Do Derivatives Improve Managed Fund Performance?

The Effects of Cash Equitising Investor Flows

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Abstract

This paper examines the use of derivatives by 275 managed funds in Australia over the period August 31 2003 to August 31 2006. Attention is given towards a particular application of derivatives: cash equitisation of investor flows. Cash equitisation is a process which allows rapid transition between cash and stock at low cost. Bringing together concepts of Edelen (1999) and Greene and Hodges (2002) a model is built which predicts that i) increases in investor flows, regardless of direction, will negatively impact on fund returns due to larger trading costs, ii) increases in investor flows affects will affect performance depending on the direction of the flows and concurrent market movements and iii) funds which cash equitise investor flows will have superior performance, on average, compared to non-equitisers. Following Koski and Pontiff (1999) we show that it is not possible to adequately assess the effect of derivative use on performance when derivative users are pooled into one category. However, when derivative users are broken up into two different categories the results suggest that derivatives, when used for cash equitisation, can reduce the burden of increased fund flow and improve managed fund performance. This result contradicts prior literature (Koski and Pontiff, 1999; Johnson and Yu, 2004; Fong, Gallagher and Ng, 2005), which found no difference between users and non-users adopting an aggregation approach. Our results reveal the importance of identifying the effect of different types of derivative usage on performance and considering the conditions under which derivatives might be beneficial.

Introduction

It is well established in the literature that investor flows into and out of a managed fund can have significant implications for that fund's performance (Edelen, 1999; Greene and Hodges, 2002). When a fund experiences new cash flow, whether net positive or negative, the fund manager determines the rate at which the fund's stock and cash position is altered to meet the liquidity demands of those driving the flow. Effectively, at each incremental point in time, the manager is faced with an instantaneous choice of either a) transacting in the market or b) maintaining the current position in order to delay transaction. In either case, the performance of the fund can suffer, depending on the magnitude of the underlying cash flows and their timing relative to market movements. In the first instance rapid transaction generates market impact and other transaction costs. Furthermore, as discussed by Edelen (1999), investor flows compel the fund manager to engage in uninformed, liquidity-motivated trading, thereby sustaining losses to informed traders. In the alternative, the fund manager can choose to maintain the current position now and transact later, thus reducing the overall rate of market transactions[1]. This may reduce market impact costs (Chan and Lakonishok, 1995). However, within the cash-drag (or cash-dilution)[2] model of Greene and Hodges (2002) lags between fund flows and market transactions can impact negatively on returns, transferring wealth from passive shareholders to active fund traders. This implies that appropriate management of fund flows is an important consideration for investment fund managers.

[1] Chan and Lakonishok (1995) find that investment managers tend to break up large orders into smaller trades over the course of several days. To the extent that those orders represent liquidity motivated, rather than information related trades, Chan and Lakonishok (1995) provide indirect evidence that managers delay transaction when funds experience investor flows.

[2] Greene and Hodges (2002) refer predominantly to the dilution effects of cash. However, cash has a concentration effect when net fund flow is negative. Therefore, we refer to this phenomenon using the neutral term, 'cash-drag'.

Derivatives can help fund managers with their cash flow management problems and the primary focus of this paper is to examine the interaction between fund flows, derivative use and fund performance. The mechanism by which derivatives are used to manage fund flows is known as 'cash equitisation' and allows a fund to move quickly between cash and asset exposure at low cost. When a fund experiences net positive flow, the fund manager goes long in an appropriate amount of index futures contracts. The cash the fund receives is rapidly exposed to market risk, thereby alleviating the cash-dilution effect of Greene and Hodges (2002). For net negative flow, the fund borrows or reduces its cash reserves to pay the redemptions and shorts an appropriate amount of index futures contract. The combination of the unsold assets and short index position creates a sub section of the portfolio for which there is zero (or heavily reduced) market risk. Thus a portion of the fund has transferred quickly from asset to cash exposure, corresponding to the liquidity demands of the fund holders. Over time, the futures, stock and cash positions associated with the cash-equitisation process are unwound at the discretion of the fund manager. We develop a formal model of fund flows and cash equitisation in Section 2.

Cash equitisation is likely to be a less costly process vis-à-vis transitions between cash and stock. Since futures markets are generally more liquid than stock markets (Frino and Oetomo, 2005) market impact costs are reduced. Adverse selection costs are also expected to be lower when trading a futures index since informed traders are unlikely to be active in an instrument where the benefits of private information are diversified across a range of securities. Therefore fund managers that cash equitise receive a double benefit of fast transactions and low cost which should be reflected in their returns. This paper investigates whether fund managers that use derivatives to cash equitise experience greater returns than non-users.

Recent empirical studies suggest that derivatives do not significantly affect a fund's return or risk measures (Koski and Pontiff, 1999; Johnson and Yu, 2004; Fong, Gallagher and Ng, 2005). A possible explanation for the null result is that the studies do not distinguish between different types of derivative use by fund managers, but rather define 'derivative use' as a fund characteristic with homogenous outcomes. Nor do previous studies examine the conditions under which derivative use might be appropriately used to improve performance. This definition would be in contrast to studies of non-financial corporations which have identified a variety of reasons for derivative use and the respective circumstances in which that use is beneficial. That literature has identified objectives such as tax reduction (Graham and Rogers, 2002; Smith and Stulz 1985), reducing financial distress costs (Smith and Stulz, 1985), hedging macroeconomic factors (Gezcy, Minton and Schrand, 1997; Guay and Kothari, 2003), hedging *accounting* earnings (Mallin, Ow-Yong and Reynolds, 2001), hedging the cost of expenses (Carter, Rogers and Simkins, 2006), generating cash flows (Adam and Fernando, 2006) and as a response to informational asymmetry concerning a firm's forecasted earnings (Dadalt, Gray and Nam, 2003). For managed funds one could envisage a similar scenario where derivatives are used for a variety of reasons each with a different effect on fund performance. When performance measures are aggregated across derivative users and across various conditions (market or fund specific) it may be difficult to ascertain the exact consequences of derivative use.

This study extends the literature by distinguishing between two different types of derivative use - a) the utilisation of index futures for cash equitisation only and b) 'extensive' derivative use, which includes the use of index futures or options (or both) for cash equitisation, speculation and trading strategies. We also provide a model that suggests that this form of derivative use would be most advantageous during periods of high net fund flow. Data on derivative use is accumulated in the same manner as Koski and Pontiff (1999), through telephone interview. Unlike prior literature, our results suggest that derivative users can improve relative performance by cash equitising fund flows. However, we also confirm the findings of previous studies – when derivative users are pooled into one category it is not immediately apparent whether derivative use is beneficial or not.

In summary, this study makes three contributions to the literature on fund performance. Firstly, we bring together the concepts of Edelen (1999) and Greene and Hodges (2002) to model the effect of cash flows on fund performance. Our model predicts that an increase in fund flow, regardless of direction, will have a negative effect on performance due to increased transaction costs. However, cash drag may be beneficial depending on the timing of new funds relative to market movements. Secondly, this study disentangles two types of derivative use rather than aggregating all derivative users into one category. This allows us to more clearly discern the possible effects of derivative use on fund performance. Thirdly, we examine the interaction between derivatives, fund flows and fund performance. This differs from previous studies which only examine the relationship between derivative use and performance and do not consider the mechanism by which improvement (or deterioration) might occur.

The rest of this paper is organised as follows. In Section 2 we develop a model which predicts how fund flow affects fund manager returns. Section 3 describes the data and sample selection criteria. Section 4 presents the results of the analysis. We follow Koski and Pontiff (1999) and present results aggregated across all derivative users. Secondly, we separate different types of users and examine the interaction between each class of user and fund flow. Section 5 concludes.

2. Modelling fund flows

Consider a fund that has assets at the beginning of the period (end of the previous period), a_{t-1}. At the beginning of the period the fund receives new (net) flows, NFF_t. The manager can choose to trade some portion of this flow, λ_t, in the market while the rest remains as cash, γ_t, to be invested later.[3] Transaction may be delayed for several reasons – in order to reduce market impact costs, to avoid trading in adverse market conditions, or, if the difference between consecutive periods is sufficiently small, because it is physically impossible to transact the entirety of the flow in that period of time. Any left over cash forms part of the net fund flow in the next period. Note that the signs on the variables determine the direction of the manager's trading and the change in the fund's cash position. When net fund flow is negative, λ_t, and γ_t are equivalent to the dollar value of assets sold and cash borrowed, respectively, to meet redemptions of the fund's shares. Finally, it is assumed that all trading as a result of fund flow, λ_t, is liquidity-motivated, rather than discretionary. Including a

[3] We divert slightly from the analysis of Greene and Hodges (2002) who assume that all flows are invested with a lag. Our model leaves open the possibility that new cash flows could be invested in the market immediately, with appropriate consequences.

discretion component to λ_t, complicates the argument without changing the final conclusions.

If the fund receives no new net flow (i.e. $NFF_t = 0$) then the return on the fund is simply the return on existing assets over the period, $r_{t,a}$.

$$r_{t,a} = \frac{a_{t-1}(1 + r_{t,a})}{a_{t-1}} - 1 \qquad (1)$$

Equation (1) provides the benchmark with which to assess the impact of fund flow on fund return. Firstly, consider a fund operating in a perfect market at information equilibrium. When $NFF_t \neq 0$, the fund will transact the entire amount in the market and $NFF_t = \lambda_t$. There is no point in delaying transaction since there are no operating nor adverse selection costs associated with trading. The fund experiences a return on the existing and the newly invested assets while the size of funds under management has increased. The return on the fund is:

$$r^*_{t,a} = \frac{(a_{t-1} + \lambda_t)(1 + r_{t,a})}{a_{t-1} + \lambda_t} - 1 \qquad (2)$$

Therefore, the impact of fund flow on performance, $r^*_{t,a} - r_{t,a}$, is equal to zero. In perfect markets with no transaction costs and when all flows can be invested immediately, performance is not diminished by new cash into the fund.

In imperfect markets trading generates costs. We do not attempt to precisely define the relationship between liquidity-motivated trading and its associated costs, though we note that the most relevant to the cash-equitisation process are market impact and adverse selection costs. We further note that both costs are increasing functions of $|\lambda_t|$, ceteris paribus, though the relationship is probably not linear in the case of market impact costs (Chan and Lakonishok, 1995). If net fund flows are invested immediately the return on the fund is diminished by these costs, which we represent mathematically as $\phi_{\text{costs}}(|\lambda_t|)$. The return on the fund is thus:

$$r^*_{t,a} = \frac{(a_{t-1} + \lambda_t)(1 + r_{t,a}) - \phi_{\text{costs}}(|\lambda_t|)}{a_{t-1} + \lambda_t} - 1 \tag{3}$$

and the effect of fund flow on performance is:

$$r^*_{t,a} - r_{t,a} = \frac{-\phi_{\text{costs}}(|\lambda_t|)}{a_{t-1} + \lambda_t} \tag{4}$$

If all flows are held as cash over the period (i.e. $NFF_t = \gamma_t$) then the fund is subject to the cash drag effect of Greene and Hodges (2002). The cash drag effect causes deterioration in fund returns when there is a delay in investing new funds in the market. Dilution occurs because new cash earns only the cash rate[4], however new investors are entitled to short run *asset* returns. Thus returns of existing shareholders are diluted by incoming cash.[5] The return of the fund when all flows are held as cash is:

[4] In Greene and Hodges (2002) cash does not earn or attract interest.

[5] The opposite scenario occurs when cash leaves a fund and there is a delay between the order to sell stock and actually implementing that order. In such a situation outgoing cash concentrates the returns of the remaining shareholders amongst a smaller group of investors.

$$r*_{t,a} = \frac{a_{t-1}(1 + r_{t,a}) + \gamma_t(1 + r_{t,c})}{a_{t-1} + \gamma_t} - 1 \qquad (5)$$

and the effect of fund flow on performance is:

$$r*_{t,a} - r_{t,a} = \frac{-\gamma_t(r_{t,a} - r_{t,c})}{a_{t-1} + \gamma_t} \qquad (6)$$

Equation (6) provides interesting insight into the management of fund flow. As stated by Greene and Hodges (2002) the impact of fund flows is not necessarily negative, and depends on the covariance between that proportion of new flow that is held as cash, and the subsequent return on the fund's assets in excess of the return on cash. Given that aggregate fund flows tend to covary positively with asset returns (Warther, 1995) the drag effect generally has negative consequences for a fund's return.

Combining equations (4) and (6) it follows that if some proportion of net fund flow is invested (or sold) and the rest is held as cash (or borrowed) then the effect on performance is:

$$r*_{t,a} - r_{t,a} = \frac{-\phi_{\text{costs}}(|\lambda_t|) - \gamma_t(r_{t,a} - r_{t,c})}{a_{t-1} + \lambda_t + \gamma_t} \qquad (7)$$

From Equation (7) it is apparent that a trade off exists between investing (selling) immediately in the market and holding (borrowing) cash. For example, attempting to lower trading costs by reducing the amount of funds invested increases the costs associated with cash dilution and cash drag.

The purpose of cash equitisation is to simultaneously reduce these two costs. When *NFF* is positive (negative), the manager immediately goes long (short) in an appropriate dollar amount of index futures contracts, φ_t. The fund's portfolio is therefore rapidly exposed to market (cash) risk, however with lower market impact and adverse selection costs vis-à-vis the stock market. If the return on the futures index is $r_{t,f}$ then the effect of fund flow on portfolio return when a manager cash equitises is:

$$r*_{t,a} - r_{t,a} = \frac{-\phi_{\text{costs}}\left(\left|\varphi_t\right|\right) - \varphi_t(r_{t,a} - r_{t,f})}{a_{t-1} + \varphi_t} \qquad (8)$$

Since $\phi_{\text{costs}}\left(\left|\varphi_t\right|\right) < \phi_{\text{costs}}\left(\left|\lambda_t\right|\right)$ (Frino and Oetomo, 2005) and typically, $(r_{t,a} - r_{t,f}) < (r_{t,a} - r_{t,c})$ this paper hypothesises that the returns on funds which cash equitise should be higher than the returns on funds that do not cash equitise. Furthermore, this effect is directly related to the magnitude and direction of *NFF*.

3. Data

3.1 Fund data

The period of analysis is August 31, 2003 to August 31, 2006. As noted by Koski and Pontiff (1999) a longer time frame improves the precision of the parameter estimates, but increases the time between the date of information on derivative use and the date of the fund returns. Following Koski and Pontiff (1999) we also examine three years of fund data. Managed fund data is sourced from Morningstar Direct. All active, long-only, domestic, open-end equity funds domiciled in Australia are considered for analysis. Funds had to be in operation as of August 31, 2006 to be included within the Morningstar database, though not all funds were in existence for the entire three year period. This yields an initial sample of 629 funds. Since there are no derivative products which adequately mimic the asset returns of imputation, small-cap and mid-cap funds, the implications of cash equitisation for these funds are unclear. These funds are removed from the sample. To avoid double counting funds of funds are also removed reducing the sample to 452 funds.

Monthly data on fund size and returns is acquired for all funds in the sample. Standardised net fund flows (*SFF*) are calculated as such:

$$SFF_t = \frac{Size_t - Size_{t-1}(1 + r_{a,t})}{Size_{t-1}} \tag{9}$$

SFF values greater than 2 and less than -1 are filtered from the sample. Investment style as defined by Morningstar, inception date and expense ratios are also taken from the database.

3.2 Derivative use

Data on derivative use was obtained by telephone interview.[6] Unfortunately the data provided only reports information on derivative investment at the institutional level,

[6] We thank a representative at the Sydney Futures Exchange, Effie Tsiaousis, for providing this data.

rather than for a particular fund. Therefore, we are only able to attribute derivative use for each fund based on whether the data indicates that the institution, which manages the fund, uses derivatives. There is reason to believe that this is not an unrealistic assumption. Fund managers within an institution typically work closely together in teams and have access to shared resources and human capital. If a particular fund manager is using derivatives to cash equitise there is a strong possibility that other fund managers within the same institution will be employing the same strategy.

The number of institutions surveyed is 66. Of this, 26 (39.4%) indicated that they did not use any derivatives, 27 (40.9%) indicated that they used derivatives for cash equitisation purposes only and 13 (19.70%) indicated that derivatives were used for cash equitisation and other purposes, such as speculation and implementing strategies. The final group are classified as *extensive* derivative users. The number of funds located in the Morningstar database for which there is also data on derivative use is 275. This sample is used for all analyses performed in this study except where indicated.

The incidence of derivative use at the institutional level is split approximately 60-40. This does not translate to individual funds. Because several non users are not in the Morningstar database and several user institutions manage a very large number of funds (i.e. >30), the eventual distribution at the individual fund level is 17 funds that do not use derivatives, 138 that cash equitise only and 120 that use derivatives extensively.

3.3 Descriptive Statistics

Table I provides descriptive statistics on the funds broken down into classes of derivative use. The mean excess returns of non users are slightly lower than users, though the difference is not significant, while mean SFF is substantially larger for users. The largest funds fall into the cash equitisers group, which has a mean fund size of $219 million. However, the median size for this group is only $22 million, substantially lower than the median fund size for non users ($72.6 million) suggesting that several very large funds are placed within the cash equitisers group. Funds within the cash equitisers group have the greatest mean age, while the youngest funds are in the extensive derivative users group. Survival bias is unlikely to be a problem given the short period of analysis (three years).

4. Results

4.1 Pooled risk and return measures

Following Koski and Pontiff (1999) risk measures are calculated and presented by derivative use and investment style (see Table II). We also provide Jensen's alpha for each sub group. No differentiation is made between different types of derivative users. Examining the table one draws similar conclusions to Koski and Pontiff (1999): derivatives do not seem to provide much benefit in terms of risk or return. There is no statistically significant difference in total risk or alpha for any investment style. For growth funds there is no statistical difference for any of the risk measures or alpha. There is strong evidence that derivatives reduce idiosyncratic risk and improve market timing. However, derivative users also experience greater systematic risk (as measured by beta) and possess more skewed returns.

4.2. Fund flow, derivative use and performance

The method (presented above) of determining the effect of derivative use does not take into account different types of use nor examine the context in which the derivatives are employed. We propose that cash equitisation provides benefits during periods of unusual fund flows. Hypothetically, this effect should be more apparent for those users that cash equitise only, rather than for users which use derivatives for many purposes. It is important, therefore, to determine the relationship between derivative use, fund flow and performance rather than aggregate across users and conditions.

Equation (7) predicts that fund performance should diminish as i) the absolute value of liquidity motivated trading and ii) the signed product of cash held and excess market returns increases. It is not possible to determine how much of flow a manager allocates to stock or to cash. A natural proxy for each of these values is the total value of *SFF* since one would assume that the magnitude and direction of *SFF* determines the magnitude and direction of trading and cash held. In order to ascertain the effect of derivative usage and fund flow on performance an extended market model regression is estimated. The dependant variable is the return of fund j in month t in excess of the interbank cash rate. The independent variables are shown in Table III.

Absolute SFF is a proxy for the level of liquidity motivated trading. The unsigned value is used since the cost of trading is an increasing function of dollar value traded and is incurred regardless of direction. Equation (7) predicts a negative coefficient on *Absolute SFF*. The interaction dummy terms on *Absolute SFF* measure the relative improvement (if any) in performance associated with the two different classes of derivative investment (D_{CE} for cash equitisers; $D_{extensive}$ for extensive users) with respect to the level of liquidity motivated trading.

Cash drag is defined as the product of signed *SFF* and the return on the ASX 200 Accumulation Index in excess of the interbank cash rate (*excess market return*). This variable captures the interaction between changes in cash position and market movements. When *SFF* is positive and the fund holds some proportion as cash, positive (negative) market movements have a negative (positive) effect on fund performance. Similarly, when *SFF* is negative and the fund reduces its cash position negative (positive) market movements have a positive (negative) effect on fund performance. Equation (7), therefore, predicts a negative coefficient on *Cash Drag*. As previously, interaction dummy terms are used to measure the effect of derivative use on performance.

Finally several control variables are added to the regression in order to eliminate the possibility that systematic correlation between derivative use and some other fund characteristic is driving the results. The control variables are the natural log of fund size (*Logsize*), the age of the fund in years (*Age*) and style dummy variables (*Value, Blend* and *Growth*).

Details of the regression are presented in Table III. The results confirm the *a priori* expectations of our fund flow model. The coefficient value on *Absolute SFF* is negative and significant. This reflects the intuition that as a fund experiences investor flows, whether net positive or negative, it is forced to engage in some form of trading which generates costs and hinders performance. The value of the coefficient, -0.016, indicates that a fund, for example, will suffer a reduction in return of 16 basis points per month if investor flows are equivalent to 10% of the fund. The coefficient on *Cash Drag* is significantly negative as predicted by Equation (7). The result confirms that increases (decreases) in fund flow are undesirable during periods of positive (negative) market movements due to dilution (concentration) effects of cash. The coefficient value, -0.449, indicates, for example, that fund performance is diminished by 7 basis points per month, when investor flows are 10% of fund size and the excess return on the market is 1.5% in that month.

The results provide several insights into the relationship between derivative use, fund flows and performance. Firstly, the coefficient values on all derivative interaction terms are positive and significant indicating that derivatives can reverse the negative effects of increased fund flow. Secondly, the magnitude of the improvement resulting from derivative use is of the same order as the magnitude of the deterioration associated with non use. This suggests that the interaction variables are indeed capturing the process of cash equitisation, rather than some other phenomenon. Thirdly, the improvement in performance is greater for those funds which cash equitise only compared to those funds that use derivatives for cash equitisation and other purposes. This is an expected result given the demarcation between the two types of derivative users. The improvement in performance for those funds which cash equitise only should correspond more closely to the incidence of fund flow vis-à-vis those funds which use derivatives for many purposes. Therefore, these results provide evidence that derivatives do improve managed fund returns and the improvement is closely related to the magnitude of net fund flows.

Conclusion

This paper examines the impact of a particular type of derivative strategy on managed fund performance. Cash equitisation is a process which allows for fast transition between stock and cash at low cost, thus alleviating the burden of high net fund flows. We develop a model that outlines the negative implications of increased fund flow. Building on Edelen (1999) and Greene and Hodges (2002) two costs are identified – trading and cash drag costs. A regression of excess returns on fund flow confirms the predictions of our model: i) absolute net fund flow has a negative impact on fund performance; ii) when cash flows into a fund, positive (negative) market movements have a negative (positive) effect on fund performance and iii) when cash leaves a fund, negative (positive) market movements have a positive (negative) effect on fund performance.

A central argument of this paper is that derivative use is not a fund characteristic with homogenous outcomes. Rather, it is important to identify the conditions under which different types of derivative strategies may be employed for beneficial outcomes. We argue that cash equitisation should be most useful during periods of unusual fund flow. Adopting an aggregation approach, no difference is found between users and non users based on risk and alpha. However, when derivative users are broken up into the two categories, it is apparent that those funds which cash equitise only experience superior returns as fund flow increases *compared to non-users and extensive users*. This suggests that differentiating between different types of derivative use is a necessary and important step for future research in this area.

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Table I: Descriptive Statistics

Sample of 275 managed funds from Morningstar Direct. Cash equitisers refers to those funds whose parent institution indicated that they used derivatives for cash equitisation only. Extensive derivative users refers to those funds whose parent institution indicated that derivatives were used for cash equitisation and other purposes. *Excess return* is the monthly percentage return of the fund in excess of the interbank cash rate. *SFF* is standardised net fund flow as defined in Equation (9). *Age* and *Size* are average values at 31 August 2006.

Panel A: All Funds			
	Mean	**Median**	**Standard Deviation**
Excess Return (%)	1.1	1.7	2.8
SFF (%)	6.6	2.2	15.2
Age (at 31 August 2006, years)	6.6	4.1	6.0
Size (at 31 August 2006, $millions)	150.7	18.4	438.0
Number	275		
Panel B: Non-Users			
Excess Return (%)	1.0	1.5	2.8
SFF	4.9	2.4	7.2
Age (at 31 August 2006, years)	6.8	5.8	3.5
Size (at 31 August 2006, $millions)	169.4	72.6	290.0
Number	17		
Panel C: Cash Equitisers			
Excess Return (%)	1.2	1.7	2.7
SFF	5.9	2.2	13.9
Age (at 31 August 2006, years)	7.2	4.3	6.8
Size (at 31 August 2006, $millions)	219.0	22.0	557.4
Number	138		
Panel D: Extensive Derivative Users			
Excess Return (%)	1.1	1.8	2.8
SFF	7.1	2.3	16.9
Age (at 31 August 2006, years)	5.9	3.8	5.2
Size (at 31 August 2006, $millions)	69.6	11.8	246.3
Number	120		

Table II: Mean Risk and Higher Moments by Investment Objective and Use of Derivatives

	Aggregate		Non Users		Users		Tests of Differences			
Standard Deviation	N	Mean	N	Mean	N	Mean	t-test	p-value	Wilcoxon	p-value
All Funds	269	0.02834	17	0.02791	252	0.028369	-0.43	0.6649	-0.2851	0.7756
Blend	145	0.028333	7	0.026554	138	0.028423	-1.28	0.2022	-0.6872	0.492
Growth	64	0.030219	4	0.029994	60	0.030234	-0.11	0.9117	-0.3744	0.7081
Value	59	0.026325	6	0.028101	53	0.026124	1.02	0.3123	1.0658	0.2865
Other	1	0.027921	0	-	1	0.027921	-	-	-	-
Idiosyncratic Risk	N	Mean	N	Mean	N	Mean	t-test	p-value	Wilcoxon	p-value
All Funds	269	0.007519	17	0.011866	252	0.007226	4.6	<.0001	3.812	0.0001
Blend	145	0.006539	7	0.011006	138	0.006313	2.91	0.0042	3.3899	0.0007
Growth	64	0.007786	4	0.007043	60	0.007835	-0.48	0.6354	-0.4576	0.6472
Value	59	0.00972	6	0.016084	53	0.009	4.76	<.0001	2.6959	0.007
Other	1	0.002666	0	-	1	0.002666	-	-	-	-
Beta	N	Mean	N	Mean	N	Mean	t-test	p-value	Wilcoxon	p-value
All Funds	269	0.966896	17	0.932388	252	0.96917	-0.72	0.4723	-1.9505	0.0511
Blend	145	0.98337	7	0.908162	138	0.987158	-1.42	0.1566	-1.9052	0.0568
Growth	64	1.054199	4	1.080084	60	1.052529	0.24	0.8105	-0.0403	0.9678
Value	59	0.875767	6	0.862187	53	0.877304	-0.22	0.8232	-0.2132	0.8312
Other	1	0.269269	0	-	1	0.269269	-	-	-	-
Timing Beta	N	Mean	N	Mean	N	Mean	t-test	p-value	Wilcoxon	p-value
All Funds	269	0.069719	17	-0.07155	252	0.079027	-2.21	0.0277	-2.4086	0.016
Blend	145	0.120474	7	-0.10311	138	0.131734	-3.09	0.0024	-2.9677	0.003
Growth	64	0.146394	4	0.241997	60	0.140227	0.7	0.4845	1.4646	0.143
Value	59	-0.13686	6	-0.24375	53	-0.12476	-0.84	0.4037	-1.442	0.1493
Other	1	-0.00097	0	-	1	-0.00097	-	-	-	-
Skewness	N	Mean	N	Mean	N	Mean	t-test	p-value	Wilcoxon	p-value
All Funds	269	-0.74323	17	-0.47624	252	-0.76131	3.42	0.0007	1.5164	0.1294
Blend	145	-0.71729	7	-0.32896	138	-0.73713	3.1	0.0023	0.4087	0.6827
Growth	64	-0.72843	4	-0.67047	60	-0.7323	0.43	0.6702	0.2912	0.7709
Value	59	-0.81656	6	-0.51857	53	-0.8503	2.16	0.0347	1.5925	0.1113
Other	1	-1.09956	0	-	1	-1.09956	-	-	-	-
Kurtosis	N	Mean	N	Mean	N	Mean	t-test	p-value	Wilcoxon	p-value
All Funds	269	0.066499	17	0.17451	252	0.059614	0.54	0.5903	1.1737	0.2416
Blend	145	-0.01585	7	0.35014	138	-0.03188	1.22	0.2252	1.9986	0.0456
Growth	64	0.016707	4	-0.27361	60	0.036061	-0.77	0.4425	-1.3451	0.1786
Value	59	0.312467	6	0.297625	53	0.314147	-0.04	0.9698	0.2132	0.8312
Other	1	0.51766	0	-	1	0.51766	-	-	-	-
Alpha	N	Mean	N	Mean	N	Mean	t-test	p-value	Wilcoxon	p-value
All Funds	269	-0.00114	17	-0.00127	252	-0.00113	-0.08	0.9346	-1.346	0.1794
Blend	145	-0.00088	7	-0.00122	138	-0.00086	-0.22	0.8254	-1.0808	0.2798
Growth	64	-0.00172	4	-0.00166	60	-0.00173	0.02	0.9853	-1.2765	0.2018
Value	59	-0.0015	6	-0.00106	53	-0.00155	0.51	0.6125	0.3386	0.7349
Other	1	0.004352	0	-	1	0.004352	-	-	-	-

Table III: Regression Results

Coefficient estimates and t-stats (p-values) for a regression of excess fund return against the following variables: *Excess market* is the return on the ASX 200 Accumulation Index in excess of the interbank cash rate; *Absolute SFF* is the unsigned value of *SFF* as calculated by Equation (9); D_{CE} is a dummy variable for funds that cash equitise only; $D_{extensive}$ is a dummy variable for funds that use derivatives for cash equitisation and other purposes; *Cash drag* is the product of signed *SFF* and *excess market*. *Logsize* is the natural log of fund size (in $millions); *Age* is the age of the fund in years; *Value*, *Blend* and *Growth* are dummy variables for investment style as defined by Morningstar Direct at 31 August 2006.

Variable	Coefficient Estimate	T-stat (p-value)
Intercept	0.003	1.45 (0.15)
Excess Market	0.996	226.97 (0.00)
Absolute SFF	-0.016	-2.80 (0.01)
(Abs. SFF)$*D_{CE}$	0.019	3.34 (0.00)
(Abs. SFF)$*D_{extensive}$	0.015	2.70 (0.01)
Cash drag	-0.449	-2.32 (0.02)
(Cash drag)$* D_{CE}$	0.454	2.29 (0.02)
(Cash drag)$*D_{extensive}$	0.343	1.74 (0.08)
Logsize	7.3 x 10-6	0.14 (0.89)
Age	1.8 x 10-5	0.89 (0.38)
Value	-0.006	-2.96 (0.00)
Blend	-0.004	-1.93 (0.05)
Growth	-0.003	-1.50 (0.13)
Adj. R-squared		0.886