

**Fund flows, derivative use and the market timing performance of fund  
managers**

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## 1. Introduction

The extant literature on investment manager performance traditionally decomposes manager skill into two classes: security selection and market timing. Security selection is the ability to compose a portfolio that possesses superior risk-adjusted returns compared to a benchmark portfolio. The established indicator of security selection skill is a manager's alpha (Jensen, 1968). Market timing measures the ability of the fund manager to anticipate market direction and adjust the portfolio accordingly (Treyner and Mazuy, 1966; Henriksson and Merton, 1981). Specifically in bull (bear) markets it is advantageous to hold high (low) beta stocks. Market timing is considered distinct to a manager's alpha, since it is possible to outperform the market by shifting between high and low risk portfolios when necessary, and does not require identifying securities with superior risk-adjusted returns.

A considerable amount of academic research finds that fund managers, on average, exhibit perverse measures of market timing, that is, they hold low beta portfolios when markets are rising and vice versa<sup>1</sup>. This troubling assessment of investment managers is explained by Edelen (1999) and Ferson and Warther (1996) as the result of realised fund flows. Specifically, because there is a strong correlation between market returns and flow (Warther, 1995) and fund managers cannot immediately allocate the new funds according to their mandated investment strategies, funds accumulate more cash during rising markets. This excess holding of cash dilutes portfolio beta and, as shown by Edelen (1999), is the source of the apparent negative market timing results of previous studies.

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<sup>1</sup> For example, Treynor and Mazuy, 1966; Kon, 1983; Henriksson, 1984; Jagannathan and Korajczyk, 1986.

Since derivatives provide an inexpensive means by which to rapidly access risk, fund managers that use derivatives should be able to reduce the burden imposed by new fund flow. The purpose of this paper is to test this hypothesis using the fund-flow-timing regressions of Edelen (1999).

Koski and Pontiff (1999) show that funds that employ derivative trading strategies are able to alleviate undesired changes to fund risk associated with increase fund flow. They therefore, provide indirect evidence for our hypothesis that fund managers use derivatives to access risk, though they do not specifically address the issue of market timing. Frino, Lepone and Wong (2007) show that fund managers who equitise incoming cash with index futures achieve returns higher than non-users of derivatives because of improved transaction costs in futures markets. This paper builds on these studies by examining another element of fund manager performance – market timing – and how this is affected by derivative trading.

Results indicate that across all funds, the average market timing performance of funds is not significantly different from zero when we control for the negative affect of fund flows. Consistent with Edelen (1999) non-users of derivatives exhibit significantly negative market timing performance in the presence of fund flows. However, the market timing performance of cash-equitising funds is not materially affected by the incidence of fund flow. We suspect that this is because cash equitising funds are rapidly able to access market risk via index futures and so avoid beta dilution associated with incoming flow.

The rest of the paper is organised as follows. Section 2 outlines the models of market timing including the regression specification of Edelen. Section 3 describes the data while Section 4 presents the results of the analysis.

## 2. Theory

The Treynor and Mazuy (1966) model of market timing involves estimating the following time series regression of fund returns in excess of the risk free rate on the market risk premium and its square:

$$r_{j,t} = \alpha_j + \beta_j R_{m,t} + \gamma_j R_{m,t}^2 + \varepsilon_t \quad (1)$$

The coefficient on the squared value of the market risk premium, gamma, is a measure of the fund's market timing. This measure of market timing is known to suffer from several biases (e.g Grinblatt and Titman, 1989). In particular, Ferson and Schadt (1996) show that time variation in market risk and the market risk premium cause funds to exhibit negative market timing performance. After controlling for time variation using lagged public information variables, the market timing performance of funds improves relative to regressions involving an unconditional benchmark.

Edelen (1999) confirms that the time variation in expected returns documented by Ferson and Schadt (1996) is intrinsically linked to fund flows. Edelen estimates the following time series regression:

$$r_{j,t} = \alpha_j + \beta_j R_{m,t} + \gamma_{1j} R_{m,t}^2 + \gamma_{2j} (R_{m,t}^2) * \lambda_{j,t} + \varepsilon_t \quad (2)$$

where  $\lambda_{j,t}$  is some measure of fund flow. This model is the same as Equation (1) with the addition of an interactive regressor on the Treynor-Mazuy squared market premium in order to control for flow related timing performance. His results indicate that the market-timing coefficient,  $\gamma_1$ , is negative when Equation (1) is estimated but insignificantly different from zero when Equation (2) is estimated. Interestingly, the coefficient on the interaction term is significantly negative. Taken together this shows that the causes of fund managers' seemingly negative market timing skill are exogenously determined liquidity shocks. Funds exhibit perverse market timing only when they experience fund flow.

Frino, Lepone and Wong (2007) present a simple model of cash equitisation that describes how funds manage cash flow with index futures. When faced with new cash flows a fund manager goes long in appropriate amount of index futures and the flow is invested, effectively, with a beta equivalent to the current portfolio. As a result derivative users should experience superior market timing because flow-related cash dilution of portfolio beta is mitigated, though whether this actually occurs or not is an empirical issue and the focus of this paper.

### 3. Data

#### 3.1 Fund data

An initial search of Morningstar Direct for active, large-cap, long-only Australian<sup>2</sup> investment trusts yields a preliminary sample of 471 funds.<sup>3</sup> The period of analysis is 31 August, 2003 to 31 August, 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 their study, we also examine three years of monthly fund data.

Monthly data on fund size and returns is acquired for all funds in the sample. Returns are net of expenses, but do not include exit and entry fees. Standardised net fund flows (*SFF*) are calculated as follows:

$$SFF_t = \frac{Size_t - Size_{t-1}(1 + r_{a,t})}{Size_{t-1}} \quad (3)$$

This calculation is based on the intuition that any change in fund size not attributable to fund returns must be due to (net) fund flow. Morningstar investment style and fund inception date are also taken from the database.

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<sup>2</sup> We examine Australian funds because our unique data on the use of derivatives pertains to Australian funds. Furthermore, the size and sophistication of the Australian investment funds industry implies that these results are relevant to other major industries such as the U.S. At the end of 2005, the dollar value of funds under management in Australia reached approximately USD700 billion (Investment Company Institute Fact Book 2006, p141), the fourth largest in the world behind the U.S., Luxembourg and France.

<sup>3</sup> 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.

Certain features of the funds management industry present complications that might affect the analysis contained in this study. Firstly, a number of institutions establish funds which pool money, mainly from retail investors, in order to directly purchase units in a single wholesale fund of an external manager. These ‘funds’ are not unique entities in themselves and including them in the analysis has the affect of double counting the returns of the underlying wholesale manager. Secondly, several firms offer ‘fund of funds’ products, whose inclusion also results in a double counting of the constituent investment managers. Finally, a number of institutions outsource all or part of their funds management operations to external managers, making it difficult to identify the manager responsible for each fund. While this does not represent double counting, correct identification is necessary in order to properly allocate the characteristic of user, or non-user, of derivatives to a particular fund.

We consult the prospectus (also known as the Product Disclosure Statement) of the 471 funds in the preliminary sample in order to resolve these issues. There are 144 funds that indirectly invest in equities through purchasing units in another fund and 53 funds of funds. After removing these from the sample, the number of remaining funds is 274. Where a fund outsources its operations we note the name of the external manager.

### *3.2 Derivative use*

The 274 funds are surveyed via telephone interview about their derivative trading behaviour. We are specifically interested if they use SPI 200™ index futures for the purposes of equitising cash. Prior studies do not classify funds based on any specific

derivative trading strategy, but rather assign the broad term of ‘derivative user’ to a fund if telephone interview indicates that the manager has traded derivatives previously (Koski and Pontiff, 1999) or that their periodic portfolio holdings include derivatives (Johnson and Yu, 2004; Fong, Gallagher and Ng, 2005). Effectively, no distinction is made between different types of derivative investment strategies, even those that would have opposite expected outcomes – for example hedging versus speculation. By examining the use of derivatives for cash equitisation purposes only, this study avoids any obfuscation associated with aggregating across different forms of derivative use.

The funds interviewed have a high rate of derivative use. One hundred and forty eight funds indicate that they use derivatives primarily for cash-equitisation with no other prominent reason for trading these securities. Another 79 funds indicate that they use derivatives for a variety of reasons that include cash-equitisation, portfolio insurance and tailored trading strategies. Since the purpose of this study is to identify the incremental benefit of using derivatives for the purposes of cash equitisation only, these 79 funds are removed from the sample. While their inclusion potentially reduces the standard error of the coefficient estimates, we feel that, in the interests of experimental design, these funds should be removed to provide a cleaner test of the benefits of cash-equitisation and avoid the aforementioned aggregation issues. Twenty eight funds indicate that they do not use derivatives at all. We did not receive a response from 19 funds. Therefore the final sample of funds used in this study is 176 – of which 148 (84.1%) are derivative users and 28 (15.9%) are non-users. In terms of monthly fund data, there are 3738 monthly fund observations for users and 674 for non-users.

Table 1 provides descriptive statistics on several fund characteristics. For all characteristics (*SFF*, *Age* and *Size*), mean values are higher for users compared to non-users. The mean and median standardised fund flow for both groups is similar, though the standard deviation is larger for user funds, suggesting that these funds experience sporadic instances of large net fund flow. While not conclusive, this fact is consistent with industry recognition that cash equitisation may be helpful in managing large cash flows. The largest funds fall into the cash equitisers group, which has a mean fund size of \$318 million.

<Insert Table 1 Here>

#### **4. Results**

Equation (2) is estimated for each fund in the sample and Table 2 presents the results of the analysis divided into non-users (Panel A) and users (Panel B) of derivatives. The non-equitising funds exhibit characteristics similar to Edelen's (1999) sample. In the absence of fund flow, the average fund in the sample does not possess superior nor perverse market timing skills, as indicated by the coefficient on  $\gamma_1$ . All negative timing ability is due to the effects of fund flow as indicated by the coefficient on  $\gamma_2$  which is statistically significant at conventional levels. Tellingly, only 37.5% of funds have positive coefficient values for this variable. These results are entirely consistent with Edelen's hypothesis that fund flow is the primary source of perverse market timing.

Panel B presents the results for cash-equitising funds. As previously, the coefficient on  $\gamma_1$  indicates that this sample of funds does not exhibit market timing significantly different from zero. The interesting result is that the coefficient on the interaction term is also not significantly different zero, rather than being significantly negative. Slightly more than half of the funds have coefficient values on the interaction term greater than zero. This finding supports our hypothesis that cash equitising funds are able to mitigate the negative consequences of fund flow by rapidly exposing new cash to market risk via index futures.

<Insert Table 2 Here>

At this point it is worth noting the results of Koski and Pontiff (1999) whose findings are closely linked to ours. Our results show that cash equitising funds do not exhibit negative market timing when they experience fund flow. We hypothesise that cash equitising funds invest new cash in index futures to rapidly obtain market risk and this has the effect of keeping portfolio beta higher during rising markets. If this hypothesis is true then a natural corollary is that fund risk is not significantly altered by fund flows. Koski and Pontiff's show that fund risk is affected by period to period fund flows but the effect is less pronounced for derivative traders. Furthermore this phenomenon is only apparent for fund *systematic* risk, not idiosyncratic. They note that this result is consistent with funds using index based derivatives to manage cash flows. It appears that the 'user' funds in both our sample and theirs exhibit similar derivative trading behaviour – the cash equitisation of investor flows.

## **5. Conclusion**

This paper examines the market timing performance of a sample of 176 investment funds between 31 August 2003 and 31 August 2006 divided into users and non-users of derivatives. We hypothesise that cash-equitising funds are able to avoid the negative implications of fund flow as documented by Edelen (1999). Our results indicate that all funds exhibit market timing skill not significantly different from zero when the effects of fund flow are controlled for. A variable designed to capture the interactive effects of fund flow on market timing is significantly negative for non equitising funds and not significantly different from zero for equitising funds. These results suggest that in a world without fund flow the average manager does not exhibit superior nor perverse market timing skills. However, given that fund flow is a regular occurrence for managers, these results also indicate that funds that choose not use derivatives are likely to be poor market timers relative to those funds that use derivatives to manage cash flows.

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## Tables

**Table 1: Descriptive statistics**

Sample of 176 Australian investment funds from Morningstar Direct.  $|SFF|$  is the absolute value of standardized net fund flow as defined in Equation (5). *Age* and *Size* metrics are based on the most recent available values (no earlier than 31 Dec 2005).

<b>Panel A: All Funds</b>			
	<b>Mean</b>	<b>Median</b>	<b>Standard Deviation</b>
$ SFF $ (%)	5.04	1.69	12.22
Age (years)	7.57	4.96	6.32
Size (\$ millions)	286.11	46.92	643.32
Number	176		
<b>Panel B: Non-Equitisers</b>			
$ SFF $ (%)	4.94	2.03	9.62
Age (years)	7.22	5.77	5.31
Size (\$ millions)	117.32	36.99	236.54
Number	28		
<b>Panel C: Cash-Equitisers</b>			
$ SFF $ (%)	5.05	1.64	12.64
Age (years)	7.63	4.92	6.51
Size (\$millions)	318.05	47.40	689.90
Number	148		

**Table 2: Flow and market timing measures of performance**

Coefficient results for flow and market timing measures of performance. Coefficient values are average across 28 non-equitising funds and 176 equitising funds. T-stats are calculated using sample standard deviation across coefficient values.

<b>Name</b>	<b>Coefficient</b>	<b>T-stat</b>	<b>% &gt; 0</b>
<b>Panel A: Non-equitisers</b>			
$\gamma_1$	0.199	0.242	50.00%
$\gamma_2$	-62.372	-2.02*	37.50%
<b>Panel B: Equitisers</b>			
$\gamma_1$	0.207	0.427	54.81%
$\gamma_2$	25.678	1.398	52.59%