INVESTING INTO THE ABYSS: THE CONTINUED MISCLASSIFICATION OF MULTI-SECTOR MANAGED FUNDS

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Abstract

The objective of this paper is to assess whether Australian multi-sector managed funds are misclassified, and then, having found this to be the case, determine if this misclassification has any impact on fund performance. We adopt a strong form of returns based style analysis to investigate a monthly sample of Australian multi-sector funds over the five-year sample period 2003:04-2008:03. The evidence provided demonstrates that insufficient attention has been paid as to whether fund managers are able to keep within their tactical asset allocation ranges and presents that misclassification exist for Australian multi-sector managed funds but that the effect on fund performance is not significant. The paper adds to the literature by demonstrating that no association exists between misclassification and fund performance.

Keywords: Managed funds, Return Based Style Analysis, Asset Allocation, Misclassification, Confidence Intervals

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Introduction

The stated investment objective or "style" of a managed fund is an important factor in aiding the decision making process for an investor. However, growing evidence suggests that many funds fail to adhere to consistent style profiles and "funds are misclassified" over time (Brown and Goetzmann 1997). In this study, consistent with popular opinion, a fund is deemed to be "misclassified" when a fund allocates outside its stated range as disclosed within their product disclosure statement (PDS) and thus is identified as breaking its mandate (Kim, Shukla and Tomas, 2000). Notably Brown, Harlow and Zhang (2009) show that failure to abide by a consistent style ultimately can lead to inferior performance.

The performance evaluation literature demonstrates that misclassification can impact negatively on investors in various ways. (1) Investors are exposed to unforseen risks and therefore are unable to achieve personal investment goals as a result of the fund manager going outside of the mandated range for a particular asset class. This has never been more important given the global financial crisis of 2007-2009 and the turbulent nature of the markets as a result of the fallout from the sub-prime collapse. (2) Misclassification may also have negative effects on fund performance. Existing studies have suggested that fund mangers who operate with an inconsistent style to that mandated within PDS are more likely to make asset allocation errors, have higher turnover and have overall poor performance compared to peer funds (Brown et al. 2009; Gallo, Phengpis, and Swanson 2007). As a result of the disadvantages identified in the literature, the current market turbulence and lack of existing empirical evidence with respect to the impact of misclassification on performance, the question of whether managed funds in Australia are misclassified is topical and worthy of further attention.

Using a monthly sample of Australian listed managed funds over the five-year sample period April 2003 to March 2008 the following research question is addressed:

Do significant levels of misclassification exist for Australian multi-sector managed funds and if so what, if any, are the effects on fund performance?

Reasons for why misclassification occurs have been previously investigated (Anderson and Ahmed 2005). The most persuasive argument is that fund managers try to time the market in certain sectors and asset classes by shifting their allocations into them regardless of a fund's stipulated mandate. A limitation of the existing literature is that most of the early work in this area has focused on US equity funds (Dibartolomeo and Witowski 1997; Christopherson 1995). Some recent studies in Australia have extended the earlier work by focusing on multi-sector funds

(Holmes and Faff 2008a, 2008b). These types of funds are worthy of investigation given many investors choose from among multi-sector funds in order to achieve their long term retirement objectives (Benson, Gallagher and Teodorowski 2007; Brinson, Singer and Beebower 1991). In this paper we disaggregate superannuation funds from managed funds as it is only the intention in this paper to investigate this issue as it relates to the managed fund industry.

Multi-sector funds specialise in investing across a number of asset classes with each fund having unique weightings allocated to each asset class. These weights impact the fund's exposure to each asset class which in turn give each style a distinctive risk and return profile.

Motivated by the contributions of Brown et al. (2009) and Holmes and Faff (2008a) Australian managed multi-sector funds are examined in order to identify if they are misclassified, and then, having found this to be the case, determine if this misclassification has any impact on fund performance. The findings reported in this paper indicate a significant proportion of funds are misclassified but that no conclusive association is found to exist between misclassification and performance.

The remainder of the paper is organised as follows: Section 2 provides a review of the existing literature related to misclassification and style analysis. Section 3 presents the data and methodology used in this paper. Section 4 provides empirical results for the differing test samples and discusses the empirical findings. Finally, Section 5 presents the conclusions of the paper and provides suggestions for future research.

2 Prior Studies incorporating Return Based Style Analysis

In order to provide contextual completeness for this investigation, it is worthwhile presenting a brief overview of style analysis. The philosophy or objective that a fund manager uses to make investment decisions regarding the securities and asset allocation of a portfolio is known as the managed fund's "style" (Sharpe 1992). Equity fund managers can be classified into different styles based on the characteristics of shares that they invest in. Israelson (1999) explains how Morningstar determines whether or not an equity fund is classified as large/small value, large/small growth or a combination of both, based on an allocated price to earnings ratio and price to book ratio score for each of the shares in their portfolio. These ratio and scores are then used to calculate an overall price to earnings ratio and price to book ratio score. The scores can then be used to sort funds into their respective style classifications. Multi-sector funds however, typically classify themselves into five broad categories; income, defensive, conservative, balanced and growth. Each of these "styles" influences the asset allocation decision of the respective fund managers in terms of the weightings that each of six different asset classes[1] receive.

An illustration of the impact that investment style can have on the behaviour of a multi-sector funds is provided by Brinson, Hood, and Beebower (1986) using US data for the period 1974-1983. In that seminal study they found that the asset allocation decision accounts for 94% of the variability of total portfolio returns (Brinson et al 1986, p. 43). Further it was the study first to identify asset allocation and therefore style as being a major determinant of portfolio return variability. The findings were supported later by Blake, Lehmann, and Timmermann (1999), who reach a similar conclusion when examining U.K. pension fund data.

There are a number of methods that an investor can use to accurately determine a managed fund's style without needing to rely on what is stated by the fund in its PDS. One alternative method, and method of choice in this paper, involves using historical returns to identify a managed fund's asset allocation. This approach is commonly referred to as "style analysis" and was developed by William Sharpe in his seminal papers (Sharpe 1988; 1992). A second alternative, namely "holdings-based style analysis" (HBSA) is described by Kaplan (2003) as using a bottom up approach wherein the fund's style is determined from the characteristics of the securities that it holds at various points in time. As to the effectiveness of the two approaches, ample evidence exists to support the widespread use of return based style analysis (RBSA) as a tool in determining a manager's effective asset mix. In a study which examined 3336 US equity funds between 1989 and 1997 Chan, Chen, and Lakonishok (2002) compared both approaches to style identification and found that in general the two give similar results. In contrast, a study by Horst, Nijman, and de Roon (2004) compared the two approaches using 18 US based funds and found that RBSA gave a better estimate of a fund's investment style and was also better at forecasting future returns. The reason for this is that RBSA tends to be more suited for identifying the actual factor exposures that are relevant for predicting future returns and also the risk exposure of the fund. Additionally Dor, Budinger, Dynkin, and Leech (2008) point out that the main advantage of RBSA is that it offers timely comparisons, gives analysts the ability to observe intra-period shifts in style, and allows for historical time series to be more readily constructed than is possible with data from actual portfolio holdings of funds. The main criticisms aimed at RBSA are not levelled at the methodology

[1]The six different asset classes are; (1) Australian Equities, (2) International Equities, (3) Listed Property, (4) Australian Fixed Interest, (5) Overseas Fixed Interest and (6) Cash.

itself, or the theory behind it, but mainly at its application. For RBSA to be effective at identifying style it needs to be implemented correctly, with appropriate indices and an investment philosophy that is able to be captured by these benchmark indices. This was acknowledged by Buetow, Johnson, and Runkle (2000). The desired characteristics of asset class benchmark indices are outlined by Sharpe (1992) who specifies that the indices used should be mutually exclusive, exhaustive, have returns that differ, and should therefore have low correlation with each other. This avoids a situation where there is confusion about where to allocate a weighting due to the returns of two or more indices behaving in a similar way. These conditions are best met when investigating multi-sector managed funds whose asset allocation strategies utilise asset classes which each have a unique index. For this reason the decision to use RBSA to examine multi-sector funds is perhaps the best application of the technique (Buetow et al. 2000). The appropriate indices to use for Australian multi-sector managed funds which cover the six target asset classes have been identified by Faff, Gallagher, and Wu (2005). In their study a sample of 80 multi-sector funds investigated in an effort to evaluate the tactical asset allocation capabilities, strategies and behaviour of Australian investment managers who invest assets across multiple asset classes. It is argued that by choosing suitable benchmark indices and carefully implementing RBSA, the investment analyst will have a clear reading of a managed funds style.

It is not yet clear why many managed funds are vague about their investment objectives. However, there is no shortage of conjecture as to the possible reasons (Chan et al. 2002). Identification of such vagaries were previously discussed in an earlier chapter, refer to section 6.2.2.

One proposition is that a fund's investment objective is intentionally left vague so that there is a degree of flexibility that would allow for temporary deviations from the stated style. Attempts to time the market by shifting allocation into an asset class that is not dominant may also explain some temporary deviations from stated style. Another possible reason is that adverse incentives could exist for funds to misclassify themselves in order to make it difficult for investors to be able to accurately identify the risk associated with a particular fund's investment objective. The suspicion that fund managers respond to adverse incentive structures in a way which will make their portfolios look more attractive to current and potential investors is nothing new (Lakonishok, Armin, Thaler, and Vishny 1991), that is not to say however that funds are deliberately misleading investors but that they may want to keep certain information to themselves. In doing this fund managers may be able to attract investors to their fund by achieving higher relative returns to funds of the same stated style at the expense of taking on higher risk. As Dibartolomeo and Witowski (1997, p. 34) phrased it: "the easiest way to win a contest for the largest tomato is to paint a cantaloupe red and hope the judges do not notice".

The majority of empirical evidence surrounding misclassification is US focused. Using realised returns from US mutual funds, Brown and Goetzmann (1997) and Dibartolomeo and Witowski (1997) found consistent results that misclassification within their respective samples was as much as 40%. More recently, Kim et al. (2000) found evidence of misclassification in as much as 50% of the mutual funds examined in their sample taking into account fund attributes and not relying on risk and return measures. With such a large proportion of US funds misclassified, the question of whether or not there are any negative consequences for investors becomes an important one. This is particularly the case in a setting like the Australian market where a high proportion of the population are either directly or indirectly involved with investments in managed funds[2]. Are investors facing significantly different levels of risk? Are they losing diversification benefits? What are the effects of misclassification on fund performance? Progress has been made towards finding an answer to these questions (Brown et al. 2009; Indro, Jiang, Hu, and Lee 1998), but again the literature has been primarily focused on equity fund styles without much consideration of multi-sector funds, that are popular within the Australian market setting.

While the bulk of research is on equity funds, multi-sector funds have not been ignored. Holmes and Faff (2008a) use rolling windows and style analysis to examine how consistent Australian multi-sector fund style weights have been over time. Their technique does not take into account whether or not funds have moved outside their mandated ranges for each asset class. It is possible that even though there have been large fluctuations in style weights they may be fluctuating within the range that investors have implicitly approved of when investing in the fund. This is of importance to investors, because if a fund allocates outside its stated range then it is breaking its investment mandate, in other words it is "misclassified". This misclassification can lead to investors having a suboptimal exposure to a particular asset class. These asset class ranges are set with the fund manager agreeing to stay within them on average to allow for the flexibility necessary to take advantage of any special information or selectivity skill that the manager may possess. As this is the case for a large number of funds, strong form RBSA[3] is a useful and

[2] In late 2008, 6.7 million people, or 41% of the adult Australian population, participated in the Australian share market either directly (via shares or other listed investments) or indirectly (via superannuation funds). For full details regarding participation in the Australian industry refer to 2008 Australian share ownership study (2008 ASX).

[3] Alternative versions exist of returns based style analysis: weak form, semi strong form and strong form. Weak

appropriate technique to use when addressing the first part of the research question 7.1, which can be answered by testing the following hypothesis.

> H_A1: Significant levels of misclassification exist with regard to the investment objective of Australian multi-sector managed funds.

In light of the fact, that the expectation is to reject the null version of the above hypothesis and find that Australian multi-sector funds are indeed misclassified, it is only then that the second part of the research question that concentrates on the association with performance can be addressed. The linkages between style changes and resulting fund performance are complex and not clearly understood. There is mixed evidence in the literature. In the case of equity funds style inconsistency can negatively impact performance (Brown et al. 2009), whereas evidence exists to suggest a positive relationship for multi-sector funds (Holmes and Faff 2007). To evaluate the degree of style drift over the sample period investigated Holmes and Faff (2007) use RBSA (Sharp 1992) in the form of a rolling window analysis to produce a series of style weights for each fund. The underling variability of these style weights is then interpreted in the form of a style drift score (SDS) following the work of Idzorek and Bertsch (2004). A positive association is reported between SDS and performance in the case of conditional performance models such as the Conditional Treynor-Mazuy alpha model and Conditional Treynor-Mazuy Kalman alpha model.

In view of the mixed findings presented by Brown et a. (2009) and Holmes and Faff (2007) the following hypothesis to address the second part of the research question is tested.

> H_A2: An association exists between misclassification and multi-sector managed fund performance.

The null version of the above hypothesis will be verified in the testing process.

3 Research Design and Data

The previous section reviewed the existing literature on return based style analysis and identified some of the key work in this area in regard to misclassification. In this section the research design is discussed, benchmarks are identified for the different asset classes examined in this paper, and a brief description of the data and sources of the data is provided.

3.1 Data

This paper utilises monthly return data for a total of 246 Australian multi-sector managed funds (superannuation funds are excluded from the analysis) for the period April 2003 to March 2008[4]. Managed fund return data was obtained using Morningstar direct (version 3.1.4), with defunct funds excluded. The requirement to remove defunct funds from the sample is largely unavoidable because if a fund does not have a complete return history over the sample period RBSA cannot be conducted. The sample consists of multi-sector funds split into five broad categories: defensive, conservative, income, balanced, and growth. Funds were segmented into these categories on the basis of their stated objectives and fund name. In cases where the fund name and objective are ambiguous then Morningstar's classification system was used as a proxy. Table 1 presents the sample selection criteria.

The final sample of managed funds (excluding superannuation funds[5]) in this paper involved limiting the total population of 2739 Australian open ended funds to those funds that had an inception date prior to April 2003 (meaning a complete data set of monthly returns exists for the required sample period), and were classified as multi-sector managed funds. This reduced the sample to 394 managed funds. Additionally, each fund was required to have a stated asset allocation range for the asset classes they invest in. This reduced the sample further to a final sample of 246 funds[6]. The asset allocation ranges were obtained from Morningstar Total Access database.

form style analysis is where the coefficients to the benchmarks are estimated in a completely unconstrained fashion. Semi-strong returns based style analysis assumes that the weights are constrained in that they must sum up to 1, but have no non-negativity restriction applied. Strong form returns based style analysis assumes all constraints are satisfied.

[4] The analysis in this paper is based on 5 years of data. Similar studies in the literature have employed 10 years of data. RBSA requires at least sixty months of consecutive data for each fund (Sharpe 1992). In the seminal study on management style and performance measurement Sharpe investigated a set of open-end mutual funds between 1985 and 1989. The five-year sample period is sufficient and the findings reported in this paper can therefore be considered as robust and representative.

[5] 2739 Australian superannuation funds available within the Morningstar Direct database as at 30 April 2008 were excluded as the emphasis of this research is on the Australian managed fund industry.

[6] 148 funds with a full data set of monthly returns were eliminated from our final sample due to insufficient or no information being available about the target asset allocation.

Table 1. Sampling Procedure

The total number of multi-sector managed funds that satisfy the sample selection criteria are detailed in this table. The final row shows the resulting size for analysis during the sample period for this study of April 2003 to March 2008.

Sampling Criteria	Number of Funds Remaining
Initial data set of Australian open end funds available in Morningstar Direct Database as at 30 April 2008	**2739**
After removing listed funds where:	
Inception date after April 2003 meaning insufficient observations	1317
Not classified as multi-sector funds	1028
Fund management failed to clearly define the asset allocation range for the asset class that they invest in	148
	2493
Final sample of listed managed funds that satisfy all data requirements	**246**

Source: Morningstar Direct Database, Morningstar Total Access database.

The composition of the sample data is shown in Table 2 and highlights that the majority of funds are classified as either growth (40%) or balanced (26%). A possible explanation for this is that during the sample period investors were more optimistic than on average due to the strength of the market (DotCom boom prior to 2000, credit boom post 2002). The market optimism led to a decrease in the popularity of defensive and conservative funds.

Table 2. Descriptive statistics for final sample, April 2003 to March 2008

This table presents a breakdown of the total sample (n) included within this paper by classification. Additionally, summary statistics are presented.

Category of Fund	n	Mean Monthly Return*	Std Dev Monthly Return*	Proportion of Sample
Multi-Sector Defensive	32	0.60%	1.01%	13.01%
Multi-Sector Conservative	27	0.55%	0.90%	10.98%
Multi-Sector Income	23	0.71%	1.45%	9.35%
Multi-Sector Balanced	65	0.83%	1.70%	26.42%
Multi-Sector Growth	99	0.86%	2.03%	40.24%
Total No. of Funds	246	0.77%	1.69%	100.00%

*Average values of each fund category

RBSA requires the use of appropriate style indices. For all cases the appropriate benchmark indices representative of the broad asset classes that an Australian multi-sector fund would invest in are necessary. The desired characteristics of asset class indices are outlined by Sharpe (1992), where it is specified that indices used should be: (i) mutually exclusive; (ii) exhaustive; (iii) have returns that differ; and (iv) should therefore have low correlation with each other. With these conditions in mind and in the spirit of Faff et. al. (2005) the following asset classes/benchmark indicies are adopted: Australia DataStream market - accumulation index (AEQ), MSCI World ex AU - Accumulation index, $A (IEQ), S&P/ASX 300 property trust index – Accumulation (LP), AU UBS Composite Bond Index - All maturities (AFI), CGBI WGBI World Non A$ All Maturities A$ (OFI), UBS AU Bank bill index all maturities – Accumulation (CASH). These same indices were used in a study of Australian multi-sector funds by Holmes and Faff (2007). The returns for these benchmark indices were obtained from the Datastream database for the period from April 2003 to March 2008.

Table 3 presents the correlation coefficients for the six benchmark indices. It is evident that no two asset classes are correlated with the exception of international (IEQ) and Australian equity (AEQ) indicies which is unavoidable providing confidence with the reliability of the analysis. Additionally, there exists a lack of options available for selecting an appropriate benchmark for these asset classes. An examination of the descriptive statistics, also presented in Table 3, with respect to return and standard deviation illustrate these asset classes are different and therefore appropriate within the RBSA.

Table 3. Correlation and descriptive statistics between asset class indices
The descriptive statistics presented are for the monthly returns over the sample period April 2003 to March 2008.

	AEQ	*IEQ*	*LP*	*AFI*	*OFI*	*CASH*
AEQ	1.00					
IEQ	0.822	1.000				
LP	0.582	0.538	1.000			
AFI	-0.176	-0.141	0.195	1.000		
OFI	-0.409	-0.466	0.006	0.491	1.000	
CASH	-0.292	-0.377	-0.229	0.232	0.301	1.000
Median Return	1.44%	1.07%	0.84%	0.39%	0.00[7]%	0.48%
Std. Deviation	2.88%	2.72%	3.84%	0.67%	2.57%	0.06%

[7]The median average return for CGBI World Non A$ All Maturities index (OFI) over the sample period April 2003 to March 2008 is actually -0.0048%

3.2 Research Design

Returns based style analysis (RBSA) involves an application of an asset class factor model developed by Sharpe (1988; 1992) and introduced in Equation 1.

$$R_{it} = [w_{i1}F_{1t} + w_{i2}F_{2t} + \ldots\ldots + w_{in}F_{nt}] + e_{it}$$

Equation 1

R_{it} is the return on fund $_i$ in period $_t$, F_{nt} represents the return of factor n for fund$_i$ in which the factors are the values of the various asset class index returns and w_{in} is the managed fund's style weight for asset class n. The error term e_{it} is the proportion of fund return which is not explained by the combination of asset class indices and can therefore be thought of as the selection component of the model. To determine the style weights the variance of the error term must be minimized subject to the constraints that the weights sum to unity and be non-negative. To achieve this Equation 1 can be rearranged to solve for the error as follows:

$$e_{it} = R_{it} - [w_{i1}F_{1t} + w_{i2}F_{2t} + \ldots\ldots + w_{in}F_{nt}]$$

Equation 2

On obtaining results from Equation 2, the standard deviation of the error term (selection) can be thought of as the tracking error of the fund from its customised passive benchmark portfolio. The proportion of variance that can be explained by the fund's style is obtained from Equation 3.

$$R^2 = 1 - \frac{Var(e_i)}{Var(R_i)}$$

Equation 3

The right hand side of Equation 3 is equal to 100% minus the proportion of variance unexplained, while the left hand side indicates the proportion of variance explained by the n asset classes (Sharpe 1992). A low R^2 can be explained by either high levels of selection in a fund, a frequent change in investment style during a period, or the fund investing in derivatives whose effects cannot be captured by any of the indices (Lucas and Riepe 1996).

RBSA examines historical returns and gives estimates of the fund's true style weightings. Sharpe (1988, pp. 65) states in reference to the technique, "if it acts like a duck, assume that it is a duck". To improve the efficiency of the technique this paper will apply confidence intervals to the style weights by using the approach developed by Lobosco and Dibartolomeo (1997). Before this approach was developed there was no good measure of the quality of fit for the estimated individual style weightings. To implement this technique the standard deviations of the estimated style weights are approximated using the following equation:

$$\sigma_{wi} = \frac{\sigma_a}{\sigma_{Bi} \times \sqrt{n-k-1}}$$

Equation 4

In Equation 4, the subscript i represents the index corresponding to the style weight being estimated σ_a is the standard deviation of the style analysis, σ_{Bi} denotes the "unexplained returns based style analysis index volatility" for index i, n the total number of returns used in the style analysis and k the number of market indices with non-zero style weights. B_i represents the portion of the returns for index i which are not attributable to the other market indices. The standard deviation of this return series is known as the "unexplained Sharpe style index volatility". As identified in Lobosco and DiBartolomeo (1997) The confidence interval calculated for a style weight on a particular index will (1) increase with the standard error of the style analysis, (2) decrease with the number of returns used, and (3) decrease with the independence of the market index from the other indices used in the analysis. The practical benefits of having confidence intervals are that statements regarding the significance of style weights can be made. This is useful to the analysis conducted within this paper as it will allow for greater precision when determining whether or not the style weights are outside the fund's asset allocation range.

Due to its ability to accurately determine a fund's investment style, RBSA can also be used to evaluate whether the stated style is consistent with what is happening in practice. For example, in the case of equity funds it is a matter of examining which index is dominant based on the style weighting and then making a comparison with the stated investment objective. In this paper the task of identifying misclassification is more difficult given the emphasis on multi-sector funds. The problem is complicated due to fact that each of the five general multi-sector styles (income, defensive, conservative, balanced and growth) is comprised of a strategic allocation among six major asset classes. There exist dominant indices among these styles and are subject to intersection in terms of a balanced and growth fund both having Australian equities as their dominant index. In order to determine if a multi-sector fund has been misclassified, a comparison with the fund's mandated asset allocation range for each asset class is necessary. Multi-sector funds like all other fund types disclose via their PDS the specific investment strategy. In addition within the PDS it is stated what asset classes the fund will invest in and the range that the manager is, on average over the recommended investment horizon of the fund, mandated to abide by. These ranges are typically set under the premise that a fund

manager will adhere to them on average over the fund's investment horizon, unless authorised by a majority of unit holders to deviate from the stated investment policy (Kim et. al. 2000). On the basis of this evidence RBSA is a suitable technique to use to answer the first part (underlined) of the contingent research question: Do significant levels of misclassification exist for Australian multi-sector managed funds and *if so what, if any, are the effects on fund performance*?

The second part of the contingent research question (*in italics*) deals with the association between fund misclassification and performance. Using RBSA, individual customised benchmarks which represent the best linear combination of asset class indices are created for each multi-sector fund within the sample. The customised benchmarks are then used to asses each fund's risk adjusted performance so that comparisons can be made between them. To achieve this, the information ratio is calculated for each fund. The information ratio (IR) is intended to serve as a measure of the special information that an active portfolio reveals through its return (Goodwin 1998). The value added or subtracted through active management per unit of added risk for monthly data is given by Equation 5.

$$IR = MIR \times 12$$

Equation 5

MIR refers to the monthly IR and can be found by dividing the monthly mean return by the tracking error as shown in Equation 6.

$$MIR = \frac{E(\bar{e}_i)}{\sigma \bar{e}_i}$$

Equation 6

The IR for each fund is then tested for statistical significance using the t-statistic in order to verify the null hypothesis for *H2*. Once the information ratio is calculated for each fund a comparison is made between those that are misclassified and those that stayed within the mandated asset allocation range. This allows the determination of whether or not the misclassified funds were able to achieve higher risk adjusted returns than the correctly classified counterparts. Ascertaining whether any observed differences are statistically significant is determined by conducting an independent samples t-test and then a Mann-Whitney U test for robustness.

To test whether a formal relationship exists between misclassification and performance cross sectional OLS regression is adopted following Holmes and Faff (2007), refer to Equation 7.

$$y_i = \beta_1 + \beta_2 D_1 + \beta_3 D_2 + \beta_4 D_3 + \beta_5 D_4 + \beta_6 D_5 + \beta_7 MER + \beta_8 SIZE + \varepsilon_i$$

Equation 7

To control for any effect that fund style may have, dummy variables for each are included in the regression equation. Where D_1 =1 for defensive style and 0 otherwise; where D_2 =1 for conservative style and 0 otherwise; where D_3=1 for income style and 0 otherwise; where D_4 =1 for growth style and 0 otherwise; where D_5=1 for misclassified funds and 0 otherwise. To avoid the dummy variables leading to a situation of perfect multicollinearity the balanced fund dummy is excluded. As misclassification is determined by examining the result of RBSA, a dummy is included where 1 represents a fund being misclassified and 0 otherwise.

Control variables for fund *SIZE* the management expense ratio (*MER*) are included in Equation 7 to capture any effects that they may have on the findings. Fund size is calculated as the natural log of the average fund size over the sample period while the median *MER* over the sample period is used for the explanatory variable. A relationship linking performance to fund size has been previously investigated (Gallagher and Martin 2005; Sawicki and Finn 2002). However, no consensus has been reached as to the nature of this link with studies finding either an inverse relationship or none at all. When including fund size in the regression the effect that it can have on *MER* needs to be explained. There is a documented inverse relationship between the two which is attributed to the effects that economies of scale can have in improving efficiency and reducing costs (Geranio and Zanotti 2005; Dowen and Mann 2004). Further to this, Holmes and Faff (2007) document a negative relationship with performance, implying that higher *MER* is not necessarily associated with higher skill.

7.4 Empirical Results

The ability of multi-sector fund managers to remain within their mandated asset class ranges and the association that this ability has with their capability to add value is the research question that is investigated within this paper.

In order to address the first part of this question RBSA is first implemented by minimising Equation 2 using Excel Solver to implement the non-negativity and the unity constraints required to perform the quadratic programming. In order to achieve this, as indicated earlier six representative asset class indices are used to determine the mean style weightings of each fund over the sample period. The style weights are then used to break down fund return that represents a linear combination of the asset class style indices plus a fund-specific error term. The degree of style and selection are then calculated as shown in Equation 3 along with the unexplained RBSA index volatility for each asset class.

R^2 is calculated for each fund following Equation 3 and presented in Table 4. On average over the total sample the amount that style contributes to

overall return is 88.615%. This finding over the sample period can be explained due to (i) low levels of selection from multi-sector fund managers (ii) and/or high levels of style consistency. Based on the results from this paper and previous studies in the literature, it is unlikely that style consistency is the main source of the high R^2 figure. A likely explanation for the high R^2 can therefore be attributed to low levels of selection.

A summary of the results of the style analysis is presented in Table 4. On average across all funds the most heavily weighted asset classes were Australian Equities, henceforth AEQ (32.86) and International equities, henceforth IEQ (19.00). A preference towards equity type securities amongst multi-sector fund managers is identified and it can be attributed to an over representation of growth and balanced funds within the sample. This over representation has created a potential bias towards their respective styles that are known to invest more heavily in equities "an equity bias". Another finding of interest is the general lack of investment in the property sector, a surprising result given the strong residential and commercial property market in Australia over the period 2003-2008. Aside from property, the second least heavily weighted asset class is overseas fixed income, henceforth OFI (10.97) with funds in general looking towards the more familiar Australian fixed income, henceforth AFI class of investments (column 5) when including fixed interest assets in their portfolio.

Table 4 presents an overview of asset allocation across the five multi-sector fund categories. On average the role that style plays (refer to style, column 8) in fund return is fairly high among all styles with the minimum being 82.588% for funds classified as conservative and the highest is 92.094% for balanced funds. This is not a large variation and suggests fund managers tend towards low levels of selection regardless of their style. As expected style weightings vary among the different investment objectives. An example of this variation is observed with funds that report to adhere to a growth objective. Prior expectations would suggest these types of funds, to have higher weightings in equities (AEQ and IEQ) than conservative funds, which is confirmed through style analysis, 65.329% and 24.193% for growth and conservative respectively[8]. As expected and reported in Table 3 there exists weighting similarities for funds with similar objectives such as conservative and defensive funds. An unexpected finding is the high degree of similarity between growth and balanced categories when their style weights are examined (column 8, Table 4). The only departure from this observation of note is that for AFI. Individual investors who choose to invest their savings in a balanced fund due to a perceived lower exposure to risky assets would be concerned with this finding, as would professional advisors who adhere to the prudent investor law.

Having created Sharpe style weights that allowed for inferences to be drawn about multi-sector managed fund behaviour and composition it is necessary to derive the confidence intervals of those weights following Lobosco and Dibartolomeo (1997). Making use of Monte Carlo simulation it is then possible to verify the funds capacity to produce an effect under ideal conditions. A summary of the results obtained (upper and lower bounds) are presented in Table 5.

Previous studies that have evaluated style analysis have tended to use the R^2 statistic as a measure of goodness of fit (Sharpe 1992). The contribution of Lobosco and Dibartolomeo (1997) in that study extended the literature to have a measure of the quality of fit for individual styles by deriving an expression that allows for the approximation of confidence intervals on style weights. The approximated confidence intervals can be useful in terms of disallowing certain combinations of market indices. In cases where indexes to be used to evaluate style are too similar, the confidence intervals will be unacceptably large. With reference to Table 5 (confidence intervals reported at a 95% level of certainty), that in no single case are the intervals found to be excessively wide indicating that the indices adopted in this study are suitable for analysing style for the asset classes investigated. The confidence intervals show that the point estimates are relatively precise reflections of the portfolio weights. The creation of confidence intervals also allows practitioners to determine whether the style weights for each investment objective are significantly different. The findings presented in this paper show that each investment objective is unique with respect to their style weightings.

[8] For growth funds the total weighting of 65.329 in equities consists of 40.813 invested in AEQ and 24.516 invested in IEQ. For conservative funds the total weighting of 24.193 in equities consists of 15.633 invested in AEQ and 8.56 in IEQ.

Table 4. Mean Style Weightings for Fund Categories

Returns based style analysis was carried out on all 246 funds over the sample period of April 2003 to March 2008. The estimated style weights (presented as percentages) calculated for each asset class represent the percentage a fund has allocated to that particular asset class. Mean values are reported with standard deviation in parentheses. The amount of return variability attributed to the funds style is given as a percentage in the eighth column. Additionally, The variability for selectivity (*) is identical to that for style in each case. In this table and all subsequent tables the abbreviations (in brackets) represent Australia DS market - accumulation index (AEQ), MSCI World ex AU - Accumulation index, $A (IEQ), S&P/ASX 300 property trust index – Accumulation (LP), AU UBS Composite Bond Index - All maturities (AFI), CGBI WGBI World Non A$ All Maturities A$ (OFI), UBS AU Bank bill index all mats – Accumulation (CASH)

Fund Category	AEQ	IEQ	LP	AFI	OFI	CASH	Style	Selectivity
Multi-Sector Defensive	16.305	11.56	6.147	32.973	6.119	26.896	88.343	
N = 32	(4.739)	(5.355)	(3.431)	(13.545)	(4.823)	(14.463)	(12.153)	11.657
Multi-Sector Conservative	15.633	8.56	4.124	37.207	3.891	30.588	82.588	
N = 27	(5.742)	(4.955)	(2.528)	(18.701)	(3.387)	(20.887)	(19.510)	17.412
Multi-Sector Income	28.983	7.652	6.919	29.171	2.756	24.518	83.447	
N = 23	(17.207)	(9.247)	(6.448)	(20.021)	(4.189)	(22.644)	(20.080)	16.553
Multi-Sector Balanced	37.413	22.622	4.372	13.395	15.504	6.693	92.094	
N = 65	(39.099)	(6.720)	(3.232)	(14.275)	(7.802)	(7.284)	(7.602)	7.906
Multi-Sector Growth	40.813	24.516	6.587	9.175	13.405	5.503	89.263	
N = 99	(11.029)	(8.488)	(4.526)	(14.941)	(8.792)	(12.557)	(9.847)	10.737
Total Funds	32.857	19.002	5.705	18.332	10.972	13.131	88.615	
N=246	(14.289)	(10.081)	(4.249)	(18.907)	(8.680)	(17.342)	(12.612)	11.385

Table 5. Confidence Intervals of Style Weights

In this table the upper limit and lower limit for the estimated style weights are presented for each asset class (at a 95% level of certainty) over the sample period of April 2003 to March 2008. Mean confidence intervals are reported for each fund style and the standard deviations used to calculate the confidence intervals are presented in parentheses. The standard deviation for style weights are approximated following Lobosco and Dibartolomeo (1997) $\sigma_{wi} = \frac{\sigma_a}{\sigma_{Bi} \times \sqrt{n-k-1}}$ where σ_a represents the standard error of the style analysis, σ_{Bi} is the unexplained Sharpe style index volatility for index *i*, n is the number of returns used in the style analysis, k the number of market indexes with nonzero style weight and *i* the index corresponding to the style weight being estimated.

Confidence Intervals	Multi-Sector Defensive N = 32		Multi-Sector Conservative N = 27		Multi-Sector Income N = 23		Multi-Sector Balanced N = 65		Multi-Sector Growth N = 99		Total Funds N = 246	
Fund Category	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit
AEQ	16.359 (2.725)	16.252 (2.725)	15.692 (2.995)	15.574 (2.995)	29.063 (4.078)	28.904 (4.078)	37.487 (3.789)	37.339 (3.789)	40.914 (5.128)	40.713 (5.128)	32.938 (4.129)	32.776 (4.129)
IEQ	11.614 (2.777)	11.505 (2.777)	8.620 (3.052)	8.501 (3.052)	7.734 (4.156)	7.571 (4.156)	22.698 (3.861)	22.547 (3.861)	24.619 (5.226)	24.414 (5.226)	19.085 (4.208)	18.920 (4.208)
LP	6.175 (1.437)	6.119 (1.437)	4.155 (1.579)	4.093 (1.579)	6.961 (2.150)	6.877 (2.150)	4.411 (1.998)	4.333 (1.998)	6.640 (2.703)	6.534 (2.703)	5.748 (2.177)	5.662 (2.177)
AFI	33.121 (7.541)	32.825 (7.541)	37.369 (8.288)	37.044 (8.288)	29.393 (11.285)	28.950 (11.285)	13.601 (10.484)	13.190 (10.484)	9.453 (14.189)	8.897 (14.189)	18.556 (11.426)	18.108 (11.426)
OFI	6.155 (1.845)	6.083 (1.845)	3.931 (2.027)	3.851 (2.027)	2.811 (2.760)	2.702 (2.760)	15.554 (2.565)	15.454 (2.565)	13.473 (3.471)	13.337 (3.471)	11.027 (2.795)	10.917 (2.795)
CASH	27.032 (6.931)	26.760 (6.931)	30.734 (7.618)	30.435 (7.618)	24.721 (10.372)	24.315 (10.372)	6.882 (9.637)	6.505 (9.637)	5.759 (13.042)	5.248 (13.042)	13.337 (10.502)	12.925 (10.502)

After performing the RBSA a significant number of funds were identified as being outside of their asset allocation range. Table 6 provides a summary of the findings.

Table 6. Composition of Misclassified Funds

Returns based style analysis was implemented to determine each managed funds estimated style weights and therefore identify which funds invested outside their mandated asset allocation range. A fund is deemed misclassified if it is outside its asset allocation range for any asset class. The number of funds misclassified is given as both a percentage of the total number of funds misclassified (refer to column 4) and as a percentage of the number of funds misclassified in a particular category (refer to column 5). Results presented are over the sample period of April 2003 to March 2008.

Category of Fund	N	Number of Funds Misclassified	Number of Funds as Percent of Total Misclassified	Number of Funds as Percent of Category
Multi-Sector – Defensive	32	19	10.05%	59.38%
Multi-Sector – Conservative	27	20	10.58%	74.07%
Multi-Sector – Income	23	14	7.41%	60.87%
Multi-Sector – Balanced	65	58	30.69%	89.23%
Multi-Sector – Growth	99	78	41.27%	78.80%
Total Sample Size	246	189	100.00%	76.83%

Out of the 246 funds in the sample 189 or 76.83% of them were deemed to be misclassified. This finding rejects H_0 that no significant levels of misclassification exist amongst Australian multi-sector managed funds supporting H_A1. Growth funds represented the category of funds that was identified as containing the greatest number of funds deemed to be misclassified (41.27%) with balanced funds (30.69%) coming in at a relatively close second place. When looking at the percentages of misclassified funds within each category, it can be identified that balanced funds have an almost 90% (89.23%) rate of misclassification. As shown in Table 6 this on the surface appears a high rate (90%) but when market conditions are taken into account it makes intuitive sense that this finding holds for the sample period investigated, given the bullish nature of the market. Fund managers, as indicated by the heavy concentration in equity type securities, overweighted their portfolios in growth assets during the sample period. On the basis of the performance of the Australian all ordinaries market index over the sample period it is clear that Australian shares were highly attractive and included within multi-sector fund portfolios at the expense of remaining within the mandated fund objective. This is an alarming finding and one that would have serious ramifications in the event of a significant market reversal.

This study predates the full impact of the global financial crisis (GFC) which became apparent in the US financial market in August 2007 and reached a crisis point in the US in August 2008. However, in Australia the impact has not been as significant as experienced in many other countries around the world (Fritjers, Dulleck, & Torgler, 2009). From the year 2003 to 2008, the Australia economy was booming as illustrated by the increase in the Australian All Ordinaries Index over this period (see Figure 1). With that said, the Reserve Bank of Australia (RBA) had a constant cash rate increase of 0.25% as also demonstrated in Figure 1 However in late 2008[9] (after the end of the sample period in this study) Australia experienced a massive decrease in cash rates as shown in Figure 1. This was mainly due to the GFC which caused dramatic changes in the Australian economy. Although Australia did not enter recession it was still severely affected.

Further examination of misclassified balanced funds was undertaken in order to investigate whether or not they were overweight (represented by 'A' in Table 7) for Australian equities (AEQ) or International Equities (IEQ). Multi-sector Balanced identified in Table 6 as the category with the greatest misclassification of funds has 25 of the 58 funds identified as being outside the stipulated dominant index (refer to Table 7). Closer inspection demonstrates that of these 17 or 68% (represented by A in column 4 of Table 7) were overweight in AEQ[10]. In total 26 funds were overweight with respect to AEQ or IEQ and two funds (fund number 200 and 213, refer Table 7) were overweight in both asses classes. These findings support the previous assertion that balanced funds consistently broke their PDS mandate in order to take advantage of higher returns at the expense of exposing investors to higher risks and also possibly reducing their exposure to other asset classes through portfolio rebalancing. A similar assertion can be made in regard to growth funds

[9] The RBA responded to the impact of the GFC for the first time by easing monetary policy in its September 2008 meeting when official cash rates were reduced by 0.25%. In October 2008 the RBA stepped up its response by reducing the official cash rates by a full 100 basis points. The stimulus package and activity by the RBS to the GFC were after the end of the sample period in this study.

[10] Three Funds, Fund number110, 184 and 204 were underweight in AEQ (refer Table 7)

which have the second highest percentage of misclassification (Table 6).

In total 29 growth funds were overweight in their dominant index (refer Appendix A.2, Panel D). The fund styles with the least amount of misclassification among them were income and conservative with 10 and 13 funds respectively identified as being outside the mandated range in the stipulated dominant index. Closer investigation of each asset class index allowed identification of the percentage of funds that are deemed overweighted was above those that were underweighted[11].

It follows that these numbers would be fairly close together when fund managers overweight a particular asset class; they may have to underweight another. In the case of multi-sector Income 10 funds were overweighted in either AEQ or IEQ; for multi-sector Growth 26; for multi-sector Defensive 4; and for multi-sector Conservative 5. In total 92 funds were misclassified in their dominant index with 71 of those being overweight in either AEQ or IEQ, suggesting managers may be attempting to time their fund's dominant index. How significant this finding is to investors is yet to be determined. Are managers who go outside of their mandated ranges doing so to take advantage of any special information they may have? Are these managers able to use this information or skill to add value? If so should investors really be all that concerned about misclassification. To answer these questions an analysis of fund performance is necessary.

To measure the performance, the information ratio was calculated for each fund (see Table 8). This ratio provides a risk adjusted measure that is useful not only for comparing skill across active managers but also for measuring a manager's performance above that attributed to investment style. The information ratio is arguably the best single measure of risk adjusted performance available (Goodwin 1998). A top quartile manager will have an information ratio of one half or higher according to Grinold and Kahn (1999). Following this evidence only 6 funds[12] out of the 246 funds evaluated can be said to have done a good job (Table 8, last column row 4).

[11] Full details are available regarding the remaining categories in Appendix A.1

[12] Funds are not identified by name in this table for purposes of brevity. A full table reporting fund name, fund classification according to PDS, whether the fund is classified correctly or not according to PDS, the information ratio, t-statistics and one and two tail significance levels are provided in Appendix A.2

Figure 1. Performance of Australian All Ordinaries Index and Changes in Official Cash Rates by Australian Reserve Bank (March 2003 – April 2008)

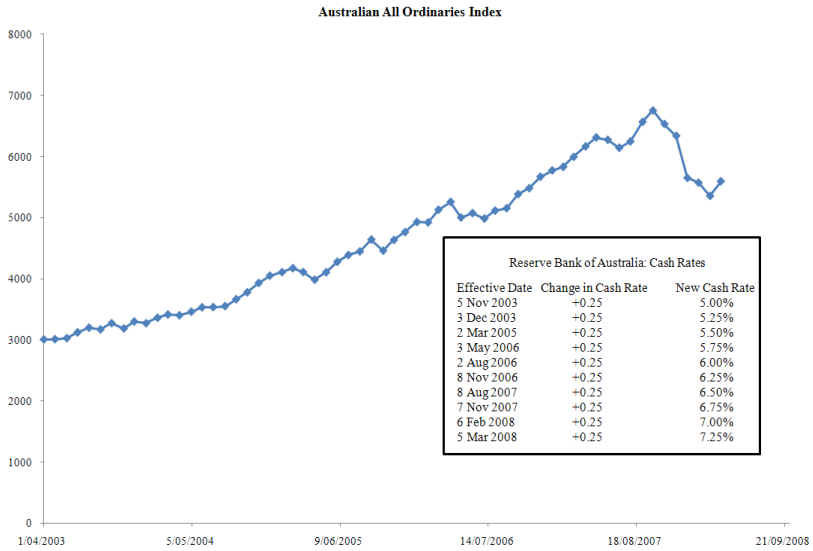

Table 7. Overweighted Investment in Australian Equities (AEQ): Multi-sector Balanced Funds

The following figure demonstrates whether asset classes in columns 4 through 9are overweighted (A) or underweighted (B) according to the PDS of each respective fund. Where a cell is shaded in black, for example the intersection between fund number 1 and AEQ indicates the dominant index for that particular fund. The dominant index is specified in column 2 and the total number of asset classes the fund invests in is indicated in column 2.

Fund Number	Dominant Index	Asset Classes	AEQ	IEQ	LP	AFI	OFI	CASH
1	AEQ	3	A			A	B	
12	AEQ	3	A		A	B		
13	AFI	1						A
16	AEQ	2				B	A	
18	AEQ	3		A		B	A	
21	AEQ	1					A	
27	AEQ	1	A					
31	AEQ	5	A	B	B		A	B
37	AEQ	1				A		
39	AEQ	1				B		
45	AEQ	1					A	
48	IEQ	1	A					
50	AEQ	2		B	A			
58	AEQ	1					A	
64	AEQ	1					A	
67	AEQ	3	A	B		B		
69	AEQ	2					B	A
70	AEQ	1					A	
75	AEQ	1	A					
88	AEQ	3			B	B	A	
92	AEQ	1	A					
99	AEQ	1	A					
101	AEQ	3		B		B		A
109	AEQ	1					A	
110	AEQ	2	B		B			
111	AFI	3	A	B	A			
113	AEQ	2	A				A	
116	AEQ	5	A		B	A	B	B
119	AEQ	3			B		A	B
131	AEQ	2				B	A	
134	AEQ	1		A				
138	AEQ	3	A			B		A
143	AEQ	3	A			B		A
148	AEQ	5	A	B	B	B	A	
164	AEQ	2				B	A	
167	AEQ	1	A					
169	AEQ	2				B	A	
170	AEQ	2				B	A	
174	AFI	4			B	A	B	B
176	AEQ	2				B	A	
181	AEQ	4			B	A	B	B
184	AEQ	2	B				A	
190	AEQ	2				B	A	
193	AEQ	2				B	A	
195	AEQ	4		A		B	A	B
200	AEQ	3	A	A				A
204	AEQ	2	B		B			
206	AEQ	1	A					
207	IEQ	2	B	A				
209	AEQ	3	A			A		B
212	AFI	4	A		B	A	B	
213	AFI	5	A	A	B	A	B	
214	IEQ	3		A		B	A	
221	IEQ	3			B	A	B	
224	AEQ	3				B	A	B
234	AEQ	2		B			A	
245	AEQ	2				A		B
246	AEQ	4		A		B	A	B

Those funds identified as qualifying for the top quartile include: two multi-sector Income classified funds with information ratios of 1.552 and 0.586 with significance at the 10% and 1% level respectively (Table 8, column 4); three multi-sector funds with a classification of Balanced with information ratios of 1.081, 0.937 and 0.633 and found to be significant at the 1%, 5% and 10% level respectively (Table 8, column 5); and one multi-sector fund classified as Growth with an information ratio of 0.754 and found to be significant at the 5% level (Table 8, column 6)

Table 8. Summary Statistics for Fund Performance Measured by the Information Ratio

Descriptive statistics for the performance of funds in aggregate and segmented into their categories over the sample period of April 2003 to March 2008 are presented in this table. The numbers of positive and negative cases are given for each category with the numbers that are statistically significant shown in parentheses. The information ratio was calculated by dividing the monthly mean return by the tracking error. (a) indicates the number of statistically significant cases at the 1% level, (b) indicates the number of statistically significant cases at the 5% level, and (c) indicates the number of statistically significant cases at the 10% level.

Fund Category	Multi-Sector Defensive (n = 32)	Multi-Sector Conservative (n = 27)	Multi-Sector Income (n = 23)	Multi-Sector Balanced (n = 65)	Multi-Sector Growth (n = 99)	Total funds (n = 246)
No. of positive cases	3	2	5	13	13	36
	$(0)^a(0)^b(0)^c$	$(0)^a(0)^b(0)^c$	$(1)^a(0)^b(1)^c$	$(1)^a(1)^b(1)^c$	$(0)^a(1)^b(0)^c$	$(2)^a(2)^b(2)^c$
No. of negative cases	29	25	18	52	86	210
	$(11)^a(1)^b(4)^c$	$(13)^a(2)^b(1)^c$	$(11)^a(2)^b(2)^c$	$(11)^a(10)^b(6)^c$	$(11)^a(28)^b(10)^c$	$(57)^a(43)^b(23)^c$
Mean	-0.782	-1.081	-0.7432	-0.44	-0.548	-0.627
St Dev	0.662	0.982	0.898	0.568	0.481	0.668
Maximum	0.119	0.488	1.552	1.081	0.754	1.552
Minimum	-2.608	-3.222	-2.494	-1.883	-2.465	-3.222

As observed from Table 8 on average Australian multi-sector managed funds have not performed well. Not only did they not add any value, but also as the persistence of negative information ratios suggests they are on average eroding value. Only 6 funds were found to have significantly positive information ratios as opposed to 123 (Table 6, column 7) which demonstrated significantly negative performance. The implication is that the gamble managers take based on their special information or skill are not paying off and even in strong market conditions it is difficult to correctly select investments which add value over a style-specific benchmark.

Different styles adopt different risk and return patterns based on their allocated investments as dictated by their unique objectives. Table 8 shows how on average each style of multi-sector fund has performed on a risk adjusted basis. It can be seen over the 2003-2008 sample period that balanced multi-sector funds (column 5) have been the best performing funds with the highest average information ratio of all styles. Of the 13[13] positive information ratios calculated for this category only 3 were found to be statistically significant. The only other categories that contain significantly positive information ratios are growth (column 6) and income (column 4) with conservative (column 3) coming in as the worst performing category with an average information ratio of -1.081, 16 of which are found to be significantly negative at either the 1%, 5% or 10% level[14].

When comparing information ratios between styles it is important to note that the style with the highest ratio may not be the most suitable as no consideration of an investor's risk aversion is taken into account. However the fund manager should be able to vary the tracking error and maintain the same information ratio on an ex-ante basis.

Table 9 presents summary statistics for fund performance for both misclassified and correctly classified funds. From Table 9 it can be observed that misclassified funds have a higher average information ratio indicating that they are outperforming their correctly classified peers. Of the 30 positive ratios for misclassified funds 3 are significant at the 5% level and 1 at the 10% level. Conversely for correctly classified funds 1 out of 6 is significant at the 5% level. What are the implications of this finding? Misclassified funds have benefited when all funds are grouped together, but when they are segmented into style categories there appears to be no difference. Investors should not be concerned about whether fund managers are keeping within their mandated asset class ranges.

[13] For multi-sector balanced funds 13 are found to report positive information ratios (2 at the 1% level of significance, 2 at the 5% level of significance and 2 at the 10% level of significance).

[14] For multi-sector conservative funds 16 are found to report negative information ratios (13 at the 1% level of significance, 2 at the 5% level of significance and 1 and the 10% level of significance).

The findings presented in Table 9 point to an association between misclassification and performance. This relationship had been examined by several researchers with the majority finding that performance and misclassification are negatively related. The rationale provided within the existing literature is that misclassification can lead to increased portfolio turnover as well as increased likelihood asset allocation errors by fund managers (Brown et al., 2009; Gallo and Lockwood 1999). In line with popular opinion, the univaraiate analysis presented in Table 8, following Holmes and Faff (2007), provides further evidence for Australian multi-sector funds of the existence of a positive association between style inconsistency and performance. With this positive association in mind a close look at whether there is a significant relationship between misclassification, as defined in this paper following Kim et al. (2000) and the amount of value added by an active manager is necessary. This allows for determination whether or not investors in misclassified funds are benefiting from an active managers' superior information.

Previous literature on the link between fund size and performance is mixed, finding either no relationship or a negative one. Intuitively one might expect that larger funds are more difficult to manage based on the difficulty in finding enough good investments to invest in. However, no significant correlation is found to exist between fund size and performance[15]. The results from executing the cross-sectional regression equation 1 are presented in table 10. The results are consistent with the correlation analysis and imply that managers of larger funds are not able to add any more value than managers of smaller funds. Along with size, a control for management expense ratio was included to take into account the effect of any possible economies of scale that may exist in larger funds. No significant association was found to exist between the two suggesting that fund size does not bring about lower expenses. Interestingly, a significant negative association is evident between MER and the information ratio (Table 10).

[15] The correlation coefficient between the independent variables and the information ratio (IR) were calculated based on Morningstar data provided for fund size (FS) and management expense ratios (MER) for the period from April 2003 to March 2008. Fund size is calculated as the natural log of the average fund size over the sample period. MER refers to the management expense ratio and is represented by the median MER over the sample period. The correlation found for IR and MER was -0.513*; for IR and FS 0.073; and for MER and FS -0.047. (*) identifies that the correlation is significant at the 1% level. For robustness Spearman correlation coefficients were calculated with similar findings found and thus are not reported here.

Table 9. Summary Statistics of Performance for Misclassified and Correctly Classified Funds

Descriptive statistics for the performance of funds in aggregate and segmented into their categories over the sample period of April 2003 to March 2008 are presented in this table. The numbers of positive and negative cases are given for each category with the numbers that are statistically significant shown in parentheses. An independent samples T-test was run to test differences in means as well as a Mann-Whitney U test for Robustness. (a) indicates the number of statistically significant cases at the 1% level, (b) indicates the number of statistically significant cases at the 5% level, and (c) indicates the number of statistically significant cases at the 10% level. (*) Mean Information ratios are significantly different at 1% level.

Panel A: Correctly classified funds

Fund Category	Multi-Sector Defensive (n = 13)	Multi-Sector Conservative (n = 7)	Multi-Sector Income (n = 9)	Multi-Sector Balanced (n = 7)	Multi-Sector Growth (n = 21)	Total funds (n = 57)
No. of positive cases	2	0	2	0	2	6
	$(0)^a(0)^b(0)^c$	$(0)^a(0)^b(0)^c$	$(1)^a(0)^b(1)^c$	$(0)^a(0)^b(0)^c$	$(0)^a(0)^b(0)^c$	$(1)^a(0)^b(1)^c$
No. of negative cases	11	7	7	7	19	51
	$(3)^a(1)^b(1)^c$	$(4)^a(1)^b(0)^c$	$(7)^a(1)^b(1)^c$	$(2)^a(0)^b(2)^c$	$(5)^a(5)^b(3)^c$	$(21)^a(8)^b(7)^c$
Mean	-0.655	-1.563	-0.839	-0.703	-0.709	-0.821*
St Dev	0.645	1.180	1.211	0.457	0.588	0.822
Maximum	0.058	-0.400	1.552	-0.163	0.222	1.552
Minimum	-2.262	-3.222	-2.494	-1.407	-2.465	-3.222

Panel B: Misclassified funds

Fund Category	Multi-Sector Defensive (n = 19)	Multi-Sector Conservative (n = 20)	Multi-Sector Income (n = 14)	Multi-Sector Balanced (n = 58)	Multi-Sector Growth (n = 78)	Total funds (n = 189)
No. of positive cases	1	2	3	13	11	30
	$(0)^a(0)^b(0)^c$	$(0)^a(0)^b(0)^c$	$(0)^a(0)^b(0)^c$	$(1)^a(1)^b(1)^c$	$(0)^a(1)^b(0)^c$	$(1)^a(2)^b(1)^c$
No. of negative cases	18	18	11	48	67	159
	$(8)^a(0)^b(3)^c$	$(9)^a(1)^b(1)^c$	$(5)^a(1)^b(2)^c$	$(9)^a(10)^b(4)^c$	$(6)^a(15)^b(15)^c$	$(37)^a(27)^b(25)^c$
Mean	-0.869	-0.912	-0.682	-0.409	-0.505	-0.568*
St Dev	0.677	0.873	0.673	0.575	0.443	0.604
Maximum	0.119	0.488	0.189	1.081	0.754	1.081
Minimum	-2.608	-2.417	-1.881	-1.388	-1.791	-2.608

Table 10. Cross-Sectional Regression Results

Cross-sectional regression results examining the determinants of the amount of value added through active management as measured by the information ratio of Australian multi-sector managed funds over the sample period of April 2003 to March 2008 are presented in this table. $y_i = \beta_1 + \beta_2 D_1 + \beta_3 D_2 + \beta_4 D_3 + \beta_5 D_4 + \beta_6 D_5 + \beta_7 MER + \beta_8 SIZE + \varepsilon_i$ (Equation 7) where D_2 =1 for defensive style and 0 otherwise; Where D_2=1 for conservative style and 0 otherwise; Where D_3 =1 for income style and 0 otherwise; Where D_4=1 for growth funds and 0 otherwise; Where D_5=1 for misclassified funds and 0 otherwise. The t-statistic is recorded in parentheses under the estimated coefficient (statistically significant coefficients t-statistics are bolded). (*) denotes significance at 1% level, (**) denotes significance at the 5% level.

Dependent Variable: Information Ratio	
Independent Variables	
Constant	0.370**
	(2.129)
Multi-Sector: Defensive	-0.568*
	(-4.413)
Multi-Sector: Conservative	-0.626 *
	(-4.913)
Multi-Sector: Income	-0.019
	(1.42)
Multi-Sector: Growth	-0.053
	(-0.596)
Misclassification	0.091
	(1.035)
Management Expense Ratio (MER)	-0.635*
	(-10.282)
Fund Size	-0.004
	(-0.224)
R^2	0.394

This significant result is found to hold for the cross-sectional regression analysis with results presented in Table 10. The significant negative association reported is alarming as it implies that the higher the expense ratio the less is the value a manager adds which is opposite of what an investor would hope for and expect. If paying more in management expenses does not lead to better performance then why are investors willing to do so?

The cross-sectional results presented in Table 10 expose the impact that each style category has on performance. Out of five styles examined, only three are significant: balanced, defensive and conservative. A positive association between risk-adjusted performance indicator (the information ratio) and style is evident but only in the case of balanced funds. The other significant style categories were negatively related to performance, which is not surprising considering that on average they had the lowest information ratios. The findings for defensive and conservative fund managers is not surprising given managers for these type of categories tend to be more passive by nature with respect to their investment objectives and therefore less likely to try to time the market.

The findings reported in Tables 8 through to 10 allow for H_A2 to be rejected which means that no association is found to exist between misclassification and fund performance. This finding gives support for the documented evidence provided by Brown et al., (2009).

The insignificant finding between misclassification and performance is consistent with the segmented univariate results summarised in Table 8 and Table 9 and reported in full in Appendix A.2). As a result investors should generally not be too concerned with whether or not a fund manager is able to stay within the mandated ranges because any perceived impact of doing so is only significant when funds are aggregated and no distinction is made between investment styles.

7.5 Conclusion

The findings reported in this paper show that significant levels of misclassification exist for Australian multi-sector managed funds but that the effect on fund performance is not significant. The findings support the concluding remarks of earlier studies, like those of Kim et al. (2000), Brown and Goetzmann (1997), and diBartolomeo and Witowski (1997), that find the current system of classification of managed funds on the basis of their stated objectives has significant room for improvements. Using RBSA this paper shows that 77% of multi-sector funds, with as much as 89% of balanced funds were misclassified over the sample period investigated. The findings suggest that in the case of multi-sector funds the proportion of funds (76.83%) that do not adhere to the reported stated objectives is considerably higher than the 50% of equity funds reported in the case of Kim et al. (2000), and 40% in the case of diBartolomeo and Witowski (1997). However, it is also concluded that despite this alarmingly high proportion of funds acting in a manner inconsistent with their stated objectives, there is no evidence to support an association between misclassification and performance.

The findings in this paper add to the literature by demonstrating that whereas in a bear market misclassification impacts on performance as previously demonstrated in the literature (Brown et al., 2009), no evidence is found to support an association between misclassification and performance in a bull market. If this is the case then whether funds deviate from the stated objectives deliberately or accidently is of no real concern as if there is no impact on performance, then what is the real damage? So what are the implications of misclassification to investors? Should investors simply ignore misclassification and give little attention to a funds mandated asset allocation ranges? The answer lies somewhere in between. While no direct finding of association with performance is identified, misclassification can still lead to investors being much more exposed to a particular asset class than they wish to be exposed.

This paper provides further evidence on the misclassification of funds in a setting different from equity funds. It provides impetus for future research into better fund classification schemes and greater monitoring of fund investments by the Australian Prudential Regulation Authority (APRA) in Australia, and other regulatory bodies of a similar ilk in other countries. Additional areas of interest worthy of further attention but not investigated within this paper include extending the work of Brown et al. (2009) to investigate additional fund types other than equity to determine if the results hold once funds are over exposed to certain asset classes in bullish and bearish market conditions.

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Appendix A.1 Overweighted Investment in Australian Equities (AEQ): The remaining Categories

The following table demonstrates whether asset classes in columns 4 through 9are overweighted (A) or underweighted (B) according to the PDS of each respective fund. Where a cell is shaded in black, for example the intersection between fund number 33 and AFI indicates the dominant index for that particular fund. The dominant index is specified in column 2 and the total number of asset classes the fund invests in is indicated in column 3. Multi-Sector Growth funds are presented in Panel A; Multi-Sector Conservative funds are presented in Panel B; Multi-Sector Income funds are presented in Panel C; and Multi-sector defensive funds are presented in Panel D.

Panel A: Multi-sector Defensive Funds

Fund Number	Dominant Index	Asset Classes	AEQ	IEQ	LP	AFI	OFI	CASH
33	AFI	3				A	B	A
53	CASH	2					A	A
85	CASH	1						B
86	AFI	3	B			A		A
98	CASH	3		A		B		A
112	AFI	1	A					
118	AFI	3			B		B	A
123	AFI	1					B	
125	CASH	2	B					B
136	AFI	2				A	B	
137	AFI	2				A	B	
141	AFI	3			A	A	B	
142	AFI	3		B		A	B	
147	CASH	1						B
188	CASH	2				B		A
217	CASH	4	A		B	B		A
225	AFI	2	A				B	
232	AFI	1				A		
237	AFI	1					B	

Panel B: Multi-sector Conservative Funds

Fund Number	Dominant Index	Asset Classes	AEQ	IEQ	LP	AFI	OFI	CASH
19	AFI	2						
38	CASH	4	A	A	A	B		
44	CASH	1		A				
68	AFI	3	A			B		B
83	CASH	2					B	A
95	AFI	2	A	B				
100	CASH	1			B			
121	AFI	1					B	
166	AFI	2		A				B
173	AFI	3			B	A	B	
178	CASH	2				B		A
180	AFI	3			B	A	B	
185	AFI	2				A	B	
189	AFI	2				A		B
201	CASH	1						A
208	CASH	4		B		A	B	B
215	AFI	2				A	B	
220	AFI	3			B	A	B	
228	CASH	2				B		A
235	AFI	3	B			A	B	

Panel C: Multi-sector Income Funds

Fund Number	Dominant Index	Asset Classes	AEQ	IEQ	LP	AFI	OFI	CASH
2	AFI	1					B	
3	AFI	1	A					
6	AEQ	1	A					
10	AEQ	1						A
26	AEQ	1						A
28	AFI	4		A	A	A		A
29	AEQ	5	A		A	A	A	A
30	AEQ	5	A	A	A		A	A
35	AFI	5	A	B		A	B	A
47	CASH	3			A	B		A
49	AEQ	1	A					
72	CASH	3		A		B		A
133	CASH	3		A		B		A
227	AFI	4		A	B	A	B	

Panel D: Multi-sector Growth Funds

Fund Number	Dominant Index	Asset Classes	AEQ	IEQ	LP	AFI	OFI	CASH
5	AEQ	2				B	A	
7	AEQ	1						A
9	AEQ	1					A	
17	AEQ	1					A	
23	AFI	2				A	B	
24	AEQ	1	A					
32	AEQ	2				B	A	
34	AEQ	5	A	B	B	B	A	
36	AEQ	3						
46	AEQ	1					A	
54	AEQ	1				B		
65	AEQ	1				B		
73	AEQ	2			B	B		
74	AEQ	4	A	B		B	A	
79	AEQ	2				B	A	
80	AEQ	3		B	A	B		
82	AEQ	2			B		A	
84	AEQ	2				B	A	
87	AEQ	2				B	A	
89	AEQ	4	A	B	A			B
93	AEQ	1				B		
97	AEQ	2				B	A	
103	AEQ	3	A	B		A		
104	AEQ	1					A	
105	AEQ	1				B		
106	AEQ	1				A		
107	AEQ	3	A	B			A	
114	AEQ	4	A			B	A	B
115	AFI	1				A		
117	AEQ	5	A		B	B	A	B
120	AEQ	2				B	A	

APPENDIX A.2. Fund Performance measured by Information Ratio

The following appendix presents the full table reporting by fund name and fund classification the information ratio (IR) , t-statistic (T-STAT) and one and two tail level of significance (IR SIG (1T) and IR SIG (2T) respectively) for the sample period April 2003 to March 2008. Additionally it is identified in this table whether funds are misclassified according to the product disclosure statement where (Y) indicates that they are and (N) indicates they are correctly classified. Summary statistics are reported in the main body of the paper. Fund names are not disclosed for publication purposes.

Number	Fund Name	Classification	MC	IR	T-STAT	IR SIG(1T)	IR SIG(2T)
1	MLC MKey InvSer/UT Horizon 4 - Balanced	BALANCED	Y	-0.830	-1.855	5%	10%
2	CFS MIF - Diversified Fund	BALANCED	Y	-1.293	-2.892	1%	1%
3	Australian Ethical Balanced Trust	BALANCED	Y	-0.323	-0.721		
4	BT Inv Choice - Wpac Balanced Grwth	BALANCED	N	-1.254	-2.805	1%	1%
5	BT Class Invmt - Active Bal Fund - NEF	BALANCED	Y	-0.450	-1.007		
6	BT Class Invmt - Balanced Returns Fund	BALANCED	Y	-0.851	-1.903	5%	10%
7	Macquarie Flexible Inv - Balanced Fund	BALANCED	Y	-0.495	-1.108		
8	BlackRock Balanced Fund	BALANCED	N	-0.372	-0.832		
9	Advance Balanced Multi-Blend Fund	BALANCED	Y	-0.955	-2.135	5%	5%
10	Perpetual's Balanced Growth Fund No.2	BALANCED	Y	-0.071	-0.158		
11	IOOF/Perennial Flexi - Balanced Fund	BALANCED	N	-0.439	-0.982		
12	ANZ OA Inv Pfolio-ING Balanced	BALANCED	Y	-0.949	-2.122	5%	5%
13	UBS Balanced Investment Fund	BALANCED	Y	0.159	0.356		
14	CFS MIF - Balanced Fund	BALANCED	N	-1.077	-2.409	1%	5%
15	Perpetual's Invmt Choice - Balanced Gr	BALANCED	N	-0.261	-0.583		
16	BT - Balanced Deeming Fund	BALANCED	Y	-0.688	-1.539	10%	
17	ING OA Inv Pfolio-Balanced	BALANCED	Y	-0.822	-1.837	5%	10%
18	ClearView Mgd Inv-Diversified Balanced	BALANCED	Y	-1.177	-2.631	1%	5%
19	ING OA Inv Pfolio-Balanced NEF	BALANCED	Y	-1.147	-2.564	1%	5%
20	EQT Charitable Balanced Fund	BALANCED	N	0.633	1.414	10%	
21	BT Wholesale - Active Balanced Fund	BALANCED	Y	0.284	0.636		
22	BT Wholesale - Balanced Returns Fund	BALANCED	N	0.111	0.249		
23	BlackRock WS Balanced Fund	BALANCED	Y	0.253	0.567		
24	ING Wholesale - Balanced Trust	BALANCED	Y	-0.336	-0.751		
25	Macquarie Master - Balanced Fund	BALANCED	N	0.099	0.221		
26	BT PPSI - Merrill Lynch Balanced Fund	BALANCED	Y	0.253	0.567		
27	BT PPSI - Ws Active Balanced Fund	BALANCED	Y	-0.199	-0.446		
28	BT PPSI - Ws Balanced Returns Fund	BALANCED	Y	0.111	0.249		
29	Schroder Balanced Fund S	BALANCED	Y	1.081	2.418	1%	5%
30	CFS FC Ws Inv - Ws Balanced Fund	BALANCED	Y	-0.766	-1.713	5%	10%
31	Optimix Ws - Balanced Trust	BALANCED	Y	-0.230	-0.513		
32	MLC Wholesale Horizon 4 Balanced Port	BALANCED	Y	-0.231	-0.516		
33	Advance Ws Balanced Multi-Blend Fund	BALANCED	Y	-0.163	-0.365		
34	Barclays Invmt Funds - Balanced Fund	BALANCED	Y	0.390	0.872		
35	BlackRock P Inv Balanced Fund	BALANCED	Y	-0.051	-0.114		
36	SUMMIT Select - Active Balanced	BALANCED	Y	-0.620	-1.386	10%	
37	SUMMIT Select - Passive Balanced Units	BALANCED	Y	-0.407	-0.910		
38	Ausbil - Balanced Fund	BALANCED	Y	0.225	0.503		
39	Macquarie Flexible Inv - Balanced NEF	BALANCED	Y	-0.731	-1.634	10%	
40	AXA - Wsale Diversified Balanced Fd	BALANCED	N	-0.653	-1.460	10%	
41	Optimix - Balanced Trust	BALANCED	N	-1.198	-2.678	1%	1%
42	AMP Capital Resp Invest Leaders Bal	BALANCED	N	-0.123	-0.275		
43	AXA Generations - AXA Bal	BALANCED	N	-1.109	-2.479	1%	5%
44	Skandia GIS-Skandia Balanced	BALANCED	Y	-0.928	-2.075	5%	5%
45	AMP Capital Resp Invest Leaders Bal A	BALANCED	Y	-0.215	-0.480		
46	Skandia GWS-Skandia Balanced	BALANCED	Y	-0.496	-1.109		
47	BT Wholesale Multi-manager Balanced Fund	BALANCED	Y	-0.657	-1.469	10%	
48	CFS FC Inv - ING Balanced	BALANCED	Y	-1.127	-2.521	1%	5%
49	CFS FC Inv - BT Active Balanced	BALANCED	Y	-0.999	-2.234	5%	5%
50	State Street Global - Passive Bal Trust	BALANCED	Y	-0.030	-0.066		

Number	Fund Name	Classification	MC	IR	T-STAT	IR SIG(1T)	IR SIG(2T)
51	Experts' Choice Balanced Fund	BALANCED	N	-0.014	-0.031		
52	Schroder Balanced Fund	BALANCED	N	0.937	2.095	5%	5%
53	ING OA IP-BlackRock Balanced EF	BALANCED	Y	-0.502	-1.123		
54	ING OA Inv Pfolio-UBS Balanced	BALANCED	Y	-0.658	-1.471	10%	
55	Vanguard Balanced Index Fund	BALANCED	N	0.445	0.995		
56	MLC WS Horizon 3 Conserv Growth Port	BALANCED	N	-0.197	-0.441		
57	MLC MKey InvSer/UT Horizon 3-Conserv Gr	BALANCED	N	-1.032	-2.309	5%	5%
58	Sandhurst BMF Bendigo Balanced Fund	BALANCED	Y	-0.993	-2.220	5%	5%
59	Skandia OIS-Skandia Balanced	BALANCED	N	-1.388	-3.103	1%	1%
60	van Eyk Blueprint Balanced Fund	BALANCED	N	-0.540	-1.208		
61	ClearView Mgd Inv-Prudent	BALANCED	N	-1.407	-3.147	1%	1%
62	BT Investment Multi-manager Balanced	BALANCED	N	-1.205	-2.694	1%	1%
63	Zurich Blend Series Balanced	BALANCED	N	-0.163	-0.366		
64	Vanguard LifeStrategy Balanced Fund	BALANCED	Y	-0.450	-1.006		
65	Russell Balanced Fund Class A Units	BALANCED	Y	-0.337	-0.753		
66	AMP FLI - AMP Conservative	CONSERVATIVE	N	-1.883	-4.210	1%	1%
67	CFS MIF - Conservative Fund	CONSERVATIVE	Y	-1.295	-2.895	1%	1%
68	ANZ OA Inv Pfolio-ING Conservative	CONSERVATIVE	Y	-1.523	-3.406	1%	1%
69	Perpetual's Invmt Choice - Conserv Gr	CONSERVATIVE	Y	-1.517	-3.392	1%	1%
70	Suncorp Conservative Fund	CONSERVATIVE	Y	-1.038	-2.321	5%	5%
71	BT Inv Choice - Wpac Conservative Grwth	CONSERVATIVE	N	-3.146	-7.035	1%	1%
72	Suncorp Conservative Fd (NEF)	CONSERVATIVE	Y	-1.218	-2.723	1%	1%
73	BT Wholesale - Ethical Conservative Fund	CONSERVATIVE	Y	0.117	0.261		
74	BT Wholesale - Conservative Outlook Fund	CONSERVATIVE	Y	-0.400	-0.894		
75	ING Life Wholesale Inv - Capital Stable	CONSERVATIVE	Y	-2.297	-5.136	1%	1%
76	CFS FC Ws Inv - Ws Conservative Fund	CONSERVATIVE	N	-0.579	-1.294		
77	BT PPSI - Ws Ethical Conservative	CONSERVATIVE	N	-0.069	-0.154		
78	BT PPSI - Conservative Outlook Fund	CONSERVATIVE	N	-0.400	-0.894		
79	ING Wholesale - Capital Stable Trust	CONSERVATIVE	Y	-0.359	-0.804		
80	Optimix - Conservative Trust	CONSERVATIVE	Y	-2.417	-5.405	1%	1%
81	Skandia GIS-Skandia Conservative	CONSERVATIVE	N	-1.224	-2.737	1%	1%
82	Aust Unity Conservative Growth Portfolio	CONSERVATIVE	Y	-0.120	-0.268		
83	Skandia GWS-Skandia Conservative	CONSERVATIVE	Y	-0.479	-1.072		
84	BT Wholesale Multi-manager Conservative	CONSERVATIVE	Y	-1.024	-2.289	5%	5%
85	CFS FC Inv - Perpetual Conservative Gr	CONSERVATIVE	Y	-0.635	-1.419	10%	
86	Experts' Choice Conservative Fund	CONSERVATIVE	Y	-0.011	-0.024		
87	Vanguard Conservative Index Fund	CONSERVATIVE	Y	0.488	1.091		
88	Sandhurst BMF Bendigo Conservative Fd	CONSERVATIVE	Y	-1.097	-2.453	1%	5%
89	Skandia OIS-Skandia Conservative	CONSERVATIVE	Y	-1.907	-4.263	1%	1%
90	SMI - ME Secure Fund	CONSERVATIVE	N	0.000	-0.001		
91	ClearView Mgd Inv-Conservative	CONSERVATIVE	N	-3.222	-7.205	1%	1%
92	BT Investment Multi-manager Conservative	CONSERVATIVE	Y	-1.928	-4.312	1%	1%
93	Advance Defensive Multi-Blend Fund	DEFENSIVE	Y	-1.376	-3.077	1%	1%
94	UBS Defensive Investment Fund	DEFENSIVE	N	0.058	0.130		
95	AXA Generations - AXA Defensive Bal	DEFENSIVE	Y	-0.439	-0.981		
96	ClearView Mgd Inv-Diversified Stable	DEFENSIVE	N	-1.319	-2.949	1%	1%
97	Barclays Man Inv - Diversified Stable Fd	DEFENSIVE	Y	-0.421	-0.941		
98	Credit Suisse Capital Stable Fund	DEFENSIVE	Y	-0.692	-1.547	10%	
99	BT Life W Mgt Policy-Capital Stable Port	DEFENSIVE	Y	-1.286	-2.877	1%	1%
100	Macquarie - Capital Stable Fund	DEFENSIVE	Y	-0.366	-0.818		
101	Macquarie Master - Capital Stable Fund	DEFENSIVE	Y	-0.504	-1.127		
102	BT PPSI - Barclays Diversified Stable	DEFENSIVE	N	-0.419	-0.936		
103	BT PPSI Merrill Lynch Wsale Managed Inc	DEFENSIVE	Y	-0.734	-1.641	10%	
104	Optimix Ws - Capital Stable Trust	DEFENSIVE	Y	-1.158	-2.590	1%	5%
105	Advance Ws Defensive Multi-Blend Fund	DEFENSIVE	Y	-0.170	-0.380		
106	Legg Mason Wholesale Defensive Trust	DEFENSIVE	Y	-1.315	-2.941	1%	1%
107	CSuisse Priv - Capital Stable	DEFENSIVE	Y	-1.794	-4.011	1%	1%
108	Barclay Invmt Funds - Capital Stable Fd	DEFENSIVE	N	0.048	0.107		
109	SUMMIT Select - Active Defensive Units	DEFENSIVE	Y	-0.644	-1.440	10%	
110	SUMMIT Select - Active Mod Defensive	DEFENSIVE	Y	-0.518	-1.157		
111	SUMMIT Select - Passive Defensive Units	DEFENSIVE	Y	-0.383	-0.857		
112	SUMMIT Select - Passive Mod Defensive	DEFENSIVE	Y	-0.369	-0.825		
113	CSuisse Sel - Capital Stable	DEFENSIVE	Y	-1.113	-2.489	1%	5%
114	Russell Strategy Defensive (Super)	DEFENSIVE	Y	-0.263	-0.589		
115	Russell Strategy Defensive (Pension)	DEFENSIVE	Y	-0.257	-0.574		
116	Russell Strategy Cautious (Super)	DEFENSIVE	Y	-0.661	-1.477	10%	

Number	Fund Name	Classification	MC	IR	T-STAT	IR SIG(1T)	IR SIG(2T)
117	AXA - Ws Diversified Capital Stable	DEFENSIVE	Y	-1.274	-2.848	1%	1%
118	AXA - Diversified Capital Stable	DEFENSIVE	Y	-2.262	-5.059	1%	1%
119	CFS FC Inv - CSuisse Capital Stable	DEFENSIVE	Y	-1.520	-3.399	1%	1%
120	Select Defensive Portfolio	DEFENSIVE	Y	0.119	0.267		
121	van Eyk Blueprint Capital Stable Fund	DEFENSIVE	Y	-0.064	-0.144		
122	ClearView Mgd Inv-Cautious	DEFENSIVE	Y	-2.608	-5.831	1%	1%
123	Zurich Blend Series Managed Stable	DEFENSIVE	Y	-0.452	-1.011		
124	ipac Classic Portfolio 1	DEFENSIVE	Y	-0.872	-1.950	5%	10%
125	Goldman Sachs JBWere Diversified Growth	GROWTH	Y	-0.865	-1.935	5%	10%
126	Challenger MTM Diversified Growth	GROWTH	Y	-0.997	-2.230	5%	5%
127	ING OA Inv ING Active Growth EF/Slct	GROWTH	Y	-1.113	-2.488	1%	5%
128	AXA - Future Growth Fund	GROWTH	Y	-0.888	-1.985	5%	10%
129	AMP FLI - AMP Balanced Growth	GROWTH	N	-1.082	-2.419	1%	5%
130	BT Inv Choice - Wpac Moderate Grwth	GROWTH	N	-2.465	-5.511	1%	1%
131	BT Inv Choice - Wpac Dynamic Grwth	GROWTH	Y	-0.625	-1.397	10%	
132	BT Invmt - BT Future Goals Fund	GROWTH	N	-0.349	-0.780		
133	BT Class Invmt - Monthly Income Fund	GROWTH	Y	-1.791	-4.006	1%	1%
134	Macquarie Flexible Inv - Managed Growth	GROWTH	Y	-0.598	-1.338	10%	
135	Invesco Diversified Growth Fund	GROWTH	N	-0.477	-1.067		
136	Advance Growth Multi-Blend Fund	GROWTH	Y	-0.876	-1.959	5%	10%
137	MLC MKey InvSer/UT Horizon 5 - Growth	GROWTH	Y	-0.859	-1.921	5%	10%
138	Invesco Protected Growth Fund	GROWTH	Y	-1.239	-2.770	1%	1%
139	ANZ OA Inv Pfolio-ING Managed Growth	GROWTH	Y	-1.140	-2.548	1%	5%
140	Suncorp Growth Fund	GROWTH	Y	-0.508	-1.135		
141	AMP FLI - AMP High Growth	GROWTH	Y	-0.922	-2.061	5%	5%
142	ING OA Inv ING Active Growth NEF	GROWTH	Y	-1.284	-2.870	1%	1%
143	Suncorp Growth Fund (NEF)	GROWTH	Y	-0.762	-1.704	5%	10%
144	Maple-Brown Abbott Diversified Invstmnt	GROWTH	Y	0.070	0.157		
145	Zurich Investments Managed Growth Fund	GROWTH	Y	-0.100	-0.223		
146	Invesco W Protected Growth	GROWTH	Y	-0.765	-1.710	5%	10%
147	Invesco W Diversified Growth	GROWTH	Y	-0.158	-0.354		
148	Barclays Man Inv - Diversified Growth Fd	GROWTH	Y	0.196	0.438		
149	Hyperion Managed Fund	GROWTH	Y	-0.831	-1.858	5%	10%
150	ING Life Wholesale Inv - Managed Growth	GROWTH	Y	-0.982	-2.196	5%	5%
151	Credit Suisse Capital Growth Fund	GROWTH	Y	-0.562	-1.256		
152	BT Classic Investment Fd Asset Selection	GROWTH	N	-0.204	-0.455		
153	CFS FC Ws Inv - CFS Ws Diversified Fund	GROWTH	N	-0.645	-1.441	10%	
154	Macquarie - Balanced Growth Fund	GROWTH	N	0.207	0.462		
155	Challenger WS MTM Diversified Growth Fu	GROWTH	Y	-0.583	-1.304	10%	
156	BT PPSI - Barclays Diversified Growth Fd	GROWTH	Y	0.195	0.436		
157	BT PPSI - Westpac PPS Moderate Growth	GROWTH	N	-0.796	-1.780	5%	10%
158	BT PPSI - Wpac Balanced Growth Fund	GROWTH	N	-0.354	-0.791		
159	BT PPSI - Wpac Dynamic Growth Fund	GROWTH	Y	-0.717	-1.604	10%	
160	Legg Mason Diversified Trust	GROWTH	N	-0.818	-1.830	5%	10%
161	The Enhanced Outcomes Fund	GROWTH	Y	0.145	0.325		
162	Zurich Invests Managed Growth Retail Fd	GROWTH	N	-0.341	-0.763		
163	Optimix Ws - Growth Trust	GROWTH	N	-0.228	-0.509		
164	Perpetual's Ws Balanced Growth Fund	GROWTH	Y	0.078	0.174		
165	MLC Wholesale Horizon 5 Growth Portfolio	GROWTH	Y	-0.394	-0.882		
166	Goldman Sachs JBWere Diversified Gr W	GROWTH	Y	-0.342	-0.764		
167	ING Wholesale - Managed Growth Trust	GROWTH	Y	-0.424	-0.949		
168	CSuisse Priv - Capital Growth	GROWTH	Y	-1.323	-2.958	1%	1%
169	Perpetual WFI Balanced Growth Fund	GROWTH	Y	-0.209	-0.467		
170	Perpetual's Balanced Growth Fund (NEF)	GROWTH	Y	-0.353	-0.790		
171	CFS FC Ws Inv - Ws High Growth Fund	GROWTH	N	-0.563	-1.258		
172	BT Wholesale - Future Goals Fund	GROWTH	Y	0.222	0.497		
173	SUMMIT Select - Active Growth Units	GROWTH	Y	-0.702	-1.570	10%	
174	SUMMIT Select - Active High Growth Units	GROWTH	Y	-0.560	-1.252		
175	SUMMIT Select - Passive Growth Units	GROWTH	Y	-0.585	-1.308	10%	
176	SUMMIT Select - Passive High Growth	GROWTH	Y	-0.589	-1.317	10%	
177	CSuisse Sel - Capital Growth	GROWTH	Y	-0.730	-1.633	10%	
178	BT PPSI Colonial First State Wsale Diver	GROWTH	Y	-0.645	-1.441	10%	
179	BT Classic Investment Fd Asset Selection	GROWTH	Y	-0.204	-0.455		
180	CSuisse Priv - High Growth	GROWTH	Y	-0.661	-1.478	10%	
181	Russell Strategy Prudent (Super)	GROWTH	Y	-0.673	-1.506	10%	
182	Russell Strategy Assertive (Super)	GROWTH	Y	-0.645	-1.441	10%	

Number	Fund Name	Classification	MC	IR	T-STAT	IR SIG(1T)	IR SIG(2T)
183	Russell Strategy Aggressive (Super)	GROWTH	Y	-0.554	-1.238		
184	Russell Strategy Prudent (Pension)	GROWTH	Y	-0.350	-0.784		
185	Russell Strategy Assertive (Pension)	GROWTH	Y	-0.295	-0.660		
186	Russell Strategy Aggressive (Pension)	GROWTH	Y	-0.196	-0.439		
187	Macquarie Master - Growth Fund	GROWTH	N	-0.195	-0.436		
188	AXA - Wsale Diversified High Growth Fund	GROWTH	Y	-0.567	-1.267		
189	Optimix - Growth Trust	GROWTH	Y	-1.145	-2.560	1%	5%
190	AXA Generations - AXA Gro	GROWTH	Y	-0.981	-2.193	5%	5%
191	Skandia GIS-Skandia Growth	GROWTH	Y	-0.723	-1.616	10%	
192	ANZ - Wholesale Growth	GROWTH	Y	-0.385	-0.861		
193	Aust Unity Balanced Growth Portfolio	GROWTH	Y	-0.471	-1.052		
194	Skandia GWS-Skandia Growth	GROWTH	Y	-0.367	-0.821		
195	BT Wholesale Multi-manager Growth Fund	GROWTH	Y	-0.419	-0.936		
196	Perpetual's Ws Diversified Growth Fund	GROWTH	Y	0.142	0.318		
197	Perpetual WFI Perpetual's Divers Growth	GROWTH	Y	-0.247	-0.553		
198	CFS FC Inv - CFS Diversified	GROWTH	Y	-0.926	-2.071	5%	5%
199	CFS FC Inv - Credit Suisse Capital Gr	GROWTH	N	-1.274	-2.849	1%	1%
200	CFS FC Inv - CFS High Growth	GROWTH	Y	-0.738	-1.650	10%	
201	Foundation IV Portfolio	GROWTH	Y	-0.039	-0.086		
202	Russell Ventura Growth 70 Fund	GROWTH	Y	-0.690	-1.543	10%	
203	Balanced Fund Class C	GROWTH	Y	-0.464	-1.038		
204	Premier Global Select Fund	GROWTH	Y	-0.622	-1.391	10%	
205	Experts' Choice Growth Fund	GROWTH	Y	-0.014	-0.031		
206	Skandia GIS-Skandia Growth with Income	GROWTH	Y	0.351	0.786		
207	ING OA Inv Pfolio-CFS Diversified	GROWTH	Y	-0.978	-2.187	5%	5%
208	Vanguard Growth Index Fund	GROWTH	Y	0.392	0.877		
209	Vanguard High Growth Index Fund	GROWTH	Y	0.215	0.481		
210	Sandhurst BMF Bendigo Future Growth Fd	GROWTH	Y	-0.682	-1.524	10%	
211	Select Growth Portfolio	GROWTH	Y	0.061	0.136		
212	Skandia GWS-Skandia Growth with Income	GROWTH	Y	0.754	1.687	5%	10%
213	Skandia OIS-Skandia Growth	GROWTH	Y	-1.111	-2.485	1%	5%
214	van Eyk Blueprint High Growth Fund	GROWTH	Y	-0.426	-0.952		
215	SMI - ME Growth Fund	GROWTH	Y	-0.013	-0.029		
216	ClearView Mgd Inv-Aggressive	GROWTH	Y	-0.932	-2.085	5%	5%
217	ClearView Mgd Inv-Assertive	GROWTH	Y	-0.871	-1.949	5%	10%
218	BT Investment Multi-manager Growth Fund	GROWTH	Y	-0.918	-2.053	5%	5%
219	Zurich Blend Series Managed Growth	GROWTH	Y	-0.474	-1.060		
220	Zurich Blend Series Priority Growth	GROWTH	Y	-0.348	-0.778		
221	AMP Capital High Growth Fund	GROWTH	Y	-0.359	-0.802		
222	ipac Classic Portfolio 2	GROWTH	Y	-1.006	-2.249	5%	5%
223	ipac Classic Portfolio 3	GROWTH	N	-0.998	-2.233	5%	5%
224	BT Class Invmt - Split Income Fund	INCOME	Y	-0.968	-2.165	5%	5%
225	Challenger Diversified Income Fund	INCOME	Y	-1.578	-3.528	1%	1%
226	BlackRock Managed Income Fund	INCOME	Y	-1.159	-2.592	1%	5%
227	BlackRock Income Trust	INCOME	Y	-0.208	-0.465		
228	AMP FLI - AMP Monthly Income Fund No 1	INCOME	Y	0.045	0.101		
229	ING OA Inv Pfolio-Tax Effective Income	INCOME	Y	-1.136	-2.540	1%	5%
230	BT Invmt - BT Income Plus Fund	INCOME	N	-1.194	-2.670	1%	1%
231	AMP FLI - AMP Monthly Income Fund No 2	INCOME	N	0.189	0.423		
232	ipac Strtgc Inv Srv - Inflation Plus 2	INCOME	Y	-1.881	-4.205	1%	1%
233	ipac Strtgc Inv Srv - Inflation Plus 4	INCOME	N	-1.213	-2.712	1%	1%
234	ipac Strtgc Inv Srv - Inflation Plus 6	INCOME	Y	-0.745	-1.667	10%	
235	MLC MKey InvSer/UT Horizon 2 - Income	INCOME	Y	-1.219	-2.726	1%	1%
236	Macquarie Flexible Inv - Inc Advantage	INCOME	Y	-1.762	-3.940	1%	1%
237	BT Class Invmt - Tax Effect Inc Fd NEF	INCOME	Y	0.586	1.311	10%	
238	ANZ OA Inv Pfolio-ING Income	INCOME	N	-0.056	-0.126		
239	AMP FLI - AMP Monthly Income Fund No 3	INCOME	Y	-0.088	-0.196		
240	ClearView Mgd Inv-Monthly Payment	INCOME	Y	-2.494	-5.576	1%	1%
241	BlackRock WS Managed Income Fund	INCOME	N	-0.734	-1.640	10%	
242	National Invmt Tr - Monthly Income Fund	INCOME	N	-0.843	-1.885	5%	10%
243	National Invmt Tr - Monthly Income NEF	INCOME	N	-1.103	-2.467	1%	5%
244	BlackRock P Inv Managed Income Fund	INCOME	Y	-1.132	-2.531	1%	5%
245	BT Wholesale- Tax Effective Income Fund	INCOME	Y	1.552	3.471	1%	1%
246	SMI - ME Income Plus Fund	INCOME	Y	0.046	0.102		