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Tactical Asset Allocation: Australian Evidence

by
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Abstract:

This paper evaluates the tactical asset allocation (TAA) capabilities, strategies and behaviour of Australian investment managers who invest assets across multiple asset classes. Specifically, we analyse the behaviour of balanced, growth and capital-stable fund managers with regard to their asset allocation activity across defensive (cash, domestic bonds, overseas bonds) and growth (domestic equities, international equities, property) asset classes, over the period December 1989 to February 2001. Overall, our evidence suggests that active managers have been unable to deliver investors with superior returns through tactical asset allocation. While the most successful asset class, domestic equities, has been value-enhancing, international shares and domestic fixed interest have generally detracted value. Finally, across all asset classes examined, our findings suggest that asset allocation into domestic equities is the most influenced by public economic information variables, with short-term interest rates, the term structure and dividend yield all having a significant explanatory role.

Keywords:

TACTICAL ASSET ALLOCATION; MULTI-SECTOR FUNDS; STRATEGIC BENCHMARKS; PERFORMANCE ATTRIBUTION.

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1. Introduction

The asset allocation decision is the most fundamental issue facing portfolio managers who invest across multiple asset classes. It has been demonstrated in a number of studies that the mix of assets between equities, bonds, property and cash is a critical factor affecting the performance of diversified funds. Indeed, Brinson, Hood and Beebower (1986), Brinson, Singer and Beebower (1991), and Blake, Lehmann and Timmerman (1999) all find that asset allocation policy decisions explain more than 90% of the variation in pension fund returns. While the asset allocation decision is clearly important for multiple sector portfolios, the literature is surprisingly sparse in terms of understanding the process by which active investment managers allocate assets across the spectrum of securities and of analysing their ability to fine-tune the portfolio's asset allocation from a fund's strategic benchmark position in an attempt to capture active returns.

Brinson, Hood and Beebower (1986) and Brinson, Singer and Beebower (1991) represents the first papers to address the topic in the US, and Blake, Lehmann and Timmerman (1999) provide an important contribution to the literature with respect to the performance of UK pension funds invested across multiple asset classes. However, in Australia the literature is largely absent. While Sinclair (1990) evaluated market timing and stock selection for Australian pooled superannuation funds invested in multiple asset classes (using an equity market proxy as the market portfolio), his sample was very small and he did not address the question of their tactical asset allocation (TAA) capabilities. Recently, Gallagher (2001) evaluated the performance of Australian pooled superannuation funds with respect to the contribution of stock selection and market timing to total portfolio returns where a manager's portfolio allocations were used to decompose the source of portfolio performance. Overall, Gallagher's (2001) performance attribution results indicated that active managers were unable to earn superior returns through either stock selection or market timing on a before-expenses basis at the total portfolio level, as well as across the three largest asset classes. Using an expanded sample over a longer time frame of 135 months, the current study provides the most comprehensive analysis (to date) of asset allocation in the Australian funds management performance evaluation literature.

To permit appropriate assessment of performance, investment managers offering managed funds with exposure to a number of different asset classes must first define their strategic or long-term passive benchmark weights in each asset sector. This entails identifying strategic benchmarks across both 'growth' assets (equities and property securities) and 'defensive' assets (bonds and cash). An investment manager's strategic benchmark is derived with reference to the collective set of risk and return assumptions across multiple asset classes, and is ultimately designed to provide investors with diversified portfolios that achieve the highest expected return per unit of risk over time. Typically, the diversified portfolio's strategic benchmark allocation to each of the asset classes is determined using quantitative models (i.e. asset-liability modeling) that incorporate historical (ex-post) asset class returns data to determine the behaviour of asset class returns (correlations) and predict the likely returns and behaviour of asset class returns and risks into the future (ex-ante). Once the investment manager's strategic asset allocation has been determined, active managers may attempt to earn additional return above the fund's stated investment policy by altering the fund's asset class

exposures over time. These deviations from the fund's long-term strategic portfolio weights represent the fund's dynamic (*tactical*) asset allocation strategy. Tactical asset allocation is described by Arnott and Fabozzi (1988, p. 4) as:

> '…active strategies which seek to enhance performance by opportunistically shifting the asset mix of a portfolio in response to changing patterns of reward available in capital markets. Notably, tactical asset allocation tends to refer to disciplined processes for evaluating prospective rates of return on various asset classes and establishing an asset allocation response intended to capture higher rewards.'

The primary motivation for our paper is to provide unique coverage of tactical asset allocation in an Australian setting, where little is known about how dynamic asset allocation is implemented and the magnitude of value-added/detracted relative to strategic benchmarks. The literature is relatively scarce in the attention provided to the dynamic asset allocation decisions made by portfolio managers, and such evidence is largely non-existent in Australia. It is important to stress that this research void exists due to limited access by researchers to the long-term data necessary for such a study. Indeed, the body of literature dedicated to the performance evaluation of multiple asset class portfolios represents a very small proportion of all studies, where performance is principally examined in sector-specific asset classes, namely equities. Our ability to gain authorized access to such data from a proprietary source not only makes our work unique in a domestic setting, but presents a worthy extension, triangulation and enhancement to a very exclusive literature on the global stage.

Moreover, a unique feature of our study that warrants particular emphasis is the superiority (relative to Blake, Lehmann & Timmerman 1999) of the strategic benchmark for 'normal' returns that we employ, since our database provides actual information regarding this strategic benchmark. Such a direct measure of the benchmark weights contrasts the indirect approximations used by Blake, Lehmann and Timmerman (1999), thereby providing us with a much less noisy framework for assessing the tactical asset allocation performance of our sample. This feature of our study constitutes an extension to this literature.

In addition, our paper makes the following important contributions to the performance evaluation literature. First, a sample of active Australian investment managers' pooled superannuation funds is evaluated to determine the importance of the asset allocation decision in terms of explaining the variation in fund returns. We examine diversified funds (Balanced and Growth) that have a majority of assets invested in growth assets, as well as Capital Stable funds that predominantly exhibit defensive asset class exposures. Second, the paper extends Gallagher (2001) by using a larger sample of investment managers as well as over a longer time horizon. Third, the paper evaluates the extent to which pooled superannuation funds are able to correctly predict asset class returns through tactically varying the fund's strategic asset allocation. The paper attempts to identify the determinants of an active manager's tactical asset allocation decision and their reliance on public information variables as a means of altering the portfolio's configuration in anticipation of capturing excess returns.

The remainder of this paper is structured as follows. Section 2 describes the data employed. Section 3 outlines the empirical framework and analysis of tactical

asset allocation strategies adopted by Australian investment managers and discusses the empirical results. The final section concludes.

2. Data

2.1 Description of Institutional Fund Dataset

This study uses monthly fund and benchmark returns as well as both strategic benchmark and asset allocation data for a sample of 51 institutional Australian growth and balanced funds and 29 capital stable funds provided by Mercer Investment Consulting (hereafter Mercer IC). The Mercer IC *Manager Performance Analytics (MPA)* database is extensive and includes all institutional pooled superannuation investment vehicles available to investors in the Australian market.[1] The data represent funds classified into three broad style categories: 'Balanced', 'Growth' and 'Capital Stable' and the total assets under management existing at February 2001 was $A35.44 billion, $A4.36 billion and $A4.13 billion, respectively. The evaluation period covers 135 months from December 1989 to February 2001 for Growth and Balanced funds (hereafter referred to as 'Diversified funds') and 122 months from January 1991 to February 2001 for Capital Stable funds. The time horizon covered by this database includes a number of economic cycles which we can examine. Investment managers report performance to Mercer IC net of management expenses and taxes (in Australian dollar terms). The analysis is not affected by survivorship bias as the Mercer IC *MPA* database retains all records of non-surviving funds, which permits analysis of the non-survivors that have closed, merged into other funds or ceased to continue operating as at February 2001. Given that Brown, Goetzmann, Ibbotson and Ross (1992) find truncating by survivorship gives rise to the appearance of predictability in mutual funds performance studies, this aspect of our study makes an important contribution to the existing literature.[2, 3]

The total fund-years for the diversified funds and capital stable funds included in the sample are 406 and 224 years, respectively. Mercer IC provided detailed information from the Mercer IC *MPA* database which monitors fund performance across the entire Australian institutional funds market. In particular, the data used in this study were derived from two specific datasets: (1) the Diversified funds sample was derived from the *Pooled Funds Survey* database; and (2) the Capital Stable funds sample came from the *Capital Stable Fund Survey* database. Summary statistics showing the performance and characteristics of the funds are presented in tables 1 and 2.[4]

1. Mercer IC does not limit its coverage by manager. The only limitation is that the funds are wholesale, are public funds (i.e. unit trust type vehicles) as well as superannuation products (i.e. for their tax status for the type of investors who access them).
2. Grinblatt and Titman (1992) argue the converse case, namely, that induced performance reversals or non-persistence is more likely (see Hallahan & Faff 2001).
3. An analysis of funds with unequal lives helps to ensure the analysis is not biased in favour of funds with sufficient longevity, or those funds that by virtue of their success remain in existence at February 2001. The data is not subject to any material survivorship bias, since all funds ceasing to exist and meeting the minimum data criterion of 36 months are included in the analysis.
4. Due to the small sample size, the Growth fund category is not reported in these tables.

Table 1

The Cross-Sectional Performance of 59 Diversified and 29 Capital Stable Funds Existing in the period 1990–2001

This table presents cross sectional statistics at the overall fund level using monthly total fund return data across diversified funds and capital stable funds. Excess fund return measures the performance difference of the fund relative to the fund's appropriate benchmark (where the benchmark accounts for the fund's specific strategic benchmark asset allocation to the various sectors). Alpha measures the risk adjusted return of the fund. All performance measures are expressed in percentage terms per month.

Panel A: Diversified Funds	
Total Overall Fund Performance	0.827
Excess Fund Return to Benchmark	0.004
t–Statistic	0.43
Alpha (risk-adjusted return)	–0.011
t–Statistic	–1.05
Panel B: Capital Stable Funds	
Total Overall Fund Performance	0.683
Excess Fund Return to Benchmark	–0.016
t–Statistic	–1.68
Alpha (risk-adjusted return)	–0.010
t–Satistic	–0.86

Table 1 shows that the mean multi-sector fund does not outperform the market and is consistent with Bird, Chin and McCrae (1983) and Gallagher (2001). The diversified sample comprises funds with both 'Growth' and 'Balanced' investment strategies, whereas the Capital Stable sample includes funds identified as 'low-risk diversified' and 'capital protected'.

Diversified funds and Capital Stable funds invest across a number of different asset classes, however the number of asset classes to which these funds have exposure and their relative weights to these asset classes is greatly dependent upon a fund's specific investment objective. The broad asset class spectrum includes investment in domestic and international equities, domestic and international bonds, direct property holdings and/or listed property securities, and cash. A small number of funds in the sample also have portfolio exposures (albeit, relatively low) to private equity or direct investments[5] and international liquid assets (cash). However, as reflected in table 2, the major difference between diversified funds and capital stable funds is that the latter type fund has significantly lower benchmark asset allocation exposures to growth-oriented assets, namely equities and property. This is so because the investment objective of capital stable funds requires the investment manager to minimise the chance of the fund's assets being eroded by negative returns over time. As we will see shortly, growth asset classes over the period 1989–2000 generally reveal both higher returns and higher

5. That is, non-listed shares representing ownership in, for example, biotechnology or information technology companies or infrastructure assets, for example, electricity, airports or toll roads.

Table 2

Descriptive Statistics of the Sample's Asset-Weighted Asset Allocation by Sector (in %) and Total Fund Sizes as at December for the Years 1989–2000

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Panel A: Balanced Funds												
No. Funds	8	29	29	30	33	34	36	37	35	36	33	33
Total Size ($A Billion)	1.38	11.01	13.85	15.05	20.58	20.82	24.43	28.27	32.29	35.78	34.41	35.44
Australian Equities	31.0	31.1	36.2	35.9	39.2	37.2	39.1	39.0	36.1	34.8	36.8	36.7
International Equities	20.1	14.9	18.7	17.9	20.2	15.9	18.6	17.1	17.6	18.6	20.2	21.9
Direct Property	12.0	12.5	9.0	8.2	5.8	8.7	8.5	6.7	5.7	4.9	2.6	2.3
Listed Property	2.2	1.9	1.7	1.9	2.8	2.8	3.3	4.8	4.8	5.9	6.2	7.1
Australian Fixed Interest	18.8	21.8	18.4	20.3	15.2	19.4	16.4	16.1	14.9	17.5	16.9	16.7
International Fixed Interest	3.7	5.0	8.7	9.4	8.4	3.6	4.8	4.3	5.6	6.4	4.9	5.6
Index-Linked Bonds	–	–	0.4	0.9	3.1	3.1	3.2	2.9	2.3	2.0	1.6	1.5
Cash	9.7	10.0	4.8	3.6	4.0	7.9	5.1	7.8	11.3	8.5	9.8	7.2
Other	2.5	2.7	2.4	2.8	4.4	4.5	4.3	4.3	3.9	3.4	2.6	2.5
Panel B: Capital Stable Funds												
No. Funds	–	–	17	19	23	23	25	26	24	22	21	21
Total Size ($A Billion)	–	–	1.79	3.39	5.67	5.10	5.80	6.04	6.56	5.96	5.10	4.13
Australian Equities	–	–	17.3	16.1	18.8	14.3	17.1	17.2	14.8	13.7	13.8	13.7
International Equities	–	–	4.4	2.3	4.7	3.6	5.0	4.0	4.3	5.0	5.8	6.5
Direct Property	–	–	1.3	1.8	2.4	4.2	4.5	3.7	3.7	2.8	1.8	1.9
Listed Property	–	–	1.3	1.9	3.4	2.1	2.7	3.2	3.2	4.0	3.6	3.4
Australian Fixed Interest	–	–	58.5	58.5	43.6	41.9	41.9	42.5	39.4	43.2	31.1	32.6
International Fixed Interest	–	–	3.1	3.9	6.8	2.8	4.2	3.7	6.3	6.8	8.8	9.8
Index-Linked Bonds	–	–	0.1	0.9	6.6	4.7	3.5	3.0	2.7	2.5	2.7	2.6
Cash	–	–	13.8	14.6	13.7	26.2	21.1	22.6	25.5	21.8	32.4	29.6
Other	–	–	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.2	0.0	0.0

volatilities than other asset classes in the period. This translates into growth assets having a higher probability of earning a negative return in the period than is the case for the defensive asset classes. Therefore, capital stable funds generally invest higher proportions of fund assets in cash and fixed income securities.

The Mercer IC *MPA* database includes monthly fund performance across individual sectors and for the total portfolio. Average asset allocations of each fund and across each month are also recorded, which allows inferences to be made concerning the asset allocation positions of investment managers relative to each fund's unique strategic benchmark. The investment managers provide these strategic benchmark weights for each of their pooled funds to asset consulting firms such as Mercer IC in order to better understand the investment strategy to be implemented.[6] Strategic benchmarks are generally fixed across time and represent a fund's long-term investment objective. They are also publicly available to investors, and provide them with information concerning the relative aggressiveness of the investment strategy. Over the short-term, managers may implement dynamic asset allocation strategies whereby the manager uses economic and capital markets forecasts as a predictor of future returns. This involves the manager under- or over-weighting a fund's asset allocation relative to their own strategic benchmark in an attempt to enhance portfolio performance via their chosen tactical asset allocation strategy.

Table 3 reports in summary form, annual average deviations from the strategic benchmarks across major asset classes (in percentage terms). For example, we see that in the case of Balanced funds (panel A), over the years 1993–1996 managers were relatively 'bullish' with regard to Australian equities, on average taking over-weight bets of around 4% above their strategic benchmarks. In contrast, for the years following this period, they deviated negligibly from their domestic equities benchmark. A second feature evident for the Balanced funds sample is a consistent 'under-weight' strategy in the Australian Fixed Interest (AFI) sector—particularly, in the latter half of our period, wherein on average they took bets against AFI in the region of 2.5 to 5%. Interestingly, this negative AFI tilt was even more pronounced for the Capital Stable funds (panel B), which on average were typically 4 to 7% under-weight. This contrasts their bullish view of AFI in 1991–1992, wherein managers over-weighted by around 8%. A third feature worthy of comment in table 3 is the Cash allocation deviations from benchmark. Mostly, we see over-weighting in cash which in part might reflect a fund flow issue. The literature finds evidence consistent with new money flows 'chasing' past period performance, and when these managers are performing well, new money flows will tend to be attracted to the fund. Over the latter part of our sample period (post mid 1990s), fund managers experienced very high absolute returns, particularly sourced from domestic and international equities asset classes. However, the late 1990s also exhibited significant liquidity entering the investment industry, and primarily sourced from superannuation contributions. In addition to liquidity reasons, the overweight positions to Cash might also be explained by managers acting defensively given the long bull run in equity securities, climaxing in the Technology boom of 2000.

6. These independent strategic benchmark weights provided by the investment managers have been used in the attribution analysis performed below.

Table 3

Descriptive Statistics of the Asset-Weighted Average Fund's Tactical Asset Allocation Strategy Relative to Strategic Benchmark for the Major Asset Classes

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Panel A: Balanced Funds												
Australian Equities	–2.6	–2.6	1.7	1.5	4.3	2.4	4.2	4.3	0.9	–0.7	–0.7	–0.2
International Equities	0.8	–4.5	–0.8	–1.7	0.8	–3.4	–0.7	–1.9	–1.9	–1.0	–0.4	0.1
Direct Property	–2.1	–1.6	–4.1	–3.1	–3.9	–0.3	–0.7	–0.5	–1.1	–1.7	–2.3	–1.5
Listed Property	0.8	0.5	0.4	–0.4	0.2	0.0	0.6	1.1	0.8	1.9	1.2	2.3
Australian Fixed Interest	–1.0	1.8	–0.6	0.7	–4.8	–0.5	–3.5	–3.7	–5.0	–2.5	–2.5	–2.4
International Fixed Interest	1.2	1.9	4.4	4.6	3.4	–1.7	–0.4	–1.1	0.4	1.7	0.3	–0.1
Index-Linked Bonds	0.0	0.0	0.0	0.0	1.4	0.0	0.1	0.2	–0.4	–0.8	–0.4	0.0
Cash	2.6	3.7	–1.2	–2.1	–1.2	2.8	0.0	2.5	6.2	3.3	4.8	2.6
Other	0.5	0.8	0.2	0.5	–0.1	0.6	0.2	–0.7	0.0	–0.2	0.0	–1.0
Panel B: Capital Stable Funds												
Australian Equities	–	–	3.9	3.1	5.7	0.8	3.2	3.4	0.8	–0.1	–1.1	–0.9
International Equities	–	–	–0.4	–1.8	0.3	–1.4	–0.5	–1.3	–1.3	–0.3	–0.2	–0.4
Direct Property	–	–	–1.9	–1.9	–1.5	1.5	1.4	0.9	0.7	0.4	0.0	0.2
Listed Property	–	–	–1.5	–1.6	–0.2	–1.7	–0.5	0.0	–0.6	0.1	0.5	0.6
Australian Fixed Interest	–	–	7.5	8.4	–5.3	–7.1	–5.0	–4.5	–6.2	–3.7	–5.6	–3.8
International Fixed Interest	–	–	–1.8	–0.3	2.4	–2.8	–1.8	–2.7	0.3	0.9	–0.4	0.0
Index-Linked Bonds	–	–	0.0	0.1	5.2	3.0	1.8	1.4	0.2	–0.2	–0.2	0.3
Cash	–	–	–6.0	–6.1	–6.7	7.6	1.5	2.8	6.0	3.0	7.1	4.4
Other	–	–	0.2	0.0	0.0	0.0	–0.2	0.0	0.1	0.1	–0.1	–0.3

Note: The figures reported in this table are based as at December for the years 1989–2000. Deviations from strategic benchmark expressed in percentage terms. Positive (negative) values indicate above (below) benchmark exposures.

2.2 Historical Asset Class Returns, Risks and Correlations

The evaluation of performance of investment managers investing across multiple asset classes first requires the identification of appropriate market proxies that represent a passive, market-capitalisation-weighted investment in a universe of securities. In theory there are numerous asset classes that may exist, however in investment markets, asset classes are typically defined in broad terms on the basis that the securities comprising the asset class have some degree of commonality in terms of their characteristics. In the Australian investment markets, the six largest and easily identifiable asset classes are Australian equities, International equities, Australian Bonds, International Bonds, Property and Cash. The market indices used as proxies for each of the asset classes are outlined in table 4 and represent passive investment strategies across each asset sector.[7]

Table 4

Benchmark Indices Employed as Asset Class Proxies

This table defines the asset class benchmarks used as proxies. These indices are widely cited by Australian investment managers, institutional investors and asset consulting firms.

Asset Class	Code	Benchmark Index
Australian Equities	AEQ	S&P/ASX 300 Accumulation Index*
International Equities	IEQ	MSCI World (ex-Australia) Index in $A (net dividends re-invested)
Direct Property	DP	Mercer Direct Property Index
Listed Property	LP	S&P/ASX 300 Listed Property Accumulation Index*
Australian Bonds	AFI	UBS Warburg Composite Bond Index
Overseas Bonds	OFI	Salomon Smith Barney World (ex-Australia) Government Bond Index Hedged in $A
Cash	Cash	UBS Warburg Bank Bill Index

Note: *ASX All Ordinaries Accumulation Index (equities) and ASX Listed Property Accumulation Index (listed property) was used prior to 1 April 2000.

Asset classes may be dichotomised into two broad categories—*growth* assets or *defensive* assets. Growth assets include equity and property investments, whereby returns derived from such investments comprise income and changes in capital value. Defensive assets on the other hand are defined as income returns from investments in bonds and liquid securities. Defensive asset classes exhibit a degree of stability in the underlying value of an investor's initial investment. That is, highly liquid money market securities and bonds derive interest income from the underlying capital value, wherein the capital value remains stable. In the case of bonds held to maturity, the principal component or initial investment is redeemable at maturity. Debt instruments provide the investor with a legal claim to repayment of the principal value at a future date. In addition, growth and defensive asset classes may be generally distinguished in terms of their historical returns, ex-post

7. These market proxies are the most commonly used/cited indexes in the Australian investment industry during the period evaluated.

volatility and the level of asset class correlation existing between sectors. To this end, table 5 presents the returns (income plus capital changes), volatilities and correlations between asset classes using data provided by Mercer Investment Consulting. The asset class proxies used rely on the standard industry benchmarks widely referenced in the Australian investment management industry and are defined as per table 4. While future returns and future volatility of asset classes are unknown, historical data provides investors with some degree of insight into the level of returns derived and the risks associated with each of the asset classes.

Table 5

Historical Annual Returns, Volatility and Correlations: Period December 1989—February 2001

This table shows the per annum returns, volatilities and correlations (Pearson) across asset classes in the period December 1989 to February 2001, where the asset classes are defined in table 4. The Consumer Price Index (CPI), as a measure of inflation and Average Weekly (Male) Ordinary-Time Earnings is also presented for comparison purposes in the period December 1989 to December 2000.

			Correlation (%)						
Asset Class	Return % pa	SD % pa	AEQ	IEQ	DP	LP	AFI	OFI	Cash
AEQ	11.0	13.2	100.0	43.5*	–1.2	54.2*	41.4*	22.4*	–3.5
IEQ	12.3	14.9	–	100.0	–5.8	29.8*	18.3*	30.0*	–6.1
DP	3.0	4.2	–	–	100.0	–1.4	–13.6	–22.2*	–10.9
LP	12.1	10.2	–	–	–	100.0	47.5*	30.8*	6.2
AFI	11.6	4.8	–	–	–	–	100.0	65.2*	32.3*
OFI	10.5	3.2	–	–	–	–	–	100.0	24.1*
Cash	7.3	0.9	–	–	–	–	–	–	100.0
CPI	2.7	1.9	–	–	–	–	–	–	–
AWE	3.4	2.4	–	–	–	–	–	–	–

Note: * Significant at 5% level.

Table 5 shows that across all asset class sectors, international equities recorded both the highest return and standard deviation in the 13–year period. As expected, the growth asset classes exhibit higher standard deviations (or risk) than is the case for defensive asset classes. An important point also needs to be identified in relation to direct property. Direct property valuations do not occur as frequently as other asset classes. That is, other asset classes are more easily priced given their relative liquidity benefits. In many cases, direct property requires valuers to estimate prices. Given the ‘staleness’ of direct property as an asset class, standard deviation measures should be expected to be understated—where a closer approximation would be to the risk/return attributes of listed property.

3. Evaluating Performance and Tactical Asset Allocation

3.1 Sources of Change in Aggregate Portfolio Weights

While tables 2 and 3 provide an interesting picture regarding some possible trends in asset allocation dynamics across our sample, they do not allow us to deduce to what extent this reflects *ex-ante* manager decisions (i.e. changes in the strategic asset allocation) versus *ex-post* rewards (i.e. due to successful market timing). In this context, as a preliminary step in their analysis, Blake, Lehmann and Timmerman (1999) develop a procedure to decompose these sources of change in aggregate portfolio weights. Accordingly, we also apply their decomposition technique to our sample as follows. Two forms of decomposition are examined. First, the mean change in portfolio weights are decomposed according to Blake, Lehmann and Timmerman (1999)'s equation (4):[8]

$$\Delta \log(\omega_{jt}) \approx r_{jt} - r_{pt} + NCF_{jt} - NCF_{pt} \tag{1}$$

where: ω_{jt} is the total portfolio holding in asset class j at the end of month t; r_{jt} is the rate of return on fund holdings of asset class j; r_{pt} is the rate of return on the total portfolio at time t; NCF_{jt} is the rate of net cash flow into asset class j in month t; and NCF_{pt} is the value-weighted net cash flow into the total fund portfolio in month t. Equation (1) states that the mean change in portfolio weights are disentangled into: (a) a passive strategy, that is, that part due to differential returns across asset classes ($r_{jt} - r_{pt}$); and (b) an active strategy, that is, that part due to net cash flow differentials across asset classes by rebalancing the portfolio ($NCF_{jt} - NCF_{pt}$).

In the second form of the decomposition, the variance of changes in portfolio weights are decomposed according to Blake, Lehmann and Timmerman (1999)'s equation (5):

$$\text{var}(\Delta \log(\omega_{jt})) \approx \text{var}(r_{jt} - r_{pt}) + \text{var}(NCF_{jt} - NCF_{pt}) + 2\,\text{cov}(r_{jt} - r_{pt}, NCF_{jt} - NCF_{pt}) \tag{2}$$

As such, this decomposition states that the short-term variation in aggregate asset allocations can be disentangled into: (a) variations in return differentials across asset classes; (b) variations in net cash flow differentials across asset classes; and (c) the covariance between differential returns and net cash flow differentials across asset classes.

The results for this analysis are reported in table 6, wherein panel A (panel B) presents the outcome for Diversified funds (Capital Stable funds). We first consider Diversified funds and the decomposition of the mean change in portfolio weight (panel A.1). Several features are evident. First, the slight increase in weight for Australian Equities (1.21%) is mostly due to passive differential returns. Second, the 2.15% increase in portfolio weight into International Equities is driven exclusively by return differential, offset slightly by some (active) net selling. Third, the decline in average asset allocation to AFI is totally due to net sales. Fourth, the net increased portfolio allocation in OFI occurs despite a (4.25%) fall in weighting

8. See Blake, Lehmann and Timmerman (1999) for a derivation of this equation.

induced by passive differential returns—hence, there was considerable (7.1%) active net purchases for this asset class. Fifth, Listed Property experienced a considerable increase in portfolio weighting of 8.3%, almost exclusively explained by active net purchases. Sixth, Direct Property saw the largest decline in average asset allocation (–13.3%) approximately equally induced by both passive and active strategies. In relation to listed and direct property, we cannot rule out that managers simply re-configured their property portfolios as a means of achieving improved diversification and liquidity benefits from listed property trusts.

Now consider Capital Stable funds and the decomposition of the mean change in portfolio weight (panel B.1). First, Australian Equities exhibited a 4% increase average asset allocation which, similar to the Diversified funds counterpart, is mostly due to passive differential returns. Second, International Equities experienced a considerable increase in portfolio weight of over 19%, exclusively due to active net purchases. This result contrasts the counterpart case for Diversified funds. Third, the 5.6% decline in average asset allocation to AFI is totally due to net sales (similar to the counterpart case for Diversified funds). Fourth, International Fixed Interest and Listed Property both experienced massive asset allocation increases in excess of 30% which are almost exclusively explained by active net purchases. Fifth, Direct Property showed a relatively neutral change (of around 2%) in portfolio weights, driven by strategic purchases despite the relatively poor performance of passive strategies (leading to a reduced allocation of 4%).

Next consider Diversified funds and the decomposition of the variance of changes in portfolio weight (panel A.2). Most notably we see that in the case of the International Equities, Australian Fixed Interest, International Fixed Interest and Listed Property asset classes; return differentials largely explain the monthly variation in portfolio weights. For Australian Equities, the variance is driven by both differential returns and net cash flow differentials, while being considerably reduced by the covariance between them.

Finally in the context of table 6, consider Capital Stable funds and the decomposition of the variance of changes in portfolio weight (panel B.2). Across all asset classes it is seen that return differentials are the dominant force (though slightly less so for Australian Equities).[9] In summary, the full set of findings displayed in table 6, are broadly consistent with their counterparts reported in Blake, Lehmann and Timmerman (1999).

3.2 Measuring Tactical Asset Allocation Ability

Tactical asset allocation performance can be assessed using the performance attribution framework proposed by Brinson, Hood and Beebower (1986) and Brinson, Singer and Beebower (1991). Performance attribution measures the effect of the portfolio manager's active investment decisions across asset sectors and their respective contribution to aggregate portfolio performance. Indeed, Brinson, Hood and Beebower (1986) and Blake, Lehmann and Timmerman (1999) document the

9. Readers should note that the variance results need to be interpreted with some caution, due to the considerable variation in the length of available data across the funds. This factor meant that the sample of funds was often changing, particularly in the case of Capital Stable funds.

Table 6
Identifying the Sources of Changes to Aggregate Portfolio Weights across Asset Classes

	Australian Equities (AEQ)	International Equities (IEQ)	Australian Fixed Interest (AFI)	International Fixed Interest (OFI)	Listed Property (LP)	Direct Property (DP)
			Panel A: Diversified Funds			
A.1 Mean Change in Portfolio Weight (annualized)	1.21	2.15	–3.32	2.89	8.30	–13.30
Due to Differential Returns	0.97	2.83	–0.32	–4.25	0.82	–6.30
Due to Net Cash Flow Differentials	0.25	–0.68	–3.00	7.14	7.48	–7.00
A.2 Percentage of Monthly Variance in Portfolio Weights						
Due to Differential Returns	93.47	84.25	90.11	99.45	84.26	59.31
Due to Net Cash Flow Differentials	75.70	28.50	17.70	2.21	35.33	23.11
Due to Covariance Between These	–69.18	–12.75	–7.81	–1.66	–19.59	17.58
			Panel B: Capital Stable Funds			
B.1 Mean Change in Portfolio Weight (annualized)	4.02	19.65	–5.58	32.24	35.31	1.77
Due to Differential Returns	3.32	0.08	–0.47	–3.46	1.37	–4.03
Due to Net Cash Flow Differentials	0.70	19.58	–5.12	35.70	33.94	5.80
B.2 Percentage of Monthly Variance in Portfolio Weights						
Due to Differential Returns	61.33	101.16	88.88	112.14	87.96	108.76
Due to Net Cash Flow Differentials	27.27	8.19	7.56	0.59	10.72	4.01
Due to Covariance Between These	11.40	–9.35	3.56	–12.73	1.32	–12.77

Note: The results in this table are based on the procedure developed in Blake, Lehmann and Timmerman (1999).

overwhelming significance of the asset allocation policy in determining the fund's overall performance. The seminal paper by Brinson, Hood and Beebower (1986) proposes an attribution framework allowing a decomposition of the active return (differential return from the benchmark return) derived through security selection and tactical asset allocation management. This approach assumes the fund manager's portfolio management objective is to outperform the fund's strategic benchmark return (or investment policy) without reference to whether the manager predominantly employs a 'top-down' approach in portfolio construction, 'bottom-up' strategy or some combination of both methodologies.

The attribution approach begins with a simple decomposition of the active raw (unadjusted for risk) return of a fund in period t: If we define r_{pt} as the portfolio return at time t, r_{bt} as the return on the asset class market proxy or benchmark index, then the return difference between r_{pt} and r_{bt} can be decomposed into security selection (r_{st}), tactical asset allocation (r_{at}) and residual or interaction (r_{rt}) components. The residual of active performance is not strictly attributable to either stock selection or asset allocation, and represents the interaction between both sources of active management decision-making. Tactical asset allocation, security selection and interaction components, respectively, over a single time period t can be expressed as:

$$R_{at} = \sum_i (\omega_{it} - \overline{\omega}_{it})(\overline{r}_{it}) \tag{3}$$

$$R_{st} = \sum_i (\overline{\omega}_{it})(r_{it} - \overline{r}_{it}) \tag{4}$$

$$R_{rt} = \sum_i (\omega_{it} - \overline{\omega}_{it})(r_{pt} - \overline{r}_{it}) \tag{5}$$

where:

ω_i = average actual weight in asset class i;
$\overline{\omega}_i$ = benchmark weight in asset class i;
r_i = return earned by the fund in asset class i;
r_p = fund return for the total portfolio;
$\overline{r}_i$ = benchmark return representing a passive investment strategy in asset class i; and
$\overline{r}_b$ = benchmark return for the total portfolio.

Burnie, Knowles and Teder (1998) also propose a modified equation from (3) that measures tactical asset allocation with respect to the difference in value-added between the individual asset class' benchmark return and the total portfolio's overall benchmark return. In this respect, the Burnie, Knowles and Teder (1998)

methodology accounts for timing ability with respect to the fund's overall investment policy and is expressed as:

$$R_{at} = \sum_{i} (\omega_{it} - \overline{\omega}_{it})(\overline{r}_{it} - \overline{r}_{bt}) \tag{6}$$

At the aggregate portfolio level, the summation across asset classes ensures the contribution of tactical asset allocation to total performance is identical for both (3) and (6). Given that this study is concerned with tactical asset allocation, we evaluate the performance of diversified funds and their ability to earn incremental returns above their strategic asset allocation benchmark with respect to equation (3). Consistent with Brinson, Hood and Beebower (1986) and Blake, Lehmann and Timmerman (1999), the returns captured by the residual term are attributed to security selection,[10] such that the decomposition of returns can be simply expressed in terms of the funds': (a) investment policy (or strategic benchmark); (b) tactical asset allocation; and (c) stock selection.

A unique feature of our study that warrants strong emphasis is the superiority (relative to Blake, Lehmann and Timmerman 1999) of the strategic benchmark for 'normal' returns, $\overline{\omega}_i$, that we employ. Specifically, our study exhibits a major advantage, in that our database provides actual information regarding this strategic benchmark, as supplied by Australian fund managers to Mercer IC. Such a direct measure contrasts the indirect approximations used by Blake, Lehmann and Timmerman (1999), namely: (a) a 'constant' benchmark based on average ex-post portfolio weights; and (b) a 'trended' benchmark in which weights are arbitrarily modeled to linearly increase or decrease over time between initial and terminal weights. As stated by Blake, Lehmann and Timmerman (1999, p. 451):

> 'The choice of normal portfolio weights is more problematic. Genuine performance measures should reflect investors' ex ante information on future asset returns. However, we only observe actual portfolio weights, and these reflect realized returns. So information on ex post returns and portfolio weights will permit only noisy performance measurement. In the absence of any information on the funds' asset-liability modeling exercises that might enable us to draw inferences about their associated strategic asset allocations, we were reduced to experimenting with a few simple, empirically plausible models.'

As such, our direct measure of the benchmark weights provides a less noisy framework for assessing the tactical asset allocation performance of our sample. This feature of our study constitutes an improvement in this literature.

The results for fund tactical asset allocation ability are presented in table 7. Overall, the evidence suggests that active managers investing across multiple asset classes have been unable to deliver investors with superior returns through tactical asset allocation over the period examined. The most successful asset class across all fund types has been domestic equities (AEQ), with an average monthly TAA return of around 0.01% and 0.02% for Capital Stable and Diversified funds, respectively. These averages are statistically different from zero based on a non-

10. The assumption is that the residual term is small relative to the returns attributable to timing, selection and investment policy.

parametric sign test (at the 5% level) in both cases, and this significance is also reinforced by the test in the case of Diversified funds. Indeed with the latter

Table 7
Empirical Tests of Tactical Asset Allocation Performance

This table summarizes tactical asset allocation performance in the six major asset classes (defined in table 4) for Diversified funds (panel A) and Capital Stable funds (panel B). The mean and standard deviations are recorded in percentage terms per month.

Sectors	AEQ	IEQ	DP	LP	AFI	OFI
Panel A: Diversified funds						
Mean	0.021	–0.028	0.004	0.005	–0.004	–0.004
Standard Deviation (Average)	0.206	0.170	0.061	0.071	0.088	0.027
Median	0.008	–0.015	–0.003	0.004	–0.006	–0.003
No. Funds Significant* and Positive	17	3	9	6	11	2
No. Funds Insignificant* and Positive	22	5	7	14	9	9
No. Funds Significant* and Negative	0	12	2	5	16	12
No. Funds Insignificant* and Negative	6	25	6	10	9	6
No. Funds with Sector Exposures	45	45	24	35	45	29
Cross-Sectional Parametric Test	2.92*	–3.68*	–0.87	1.48	–1.00	–0.96
Cross-Sectional Non-Parametric Test	4.77*	–4.47*	1.43	0.68	–0.89	–1.49
Panel B: Capital Stable funds						
Mean	0.009	–0.015	0.009	–0.001	–0.027	–0.005
Standard Deviation (Average)	0.135	0.075	0.023	0.063	0.135	0.028
Median	0	–0.008	0.004	0.001	–0.013	–0.003
No. Funds Significant* and Positive	8	1	9	4	4	3
No. Funds Insignificant* and Positive	13	5	3	9	8	1
No. Funds Significant* and Negative	1	9	4	5	8	8
No. Funds Insignificant* and Negative	5	11	1	5	9	4
No. Funds with Sector Exposures	27	26	17	23	29	16
Cross-Sectional Parametric Test	1.43	–4.44*	2.30*	–0.28	–2.10*	–1.65
Cross-Sectional Non-Parametric Test	2.69*	–2.94*	1.46	0.42	–1.11	–2.25*

Note: * Significant at the 5% level.

The non-parametric sign test, tests whether there are a significantly greater number of positive than negative cases across our sample of funds. The statistic is calculated as:

$$Stat = \frac{(A_t \pm 0.5) - E_i}{\sqrt{N_t P(1-P)}}$$

where, A is the actual number of positive cases. If A < 1/2N, the expression $(A_t + 0.5)$ is applied and if A > 1/2N, the expression $(A_t - 0.5)$ is applied. E_i = expected number of positive cases, N_t = total number of observations, P = expected percentage of positive cases under the null hypothesis, that is, $p = 0.5$.

category, AEQ asset allocation returns are positive in all but 6 of the 45 funds, 17 cases of which are individually significant at the 5% level. In contrast, table 7 reveals that tactical asset allocation in international shares (IEQ) and domestic fixed interest (AFI) has generally been value detracting. Specifically, in the case of AFI an average monthly TAA return of –0.027% is observed for Capital Stable funds and this value is statistically significant according to the parametric *t*–test (at the 5% level). With regard to the asset class of IEQ, the average monthly TAA return of –0.015% (–0.028%) for the Capital Stable (Diversified) funds is statistically significant for both the parametric and non-parametric tests (at the 5% level).[11, 12]

3.3 Manager's TAA Strategy Given Publicly Available Information

A major goal of this study is to examine the potential determinants of tactical asset allocation decisions by managed funds in Australia. To this end we investigate whether, and to what extent, a set of public information or macroeconomic variables predict shifts in TAA behaviour. The selection of market and macroeconomic indicators is somewhat arbitrary, and to keep the analysis manageable we confine our analysis to a set of three lagged variables that previous return predictability studies have identified—the 1–month treasury bill yield (Ztnote), dividend yield (Zdivy), and the term structure premium (between 10–year Treasury bond yields and the 3–month treasury bill yields) (Zterm).[13] Our data source was the Reserve Bank of Australia's (RBA) Electronic database. We also employ the dividend yield of the MSCI World (ex-Australia) Index for our examination of the determinants of asset allocation dynamics for international equities.

Following Blake *et al.*'s (1999) decomposition on the cross-sectional aspects of asset allocation dynamics, shifts in relative net cash flows across asset classes (net of the liquidity component) are used in this paper to proxy *active* decisions in asset allocation and thus, market timing ability. This captures the fund managers' active strategy of rebalancing the portfolio by redirecting cash flows across asset groups instead of that due to cash flow (liquidity) shocks or due to return differentials between sectors. Relative net cash flows (*RNCF*) for each individual asset class are defined as:

$$RNCF_{ijt} = \left\{ w_{ij,t} F_{i,t} - \left[w_{ij,t-1} F_{i,t-1} (1 + r_{ij,t}) \right] \right\} / \, w_{ij,t-1} F_{i,t-1} \qquad (7)$$

where i = fund manager;
j = asset class;

11. Jonathan Shead at SSgA has also reported evidence at the sector level which shows that Australian managers have been successful overall in Australian equities, while unsuccessful in International shares. This research is available on the SSgA website www.ssga.com.
12. One final issue based on unreported analysis, is worthy of comment. We found that funds which failed within our sample period have weaker tactical asset allocation performance than the surviving ones. Further, the distributions of their tactical asset allocation performance across asset classes were more peaked and positively skewed indicating a higher degree of consistency in their ability to add value to fund performance.
13. See Ferson and Schadt (1996), Sawicki and Ong (2000) and Flannery and Protopapadakis (2002).

t = month;
F = fund's total asset value;
r = return; and
w = proportion of fund i's total asset value (F).

For the main fund types, a fixed effects[14] unbalanced panel data regression was run with the relative net cashflows (dependent variable) against the vector of lagged public information variables Z_{t-1}: Ztnote, Zterm and Zdivy.[15]

$$RNCF_{ijt} = \alpha_{ij} + Z'_{t-1}\beta + \varepsilon_{ijt} \quad (8)$$

3.3.1 Diversified Fund Manager's TAA Strategy Given Publicly Available Information In the case of Diversified funds, panel A of table 8 reports the outcome of estimating this model. Generally, we observe that across the six asset classes, economic variables appear most important in determining the appropriate level of asset allocation for Australian Equities. Specifically, coefficients on Ztnote and Zterm are both significant at the 1% level, and exhibit positive coefficients, suggesting that fund managers increase their asset allocation to Australian shares when the economy is both performing well and is expected to continue to do so (upward sloping yield curve). That is, it seems that asset class shifts enacted by fund managers follow a type of momentum pattern.[16, 17]

Similar to the AEQ case, for Listed Property both Ztnote and Zterm are significant (though at the 5% level this time), and also reveal positive coefficients.[18] This suggests that fund managers increase their asset allocation to Listed Property during normal economic conditions, and when the economy is struggling (but expected to perform better in the future) due to an expected 're-rating' (i.e. when the yield curve is upward sloping). The positive coefficient on Ztnote suggests that fund managers also increase their asset allocation to Listed Property when short-term interest rates are higher.

In the case of Overseas Fixed Interest (OFI), the coefficient on Zdivy is positive and significant at the 5% level, while the Zterm coefficient is negative and significant at the 10% level. The positive Zdivy coefficient potentially suggests that fund managers increase their allocation to OFI when the domestic equity market is

14. The fixed effects model is consistent with the error structure of the model used by Blake, Lehmann and Timmerman (1999) for analysing UK pension fund behaviour.
15. Observations that were more than two standard deviations away from the mean have been excluded.
16. Strong price momentum has been documented in the Australian equity market. Hurn and Pavlov (2003) show evidence of medium-term momentum prevalent in the Australian equity market. Similarly, Demir, Muthuswamy and Walter (2004) find evidence of a very strong momentum anomaly (at both short and intermediate horizons) which is robust to size, liquidity, and risk-adjustment techniques.
17. The authors are aware of some unpublished research which investigates momentum strategies in a TAA setting. Generally, this research shows that asset class shifts follow a momentum pattern—managers reallocate to sectors based on past sector returns, and this phenomenon is more pronounced among funds with poor market timing skill.
18. This is not entirely unexpected, given table 4 shows Listed Property and Australian Equities asset classes are highly correlated in terms of their performance.

Table 8

Economic Conditions and Asset Allocation

This table presents in panel A, the panel data regression results for the sample of Diversified Funds (i.e. Balanced and Growth Funds) and in panel B, the results for Capital Stable Funds. Direct Property is excluded from the analysis due to relative illiquidity of the asset class for a fund manager to quickly shift their asset class exposure. The model specification is defined in equation (8) as follows:

$$RNCF_{ijt} = \alpha_{ij} + Z'_{t-1}\beta + \varepsilon_{ijt} \tag{8}$$

where *RNCF* is the relative net cash flows defined as:

$$RNCF_{ijt} = \left\{ w_{ij,t} F_{i,t} - \left[w_{ij,t-1} F_{i,t-1} (1 + r_{ij,t}) \right] \right\} / \, w_{ij,t-1} F_{i,t-1} \tag{7}$$

i = fund manager;
j = asset class;
t = month;
F = fund balance;
r = return;
w = proportion of fund i's total asset value (F); and
Z_{t-1} = the vector of public information variables lagged one period (treasury note rate, term spread and dividend yield).

	AEQ	IEQ	AFI	OFI	LP	Cash
			Panel A: Diversified Funds			
Constant	–0.0292	–0.0308	0.0754**	–0.0750	0.0082	0.2409
	(0.1856)	(0.3440)	(0.0476)	(0.2239)	(0.5146)	(0.3789)
Ztnote	0.0543***	–0.0767	–0.0364	–0.0490	0.0244**	0.1751
	(0.0004)	(0.1591)	(0.1684)	(0.7353)	(0.0355)	(0.4385)
Zterm	0.0928***	–0.0423	0.0429*	–0.3214*	0.0241**	0.0262
	(0.0000)	(0.5476)	(0.0954)	(0.0509)	(0.0108)	(0.9153)
Zdivy	–0.0296	0.3515***	0.0510	0.6931**	–0.0243	–1.0195
	(0.5330)	(0.0025)	(0.5315)	(0.0156)	(0.5653)	(0.1343)
F–Statistic	3.91***	4.36***	1.55**	1.88***	3.35***	1.17
	(0.0000)	(0.0000)	(0.0202)	(0.0071)	(0.0001)	(0.2281)
No. Funds	36	35	37	24	31	35
R^2. Adj.	0.0579	0.0572	0.0220	0.0455	0.0614	0.0226
			Panel B: Capital Stable Funds			
Constant	–0.0104	–0.1911***	0.0360	–0.0630	0.0174**	–0.0656
	(0.7744)	(0.0032)	(0.2860)	(0.4501)	(0.0481)	(0.4681)
Ztnote	0.2180***	0.0388	0.1271***	–0.0246	–0.0043	0.1298
	(0.0000)	(0.8407)	(0.0003)	(0.9213)	(0.6777)	(0.1693)
Zterm	0.0652*	–0.0228	0.0345	–0.3790	–0.0112	0.0748
	(0.0734)	(0.9200)	(0.3044)	(0.1573)	(0.1860)	(0.4187)
Zdivy	–0.2765*	0.7050*	–0.1737	0.8616*	–0.0217	–0.3079
	(0.0608)	(0.0733)	(0.1877)	(0.0705)	(0.5655)	(0.3682)
F–Statistic	2.62***	1.04	2.40***	0.96	1.69**	0.93
	(0.0000)	(0.4117)	(0.0002)	(0.4949)	(0.0434)	(0.5436)
No. Funds	26	27	25	17	17	19
R^2. Adj.	0.0672	0.0277	0.0482	0.0303	0.0393	0.0180

Note: *p*–values are shown in brackets;
*,**,*** denote significance at the 10, 5 and 1% level, respectively; and
the *F*–test is for the null hypothesis of no fixed effects.

in decline and dividend yields are increasing (since when equity markets 'correct', companies tend to smooth dividends, inducing a rise in percentage yields). In contrast to OFI, for the Australian Fixed Interest (AFI) sector, the coefficient on Zterm is positive (and significant at the 10% level). This suggests that fund managers increase their domestic fixed interest asset allocation and decrease their overseas fixed interest allocation when (domestic) long-term interest rates are higher.

For International Equities (IEQ) only Zdivy produced a significant, positive coefficient, at the 1% level. This is not surprising, since it potentially suggests that fund managers increase their asset allocation in foreign equities when domestic dividend yields are increasing—a situation likely to coincide with a decline in the domestic share market.

Finally, it is noted that no economic variables were significant in determining fund managers asset allocation to Cash. It is likely that cash has relatively small weights in Diversified funds, and as a consequence its asset allocation may be determined as a residual from the larger asset classes, thereby explaining the generally lower importance of economic variables. Indeed, cash also has an important role in managing liquidity between the fund and investors.

3.3.2 Capital Stable Fund Manager's TAA Strategy Given Publicly Available Information Panel B of table 8 reports the results for the Capital Stable sample of funds. Similar to the case of Diversified funds, economic variables seem best at explaining asset allocation for Australian Equities. Once again, coefficients on Ztnote (1% level) and Zterm (10% level) are positive and significant for Australian equities, while the Zdivy coefficient is now also significant at the 10% level and shows a negative sign. This latter result suggests that (unlike their Diversified fund counterparts) there is weak a tendency for Capital Stable fund managers to reduce their asset allocation to Australian equities when the sharemarket is in decline and dividend yields are increasing. Presumably this differential response to the dividend-based public information variable reflects the more cautious/conservative nature of Capital Stable managers.

For International Equities the pattern mimics the counterpart case for Diversified funds—only the coefficient on Zdivy is positive and significant (this time only at the 10% level), again suggesting an increased allocation to foreign equity when the domestic market is in decline. In the case of Australian Fixed Interest, only the coefficient on Ztnote is positive and significant at the 1% level. This suggests that asset allocation to domestic fixed interest increases with higher short-term interest rates.

For the remaining asset classes very little evidence is forthcoming that Capital Stable fund managers base asset allocation decisions on this set of economic variables. Arguably, this reflects that for Overseas Fixed Interest; Listed Property and Cash, the conservative nature of this type of manager sees them adopting some type of 'immunity' strategy on asset allocation with regard to economic conditions.

4. Summary and Conclusion

This paper provides both an original and comprehensive analysis of tactical asset allocation abilities and strategies employed by Australian investment managers

who invest assets across multiple asset classes. Consistent with the literature concerning US and UK funds investing in multiple asset classes, the strategic asset allocation adopted by superannuation funds represents the single most important determinant of portfolio returns. We analyse the behaviour of Balanced, Growth and Capital Stable fund managers with regard to their asset allocation activity across defensive (cash, domestic bonds, overseas bonds) and growth (domestic equities, international equities, property) asset classes, over the period 1990 to 2001.

It is worthy of emphasis that the literature on dynamic asset allocation decisions made by portfolio managers is generally sparse and largely non-existent outside the US. Such a research void exists due to limited access by researchers to the data necessary for such a study. Our ability to gain authorized access to such data from a proprietary source ensures that our study enhances a very exclusive literature on the global stage. Moreover, a unique feature of our study that warrants strong emphasis is the superiority (relative to Blake, Lehmann & Timmerman 1999) of the strategic benchmark for 'normal' returns that we employ, since our database provides actual fund information regarding this strategic benchmark. Such a direct measure of the benchmark weights contrasts the indirect approximations used by Blake, Lehmann and Timmerman (1999), thereby providing us with a much cleaner experimental framework for assessing the tactical asset allocation performance of our sample.

Overall, our evidence suggests that active managers have been unable to deliver investors with superior returns through tactical asset allocation. While the most successful asset class, domestic equities, has been value-enhancing, international shares and domestic fixed interest have generally detracted value. Finally, across all asset classes examined, our findings suggest that in terms of factors that might influence changes in asset allocations over time, domestic equities is most influenced by public economic information variables, with short-term interest rates, the term structure and dividend yields all having a significant explanatory role.

Given the inability of managers to add value through tactical asset allocation, this leads researchers to speculate as to the reasons why dynamic asset mix strategies detract from aggregate portfolio returns. Blake, Lehmann and Timmerman (1999) postulate that in the UK the evidence might be explained due to the overall structure of the pension fund industry, including competition levels amongst investment providers, trustee governance, as well incentive arrangements in existence in the market. Given the empirical evidence, the debate will continue regarding the role of dynamic asset allocation strategies, and whether Plan sponsors should maintain static asset class exposures in line with their strategic benchmarks. Future research should examine why tactical asset allocation has failed to deliver superior returns above strategic benchmark weights. Indeed, the extent to which portfolio construction is a significant determinant should be empirically examined, such that a comparison can be made between portfolios which exercise a 'top-down' approach to asset allocation relative to 'bottom-up' portfolio construction. How the investment manager ultimately achieves the fund's aggregate asset mix, coupled with the research and investment process executed by chief investment officers, represent important avenues for future research.

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