Do active funds deliver?

How market timing and security selection performance shapes up

The significant recent growth in the index fund market again casts light on the debate about the relative performances of active and passive management. DAVID GALLAGHER reports on a study of returns over eight years and concludes that there are sound reasons for the popularity of the passive approach.

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The central issue in the debate over the relative merits of active and passive investment strategies is whether active funds are able to generate excess returns which more than offset the higher expenses and risks associated with the strategy.

The decision on whether investors will adopt active or passive strategies depends on whether they believe capital markets are efficient. Index fund managers subscribe to the view that markets are broadly efficient and that, over time, index-mimicking portfolios will outperform the average active fund.

Active managers, on the other hand, believe that returns in excess of the underlying benchmark index are achievable through the use of security-specific and macroeconomic information. The identification of mispriced securities (security selection) and altering the portfolio's asset allocation in anticipation of market movements (market timing) are the two methods active managers use to earn excess returns. Active management involves substantially higher expense than passive strategies because of the cost of obtaining and analysing price-sensitive information. Transaction costs are also significant, as active funds have higher stock turnover than index funds (Keim and Madhavan 1998).

Other costs are associated with an active management strategy, including market-impact costs and opportunity costs. These implicit costs arise where large orders move security prices in the direction of the trade (market-impact costs) or where the manager cannot transact their information-motivated orders instantaneously and entirely (opportunity costs due to the decaying value of information over time).

The academic literature documents widely that most active funds have not outperformed passive benchmarks (for example, Robson 1986, Sinclair 1990, Elton, Gruber, Das and Hlavka 1993, Malkiel 1995 and Gallagher 1999). One of the arguments advanced by Sharpe (1991) as to why active funds have not added value is that, before expenses, the performance of the average dollar invested in active funds must equal that of the average passively managed dollar.

The reasoning is that the performance of the index equals the weighted average return of both active and passive investors across the entire market. By definition, active management must be a zero-sum game where for every winner there exists a loser.[1] Given Keim and Madhavan's (1998) transaction-cost argument and Sharpe's (1991) "arithmetic of active management", the average active dollar invested must underperform the average passive dollar

TABLE 1 **Market indexes**

Asset class	Market index
Australian equities	ASX All-Ordinaries Accumulation Index
International equities	MSCI World (ex-Australia) Accumulation Index
Australian direct property	Towers Perrin Direct Property Index
Australian listed property	ASX Listed Property Accumulation Index
Australian fixed interest	Warburg Dillon Read Composite Bond Index
International fixed interest	Salomon Bros. World Bond Index
Australian inflation-linked bonds	Warburg Dillon Read Inflation-Linked Bond Index
Cash	Warburg Dillon Read Bank Bill Index

when expenses are deducted from returns. Indexing in Australia has gained significant attention only in the past few years. The US has also experienced significant growth in index fund assets, particularly in the mid-to-late 1990s. This is surprising, given that the origins of indexing as an investment strategy date back to the early 1970s.

Superfunds magazine has reported that index-oriented funds in Australia increased by more than 60% in the year to March 1999. Total index funds under management in Australia were estimated to be about $A41.3 billion at March 1999, representing about 10% of the total Australian funds market. Given the performance of active funds relative to passive benchmarks and the wider acceptance of indexing, superannuation trustees are increasingly asking what proportion of assets, if any, should be earmarked for passive management in meeting a fund's investment objectives.

This study evaluates the market-timing and security-selection performance of Australian active pooled superannuation funds from January 1991 to December 1998. Performance is measured at the total fund level as well as for the three largest asset classes in diversified superannuation funds: Australian equities, international equities and Australian fixed interest. The conclusions are that most active funds do not add value in either market timing or security selection.

DATA AND METHODOLOGY

The study evaluated monthly performances of 13 Australian pooled superannuation funds over the eight-year period January 1991-December 1998. Investment performance data were provided by Towers Perrin Australia and are evaluated before investment management fees and tax. The funds included in the analysis are classified by Towers Perrin as either average volatility or above-average volatility diversified investment vehicles. While the analysis includes only a small number of funds, each fund is representative of the investment performance of one investment manager.

A problem with the sample group is survivorship bias, which implies that the performance of funds included in the study will be overstated given that poorly-performing funds have a greater probability of closing. While the survivorship-bias problem is faced by most performance evaluation studies, the true extent of the bias inherent in the analysis is not known.

Total assets under management for the sample at December 1998 was about $A25.6 billion. The benchmarks used in measuring active performance are shown in Table 1.

The performance attribution framework adopted in this study measures the effect of the portfolio manager's active investment decisions across asset sectors and their respective contribution to portfolio performance. Performance attribution decomposes the active return (fund return in excess of the index's performance) or value-added into security-selection and market-timing components.

To implement the Burnie, Knowles and Teder (1998) performance attribution method, funds were partitioned according to the predominant portfolio management style implemented by funds (top-down or bottom-up), using information provided by the investment managers. Top-down portfolio management assumes that investment managers' emphasis is on asset allocation (funds A-G), whereas the bottom-up strategy gives precedence to security selection (funds H-M). The performance attribution methodology used in this study is detailed in the appendix.

RESULTS

Table 2 shows that most active funds did not exhibit superior security-selection or market-timing performance in the period. At the total fund level, only one fund exhibits significantly positive timing and selection ability.

Evaluation of performance across the Australian equities, international equities and Australian fixed-interest sectors also reveals that most funds did not earn significantly positive active returns.

While Australian equities was the most successful asset class in the sample for security selection, no evidence exists of superior market-timing ability in the sector. Funds performed particularly poorly in stock selection in the international equities asset class, where three funds have significantly negative active returns. Although the evidence is not reported in this article, the overall findings across the sectors and total portfolio for security selection and market timing are also supported where risk-adjusted performance is considered.

Additional tests were performed to evaluate the consistency of market-timing and selection abilities of active managers.

Analysis of the number of periods (months) where investment managers make accurate forecasts that add value (rather than the magnitude of the forecasts) provides information about the relative success of the portfolio management process over time.

A successful forecast is defined as added value attributed to market timing and stock selection. The null hypothesis assumes that the proportion of successful forecasts made by portfolio managers equals the number of unsuccessful forecasts. Rejection of the null indicates that a portfolio manager exhibits skill where the proportion of successful forecasts exceeds 50% in either market timing or stock selection.[2] Table 3 provides further evidence of the inability of active funds to add value consistently over time. Most funds in Australian equities (security selection and market timing) and Australian fixed interest (market timing) added value more than 50% of the time; however, the only a small minority are statistically significant. These results suggest that active funds were unable to differentiate their forecasting skills from chance.

CONCLUSION

The results of the study indicate that most active fund managers did not exhibit successful market-timing or security-selection performance in the eight-year period. When the survivorship issue is considered, the inability of active funds to earn returns significantly greater than zero is a conclusive result because of the likelihood of the sample being skewed toward the more successful funds. The findings confirm previous Australian and international studies that active funds do not outperform passive benchmarks. After consideration of management fees, active funds would appear even less attractive. Overall, it is not surprising that lower-cost index funds have recently experienced significant growth.

APPENDIX

The study employs a geometric performance attribution framework following Burnie, Knowles and Teder (1998). This approach assumes that fund managers prioritise their portfolio management strategies between top-down and bottom-up styles and therefore renders obsolete the interaction or residual term in the traditional performance attribution framework.[3]

Top-down portfolio management assumes that an investment manager's primary emphasis is on asset allocation, whereas a bottom-up strategy assumes that security selection takes precedence. The total portfolio's market timing (MT) and security selection (SS) components for a top-down investment strategy at time t are represented geometrically as:

$$MT_t = \frac{(1+\sum_i \omega_i \bar{r}_i)}{(1+\bar{r}_b)} - 1$$

$$SS_t = \frac{(1+r_p)}{(1+\sum_i \omega_i \bar{r}_i)} - 1$$

where in period *t*:

ω_i = average actual weight in asset class *i*;
r_i = benchmark return representing a passive investment strategy in asset class *i*;
$\bar{r}_b$ = benchmark return for the total portfolio;
r_p = fund return for the total portfolio.

The individual asset class contributions for a top-down portfolio manager can be expressed geometrically as:

$$MT_t = (\omega_i - \bar{\omega}_i)\left[\frac{(1+\bar{r}_i)}{(1+\bar{r}_b)} - 1\right]$$

$$SS_t = \frac{\omega_i (r_i - \bar{r}_i)}{(1+\sum_i \omega_i \bar{r}_i)}$$

TABLE 2 **Average monthly value-added attributable to security selection and market timing (January 1991 to December 1998) in percentage terms**

	Total portfolio (%)		Australian equities (%)		International equities (%)		Australian fixed interest (%)	
Fund	SS	MT	SS	MT	SS	MT	SS	MT
A	-0.004	-0.030	-0.022	-0.004	-0.033†	-0.014	0.006	0.013
B	-0.091	-0.010	-0.007	-0.001	-0.004	-0.002	-0.007	0.011
C	-0.039	-0.022	0.071†	0.003	-0.070‡	-0.002	0.006	0.018
D	0.109†	0.059†	0.159‡	0.012	-0.033	0.000	0.005	0.002
E	-0.057	0.020	0.027	0.011	-0.055†	-0.022†	0.011‡	0.003
F	-0.054	0.007	-0.001	0.005	-0.046	0.001	-0.001	0.004
G	0.045	-0.041	-0.013	-0.003	0.066	-0.004	-0.001	0.002
H	-0.013	0.047*	0.023	-0.001	-0.025	-0.001	-0.005	0.016
I	0.195‡	-0.067†	0.180‡	-0.001	0.007	-0.002	-0.006	0.024†
J	0.034	0.021	0.030†	0.003	-0.019	0.010†	-0.002	-0.001
K	0.081*	0.011	0.036†	0.002	-0.025	0.009†	-0.005	0.003
L	-0.025	-0.039	0.028	0.012	-0.029	0.009	-0.003	0.002
M	-0.112*	0.031	0.012	0.010	-0.061	0.002	-0.003	0.021*

*Significant at 0.10 level †Significant at 0.05 level ‡Significant at 0.01 level

where in period t:
$\bar{\omega}$ = benchmark weight in asset class i;
r_i = return earned by the fund in asset class i;

Portfolio management decisions that are predominantly bottom-up assume stock-picking is of higher priority than tactical asset allocation. The bottom-up attribution framework at the total portfolio level can be represented geometrically as:

$$MT_t = \frac{(1+r_p)}{(1+\sum_i \bar{\omega}_i r_i)} - 1$$

$$SS_t = \frac{(1+\sum_i \bar{\omega}_i r_i)}{(1+\bar{r}_b)} - 1$$

The individual asset class contributions for a bottom-up portfolio manager can be expressed geometrically as:

$$MT_t = (\omega_i - \bar{\omega}_i)\left[\frac{(1+\bar{r}_i)}{(1+\sum_i \bar{\omega}_i r_i)} - 1\right]$$

$$SS_t = \frac{\omega_i (r_i - \bar{r}_i)}{(1+\bar{r}_b)}$$

NOTES

1. Sharpe's assertion here is that at the aggregate level the arithmetic must hold. In reality however, professional active managers may not accurately represent the average active dollar invested in the index. However considering the relative size of total assets managed on behalf of investors by active managers, the argument still has merit.

2. Given the law of probabilities, active funds with no skill would be expected to have a 50% chance of making a correct forecast in any period. The expectation is that informed managers should make correct forecasts more than 50% of the time.

3. Performance attribution analysis was also performed using an alternative method that captures the interaction between security selection and market timing performance. The results also support the conclusions presented in this article.

REFERENCES

Burnie, J. J. Knowles and T. Teder, 1998, "Arithmetic and Geometric Attribution", *Journal of Performance Measurement*, Fall 1998, pp. 59-68.

Elton, E., M. Gruber, S. Das and M. Hlavka, 1993, "Efficiency with Costly Information: A Reinterpretation of Evidence from Managed Portfolios", *Review of Financial Studies*, Vol. 6 (1), pp. 1-22.

Gallagher, D., 1999, "The Performance of Actively Managed Australian Equity Funds", working paper, The University of Sydney.

Keim, D., and A. Madhavan, 1998, "The Cost of Institutional Equity Trades", *Financial Analysts Journal*, July/August, pp. 50-69.

Malkiel, B., 1995, "Returns from Investing in Equity Mutual Funds 1971 to 1991", *The Journal of Finance*, Vol. 50 (2), pp. 549-72.

Robson, G., 1986, "The Investment Performance of Unit Trusts and Mutual Funds in Australia for the Period 1969 to 1978", *Accounting & Finance*, Vol. 26, pp. 55-79.

Sinclair, N., 1990, "Market Timing Ability of Pooled Superannuation Funds January 1981 to December 1987", *Accounting & Finance*, Vol. 30, pp. 511-65.

Sharpe, W., 1991, "The Arithmetic of Active Management", *Financial Analysts Journal*, Vol. 47 (1), pp. 7-9.

Superfunds, July 1999, Vol. 228, pp. 23-6. J

TABLE 3 **The proportion of months where value added due to security selection and market timing is positive (January 1991 to December 1998)**

	Total portfolio (%)		Australian equities (%)		International equities (%)		Australian fixed interest (%)	
Fund	SS	MT	SS	MT	SS	MT	SS	MT
A	47.9	42.7	47.9	47.9	46.9	37.5†	61.5†	58.3
B	37.5†	56.3	38.5†	52.1	53.1	54.2	50.0	62.5†
C	46.9	45.8	60.4*	49.0	32.3‡	46.9	47.9	61.5†
D	55.2	58.3	63.5‡	55.2	45.8	46.9	59.4*	53.1
E	43.8	47.9	58.3	53.1	40.6*	43.8	58.3	46.9
F	43.8	53.1	49.0	57.3	49.0	49.0	52.1	57.3
G	55.2	37.5†	47.9	55.2	61.5†	46.9	49.0	54.2
H	47.9	55.2	52.1	42.7	47.9	44.8	42.7	57.3
I	67.7‡	36.5‡	68.8‡	37.5†	47.9	45.8	49.0	61.5†
J	55.2	55.2	59.4*	61.5†	43.8	63.5‡	53.1	50.0
K	55.2	47.9	59.4*	59.4*	42.7	65.6‡	49.0	60.4 *
L	45.8	45.8	52.1	47.9	44.8	55.2	53.1	56.3
M	40.6*	57.3*	53.1	57.3*	41.7	52.1	47.9	60.4*

*Significant at 0.10 level †Significant at 0.05 level ‡Significant at 0.01 level