Survivorship bias of unit trusts in South Africa: 2009 - 2019

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A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Master in Business Administration.

11 November 2019

Abstract

This report examines the survivorship bias that exist as a result of unit trust fund closure in South Africa. Only one previous study had been completed on survivorship bias of unit trusts in South Africa in a previous time period, although many exist on unit trust performance. This report aimed to widen the sample and therefore included all unit trust categories. The number and presence of fund closures, fund failure rates and survivorship bias were analysed according to category, fund size and management company over the sample period.

The findings show that failure rates increase the longer the time period, and that smaller funds are more likely to fail. Contrary to other research, survivorship bias estimates yield similar results over 10 years using equal- and size-weighted methodologies. Negative biases are also shown to exist at category and management company level. Survivorship bias was shown to exist over multiple time periods and that closed funds underperformed relative to surviving funds.

Keywords

Unit trusts, survivorship bias, performance.

Declaration

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

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11 November 2019

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1 Introduction to Research Problem

1.1 Background

Many South Africans who are fortunate enough to have fulltime employment will most likely be invested in some form of retirement annuity or provident fund, provided to them by their employer. These funds are in the form of retirement annuities, provident funds or pension funds with a mandate to invest a portion of an employee's salary in a long-term instrument. Individuals who are not entitled to such employment benefits, would be advised to commence saving for their own retirement. These individuals would, in light of the overwhelming volume of complex investment information available, tend to approach a financial planner or advisor to assist them in developing a retirement or savings plan. It is likely that the appointed financial advisor will offer the individual product(s) that will invest in a collective investment scheme ("CIS"). These are also known as unit trusts and will be referred to as "unit trusts" or "funds" for this report.

When faced with this investment decision, the individual needs to consider an innumerable variety of products, options and advice. For example, as an investor, the individual would need to choose between the different financial service providers, taking into consideration the service provider's fees and guarantees, when it would be the best time to invest, how much capital to invest, and what type of fund should be invested in. In addition, a very important consideration for such an investor would be the question of the return on their investment.

As a result, when an individual investor considers a product to invest in, a few factors are considered. A survey conducted by Allan Gray in 2018 on 400 financial advisors cited that performance of the unit trusts and the relative performance (compared to other unit trusts) of unit trusts are the 1st and 2nd most important attributes, respectively, that financial advisors consider when investing in a portfolio (Mohamed 2018). Any investor would prefer to avoid losing invested capital, but unfortunately the nature of markets and the economy means that investments will go through cyclical events. As a result of the nature of the investment market, investors must maintain a long-term view of their investments.

Even though the South African economy has gone through many political and economic challenges, the Johannesburg Stock Exchange (JSE) has been one of the most successful stock exchanges globally and achieved an annualised real return of

7.2% per year for the period 1900 – 2016 (Dimson, Marsh, & Staunton, 2017) which was the highest reported by Credit Suisse in their published Global Investment Returns Yearbook 2017.

1.2 Definition of survivorship bias

Survivorship bias (in terms of unit trusts) is the bias that results when performance studies are conducted on datasets that do not include liquidated or merged unit trusts. The performance measurement therefore only includes unit trusts that are existing and does not include the performance of any failed funds. The implication of this is that fund managers' performances are skewed upward if they presided over the active management of any unit trusts with relatively poorer performance which had been liquidated or merged with other funds (Pawley, 2006).

In his book "The Black Swan", author Nassim Nicholas Taleb (2007) referred to this bias as "silent evidence" (p. 101) and that it can be corrected by "taking into account both the dead and the living instead of only the living" (p. 102). Rohleder, Scholz and Wilkens (2011) define survivorship bias as "the performance difference between two fund portfolios, a biased and an unbiased one" (p. 443).

The historical performances of these funds are not disclosed by either the management company or the fund/asset manager. A fund or asset manager can therefore get rid of the poor performing fund (see below) which will improve their performance outcomes (Pawley, 2006). Even though funds were managed over a time period on behalf of investors by a fund manager, the performance record of the closed funds is not included in the historical track record of the manager.

1.3 Closure of unit trust funds

When a unit trust starts to underperform, fund managers struggle to attract new investments. These funds are also likely to lose clients, as capital is taken elsewhere to better performing funds. A study has found that high performing funds (in South Africa) attract most of the net inflows (Arendse, Muller and Ward, 2018). The underperforming unit trusts struggle to maintain their investment mandate and the manager would generally rather liquidate the assets held in the fund or merge the remaining capital in better performing funds elsewhere in the business. In this case, investors who were invested in the closed fund will unfortunately not have the opportunity to wait it out but will have their losses locked in by the fund manager. They will be transferred to another fund of the same Management Company (to be

referred to as Manco for the rest of the report) or be forced to take their capital and invest elsewhere. Effectively, the investor loses the opportunity for their investment to potentially recover and/or increase its performance in future.

Once the unit trust has been closed (i.e. liquidated or merged with another fund), the history and record of the closed fund effectively disappears from the public eye (Pawley, 2002). Holders of units in the trust are required to be informed of such changes as per regulatory requirements, but the investing public would be unaware especially when considering whether to invest with the fund manager.

What does not disappear, is the under-performance experienced by the investors who were invested in the fund. Additionally, the minimum disclosure documents distributed by fund managers only shows returns and performance of active funds. The historical performance of any of the closed funds are disregarded for reporting purposes and for establishing the company's overall investment performance. It is submitted in this study, that the reported (weighted) performance of the Manco, asset manager or fund manager should include the performance of the funds that have been closed, and not only the ones that are currently active in order to avoid survivorship bias and to ensure honest and open reporting to investors. The historical track record of funds managed by Manco, fund manager or asset manager must be visible to potential investors.

Unfortunately, this does not happen in practice in South Africa. It would therefore be a very onerous exercise for an investor to access the relevant information in order to assess the true overall performance of funds under a certain fund manager or Manco, given that information on closed funds are not published or readily available to the public. An investor would also not be able to determine, statistically, how many of the investment company's funds have survived versus the amount of funds that have been closed. This is an important consideration for a potential investor as it may impact the likelihood of the survival of the fund being considered for investment. As mentioned earlier, this information is not readily and publicly available to investors. It is submitted that new investors should not solely consider a fund with the highest returns but should also consider investing with fund managers and Mancos that are least likely to close their unit trust funds.

While the new fund may have achieved a positive return, the "transferred" investor's capital will not have achieved the same return, as the investor is now only recently

been invested in this new fund. The investor's capital effectively comes from another low performing fund and it is merged into this well performing fund. However, based on the published reports on the fund's return, it will appear as though the transferred investor's cash has achieved a higher return, based on the investor's new fund's historic return.

Any new investors perusing performance documents and/or statistics of funds would be unaware of mergers that have occurred into a fund or the associated reasons. Merging a failing fund with other funds with more respectable track records allows the Manco and/or fund manager to retain its clients and the associated fee income, while effectively hiding the historical performance of the closed fund.

This is a practical illustration of bias suffered by the transferred investor who is under the impression that his investment is performing well, without realising he was invested in a closed fund and with the transfer to the new fund, has to effectively start building his portfolio of investment's performance from scratch.

From another point of view, fund closures can achieve some benefits, like improved scale and efficiency, and allow fund managers to focus on its core capabilities.

1.4 Unit trust investor behaviour

Market volatility guarantees that funds will underperform from time to time, but investors often make the mistake of switching to better performing funds in order to try and avoid being exposed to periods of underperformance of the unit trust fund. Moving between funds forces an investor to sell the units in the underperforming fund, locking in the underperformance achieved and preventing one from recovering from the losses in future (Mthimkhulu, 2019). Transaction costs (like fees and taxes) occur when switching between funds, and these can accumulate over time when such switches are done on a regular basis and significantly impact a portfolio's long-term growth.

Firer, Gray, Sandler, and Ward, (1996) found that it was extremely unlikely that one could outperform a buy-and-hold strategy by attempting to time the market. Their study considered unit trusts within the same Manco (Firer et al., 1996). Switching to unit trusts outside the group would have led to even higher transaction costs and subsequent lower returns (Firer et al., 1996). The average investor is therefore generally largely ill-equipped to make correct investment allocation decisions in the short term.

A study by Dichev (2007) indicated that dollar-weighted returns were lower than buy-and-hold returns of securities (or shares). The dollar-weighted returns measured the actual growth of investors capital in the fund and were dependent on the timing and size of capital flows into these securities. On the other hand, the buy-and-hold returns were effectively equal to the security return as the capital remained in the fund throughout the period.

It found the difference in return to be an average of 1.5% on 19 global stock exchanges (including the JSE) over the period from 1973 to 2004. Hsu (2015) investigated this discrepancy (known as the behavioural return gap) between buy-and hold returns and dollar-weighted returns of value funds in the USA between 1991 and 2003. He found a discrepancy of 1.29%, which indicated that the full value offered by the buy-and-hold strategy was not achieved. As an extreme example, a fund managed by Ken Heebner in the USA managed to achieve an annualised return of 18% over a decade ending in 2009, yet the mean investor lost 11% during that time in dollar-weighted returns due to investors chasing high returns and failing dismally (Gray, 2015).

Switching between funds haphazardly is therefore an expensive exercise, in terms of costs and returns foregone.

1.5 Unit trusts in South Africa

Most South African investment companies, life insurance providers and asset managers are members of the Association of Savings and Investment South Africa (ASISA). ASISA has 130 members across the country and is an important partner to the investment industry at the government negotiation table, with one of their aims to promote a society that saves and invests for the future (ASISA, 2019b). The country's first unit trust had assets of R600 000 under management and was launched in June 1965 (ASISA, 2015). ASISA reported that at the end of June 2019, South Africans could choose from a total of 1607 portfolios, with a total value of R2.4 trillion total assets under management (ASISA, 2019c). This indicates the significant growth that the CIS industry has undergone during the past 53 years since 1965.

ASISA also reported that at the end of December 2018, the total assets under management in the local unit trust industry decreased by 0.4% in the year, from R2.25 trillion at the start of 2018 to R2.24 (ASISA, 2019a) at the end of 2018. A trend consistent throughout 2017 and 2018 was investors opting for the perceived safety

of interest-bearing portfolios due to the uncertain macroeconomic environment and the below-average performance of the JSE. Many South African investors still opted for investing in equity and multi-asset portfolios (ASISA, 2019a).

Stanlib finalised the closure of 15 of their managed funds in March 2018 (Bechard, 2018) in what was described as a *"*rare mea culpa" (Business Times, 2018, para.4) for the asset management industry. Stanlib voiced that it wanted to simplify its offering in a changing market by closing of said funds. This sort of disclosure made by Stanlib was a rare occurrence, due to the investment industry regularly closing funds without disclosing the reasons of these fund closures to the public.

The active management industry could also be mindful of the rise in more competitive alternatives to traditional unit trust funds, such as index trackers, which have grown substantially over the past number of years. Recent trends in the industry suggest that actively managed unit trust funds are declining in popularity, as the total number of South African unit trusts available to retail investors shrunk for the first time in a decade (since the crash of 2008) (Cairns, 2019a). Passive funds (like index trackers) continued to grow, albeit from a low base. Active managed funds in South Africa have been found to be expensive, while not delivering an outperformance of the market (Coetzee, De Villiers and Nel, 2018).

While unit trusts have experienced high historic levels of growth in South Africa and globally (Wolmarans and Meyer-Pretorius, 2006), recent studies seem to indicate that actively managed funds are being outperformed by passive funds like index trackers (Muller and Ward, 2011). Nana (2012), found no evidence domestic equity unit trusts outperform either the market or passive managed funds. While index tracker funds will match the index, actively managed funds are subject to manager selection.

According to the latest Standard & Poor's (S&P) Indices Versus Active (SPIVA) South Africa scorecard released for mid-year 2019, 74% of actively managed, South African equity and fixed income funds failed to outperform the S&P South Africa Domestic Shareholder Weighted (DSW) index (Innes, Bezuidenhoudt, and Cairns, 2019). Regardless of some of these findings, unit trusts remain a popular investment method in South Africa.

Following the global financial crisis in 2008, equities on the JSE had started to recover and delivered an annualised average return of 19.9% per year for five years

leading up to 2014 (Cairns, 2019b). Since then, the performance of the South African economy and subsequently the JSE, had been weak. For five years, up to the end of March 2019, the total return of the JSE all share index (with dividends reinvested) was lower than the previous five-year period, at 6.44% per year (Cairns, 2019c). In 2018, the JSE experienced its biggest decline in return in ten years, with the JSE all share index (ALSI) down by 8.5% (ASISA, 2019a). The period from 2014 to 2018 has been regarded as a period of low growth for the JSE. These factors are out of the control of the fund manager and unfortunately it is the investor who suffers most under these circumstances.

From the facts stated above, unit trusts still play a prominent role in the local South African investor's behaviour, even though the market has not performed well over the past number of years. Several studies in recent years have assessed the performance of unit trust funds in South Africa.

1.6 Research objectives

Two previous studies examined the effect of survivorship bias in South Africa; by Pawley (2006) on South African equity unit trusts and Gilbert & Strugnell (2010) on listed shares on the JSE. The time period researched in each of the papers was from 1972 to 2004 (Pawley) and from 1984 to 2007 (Gilbert & Strugnell). Pawley found that the survivorship bias during the sample period overstated annual returns of unit trusts over five years by 0.23%, and over 20 years by 1.05%. Gilbert and Strugnell (2010) found the impact of survivorship bias to be "present and material" (p. 31) and concluded that an effort ought to be made to avoid this bias when assessing performance.

No other studies on the effect of survivorship bias have been conducted in South Africa since the two mentioned above. Therefore, there exists an unexploited research area in the time period after 2005. The time period investigated for this research paper (2009 – 2019) is recognized by the following significant events that impacted local equity markets:

1. The aftermath of the global financial crisis of 2008;
2. The firing of then finance minister Nhlanhla Nene in December 2015 and the subsequent fall in South African equity markets;
3. The collapse of Steinhoff in 2017;
4. The relatively strong performance of the JSE between 2009 and 2014; and

5. The relatively weak performance of the JSE between 2015 and 2018.

The question therefore arises: Why would fund managers be hesitant to disclose the historical performance of failed funds to their existing investors and/or the public (potential new investors)? Fund managers might fear damage to their reputation, or that existing investors would withdraw their investments and take their capital elsewhere. It is submitted that it must be challenging for fund managers to sell an under-performing fund to the public as an attractive investment product and would therefore rather not disclose the failure of funds.

The objectives of the research are to determine the extent of unit trust closure in South Africa, the corresponding failure rate and the subsequent survivorship bias prevalent in the unit trust industry over the period from 2009 to 2019.

1.7 Benefits of the study

The information gathered from this research will be useful to assess whether survivorship bias was present during the periods mentioned above, and to what extent. The failure rate and number of closed unit trusts will also be determined. Taking into account the South African political and economic environment and the corporate failures that have occurred over this period, the findings of this study will give investors valuable information on the true performance of unit trusts in South Africa between 2009 and 2019, and the likelihood of fund failure. Given the lack of outperformance mentioned above, there is a real risk that even more funds are underperforming than regularly reported.

For investors it is important to understand that Mancos do not always disclose to the public when their funds have been closed and why. The disclosed rates of return might be honest reflections of a single fund's performance but is not necessarily reflective of all funds that were under a fund manager's responsibility over a certain time period. Pawley (2006) lists the following three implications for investors:

1. It might incorrectly seem to investors that the fund is outperforming its benchmark;
2. Excluding the failed funds from past performance figures indicate performance higher than what was truly achieved; and
3. Funds may be selected for long term goals based on incorrect historical performance data.

Pawley (2006) also found that fund survival rates were dramatically on the decline the longer the time period. Within the tumultuous period in the South African economy over the past number of years, and the need for more transparency and governance from business society, including investment companies, these questions certainly require further investigation.

This research paper will benefit the investment fraternity by bringing to light the currently unknown effect of survivorship bias on stated returns within the sample period. A small reduction in return of an investment of even 1% per annum, can have significant impact over the long term of an investment portfolio. Additionally, the failure rate of unit trusts will give significant insight into how many of these unit trusts have a sustainable lifespan, which many investors would want to be informed of, as part of their long-term investment strategy.

2 Literature Review

2.1 Introduction

The performance of unit trusts in South Africa has received considerable research attention over the past number of years. This trend is correlated with the high growth in unit trusts over the past 20 years. However, the presence and extent of survivorship bias on the performance measurement of unit trusts has not been researched in South Africa since the previous paper published by Pawley in 2006.

The literature review will provide context and information relevant to the research objectives.

2.2 Survivorship bias in World War II

Abraham Wald was a member of the Statistical Research Group (SRG) during World War II (Mangel and Samaniego, 1984) who was tasked with providing statistical and mathematical support to the military. Wald was specifically assigned to improve the survival rates of aircraft, by assessing aircraft returning from the battlefield for damage suffered (Mangel and Samaniego, 1984).

The operational commander had to determine what tactics would improve the survivability of planes, so that reinforcements could be applied to the body of aircrafts in the most effective manner. Reinforcements could not be applied liberally as it would increase the weight of the aircraft and use more fuel. Wald had to determine where planes were the weakest, so that reinforcement could be applied in the correct areas of the plane (Mangel and Samaniego, 1984).

The problem was that all the planes that he could collect information from and that formed part of his sample, had survived the onslaught on the battlefield. Therefore, no information was available to him about the airplanes that did not survive. His sample had been biased with only the survivors remaining.

Previously, military personnel had reinforced the planes where the most bullet holes had been found. However, Wald held that reinforcement ought to be applied to the areas where returning planes were not hit. The returning airplanes survived; therefore the bullet holes must have been in areas that were non-fatal to its mission. Strengthening the areas where the planes were most hit would not guarantee the survival of more planes, and it is rather the reinforcement of areas that were not hit that would ensure more planes make it back home safely.

Wald published his findings in a report which had been kept classified until being released to the public (Ellenberg, 2014). It proved important in operational research and provided methods for reacting to incomplete data.

2.3 Literature on Survivorship bias of unit trusts

2.3.1 Survivorship bias in South Africa

Pawley (2006) analysed the effect of survivorship bias on South African domestic equity unit trust funds performance between 1976 and 2004. From his analysis, it was evident that rates of return increased consistently over several time periods when considering only surviving funds. This suggested that closed funds were poor performing. The average equal weighted annual net rates of return were calculated for each year of the unbiased sample, and then compared to the annual rates of return of the biased sample. The bias ranged from 0.23% at 5 years to the highest bias of 1.05% at 20 years. This bias was found to "overstate real annualised returns by as much as 47.47% at 20 years" (Pawley, 2006, p. 25.), when compared to the average inflation over the same time period.

An additional finding Pawley (2006) made was the attrition rate of unit trusts was increasing as the availability of funds on offer increases. The average annual rate of failure was found to be 5.23%, with the ten-year failure rate at 37.92% and 52.59% over 20 years. This finding indicated a higher than 50% chance that any investor would have to move their investment to an alternative investor over an investment period. Investment periods are likely to last more than 20 years (Pawley, 2006). No research has since been completed on survivorship bias of unit trusts in South Africa.

Gilbert and Strugnell (2010) investigated the effect of survivorship bias on the mean reversion of share returns on the JSE, in the period between 1984 and 2007. Their study included two datasets, namely one with only currently listed shares and another with both listed and unlisted shares. The effect of survivorship bias was confirmed to be "present and material" (Gilbert and Strugnell, 2010, p. 31.). The effects of mean reversion were found to be similar in the two datasets and confirming the patterns of mean reversion from earlier studies. It also found that returns were higher from portfolios of shares solely selected from current listings, again suggesting that lower performing shares are readily delisted.

2.3.2 Survivorship bias Globally

Looking at studies conducted in locations other than South Africa, Grinblatt and Titman (1989) investigated returns earned by mutual funds ("mutual funds" is the term used to describe unit trusts in the UK and US) in the United Kingdom between 1975 and 1984. Their study found the bias in return over a 10-year period between a sample with only surviving funds (157 funds) compared to a sample without subjection to survivorship bias (274 funds) over the sample period to be between 0.1% and 0.4% per year.

In a study on mutual funds in the United States of America, Malkiel (1995) studied the returns of all equity mutual funds between 1971 and 1991. Malkiel postulated that the more successful funds survive, allowing the returns of the surviving funds to overstate the success of the fund management. Underperforming mutual funds were merged with more successful funds. He found that, collectively, funds underperformed in comparison to benchmark portfolios and that survivorship bias was more evident than previously estimated, with a bias of 1.4% per year (over a 10-year period). Significant results were shown over a 15-year period, where the difference in average yearly return between surviving and all funds were found to be 4.2%. Malkiel (1995) noted that persistent performance was likely to be influenced by survivorship bias. Malkiel (1995) differed in his study from Grinblatt and Titman (1989), as he measured actual returns and not hypothetical returns.

A 1996 report from the United States conducted by Elton, Gruber and Blake (1996), examined the rate of fund disappearance and the associated impact on returns between 1976 and 1993. Their method differed from other studies previously conducted, as they used risk-adjusted returns in addition to raw returns. Two studies were completed on funds: one on funds smaller than $15 million and another on funds larger than $15 million, respectively. They found the bias to increase the longer the sample period. An interesting finding was made in this study regarding the survivorship bias and the effect thereof on the relevant fund size. When the biased performance of the largest and smallest funds was compared, little difference was found between the large and the small funds' performances (Elton et al., 1996). However, when the unbiased sample (i.e. taking into consideration all the closed funds) of both large and small funds were compared, the smaller funds performed much worse in comparison to the large funds (Elton et al., 1996). This conclusion was consistent with the fact that a larger percentage of small funds failed and that

funds that fail have poorer performance. The survivorship bias per annum was estimated to be between 0.71% and 0.77% per year over the 17-year period between 1976 and 1993 (Elton et al., 1996).

In another study by Carhart, Carpenter, Lynch and Musto (2002) on unit trusts in the United States, it was found that the average bias ranged from 0.07% for one-year samples and increased to 1% for samples longer than 15 years. The database in this study by Carhart et al., (2002) included all equity mutual funds between 1962 and 1995 in which they found the average annual fund attrition rate over this time period was found to be 3.6%. Their evidence also showed that funds were closed after consistently poor performance over multiple years Carhart et al., (2002). As found by Elton, Gruber and Blake (1996), Carhart et al., (2002) also found that the survivor bias increased with sample length.

Rohleder et al., (2011) attempted to evaluate and explain different methodologies for determining survivorship bias in fund performance on 4964 US domestic equity mutual funds between January 1993 and December 2006. As part of this research they found that smaller funds were more frequently closed after poor performance than larger funds and they confirmed previous studies' findings that non-surviving funds under-performed significantly. Underperforming funds shrank in size as outflows continued (Rohleder et al., 2011). When different weighting schemes were applied to calculating for an annual bias, equal-weighting yielded survivorship bias estimates five times higher than value-weighting, which resulted from non-survivors on average being smaller than surviving funds. The different methodologies yield a resulting survivorship bias of between 0.22% and 1.57% per year.

In a recent report by Hanke, Keswani, Quigley, and Zagonov (2018), the authors compared risk-adjusted and total returns of unit trusts from two of the United Kingdom's most widely used databases (Morningstar and S&P Micropal). Through their analysis, they found that the treatment of surviving and non-surviving funds were different when comparing information between the two databases mentioned above (Hanke et al., 2018). When they compared risk-adjusted and total returns of funds over a corresponding period, they concluded that fund performances were significantly different and the results were dependent on the choice of data source (Hanke et al., 2018). Therefore, an analyst or researcher conducting performance measurement of a similar set of unit trust data could get significantly different results when using two different databases. This should be of concern to any researcher as

conclusions collected from the data can be drawn into question, while comparisons between studies may be reliant on the database used.

The most recent SPIVA Europe scorecard released for mid-year 2019 indicated that many unit trusts across geographies do not survive for more than 10 years (Innes & Cairns, 2019). The 10-year survival rates of European equity and UK equity were 47.88% and 44.20% respectively.

From the above, although different methodologies were applied, survivorship bias was evident and should be a consideration when assessing the performance of unit trusts.

2.4 Unit trust performance in South Africa

Many studies in recent years have attempted to investigate the performance of unit trusts in South Africa. The following section will summarise several of them to provide context for this report.

In a study by Meyer (1998) on South African unit trust performance between 1985 and 1995, some persistence in performance was found, but it was more likely to be negative performance than positive. Minor differences were found in the results between nominal and risk-adjusted returns (Meyer, 1998). Another finding Meyer made in the study was that the results in the South African market mirrored those from a much larger market, like the USA. An interesting finding from the research was that the "repeat loser phenomenon" was stronger over shorter evaluation periods (one- and two-year periods) and the "repeat winner phenomenon" was stronger over the four-year period. When considering the sample period of this study, Meyer claimed that no funds were closed and therefore the dataset was not subject to survivorship bias (Meyer, 1998). This is in contrast with Pawley (2002), who found that survivorship bias to be present in South African unit trusts between 1976 and 2001, albeit during a similar but longer time period.

When assessing selected South African unit trusts over a five-year period between 1998 and 2002, Oldham and Kroeger (2005) found in their analysis of 20 unit trust funds no evidence that fund managers could provide their investors with above average growth. Performance was not measured by nominal returns, but by using the commonly used Arbitrage Pricing Theory (APT) and Capital Asset Pricing Model (CAPM), which relate unit trust returns to portfolio risk and the overall share market premium (Oldham and Kroeger, 2005). The study found that only four funds

managed to beat the market (in this case the JSE all-share index), while six achieved a negative performance in comparison to the market's performance.

An empirical study on unit trust performance in South Africa between 1965 and 2005 was completed by Wolmarans and Meyer-Pretorius (2006). Over this time period, the industry grew from one fund in 1965, to 567 in 2005 with a value of R345 billion. The authors found that the average nominal annual return of unit trusts, compared to the JSE all share index, to be approximately 1.5% higher over the time period studied. However, when costs and fees were taken into consideration, the return dropped to approximately 5.5% lower than the index. It was noted in this study that during the 25 years from 1965 to 1990, only one fund closed, while 111 funds closed between 1990 and 2005 (Wolmarans and Meyer-Pretorius, 2006).

In light of the poor performance of unit trusts in South Africa in the past, Muller and Ward (2011) found in their study that fund managers take less active positions (i.e. they are more likely to reduce their risk and simulate the index). The trend was shown to be quite clear; in 1988 the level of "active share" was 50.5%, reducing to 15% in 2001 and then remaining constant at this level, until it dropped to 13.8% in 2010 (Muller and Ward, 2011). Additionally, no relationship was found between the percentage of active share and a fund's risk-adjusted return, drawing into question the fund-picking abilities of fund managers. The abilities of fund managers to pick stocks while simultaneously charging high fees were therefore questioned in this study (Muller and Ward, 2011). The authors of the study also observed that certain index-tracking funds regularly outperformed 80% of the domestic general equity funds over five-year periods.

In a thesis completed in 2012 as partial fulfilment of a Master's in Commerce at the University of Witwatersrand, a study was conducted to determine whether unit trusts achieve superior and consistently superior performance (Nana, 2012). The study applied six performance measures to 151 South African equity unit trusts existing in the 10-year period from 2001 to 2010. While this dataset was also subject to survivorship bias, as failed unit trusts were not included in the analysis, it could not find sufficient evidence that South African domestic equity unit trusts outperformed the market (Nana, 2012).

More studies on the performance of unit trusts in South Africa have been completed since 2015. The risk-adjusted performance of South African equity unit trust

managers between 2002 and 2012 was explored by Malefo, Hsieh and Hodnett (2016). This study revealed that on average, and consistent with previous reports, most equity unit trust managers underperform the market, even when not correcting for survivorship bias. If they had corrected for survivorship bias, the calculated performances would most likely have been even poorer.

A performance evaluation study was done in 2017 of 191 equity unit trusts in South Africa between 2006 and 2016 (Thobejane, Simo-Kengne, and Muteba Mwamba, 2017). The study found poor evidence of stock selection, market timing ability and performance persistence. The dataset in this research paper included all unit trusts that were in operation since the start of the sample period and is therefore free of survivorship bias.

A recent study by Coetzee et al., (2018) reported similar findings. No evidence was found of superior returns when assessing 114 equity funds between 2008 and 2015. The authors also found that the cost of active management was expensive, when considering the negative performance relative to the chosen benchmark (Coetzee et al., 2018). No mention was made of survivorship bias; therefore, it was assumed that only funds that survived from the start to the end of the sample period were included in the study, which subjects the research findings to survivorship bias.

The abovementioned findings from previous studies on performance of unit trusts in South Africa makes a strong case that active management does not perform better than the appropriate market benchmark. It is shown that the fees charged for active management eat into returns, and that fund managers rarely pick winners over losers on the all share index. Many of these studies do not consider survivorship bias, which should in fact further reduce the findings of performance measurement.

From the previously published literature it is evident that no research has been done on unit trust failure, specifically taking into account survivorship bias in the past 12 years in South Africa. These years have been recognised by significant economic and political events globally and in South Africa, such as the global financial crisis of 2008, the sacking of Nhlanhla Nene in 2015 and the Steinhoff collapse in 2017. All these events had a significant impact on the JSE and consequently on the investments and savings of many South Africans who had invested in unit trusts.

During this period, the South African economy has also been in two technical recessions (characterised by two consecutive quarters of negative growth in gross

domestic product) in 2009 and again in 2018. All these events had significant consequences for investors during this period.

Trends in the South African unit trust market indicate that more index-tracking funds are entering the market (Cairns, 2019a). Managers have also been taking fewer active positions as a portion of unit trusts on the JSE (Muller and Ward, 2011). In South Africa, both active and passive funds grew in number between 2009 and 2017 but in 2018, only passive funds grew in number, while the number of active funds declined (Cairns, 2019a). Passive funds also reported higher inflows in 2018 compared to 2017, while inflows for active funds declined (ASISA, 2019a).

This trend may be indicative of investors becoming more dissatisfied with their returns from managed funds and are seeking a low-cost and lower-risk investment that will guarantee well diversified assets with a positive return. This trend will likely affect unit trust providers, as their products are not performing well relative to the JSE and there is a large variety of unit trust funds to choose from. Equity portfolios must perform within the top quintile to attract significant flows (Arendse et al., 2018), which will most likely lead to consolidation (the total number of funds will reduce) in the industry.

2.5 The Collective Investment Scheme (CIS) industry in South Africa

The following section aims to provide the reader with an overall view of the structure of the CIS industry in South Africa, to better understand the prevailing classifications, rules and guidelines followed by stakeholders.

2.5.1 Legal Framework

Unit trusts in South Africa are regulated by the Financial Sector Conduct Authority (FSCA), previously known as the Financial Services Board (FSB). Unit trusts were the first type of CIS offered to investors in South Africa. The regulation surrounding CIS governs the working of the industry, which will be briefly outlined below.

Every new CIS must be registered with the FSCA in terms of the Collective Investment Schemes Control Act 45 of 2002 (CISCA) (Republic of South Africa, 2002a) and must comply with the provisions of the Act. The Act regulates the administration, management and transfer of collective investment schemes. This Act replaced the previous Unit Trust Control Act of 1965. CISCA places certain restrictions on unit trusts, such as how much the unit trust may invest in unlisted

companies and how much weighting certain shares may have in a portfolio. Managers are also not allowed to borrow money to invest in the market, or to short the market.

Any investment manager must be registered with the FSCA in terms of the Financial Advisory and Intermediary Services Act 37 of 2002 (FAIS) (Republic of South Africa, 2002b) in order to manage an investment on behalf of investors.

There are three separate bodies which are involved in the operation of a unit trust. These are the Manco, the trustee and the investors, and are described below:

- The Manco is a separate legal entity that acts on behalf of unit holders. The Manco is responsible for all matters regarding the management of the fund including marketing, keeping records, administration and making investment decisions. The Manco charges a fee for these services as stipulated in the trust deed (to be discussed below);
- The trustees act as an independent arbiter. Every unit trust is required to have a separate institution fulfil this role. The trustees will act as a safeguard against potential mismanagement by the Manco. They have a responsibility towards investors; and
- The investors are the individuals who invest their money into unit trusts and who expect a reasonable return. The fund itself is not a separate legal entity and cannot be declared insolvent.

The trust deed is the main governing document of a unit trust that outlines the relationship between the trustee and the Manco and falls under the authority of the registrar of the FSCA. The registrar has the authority to inspect the work of the trustees and the Manco. The trust deed also sets the mandate of the fund like the investment philosophy (where and in which instruments the fund will invest in), the risk level and the fees to be charged by the manager. This mandate is a legal agreement required by law whereas the ASISA classification (to be discussed below) is an industry guideline that members follow.

Once the trust deed has been effected, the unit trust comes into operation when the Manco deposits assets with the trustee. The Manco can now create units and start selling them to investors. All assets in the trust are held in the trustee's name. The trustees also ensure that the mandate of the fund is adhered to and if they suspect this not to be the case, the trustees have the power to replace the manager.

The investors in a unit trust become holders of a unit/units, similar to how someone would own shares in a listed company. The manager then invests the investor's money into listed equity, bonds, property, money markets etc. as prescribed by the deed on behalf of the investor. The investor therefore owns these assets albeit in an indirect manner. Unit trusts are open-ended, meaning that new units are created by the Manco on a continual basis unlike a listed company with a fixed number of shares in issue. Fund managers can also decide to close the fund to new investors. If investors sell units held in a unit trust on a large scale, the Manco will need to sell assets in order to be able to pay investors out.

The value of each unit is determined by the value of the portfolio (the pool of funds) divided by the number of units in issue. All unit prices are calculated daily. All income that is generated through interest, dividends or other fees are paid out the investor or reinvested into the fund, according to the wishes of the investor.

Fund managers are required by the FSCA to supply fund factsheets, or minimum disclosure documents (MDDs). These documents are intended to increase transparency and to provide investors with the necessary information when considering an investment product. The requirements for MDDs are as outlined in the rules and regulations of CISCA, published in the Government Gazette as Board Notice 92 of 2014 (Republic of South Africa, 2002a). MDDs for all unit trusts are publicly available and ought to comply with the requirements set out by the FSCA, as stipulated below:

- Each portfolio under the name of the Manco must have its own MDD, including 3rd-party managed funds;
- Characteristics of the portfolio in terms of nature and risk;
- Must be updated quarterly;
- Discloses:
    - portfolio name and registration number;
    - investment objective as determined by the deed;
    - the risk reward profile;
    - portfolio benchmark;
    - fees and charges;
    - portfolio launch date;
    - portfolio classification;
    - portfolio size;

    - distribution dates;
    - performance;
    - name of the manager and the trustee with their contact details;
    - portfolio valuation;
    - asset allocation;
    - additional mandatory disclosures (i.e. past performance is not an indicator of future performance etc.);
    - prices; and
    - where to get more information on the investment.
- Must not contain technical jargon, must be readable and not longer than four A4 pages.

2.5.2 The Association for Savings and Investment (ASISA)

ASISA is a non-profit organisation and industry body that assists the FSCA in regulating the investment industry. They represent the interests of its members whom manage approximately R6.2 trillion worth of investments. ASISA allows its 130 members access to the government negotiating table, where they can pro-actively engage on policy, regulation and other important issues. Members of ASISA provide the following products to their clients (ASISA, 2019b):

- Pension and provident funds;
- Retirement annuities;
- Endowment policies;
- Unit trusts, exchange traded funds (ETFs), hedge funds; and
- Risk protection policies.

The R6.2 trillion assets under management within the financial sector consists of (ASISA, 2019b):

- R2,175 billion in unit trust savings;
- R2,816 billion in life offices; and
- R1,224 billion in retirement savings.

This R6.2 trillion worth of investment is subsequently invested into (ASISA), 2019b):

- R958 billion placed with banks;
- R775 billion in government bonds, local government and state-owned entities;
- R1,062 billion in fixed interest;

- R3,317 billion in equities (listed and unlisted); and
- R93 billion in fixed property.

The assets shown above belong to ordinary South Africans, which is collected by the financial services sector into productive enterprises that create wealth and contribute to the national economy. This cycle, in turn, creates additional employment and effectively more savings. The role that savings play in the economy is thus very important. Managers need to strike the balance between providing safe investments while providing a sensible risk-adjusted return. Of the total R6.2 trillion assets under management, approximately R2,175 billion is invested in unit trusts (ASISA, 2019c).

2.5.3 Fund Classification

ASISA provides a classification system which describes and categorises the different funds based on the mandate of the investment product. The goal is to group similar unit trusts together which will promote awareness and assist with comparison and assessment of unit trusts. The classification is listed below with a brief description of each (ASISA, 2018):

1. First tier of classification:
    a. South African portfolios – 60% of portfolios must be invested in South Africa markets.
    b. Worldwide portfolios – these invest in both South African and foreign markets with no limits set for domestic or foreign assets.
    c. Global portfolios – at least 80% of portfolios must be invested outside of South Africa.
    d. Regional portfolios – at least 80% exposure to a specific country or region outside of South Africa.
2. Second tier of classification (with subcategories within each):
    a. Equity portfolios – general, large cap, mid & small cap, resource, financial, industrial unclassified, general Africa;
    b. Multi-asset portfolios – flexible, high equity, medium equity, low equity, income, target date;
    c. Interest-bearing portfolios – variable term, short term, money market
    d. Real estate portfolios - general

A table representing the classification is shown in Table 2-1 below.

Table 2-1 - ASISA Fund Classifications (ASISA, n.d.)

Tier 1 - Geographic	Tier 2 – Asset type	Tier 3 - Category
South Africa	Equity	General, Large cap, Mid & small cap, Resources, Industrial, Financial, Unclassified
	Multi-asset	Income, Low equity, Medium equity, High equity, Flexible, Target date
	Real estate	General
	Interest bearing	Variable term, Short term, Money market
Worldwide	Equity	General, Unclassified
	Multi-asset	Flexible
	Interest bearing	Variable term, Short term
Global	Equity	General, Unclassified
	Multi-asset	Income, Low equity, Medium equity, High equity, Flexible
	Interest bearing	Variable term, Short term
	Real estate	General
Regional	Equity	General, Africa, Unclassified
	Multi-asset	Flexible
	Interest bearing	Variable term, Short term
	Real estate	General

Within the categories stated above, there are different types of unit trust funds:

- **Funds of funds** – these are unit trust funds that only invest in other funds, in either the Manco's own range of funds (internal) or another Manco's funds (external).

- **Multi-managed funds** – these are a type of fund of fund, with the aim of combining the investment styles of different fund managers into one product. The managers are selected based on their strength in a specific area.
- **Index or tracker funds** – these funds are mathematically setup to replicate a chosen index. There fees are lower but theoretically they cannot outperform the index.
- **Feeder funds** – a fund that is rand-based that feeds into an offshore version of that fund. These funds enable exposure to foreign investments.
- **Shari'ah funds** – funds that are structured in compliance with Islamic law.
- **White label funds** – when a 3rd party does not have a Manco license of its own and registers its own portfolio in the name of another Manco.
- **Institutional funds** – funds that are tailored to meet the needs of a bulk investor, with the units not held in the name of the individual investor but in the legal entity. These include pension funds, provident funds, retirement funds etc.
- **Active funds** – Fund managers actively selecting and picking stocks based on technical analysis, skills and resources to achieve returns superior to the index.

In terms of the ASISA Fund Classification Standard, fund names must reflect the nature of the fund in the name:

- Fund of funds must have the words "fund of funds" in their names.
- Index portfolios must have the word "index" or "tracker" in their names.
- Money market portfolios must have the words "money market" in their names.
- Feeder portfolios must have the words "feeder fund" in their names.
- White-label funds must have the name of the Manco and the fund manager in its name.
- Portfolios may only use the word "institutional" in their names if they are only available to retirement funds, provident funds etc. and not individual investors.

It is important to note is that within a single unit trust, multiple classes can exist. These classes differentiate between fees being paid by the investor, so, although the investment product and the mandate is the same, the net return in each class will be slightly different net of fees. Different classes allow fund managers to charge different fees to bulk buyers like for example pension funds, who might enjoy the benefit of a

reduced fee. The same fund can have multiple classes, most likely labelled A, B, C, I or R (but can be any letter or code).

2.5.4 Codes, Standards and Guidelines

As stated above, CISCA regulates the management and operation of collective investment schemes in South Africa. Board Notice 92 of 2014 of CISCA dealt with the disclosure aspect of collective investment schemes. These included regulation for advertising, marketing and information disclosure and is today relevant for fund managers and financial advisors to ensure that customers receive consistent and fair information.

The FSCA has also set in motion the Treating Customers Fairly (TCF) framework (FSCA, n.d.). This framework intends to govern the way a business conducts dealing with its clients, through all stages of the product lifecycle i.e. from promotion to servicing. There are six TCF outcomes that regulated entities are expected to deliver on, these are (FSCA, n.d.):

1. Customers can be confident they are dealing with firms where TCF is central to the corporate culture.
2. Products and services marketed and sold in the retail market are designed to meet the needs of the identified customer groups and are targeted accordingly.
3. Customers are provided with clear information and kept appropriately informed before, during and after point of sale.
4. Where advice is given, it is suitable and takes account of customer circumstance.
5. Products perform as firms have led customers to expect, and service is of an acceptable standard and as they have been led to expect.
6. Customers do not face unreasonable post-sale barriers imposed by firms to change product, switch providers, submit a claim or make a complaint.

In addition to FAIS, CISCA and TCF, ASISA has a set of codes, standards and guidelines that its members are expected to abide by. This is complementary to regulatory framework already in place and therefore compliance is voluntary. ASISA considers many of these codes to be industry best practice. The codes, standards and guidelines as defined by ASISA are found on their website (www.asisa.org.za) and are listed below:

- **Codes**
    - Global Forex Code of Conduct
    - The Code for Responsible Investing in South Africa
- **Standards**
    - The listed standards include multiple documents on the calculation of costs, expenses, expense ratios, net asset value (NAV), fund classification, reporting templates etc.
- **Guidelines**
    - These include guidelines on tax-free savings account transfers, trading policies, transaction cost methodologies, valuations and operations.

2.5.5 Relevance to research

As part of FSCA and CISCA regulations, fund managers are required to disclose to their investors if there are planned amendments the deed / mandate of the fund, in the event of fund closure or when a merger of funds are to take place. In these instances, a ballot will be sent whereby investors are able to vote on such amendments, fund closures or amalgamation of funds.

There has been established a process for disclosing internally to investors who have “skin in the game”, in the event of fund closure or merger. It is noted that the industry subscribes to and expects its members to adhere to a strict code of conduct and high level of transparency.

2.6 Conclusion

Given the prevalence of survivorship bias in the unit trust industry as indicated by the literature, this study will address the gap in the South African literature by analysing the problem over a new time period, with a larger number of unit trusts. As indicated by previous studies in the review of literature, most unit trusts do not outperform their indexes while many do not outperform passive funds such as index trackers. The presence of closed unit trusts and the associated bias will likely indicate that performance is even worse than reported.

Should there be bias found in this study, the question arises: Should member associations and/or the regulator consider asking management companies and/or fund managers to disclose the performance and number of closed funds under their

responsibility? Is it truthful of fund managers to claim that they have achieved a certain return when in fact this excludes closed funds that were under their management?

This study will use a larger sample than the previous analysis done by Pawley (2006), by including all categories of the ASISA unit trust classification.

The answers to the questions stated above will provide valuable information to investors, fund managers, financial advisors, member associations and regulators regarding the survivorship bias inherent in the performance of unit trusts.

3 Research Questions

The purpose of the research was to contribute to the existing knowledge on unit trust closure in South Africa, specifically relating to the number of funds closed, its rate of failure and the resultant survivorship bias occurring as a result. The study will cover all the ASISA categories and over the most recent ten and a half-year period. The study also describes the extent of fund closures across the different categories, by fund size and by Manco.

Based on the literature review, the purpose stated above and the data available for analysis, the following research questions were asked:

3.1 Research question 1

How many unit trusts have been liquidated and merged between 2009 and 2019?

3.2 Research question 2

What is the failure rate of unit trusts from 2009 to 2019?

3.3 Research question 3

What is the survivorship bias within the unit trust industry?

4 Research Methodology

4.1 Research design

The purpose of the research was to describe selected phenomena that occurs within the unit trust industry over a time period of 10 years and six months, from January 2009 to June 2019. Therefore, this is a quantitative, longitudinal, descriptive study, primarily by analysis of secondary data. The methods used in descriptive studies include analysis of secondary data (Saunders & Lewis, 2012), which aligns with the objectives of this research. The financial data associated with unit trust performance necessitated the quantitative nature of the research.

The research followed the positivist philosophy. The nature of the research occurred by measuring observable facts and generating useful and reliable data (Saunders & Lewis, 2012). The result yielded information based on observable fact and remedies (Saunders & Lewis, 2012). Positivism will therefore be the most appropriate research philosophy for the purposes of this report.

The data that will be accessed for the purpose of research is historical time-series data available on electronic data vendor databases which will allow a view of past events and subsequent changes during the sample period (Saunders & Lewis, 2012).

The concept of survivorship bias studied in the research had already been defined and did not develop during the study. Rather, the presence of the concept of survivorship bias was described in the South African unit trust industry over a period not described in the literature before.

Previous studies conducted on survivorship bias in unit trusts differed in their empirical designs (Rohleder et al., 2011). Studies differed in their definition of surviving funds and used different weighting schemes which had implications for the results obtained.

To define surviving funds, previous studies used either funds that survived throughout the entire period from start to finish (full-data conditioning) like Grinblatt and Titman (1989) and Elton et al. (1996), or funds that existed at the end of the sample period (end-of-sample conditioning) like Carhart et al., (2002) and Pawley (2006). Malkiel (1995) considered both definitions.

Weighting of individual fund returns were a choice of size-weighting or equal-weighting. Most studies, including the previous report in South Africa by Pawley (2006) used equal-weighted returns (Rohleder et al., 2011). Malkiel (1995) used size-weighted in his analysis.

This study used end-of-sample conditioning and compared equal- and size-weighted returns. The methodology for each question is described in detail below.

4.2 Unit of analysis

The units of analysis were all unit trusts as classified by ASISA that existed or ceased to exist over the sample period, which includes funds that were liquidated or merged. For the purpose of the research, liquidated and merged funds will be referred to collectively as closed funds.

4.3 Population

The population consisted of all unit trust funds as defined by the ASISA fund classification. These include all unit trusts in the Tier 1 category, namely South Africa, Worldwide, Global and Regional. Even though the South Africa category dominates in terms of size and number of unit trusts, closures of unit trust occurred in all four categories. The population included all funds that existed or ceased to exist over the sample period.

All ASISA categories of unit trusts were included for the following reasons:

1. All categories are available for individuals to invest in, whether directly or indirectly; and
2. Manco's have unit trusts in many different categories and not necessarily in single categories, therefore excluding smaller funds or categories would exclude a portion of funds managed by Manco's and possibly yield inaccurate results.

This analysis therefore included the entire available investable unit trust universe present in South Africa.

4.4 Time horizon

The time horizon for the study stretched from 1 January 2009 to 30 June 2019. This resulted in a total of 126 months' worth of data. The sample period covered this specific range as the Morningstar dataset only started to retain the performance

history of closed unit trusts in the South African industry in 2009. Any data provided before January 2009 did not include closed funds and therefore was not useful for the purpose of this study.

4.5 Fund selection and inclusion criteria

All surviving and non-surviving unit trust funds that were in the Morningstar database were included in the analysis. Surviving funds were characterised as being in existence at the end of the sample period (end-of-sample conditioning). Non-surviving funds were defined as funds that existed at some point within the sample period and had been closed. Using full-data conditioning as a definition of surviving funds (defined as funds that survived throughout the entire period) would have excluded a large portion of funds in existence at the end of the dataset.

The dataset contained information of all unit trust funds from all ASISA categories and included institutional and retail funds. Data was sourced from the Morningstar database which included monthly comprehensive fund size, cumulative return, net flow and net class assets.

The data was provided not for each fund individually, but for all current classes within the fund. To answer question 1 and 2, funds with multiple share classes were consolidated into its single code to analyse closure and failure rates across categories and Mancos. For question 3, returns were calculated across classes. Due to the different fees paid for different classes within a fund resulting in slightly different net returns for each class, return per fund was weighted according to each class's reported monthly cumulative return and net class assets.

To deem a fund as either liquidated or merged, all the classes within the fund must have been liquidated or merged, meaning that the entire fund has ceased to exist on its own. There were examples within the dataset where only certain classes within the fund had been merged or liquidated. In these cases, the remaining classes of the original fund had remained, and the fund was deemed to be in existence.

Classes within funds had been merged and liquidated at different times. The fund was considered to be in existence until the last remaining class had been liquidated or merged. The entire fund was classified as closed when all classes have been merged and / or liquidated. It was then classified according to what happened to its last remaining class (merged or liquidated) and the date at which it occurred. Only when the entire fund was liquidated, or when the last remaining class was liquidated

later than another class, was the considered liquidated. In either case, the entire original fund ceased to exist and is considered here in analysis of survivorship bias.

Merged and liquidated funds were considered as closed funds. In both these cases, the record of the previous fund ceased to exist, whether by merger or liquidation, and a survivorship bias was present.

4.6 Data analysis

4.6.1 Research Question 1

How many unit trust funds have been liquidated and merged between 2009 and 2019?

The number of unit trust that have closed throughout the sample period was analysed on a yearly basis, for each year until the end of the period. As described above, liquidations and mergers were considered as closed funds when the entire fund has ceased to exist. New funds added were considered and allowed for a net number of funds to be calculated on a yearly basis.

The number of fund closures was also analysed by:

- ASISA categories – the number provided gave an indication of where most closures occur;
- Manco – the result gave an indication of how many funds were closed by all Manco's. Additionally, the number was expressed as a percentage of total funds managed during the period. The average age of all funds managed over the time period were expressed in months (maximum period is 126 months); and
- Fund size – due to the fluctuating nature of fund size over a fund's lifetime, its size was determined at each individual fund's largest size achieved over its lifetime. Funds were then divided into four quartiles according to this fund size, to determine the number of funds closed based on its relative size.

A final analysis was completed that described the funds that would eventually close before the end of the sample period, as a percentage of total industry size. This result gave an indication as to the size of funds that would eventually close as a percentage of the total industry size at a given point in time.

No previous research in South Africa on unit trust closure has detailed the number of funds closed per category and by fund manager.

4.6.2 Research Question 2

What is the failure rate of unit trusts from 2009 to 2019?

All funds that existed in all categories every month throughout the period was calculated, with a result for each of the 126 months. Analysis was then completed to determine whether these funds was still in existence 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 years later, for a result over ten time periods. The average annual failure rates were then calculated for each time period. This methodology is consistent with Pawley (2006).

The number of observations for each period declines as less data is available and the end of the sample period draws nearer. For example, the 10-year failure rate calculation has only 6 months' worth of data was available to analyse. Failure rates was calculated according to size quartiles defined in question 1.

4.6.3 Research Question 3

What is the survivorship bias within the South African unit trust fund industry?

To determine the extent of survivorship bias over the sample period, the difference between the return of funds that existed at the end of the sample period (the biased sample) was compared to the return of all funds that existed over the same period (the unbiased sample), therefore inclusive of all closed funds that existed at some point over the sample period.

This analysis included the entire sample and not divided into ASISA categories. Returns calculated were geometric means. For question 3 the sample period stretched from 2010 to 2019. The returns were compared to the total return of the JSE All Share Index for each time period.

The average annualised returns of all funds that existed at the end of the sample period was calculated. This was the biased sample, as it excluded all funds that were closed over the sample period. Then the average annualised returns were calculated for all funds that existed throughout the sample period. The difference in return indicated the survivorship bias when comparing surviving funds with all funds.

This analysis was completed according to equal-weighting and size-weighting. The average annualised rates of return were calculated for 3-, 5- and 10-year periods from the start of the period. The 5-year average annualised rate of return was also calculated for the second half of the sample period, due to the considerable difference in performance the JSE recorded over the second five years of the sample period versus the first five years.

The average annual rates of return of the biased and unbiased sample were also calculated for each year of the period, to compare yearly biases. For the six-month period in 2019, returns were calculated according to year to date information.

Both weighting methods of size-weighting and equal-weighting was used to compare the results given the considerable differences the choice of method has made in previous studies, as per Rohleder et al., (2011). As described in the literature review, Rohleder et al., (2011) found that equal-weighting resulted in a bias estimate five times higher than size-weighting. In this analysis, equal-weighting and size-weighting calculations was used to compare methodological differences.

The third analysis determined the bias by ASISA categories, broken down into institutional and non-institutional funds and using equal- and size-weighting. The bias calculated was the difference between the average annualised biased and unbiased return over the sample period.

The final analysis documented the bias for each Manco in the sample. As above the bias was the difference between the average annualised biased and unbiased return over the sample period. Mancos that did not exist anymore at the end of the sample period was excluded from this analysis.

4.7 Data reliability

A caveat necessary for consideration is that information from different sources tend to be inconsistent. ASISA provides statistics on a quarterly basis on fund prices, fund statistics (i.e. fund flows and sizes) and a list of currently existing unit trusts. However, ASISA is not a professional market data and information provider. There were some inconsistencies in the data between ASISA and Morningstar; attempts to consolidate a dataset of this size would not be efficient. Due to the Morningstar's credibility and history as a provider of unit trust data globally and in South Africa, the dataset provided by Morningstar was used for analysis and as the single source of truth.

The data was deemed to be reliable and credible as Morningstar is one the most well-known and widely used market data providers to the financial services industry, which includes investment firms, financial advisors, banks and researchers globally. Morningstar is a NASDAQ listed firm with operations in 27 countries.

4.8 Limitations

The limitations of the study are listed below:

1. This study did not describe relationships between survivorship bias, fund failure rates, fund performance and market performance. It aimed to provide an empirical result that would give an indication as to the closure of unit trusts and the resultant survivorship bias;
2. The study did not explore reasons for fund closures;
3. The time-period stretched only 10.5 years whereby previous studies were able to analyse on average 20 years of data;
4. Analysis on failure and survivorship bias were done down to Manco level, and not to the individual fund managers. Many Manco's manage their own funds, but funds under their license are managed by 3rd party (or white-label) fund managers. No analysis was done on fund manager level.

5 Results

5.1 Research Question 1

Over the course of the sample period a total of 1953 funds existed of which a total of 509 funds were closed (either liquidated or merged), leading to 1444 in existence in June 2019. This related to a total of 5775 fund classes within the 1953 funds. Of these classes, 1473 were liquidated or merged although not all as part of an entire fund closure. 1123 of these classes were closed over this time period.

At the start of January 2009 736 funds were existence. Of these 736 funds, 488 existed throughout the entire period and 248 were closed before June 2019. A total of 1217 new funds were launched over the sample period of which 261 were closed before June 2019.

Table 5-1 Descriptive statistics

Date	Description	Number	Closures
Entire period	Funds in existence	1953	509
	Classes in existence	5775	1123
January 2009	Opening number of funds	736	248
Entire period	New funds launched	1217	261
June 2019	Funds at end of period	1444	
Entire period	Funds that survived from start to end of period	488	

The number of funds that were closed by liquidation and merger is shown in the Table 5-2 and Figure 5-1 below. Additional information on the number of new funds added per year is also shown, with the net amount of funds indicated. It must be noted that the 2019 data only includes information up until June 2019, and the net number of funds in 2009 includes the 736 that existed at the start of the period.

The non-existent category existed until the end of 2012 before new classification standards were implemented by ASISA.

Table 5-2 New funds and closed funds by year in all categories

Year	Liquidated	Merged	Closed[1]	New	Net Funds
Opening number of funds					736[2]
2009	4	0	4	115	847
2010	14	19	33	60	874
2011	20	28	48	68	894
2012	28	40	68	79	905
2013	19	34	53	106	958
2014	13	14	27	129	1060
2015	20	12	32	177	1205
2016	17	9	26	199	1378
2017	46	40	86	133	1425
2018	59	28	87	110	1448
2019	36	9	45	41	1444
Total	**276**	**233**	**509**	**1217**	**1444**

1 Closed is the sum of liquidated and merged funds

2 Net funds include 736 funds in existence at start of period

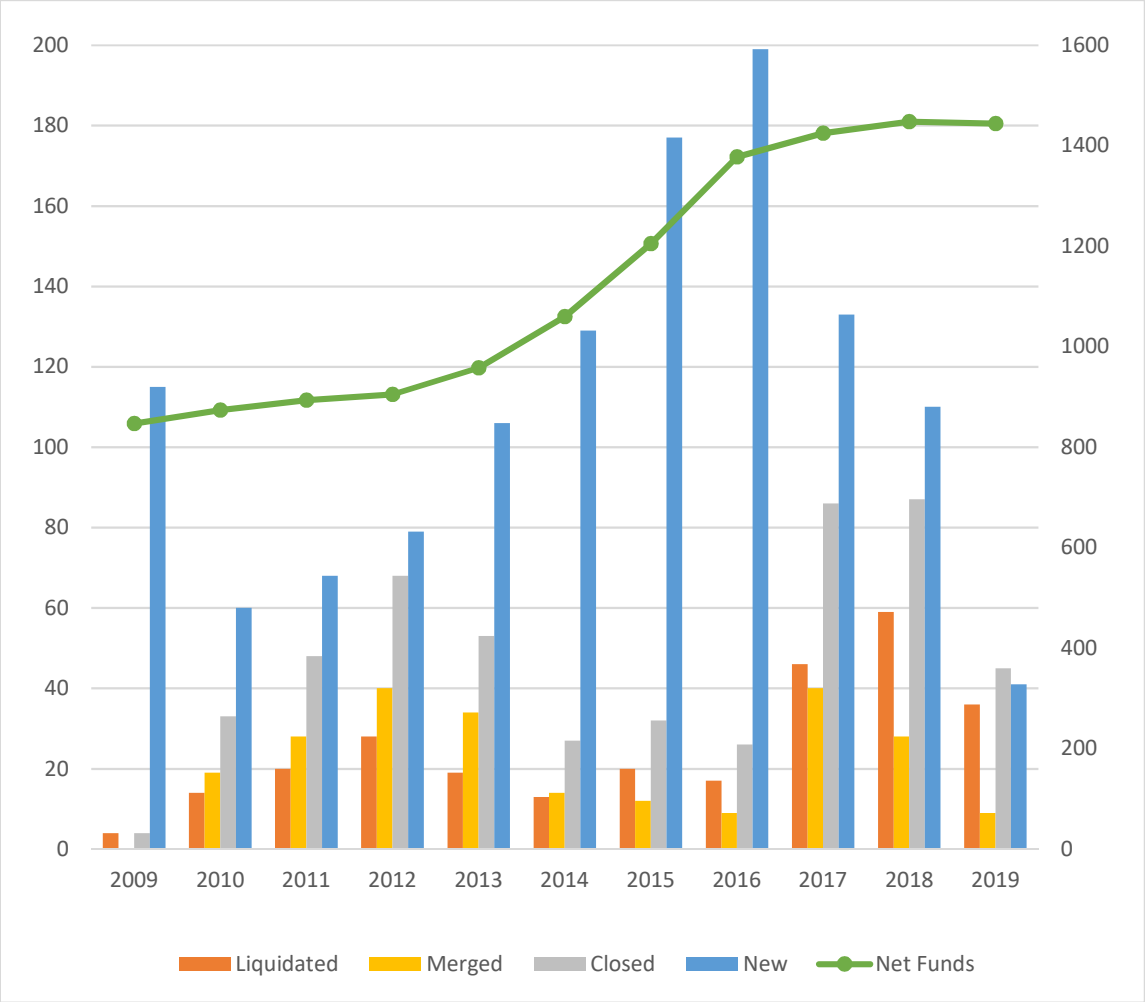

Figure 5-1 New funds and closed funds by year for all categories

5.1.1 Breakdown by ASISA Category

The number of funds closed every year by the Tier 1 categories is shown in Table 5-3 and Figure 5-2 below.

Table 5-3 Fund closures by Tier 1 Category (2009 - 2019)

Year	South Africa	World-wide	Global	Regional	Non-existent[1]	Total
2009	3				1	4
2010	27	1	3		2	33
2011	30	1	8		9	48
2012	39	2	9	2	16	68
2013	44	3	4	2		53
2014	23	1	3			27
2015	28		3	1		32
2016	22	2	2			26
2017	77	2	6	1		86
2018	76	2	7	2		87
2019	36	2	6	1		45
Total	**405**	**16**	**51**	**9**	**28**	**509**

1 The non-existent category existed before new classification standards were released by ASISA

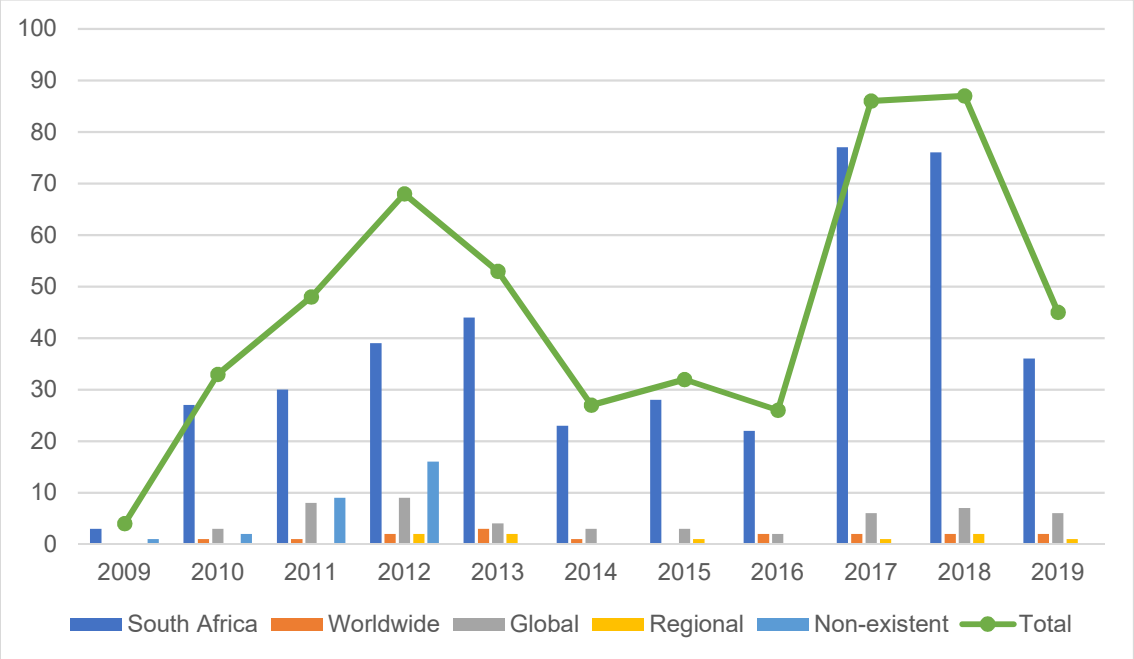

Figure 5-2 Fund closures in all categories per year (2009 - 2019)

The number of funds closed every year in the South African category is shown in Table 5-4 and Figure 5-3 below.

Table 5-4 Fund closures by the South African category (2009 - 2019)

Year	Equity	Multi-asset	Interest bearing	Real estate	Total
2009	1	2			3
2010	6	16	3	2	27
2011	10	18	1	1	30
2012	9	27	2	1	39
2013	6	37	1		44
2014	13	6	3	1	23
2015	10	17	1		28
2016	4	15	3		22
2017	21	50	4	2	77
2018	22	52	1	1	76
2019	16	13	5	2	36
Total	**118**	**253**	**24**	**10**	**405**

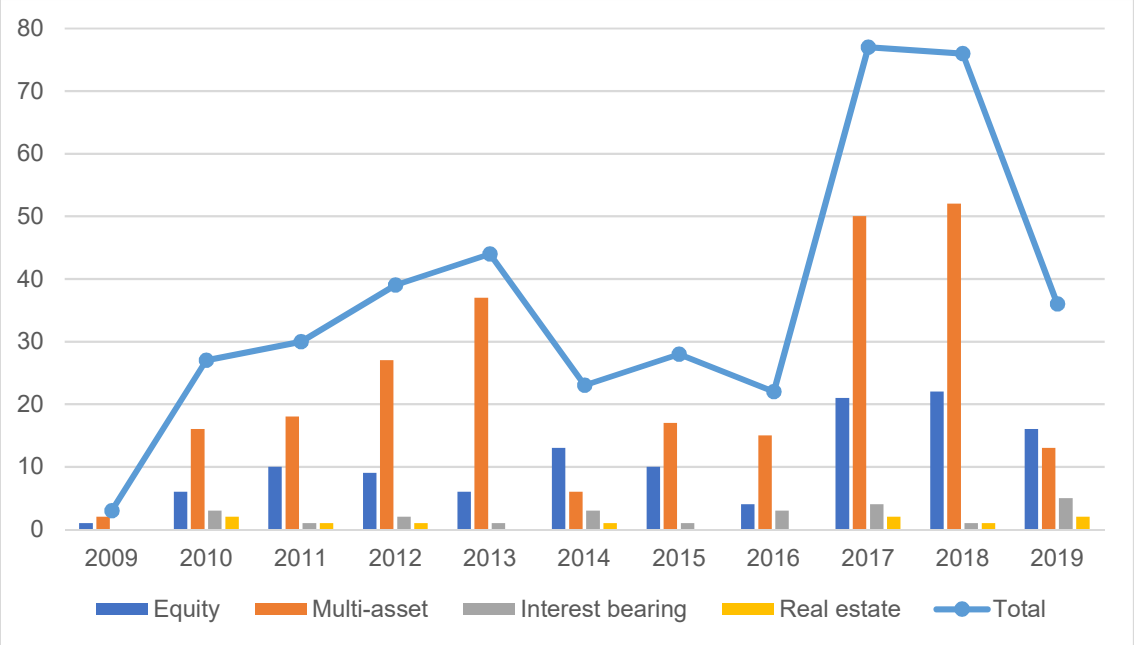

Figure 5-3 Fund closures by the South African category per month (2009 - 2019)

A breakdown of the number of closed, new and net funds in the South African category is shown in

Table 5-5 and Figure 5-4 below.

Table 5-5 Closed and net funds in the South African category by year

Year	Liquidated	Merged	Closed[1]	New	Net Funds
Opening number of funds					589[2]
2009	3		3	90	676
2010	10	17	27	56	705
2011	13	17	30	61	736
2012	18	21	39	70	767
2013	15	29	44	80	803
2014	11	12	23	106	886
2015	18	10	28	134	992
2016	14	8	22	146	1116
2017	37	40	77	103	1142
2018	51	25	76	84	1150
2019	28	8	36	31	1145
Total	**218**	**187**	**405**	**961**	**1145**

1 Closed is the sum of liquidated and merged funds

2 Net funds include 589 funds in existence at start of period

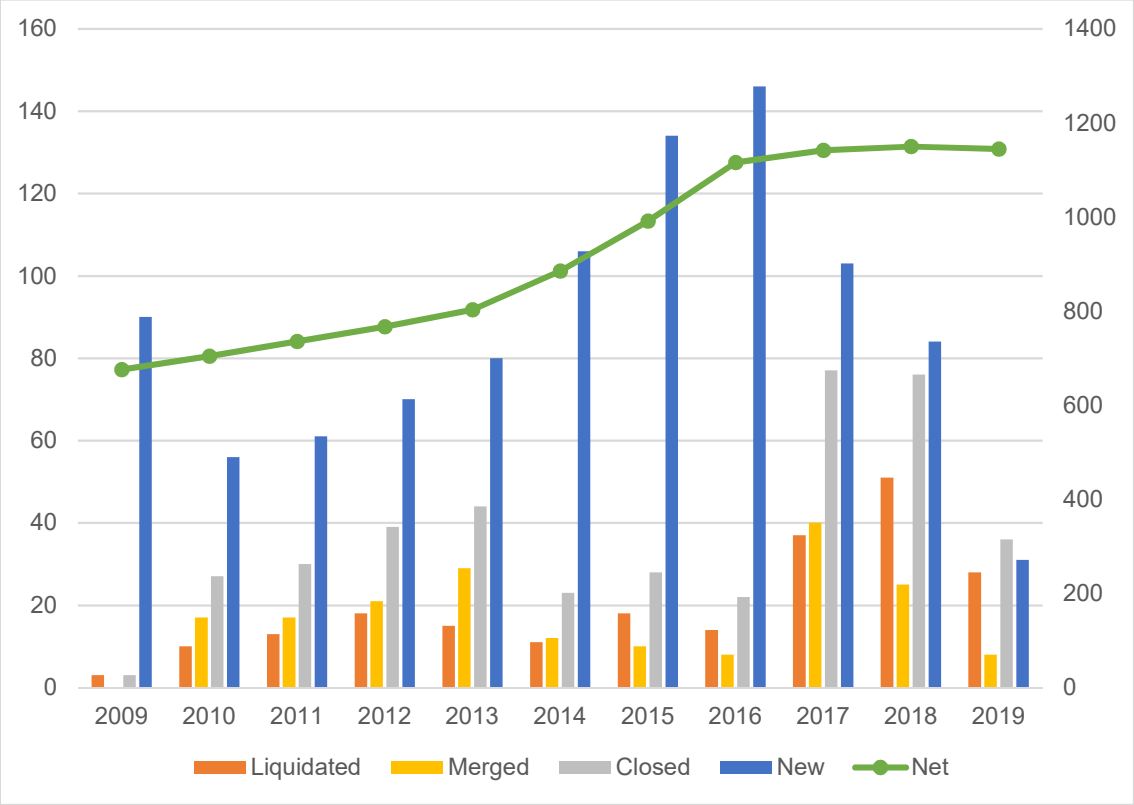

Figure 5-4 New and closed funds per year in the South African category

In the next tables, the size of all the funds in December at the end of each year from 2009 to 2018 is indicated, firstly for all Tier 1 categories and then for the South African

categories. Then the value of funds that have closed is shown as a value and as a percentage of the total amount. This indicates the value of funds at a given point in time that would have closed in the future before the end of the research period. Funds of funds have not been excluded and therefore double counting exists.

The total fund size for all ASISA categories is shown Table 5-6 below, and for the South Africa categories in Table 5-7 at each December between 2009 and 2018.

Table 5-6 Fund size and closed fund sizes by ASISA Tier 1 category (in R 000 000 000)

Date	Dec 2009	Dec 2010	Dec 2011	Dec 2012	Dec 2013	Dec 2014	Dec 2015	Dec 2016	Dec 2017	Dec 2018
South Africa	R696.241	R848.203	R926.440	R1 164.730	R1 433.062	R1 633.715	R1 769.181	R1 940.392	R2 184.877	R2 163.903
Closed	R72.577	R78.801	R73.610	R98.650	R93.964	R87.143	R65.991	R66.820	R38.089	R9.763
% closed	10.42%	9.29%	7.95%	8.47%	6.56%	5.33%	3.73%	3.44%	1.74%	0.45%
Worldwide	R16.397	R19.287	R21.401	R27.940	R43.373	R56.552	R70.379	R74.088	R81.481	R76.360
Closed	R0.990	R0.853	R0.629	R0.756	R0.500	R0.420	R0.472	R0.230	R0.134	R0.055
% closed	6.04%	4.42%	2.94%	2.71%	1.15%	0.74%	0.67%	0.31%	0.16%	0.07%
Global	R28.658	R32.176	R38.910	R49.721	R84.848	R104.849	R154.118	R155.481	R173.307	R168.648
Closed	R3.883	R3.686	R2.058	R1.826	R2.503	R2.637	R1.997	R2.009	R1.931	R0.686
% closed	13.55%	11.46%	5.29%	3.67%	2.95%	2.51%	1.30%	1.29%	1.11%	0.41%
Regional	R5.670	R7.481	R6.694	R9.333	R13.899	R13.642	R12.467	R6.745	R7.191	R6.948
Closed	R1.085	R0.701	R0.346	R0.349	R0.185	R0.229	R0.232	R0.378	R0.238	R0.010
% closed	19.14%	9.37%	5.16%	3.74%	1.33%	1.68%	1.86%	5.60%	3.31%	0.15%
Non-existent	R16.679	R16.416	R9.824	R0.351	0	0	0	0	0	0
Closed	R16.679	R16.416	R9.824	R0.351	0	0	0	0	0	0
% closed	100.00%	100.00%	100.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total	R763.645	R923.563	R1 003.269	R1 252.074	R1 575.182	R1 808.758	R2 006.145	R2 176.705	R2 446.856	R2 415.859
Closed	R95.214	R100.458	R86.466	R101.932	R97.151	R90.430	R68.692	R69.436	R40.391	R10.515
% closed	12.47%	10.88%	8.62%	8.14%	6.17%	5.00%	3.42%	3.19%	1.65%	0.44%

Table 5-7 Fund size and closed fund sizes by ASISA South African category (in R 000 000 000)

Date	Dec 2009	Dec 2010	Dec 2011	Dec 2012	Dec 2013	Dec 2014	Dec 2015	Dec 2016	Dec 2017	Dec 2018
Equity	R144.507	R173.225	R184.855	R227.273	R270.962	R306.627	R299.133	R320.655	R370.830	R340.677
Closed	R22.692	R25.007	R22.422	R25.633	R27.062	R22.970	R15.940	R15.680	R13.171	R4.789
% closed	15.70%	14.44%	12.13%	11.28%	9.99%	7.49%	5.33%	4.89%	3.55%	1.41%
Interest bearing	R281.744	R336.091	R321.968	R361.621	R400.912	R390.269	R390.717	R453.301	R520.289	R570.847
Closed	R3.474	R2.129	R2.473	R20.789	R24.481	R24.237	R2.738	R3.687	R2.551	R1.143
% closed	1.23%	0.63%	0.77%	5.75%	6.11%	6.21%	0.70%	0.81%	0.49%	0.20%
Multi-asset	R251.213	R313.306	R391.762	R533.915	R715.271	R881.674	R1 018.199	R1 098.678	R1 210.002	R1 190.587
Closed	R43.524	R48.111	R46.430	R48.273	R38.247	R34.954	R42.307	R41.152	R14.039	R3.815
% closed	17.33%	15.36%	11.85%	9.04%	5.35%	3.96%	4.16%	3.75%	1.16%	0.32%
Real Estate	R18.777	R25.581	R27.854	R41.920	R45.917	R55.145	R61.132	R67.758	R83.756	R61.792
Closed	R2.887	R3.554	R2.286	R3.955	R4.173	R4.982	R5.006	R6.302	R8.328	R0.016
% closed	15.37%	13.89%	8.21%	9.43%	9.09%	9.03%	8.19%	9.30%	9.94%	0.03%
Total	R696.241	R848.203	R926.440	R1 164.730	R1 433.062	R1 633.715	R1 769.181	R1 940.392	R2 184.877	R2 163.903
Closed	R72.577	R78.801	R73.610	R98.650	R93.964	R87.143	R65.991	R66.820	R38.089	R9.763
% closed	10.42%	9.29%	7.95%	8.47%	6.56%	5.33%	3.73%	3.44%	1.74%	0.45%

5.1.2 Breakdown by Management Company

The total fund sizes managed as at June 2019 per Manco is shown in Table 5-8 below, in descending order. The total number of unit trusts managed and the number of unit trusts closed over the entire period is shown for every Manco. The average length of unit trusts managed per Manco was calculated. The maximum length of the period is 126 months.

Table 5-8 Manco's listed by total size and unit trusts

Manco	June 2019 fund size	Unit trusts	Closed	% closed	Average record in months
Allan Gray Unit Trust Management	R297 926 998 356	11	0	0%	110
Coronation Management Company	R252 771 652 197	38	14	37%	86
STANLIB Collective Investments	R240 236 124 997	102	34	33%	94
Investec Fund Managers SA	R208 608 978 570	40	13	33%	95
Nedgroup Collective Investments	R207 664 380 730	57	13	23%	95
Sanlam Collective Investments	R189 064 268 669	231	49	21%	72
Absa Fund Managers	R144 090 102 609	62	15	24%	70
Boutique Collective Investments	R119 157 376 081	387	74	19%	61
Old Mutual Unit Trust Managers	R116 722 996 177	69	21	30%	84
Prudential Portfolio Managers	R113 064 946 180	18	1	6%	97
PSG Collective Investments	R98 793 611 384	32	13	41%	85
Prescient Management Company	R95 203 436 765	129	24	19%	62
Momentum Collective Investments	R80 017 655 291	107	51	48%	64
Foord Unit Trusts	R54 447 701 915	8	0	0%	103
Discovery Life Collective Investments	R53 695 201 475	25	1	4%	99
SIS Management Company	R44 758 540 187	15	1	7%	103
PPS Management Company	R27 496 275 652	15	0	0%	77
Satrix Managers	R26 884 881 378	17	0	0%	64
Ci Collective Investments	R24 910 383 517	78	4	5%	54
Ashburton Management Company	R22 567 779 904	35	15	43%	66
H4 Collective Investments	R17 439 154 592	20	1	5%	72
Marriott Unit Trust Management Company	R16 783 478 854	14	0	0%	117
IP Management Company	R16 624 484 707	67	13	19%	73
Prime Collective Investment Schemes	R15 360 285 110	66	11	17%	71
Oasis Crescent Management Company	R14 709 521 377	16	2	13%	113
Alexander Forbes Investments	R13 446 606 739	26	7	27%	89

Manco	June 2019 fund size	Unit trusts	Closed	% closed	Average record in months
10X Index Fund Managers	R10 109 720 296	4	0	0%	5
Sygnia Collective Investments	R9 630 689 053	24	2	8%	55
Personal Trust International Management Company	R6 969 418 354	7	2	29%	109
Rezco Collective Investments Limited	R6 016 587 201	5	0	0%	72
Standard STANLIB	R5 563 963 977	12	3	25%	32
Bridge Collective Investments	R4 467 121 580	10	1	10%	85
Glacier Management Company	R4 173 130 355	9	6	67%	56
Kagiso Collective Investments	R4 169 747 262	9	0	0%	89
FNB CIS Manco	R3 369 938 233	6	1	17%	35
Novare CIS	R2 904 403 101	18	3	17%	39
Gryphon Collective Investments	R2 775 803 391	10	4	40%	70
Cadiz Collective Investments	R2 142 609 792	7	1	14%	116
RECM Collective Investments	R1 781 998 870	8	2	25%	67
Itransact Fund Managers	R828 295 251	6	2	33%	73
Sanne Management Company	R660 725 562	2	0	0%	30
FedGroup Management	R569 905 325	7	0	0%	51
Africa Collective Investments	R526 599 503	9	0	0%	17
CoreShares Index Tracker Managers	R355 478 666	10	3	30%	27
Community Growth Management Company	R105 494 463	3	1	33%	113
Alusi Management Company	R39 295 454	2	1	50%	67
MET Collective Investments	0	94	94	100%	43
Hermes Management Company	0	3	3	100%	35
Visio	0	1	1	100%	11
NeFG Fund Management	0	1	1	100%	33
Grindrod Collective Investments	0	1	1	100%	74
Total	**R2 579 607 749 102**	**1953**	**509**		

5.1.3 Breakdown by fund size

All the funds in the sample period were divided into four quartiles based on its largest fund size achieved over its lifetime.

Table 5-9 Number of fund closures by fund size

Quartile	#Funds	Fund closures	Fund size range	% closures
1st	488	241	R 0 - R 111 000 000	47.34 %
2nd	489	123	R 111 000 000 - R 333 100 000	24.17 %
3rd	488	96	R 333 100 000 - R 1 050 000 000	18.86 %
4th	488	49	R 1 050 000 000 - R 158 500 000 000	9.63 %
Total	1953	509		100%

5.2 Research Question 2

5.2.1 All funds failure rates

Table 5-10 below indicates the average 1 – 10 year period failure rates for years from 2009 to 2018 for all funds in the sample, inclusive of all categories. No data was available for 2019 as no funds in this year were older than one year at the time of writing. The results are indicated on Figure 5-5 below.

Table 5-10 Failure rates of all unit trusts over multiple periods

Period	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018[1]	Average
1 year	3%	5%	7%	6%	5%	3%	2%	4%	7%	5%	5%
2 years	7%	11%	13%	11%	8%	5%	6%	10%	11%		9%
3 years	13%	17%	17%	13%	10%	8%	12%	13%			13%
4 years	19%	22%	20%	15%	12%	14%	15%				17%
5 years	23%	23%	21%	17%	18%	16%					20%
6 years	24%	25%	23%	22%	21%						23%
7 years	26%	26%	27%	24%							26%
8 years	27%	31%	30%								29%
9 years	31%	32%									32%
10 years	33%										33%

1 The 2018 figure includes only 6 months' worth of data

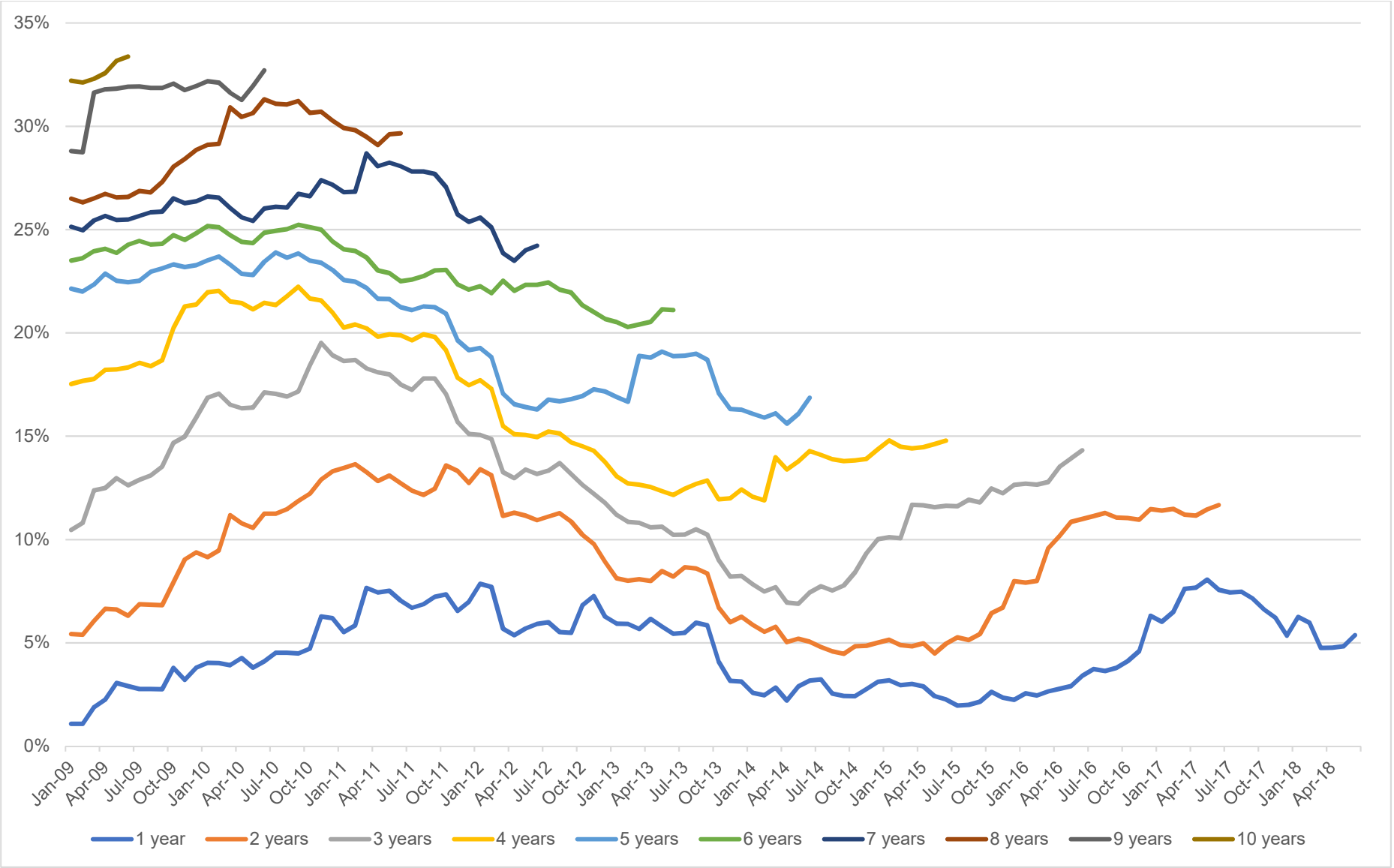

Figure 5-5 Failure rates of unit trusts over multiple periods

5.2.2 Failure rates by size quartile

Failure rates were also calculated for the four size quartile groups as determined in Table 5-9 and is indicated in Table 5-11 to Table 5-14. The average failure rates per period is compared between all size quartiles and compared to the full sample. The result is shown in Table 5-15 and Figure 5-6.

Table 5-11 Failure rates of Q1 unit trusts (smallest group)

Period	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018[1]	Average
1 year	9%	19%	25%	24%	18%	10%	10%	12%	16%	16%	15%
2 years	26%	39%	44%	37%	26%	21%	22%	28%	28%		30%
3 years	44%	55%	54%	44%	35%	33%	38%	35%			43%
4 years	59%	64%	59%	52%	44%	47%	46%				54%
5 years	65%	67%	65%	57%	55%	52%					62%
6 years	67%	71%	68%	65%	60%						67%
7 years	72%	74%	74%	69%							73%
8 years	74%	79%	77%								76%
9 years	78%	79%									78%
10 years	79%										79%

Table 5-12 Failure rates of Q2 unit trusts (second smallest group)

Period	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018[1]	Average
1 year	3%	5%	12%	9%	7%	3%	1%	5%	6%	4%	5%
2 years	8%	18%	21%	17%	11%	5%	5%	10%	11%		11%
3 years	21%	28%	28%	20%	13%	9%	11%	14%			17%
4 years	31%	34%	31%	21%	17%	16%	16%				23%
5 years	37%	38%	32%	24%	23%	18%					29%
6 years	40%	38%	36%	29%	26%						34%
7 years	40%	40%	38%	32%							38%
8 years	42%	42%	41%								42%
9 years	45%	44%									44%
10 years	46%										46%

Table 5-13 Failure rates of Q3 unit trusts (second largest group)

Period	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018[1]	Average
1 year	1%	2%	2%	4%	5%	2%	2%	2%	7%	4%	3%
2 years	3%	4%	6%	9%	7%	4%	3%	9%	10%		6%
3 years	5%	8%	11%	11%	9%	5%	9%	11%			9%
4 years	10%	13%	13%	12%	10%	11%	13%				12%
5 years	14%	15%	14%	13%	16%	15%					15%
6 years	15%	16%	15%	20%	20%						17%
7 years	17%	17%	22%	22%							19%
8 years	18%	24%	24%								22%
9 years	25%	26%									25%
10 years	27%										27%

Table 5-14 Failure rates of Q4 unit trusts (largest group)

Period	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018[1]	Average
1 year	1%	0%	1%	2%	1%	1%	1%	1%	3%	1%	1%
2 years	1%	2%	3%	3%	2%	2%	2%	4%	5%		3%
3 years	2%	3%	4%	3%	3%	3%	5%	6%			4%
4 years	3%	4%	4%	4%	4%	5%	6%				4%
5 years	5%	5%	5%	5%	7%	7%					6%
6 years	5%	6%	6%	8%	8%						7%
7 years	6%	7%	9%	9%							8%
8 years	7%	10%	11%								9%
9 years	11%	11%									11%
10 years	12%										12%

Table 5-15 Average period failure rates for Q1 – Q4 quartiles

Period	Q1	Q2	Q3	Q4	All funds
1 year	15%	5%	3%	1%	5%
2 years	30%	11%	6%	3%	9%
3 years	43%	17%	9%	4%	13%
4 years	54%	23%	12%	4%	17%
5 years	62%	29%	15%	6%	20%
6 years	67%	34%	17%	7%	23%
7 years	73%	38%	19%	8%	26%
8 years	76%	42%	22%	9%	29%
9 years	78%	44%	25%	11%	32%
10 years	79%	46%	27%	12%	33%

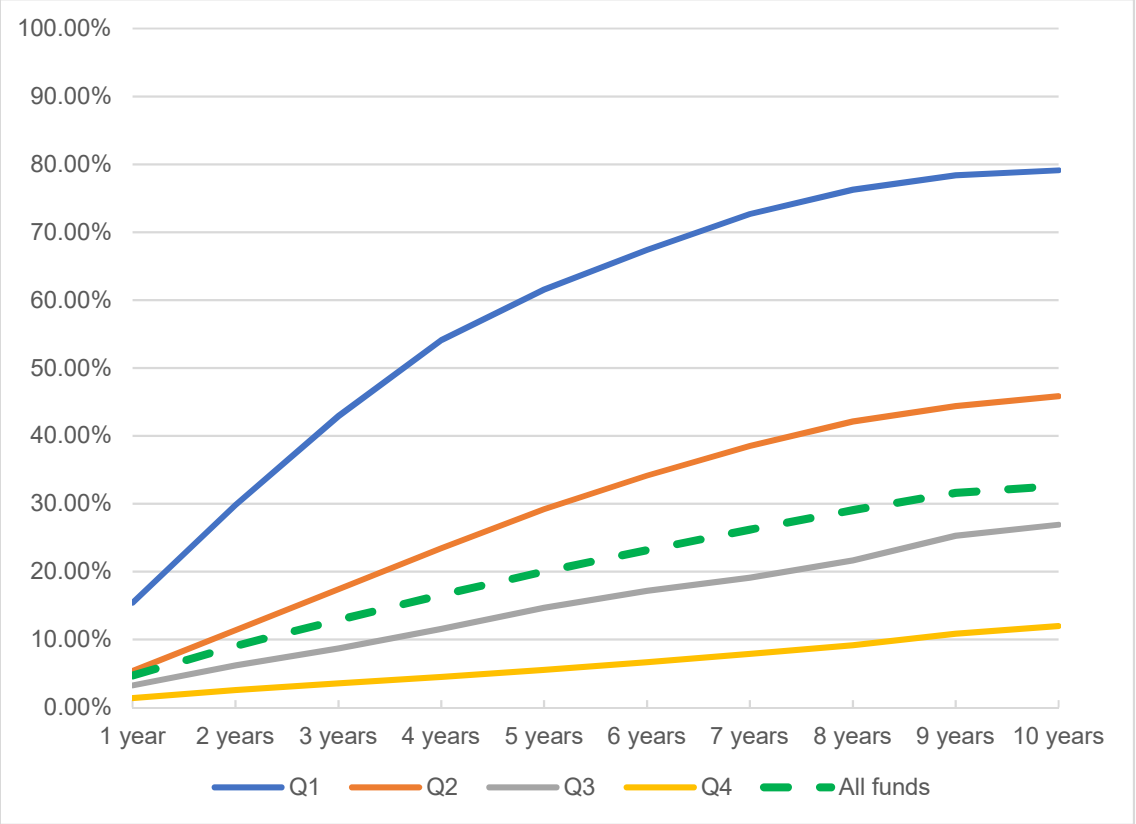

Figure 5-6 Period failure rates compared across size quartiles (Q1 Smallest)

5.3 Research question 3

5.3.1 Survivorship bias of all funds (equal-weighting)

In Table 5-16, the annualised rates of return were calculated (equal-weighted) and are indicated for 3-, 5- and 10-year periods. Returns were calculated for the biased sample, the unbiased sample and for the JSE ALSI (total return). The bias is the difference between the biased and unbiased sample. Two 5-year periods were covered, from 2010 and from 2015.

Table 5-16 Average annualised returns and survivorship bias (equal-weight)

Period	Year from	Biased	Unbiased	Bias	JSE
3 years	2010	11.37%	11.11%	0.27%	15.63%
5 years	2010	12.31%	11.93%	0.38%	15.79%
10 years	2010	9.20%	8.89%	0.31%	11.40%
5 years	2015	5.84%	5.61%	0.23%	6.72%

Each year in the period was measured for annual return for the biased and unbiased sample are shown below in Table 5-17 with the resultant bias.

Table 5-17 Average annual returns and survivorship bias (equal-weight)

Year	Biased	Unbiased	Bias	JSE
2010	11.40%	11.05%	0.35%	19.00%
2011	6.70%	6.40%	0.30%	2.57%
2012	16.21%	16.06%	0.14%	26.62%
2013	17.51%	16.80%	0.71%	21.45%
2014	10.07%	9.67%	0.40%	10.89%
2015	8.70%	8.16%	0.54%	5.13%
2016	2.83%	2.69%	0.14%	2.62%
2017	9.72%	9.63%	0.08%	20.97%
2018	-1.42%	-1.63%	0.21%	-8.53%
2019 YTD	6.82%	6.76%	0.06%	12.32%

5.3.2 Survivorship bias of all funds (size-weighting)

In Table 5-18, the annualised rates of return were calculated (size-weighted) and are indicated for 3-, 5- and 10-year periods. Returns were calculated for the biased sample, the unbiased sample and for the JSE ALSI (total return). The bias is the difference between the biased and unbiased sample. Two 5-year periods were covered, from 2010 and from 2015.

Table 5-18 Average annualised returns and survivorship bias (size-weight)

Period	Year from	Biased	Unbiased	Bias	JSE
3 years	2010	10.19%	9.73%	0.46%	15.63%
5 years	2010	10.99%	10.14%	0.85%	15.79%
10 years	2010	8.74%	8.34%	0.40%	11.40%
5 years	2015	6.28%	6.38%	-0.09%	6.72%

Each year in the period was measured for annual return for the biased and unbiased sample are shown below in Table 5-19 with the resultant bias.

Table 5-19 Average annual returns and survivorship bias (size-weight)

Year	Biased	Unbiased	Bias	JSE
2010	10.31%	10.46%	-0.16%	19.00%
2011	6.81%	6.68%	0.13%	2.57%
2012	13.55%	12.11%	1.44%	26.62%
2013	15.41%	13.52%	1.89%	21.45%
2014	9.09%	8.06%	1.03%	10.89%
2015	8.78%	7.19%	1.59%	5.13%
2016	4.12%	6.31%	-2.20%	2.62%
2017	10.18%	9.28%	0.90%	20.97%
2018	-0.62%	0.91%	-1.53%	-8.53%
2019 YTD	6.11%	5.11%	1.00%	12.32%

5.3.3 Survivorship bias by ASISA categories

The equal-weighted and size-weighted survivorship bias are shown for all ASISA categories (annualised over 10 years) and split into institutional and non-institutional funds in Table 5-20.

Table 5-20 Bias calculated over 10-years annualised by ASISA category

Tier 1	Tier 2	Tier 3	Non-institutional		Institutional	
Geographic	**Asset Type**	**Category**	**Equal**	**Size**	**Equal**	**Size**
South Africa	Equity	Financial	0.64%	0.10%	0.44%	0.34%
		General	1.21%	0.85%	0.00%	-0.47%
		Industrial	0.50%	0.19%	0.63%	0.59%
		Large cap	1.27%	1.79%	0.00%	2.49%
		Mid/small cap	0.03%	0.03%	0.00%	-1.20%
		Resources	0.48%	-0.52%	0.02%	-0.46%
		Unclassified	-0.60%	-0.49%	-0.05%	0.00%
	Multi-asset	Flexible	1.19%	1.92%	0.57%	0.62%
		High Equity	0.21%	0.17%	0.11%	0.44%
		Income	0.15%	0.48%	0.08%	0.88%
		Low equity	0.13%	0.07%	0.06%	0.55%
		Medium equity	0.20%	0.40%	0.18%	0.36%
		Target date	0.00%	-0.10%	0.00%	9.18%
	Real estate	General	0.06%	-0.21%	0.08%	0.08%
	Interest bearing	Money market	0.00%	0.02%	0.00%	0.10%
		Short term	0.00%	0.02%	0.03%	0.05%
		Variable term	0.57%	-0.06%	0.22%	-0.14%
Worldwide	Equity	General	-3.85%	-4.30%	-3.23%	-1.11%
		Unclassified	-8.43%	-8.43%	-8.69%	-8.69%
	Multi-asset	Flexible	-0.13%	1.99%	-0.16%	0.04%
Global	Equity	General	0.88%	0.33%	0.37%	1.88%
		Unclassified	-1.86%	8.79%	-1.19%	11.01%
	Multi-asset	Flexible	0.05%	-0.07%	0.04%	1.06%
		High equity	0.03%	-0.07%	0.00%	0.38%
		Income	0.00%	-0.23%	0.00%	0.08%
		Low equity	0.00%	-1.04%	0.40%	1.16%
		Medium equity	0.00%	-0.12%	0.00%	-0.05%
	Interest bearing	Variable term	1.17%	0.46%	0.86%	1.38%
		Short term	0.00%	0.14%	0.00%	1.78%
	Real estate	General	0.13%	0.64%	0.39%	0.13%
Regional	Equity	Africa	-0.48%	2.04%	-1.14%	3.36%
		General	0.53%	0.40%	0.65%	0.17%
		Unclassified	0.00%	3.67%	0.00%	3.71%
	Multi-asset	Flexible	-4.29%	10.86%	0.00%	0.34%
	Interest bearing	Short term	0.15%	3.84%	-1.17%	-3.14%
	Interest bearing	Variable term	0.98%	0.00%	-1.69%	0.00%
	Real estate	General	0.00%	0.00%	0.29%	-11.32%

5.3.4 Survivorship bias by Manco

The equal-weighted and size-weighted survivorship bias for all Mancos (annualised over 10 years) are shown in Table 5-21. Mancos that did not exist at the end of the sample period were excluded from the list.

Table 5-21 Bias calculated over 10-year annualised by Manco

Manco	Bias	Manco	Bias
10X Index Fund Managers	0.00%	Itransact Fund Managers	1.32%
Absa Fund Managers	0.26%	Kagiso Collective Investments	0.00%
Africa Collective Investments	0.00%	Marriott Unit Trust Management Company	0.00%
Alexander Forbes Investments	0.01%	Momentum Collective Investments	0.53%
Allan Gray Unit Trust Management	0.00%	Nedgroup Collective Investments	0.28%
Alusi Management Company	0.08%	Novare CIS	-0.20%
Ashburton Management Company	0.24%	Oasis Crescent Management Company	-0.29%
Boutique Collective Investments	0.34%	Old Mutual Unit Trust Managers	-0.04%
Bridge Collective Investments	0.24%	Personal Trust International Management Company	-0.17%
Cadiz Collective Investments	-0.26%	PPS Management Company	0.44%
Ci Collective Investments	0.01%	Prescient Management Company	0.34%
Community Growth Management Company	0.79%	Prime Collective Investment Schemes	0.00%
CoreShares Index Tracker Managers	0.43%	Prudential Portfolio Managers	0.43%
Coronation Management Company	0.55%	PSG Collective Investments	0.32%
Discovery Life Collective Investments	0.01%	RECM Collective Investments	-1.54%
FedGroup Management	0.00%	Rezco Collective Investments Limited	0.00%
FNB CIS Manco	-1.00%	Sanlam Collective Investments	0.18%
Foord Unit Trusts	0.00%	Sanne Management Company	0.00%
Glacier Management Company	-0.33%	Satrix Managers	0.00%
Gryphon Collective Investments	0.53%	SIS Management Company	0.38%
H4 Collective Investments	0.18%	Standard STANLIB	0.22%
Investec Fund Managers SA	0.28%	STANLIB Collective Investments	0.23%
IP Management Company	0.41%	Sygnia Collective Investments	-2.05%

6 Discussion of Results

6.1 Research question 1

Over the course of the sample period, which totals to 10 and a half years, 1953 unit trust funds existed of which 509 were closed. This relates to approximately one quarter of funds that do not survive. However, the results from the analysis allowed a deeper understanding of where fund closures occurred in terms of categories, Manco's and fund sizes.

Referring to Figure 5-1, the number of net funds increased steadily from 2012 to 2016, indicating that many new funds were opened in over this period. The data indicated that from 2011 to 2016, the number of new funds offered to the market increased annually with a maximum of 199 new funds opened in 2016.

Fund closures increased yearly from 2010 to reach 68 in 2012 and decreased to 26 in 2016. 2017, 2018 and 2019 year-to-date proved to be disastrous for the CIS industry with 86 closures in 2017 and 87 in 2018. The six months in 2019 saw 45 closures which had exceeded the number of new funds introduced to the market. The number of net funds decreased from 2018 into 2019, which was the first time in the sample period that the total number of funds decreased. It might indicate that, in the current economic conditions, a level of market saturation has been reached and the industry is in a phase of correction.

Clearly the weak returns achieved on the JSE throughout 2014 to 2019 (Cairns, 2019c) has had a negative impact on the unit trust industry. 2018 was the worst year in a decade on the JSE (ASISA, 2019a) and was also the year in which the most funds closed. Excluding the first six months of 2019, 2018 also saw the smallest number of new funds open since 2013.

6.1.1 Closure by ASISA category

When considering the breakdown of fund closures by ASISA categories, funds in the South African category dominate closures over the time period. Of the 509 fund closures, 405 occurred in the South African category. Roughly 80% of closures occurs in this category, which is mostly in-line with this category's relative size the entire industry. The funds in the South African category must invest at least 60% of their assets in South African investment markets.

Within the South African category, four categories exist (equity, multi-asset, interest bearing and real estate). Most fund closures had occurred in the multi-asset category (253), with 118 closures in the equity category. On a yearly basis, the multi-asset category had the most closures except in 2014 and 2019. The pattern of closed and new funds in the South African category mirrors the overall trend.

The size of funds that had been alive at different points in the sample period were shown in Table 5-6 and Table 5-7. This indicated the value of funds that would be closed eventually as a percentage of the total size of the respective categories. The percentage reduces as the period nears the end, however the differences between categories are quite clear.

12.47% of the value of funds that was alive in December 2009 did not exist at the end of June 2019. Regional funds closed almost 20% of its value of funds since December 2009, while in the South Africa category 10.43% of the total value were closed.

When considering the four South African categories, total size of funds that closed was quite similar at 10.42%. Multi-asset (17.33%) and equity (15.7%) had the highest percentages. Interest bearing funds had low percentages throughout, which confirm its relatively lower risk of closure.

The South African category dominated in terms of fund closures, with fund closures most prevalent in the multi-asset and equity categories.

6.1.2 Closure by Manco

As reported at June 2019, Allan Gray has the largest assets under management reported, with just under R297 billion in managed in funds. Notably, Allan Gray had no fund closures during the sample period. Of the 51 Mancos in the sample, four do not exist anymore. The largest of these were Met Collective Investments, which exited the unit trust industry (94 funds in total) and moved its funds to other Manco's (Cairns, 2017).

The highest number of funds were managed during this period by three Mancos with multiple white-label funds under its respective licenses. Boutique Collective Investments (387 funds, 74 of them closed), Sanlam Collective Investments (231 funds, 49 closed) and Prescient Management Company (129, 24 closed) funds had the most funds under its names during the entire period. More or less 20% of the

number of funds managed by these three Mancos were closed over the sample period. Momentum Collective Investments managed 107 funds, of which 51 closed (48%).

When track record was considered (the average number of months per unit trust managed, out of a total of 126 months), Marriott Unit Trust Management Company had the highest track record (117 months) across its 14 funds of which none has been closed over the sample period. Other notable Mancos with high track records were Cadiz Collective Investments (116 months), Community Growth Management Company and Oasis Crescent Management Company (both with 113 months). SIS Management Company (103 months), Foord Unit Trusts (103 months), Discovery Life Collective Investments (99 months) and Prudential Portfolio Managers (97 months) all achieved a closure rate of less than 10% while achieving high track records.

Other Mancos that achieved 0% closure of unit trusts include Kagiso Collective Investments, Rezco Collective Investments, PPS Management Company, Satrix Managers, Fedgroup Management and Africa Collective Investments.

6.1.3 Closure by fund size

When the sizes of funds were considered, it was clear that smaller funds made up the bulk of closures over the sample period. Of the 509 closures recorded during the sample period, 241 (47.34%) were funds that never achieved a fund size larger than R111 000 000. A further 123 funds (24.17%) between R111 000 000 and R333 100 000 in size closed. Only 9.63% of funds that were ever larger than R1 050 000 000 closed during the sample period.

This finding confirms the conclusion by Elton et al., (1996), who found that a larger percentage of smaller funds failed. Rohleder et al., (2011) also found that smaller funds were less likely to survive. Pawley (2006) made no findings in terms of the sizes of funds that close.

6.2 Research question 2

The calculated failure rates of funds confirm that the longer the time period, the larger the failure rates of funds in the sample. When the failure rates of all funds were considered, the average 1-year failure rate was 5%, 5-year failure rate at 20% and increasing steadily to 33% for the 10-year period.

Pawley (2006) made largely similar findings in his assessment of failure rates, with an average 1-year failure rate of 5.23%, 5-year failure rate of 23.04% and 10-year failure rate of 37.92%. While this analysis incudes all categories of funds, Pawley (2006) only considered equity unit trusts. Carhart (2002) found an average annual fund attrition rate of 3.6% on unit trusts in the United States.

The SPIVA Europe scorecard released for mid-year 2019 showed that the 1-year failure rates calculated here is largely consistent with those in Europe. The difference is noted over the 10-year period, where the failure rates (for period ending June 2019) for 23 reported fund categories across Europe was an average of 49.4% (median of 52.1%) (Innes & Cairns, 2019). This is considerably higher than the average 10-year failure rate (33%) reported for South Africa.

When the failure rates are calculated for different groups based on the fund size achieved over its lifetime, the numbers vary considerably. The average 10-year failure rate of funds larger than R1 050 000 000 (the largest group of funds, 4th quartile) were significantly lower than the overall figure at 12%. The difference became clear when compared to the average 10-year failure rate of the smallest group of funds in the sample (smaller than R111 000 000, 1st quartile) of 79%.

This confirmed the previous findings (Elton et al., 1996; Rohleder et al., 2011) that smaller funds are more likely to close. A disturbing finding was that the average failure rates of the smallest group over all time-periods (1 to 10 years) was consistently double that of the next group (2nd quartile) until the 7-year period. Smaller funds clearly close more often and should be carefully considered for investment purposes.

These findings confirm that smaller funds close more rapidly than larger funds. Long-term investors would be better served placing their funds in larger funds, to avoid fund closures that are prevalent in smaller funds. None of the previous literature covered in the literature review considered the failure rates of different size groups.

6.3 Research question 3

6.3.1 Survivorship bias of all funds (equal-weighting)

The results of the first analysis was compared with Pawley (2006) who calculated survivorship bias on South African domestic equity unit trusts using equal-weighted methodology, albeit over a longer period and a smaller sample than this study.

With reference to Table 5-16, the annualised return of the biased sample of all unit trusts in the sample (and excluding closed unit trusts) measured from 2010 was 11.37% over 3 years, 11.93% over 5 years and 9.20% over 10 years. The second 5-year period indicates the slump experienced by the JSE, with a much lower annualised return of 5.84% over the 5-year period from 2015 – 2019.

When the returns from the biased sample was compared to the unbiased sample, the bias was quantified. The unbiased sample consistently underperforms over all periods, by 0.27% (3-year period from 2010), 0.38% (5-year period from 2010) and 0.23% (5-year period from 2015). The bias over the entire 10-year period was found to be 0.31%, which is slightly out of and below the 10-year range of 0.38% to 0.71% that Pawley (2006) found. Interestingly, the range of bias calculated from the two 5-year periods above (0.23% and 0.38%) matches almost precisely the range of 5-year average bias that Pawley (2006) calculated over multiple 5-year periods (0.23% - 0.39%).

As seen the second 5-year period was notably weaker-performing than the first 5-year period. Notable for investors wass that the unbiased sample consistently underperforms the JSE ALSI over all periods confirming that overall the unit trust industry is not delivering returns above the JSE for all periods covered, even when not considering funds that were closed.

Pawley (2006) and Carhart et al., (2002) found that the bias increased with sample length. According to Pawley, this implied that funds that closed under-perform consistently and over many time periods. The finding in Table 5-16 contradict Pawley, as the bias did not increase the longer the period became. The bias increased from the 3-year period to the 5-year period, but then decreased again over the entire 10-year period. It is assumed that the relatively poor performance of the JSE over the second 5-year period pushed the bias downwards. The difference between the performance of surviving and non-surviving funds narrowed due to the weak market.

In Table 5-17, the bias was calculated for each year in the period separately. Consistently, the biased sample performs better than the unbiased. The bias over all years ranged from 0.06% to 0.71%.

The annualised bias found here is similar and slightly lower than found in previous studies. Grinblatt & Titman (1989) found a bias to be between 0.1% and 0.4% per

year. Elton, Gruber and Blake (1996) estimated the bias to be between 0.71% and 0.77%. Carhart et al., (2002) had a slightly higher result of 1% per year but over a longer period of 15 years. Rohleder et al., (2011) found a higher bias of 1.2% to 1.5% per year.

6.3.2 Survivorship bias of all funds (size-weighting)

The survivorship bias calculated using size-weighted methodology resulted in a slightly different answer than in the first analysis. The resultant size-weighted bias was higher than the equal-weighted result for three of the four periods, as shown in Table 6-1 below. During the weak performing 5-year period from 2015 onwards, the size-weighted bias was negative.

Table 6-1 Comparison between annualised equal- and size-weighted bias

Period	Year from	Equal weighted bias	Size weighted bias	JSE
3 years	2010	0.27%	0.46%	15.63%
5 years	2010	0.38%	0.85%	15.79%
10 years	2010	0.31%	0.40%	11.40%
5 years	2015	0.23%	-0.09%	6.72%

The 10-year annualised bias was found to be 0.40%, which is slightly higher than the equal-weighted bias. This finding is in contrast with Rohleder et al., (2011), where it was found in their analysis that equal-weighting resulted in a resultant bias of approximately five times as high compared to size-weighting. This finding was made as a result of closing funds being smaller than surviving funds and therefore skewing the result towards smaller funds. When size-weighting the results, the smaller funds' significance in the sample was reduced (Rohleder et al., 2011).

From the results in question 2, a significantly larger number of smaller funds were closed over the sample period than larger funds. The results in Table 6-1 should therefore be consistent with that finding, and result in a smaller bias when size-weighting the sample. There could be two reasons for this result:

1. Due to the sheer number of smaller funds that closed, the cumulative size-weighted bias inherent in smaller funds outweigh that of larger funds; or
2. One or more of the larger fund closures dominate the bias which resulted in a skew towards size- over equal-weighting.

It was not within the scope of this study to determine the distribution and effect of smaller funds as opposed to larger funds and the resultant survivorship bias.

In Table 5-18, the bias was calculated for each year in the period separately. Here, the biased sample do not consistently outperform the unbiased, as there are three years out of the ten where a negative bias exists. The negative bias ranged from -0.16% to -2.20% and the positive bias from 0.13% to 1.89%.

A negative bias result when the unbiased sample performed better than the biased sample. The negative bias result in Table 5-18 and in the 5-year period from 2015 in Table 6-1 (-0.09) suggest that the closure of larger funds can skew the result or that remaining funds start underperforming after fund closure have occurred. It is therefore questioned whether size-weighting is a viable option to reduce the bias, as suggested by Rohleder et al., (2011).

Elton, Gruber and Blake (1996) found that smaller funds performed much worse than larger funds in their study. While consistent that more small funds were closed as indicated in question 2, it is possible large funds can influence the result when conducting a size-weighted analysis.

In studies where size-weighting methodology was used, the bias was found to be larger and smaller than calculated above. Other studies found a larger bias of 1.4% per year (Malkiel, 1995) and smaller (Rohleder et al., 2011) with a range of 0.2% to 0.3% per year.

6.3.3 Survivorship bias by ASISA categories

With reference to Table 5-20, the annualised bias was calculated for all ASISA categories and is indicated according to institutional and non-institutional and equal- and size-weighting.

When equal weighting is considered, most of the highest percentage biases were calculated for the South African equity category (financial with 0.64%, general with 1.21%, large cap with 1.27%) which is the biggest category in the South African category.

6.3.4 Survivorship bias by Manco

Survivorship bias of Mancos were annualised equal-weighted over the 10-year period. Mancos that did not close any funds had a bias of 0%. The highest bias

recorded was Itransact fund managers at 1.32%. Of the 46 Mancos (excluding the ones that did not exist anymore) 26 recorded a positive bias and 11 recorded no fund closures and therefore no bias.

Nine Mancos recorded negative biases, ranging from -0.04% to -2.05%. This is the result of the unbiased sample having a higher annualised return than the biased sample. This means that the funds that were alive at the end of the sample period in Manco's portfolio of funds, were underperforming the funds that was closed in the sample period.

The reasons for this could be:

1. An incorrect decision has been made; or
2. The relatively weaker performance of the surviving fund was anticipated and was part of a strategic long-term decision.

The exact reasons for a negative bias are yet to be investigated. Whatever the reasons might have been, a negative bias must be a concern for investors as it indicates that existing funds are not outperforming closed funds.

7 Conclusion

7.1 Principal findings

The findings show that funds are regularly closed in all ASISA categories, with the most notable number of closures in the largest categories. A quarter of funds that existed over the 10-year sample period do not exist anymore, indicating that fund closures have been pervasive. The South African category and the equity and multi-asset categories dominated the number of fund closures. The addition of new funds to the market reached a peak in 2016, before reducing every year until 2019.

In the South African category, the findings show that between 15.37% and 17.33% of the total value of the equity, multi-asset and real estate categories in 2009 had closed 10 years later. The number of funds closed by Mancos have varied significantly, however the findings indicate that many Mancos have long track records and no closures which indicate consistency and sustainability of funds.

Added to these findings are the failure rates, which showed that 71.51% of fund closures were funds that never achieved a fund size larger than R333 million. Funds smaller than R 111 million had a significantly higher failure rate than the rest of the sizes, with almost 80% of funds not surviving longer than 10 years. Only 12% of funds larger than R1,05 billion did not survive 10 years.

Failure rates were constantly increasing which were consistent with the findings of Pawley (2006). This indicated that the longer a fund survived, the higher likelihood of fund closure. The data also indicated that larger funds were therefore much less likely to close and provided investors with better sustainability.

The data showed that investors and advisors would be in a better position to avoid fund closures by selecting investments based on sustainability and track record, not necessarily only on performance returns.

The analysis on the survivor bias over the entire sample indicated that unit trusts underperform the JSE consistently. Over a period of 10 years, the unbiased sample, which includes closed funds, underperformed the biased sample by 0.31%. The implication here is that performance figures provided to the public on unit trusts must be adjusted downwards to account for the resultant bias. Investors should be advised to bring into question these figures and obtain more information on unit trust closures when considering a Manco or fund manager.

The bias that is calculated across the sample does seem to be dependent on multiple variables. A few assumptions can be made from the data. When the performance difference between surviving and non-surviving funds were very small, the equal-weighted bias reduced and became negative as seen in some of the results. Negative bias occurs when the performance of surviving funds are lower than that of closed funds. When the overall performance of the market is down, more fund closures are likely to occur but then the bias is likely to be lower. When the market does well, less closures occur but the bias is likely to be higher.

The difference in weighting methodology did not have the effect of Rohleder et al., (2011) where, as a result of fund closures being smaller in size, equal-weighting methodology resulted in a higher bias number when compared to size-weighting. In the dataset analysed for this research, size-weighting resulted in a slightly larger bias, which can indicate that either a small number of larger funds or the sheer volume of smaller funds dominate the result. It is therefore argued that equal-weighting is a more suitable method for determining survivor bias as the average investor is not concerned about the size of the bias overall in the industry, but in how it might affect their own investments.

There may be many reasons for fund closures, including consolidation of products and a renewed focus on core strategic capabilities. The data indicated that the main reason for fund closure were underperformance. Underperformance of funds are then exacerbated by investors chasing high returns.

High performing funds attract most inflows (Arendse et al., 2018). When investors move their investments elsewhere in search of high returns, the effect is detrimental to the fund as it struggles to maintain its mandate and eventually closes. The industry have also been characterised by a move to passive investments such as index trackers which achieve the market return.

The biases recorded per Manco over the 10-year period indicate that Mancos had positive and negative biases. In the case of negative biases, the surviving funds' performance were inferior to those that had been closed in the same Manco. Of the 46 Mancos in existence at the end of the sample period, only nine had 0% bias. This is notable in that the remaining Mancos closed a portion of their funds with the result that their overall track record is not accurate.

Investors also need to be patient and not only move for the sake of moving. The cyclical nature of the market means that funds will underperform. Educated investors must be aware that constantly moving around in search of better outcomes destroys long term value (Gray, 2015). Investors that follow a buy-and-hold are more likely to achieve superior returns as opposed to attempts to time the market (Firer et al., 1996).

The results from the analysis indicate that fund failures are pervasive and across the industry. Failure rates of funds increase as fund size decrease, indicating the challenges that smaller fund managers and Mancos face. Survivorship bias is present in the industry, resulting in the conclusion that reported performance of Mancos is not entirely accurate and does not include all the funds that fell under the purview of the Manco.

Investors can reduce the risk of fund closures and failures by selecting Mancos with long track records, low rate of closures and low survivorship bias. Investors who choose not to invest in index or tracker funds, are expecting a return higher than the index. These investors should be aware of changes made to their fund mandate, and when mergers or liquidations occur so that questions can be asked of managers and so that they can be held accountable for investment decisions.

7.2 Implications for management and other relevant stakeholders

Because survivorship bias is present in the industry and Mancos regularly close funds, the implications for investors are:

1. Statistics provided to investors on historical performance of investment products are likely incorrect;
2. This might lead to investment decisions being made on false or lack of complete information;
3. Investors who were moved to new funds as part of a fund merger will likely be unaware of the bias they are exposed to in their investment performance;
4. Investors must be aware of when managers close funds as this will lock in the losses experienced until that date; and
5. Investors should consider factors other than historical return when investing with Mancos for the future.

Mancos are required by the FSCA to provide minimum disclosure documents (MDDs) to increase transparency and provide clear information. Additionally, the

Treating Customers Fairly (TCF) framework expects service providers to deliver on six outcomes throughout the product lifecycle. Outcome number three states that customers should be provided with clear information and kept appropriately informed throughout the process.

It can be argued that withholding information of fund failures and survivorship bias from clients and the investing public is not transparent and does not provide clear information. The minimum disclosure documents only cover existing funds and not ones that have been closed in the past. Therefore, the implications for Mancos are:

1. Mancos must disclose the number of funds that has been closed and the reasons for doing so to new and existing investors;
2. Estimates of survivorship bias must be included in statistics on historical fund performance to allow for better decision -making and transparency.

ASISA and the FSCA have a role to play in terms of policy and industry guidelines and standards to ensure an amenable agreement where all sides can benefit from transparency and clarity.

7.3 Limitations of the research

The limitations of the study are:

1. This study did not describe relationships between survivorship bias, fund failure rates, fund performance and market performance. It aimed to provide an empirical result that would give an indication as to the closure of unit trusts and the resultant survivorship bias;
2. The study did not explore reasons for fund closures;
3. The time-period stretched only 10.5 years whereby previous studies were able to analyse on average 20 years of data;
4. Analysis on failure and survivorship bias were done down to Manco level, and not to the individual fund managers. Many Manco's manage their own funds, but funds under their license are managed by 3rd party (or white-label) fund managers. No analysis was done on fund manager level.

7.4 Suggestions for future research

Based on the findings of this study and the limitations on the research, the following areas are suggested for future research:

1. Calculation of survivorship bias based on fund sizes to determine where the largest survivorship bias exists, in small or large funds;
2. Dataset permitting, an analysis of survivorship bias since the first unit trust was opened in 1965;
3. Analysis of survivorship bias to fund manager level; and
4. Comparison of survivorship bias to selected benchmarks.

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