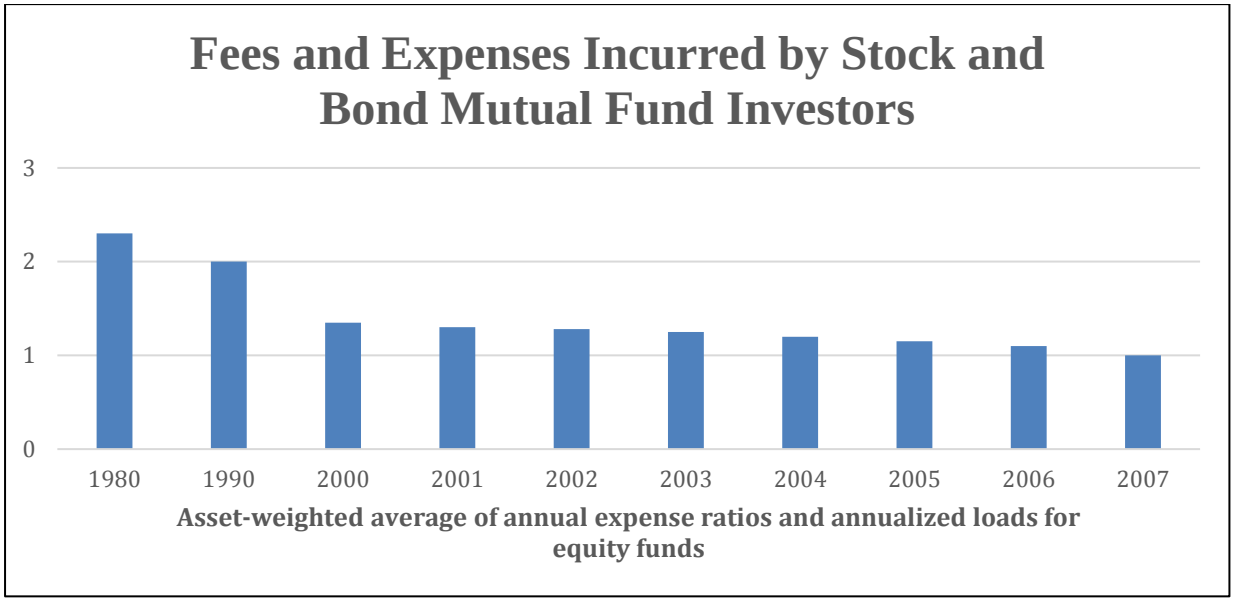


Figure 5: Fees and expenses incurred by investors over time, Schonfeld (2009)

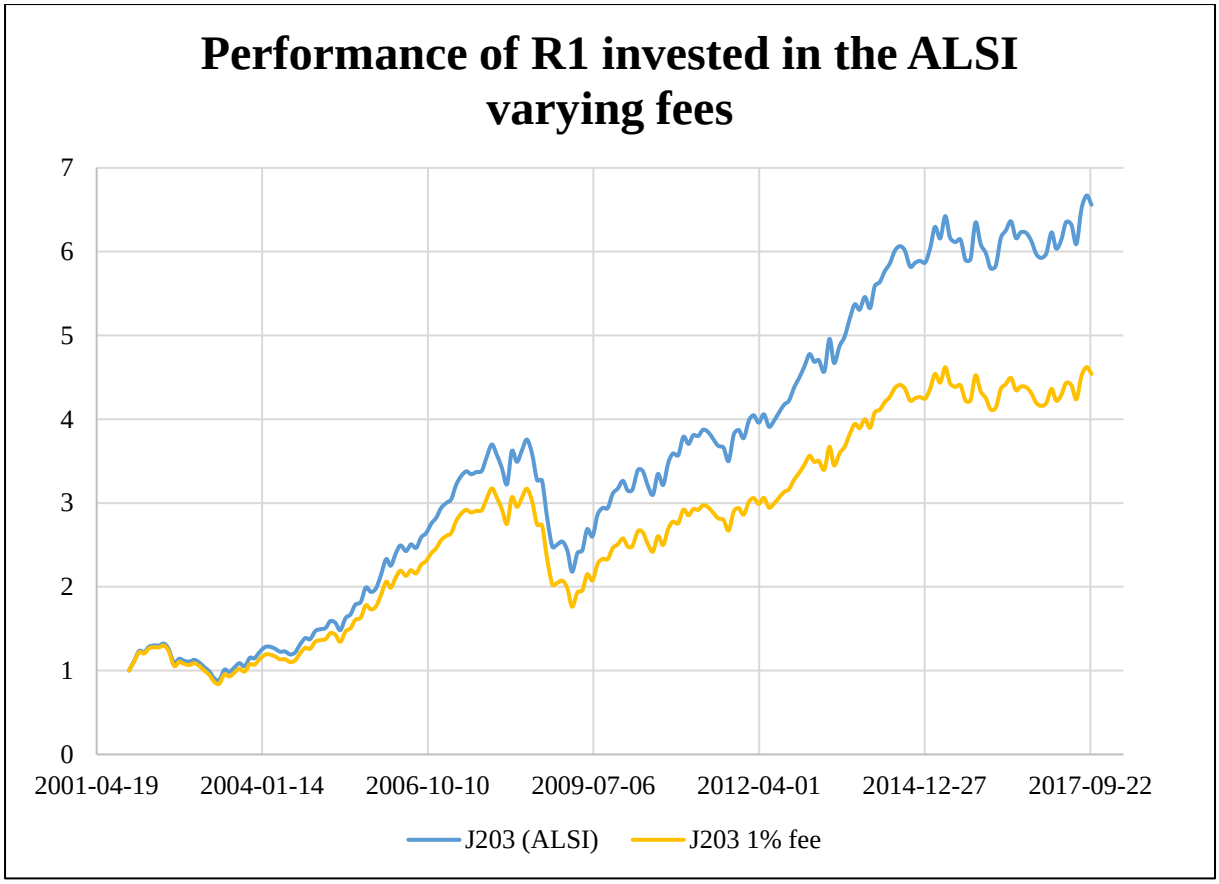


Figure 6: Line graph showing the performance of R1 invested in the ALSI (J203) with varying fees over time, Bloomberg 2017

Sharpe (1966) was among the first authors to document the predictability of fees on future performance. The author showed that the market was efficient and it is near impossible for active managers to outperform their benchmarks. In fact, after accounting for fees, the author showed that managers, on average, slightly underperformed the S&P 500. While investigating other factors such as fund size and past performance, the author found that fees subsumed any predictability of those factors as the market was efficient. There by concluding that investors would be better off buying an ETF that tracks the S&P 500 rather than trying to outperform it.

Jensen (1968) seminal work derives the 'Jensens' Alpha' and measures the predictablity of 115 funds in the period 1945-1964 to earn abnormally high returns. The results show that these funds were on average not able to predict security prices well enough to outperform a buy and hold strategy. The funds performance is gross of management fees where if fees are included, the funds underperformance would have had a greater magnitude.

The transaction costs and expense ratio of mutual funds has been a much researched subject in the area of mutual funds. Wermers (2000) measured the performance of funds from 1975 to 1994 and decomposed returns and fees into their respective components. Results showed that funds underperformed the benchmark by 1.6% per year. This can be split evenly between expense ratios and transaction costs causing the underperformance, highlighting the inverse relationship between fees and performance.

Edwards and Caglayan (2001) used data on the monthly returns of hedge funds during the period 1990 to 1998 to estimate six-factor alphas. The study investigates whether hedge funds that employ attractive incentive fees to compensate fund managers perform better than funds that don't. The authors purport that higher incentive fees coupled with managers investing their own money in the fund may better align the interest of managers and investors. Their finding showed that the management fee has a negative relationship with excess returns and a positive relation to incentive fees

Elton, Gruber, & Blake (2003) study the use of incentive fees by mutual funds. They establish the fact that 10% of the assets under management by bond and stock funds are managed by funds with incentive fees which attests to the importance of these funds in the mutual funds industry. The authors attempt to better understand if by offering an incentive fee, it motivates them to deliver higher returns. The results showed funds with incentive fees exhibit better stock selection ability than funds without incentive fees. Funds with incentive fees also have lower expense ratios than funds without incentive fees as managers and investors interests are aligned. The fund holder benefits from two influences: better stock picking ability and lower expenses. The authors conclude that funds with incentive fees deliver superior performance.

Droms and Walker (1998) found that fees play an important role in a fund whereas Grinblatt and Titman (1998) found no significant relationship between expense ratios and performance. Their results showed that regardless of the expense ratio being small or large, there will be no impact on performance. In contradiction, Dahlquist, Engstrom and Soderlind (2000) showed that performance was negatively related to fees on the Swedish market.

2.2.3 FUND SIZE

While past performance and fees play an important role in a fund's performance, fund size has been studied across various markets with conflicting results. On its own, fund size has very little explanatory power in explaining fund performance, however when looking at fund size relative to the market that is constrained with regulations. Fund size plays a significant effect in understanding an asset manager's agility and market impact, (Chen et al., 2004).

Fund size has been studied in numerous markets, it is to this author's knowledge that very little literature explores its role in the South African industry. This section can be split into three sections which go into detail in unpacking fund size in various markets. The first section shows how fund size is significant and has a positive relation with performance. The second section shows that there is no significant relation between fund size and performance and the last section shows an inverse relation between fund size and performance.

2.2.3.1 LARGE FUNDS OUTPERFORMING SMALL FUNDS

The notion that large funds are able to outperform small funds makes theoretical sense. Larger managers have a larger balance sheet; this allows them some advantages; superior research, advanced technology and a larger buffer in tough times. Research showed six rationales' that could help explain this phenomenon; survivorship bias, economies of scale, substitutability of underlying asset class, trading strategies, stock selection and unclear causation.

The main two arguments that the literature highlights the most as the main cause of large funds outperforming small funds is economies of scale and survivorship bias. The economies of scales hypothesis highlights that the startup operational costs and running a fund can be high. However these costs are static and independent of the trade book a manager runs. Smaller managers may struggle to find a balance with meeting the monthly fixed obligations while realizing respectable returns. Large managers have a clear advantage as these fixed costs may make up a fraction of their assets and thus it wound not have a significant impact on the after fees adjusted returns. Smaller manager's returns can decrease significantly after adjusting for these costs as it makes up for a much larger portion of their asset base (Low, 2012).

Looking at survivorship bias, the propensity for small funds to die out after a spate of bad performance is much higher than larger funds. The implications of this can be that the sample of active small funds will only comprise of top performers whereas the sample of larger funds is mixed between good and bad performing funds. To then compare the two will be misleading since one is comparing only top performing small funds with varying performing large funds (Elton et al., 1996).

Focusing on the economies of scale hypothesis, Carter (1950) showed superior research abilities, improved bargaining power among brokers resulting in lower commission, supporting the notion that larger funds get superior returns. Supporting this view in a South African context, Cassidy (1991) investigated the relationship between returns and fund size. The study included a sample of nine firms over a period of 15-years. The results showed a positive relationship and concluded that the outperformance of larger funds was either due to their ability to afford superior managers or greater bargaining power against brokerage houses

Elton et al. (1996) examined the impact of survivorship bias. This was done by studying the rate at which funds disappear due to poor performance. The article estimated the size of this bias by tracking all funds that existed in 1976. The study made use of 361 funds categorized as having a common stock investment policy. The sample was then divided on size alone, with $15 million in net assets being the benchmark. The study yielded two very different inferences about the impact fund size has on performance. Looking at the biased results, there is no difference in performance for large and small funds. In fact, smaller funds seem to marginally outperform large funds. However, when the examining the alphas on the large and small funds in the unbiased sample. There is strong evidence that shows smaller funds perform significantly worse than large funds. As a result, there is a larger proportion of small funds that fail to survive relative to large funds.

Philpot, Hearth, Rimbey and Schulman (1998) studied fixed income funds over a 13-year period. They found a positive relationship between net risk-adjusted returns and size. The authors thus concluded that size improved efficiencies of the fund.

Different from the other research, Liang (1998) studied firm characteristics and their effect on performance in the hedge fund industry. In contrast to the volumes of work done on mutual funds, there has been a lack of research in the hedge fund area due to the difficulties of

accessing private hedge fund data. This research uses a comprehensive hedge fund database that consisted of over 1000 funds to study their performance and attributes. Results showed that average monthly returns were positively related to fund assets. The authors conclude that the larger funds outperform and thus experience economies of scale.

Dahlquist et al. (2000) conducted a comprehensive study on the Swedish financial market between 1992 and 1997. The sample consisted of 210 funds spread across three types of equity, bonds and money market respectively. Any survivorship biases that could skew results as shown by Elton et al. (1996) were taken into account as very few funds did not survive the sample period. They defined size as the total net asset value of each fund's portfolio and tested its significance against performance using OLS regressions. Results showed a positive relationship between the money market and bond funds performance with size.

Otten & Bams (2002) presented an overview of mutual funds in the European market. The study consisted of 506 funds in the sample spread across five European countries. Results from all five countries in the study showed a positive relationship between fund size and performance. The authors argue that there is still economies of scale that can explain for the positive relation, they compared the average size of these funds with US and found them to be significantly smaller. They thus argued that these funds still need to grow to their efficient size before they may experience any diseconomies of scale.

Broeck and Vennet (2003) identified ex ante fund attributes that can be related to performance specifically to European equity funds. The paper investigated the role fund size, fees, historical performance and age have on returns. Their analysis revealed that fund size and historical performance are related to fund efficiency. Larger funds exhibit a higher degree of this efficiency over small funds. The sample consisted of 179 funds over a 36 month period. To reduce skewness of the size variable, as defined by the net asset value, the authors took the natural log of the fund size variable. Their results showed a positive relationship giving evidence to support that there are still economies of scale in the European mutual fund industry which is consistent with Otten & Bams (2002).

Ammann and Moerth (2005) investigated whether an increase in assets flowing in the hedge fund industry diminishes returns and in particular, if large hedge funds underperform small hedge funds. This is often conjectured due to the limited capacity in certain strategies. They

used cross-sectional regressions to identify the impact of fund sizes on excess returns, standard deviations, Sharpe ratios and alphas. The sample data was broken down into 100 percentiles based on their fund sizes and each percentile was regarded as a sub-sample. A regression was then done on the natural log of average fund sizes in each sub-sample with average excess returns. Interestingly, results showed that very small funds of the lowest decile were underperforming. The possible explanation can be attributed to economy of scale effect, the operational expenses play a significant role for smaller funds in hurting their returns. Evidence shows a positive relationship between size and return as smaller funds cannot compete due to high operational expenses.

Ferreira et al. (2006) studied the performance of mutual funds around the world. Their study was very comprehensive as it made use of 10,568 open-end equity funds from 19 countries over a 15 year period. The study regressed abnormal fund returns against five fund characteristics, namely; age, fund size, fees, management structure and management tenure. An important finding shows that fund size is positively associated with higher performance. The fact that the study uses a large sample, contrary to the majority of previous studies that used national funds, might not account for country heterogeneity in industry size. The average size of mutual funds differs from country to country. The average size of European (as well as non-U.S.) funds is much smaller than the average size of the U.S funds, it is possible that the regression results are influenced by this fact. The authors thus conclude that the positive relation suggests the presence of significant economies of scale.

Bialkowski and Otten (2011) provided evidence on the performance of mutual funds in a prominent emerging market, Poland. The study presented an overview of the Polish mutual fund industry and investigates mutual fund performance using a survivorship bias controlled sample of 140 funds which was done using the Carhart (1997) 4-factor asset-pricing model. In addition, the authors investigated whether Polish fund managers exhibit “hot hands”, persistence in performance and finally the influence of fund characteristics on risk-adjusted performance. The results showed the risk-adjusted performance of Polish mutual funds is positively correlated with natural logarithm of fund assets (fund size). Their conclusion is consistent with the economies of scale hypothesis.

Low (2012) examines the degree to which fund characteristics contributes to the explanatory power of fund returns. The study differentiates itself by separating a managers stock picking abilities with market timing abilities. By breaking down performance into components, the study can accurately measure a manager's expertise and thus conclude which activity can generate higher returns for investors. The variables considered are fund size, expense ratio, investment objective, portfolio turnover ratio, fund risk, fund age, and the growth rate of fund size. The sample consisted of 65 unit trusts over a five-year period (2000-2004) on the Malaysian market. The authors used a two stage regression analysis. The first stage tested the overall performance of the fund. The second stage broke returns down into market timing and stock picking, and assesses the significance of the variables on the manager's abilities. Results showed that there was a strong negative correlation between market timing and selectivity, implying managers have a trade-off between stock picking and market timing. The correlation gives evidence of activity specialization among managers. For market timing, a positive correlation was found with size showing that managers of large fund size can exploit the predictability of general market movements, concluding that large managers have an advantage of economies of scale over their smaller counter parts.

2.2.3.2 FUND SIZE PLAYS NO ROLE IN FUND PERFORMANCE

This section outlines the literature that has shown size to play no significant role in a fund's performance. Research shows that fund size is a proxy for an explanatory variable and if both are included in testing, fund size is shown to be redundant.

Sharpe (1966) sought to extend Treynor (1965) work by testing it on an empirical basis to measure its predictability. It will also attempt to make explicit relationships between recent developments in capital theory and alternative models of a mutual fund performance, these too will be subject to empirical tests. Using a sample of 34 open-end mutual funds during the period 1944-1963. The sample was divided into two periods, the first period was used to rank the funds according to fund size, expense ratio and performance. Then using these rankings, the author looked at how these funds performed from 1954-1963. Doing this allowed him to study if past performance determined future performance. Results showed that fund size had no effect in predicting future performance however expense ratios had a negative effect. The paper concluded by showing that investors should focus on finding a manager with low expenses as that is the main determinant in returns.

Grinblatt and Titman (1994) investigated the same sample of domestically investing mutual funds as in their 1989 study. The purpose of this study was to investigate how mutual fund performance relates to past performance. The sample consisted of 279 funds over a 10 year period (1974-1984). To ensure reliable results, a control group of 109 passive portfolios was used. The sample was then split according to fund characteristics, these include; fund size, dividend yield, co-skewness with monthly rebalanced equally weighted index, interest rate sensitivity, past returns over the past three years and beta calculated against the equally weighted index. Net asset value was used as a proxy for fund size in the cross-sectional regression. Using two different benchmarks, the coefficient on the net asset value variable was negative but insignificant regardless of the benchmark in use. The authors thus conclude by saying that the persistence of performance cannot be explained by inefficiencies in the benchmark that are related to firm size, dividend yield, past performance, skewness, interest rate sensitivity or beta.

Droms & Walker (1996) added to the growing body of empirical literature on investment performance and its relation to fund size. The study did so by pooling cross-section/time series regression methodology to a large sample size. Their results showed that returns are not related to asset size on a risk-adjusted and non-risk adjusted basis.

Gallagher and Martin (2005) investigated the performance of actively managed equity funds in the Australian market. The study examined to what extend both fund size and manager size were related to risk-adjusted returns. By their nature, large investment managers will engage in higher trade volumes and thus experience higher costs. Trade difficulty also increases as large trades have a higher potential to move the market. Fund size was measured as the natural log of a fund's net asset value. First, in a manner consistent with various other studies the entire nine-year sample was tested. Second, as fund size is not consistent over time, the sample was then split into three-year sub-periods and fund size was then tested again. The relationship between fund size and return was tested through pooled regressions, where risk adjusted returns was regressed against average fund size. Results showed that there was no significant relationship between fund size and performance as small funds did not out perform their larger counter parts. While logic permits that larger funds should experience increased difficulties in the efficient execution of their trades compared with a small fund, ceteris paribus, in the long term evidence suggests that size is not a significant disadvantage.

Lindeen & Gros (2009) analysed the effect of mutual fund size on performance by studying 59 Swedish equity mutual funds over the period 1998 to 2008. They argue that fund size can be seen as a "proxy" for capturing the various determinants affecting performance and driven by size. The size-driven factors tested in this study include liquidity costs, economies of scale in mutual fund families, extreme net flows and persistence in performance. Using regressions and analysing these factors by dividing funds into groups based on fund size, the authors find that there is no significant relation between fund size and performance between groups over the ten-year period.

Keswani (2011) examined factors affecting fund performance in an Indian context. The study considered 21 balanced mutual fund schemes that have at least a three-year track record over a three-year period. Correlation coefficients were calculated between fund size and the four parameters of performance (return, risk, return/risk and the Sharpe ratio). Results showed that no significant relation was found on any of the four parameters. The author concludes by

showing that there is no evidence to support fund size having an effect on the performance of balanced mutual funds.

Abbasi et al. (2012) studied the effect size has on the Iranian market between 2007 and 2011. The study acknowledges that there are several aspects and dimensions in evaluating the performance of mutual funds, but it focused on five aspects: namely Sharpe measure; Jensen differential measure; Treynor measure; Sortino measure and Information measure. Correlation coefficients between all the parameters were computed to assess the degree of relationship between fund size and performance of mutual funds. It made use of four sets of hypothesis testing coupled with the Pearson's correlation coefficient to investigate the effect size had or if size is merely a proxy for another explanatory variable. The tests were done in the following four categories; all Iranian mutual funds, fixed income instruments mutual funds, big cap stock mutual funds and small cap mutual funds. As far as the relationship between fund size and performance of fixed income instruments mutual funds were concerned, no significant relationship was found between them. This meant that the results showed the change in the size of fund did not have any significant contribution to the performance of Iranian mutual funds. Regarding the correlation between fund size and performance of big cap stock mutual funds, the result similar to fixed income instruments was found whereas, in the case of the small cap stock mutual funds, a significant correlation was found between fund size and Jensen differential measure. In other words, there was no significant relationship between fund size and Sharpe measure, Treynor measure, Sortino measure and Information measure and the performance of small cap stock mutual funds. The study however also makes mention that the time period of this study was five years which may not truly represent the performance of funds and thus there may be a survivorship bias effect. The performance of newly started funds may be over or under estimated due to short time span and small amount of observations.

Mhaka, Mhaka and Nyamwanza (2014) studied if fund size mattered in the pension fund industry. The study made use of 20 stand-alone pension funds and nine fund administered pension funds from 2010 to 2013. As at the end of 2009, the pension fund industry made up 54% of investments on the Zimbabwean stock exchange by market capitalisation, making it the single most dominant industry on the local bourse. The study's objective was to determine if there was a significant relation between fund size and performance, the second part was to determine in what direction. Results showed there was no significant relation. This could be due to the fact that fund size alone does not determine the performance of a pension fund in

Zimbabwe. The implications of these results mean using fund characteristics such as size to predict returns will not work for Zimbabwe. It is worth mentioning that the Zimbabwean economy has been plagued with issues and seen hyperinflation. The country has since then adopted the US Dollar as its currency in an attempt to stabilize the economy. These issues were not factored into the study and thus may skew the results.

2.2.3.3 SMALL FUNDS OUTPERFORM LARGE FUNDS

This section summaries the previous research that has found small managers to produce better returns than large managers. The research showed seven rationales' that could help explain this phenomenon; style, liquidity, trading strategy, market impact and agility, risk, the optimal size and market efficiency.

The main argument that the literature highlights the most as the main cause of small funds outperforming large funds is market impact and agility. This is however very closely related to liquidity and style. Smaller funds are able to move in and out of positions much faster than their larger counterparts. Should a large fund try to take a position, for it to make a significant stake in the portfolio, the size of the trade will be large. Brokerage houses may struggle to source these securities immediately and thus it can take weeks and even months to execute the entire trade. By which time the opportunity may have already been priced out. Liquidity thus plays an important role in this as the more illiquid the market, the more difficult it will be to execute large block trades. The second nuance to this argument is the market impact of these large block trades. If the house view of these larger asset managers is to change their positions. The liquidity of the underlying security will play a large role in the market impact. One big block trade on a thinly traded security will move the market against the asset manager. Larger managers will then complete the trade over a long time to limit any negative price moves. Smaller asset managers are more agile as their trading block size will be significantly smaller and thus have a smaller market impact. They are thus able to trade their positions faster.

One of the first scholars who found an effect related to the size of mutual funds were Grinblatt and Titman (1989). Their study investigated quarterly holdings of 274 mutual funds in the US market over 1975- 1984 and controlled for any survivorship biases. To examine the effect of fund size, the authors formed five portfolios of the mutual funds ranked on their net asset values. They found in the smaller funds achieved significantly better risk adjusted performance (2.5%) than larger funds. They believed that the concentration of aggressive growth funds among the small fund category might have skewed their results to help to explain the inverse relationship between size and gross returns. This is because of the 55 funds in the smallest quintile, 21 were aggressive-growth funds and 17 were growth funds. Controlling for this factor, small funds however still generated higher returns than larger funds. Consequently, the

authors concluded that both fund size and investment objective could determine abnormal performance.

Gorman (1991) examined if mutual fund asset size was related to long term return after controlling for risk using the Capital Asset Pricing Model (CAPM). Using the annual returns and asset sizes for a sample of 335 mutual funds from 1974 to 1985. The study used total net assets to define the independent variable 'size'. The results showed that the smallest funds had higher risk adjusted returns and thus size has an effect on performance.

Zheng (1999) studied if investors had the ability to select superior managers. The sample consisted of all equity funds from 1970 to 1993 and had 1826 observations. The author sought to see if fund size would affect investors fund selection abilities. If so are investors more cautious when investing in a small fund or is a manager's skill greater in a small fund? If so, one could expect more funds to flow in to a small fund than a large one. Results showed that there was no evidence to support the claim that funds that receive more money will subsequently beat the market with exception to small funds, thus concluding there is a size effect with 'smart money'.

Indro, Jiang, Hu, and Lee (1999) argue that funds must attain a minimum fund size in order to achieve sufficient returns to justify their costs of acquiring and trading on information, effectively their expenses. The study, based in the US, consisted of 683 actively managed equity funds over a three-year period (1993-1995). The results showed that some funds experience diseconomies of scale as 10% of the largest funds overinvested in information acquisition and trading. The authors also examine the role style has with returns as they argue that value investors tend to overinvest in research when compared with growth managers. Results from regression analysis showed that value investors were overexposed to large-cap companies and growth investors were exposed to small-cap companies. Incorporating size with style, analysis shows size plays a large role for growth funds when compared with value or blended. In conclusion there is a tipping point where funds that grow too large experience diseconomies of scale from over investment.

Consistent with the above conclusion, Becker & Vaughan (2001) offered an interesting oxymoron on how investment manager's success can lead to their demise. The significant flows typically flow to high performing managers. As a result they lose flexibility and it becomes more difficult for them to move in and out of positions. The study creates hypothetical managers who follow the exact same strategy and have the same skill only varying in asset size. The simulation uses real Australian market data, 250 stocks that make up the Australian All Ordinaries index over a three-year period. Results showed that on average, doubling a fund's assets will reduce its active return by 0.5%. A quadrupling of the assets base will destroy approximately 35% of the ability to add risk-adjusted value. They conclude by showing that there is both a negative relation between size and performance, and second that there is no such thing as an optimal size. This is because bigger funds lose flexibility in implementing their strategies and trades will take longer to execute.

The fund size effect is commonly hypothesized to be caused by transaction costs, however due to the lack of transactions data, prior studies have investigated the transaction costs theory indirectly. Chan, Faff, Gallagher and Looi (2009) analysed daily transactions of Australian equity managers from 1998 to 2001. The author introduced an "intimidation effect" where the potential transaction costs are likely to change the way a manager trades and configures his portfolio. They tested if the fund size effect existed as well as its implications it has with trading costs. The results showed that large funds incur higher aggregate market impact costs than small managers and that large funds construct trade packages and portfolios that are vastly different to that of small managers. These differences are consistent with an attempt by large managers to reduce expected market impact costs by trading predominantly in large cap stocks, making smaller bets, and trading less actively. In attempting to avoid market impact costs, large managers form portfolios that they might not have otherwise formed, and therefore incur an opportunity cost of fund size Evidence shows that large managers expecting to face higher market impact costs may construct their portfolios in a way to reduce this impact but at the same time doing so, they formed portfolios they may not have otherwise formed, incurring an opportunity cost. They conclude by arguing the fund size effect is composed of transaction costs and market impact.

If a growth in assets can have a negative effect on fund performance, it would be relevant to investigate the fund behaviour in response to the new constraints imposed by this growth. Pollet and Wilson (2008) studied the change in behaviour among fund managers as their assets grew. Their results showed that primarily, an increase in funds will result in an increase in ownership shares of the companies they are invested in (larger stakes). Secondly the number of shares invested in starts to grow slowly in response to flows. They conclude that funds experience diseconomies of scale as they have an inability to scale their investment objectives. This means that as AUM grows, managers are unable to scale their strategy, so rather than taking new capital and investing in current securities at the same proportion. Funds will diversify their portfolios rather than scale them as their AUM increases. This can be due to a multitude of reasons however a large contributing factor to this is restrictions imposed by the regulatory authority. This paper is slightly different from the others as it documents a response in fund behaviour rather than just linking performance and size.

The above research has focused on mutual funds across various markets, Teo (2009) studied the relationship between size and performance in the hedge fund industry. The sample consisted of over 4,500 hedge funds between the periods 1994 to 2008. Their regression analysis controlled for various fund characteristics that may have affected performance and allowed for style and investment region fixed effects. Their results showed the relationship between size and performance to be downward slopping and convex. An increase of assets from $10 million to $500 million resulted in on average a 1.5% decrease in abnormal returns. They conclude by showing that on average small hedge funds outperform by 2.75% per annum after adjusting for risk While this relation is negative, it is not only confined to the smallest funds. There was evidence to suggest that the fund size effect is most apparent for funds trading small illiquid securities, suggesting market impact may play a role.

Addressing the issue of liquidity, Perold and Salomon (1991) built upon research related to trade block size and transaction costs. They investigated the diseconomies of scale in active management stemming from the higher costs associated with larger transactions. Portfolio managers who have to execute large blocks will have to alter their strategy to contain market impact. To do this they will trade more slowly which is an effective way of managing market impact. In previous work, Perold (1988), found diseconomies of scale within the active fund management industry. There is a positive relationship between size and trading block as the assets under management grow, trade block sizes also followed suit. This then would lead to

higher transaction costs, as a result there would be a greater negative market impact on stock prices, resulting in deteriorating fund performance.

A study by Chen et al. (2004) investigated the relationship between fund size and mutual fund performance. Their sample period was between 1962 and 1999 on the US market. Since funds may have different styles, the authors adjust for such by utilizing various performance benchmarks to account for the possibility that they load differently on small stock, value stock and price momentum strategies. As various studies have shown that funds with $15 million in AUM maybe upward biased and are thus excluded from the study, Elton et al. (1996). To further narrow the possible explanations for this phenomenon, the authors investigated the role of liquidity on performance and fund characteristics. To do this they use investment mandates as a proxy for firms that will invest in small and illiquid stocks, their study is thus heavily reliant on using investment mandates i.e. ”small-cap growth funds”. They concluded that small funds have a comparative advantage of investing in small cap companies and can thus outperform their larger counter parts.

Yan (2008) used stock transactions data as well as detailed holding of US actively managed equity mutual funds from 1993 to 2002. This study tested the effect of liquidity and investment style on the relation between fund size and performance. Recognising that Chen et al. (2004) had done a similar study, the authors wanted to improve on this by both changing the sample period length (more relevant) and using more direct measures of liquidity rather than investment mandate. The sample was then sorted into quintiles according to size. He used four models to test alpha’s; CAPM alpha, Fama-French three factor alpha, Carhart four factor alpha and the conditional four factor alpha. Regardless of the alpha measured, the smallest size quintile performed significantly better than the largest. These results are consistent with Chen et al. (2004) however the magnitude of outperformance is greater in this paper. The author argued that this could be due to a greater reward for superior stock picking skills. The author concludes that liquidity is an important reason why fund size erodes performance and that the more illiquid the fund’s holdings, the greater the erosion of performance on a large fund.

The fund size effect has been studied over various markets however there are very few authors that have studied it in a South African market. Pillay et al. (2010) examined the fund size effect

by constructing hypothetical portfolios of various sizes, using historical stock data for each year between 1991 and 2008. Each of the portfolios would contain 40 randomly selected stocks from the investment universe of the JSE listed shares. The results showed there is a negative relation between size and return; with liquidity being the underlying cause for this relationship. Performance would be hurt for funds greater than R5 billion. They showed that as funds got larger, they would experience an increase in resource share concentration. They conclude that large funds increasingly focus on high liquid stocks, which are the large cap shares on the JSE, implying that these managers should switch to a passive strategy that tracks the ALSI rather. Small to medium managers must be aware of the role size has on their portfolios and should thus cap them.

With the large increase in funds over the past five years, it would be valuable to evaluate if these boutique funds can outperform their larger and more established counterparts. Carhart (1997) showed how boutique funds have a competitive advantage of being able to invest in small capitalisation (small cap) shares giving the funds an opportunity to invest in good performing shares that do not constitute a meaningful portion of larger funds. Larger fund managers have the advantage of a larger balance sheet and all the resources associated with that such as an excellent research team and top of the range systems but could prove to be sluggish and bureaucratic in a world where the first acquirers of information reap rewards via better quality of research and first move advantage when it comes to buying and selling of shares, making the flexibility of boutiques unit trusts attractive to investors, Gallagher & Martin (2005). However prominent managers of large institutional funds can obtain exclusive investment opportunities not available to other market participants such as larger discounts on Initial Public Offerings (IPO) and highly competitive prices from brokers that smaller managers may not have access to, Ciccotello & Grant (1996).

2.3 THE IMPLICATIONS OF THE SOUTH AFRICAN MARKET

Understanding the drivers of fund performance is of paramount importance to multi-managers and investors alike. Exploiting anomalies such as small funds out performing larger ones, (Kretschmann and Hamilton, 2017), or funds experiencing the hot hands anomaly, Huij and Post (2011), shows that investors can form portfolios and earn a substantial return. Gruber (1996) and Keswani and Stolin, (2008) found conclusive evidence that investors channel money toward mutual funds that subsequently perform well in the US and UK markets. If investors could accurately identify funds that are going to do well, they would buy the winners and sell the losers. This market mechanism would then push the price up of future winner and eliminate any gains in an efficient market.

Magnusson and Wydick (2002) studied eight African countries to see if they were weak-form efficient. The results showed that the South African market dwarfed the other African markets in market capitalization and it followed a random walk. These results are consistent with findings from Smith, Jefferis and Ryoos (2002) which investigated 15 African markets testing for weak-form efficiency. The study categorized the data in to 4 segments; South Africa, medium-sized markets, small new markets which have experienced growth and small new markets that are yet to experience growth. They showed that while the JSE is very large in market capitalization, liquidity remains low as there is a high concentration of share ownership by large conglomerates in the mining section which is consistent with Pillay et al. (2010). The study concluded that the JSE follows a random walk.

While the South African market has been shown to follow a random walk, it is unique when compared with developed markets in terms of its distribution. There are 160 shares listed on the main board, however when looking at market cap of these shares it shows the ALSI to be severely skewed. The top 40 shares make up approximately 90% of the JSE by market capitalization.

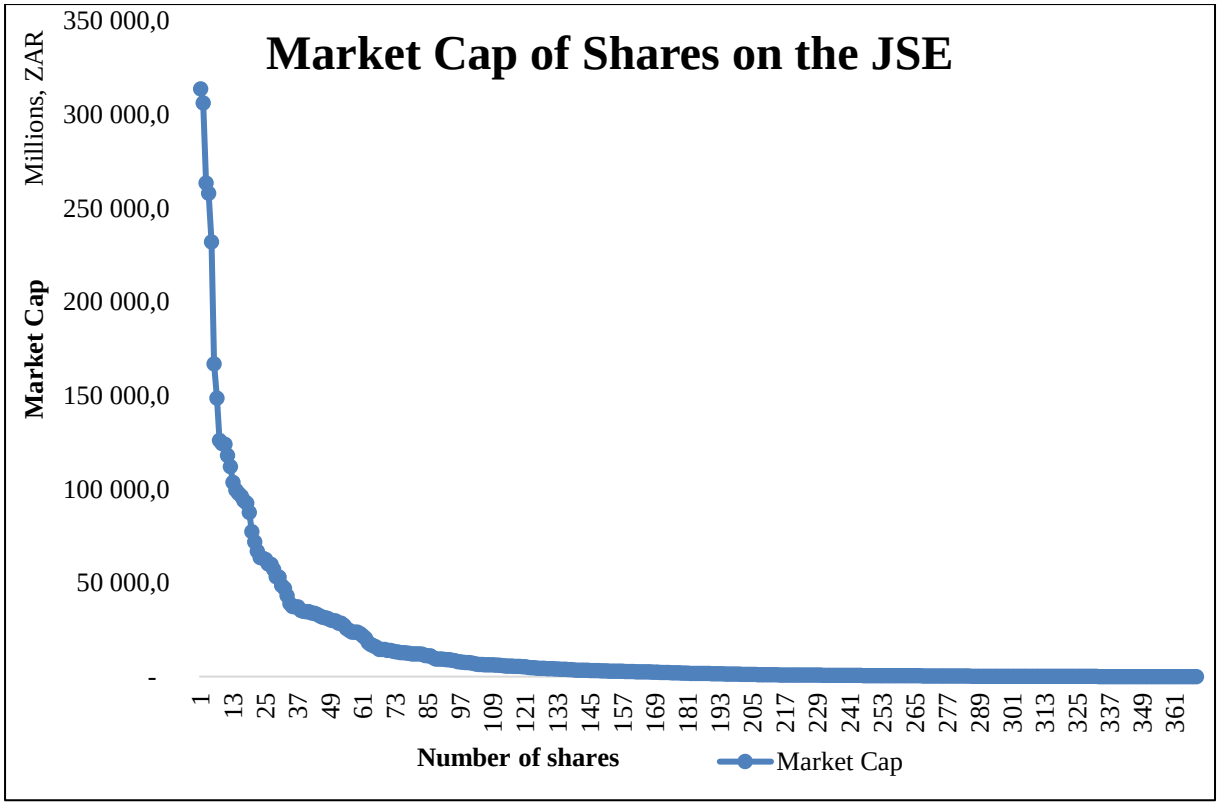


Figure 7: Line Graph Showing the Distribution of the JSE by Market Cap for each share, Bloomberg (2017)

Figure 7 shows the distribution of all the listed securities on the JSE by their market cap. It is evident that the JSE is skewed with the top 10 securities making up approx. 50% and the top 40 making up approx. 90% of the JSE market capitalization. With few shares dominating the JSE, this poses a major problem as any small moves in the top 10 shares relates to a similar move in the whole market. Alternatively there needs to be a large move in a small cap share to move the market. The larger companies listed on the JSE such as Naspers have international exposure and are duel listed in overseas markets. These large securities are very liquid and are traded daily, thus the bid-offer spreads are thin. On small cap securities, they are thinly traded so the bid-offer spread is much wider. This speaks to the liquidity of the market which has been extensively studied in other markets (Liu, 2006).

So if the South African market has been shown to follow a random walk, then how is it possible that funds investing in 'small-cap' stocks are outperforming as seen in Figure 8. A question of if there is a liquidity premia that exists in the 'small-cap' market on the JSE.

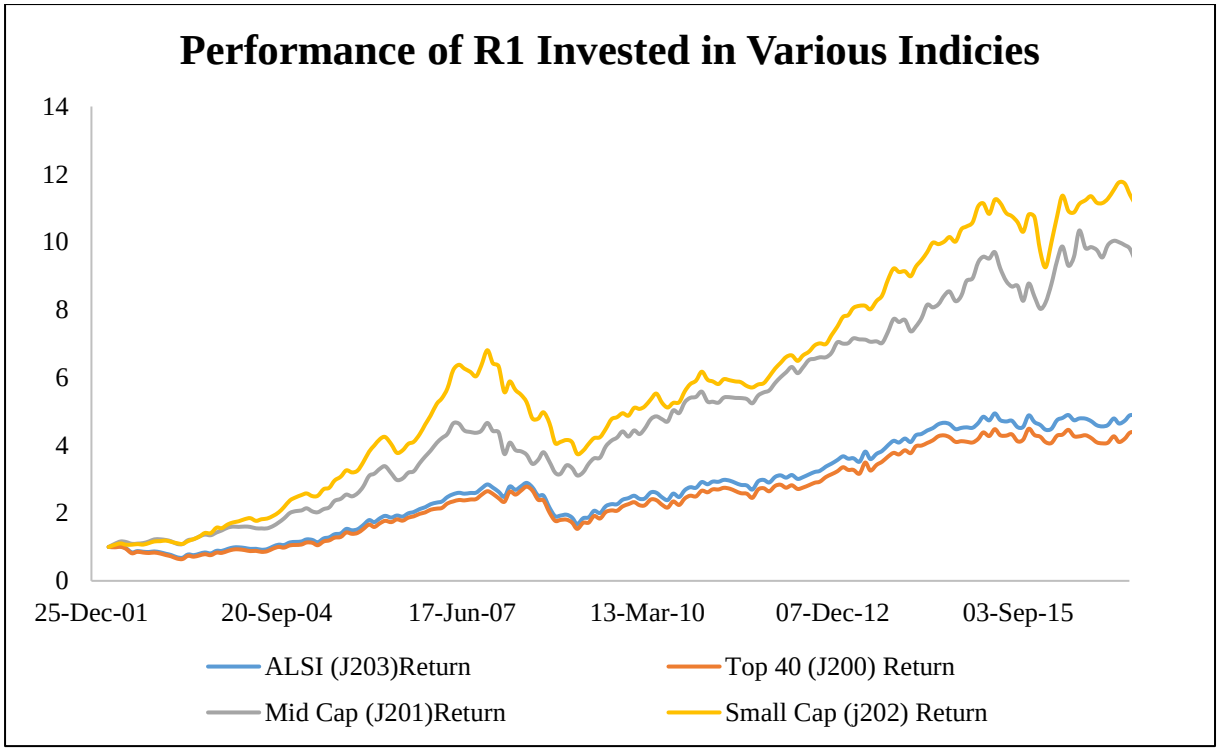


Figure 8: Line Graph Showing the Performance of R1 Invested in Various Indices, Bloomberg 2017

Liquidity is important to investment planning as in the financial industry as asset managers must construct a suitable portfolio that is in line with their investor's liquidity preferences and time horizon, (Amihud & Mendelson, 1986). As such, in order for investors to consider investing in illiquid securities, they must be compensated through a premium on their expected returns (liquidity premium).

Liu (2006) reinforces the interpretation that there are four dimensions of liquidity. First is Trading Cost, which refers to the extra cost incurred in buying (or selling) a security due to the illiquidity of the market. If the security has few sell orders open at fair price it may cost more for the buyer to complete their trade (normally measured through bid-ask spread). Second is Trading Quantity, reflecting the amount of securities traded in a certain time, showcasing that a higher amount of trades being executed results in a higher liquidity. This is normally measured through variables such as turnover. Thirdly there is Price Impact, which pertains to the effect of executing trades on the price of the security. Buying a large amount of securities in a small company will result in the price increasing and larger costs arising with the purchases (measured through a return to volume variable). Lastly there is Trading Speed, which refers to the degree of ease in which a security can be quickly sold or bought. If a security has a high trading speed it will be easier to sell it off quickly and as soon as possible when required (can be measured in accordance with the methodology of Liu (2006)).

In a South African context, Muller and Ward (2013) showed significant results are found for a large array of "styles" or market factors. The authors reiterate the significance of the illiquidity premium and find liquidity to have a significant effect.

Thus a question must be asked if fund size affecting performance is due the smaller funds being more agile and are able to capitalize on speed of moving in and out of positions without having a market impact. The alternative is while the South African market has been shown to be efficient, efficiency plays a major role in a fund's performance, these small managers may be experiencing better performance as they are just investing in 'small-cap' stocks and receiving a higher return as part of the return is a liquidity premium.

Figure 8 shows the performance of R1 invested in various indices with the best performing being the small cap index. An investor who had placed R1 in the small cap index in 2002 would have R10.92 as of Q3 2017. However he is more exposed to events when compared with the ALSI and Top 40. A good illustration of this is the crash the market had following the firing of Finance Minister Nhlanhla Nene and wiping off R500 billion from the market on the 9th of December 2015. Figure 8 shows that the hardest hit was the small and mid-cap indices over that period where as the ALSI and large cap index were hardly affected. Small cap securities have a stronger beta with South Africa where as larger companies that have international exposure have diversified out some South African risks.

It can be seen that there is a close relationship between the ALSI and the Top 40. This is to be expected as 90% of the ALSI is the Top 40. This however means that investors buying the Top 40 are effectively buying the market. R1 placed in 2002 in the ALSI would have returned R4.66. This shows that there are opportunities for investors to blend their portfolios with small and large cap stocks. Larger managers may however struggle to do this due to regulation discussed in the next section.

2.4 THE SOUTH AFRICAN REGULATORY ENVIRONMENT

Understanding the regulatory environment will play a large role in better understanding the constraints faced by a fund manager. This will show all the moving parts of how illiquidity and small managers are able to outperform to due to the constraints faced by the industry.
Board notice 90 of the Collective Investment Schemes Control Act serves to outline the regulations on what CIS's can and cannot do. Focusing on the 'standard portfolio' section as in this study only standard equity portfolios are considered, other portfolio types such as fund of funds or feeder funds are ignored, the main constraints can be summarized as:

- A fund may not own more than 5% of the market value of a stock, if the market capitalization of the stock is less than R2bn.
- A fund may not own more than 10% of the market value of a stock, if the market capitalization of the stock is greater than R2bn.
- A fund management company may not be exposed, through its underlying funds to more than 25% of a security, if that security is within the same group as the management company.

These constraints make it difficult for managers with a large asset base to take meaningful positions. A fund manager may not be exposed to more than 25% of a security, as anything more than this will allow the fund manager to invoke special resolutions[1]. Thus the purpose of this restriction is to protect shareholders from managers buying significant stakes in companies and then taking control of the company. However the issue with this restriction is it limits the investable universe for large funds. As a result fund size plays a role in what large manages can invest in and thus affects their performance.

Figure 9 shows how as the asset base of a manager increases, the universe of available shares declines. It is constructed using the above regulatory requirements stated above. This negative relation is directly due to the above regulations imposed by the FSB. It illustrates how the size of the assets under management impacts the investment universe of a portfolio manager by using the FTSE/JSE All Share Index as the investment universe. By assuming significant exposure to any individual share to be 5%, in accordance with the above constraints, the

[1] Special resolutions allows the fund manager to alter the corporate structure by changing boards.

number of shares a portfolio of R5 billion is able to hold is 158. The number decreases rapidly as the portfolio size increases to R100 billion and more.

The implications of this are that funds with a smaller base have a wider universe of shares to pick from. This gives them a distinct advantage as they have more options. Secondly, these restrictions also prohibit larger fund managers from taking significant stakes in shares. As a result the larger asset managers in South Africa, as outlined by Table 2, are only able to take significant stakes in the Top 40 and act more as funds that track the ALSI.

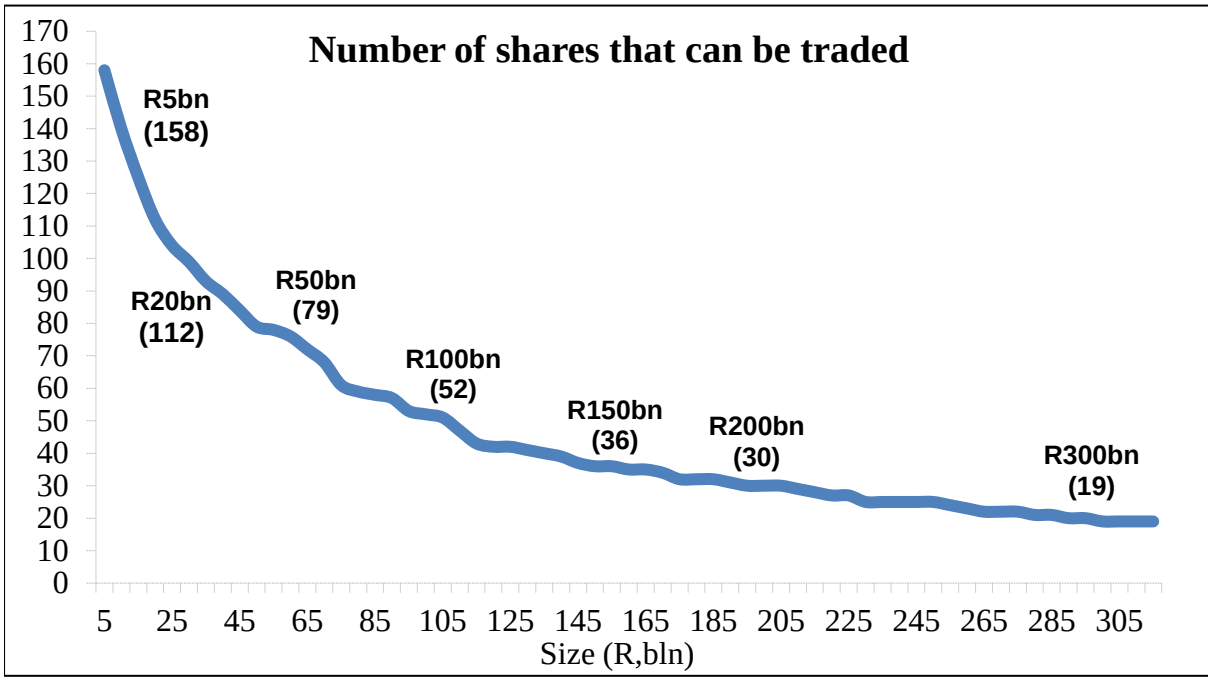


Figure 9: Line graph showing the inverse relationship between AUM and investable shares, Bloomberg (2017)

Table 4: Contrasting the shareholdings of Famous Brands and Taste Holdings by varying AUM, Bloomberg (2017)

Manager A, AUM:R5bn	Manager B, AUM:R300bn	Step
5% allocation: 0.05*5 000 000 000= R250 000 000	5% allocation 0.05*300 000 000 000= R15 000 000 000	1
Famous Brands Ltd Share price: R115.48 Market cap: R15 428 700 000		2
Shareholding % of Famous Brands: R250 000 000/ R15 428 700 000 = 2%	Shareholding % of Famous Brands: R15 000 000 000/ R15 428 700 000 = 97%	3
Maximum shareholding % of Famous Brands by 1 manager is 25%, thus: 0.25*15428700000 = R3 857 175 000		4
Maximum allocation allowed to Famous Brands: R250 000 000/ R5 000 000 000 = 5%	Maximum allocation allowed to Famous Brands: R3 857 175 000/ R300 000 000 000 = 1.3%	5
Taste Holdings Share price: R1.18 Market cap: R674 100 000		6
Shareholding % of Taste Holdings: R250 000 000/ R674 100 000 = 39%	Shareholding % of Taste Holdings: R15 000 000 000/ R674 100 000 = 2318%	7
Maximum shareholding % of Taste Holdings by 1 manager is 25%, thus: 0.25*674100000 = R168 525 000		8
Maximum allocation allowed to Taste Holding: R168 525 000/ R5 000 000 000 = 3.37%	Maximum allocation allowed to Taste Holding: R168 525 000/ R300 000 000 000 = 0.06%	9

To further understand this, the above table illustrates two identical asset managers taking positions in Famous Brands Ltd and Taste Holdings with the only exception of AUM varying.

Table 4 illustrates a practical issue faced by large asset managers. Both asset managers A and B wish to allocate 5% of their portfolio to an equity share in the food and beverage industry as they believe this will be booming industry. Asset manager A can thus allocate R250mn and manager B can allocate R15bn as seen in step 1.

The market capitalization of Famous Brands is approx. R15.4bn, a 5% allocation of these asset managers' funds would buy 2% and 97% of the company respectively. Asset manager B can almost buy out the entire value of Famous Brands from just a 5 % allocation of his fund as illustrated in step 3.

Regulations stipulate that no fund can hold more than 25% of a company as anything above this will allow the manager to call for special resolutions at their desire. In the case of Famous Brands, manager A will not breach this and the full 5% allocation can be done. In the case of manager B, because he wishes to allocate R15bn, it will be greater than the 25% limit so the maximum he can buy is R3.85bn as seen in step 4. Maxing out the total shareholding value any one manager can hold, will only make up 1.3% of the value in the portfolio, this is illustrated in step 5.

This effect is exasperated in smaller companies, doing the same analysis on Taste Holdings. A company that is a peer to Famous Brands however significantly smaller, one can see how insignificant these shares will have on the portfolio. Both asset manager A and B would not be able to invest their full 5% into Taste, thus the maximum they would be able to allocate is R168mn. This would only make up 3.37% and 0.06% against the total portfolio of each manager respectively

There are two main implications that can be taken from this. The first is that, small funds experience a clear advantage over large funds in their ability to take larger meaningful stakes in a larger universe of shares. As shown above, manager B is unable to take any significant stake in Taste Holdings. Thus even if Taste had an exception year and produced double digit or triple digit returns, this would have an insignificant effect on the performance of fund B.

The second major implication revolves around liquidity and market impact. Even if large managers took significant positions in these smaller companies. To realize any return made by exiting their position will be very challenging. As these small cap stocks are thinly traded, if the house view was to exit a position, trying to sell a few billion Rand (R bn) worth of shares, it would flood the market and move it against themselves, Liu (2006). Often to prevent this, these managers with large positions will sell out over a long period of time in small trading blocks. The problem with this is that a lot can happen over this time and the difference in price between when they first tried to exit their position compared with when they are able to move the last few million rand (R mn) of shares could be large and almost not worth the trouble.

Smaller managers that have a significantly smaller stake in the company but a larger stake in their fund, have a clear advantage here. Again, should they wish to realize their returns, it will be much easier for them to sell out of their positions as their absolute size is small. Effectively they can sell out of positions much faster without affecting the market against themselves. This gives them a distinct advantage over large asset managers. Thus larger managers must also be mindful of this and balance the desired allocation with any negative market impact that maybe experienced when exiting the position.

2.5 SUMMARY OF THE LITERATURE

While the role of fund size has been studied in detail across various markets and yielded different results, liquidity and regulation are main drivers. South Africa will be an ideal market to study this phenomenon as it is so skewed and well regulated. These factors play an important role in a manager's portfolio and will play a large role in his agility.

The main argument behind the fund size effect centres on the economies of scale hypothesis. In the European market, which is much smaller than its US counterpart, funds would experience economies of scale as new capital could be used to execute trading ideas.

The counter argument is diseconomies of scale where authors such as Pollet and Wilson (2008) that studied fund behaviour. Their study showed that managers don't use new capital to scale their positions but rather diversify their portfolios by trading new ideas.

Fund managers in South Africa will face similar issues described by Pollet and Wilson (2008), as fund managers will struggle to scale their investment ideas in the highly regulated environment. They will have to trade new ideas and further diversify their portfolios as scaling will be difficult on the JSE where the majority of securities have small capitalisations. As shown in Figure 9, as managers get larger their investable universe shrinks. This is consistent with the diseconomies of scale argument as managers cannot scale their investments.
Ultimately, they will get so large that their only investable universe will comprise of the top 40. As shown by Figure 8, the ALSI and Top 40 (which is what large managers can ultimately hold) has underperformed the small cap index.

3 METHODOLOGY

3.1 SAMPLE

The study will focus on CIS funds, in the equity only space. The exclusion of fixed income funds and multi-asset funds (funds with exposure to various types of security classes such as bonds, REITS and unlisted securities), will allow the study to understand how the distribution of the market, as outlined by Figure 7 and how regulations influence performance. This will allow the study to investigate the role of illiquidity faced by large managers seeking to invest in 'small-cap' stocks. There are three categories of equity funds that have been classified by ASISA. These are 'General Equity', 'Large Cap' and 'Mid to Small Cap' where funds with the general equity classification can invest in both small and large cap shares. Whereas funds with a 'Large Cap' classification can only invest in large cap securities.

Isolating the domestic general equity funds sector is advantageous because these funds will have similar mandates and will experience similar risks and constraints. This will eliminate any biases that may arise from including other types of funds such as fixed income, international and private equity. They also have similar benchmarks as their underlying securities will be similar, only varying in allocation. Thus multi-class funds are not included as there may be other drivers of performance associated with fund characteristics.

The data used in the study was collected from Morningstar, an investment research and investment management firm that specializes in the collection and distribution of fund data. Only South African equity CIS funds from January 2010 to December 2017 were considered. The data sample was collected on a monthly basis. The variables collected include fund size, TER, Management Fee, ASISA classification and benchmark. The portfolios are constructed using fund returns data collected for one, three, five and seven-years consecutively. This allows the study to compare these variables in the short and long run. The portfolio constructed from the data sample is then used to estimate the regression results using other dependent variables as shown in Table 5 below.

Table 5: List of explanatory variables

Variable	Definition
1.Fundsize	Often referred to as AUM (Assets Under Management), this is the Rand value of the manager's portfolios. Research has shown it to have varying effects in different markets
2.TER	Total Expense Ratio is a measure of the total costs associated with managing and operating an investment fund, such as a mutual fund. These costs consist primarily of management fees and additional expenses, such as trading fees, legal fees, auditor fees and other operational expenses. To isolate management fees and expenses the study removed management fee from TER. By doing this one is able to study the effect of increasing expenses such as better research and technology to study whether or not they add value
3. Management Fee	This is the fee charged by the manager for managing the fund
4. ASISA Classification	The Association for Savings and Investments South Africa (ASISA) categorize every fund in South Africa. This study will be making use of three out of the 34 classes. Mainly the general equity, large cap and mid to small cap classification will be used
5. Benchmark	This is what the fund uses as a reference point for their performance. Many funds benchmark against the ALSI however other funds may use various other benchmarks such as the SWIX or a hybrid
6. Portfolio Lag	This is the past performance of the portfolio. This variable is included to see if the past performance may be indicative of future performance.

The data is collected according to its availability. Some funds do not have data points for most of the years and the data is truncated to a 7-year period. This is done to eliminate any survivorship bias that may arise with older, more established funds outperforming. The data included in this section are solely those which fit the duration of the study and have all the required data points.

3.2 APPROACH

While the fund size has been studied in various ways such as portfolio simulation (Beckers & Vaughan, 2001) to empirical analysis and the role of liquidity (Chen et al., 2004). It has also been documented in various markets such as the US, Australia, Europe, Malaysia, Iran and South Africa. However it is to this study's best knowledge that there has been no recent empirical study of funds and their characteristics in a South African context.

Pillay et al. (2010) studied the role of fund size in South Africa, the study simulated hypothetical portfolios using stock data. The study thus provided a theoretical framework but does not give a clear indication of what fund managers in South Africa do. As there has been no similar study done in South Africa that makes use of fund data, this study will follow a similar methodology used by Abbasi et al. (2012). The methodology of this research report is to test the significance of fund attributes and their explanatory power on performance.

Figure 10 shows the performance of all 261 funds over a seven-year period with some funds starting in different years. Any firms that closed over the period were not dropped from the sample. It shows the value of a R1 investment in the beginning of the holding period to what it is worth at the end of the holding period. The methodology seeks to uncover what are the driving factors behind group A that lead to their outperformance as well as what are the unique characteristics in group B that lead to their underperformance.

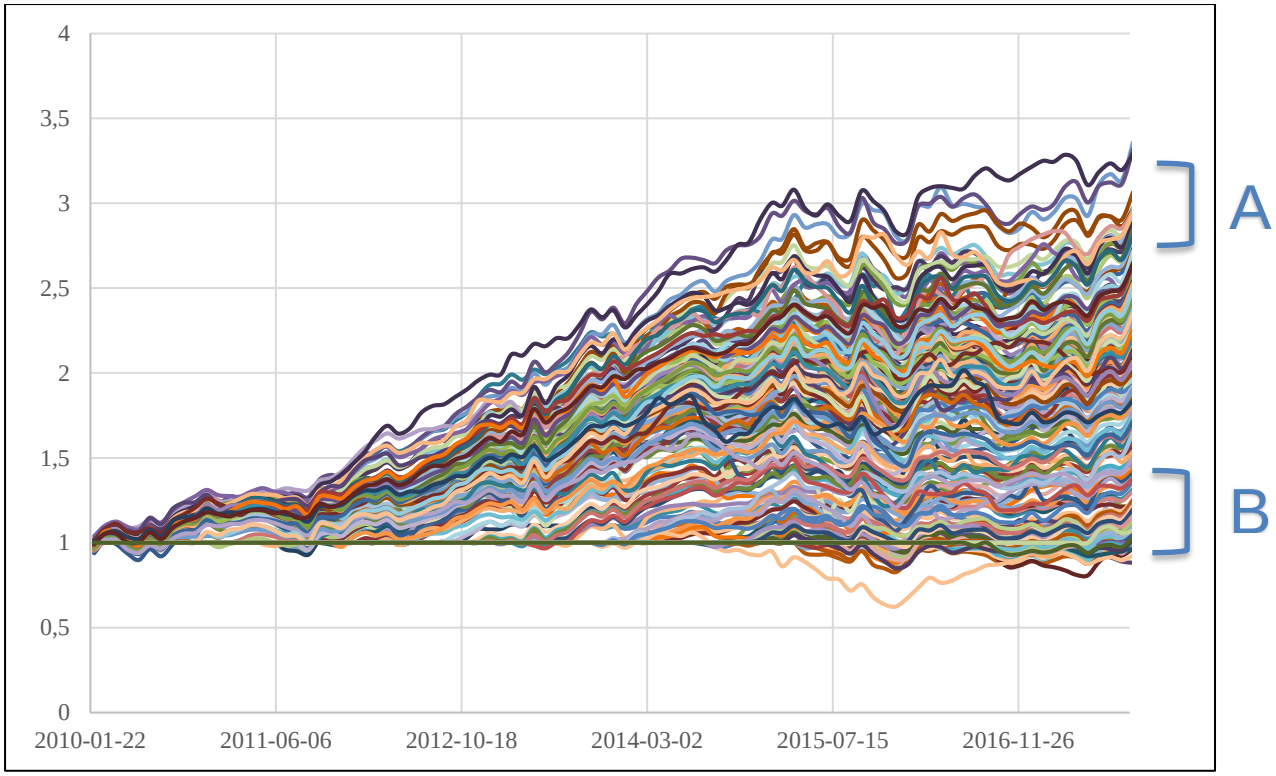


Figure 10: A line graph showing the performance of a R1 investment in all the CIS equity funds, Morningstar 2017

To determine the explanatory power of fund size, past performance, management fees and TER are regressed against performance. Four regressions are run against the performance of funds over a one-year holding period as outlined by equations 2 to 5 below. These regressions are then repeated for holding periods of three, five and seven-years

The testing will control for investment mandate variables (funds investing in small and large cap shares only) within regression analysis. This is to separate any causality that may arise from small funds and a small cap mandate. This is done by introducing a dummy variable AC as seen in equation 5 below. As the data makes use of three ASISA categories (general equity, large cap and small cap), three dummy variables are used to control for this. These AC, ASISA_Large_cap and ASISA_Small_cap. A second dummy variable is introduced to account for a funds risk profile. This is done by using a dummy variable that captures the funds benchmark which can be seen in equation 5 below. This is done by introducing a 1 for all funds that used the ALSI as their benchmark and 0 for all other benchmarks. The OLS approach will be used to study the effect of the regressands on the regressor (portfolio's performance) which is constructed using returns of various funds for data collected from Morningstar.

The general equation used to determine the regression results for each portfolio is generalized as follow.

$P_i = F(Fundsize,\ TER,\ Management\ Fees,\ ASISA\ Classification,\ Benchmark,\ Lag\ of\ P_i)$…… Eqn(1).

Where P_i represent the portfolio, and the subscript i, represent the current period. Four portfolios are constructed to represent the four holding periods. Equations 3 to 5 are then run on each portfolio to study the explanatory variables on performance through time. Each new regression run adds a variable; this is done to study the explanatory power these characteristics have on performance. The below equations show the four regressions run on each time period.

$Portfolio_i = \beta_0 + \beta_1 Fundsize + \beta_2 L.Portfolio_i$ ……..……Eqn(2).

$Portfolio_i = \beta_0 + \beta_1 Fundsize + \beta_2 TER + \beta_3 L.Portfolio_i$ ……...……Eqn(3).

$Portfolio_i = \beta_0 + \beta_1 Fundsize + \beta_2 TER + \beta_3 MF + \beta_4 L.Portfolio_i$ ……Eqn(4).

$Portfolio_i = \beta_0 + \beta_1 Fundsize + \beta_2 TER + \beta_3 MF + \beta_4 AC + \beta_5 Benchmark + \beta_6 L.Portfolio_i$……...……Eqn(5).

Where MF represents management fee, AC is abbreviated for ASISA classification and TER is total expense ratio. The Stata software is used perform the empirical analysis of the results. To explore the implications of fund attributes and performance over time, four hypotheses are introduced

A second test is then conducted by dividing the sample into 10 groups ranked from smallest to largest by AUM and taking the average performance. The performance of these groups is then studied through time to investigate which decile yields superior performance.

3.3 RESEARCH HYPOTHESES

In order to evaluate the role of fund size, management fees past performance and total expense ratio has on performance, four hypotheses are used. The first studies the significance of these variables over a one-year period. The second, third and four follow the same test as the first however over a longer period. This is done to see if these characteristics can add to a viable long term investment strategy or if they are merely phenomenon whose effect dissipates in the long run.

1. **All South African Long Only Equity Funds Over a 1-Year Period**
   H_0: There is no significant relationship between fund size, TER, MF, AC, Benchmark and P_{i-1} on P_i over a one-year period.
   H_1: There is a significant relationship between the variables and performance over a one-year period.
2. **All South African Long Only Equity Funds Over a 3-Year Period**
   H_0: There is no significant relationship between fund size, TER, MF, AC, Benchmark and P_{i-1} on P_i over a three-year period.
   H_1: There is a significant relationship between the variables and performance over a three-year period.
3. **All South African Long Only Equity Funds Over a 5-Year Period**
   H_0: There is no significant relationship between fund size, TER, MF, AC, Benchmark and P_{i-1} on P_i over a five-year period.
   H_1: There is a significant relationship between the variables and performance over a five-year period.
4. **All South African Long Only Equity Funds Over a 7-Year Period**
   H_0: There is no significant relationship between fund size, TER, MF, AC, Benchmark and P_{i-1} on P_i over a seven-year period.
   H_1: There is a significant relationship between the variables and performance over a seven-year period.

4 RESULTS

The descriptive statistics, correlation matrix and regression results of the four portfolios are presented and extensive explanation of the finding is discussed. The diagnosis analysis of the result is presented in the first section.

4.1 RESULTS FOR OLS REGRESSION

This section presents the overall sample and its correlation matrix and is then divided in to four sub sections where each one discusses the regression results for the corresponding portfolio.

Table 6: Correlation matrix of the overall sample variables and performance

	Portfo_1	Portfo_3	Portfo_5	Portfo_7	Fundsize	Asisa	Benchm~k	TER	Manage~s
Portfo_1	1,0000								
Portfo_3	0,5277	1,0000							
Portfo_5	0,3724	0,7809	1,0000						
Portfo_7	0,3105	0,6714	0,9590	1,0000					
Fundsize	0,0906	0,1737	0,1822	0,2036	1,0000				
Asisa	-0,1822	0,0026	0,0857	0,1359	-0,0465	1,0000			
Benchm~k	0,0493	0,0763	0,0468	0,0371	0,0876	0,2046	1,0000		
TER	-0,0455	0,1000	0,2178	0,2359	0,1241	-0,0917	-0,2144	1,0000	
Manage~s	-0,2317	-0,1301	0,0436	0,0869	0,1101	-0,0039	-0,2154	0,6739	1,0000

Table 6 above presents the correlation matrix for the data sample used in this paper. From the correlation matrix, there is a higher correlation between the portfolios, as expected, since returns are from year to year. The other variables have a low collinearity between them as seen in the table above. Low collinearity between variables allow for regression analysis to be performed without one running into a multicollinearity problem. Most of the highly collinear variables are the portfolio's which are used as dependent variable and would not pose any econometrical problem, since they are not going to be included in the regression together.

Table 7: Descriptive statistics of the overall sample

Variables	(1) N	(2) Mean	(3) S.D	(4) Min	(5) Max
Fundsize	261	1.444e+09	3.691e+09	961,605	4.264e+10
Portfolio_1	261	1.094	0.0576	0.883	1.238
Portfolio_3	261	1.168	0.109	0.883	1.498
Portfolio_5	261	1.449	0.342	0.883	2.405
Portfolio_7	261	1.656	0.556	0.883	3.087
Management_Fees	261	1.095	0.577	0	3.135
TER	261	1.193	0.837	0	3.590
Asisa	261	1.160	0.460	1	3
Benchmark	261	1.744	0.437	1	2

The descriptive statistics for data used show the variation of measure of central tendency for all variables used in the model estimation, as seen in Table 7. The Fundsize standard deviation is larger than the mean. All portfolios have a lower standard deviation than their average. Also management fees, TER and the benchmark have lower standard deviation to their mean. The average fund size is R1.44 bn, while the average return are 1.094, 1.168, 1.449, and 1.656 % for portfolio one, three, five and seven respectively. The management fee is 1.095% per annum on average. TER is 1.193% per annum, while the benchmark attains the mean of 1.744%. All portfolios have the minimum value of 0.883 but a variable maximum value. Fundsize has the largest range, followed by portfolio seven. The size of Fundsize is relatively large compared to other variables.

4.1.1 Results Obtained for Portfolios with a 1-Year Holding Period

This section explores the results for a one-year holding period. Figure 11 shows the return of a R1 investment for each fund in the sample, could deliver over a 1-year holding period.

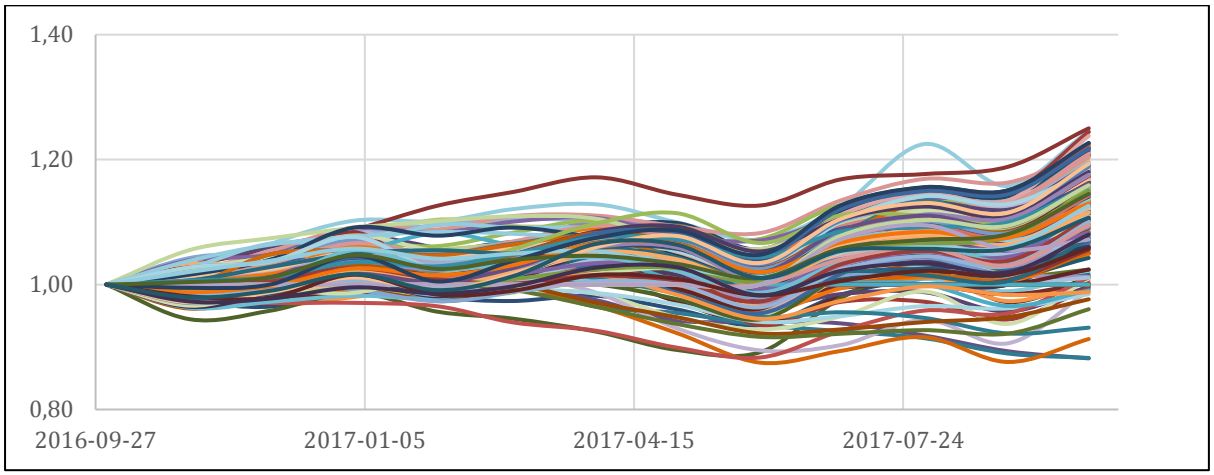


Figure 11: Performance of a R1 investment over a one-year period

Table 8 reports the results for the four regressions run over a one-year holding period where equations 2 to 5 are OLS 1 to 4 respectively. Estimating only Fundsize and the lag of portfolio for portfolio one, the Fundsize variable is positive, very small and insignificant in explaining portfolio ones' performance at a 5% level. The lag of portfolio is positive and significant at 5% level, in explaining current portfolio returns. Each 1% increase in previous portfolio returns lead to 0.15% increase in current portfolio one returns.

When TER is introduced in the model through OLS 2, the results do not change much, TER is negative and insignificant but it becomes significant at 5% level and positive when management fees are included. Lag of portfolio one remains significant and maintains the same magnitude of influence as previously in OLS 1. The Fundsize variable is positive and significant at a 10% level in explaining portfolio one returns. The lag of portfolio ones' returns is also significant at 5% level in explaining current portfolio returns.

Table 8: Showing the regressional results for a one-year holding period

Variables	**(1)** **OLS_1**	**(2)** **OLS_2**	**(3)** **OLS_3**	**(4)** **OLS_4**
Fundsize	1.60e-12*	1.70e-12*	1.83e-12*	1.32e-12
	(9.59892e-13)	(9.67745e-13)	(9.34666e-13)	(8.48989e-13)
TER		-0.00356	0.01288**	0.01300**
		(4.25666e-03)	(5.52685e-03)	(5.02336e-03)
Management_Fees			-0.03575***	-0.02192***
			(8.03930e-03)	(7.46710e-03)
2.ASISA_Large_Cap				0.04613***
				(1.15989e-02)
3.ASISA_Small_Cap				-0.11227***
				(1.65623e-02)
2.benchmark				0.00563
				(7.43999e-03)
L.Portfolio_1	0.14976**	0.14842**	0.12763**	0.11389**
	(6.15703e-02)	(6.16269e-02)	(5.96752e-02)	(5.37522e-02)
Constant	0.92826***	0.93382***	0.97590***	0.97264***
	(6.76166e-02)	(6.79818e-02)	(6.63050e-02)	(6.01843e-02)
Observations	261	261	261	261
R-squared	0.030	0.033	0.102	0.284
F	4.029	2.916	7.291	14.31
Adj-R	0.0228	0.0216	0.0882	0.264

Standard errors in parentheses: *** p<0.01; ** p<0.05; * p<0.1

When the model is appended to account for management fees as seen in OLS 3, the results improve; Fundsize is still positive and significant at a 5% level, and TER becomes positive and significant at 5% level. Each 1% increase in TER, portfolio one returns increase by 0.012%. Management fees is negative and significant at a 1% level. Each 1% increase in management fee, the portfolio one returns will decrease by 0.035 %. The lag of portfolio one is significant at 5% level and positive. Each 1% increase in portfolio one return in the previous period will lead to 0.13% increase in current portfolio one returns.

When the model is estimated with dummies of ASISA classification and Benchmark in OLS 4, Fundsize remains positive but insignificant in explaining portfolio performance. TER is positive and significant at a 5% level. Each percentage increase in TER, portfolio returns will go up by 0.012%. Management fees is negative and significant at 1% level, each 1% increase in management fee, portfolio returns will decrease by 0.020%. On ASISA classification, the portfolio return will increase by 0.045% for funds that invest in large cap securities only. Likewise, portfolio returns will go down by 0.11% for funds that invest in small cap securities

only. Both classifications are significant at 1% level. For the benchmark dummy, the variable is positive but not significant for portfolio one. The goodness of fit increases from 3.9% to 28.1% with the inclusion of variables. This means the variables in model are weak in explaining the models fit.

4.1.2 Results Obtained for Portfolios with a 3-Year Holding Period

This section explores the results for a three-year holding period. Figure 12 shows the return of a R1 investment each fund in the sample could deliver over a three-year holding period. The best performing fund over a three-year holding period was the Anchor BCI Equity fund delivering a return of 50%. The worst performing fund over this period was the NewFunds Shari'ah Top 40 ETF fund delivering a return of -11%. There was a large drop in performance over the December 2015 period due to the firing of the South African finance minister.

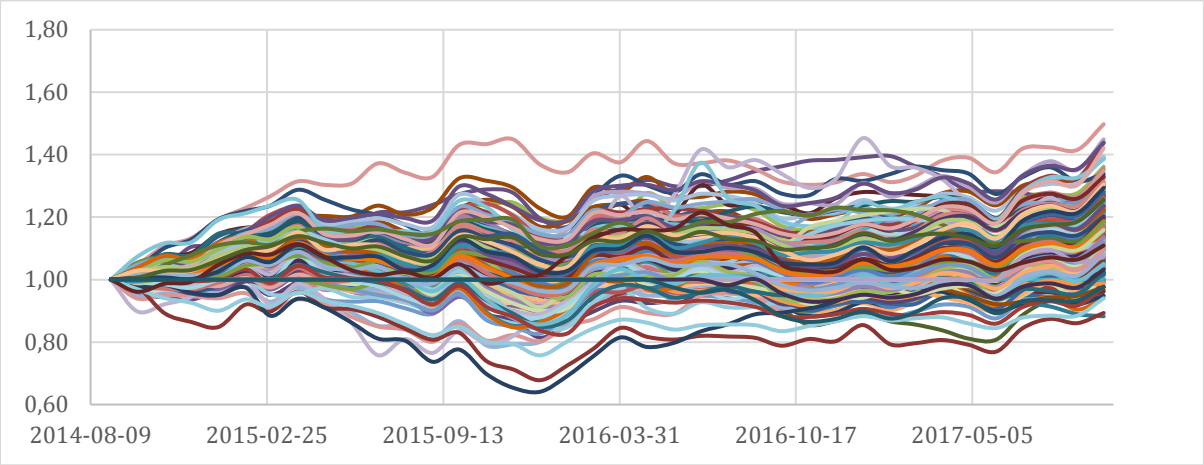


Figure 12: Performance of a R1 investment over a three-year period

When estimation is performed using OLS 1, Fundsize and the lag of portfolio seen in Table 9, the Fundsize variable is positive, very small and significant at 1% in explaining portfolio three's returns. The lag of portfolio is negative and insignificant in explaining performance over a three holding period.

When TER is introduced in the model through OLS 2 the results do not change much, TER is positive but insignificant. Lag of performance remains insignificant but decreases in magnitude. The Fundsize variable is positive and significant at a 1% level in explaining performance for a three-year holding period.

Table 9: Showing the regressional results for a three-year holding period

Variables	**(1)** **OLS_1**	**(2)** **OLS_2**	**(3)** **OLS_3**	**(4)** **OLS_4**
Fundsize	5.15e-12***	4.86e-12***	5.11e-12***	4.75e-12***
	(1.81528e-12)	(1.82736e-12)	(1.75756e-12)	(1.75266e-12)
TER		0.01017	0.04293***	0.04569***
		(8.03968e-03)	(1.04081e-02)	(1.03705e-02)
Management_Fees			-0.07113***	-0.06034***
			(1.51362e-02)	(1.54251e-02)
2.ASISA_Large_Cap				0.06637***
				(2.40318e-02)
3.ASISA_Small_Cap				-0.04464
				(3.42472e-02)
2.benchmark				0.01161
				(1.53625e-02)
L.Portfolio_3	-0.00212	-0.00169	-0.02604	-0.01392
	(6.20878e-02)	(6.20165e-02)	(5.98438e-02)	(5.94498e-02)
Constant	1.16262***	1.15042***	1.21726***	1.17603***
	(7.31207e-02)	(7.36686e-02)	(7.22347e-02)	(7.31671e-02)
Observations	261	261	261	261
R-squared	0.030	0.036	0.113	0.148
F	4.051	3.241	8.151	6.289
Adj-R	0.0229	0.0252	0.0991	0.125

Standard errors in parentheses: *** p<0.01; ** p<0.05; * p<0.1

When the model is expanded to account for management fees in OLS 3, the results improve; Fundsize is still positive and significant at 1% level, and TER remains positive and becomes significant at a 1% level. Each 1% increase in TER, returns increase by 0.042%. Management fees is negative and significant at a 1% level. Each 1% increase in management fee, the performance will decrease by 0.07%. The lag of performance is negative and insignificant.

When the model is estimated with ASISA classification and Benchmark as dummies in OLS 4, Fundsize is positive and significant in performance over a three-year period. Management fees are negative and significant at 1% level. On the ASISA dummy variable, performance over a three-year holding period will returns will increase by 0.067% for funds that are categorized focus large cap shares when compared with general equity. Likewise performance will go down by 0.044% for funds that are classified as small cap funds. The goodness of fit for portfolio three increased from 3% to 15%. This means the variables in model are weak in explaining the model fit.

4.1.3 Results Obtained for Portfolios with a 5-Year Holding Period

This section explores the results for a five-year holding period. Figure 13 shows the return of a R1 investment each fund in the sample could deliver over a five-year holding period. The best performing fund over a three-year holding period was the Momentum MoM Emerging fund delivering a return of 226%. The worst performing fund over this period was the Stonehage Fleming SCI Equity fund delivering a return of -7%.

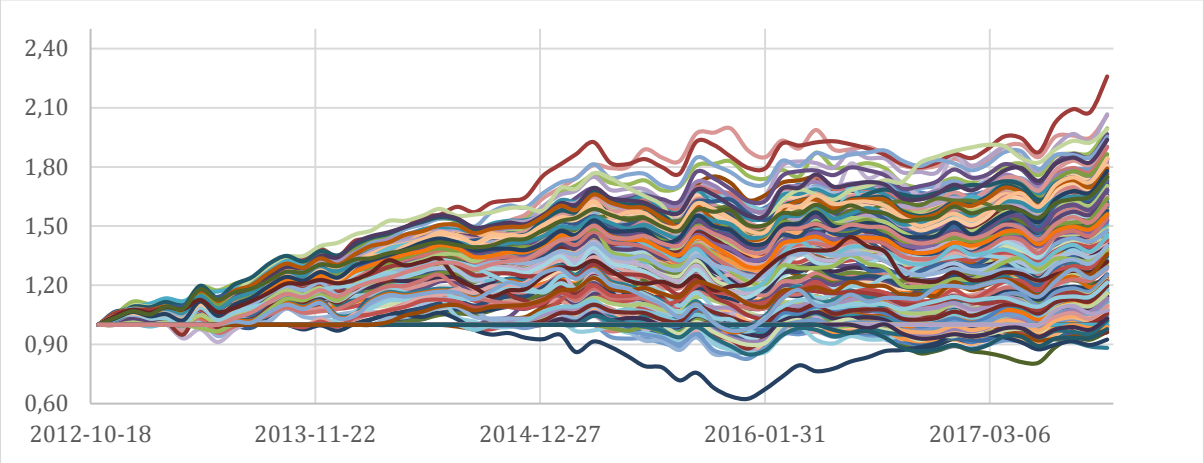


Figure 13: Performance of a R1 investment over a five-year period

When OLS 1 is performed using Fundsize and the lag of portfolio for Portfolio five as seen in Table 10, the Fundsize variable is positive, very small and significant at 1% in explaining the performance over a five-year holding period. The lag of portfolio is negative and insignificant in explaining portfolio five returns.

When TER is introduced in OLS 2 in the model the results do not change much, TER is positive and significant at 1%. Each 1% increase in TER, the performance over a five-year period will increase by 0.084%. Lag of portfolio is insignificant and maintains the same magnitude of influence as previously in OLS 1. The Fundsize variable is positive and significant at a 1% level in explaining portfolio fives returns.

Table 10: Showing the regression results for a five-year holding period

Variables	**(1)** **OLS_1**	**(2)** **OLS_2**	**(3)** **OLS_3**	**(4)** **OLS_4**
Fundsize	1.69e-11***	1.47e-11***	1.52e-11***	1.42e-11***
	(5.65295e-12)	(5.59641e-12)	(5.54107e-12)	(5.43920e-12)
TER		0.07986***	0.13590***	0.15087***
		(2.46785e-02)	(3.28576e-02)	(3.22450e-02)
Management_Fees			-0.12152**	-0.08856*
			(4.76708e-02)	(4.78183e-02)
2.ASISA_Large_Cap				0.30982***
				(7.43384e-02)
3.ASISA_Small_Cap				-0.04729
				(1.06445e-01)
2.benchmark				0.02961
				(4.78464e-02)
L.Portfolio_5	-0.03159	-0.03542	-0.04145	-0.03746
	(6.12819e-02)	(6.01988e-02)	(5.96119e-02)	(5.80628e-02)
Constant	1.46884***	1.38262***	1.45674***	1.35218***
	(9.19983e-02)	(9.42012e-02)	(9.76395e-02)	(1.03355e-01)
Observations	261	261	261	261
R-squared	0.035	0.073	0.096	0.159
F	4.686	6.729	6.779	6.812
Adj-R	0.0276	0.0620	0.0817	0.135

Standard errors in parentheses: *** p<0.01; ** p<0.05; * p<0.1

When the model includes management fees in OLS 3, the results improve. Fundsize is still positive and significant at 1% level, and TER remains positive and significant at a 1% level. Management fee is negative and significant at a 5% level. Each 1% increase in management fee, the portfolio five returns will decrease by 0.12%. The lag of portfolio returns is negative and insignificant.

When the model is estimated with the ASISA and benchmark dummies as in OLS 4, Fundsize is positive and significant in explaining performance over a five-year period. TER is positive and significant at 1% level. Management fee is negative and significant at 1% level, each 1% increase in management fee, portfolio returns will fall by 0.088%. On ASISA classification, the portfolio five returns will increase by 0.31% for large cap funds. Likewise portfolio returns will go down by 0.047% for small cap funds. The goodness of fit increased from 4% to 17%. This means the variables in model are weak in explaining the model fit.

4.1.4 Results Obtained for Portfolios with a 7-Year Holding Period

This section explores the results for a seven-year holding period. Figure 14 shows the return of a R1 investment each fund in the sample could deliver over a seven-year holding period. The best performing fund over a seven-year holding period was the Mazi Capital Prime fund delivering a return of 296%. The worst performing fund over this period was the Stonehage Fleming SCI Equity fund delivering a return of -7%.

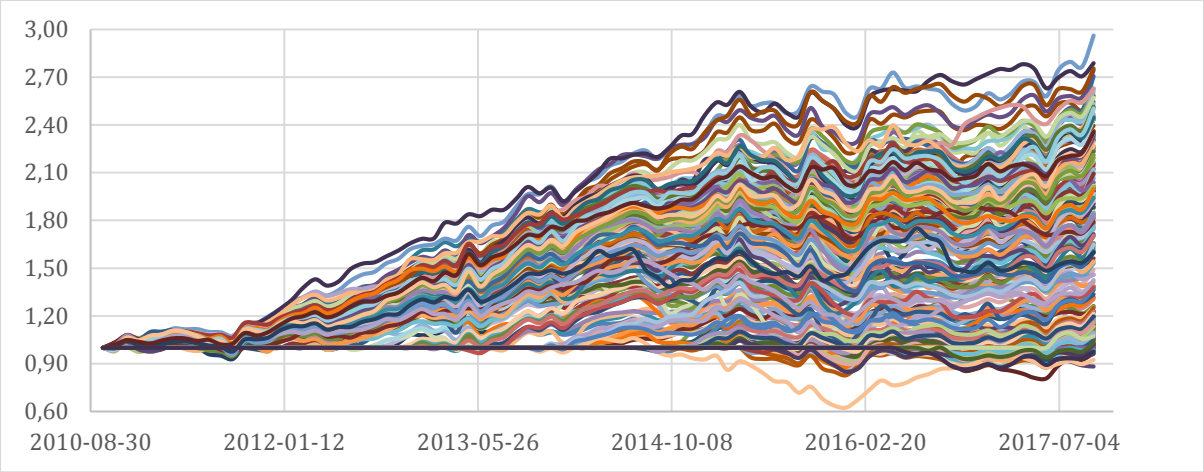


Figure 14: Performance of a R1 investment over a seven year period

When OLS 1 estimation is performed using Fundsize and the lag of portfolio for portfolio seven, the Fundsize variable is positive, very small and significant at 1% in explaining performance over a seven-year period as reported in Table 11. The lag of portfolio is negative and insignificant in explaining current portfolio returns.

Through OLS 2, TER is introduced in the model, the results are positive and significant at 1%. Lag of portfolio seven is insignificant. The Fundsize variable is positive and significant at a 1% level in explaining portfolio seven returns.

Table 11: Showing the regression results for a seven-year holding period

Variables	**(1)** **OLS_1**	**(2)** **OLS_2**	**(3)** **OLS_3**	**(4)** **OLS_4**
Fundsize	3.08e-11***	2.68e-11***	2.74e-11***	2.65e-11***
	(9.17970e-12)	(9.05251e-12)	(9.01989e-12)	(8.83135e-12)
TER		0.14145***	0.20565***	0.23350***
		(3.99441e-02)	(5.34973e-02)	(5.23826e-02)
Management_Fees			-0.13923*	-0.10020
			(7.76040e-02)	(7.76770e-02)
2.ASISA_Large_Cap				0.52604***
				(1.20716e-01)
3.ASISA_Small_Cap				0.09231
				(1.72956e-01)
2.benchmark				0.03092
				(7.77700e-02)
L.Portfolio_7	-0.01790	-0.02230	-0.02481	-0.02396
	(6.10966e-02)	(5.97871e-02)	(5.95471e-02)	(5.78520e-02)
Constant	1.64005***	1.48475***	1.56381***	1.41696***
	(1.07855e-01)	(1.14271e-01)	(1.22017e-01)	(1.36229e-01)
Observations	261	261	261	261
R-squared	0.042	0.087	0.098	0.165
F	5.683	8.138	6.961	7.125
Adj-R	0.0348	0.0761	0.0840	0.142

Standard errors in parentheses: *** p<0.01; ** p<0.05; * p<0.1

When the model includes management fee, the results improve; Fundsize is still positive and significant at 1% level, and TER remains positive and significant at 1%. Management fees is negative and significant at a 10% level. Each 1% increase in management fee, the portfolio return will decrease by 0.15%. The lag of portfolio seven is negative and insignificant.

When the model is estimated with ASISA and a benchmark as dummy variables, the Fundsize is positive and significant in explaining performance over a seven-year period. TER is positive and significant at 1% level. Management fees is negative and insignificant, each one unit increase in management fee. On ASISA classifications, the portfolio seven returns will increase by 0.52% for large cap funds. Likewise, portfolio returns will go up by 0.09% for small cap funds. The goodness of fit for portfolio seven increases from 4.4% to 17.4%. This means the variables in model are weak in explaining the model fit.

4.2 RESULTS FOR SIZE DECILES

To better understand the role of fund size, funds were ranked and grouped into deciles from largest to smallest with 1 being the smallest funds and 10 being the largest funds. The average return was then taken of each decile. The best performing funds are then ranked '1' in the left column below and the worst performing funds are ranked '10'. This section outlines the performance of these deciles.

Table 12: Showing the best performing deciles over the holding periods

Rank	One-Year	Three-Year	Five-Year	Seven-Year
1	2	2	7	6
2	10	4	1	10
3	4	10	2	1
4	7	7	5	4
5	8	8	6	7
6	3	3	4	3
7	9	5	10	9
8	6	6	3	2
9	1	1	8	5
10	5	9	9	8

From Table 12, it can be seen that the best performing decile over a one- and three-year period was the second smallest group of funds. As the time period was extended to five- and seven-year, the best performing funds were in decile seven and six. Interestingly the largest decile, consistently stayed in the top three performing deciles with exception to a five-year holding period. This is consistent with the previous results showing a positive and significant coefficient between fund size and performance.

4.3 MODEL DIAGNOSTICS

To ensure accuracy and reliability of the results, some diagnostics were run on the model and are reported below.

Table 13: Showing the diagnosis results for each portfolio with all the variables

Portfolio	**Heteroscedasticity Chi2_Probability**	**Multicollinearity VIF for variables**	**Serial Correlation Chi2_probability**
Portfolio One	0.0020	<5	0.201
Portfolio Three	0.8482	<5	0.997
Portfolio Five	0.5237	<5	0699
Portfolio Seven	0.1877	<5	0.646

Heteroscedasticity is a result of violation of homoscedasticity or the assumption of constant variance of error term. Often the causes of Heteroscedasticity when it arise, can be due to outliers in data, error learning model, incorrect specification of the model or skewness of data. The presences of heteroscedasticity often lead to inefficiency of the estimators.

To detect heteroscedasticity we use Breusch-Pagan/Cook-Weisberg test with the null that the error variances are equal versus the alternative that the error variances are multiplicative function of one or more variable the following results are obtained for each portfolio. If the Probability of Chi-Square is insignificant, heteroscedasticity is not a problem. As seen from the table above, heteroscedasticity only persist in portfolio one estimation, but not in the rest of other portfolio's estimations.

The null hypothesis is that there serial correlation; the alternative is there is no serial correlation. From the table above, we fail to reject the null hypothesis and conclude that serial correlation is not a problem in this instance for all portfolios.

The main source of Multicollinearity is the violation of no linear relation between the regressors in the model. Often collinearity is a state of nature; there is some form of collinearity, so the main issue becomes severity of the collinearity. Presence of multicollinearity is spurious results, where one gets a high R-square but insignificant t-values or a high pairwise correlation. Using Variance Inflation Factor (VIF) to detect the severity of collinearity. If VIF is less than 5, collinearity is not a problem. From the table above most regressors have a VIF less than 5, we conclude that collinearity is not a problem.

4.4 ECONOMIC INTERPRETATIONS AND IMPLICATIONS OF THE FINDINGS

This section seeks to investigate the economic interpretations of the results by blending the statistic results with theory. Jensen (1968), Malkiel (1995), and Fama and French (2008) document that actively managed U.S. equity mutual funds significantly "underperform" passive investment strategies, net of fees. Highlighting the importance of fees and the negative effect it has on performance. The well documented inverse relationship between management fees and performance is apparent in these results. The results shown above are consistent with previous literature, where across all holding periods, there is a negative and significant relationship, (Jones & Wermers, 2011).

With the inclusion of management fees in the regression of variables on one-year performance, the coefficient was -0.035 and significant. As the holding period was increased the magnitude increases further from -0.035 to -0.14. This increase is exponential as management fees have a compounding negative effect on performance as seen in Figure 6.

Many authors have debated if spending money on better resources is worth it, while contrary to this argument, many academics believe the optimal thing a manager should do is focus on keeping expenses as low as possible. Consistent with this, Elton, Gruber, Das, and Hlavka, (1993), Harless and Peterson (1998) and Gil-Bazo and Ruiz-Verdú (2009) found a negative relation between TER and performance.

The results from this study show an interesting phenomenon whereby the coefficient for TER reported for three, five and seven-year portfolios is positive and significant. In the short run, TER has a negative relationship with performance. However as the holding period increases, the relationship changes to a positive one. This is consistent with Ippolito (1989) and See and Jusoh (2012) which found funds who spent more on research delivered superior returns. Our interpretation of this is that to deliver high returns over an extended period of time, funds need to invest in resources to deliver returns. This would explain the short-run negative relation that then switches to a positive one.

Often referred to the ‘hot hands’ effect, where a fund with good performance in one-year will have good performance in the following year. The results presented above are consistent with Firer et al. (2001), Bollen and Busse (2004), Bauer et al. (2006) and Białkowski and Otten (2011), where the hot hands phenomenon exists in the short-run.

The results showed that for a one-year holding period the relationship was positive and significant. However as the holding period increased, this relationship dissipated and became insignificant. This implies that an investor could buy the best performing funds last year as they will have high returns this year.

The results for fund size uncover an interesting occurrence. This research has shown how small asset managers in South Africa may have a competitive advantage in taking meaningful positions in small cap securities. It has also shown how smaller asset managers have a wider range of securities to invest in. However, the results have shown to be a positive relation with fund size and performance which is consistent with Elton et al. (1996), Otten and Bams (2002) and Broeck and Vennet (2003). These results contradict the findings of Pillay et al. (2010). The interpretation of this may be due to the underlying securities. When the market is bullish on the Top 40 and bearish on small cap securities. Larger asset managers have a clear advantage as they may benefit from economies of scale. As the market is herding towards the more liquid shares in the Top 40 and avoiding smaller securities, small asset managers do not capitalize on these small cap shares. This has been documented by Falkenstein (1996), which argues that funds have a preference to securities that have a high visibility and small bid offer spreads, characteristics most common in the Top 40. This is evident in this researchers results which shows the ASISA_Large_Cap variable has a positive relation with performance. Meaning funds that only invest in large cap securities have outperformed funds that invest in small cap securities. This is further corroborated by the negative relation between ASISA_Small_Cap variable and performance. This provides evidence that Top 40 securities outperformed during the sample and larger managers could enjoy economies of scale.

Analysis of the fund deciles is consistent with the above interpretation where the largest decile was in the top three best performing deciles over the sample period with exception to the five-year holding period. While smaller managers have a competitive advantage in being more nimble and have a large universe of securities to invest in. This advantage is redundant when market conditions dictate managers to go long on the Top 40. In this case larger managers will

benefit from economies of scale and outperform. This is explanation is consistent with this study's' results.

As a result, there is no rule of thumb for investors to follow that will guarantee superior performance with respect to choosing managers based on size alone. Investors should look at various attributes and understand the manager they mandate very well.

5 CONCLUSION

The aim of this study was to investigate the driving factors of performance in South African funds by making use of a data set from Morningstar. This was done by investigating the explanatory power of fund size, past performance, TER and management fees on the performance of funds over a one, three, five and seven-year holding period. It has provided a comprehensive view on the financial and regulatory landscape in South Africa.

The results showed that consistent with financial literature, management fees have a negative relationship with performance and by increasing the holding period the effect becomes greater. Past performance can only explain future returns for one-year, as the holding period is increased the hot hands phenomenon dissipates. TER shows that as funds invest in resources, this pays off in the long run as there is a negative relationship over a one-year period however this turns positive in the long run. Lastly fund size has a positive relationship with performance. This research hypothesizes that funds in South Africa will primarily hold significant stakes in Top 40 shares and as a result larger funds benefit from economies of scale. From these results, investors should pick funds that have low fees and have been shown to perform well previously. By investing in larger funds, the investor will benefit from economies of scale and enjoy superior performance.

This study has been extensive in investigating the CIS industry in South Africa, however there are avenues for future research. The first is the sample period, this may certainly be extended to ensure a robust and complete sample. Data collected from Morningstar was truncated to prevent survivorship bias. For this reason the sample period was only seven years, by increasing the time period, the results may offer more conclusive results . Fund size can be viewed as a proxy for agility and market impact, where it is used to gauge the nimbleness of a fund in taking positions. By using data that shows the underlying positions of funds, two valuable results can be reached. The first will be to see if there is any difference in holdings and allocations between small and large funds. By having the underlying positions of every fund, the researcher maybe able to see if funds take positions in the Top 40 regardless of fund size. The second would be to understand the size of positions large asset managers have to smaller shares and if they do indeed take positions in small cap shares. Making use of data that showed the average length of time to execute trades would shed light on whether or not smaller funds are more nimble as well as gauge a funds price impact.

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