# Top Management Turnover: An Analysis of Active Australian Investment Managers*

*by*
David R. Gallagher [a]
Prashanthi Nadarajah [b]

***Abstract:***

This study examines the relationship between top management turnover (i.e. investment directors) and investment performance for actively managed Australian funds. This issue is significant given the importance of executive management in the implementation of the institution's investment strategy, the sizeable assets under their control, as well as the overall success and profitability of the funds management operation. In addition, investors, asset consultants, managed fund ratings agencies and the financial media devote significant resources to the scrutiny of performance, the organizational activities, leadership and human capital of investment management firms. Accordingly, this study examines the impact of performance and fund flow activity on top management turnover in both the pre-and-post replacement period. The research documents that turnover of underperforming investment managers results in significantly higher performance in the post-replacement period, while turnover coinciding with outperforming managers delivers investors significantly lower returns. The evidence also identifies significant changes in portfolio risk associated with managerial turnover. Finally, this research documents that underperforming investment managers exhibit significantly lower fund flows prior to replacement.

***Keywords*:** INVESTMENT MANAGERS; FUND PERFORMANCE; TURNOVER; FUND FLOW

[a] School of Banking and Finance, The University of New South Wales, Sydney, N.S.W. 2052; Securities Industry Research Centre of Asia-Pacific (SIRCA) and Capital Markets CRC Limited

[b] School of Banking and Finance, The University of New South Wales, Sydney, N.S.W. 2052; MLC

---

* The authors are grateful to Mercer Investment Consulting, the Securities Industry Research Centre of Asia-Pacific (SIRCA), and the Investment and Financial Services Association (IFSA) for use of data employed in this research. David Gallagher thanks Mercer Investment Consulting and the Australian Research Council (DP0346064) for research funding. Prashanthi Nadarajah gratefully acknowledges an honours scholarship from Capital Markets CRC Limited. We also acknowledge the helpful comments provided by Doug Foster (Area Editor), Matt Pinnuck, Jerry Parwada, Peter Swan, and an anonymous referee.

# 1. Introduction

This paper examines the relationship between investment performance and top management turnover experienced by Australian investment institutions. The issue is significant given that significant pools of assets are delegated by investors to professional investment managers for the purposes of achieving the investment objectives of clients. The issue is also critical in terms of the different corporate governance mechanisms and principal-agent problems that exist between investors, shareholders and management. This is because unit holders in trust funds cannot participate in exercising corporate control in the same manner in which shareholders can exercise their collective will on company boards. Accordingly, while internal and external control mechanisms of investment management organizations are likely to be related to corporate governance practices experienced by listed companies, the literature has not devoted significant attention to organizational behaviour that is associated with changes in top management of investment firms. This gap in the literature is surprising given the size of assets under management across investment management institutions as well as the important responsibilities that professional investors execute in financial markets. While the literature has only recently provided some attention to how investment performance is related to investment manager characteristics and risk (e.g. Chevalier and Ellison (1997, 1999a,b), Gallagher (2003)), managerial replacement for U.S. mutual funds (Khorana (1996, 2001), and fund performance-flow relationships (e.g. Sirri and Tufano (1998) and Sawicki (2000)), important empirical questions remain. This study represents the first rigorous analysis of the relationship between investment performance pre-and-post top managerial replacement for Australian fund managers. In particular, the paper investigates the extent to which top management turnover is related to a fund's relative performance in the market, portfolio risk, and net fund flow activity.

An examination of performance, risk and flow surrounding top management turnover can also be motivated across a number of institutional and theoretical criteria. First, given the important responsibilities of investment directors in managing portfolios, the size of funds delegated to

investment management firms is substantial. Australian Bureau of Statistics figures identify that total assets under the direct control of investment managers exceeded $A430 billion at 31 March 2003. Second, professional investment analysts, consultants and funds ratings agencies devote significant attention and resources to the organizational and performance assessment of investment products. Top management turnover represents a critical alert issued to superannuation clients and financial advisers by independent expert analysts, who provide assessments of the likely performance implications associated with the replacement of key investment personnel. In addition, the financial press closely monitor and scrutinize why turnover among top management has occurred, often speculating the potential factors leading to the departure. This activity indicates that while an investment director is an important component of the overall investment team, their responsibilities and value in driving and leading the investment operation is a strategic element of the process. Third, given the revenue models of investment managers are determined by a percentage fee applied to total assets under management, the performance-flow relationship identified in the literature indicates that profitability will be significantly related to the performance of the funds operated by the investment team. Fund flows are expected to be a critical determinant of the success of the investment institution as well as the organizational stability of the investment team. The success of the Head of Equities, Head of Fixed Interest or Chief Investment Officer is therefore similar in responsibility to that of the performance of a chief executive officer for a listed company. Fourth, given the Australian investment management industry is highly concentrated (where the top 10 institutions control in excess of 60 percent of total assets) and the subsequent implications for competition, the importance of good corporate governance mechanisms is paramount.

This paper makes four important contributions to the literature. First, this study represents the first significant and rigorous examination of the relationship between performance and top investment management turnover utilizing Australian data. The study explores the extent to

which returns, risk and fund flow activity explain turnover, as well as the performance attributes of managed funds pre-and-post managerial replacement. While Khorana (1996, 2001) provides attention to U.S. mutual funds, there are important institutional differences between Australian and U.S. markets (e.g. tax structures, portfolio compositions, management structures). Second, the study is also important given that mutual fund studies find evidence of differences in sophistication among investor groups (e.g. Gruber (1996), Capon *et al.* (1996), Zheng (1999), and Sawicki and Finn (2002)). In relation to this issue, our study explores potential clientele differences by examining an institutional investor's role in contributing to top management turnover given their ability to influence fund flow activity. Third, the research is an important extension of Chevalier and Ellison (1999a,b) and Gallagher (2003), who examine performance related to investment manager characteristics including education, experience, institutional asset size, and investment style. This study provides specific attention to one of the most important investment management characteristics – an investment institution's management of human capital. The paper further extends the work of Prather, Middleton and Cusack (2001) who consider performance differences (stock selection and market timing) between team-oriented and individual manager-specific portfolios. Our study examines the performance impact surrounding top management turnover and is a direct examination of team-oriented investment management. Fourth, this paper provides empirical evidence for investors, regulators, investment managers, asset consultants and academics in better understanding the performance effects pre-and-post managerial replacement. In the case of institutional investors and independent investment advisors, top management replacement and the potential impact on future performance is a critical issue. In addition, regulators will be concerned with portfolio risk variation surrounding replacement, particularly for those managers who eventually experience termination due to poor performance. Furthermore, investment institutions attempting to retain superior performers will be concerned with the potential corporate implications of losing their 'star' investment leader.

Our research documents the following important findings given managerial replacement within investment institutions. First, managerial replacement for underperforming managers results in significantly higher returns in the post-replacement period, whereas turnover of outperforming managers translates into significantly lower performance post-replacement. In terms of poor performers, our evidence confirms the successful activation of internal corporate control mechanisms in that underperformance leads to termination of employment. Our analysis also identifies that in the pre-replacement period, underperforming investment managers are more reliant on momentum strategies than is the case for superior performers. Underperforming managers also significantly increase their fund's idiosyncratic (residual) risk and tracking error in the pre-replacement period. Finally, this study documents that underperforming investment managers experience significantly lower fund flows prior to replacement, indicating that investors indeed discipline poor performance.

The remainder of this paper is structured as follows. Section 2 provides a brief review of the literature, and this is followed by a description of the data employed. Section 4 outlines the research hypotheses. Section 5 discusses the research design. Section 6 presents the empirical results and Section 7 concludes the study.

## 2. Literature Review

The literature review is presented in three sub-sections and provides background concerning the relationship of how top management turnover is related to investment performance, fund flow activity and portfolio risk.

### *2.1 Performance and Top Management Turnover*

The interaction between investors and investment management institutions represents a principal-agent relationship. Investors delegate assets to professional portfolio managers, for a

fee, with the expectation performance will be commensurate to a fund's investment objectives (e.g. to outperform the market). While performance is important to the principal and agent, the incentives for an investment firm are to maximize the total assets under management, as revenue is earned based on a percentage of fund assets. Although performance and asset size are interrelated, the first objective for the manager is to maximize total assets under management.

Khorana (1996) documents an inverse relationship between top management turnover and performance for U.S. mutual funds. He also finds that underperforming funds in the two years prior to replacement is a significant predictor of top management turnover. Furthermore, mutual fund managers in the lowest performance decile are four times as likely to experience replacement compared to those in highest decile. Chevalier and Ellison (1999b) also examine the termination-performance relationship for U.S. mutual fund managers and find the probability of termination is significantly related to prior performance. They also report the termination-performance relationship is more sensitive for younger managers than older managers. In terms of post-replacement performance, Khorana (2001) finds underperforming managers significantly increase performance. However, these new hires did not earn significantly positive risk-adjusted returns to the market.

While poor performance increases the likelihood of top management turnover in U.S. mutual funds, superior performing fund managers are also likely to experience turnover. These factors include superior managers either retiring, or may be the result of internal disagreements over compensation levels, or an offer from a competitor firm to defect. Khorana (2001) finds that for funds that experience positive abnormal performance prior to replacement, these funds experience a significant deterioration in performance after the departure. Gallagher (2003) also briefly examines this relationship using a sample of Australian managed funds, and concludes mixed findings depending on the role occupied by the manager. While performance improved

post-replacement for heads of Australian equities, the overall return enhancement was not statistically significant. In terms of heads of fixed income and Chief Investment Officers, Gallagher (2003) reports significant performance decreases for fixed interest directors in the six and twelve-month post period, whereas CIOs turnover translates into significantly higher returns in the same periods.

The literature concerning top management turnover for listed corporations is significantly more abundant than is the case for investment management firms. Chief Executive Officers (CEO) are charged with the responsibility of maximizing shareholder wealth. Given this objective, a number of studies have evaluated pre-managerial replacement for company CEOs. Coughlan and Schmidt (1985) find an inverse relationship between stock performance and CEO turnover for U.S. companies. They also find that after controlling for age, an executive whose firm ranks in the bottom one percent of abnormal stock returns is seven times more likely to depart the firm than for CEOs in the top percentile. Warner, Watts and Wruck (1988) examine the relationship between a firm's stock returns and subsequent top management changes, and report an inverse relationship between stock returns and forced turnover. Their findings show that only extreme levels of stock price performance affect the likelihood of a top management change. Gilson (1989) also finds that in financially distressed firms, top management turnover appears to increase rapidly in response to extremely poor stock price performance. Murphy and Zimmerman (1993) find that the probability of CEO turnover is higher when stock returns and changes in corporate earnings are lower. In the post replacement period, Denis and Denis (1995) document that forced top management resignations were followed by large improvements in stock price performance.

*2.2 The Performance-Flow Relation*

The operation of successful external control mechanisms are important functions in disciplining underperforming investment managers and rewarding superior fund managers. An essential

mechanism in the investment industry is net fund flows activity, where investors are responsive to performance indicators. Ippolito (1992) identifies that poorly performing funds progressively 'leak' assets, which are then invested with a superior past performing fund. The evidence also reveals that investors disproportionately allocate new investments to superior funds than liquidate assets from underperforming funds. These findings have been confirmed by Patel, Zeckhauser and Hendricks (1992). Chevalier and Ellison (1997) consider the flow-performance relationship to be an implicit incentive contract, where investment firms seek to maximize the total funds under management. They examine the relationship between excess returns (at different levels) in the current year and flows in the following year, and identify that fund outflow (inflow) is most sensitive to higher levels of underperformance (outperformance). Sirri and Tufano (1998) also investigate the allocation of investment assets into and out of U.S. mutual funds on the basis of past performance, and find that fund allocation toward better performance is disproportionately higher. In addition, superior performing funds are shown to invest more significantly in marketing, and this has been shown to generate significantly higher fund flow (Sirri and Tufano (1998), Fant and O'Neal (2000)). Other studies document a 'smart money' effect (Gruber (1996), Zheng (1999), Sawicki (2000) and Sawicki and Finn (2002)), including a size effect that exists between large and small funds. Sawicki and Finn (2002) also document that small and young funds exhibit a stronger money-flow effect than larger and older funds.

Khorana (1996, 2001) provides evidence and support for the theory that external control mechanisms can be used effectively in disciplining mutual fund managers. Khorana (1996) reports a significant difference in the asset growth rates in the year prior to turnover compared with those managers who did not experience replacement. Khorana (2001) also examines whether investors liquidate assets from mutual fund managers experiencing either negative performance pre-replacement, or when turnover coincides with the departure of superior managers. Khorana reports that for underperformers in the pre-replacement period, mutual

funds experience substantial decreases in net asset flows. Chevalier and Ellison (1999a) also find that outflows were halved as a result of terminating a manager who performed poorly.

*2.3 Performance and Risk Characteristics*

When investment managers are faced with the prospect of dismissal (due to underperformance), it is highly likely that they might engage in activities which increases fund risk in the hope of reversing the fund's poor performance. Brown, Harlow and Starks (1996) also assert that rational investment managers may reconfigure their portfolios conditional on their fund's relative ranking against competitors in order to maximize their compensation. The tournaments theory hypothesizes that poor performers will increase their level of risk in order to improve their year-end rankings. Brown *et al.* (1996) find that on average, mid-year 'losers' actively increase their level of volatility in the second half of the year more than is the case for mid-year 'winners'. Chevalier and Ellison (1997) report similar findings, documenting that funds which increase the level of portfolio risk as year-end approaches is most likely associated with funds underperforming the market. However, Busse (2001) contradicts the findings of Brown *et al.* (1996), reporting that when unbiased monthly standard deviation estimates are employed, the increase in risk of poor performers compared to better performers no longer exists. Busse (2001) also finds that actual volatility at the end of the year is very close to its predicted volatility (using start-of-the-year predictions) and that changes in intra-year levels of volatility are not entirely indicative of conscious actions by the managers. Khorana (1996) analyses the levels of systematic risk prior to management turnover, finding that mean levels of systematic risk for the replacement sample are significantly larger than that of the sample without replacement. Khorana (2001) compares the level of systematic and total risk for pre-and-post replacement years. The evidence shows that for underperforming managers, a marginal yet statistically significant increase in the median fund risk (total risk) arises in the pre-replacement period, whereas a significant decrease occurs in the post-replacement period. However, systematic risk levels remain constant pre-and-post replacement. Brown, Goetzmann and Park

(2001) investigate portfolio risk changes with respect to hedge funds. While incentive contracts in the hedge fund industry are different to those in the mutual fund industry, the evidence shows that managers who performed well in the first half of the year reduced their level of risk in the second half, while poor performers showed evidence of increasing portfolio risk.

## 3. Data

This study examines Australian investment manager changes and fund performance in the period January 1991 to April 2001. The sample of personnel changes in the roles of Head of Australian equities (Head AEQ), Head of Australian fixed interest (Head AFI), and Chief Investment Officer (CIO) was compiled using information contained in historical IFSA Investment Manager Questionnaires and data from Mercer Investment Consulting. For cross-checking purposes, we compared the IFSA and Mercer data, as well as relying on the financial press records to determine when the *actual* investment manager changes occurred. This data checking purpose is extremely important, as not all changes become effective at the announcement date.

The IFSA and Mercer data was also used to identify the investment manager's arrival date to the investment management firm as a means of measuring tenure. To be included in the sample, the study also requires investment managers to be employed in their role for a period of at least 12 months prior to the turnover month. Accordingly, the sample contains a total of 90 top management changes, decomposed into 41 Heads of Equity, 16 changes in Heads of Fixed Income and 33 changes in Chief Investment Officer (CIO). This requirement is a necessary enhancement to Khorana (2001), who dictates that a fund experiencing managerial replacement have at least three years of performance history prior to the managerial replacement month. Our shorter window is important for two reasons. First, the average tenure period of top management in Australia is less than three years (which is a unique feature of the Australian

market) and therefore avoids significantly reducing our sample size (see Table 1). Second, the study mitigates against biasing the results towards those managers who are the better performers, and who also enjoy significantly greater longevity.

INSERT TABLE 1

In identifying the managerial replacement month for the Head of AEQ, Head of AFI and CIO, the next task requires identifying wholesale funds from the investment management firm in the appropriate asset classes. Most managers offer only a very small number of unique pooled funds (i.e. unit trusts) in the institutional market, and therefore the task of identification is relatively straight forward. The balanced fund data contains one record per manager and this sample is used to examine changes surrounding CIO replacement. For wholesale Australian equities and bonds, the study identifies all funds offered by the investment management firm. In aggregate, the study includes 136 funds. The fund performance data, asset size, and management expense ratio (MER) data is obtained from the Morningstar database for Australian equities and Australian fixed interest funds whose investment objectives were to outperform either the S&P/ASX 200 or S&P/ASX 300 Accumulation Index and UBS Warburg Composite Bond Index (all maturities), respectively. Mercer Investment Consulting supplied balanced fund returns, benchmark weights across asset classes, and fund size data. Given balanced funds invest across different asset classes in different weights to other funds, the study measures performance relative to accurately specified benchmarks following the approach of Gallagher (2003). Both databases include surviving and non-surviving funds. For the Morningstar data, the study sources fund information for wholesale trusts in both Australian equities and Australian fixed income.[1] The NTP fund returns are after management expenses, PST fund returns are after expenses and tax, and balanced fund returns are net of expenses and tax. The study also employs a risk-free rate obtained from the Reserve Bank of Australia, and

[1] Pooled superannuation trusts (PST) are superannuation products that pay tax at the fund level on earnings at rate of 15%. NTP funds are defined as non-tax paying funds, and tax is payable in the hands of individual investors.

is defined as the yield on a 10-year Commonwealth Government Bond adjusted to a monthly rate.

When investment manager changes arise, Khorana (2001) and Gallagher (2003) suggest that the motives for departure include removal due to underperformance, poaching of outperforming managers by competitors, factors related to remuneration levels or personal reasons. It is difficult (and indeed) unlikely to identify the exact reasons behind turnover of top management. Given this difficulty, the study follows Khorana's (2001) technique as a means of trying to understand managerial replacement by dividing all turnovers into 2 sub-samples – a negative performance sample (NP) and a positive performance sample (PP). To determine which sub-sample a fund belongs to in each asset class, the objective-adjusted return (OAR) of portfolios in the periods prior to replacement are calculated. This decomposition technique is used to proxy the true motive behind replacement.

Interestingly, Khorana (1996) documents a large number of replacements in the month of January, suggesting that this may be due to replacement based on calendar year-end reviews of mutual fund managers, which is also the end of the U.S. financial year. In Australia, we would expect a higher percentage of replacements in either January (at turn of the year), or more likely after 30 June (post end of financial year). Our analysis indicates that 19 percent of all replacements occur in the month of October, which might be explained by performance reviews that also coincide with bonus payments. A decomposition of the sample into the NP and PP sub-samples again finds October to be the month in which the highest percentage of replacement arises, 18 and 20 percent respectively. For the NP sample, the second highest replacement month has a percentage half that of October's.

## 4. Hypotheses

This research examines investment performance relationship surrounding changes in top management of institutional investment managers. Investment performance is defined in terms of fund returns and fund flow measures. Consistent with the research objectives and the literature, the following six hypotheses are outlined below:

$H_1$: *Underperforming investment managers experience increasing levels of negative performance in the periods prior to turnover.*

$H_2$: *Outperforming investment managers exhibiting superior skills experience increasing levels of positive performance in the periods prior to turnover.*

$H_3$: *Portfolios in the NP sample experience improvement in performance in the periods after replacement. Portfolios in the PP sample experience a decline in performance in the periods after replacement.*

$H_4$: *Underperforming investment managers increase portfolio risk in the period prior to turnover, in an attempt to improve their poor past performance.*

$H_5$: *Outperforming investment managers do not change the risk of their portfolios in the period prior to turnover due to their already superior performance.*

$H_6$: *In the pre-replacement period, underperforming investment managers experience lower net asset flows compared to outperforming investment managers.*

## 5. Research Design

### *5.1 Fund Performance*

Investment performance is measured using three approaches – the one and four factor alphas (risk-adjusted excess returns), and the objective adjusted return (OAR) proposed by Khorana (1996, 2001).[2] Risk adjusted performance is estimated using OLS, and controls for the market factor only in the single index model (see equation 1). The four index model adjusts for risk in equity fund performance by accounting for additional risk factors identified in the literature, namely, investment style factors and price momentum in the spirit of Carhart (1997), Elton, Gruber, Das and Hlvaka (1993) and Elton, Gruber and Blake (1999) (without the inclusion of a bond factor). The Carhart (1997) four factor model includes the three Fama and French (1993) factors as well as controlling for the one year momentum anomaly identified by Jegadeesh and Titman (1993). The four index alphas are important in order to control for investment managers implementing different styles in the management of their portfolios. In Australian equities, there are four important investment style classifications adopted that should explain how performance has been achieved by the manager - 'value', 'growth', 'growth-at-a-reasonable-price', and 'style neutral'. The one and four index models respectively are expressed as:

$$R_{it} = \alpha_{1i} + \beta_i RM_t + \varepsilon_{it} \quad (1)$$

$$R_{it} = \alpha_{4i} + \beta_i RM_t + \beta_{SLi} SL_t + \beta_{GVi} GV_t + \beta_{PRi} PR1YR_t + \varepsilon_{it} \quad (2)$$

where:

$R_{it}$ = the excess return of fund $i$ in period $t$ (where excess return is fund return in excess of the risk-free rate);

$RM_t$ = the excess return of the market in period $t$; where for Australian equity funds the benchmark is the S&P/ASX 300 Accumulation Index, for Australian bond funds relies on the UBS Warburg Composite Bond Index (all maturities) as the market proxy. Balanced funds each have their own market index which accounts for the differences in strategic allocations to the various asset classes;

[2] Khorana (2001) also employs a matched sample approach and the percentile performance rankings of the fund. For the purposes of this paper, the calculation of these two performance measures is not viable. Khorana's (2001) matched sample approach requires constructing a sample of matching firms exhibiting similar performance histories and the same investment objective as the investment firm that experienced replacement. The key point in this approach is that the matched firm did not experience replacement. Due to data restrictions it is impossible to construct a matched sample. The same restrictions also exist in the percentile ranking approach.

$\alpha_i$ = the alpha of fund *i* from either the one factor or four factor model*;*

$\beta_i$ = the systematic beta risk of fund *i*;

*SL* = the difference between the return on the S&P/ASX Small Ordinaries Accumulation Index (small-cap firms) and the S&P/ASX 20 Accumulation Index (large-cap firms);

*GV* = the difference between the Salomon Smith Barney (SSB) All Growth Index and the SSB All Value Index; and

*PR1YR* = the momentum factor measured following Carhart (1997), as the difference between an equally weighted return of firms comprising the S&P/ASX 300 with the highest 25 percent 12-month return (lagged one month) and the lowest 25 percent 12-month return (lagged one month).

$\varepsilon_{it}$ = error term of fund *i* in period *t*.

The study also examines performance according to the objective-adjusted return (OAR), where objective describes whether the fund is an equity, fixed interest or balanced portfolio. OAR does not control for risk, and is therefore a raw measure of performance. The OAR enables a decomposition of investment manager changes into both positive (PP) and negative (NP) performance samples. The objective-adjusted return (OAR) of a portfolio is the 12-month holding period return of a fund in excess of the 12-month holding period return of the appropriate benchmark. This is calculated as follows:

$$OAR = \left[\prod_{t=1}^{12}(1 + Ri,t) - 1\right] - \left[\prod_{t=1}^{12}(1 + Ro,t) - 1\right] \quad (3)$$

where:

$R_{i,t}$ = return of fund *i* in month *t*; and

$R_{o,t}$ = return of the benchmark fund for a particular objective in month *t*; for Australian equity and bond funds, where the benchmarks are the S&P/ASX 300 Accumulation Index and the

UBS Warburg Composite Bond Index (all maturities) respectively. For balanced funds the benchmark is dependent on each manager's strategic asset allocations as previously defined.

*5.2 Matched Sample Approach*

The purpose of a matched sample approach is to compare firms that experienced replacement with those exhibiting stable management for a given period. This technique is employed by Khorana (1996, 2001). In our study, the matched-sample approach is only undertaken for Australian equity and Australian bond funds due to data constraints for the balanced fund sample. To employ a matched sample approach, for each turnover event (identified by month and year), a *single* portfolio is identified with a similar performance history prior to the turnover event (yet did not experience replacement in the 24 months surrounding the turnover date). The 12-24 months pre-and post- turnover event for the matched sample portfolio is then examined. For each portfolio in the NP sample, we identify a fund that also had negative performance (measured by the OAR) prior to the turnover month that did not experience turnover in the surrounding 24 months. The approach is also performed for portfolios in the PP sample.

There are a total of 57 turnover events in the Australian equity and fixed interest sample. However, there are 14 turnover events in the sample for which a matched portfolio could not be identified due to limitations on data availability. Additionally, in an ideal scenario, one would match portfolios based on pre-turnover performance (both in magnitude and in sign i.e. positive or negative) and style (i.e. growth, GARP etc.), however again due to data constraints, this is not possible. In this matching approach, a potential matching portfolio can be used more than once (i.e. sampling with replacement) but in these particular cases, because turnover events occur in many different periods, although the data is from the same portfolio, it is not from the same time period. The OAR performance variable is calculated for the matched-sample funds and compared with the replacement sample. This permits the determination of whether the

removal of underperforming investment directors is truly value adding, and whether the removal of outperforming investment directors is value-destroying.

Khorana (1996) finds that the replacement sample prior to turnover has significantly higher portfolio turnover rates, larger increases in expenses, larger increases in beta and significantly worse performance than the control sample. Khorana (2001) also finds that when comparing the performance of NP funds in the pre-and-post-replacement periods, funds that experienced replacement incur significantly higher performance improvements than those who did not experience turnover. However for the PP sample, funds that experience managerial replacement suffer from significant performance declines, compared with those who did not experience turnover.

*5.3 Fund Risk*

Four risk measures are computed in order to determine how risk portfolio changes pre-and-post replacement as a means of identifying evidence of how managers adjust the risk characteristics of their portfolios conditional on their performance. Risk is examined according to systematic risk, tracking error, residual risk and total risk in the pre-replacement (i.e. Year -1, Year 0) and post-replacement periods (i.e.Year 1, Year 2). Systematic risk is defined as the fund's beta, estimated using equation (1). The tracking error of a portfolio is the standard deviation of monthly portfolio excess returns to the portfolio's benchmark index. Residual risk (or idiosyncratic risk) of a portfolio is calculated as the standard deviation of the residuals obtained from equation (1). The total risk of a portfolio is calculated as the standard deviation of monthly portfolio returns. Tracking error, residual risk and total risk measures are computed using monthly returns, but are expressed in annualized form. While systematic risk and residual risk are commonly used measures in the literature, the tracking error and total risk measures are also considered; given the IFSA questionnaire responses from investment management companies indicate they are also concerned with these two risk proxies.

*5.4 Management Expense Ratios*

Management expense ratios (MERs) are fees expressed as a percentage of the total assets of the fund. Khorana (2001) suggests that in a competitive market, MERs should decline over time where investors become more price-sensitive, investment management firms increase in size and improve their economies of scale, and new entrants commence operations. In order to examine the statistical significance of changes (over various event windows) in performance and risk, tests are also conducted to determine the responsiveness of MERs to managerial replacement.

*5.5 Fund Flows*

U.S. mutual fund studies document a fund performance and flow relation, where investors respond asymmetrically to past performance. While Sirri and Tufano (1998) find that fund flow responsiveness is less sensitive to poor past performance, Khorana (2001) argues that an improved test is likely to be captured in an examination of top management turnover. Sawicki (2000) provides Australian evidence of the flow-performance relationship in an analysis of Australian institutional funds, documenting that investors reward superior managers with fund inflow and penalizing underperforming managers with fund outflow. Accordingly, this paper examines the flow-performance relationship conditional on Australian investment manager turnover. This study measures net fund flow activity as follows:

$$NETFLOW_{i,t} = [ASSETS_{i,m,t} - ASSETS_{i,m,t-1} * (1 + Ri,m,t)] / ASSETS_{i,m,t-1} \qquad (4)$$

where:

$Assets_{i,m,t}$ = size of fund *i* at the end of month *m* in year *t* where *m* refers to the month prior to the managerial replacement month;

$Assets_{i,m,t-1}$ = size of fund *i* at the end of month *m* in year *t-1*; and

$R_{i,t}$ = return of fund *i* from month *m*, year *t-1* to month *m*, year *t*.

The NETFLOW variable is a relative measure of the asset flows (i.e. growth or decline) experienced by a fund, given that a fund's asset size is incorporated into the denominator. Khorana (2001) advocates the use of a multivariate regression model to examine the relationship between flow and performance, and this study examines pre-and-post replacement given equation (5):

$$NETFLOW_{i,t} = f\begin{pmatrix} ObjectiveFlows_t; FundPerformance_{i,t-1}; Risk_{i,t-1}; Log(Assets)_{i,t-1}; \\ NegativePerformanceDummy; Pre-ReplacementDummy; InteractionEffects \end{pmatrix} \quad (5)$$

where:

$Objectiveflows_t$ = average asset inflows into all other investment management firms with the same investment style as the firm which experienced replacement;

$Fund\ Performance_{i,t-1}$ = lagged 1-factor alpha for all funds and lagged 4-factor alpha for equity funds;

$Risk_{i,t-1}$ = annualized standard deviation of monthly returns;

$Log(Assets)_{i,t-1}$ = Lagged natural logarithm of fund size;

*NPD* = a dummy variable, taking on the value of 1 if fund is from NP sample and takes on the value of 0 if fund is from PP sample; and

*PRE* = a dummy variable, taking on the value of 1 for fund flows in Year -1 and Year 0 and takes on the value of 0 for fund flows in Year 1 and Year 2.

*Objective flows* are an important control in determining the asset growth or decline which can be explained by fund managers implementing the same investment style. The study therefore accounts for equity and bond funds according to investment style, where equity styles are value, growth, growth-at-a-reasonable-price, and style neutral, and bond funds are partitioned into duration and other. Lagged performance measures are used to account for the time taken for

flow to respond to past performance. *Log(Assets)* controls for the differences in fund sizes across the sample. The dummy variable *NPD* determines if asset flows react differently to underperformance compared to superior performance. The dummy variable *PRE* accounts for differences in fund flows between the pre-and-post replacement, and takes on the value of one if flows arise in the pre-replacement period (i.e. the years -1, 0). Following Khorana's (2001) methodology, two additional dummy variables are constructed. In the first case, the positive performance measures are maintained, whereas the negative performance measures take on the value of zero. In the second case, the negative performance measures are maintained as is, and the positive performance measures take on the value of zero. These measures are constructed in order to assess differences in asset flows between positive and negative performance. An interaction variable (*NPD*PRE*) is also included and examines the relationship of asset flows to underperforming investment managers in the periods prior to replacement.

## 6. Empirical Results

### *6.1 Fund performance in the pre and post-replacement years*

This section provides evidence concerning the relationship between investment performance in the pre-and-post periods surrounding top management turnover. Performance is measured using the objective-adjusted return (OAR), 1-factor alpha and the 4-factor alpha (Australian equity funds only). Given that the most significant determinant of top management turnover is expected to be performance, the sample is partitioned on the basis of positive performance (PP) and negative performance (NP) sub-samples as a proxy for managerial replacement. The mean and median of performance coinciding with managerial replacement in the two years pre-and-post turnover for each partition are also presented. The two panels presented in Table 2 show the performance levels in the years surrounding replacement (Panel A) and the changes in performance between these periods (Panel B). We hypothesise that managerial replacement

among poor performers is motivated due to poor past performance, whereas superior manager departure is expected to lead to lower performance in the post replacement period.

Consistent with the hypotheses, Panel A of Table 2 documents that the mean level performance (for all measures) are negative (positive) in the pre-replacement years for the NP (PP) sub-sample. Managerial replacement is strongly related to performance in that prior to top management turnover, NP managers deliver investors lower returns. In terms of performance changes, Panel B of Table 2 reveals the mean (median) change in alpha and OAR from Year -1 to Year 0 is -0.042% (-0.036%) and -0.840% (-0.240%) respectively. However this decline is not statistically significant. The 1-factor alpha suggests that as the replacement event approaches, mean and median levels of performance increase even more, although again this increase is not statistically significant. The mean (median) change in alpha from Year -1 to Year 0 is 0.034% (0.022%).

INSERT TABLE 2

Determining the impact on performance post-replacement represents one of the most important contributions of this paper. For the NP sample, both the 1-factor alpha and OARs exhibit statistically significant increases in both the mean and median levels of performance in the post-replacement years. These results further emphasize that institutions discipline poor performers by terminating employment, and when termination arises the post-replacement appointment provides NP funds with a significant improvement in performance. For the PP sample, the mean (median) levels for 1-factor alphas and OAR show significant declines in performance post-replacement. These results indicate that superior performers are not generally replaced with superior past-performing top management. An interesting finding for the NP sample is that performance improvements are not necessarily instantaneous. Significant improvements for NP performers occur in the period between Year 1 to 2, and in the longer

time horizon between Year 0 to 2. This suggests that the new investment managers attempting to address underperformance incur a small period of further underperformance as they re-configure the portfolio and strengthen their investment process and team.

The four-factor alphas provide a more rigorous performance examination for active equity funds surrounding changes in the head of Australian equities. The results presented in Table 2 (Panel B) are consistent with the overall results across replacement for CIOs and heads of Australian fixed interest. Specifically for the NP sample, this research documents statistically significant improvements in risk-adjusted returns post replacement. However, the PP sample in the post-replacement period derive negative risk-adjusted performance, however, these are statistically indistinguishable from zero. This compares to significant outperformance in the pre-turnover period, and further verifies the inability of 'past winner' investment institutions to recruit superior performers in the post-period.

The results presented in this section confirm the hypotheses $H_1$, $H_2$, and $H_3$ and are consistent with Khorana (1996, 2001). Khorana (1996) also finds that fund returns two years prior to the replacement month for underperforming funds are a significant predictor of top management turnover. Khorana (2001) reports a statistically significant increase in the fund's post-replacement performance relative to past performance. Our results are also consistent with Gallagher (2003) who finds that turnover in heads of Australian equities and CIOs results in improvements in post-replacement performance. Khorana (2001) also identifies that funds experiencing positive abnormal performance in the period prior to replacement subsequently experience deterioration in performance post departure. The results in this research provide further evidence that appropriate internal corporate control mechanisms are effective for underperformers – their employment ceases.

*6.2 Matched Sample Approach*

This section provides a comparison between the replacement sample of portfolios and those that did not experience managerial turnover. In particular it allows for the comparison between underperforming funds that either experience managerial replacement or not, and to specifically determine whether new investment managers (in portfolios that experience replacement) ultimately add value for investors. With respect to outperforming funds, the matched sample technique enables an assessment of whether a new investment manager's arrival ultimately destroys value for investors. Panel A and B of Table 2 records the mean and median performance, and changes in performance, over the given years for a matched sample of NP and PP portfolios, respectively.

Examining the pre-and-post-replacement performance measures at an annual level indicates that for the NP sample, there is a significant increase in average performance (measured by OARs) from year 0 to year 2, and significant increases in median performance from year 0 to year 1 and year 0 to year 2, while for the PP sample, there is a significant increase in average and median performance from year 0 to year 1. The result for the NP sample is surprising given that even without managerial replacement, these particular portfolios have improved in performance. However, examining the longer time horizon (i.e. from year -1 to 2), there is no significant change in mean or median performance for the matched NP sample indicating that turnover in underperforming funds does actually add value. The magnitude of the significant increase in performance from year 0 to year 1 is interesting, however all the results are consistent with the theory that turnover of outperforming managers destroys some of the portfolio's value, while the performance of portfolios in the PP matched sample continue to perform well with no significant decreases in performance. These results are consistent with Khorana (2001) who finds that NP portfolios that experienced replacement incurred higher performance improvements than those that did not, while PP portfolios that experienced replacement suffered larger performance declines compared with firms having stable management.

It must noted however, that when comparing the performance of the NP replacement sample with that of the NP matched sample, the NP replacement sample has lower mean and median performance compared to the NP matched sample. This suggests that perhaps only the investment managers with the poorest performance experience replacement.[3]

*6.3 Performance Attribution*

This section examines Australian equity funds and the factor loadings of funds experiencing managerial replacement. The analysis permits a comparison of portfolio characteristics between underperforming and outperforming investment managers by evaluating fund sensitivities to the market index, market capitalization size of stocks, growth versus value stocks, and momentum versus contrarian investment strategies. Table 3 presents the mean and median parameter estimates for the NP and PP samples using the 4-factor model in the years surrounding investment manager turnover.

INSERT TABLE 3

Analysis of the median factor loadings of PP sample in the pre-replacement period suggests a higher sensitivity to small stocks holdings and momentum strategies for both year -1 and year 0. Median factor loadings for the NP sample in Year -1 show a negative coefficient on momentum and larger sensitivity to small stocks, while in Year 0, median loadings show a positive momentum factor and larger exposure toward large stocks. The momentum results are consistent with that of Khorana (2001) who proposes that the difference in performance between the NP and PP samples may be due to the inability of the NP investment managers to identify and exploit momentum stocks. The size factor results in Year 0 are also consistent with that of Khorana (2001) and Carhart (1997), who find superior performers are more likely

to invest in small stocks. The change in exposure from small stocks to large stocks (from Year -1 to Year 0) could be due to underperforming investment directors moving toward more liquid securities with higher analyst coverage. This would provide them with improved flexibility in moving in and out of positions in a timelier manner. The NP sample also shows a median change in exposure from growth stocks to value stocks, that is 0.073 in Year -1 to -0.074 in Year 0. The change in exposure from small to large stocks and growth stocks to value stocks (Year -1 to Year 0) for the NP sample could also suggest that underperformers are engaging in different investment strategies in attempts to reverse their poor performance.

Analysis of factor loadings in the post-replacement period shows that for the NP sample, new investment managers are more reliant on momentum stocks in the first year post replacement. For the PP sample, median estimates suggest that in the first year after replacement, the new investment manager continues to identify momentum stocks prior to Year 2.

*6.4 Risk characteristics in the pre and post-replacement years*

This section examines the relationship between portfolio risk and managerial replacement in the pre-and-post period. Table 4 reports computations of the four risk measures in the years pre-and-post top investment manager turnover. The results separate the sample into positive and negative performance sub-samples, and evaluate the two years surrounding the replacement event. While the literature supports the use of beta, residual risk and total risk, tracking error is also examined in response to the IFSA questionnaires which conveyed managers were more concerned with actively managing the portfolio's tracking error (and not systematic risk).

INSERT TABLE 4

[3] Ideally one would want to compare a matched sample of portfolios with very similar performance (i.e. in magnitude and in sign) to the replacement sample. If one was to match on these conditions, it is likely that we would then see the true value added by the new investment manager in the NP replacement sample.

The results in Table 4 (Panel B) show that in the pre-replacement years (Year -1 to 0) the NP sample experiences a statistically significant decline in the mean (median) systematic risk, -0.049 (-0.031) and an increase in the median total risk of 0.154 (insignificant at conventional levels). Given the importance of tracking error management, the results show a statistically significant increase in tracking error pre-replacement, 0.545 (0.101). This indicates that underperforming managers actively increase their portfolio's deviation away from the market index in an attempt to reverse poor performance. The results for residual (or idiosyncratic) risk analysis show that the NP sample experiences a statistically significant increases in mean and median levels from Year -1 to Year 0. This further suggests that managers experiencing poor performance increase the portfolio's risk at the cost of diversification. Overall, these results are consistent with Khorana (2001) and Chevalier and Ellison (1997) and supports hypothesis $H_4$. In terms of post-replacement, this study identifies that risk levels vary according to the sub-sample (NP and PP), risk measure and interval length post turnover. Total risk for the NP sample records significant mean and median increases in the first post-replacement year (Year 1) in comparison to pre-replacement years.

Risk analysis for the PP sample pre-and-post replacement in Table 4 (Panel B) documents that mean (median) levels of systematic and total risk experience statistically significant declines as replacement approaches, -0.066 (-0.086) and -1.102 (-0.939) respectively, while tracking error experiences statistically significant increases of 0.594 (0.047). This suggests that outperforming investment managers actively increase their performance deviation from the benchmark portfolio. Furthermore, examining broader time horizons – Year -1 to 1 and Year -1 to 2 – reveals a significant decline in mean and median systematic and total risk. However, analysis of the residual risk levels in the pre-replacement period suggests conflicting results. For Year -1 to Year 0, there is a statistically significant increase in the mean levels of residual risk, but a statistically significant decrease in median levels. This conflict in results leaves our study unable to provide confirmation of hypothesis $H_5$. Changes in the mean and median levels

of residual risk in the pre-replacement period (Year -1 to Year 0) for the NP versus PP sample show that the NP sample experiences larger increases in residual risk. This finding supports Brown, Harlow and Starks (1996) who report that poor performers increase volatility by a larger magnitude than superior performers.

Further comparison the overall risk measures coinciding with replacement for both PP and NP samples provide interesting findings. Table 4 (Panel A) indicates that total, systematic, residual and tracking error risk levels of the PP sample are higher than the NP sample. Overall this suggests that pre-replacement, superior investment managers take on higher risk and actively deviate by a larger magnitude from the benchmark. In the post-replacement period, a possible explanation for lower levels of risk in the NP sample suggest that due to the poor track record of these portfolios, the new investment managers migrate towards the benchmark. For the PP sample relating to the post-replacement period, new investment managers do not trend their portfolio risk towards benchmark.

*6.5 Management expense ratios in the pre and post-replacement years*

This study examines the extent to which expense ratios are influenced by managerial replacement for equity and fixed interest funds only.[4] Investors could expect that underperforming managers may levy lower expense ratios than superior performers, as well as underperformers being more willing to reduce expenses when past performance has been inferior. Fee reductions might also be a means of improving the fund's net performance, and therefore serve as a compensation mechanism to further mitigate asset outflows. In terms of superior performers experiencing managerial replacement, investors might expect higher MERs compared to poor performers, however post-replacement, if performance cannot be maintained, then fees may be expected to decline. An added complexity when examining this MER issue relates to whether fee reductions are attributable to (a) past performance, (b) be explained by increasing levels of competition in the sector, or (c) arise due to combination of these two

possibilities. Table 5 presents the mean and median MERs pre-and-post replacement (Panel A), and the changes in MERs surrounding top management turnover (Panel B).

INSERT TABLE 5

As expected, management expense ratios in the NP and PP samples experience a decline through time. These results are consistent with Khorana (2001) and give support to the notion of the increasing level of competition in the Australian investment management industry. These results are also in accordance with Mercer Fee Surveys of wholesale investment products. Table 5 (Panel B) documents that for underperforming managers, significant fee reductions are recorded in the post-replacement period, possibly as a means of encouraging investors to remain loyal to the incumbent manager, but also in attracting potential new money flows. The table shows that fees are relatively constant pre-and-post replacement for superior performing managers.

*6.6 The relationship between fund flow and performance conditional on replacement*

This section examines the relationship between fund flow and performance conditional on top management turnover and seeks to provide evidence that in the pre-replacement period, underperforming investment managers experience significantly lower net asset flows. Table 6 confirms that a fund's current flows have a positive (statistically significant) relationship with lagged performance (alpha). This indicates that investors are responsive to a fund's past performance and confirms the research by Sawicki (2000). These results are also consistent with Khorana (2001) for U.S. mutual funds.

INSERT TABLE 6

[4] Balanced fund fee levels were not available.

The table also documents that risk (volatility) in the previous year is significantly negatively related to net fund flow. The results also show that for all funds (Panel A) and equity funds (Panel B) there is no evidence of a relationship between net flow and objective flow, which is inconsistent with Khorana (2001) who finds a positive relationship. The source of inconsistency may arise due to sample size constraints, given that the absolute number of turnover events in Australia is substantially smaller than in the U.S. The study also concludes that net flows and asset size are unrelated for all funds (Panel A), whereas for equity funds (Panel B), larger funds experience significant increases in net fund flows. This may be explained given the dynamics existent in the Australian market, where the market is highly concentrated across larger institutions. Larger funds are also more likely to be offered by larger fund managers which in turn are potentially more exhaustively researched by independent analysts, enjoy longer track records, increased brand awareness and reputation, and proxy for managerial ability among clients.

The net fund flow regressions also examine the relationship between asset growth/decline and managerial replacement. The results in Panel B show that for equity funds the independent variables best explain the variation in fund flows, where model (7) records the highest coefficient of determination (i.e. adjusted $R^2$). An examination of the dummy variable coefficients in Table 6 permits inferences concerning the impact of (a) negative performance versus positive performance and (b) pre-versus-post replacement on net fund flow. In terms of risk-adjusted performance, the coefficients for all funds (Panel A, models (2) and (3)) are statistically significant and reveal funds with negative performance (i.e. underperformers) experience lower net fund flows than funds with positive performance (i.e. superior performers). Similar results are also reported for equity funds (Panel B, model (2) versus model (3) and model (5) versus model (6)). The interaction term, measuring net fund flows for underperformers in the pre-replacement period (NPD*PRE), is an important test of the external corporate governance mechanism whereby investors discipline management for poor past

performance. The coefficient in both Panels A and B document an inverse relationship. The negative relationship is statistically significant for the equity fund sub-sample, yet insignificant for all funds at conventional levels ($p$-value = 0.13). The results support the hypothesis ($H_6$) that poor (negative) performance prior to replacement leads to lower net fund flows, and confirms Khorana's (2001) findings.

## 7. Conclusion

This study examines the relationship between top management turnover and the performance of actively managed Australian equities, fixed interest and balanced funds in the period 1991 to 2001. Top management encompasses individuals employed by investment management firms and serving in the role of either Head of Australian equities, Head of Australian fixed interest, or Chief Investment Officer. The research investigates the impact on performance, risk and fund flow activity pre-and-post managerial replacement. This area of research is significant given the significant responsibility of investment directors in managing their investment teams, the sizable assets under their control, the significant research effort and resources dedicated to the research of investment management institutions by fund ratings agencies and asset consultants, the attention provided by the financial press, and ultimately the impact of managerial replacement on investors. In addition, this paper provides the first rigorous examination of managerial replacement across investment management institutions in Australia.

The research documents a number of important findings. First, managerial replacement for underperforming managers results in significantly higher returns in the post-replacement period, whereas turnover of outperforming managers translates into significantly lower returns post-replacement. In terms of poor performers, our evidence confirms the activation of internal corporate control mechanisms, in that underperformance leads to a termination of employment.

The evidence also suggests that superior performing managers departed organizations either on the basis of inadequate remuneration levels, poaching by a competitor, or retirement from the industry. In terms of Australian equities and the factor loadings explaining investment performance in the pre-replacement period, there exists a high degree of variation across funds that derive both inferior (negative) and superior (positive) performance. Our analysis identifies that in the pre-replacement period, underperforming investment managers are more reliant on momentum strategies. The results also show that the factor loadings for both underperforming and outperforming managers post-replacement substantially increase their fund's sensitivity to momentum in Year 1. The study also finds that underperforming investment managers increase their fund's idiosyncratic (residual) risk and tracking error in the pre-replacement period. This is in contrast new hires having a negligible impact on residual risk and tracking error post replacement. In the pre-replacement period, our results show larger increases in residual risk are incurred by underperformers compared with outperformers, which is consistent with Brown, Harlow and Starks (1996).

Finally, this study documents that underperforming investment managers experience significantly lower net fund flows prior to replacement, indicating that investors discipline poor performance. The flow-performance relationship conditional on investment management turnover indicates the functioning external corporate control mechanisms. These results are not surprising, particularly given that the revenue models for fund management firms derive income as a percentage of total assets under management.

## References


Australian Bureau of Statistics (2003), Managed Funds Australia, Cat. 5655.0, March Quarter 2003.

Brown, S., Goetzmann, W., Park, J., (2001), Careers and Survival: Competition and Risk in the Hedge Fund and CTA Industry, *Journal of Finance* 56, 1869-1886.

Brown, K., Harlow, W., Starks, L., (1996), Of Tournaments and Temptations: An Analysis of Managerial Incentives in the Mutual Fund Industry, *Journal of Finance* 51, 85-110.

Busse, J., (2001), Another Look at Mutual Fund Tournaments, *Journal of Financial and Quantitative Analysis* 36, 53-73.

Capon, N., Fitzsimons, G., Prince, R., (1996), An Individual Level Analysis of the Mutual Fund Investment Decision, *Journal of Financial Services Research* 10, 59-82.

Carhart, M., (1997), On Persistence in Mutual Fund Performance, *Journal of Finance* 52, 57-82.
Chevalier, J., Ellison, G., (1997), Risk Taking by Mutual Funds as a Response to Incentives, *Journal of Political Economy* 105, 1167-1200
Chevalier, J., Ellison, G., (1999a), Career Concerns of Mutual Fund Managers, *Quarterly Journal of Economics* 114, 389-432
Chevalier, J., Ellison, G., (1999b), Are Some Mutual Fund Managers Better Than Others? Cross-Sectional Patterns in Behavior and Performance, *Journal of Finance* 54, 875-899.
Coughlan, A., Schmidt, R., (1985), Executive Compensation, Management Turnover, and Firm Performance, *Journal of Accounting and Economics* 7, 43-66.
Denis, D., Denis, D., (1995), Performance Changes Following Top Management Dismissals, *Journal of Finance* 50, 1029-1057.
Elton, E. J., Gruber, M. J., Blake, C. R., (1999), Common Factors in Active and Passive Portfolios, *European Finance Review* 3, 53-78.
Elton, E., Gruber, M., Das, S., Hlavka, M. (1993), Efficiency with Costly Information: A Reinterpretation of Evidence from Managed Portfolios, *Review of Financial Studies* 6, 1-22.
Fama, E., Jensen, M., (1983), Separation of Ownership and Control, *Journal of Law and Economics* 26, 301-325.
Fama, E., French, K., (1993), Common Risk Factors in the Returns on Bonds and Stocks, *Journal of Finance* 47, 427-466.
Fant, L., O'Neal, E., (2000), Temporal Changes in the Determinants of Mutual Fund Flows, *Journal of Financial Research* 23, 353-371.
Gallagher, D. R., (2002), Investment Manager Characteristics, Strategy and Fund Performance, Doctoral Thesis, School of Business, The University of Sydney.
Gallagher, D. R. (2003), Investment Manager Characteristics, Strategy, Top Management Changes and Fund Performance, *Accounting and Finance*, Forthcoming.
Gruber, M., (1996), Another Puzzle: The Growth in Actively Managed Mutual Funds, *Journal of Finance* 55, 783-810
Heinkel, R., Stoughton, N., (1994), The Dynamics of Portfolio Management Contracts, *Review of Financial Studies* 7, 351-387.
Ippolito, R., (1992), Consumer Reaction to Measures of Poor Quality: Evidence from the Mutual Fund Industry, *Journal of Law and Economics* 35, 45-70.
Jegadeesh, N., Titman, S., (1993), Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency, *Journal of Finance* 48, 65-91.
Khorana, A., (1996), Top Management Turnover: An Empirical Investigation of Mutual Fund Managers, *Journal of Financial Economics* 40, 403-427
Khorana, A., (2001), Performance Changes Following Top Management Turnover: Evidence from Open-End Mutual Funds, *Journal of Financial and Quantitative Analysis* 36, 371-393
Mercer, W. M., *Institutional Fee Survey*, 2000.
Murphy, K., Zimmerman, J., (1993), Financial performance surrounding CEO Turnover, *Journal of Accounting and Economics* 16, 273-315.
Patel, J., Zeckhauser, R., Hendricks, D., (1992), Investment Flows and Performance: Evidence from Mutual Funds, Cross Border Investments and New Issues, in R. Sato, R. M. Levich, R. V. Ramachandran, Eds., *Japan and International Financial Markets: Analytical and Empirical Perspectives,* New York, NY, Cambridge University Press.
Prather, L. J., Middleton, K. L., Cusack, A. J., (2001), Are N+1 Heads Better Than One? The Timing and Selectivity of Australian-managed Investment Funds, *Pacific-Basin Finance Journal* 9, 379-400.
Sawicki, J., (2000), Investors' Response to the Performance of Professional Fund Managers: Evidence from the Australian Wholesale Funds Market, *Australian Journal of Management* 25, 47-66.
Sawicki, J., Finn, F., (2002), Smart Money and Small Funds, *Journal of Business Finance and Accounting* 29, 825-846.
Sirri, E., Tufano, P. (1998), Costly Search and Mutual Fund Flows, *Journal of Finance* 53(5), 1589-1622
Warner, J., Watts, R., Wruck, K., (1988), Stock Prices and Top Management Changes, *Journal of Financial Economics* 20, 461-492.
Zheng, L., (1999), Is Money Smart? A Study of Mutual Fund Investors' Fund Selection Ability, *Journal of Finance* 54, 901-933.

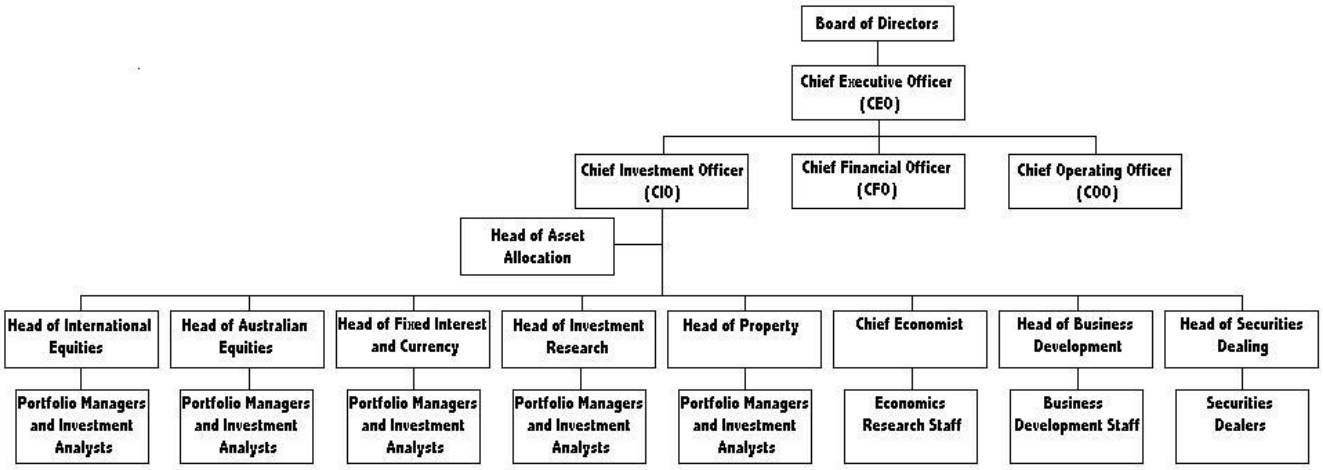
## Appendix - Hierarchical Structure of Investment Management Institutions

Khorana (1996) outlines the organizational and governance structure of U.S. mutual funds companies. A mutual fund company is governed by the board of directors, where directors are responsible for the fund activities and overall management. In addition, the board of directors is required to regularly review the performance of the investment advisor, who is responsible for the behaviour of the portfolio manager. Khorana (1996) identifies that it is in the best interests of the investment advisor to closely monitor the portfolio manager, given their own compensation contract (generally) entitles them to receive an annual fee based on a percentage of the fund's average net assets. If the advisor fails to adequately monitor the fund manager, underperformance will likely result in outflows resulting in a reduction in the size of the fund, and hence the fees earned by the advisor. The standard management process involves the investment advisor assisting the board of directors in assessing the performance of the fund manager. If investment performance delivered by the individual fund manager is not satisfactory, it is likely that the investment advisor will initiate a replacement of the manager (see Khorana 1996).

In Australia, the organizational and governance structure of Australian investment managers is similar to the U.S., however there are discernable differences. Information on the management and ownership structure of investment management companies was acquired from the Investment and Financial Services Association Limited (IFSA) Investment Manager Questionnaires. These documents are typically annual questionnaires of investment management firms, who provide standardized responses to questionnaires regarding the organizational structure of the firm, the staff employed, investment process adopted, expenses charged and products available to investors. Figure A1 shows the organizational structure of a typical investment management firm.

The chief investment officer (CIO) of the investment management firm is responsible for the overall investment process, and is the investment leader across all of the asset classes in which funds are offered by the institution. The CIO's title can also vary across institutions, and may be referred to as General Manager of Investments, or Investment Director. The CIO is responsible for the asset allocation decision for balanced (or multi-sector) funds, and the CIO chairs the weekly or fortnightly asset allocation committee. In some cases, investment firms delegate asset allocation responsibilities to another senior professional (i.e. the Head of Asset Allocation), whose role is to assist the CIO in the execution of the investment strategy across the asset classes. The asset allocation committee includes all sector heads in the major asset classes, as well as the chief economist, who all are accountable to the CIO and Chief Executive Officer. Within each sector are individual Heads or Directors whose responsibility is to manage the overall investment team in the specialized asset class. These include portfolio managers and analysts, and the emphasis of investment process requires that the sector Head successfully managing the participation of all investment professionals.

**Figure A1: The Generalised Organisational Structure of Australian Investment Management Entities**




*Source: D.R. Gallagher (2002)*

While the process is team dependent, the sector Head is ultimately accountable for leadership and the performance achieved by the sector team. The team-oriented approach relies on regular meetings within these sector teams, reviewing current market conditions and future expectations, analysis of whether portfolios are consistent with their risk/return objectives and investment style, as well as decisions concerning stock selection and portfolio weights. The team oriented emphasis of the Australian investment management industry is also documented by Prather, Middleton and Cusack (2001). Fund ratings agencies and institutional asset consultants devote significant attention to the human capital dimension of funds management firms, in particular through their ratings alerts. A significant number of alerts are related to important changes in leadership, management or firm ownership, in particular the expected impact of a change surrounding the three most important roles of investment responsibility - the Head of Australian Equities, the Head of Australian Fixed Interest or CIO.

## Table 1
## Descriptive Statistics

Panel A shows the number of top managerial replacements in Australian equities, Australian fixed interest and Australian balanced funds in the period 1991 to 2001. The panel also provides mean, median and standard deviation statistics concerning tenure for top management. Panel B presents the descriptive statistics for funds of institutions that experienced managerial replacement year (Year 0). The statistics calculated are the 1-factor Alpha, Beta, NetFlow and Log of Fund size. NetFlow is measured as:

$$NETFLOW_{i,t} = [ASSETS_{i,m,t} - ASSETS_{i,m,t-1} * (1 + Ri,m,t)] / ASSETS_{i,m,t-1}$$

***Panel A: Descriptive Statistics of Management Replacement***

| | Heads of Australian Equities | Heads of Australian Fixed Interest | Chief Investment Officers |
|---|---|---|---|
| Number of replacements | 41 | 16 | 33 |
| Tenure (in years) | | | |
| Mean | 2.955 | 3.035 | 3.213 |
| Median | 2.670 | 2.919 | 3.003 |
| Standard deviation | 1.694 | 1.774 | 1.913 |

***Panel B: Descriptive Statistics of Funds in Managerial Replacement Year***

| | Australian Equity Funds | Australian Fixed Interest Funds | Balanced Funds |
|---|---|---|---|
| 1-Factor Alpha (% per month) | | | |
| Mean | 0.068 | 0.036 | 0.006 |
| Median | 0.052 | 0.030 | 0.003 |
| Standard deviation | 0.451 | 0.083 | 0.202 |
| Beta | | | |
| Mean | 0.894 | 0.933 | 1.055 |
| Median | 0.876 | 0.954 | 1.072 |
| Standard deviation | 0.133 | 0.136 | 0.136 |
| NetFlow | | | |
| Mean | 0.305 | 0.367 | 0.113 |
| Median | 0.071 | 0.226 | 0.079 |
| Standard deviation | 0.743 | 0.439 | 0.506 |
| Log Fund Size ($ million) | | | |
| Mean | 3.936 | 3.581 | 5.973 |
| Median | 3.912 | 3.796 | 6.211 |
| Standard Deviation | 1.565 | 1.575 | 1.218 |

## TABLE 2
## Performance in the Years Pre and Post Top Investment Manager Turnover

This table presents the mean and median (represented in italics) performance of actively managed Australian equities, fixed interest and balanced (multi-sector) funds that experienced managerial replacement in the period 1991 to 2001. The three performance measures used are the 1-Factor Alpha, the 4-Factor Alpha based on Carhart's 4-Factor model, and the Objective-Adjusted return (performance of the fund relative to its benchmark) as defined by Khorana (2001). The 4-Factor Alphas are calculated for equity funds only. NP (PP) refers to funds that experienced negative (positive) objective-adjusted returns in the 12-24 month period prior to the month in which replacement occurred. The 1-Factor and 4-Factor Alphas are measured using monthly returns while the OAR is reported in annual terms. In addition, this table also reports the returns the for matched sample approach (only undertaken for Australian equity and Australian bond funds). The purpose of a matched sample approach is to compare firms that experienced replacement with those that did not for a given period. To employ a matched sample approach, for each turnover event (identified by month and year), we identify a single portfolio with similar a performance history prior to the turnover that did not experience replacement in the 24 months surrounding the turnover date and examine the 12-24 months pre and post the turnover event. The matched sample OAR is also reported in annual terms. Year 0 is the 12 month period prior to the managerial replacement month. Year -1 is the 12 month period prior to Year 0 and so forth. Panel A presents the actual levels of performance for the given years. Panel B presents the changes (i.e. difference) in mean and median levels of performance over different years. In order to test the significance of the changes in performance at the mean and median levels, a paired *t*-test and the Wilcoxon signed rank test are used, respectively.

***Panel A: Performance Measures and Managerial Replacement***

| | | Years with respect to top managerial turnover | | | |
|---|---|---|---|---|---|
| | | Year -1 | Year 0 | Year 1 | Year 2 |
| 1-Factor Alpha | NP | -0.085 | -0.151 | -0.046 | 0.053 |
| (in % per month) | | *-0.057* | *-0.098* | *-0.028* | *-0.002* |
| | PP | 0.211 | 0.241 | 0.072 | 0.130 |
| | | *0.170* | *0.186* | *0.002* | *0.149* |
| 4-Factor Alpha | NP | -0.126 | -0.053 | -0.053 | 0.304 |
| (in % per month) | | *-0.182* | *0.024* | *-0.105* | *0.282* |
| | PP | 0.217 | 0.360 | 0.155 | 0.224 |
| | | *0.149* | *0.357* | *0.241* | *0.206* |
| Objective-Adjusted Return (OAR) | NP | -1.488 | -2.817 | -0.480 | 0.564 |
| (in % p.a. ) | | *-1.608* | *-1.847* | *-0.297* | *-0.160* |
| | PP | 3.084 | 2.629 | 0.988 | 1.657 |
| | | *2.232* | *1.839* | *-0.041* | *1.301* |
| Matched-Sample OAR | NP | -0.159 | -1.965 | -1.093 | -0.210 |
| (in % p.a. ) | | *-0.628* | *-1.697* | *-1.205* | *-0.339* |
| | PP | 3.925 | 2.673 | 5.421 | 3.185 |
| | | *2.364* | *2.157* | *7.131* | *2.910* |
| Number of observations | | | | | |
| 1-Factor Alpha / OAR | NP | 54 | 80 | 58 | 50 |
| | PP | 43 | 56 | 35 | 31 |
| 4-Factor Alpha | NP | 24 | 35 | 18 | 15 |
| | PP | 30 | 38 | 19 | 18 |
| Matched Sample OAR | NP | 24 | 29 | 29 | 25 |
| | PP | 12 | 14 | 14 | 11 |

***Panel B: Changes in the Level of Performance and Managerial Replacement***

| | | Years with respect to top managerial turnover | | | | | |
|---|---|---|---|---|---|---|---|
| | | -1 to 0 | -1 to 1 | -1 to 2 | 0 to 1 | 0 to 2 | 1 to 2 |
| 1-Factor Alpha | NP | -0.042 | 0.083 | 0.166*** | 0.033 | 0.125*** | 0.106** |
| (in % per month) | | *-0.036* | *0.028** | *0.014*** | *0.048* | *0.075*** | *0.041** |
| | PP | 0.034 | -0.092 | -0.014 | -0.168** | -0.128** | 0.048 |
| | | *0.022* | *-0.112*** | *-0.004*** | *-0.144*** | *-0.109** | *0.012* |
| 4-Factor Alpha | NP | 0.077 | 0.103 | 0.540*** | 0.096 | 0.498*** | 0.414*** |
| (in % per month) | | *0.195* | *0.025* | *0.488**** | *-0.039* | *0.349**** | *0.420**** |
| | PP | 0.179*** | 0.058 | 0.086 | -0.206 | -0.131 | 0.055 |
| | | *0.238**** | *0.019* | *0.163* | *-0.212* | *-0.188* | *-0.099* |
| Objective-Adjusted Return (OAR) | NP | -0.840 | 1.375** | 2.296*** | 1.117*** | 2.118*** | 1.161* |
| (in % p.a.) | | *-0.240* | *1.240**** | *0.880**** | *1.170**** | *1.350**** | *0.140** |
| | PP | -0.560 | -2.192** | -1.103 | -1.495** | -1.045 | 0.560 |
| | | *-0.360* | *-1.650*** | *-0.570**** | *-1.700*** | *-0.660*** | *1.340* |
| Matched Sample OAR | NP | -1.602 | -0.839 | -0.223 | 0.999 | 1.956* | 0.708 |
| (in % p.a.) | | *-1.062* | *-0.548* | *-1.251* | *0.547** | *1.469** | *0.819* |
| | PP | -1.578 | 1.837 | 0.242 | 2.458* | 0.819 | -1.719 |
| | | *-0.206* | *5.052* | *2.176* | *4.849** | *0.999* | *-2.809* |

*, **, *** represent statistically significant differences at the 10%, 5%, and 1% levels respectively

## Table 3
## Performance Attribution for Australian Equity Funds Employing a 4-Factor Model

The table presents the mean and median (represented in italics) parameter estimates calculated from regressions employing the 4-factor model. The results only pertain to Australian equity funds and thus examine the performance attribution of Heads of Australian Equities in the pre-and-post replacement years. $RM_t$ is the excess return of the market index, defined as the S&P/ASX 300 Accumulation Index; $SL_t$ (size factor) is the difference between the return on the ASX Small Ordinaries Accumulation Index (small-cap firms) and the ASX 20 Accumulation Index (large-cap firms); $GV_t$ (book-to-market factor) is the difference between the Salomon Smith Barney (SSB) All Growth Index and the SSB All Value Index. Consistent with Carhart (1997), $PR1YR_t$ (the momentum factor) is calculated by subtracting the equally weighted return of firms with the highest 25% 12 month return, lagged one month from the lowest 25% 12 month return lagged one month, where the universe of stocks represents the S&P/ASX 300. NP (PP) refers to funds that experienced negative (positive) objective-adjusted returns in the 12-24 month period prior to the month in which replacement occurred. Year 0 is the 12 month period prior to the managerial replacement month. Year -1 is the 12 month period prior to Year 0 etc.

| | | Years with respect to top managerial turnover | | | |
|---|---|---|---|---|---|
| | | Year -1 | Year 0 | Year 1 | Year 2 |
| RM | NP | 1.012 | 0.816 | 0.943 | 0.951 |
| | | *1.005* | *0.818* | *0.901* | *0.947* |
| | PP | 1.012 | 0.889 | 1.004 | 0.982 |
| | | *0.999* | *0.896* | *1.020* | *1.003* |
| SL | NP | 0.139 | 0.036 | 0.041 | 0.040 |
| | | *0.114* | *-0.003* | *-0.008* | *-0.011* |
| | PP | 0.082 | 0.035 | 0.082 | 0.038 |
| | | *0.084* | *0.008* | *0.055* | *0.024* |
| GV | NP | 0.013 | -0.120 | 0.093 | -0.036 |
| | | *0.073* | *-0.074* | *0.097* | *-0.013* |
| | PP | 0.049 | -0.013 | 0.149 | 0.067 |
| | | *0.102* | *-0.033* | *0.149* | *0.032* |
| PR1YR | NP | -0.021 | 0.018 | 0.024 | -0.008 |
| | | *-0.019* | *0.008* | *0.018* | *-0.003* |
| | PP | -0.009 | 0.000 | 0.018 | 0.001 |
| | | *0.009* | *0.000* | *0.026* | *-0.003* |
| Number of observations | | | | | |
| | NP | 24 | 35 | 18 | 15 |
| | PP | 30 | 38 | 19 | 18 |

## Table 4
## Risk in the Years Pre and Post Top Investment Manager Turnover

The table presents the mean and median (represented in italics) risk measures for actively managed Australian equity, fixed interest, and balanced funds that experienced managerial replacement in the period 1991 to 2001. The four risk measures examined are beta, tracking error (the standard deviation of returns in excess of the benchmark return), residual risk (the standard deviations of residuals from the market model) and total risk (the standard deviation of monthly fund returns). NP (PP) refers to funds that experienced negative (positive) objective-adjusted returns in the 12-24 month period prior to the month in which replacement occurred. Year 0 is the 12 month period prior to the managerial replacement month. Year -1 is the 12 month period prior to Year 0 etc. Panel A presents the levels of risk for the given years surrounding top management replacement. Panel B presents the changes (i.e. difference) in mean and median levels of risk over different years. In order to test the significance of the changes in performance at the mean and median levels, a paired *t*-test and the Wilcoxon signed rank test are used respectively.

***Panel A: Risk Measures and Managerial Replacement***

| | | Years with respect to top managerial turnover | | | |
|---|---|---|---|---|---|
| | | Year -1 | Year 0 | Year 1 | Year 2 |
| Beta | NP | 0.988 | 0.934 | 0.998 | 0.983 |
| | | *0.986* | *0.950* | *1.003* | *0.982* |
| | PP | 1.021 | 0.963 | 1.009 | 1.004 |
| | | *1.014* | *0.940* | *0.995* | *1.004* |
| Tracking Error | NP | 2.755 | 3.361 | 2.218 | 2.262 |
| (in % p.a.) | | *2.064* | *2.464* | *1.848* | *1.616* |
| | PP | 3.069 | 3.592 | 3.417 | 3.117 |
| | | 2.846 | 3.001 | 2.954 | 2.908 |
| Residual Risk | NP | 2.409 | 3.084 | 1.991 | 2.071 |
| (in % p.a.) | | *1.750* | *2.224* | *1.738* | *1.406* |
| | PP | 2.882 | 3.252 | 3.172 | 2.950 |
| | | 2.671 | 2.573 | 2.775 | 2.481 |
| Total Risk | NP | 8.554 | 8.433 | 8.772 | 8.288 |
| (in % p.a.) | | *8.589* | *8.649* | *8.562* | *8.193* |
| | PP | 11.218 | 10.238 | 10.344 | 9.853 |
| | | *11.267* | *10.463* | *10.569* | *9.579* |
| Number of observations | | | | | |
| | NP | 54 | 80 | 58 | 50 |
| | PP | 43 | 56 | 35 | 31 |

| *Panel B: Changes in the Level of Risk and Managerial Replacement* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Years with respect to top managerial turnover | | | | | |
| | | -1 to 0 | -1 to 1 | -1 to 2 | 0 to 1 | 0 to 2 | 1 to 2 |
| Beta | NP | -0.049** | -0.021 | -0.036 | 0.023 | 0.005 | -0.016 |
| | | *-0.031*** | *-0.024* | *-0.038* | *0.042* | *0.011* | *-0.023* |
| | PP | -0.066*** | -0.073** | -0.060* | 0.030 | 0.024 | 0.003 |
| | | *-0.086**** | *-0.071*** | *-0.047** | *0.058* | *0.067* | *0.010* |
| Tracking Error (in % p.a.) | NP | 0.545** | 0.149 | -0.018 | -0.117 | -0.035 | 0.153 |
| | | *0.101** | *0.139* | *-0.181* | *-0.190* | *-0.413* | *-0.143* |
| | PP | 0.594*** | 0.327 | 0.034 | -0.191 | -0.557 | -0.403* |
| | | *0.047*** | *0.402* | *0.917* | *0.108* | *-0.140* | *-0.718* |
| Residual Risk (in % p.a.) | NP | 0.663*** | 0.323 | 0.127 | -0.120 | 0.006 | 0.124 |
| | | *0.272*** | *0.348* | *0.018* | *-0.078* | *-0.369* | *-0.281* |
| | PP | 0.433** | 0.286 | 0.055 | -0.041 | -0.303 | -0.300 |
| | | *-0.109** | *0.451* | *0.124* | *0.351* | *0.032* | *-0.338* |
| Total Risk (in % p.a.) | NP | -0.162 | 0.819* | 0.332 | 0.903** | 0.241 | -0.747 |
| | | *0.154* | *0.254** | *0.558* | *1.667* | *1.038* | *-1.112*** |
| | PP | -1.102** | -1.293* | -1.531* | 0.085 | -0.635 | -0.972* |
| | | *-0.939*** | *0.118** | *-0.457* | *-0.408* | *-1.449* | *-2.584*** |

*, **, *** represent statistically significant differences at the 10%, 5%, and 1% levels respectively

## Table 5
## Expense Ratios for Equity and Fixed Interest Funds in the Years Pre-and-Post Top Investment Manager Turnover

This table presents the mean and median (represented in italics) management expense ratios (MERs) for actively managed Australian equity and Australian fixed interest funds that experienced managerial replacement in the period 1991 to 2001. NP (PP) refers to funds that experienced negative (positive) objective-adjusted returns in the 12-24 month period prior to the month in which replacement occurred. Year 0 is the 12 month period prior to the managerial replacement month. Year -1 is the 12 month period prior to Year 0 etc. Panel A presents the MERs for the years surrounding replacement. Panel B presents the changes (i.e. differences) in mean and median levels of risk over different years. In order to test the significance of the changes in performance at the mean and median levels, a paired *t*-test and the Wilcoxon signed rank test are used respectively.

***Panel A: Expense Ratios and Managerial Replacement***

| | | Years with respect to top managerial turnover | | | |
|---|---|---|---|---|---|
| | | Year -1 | Year 0 | Year 1 | Year 2 |
| Expense Ratio (in % p.a.) | NP | 1.080<br>*1.050* | 1.026<br>*1.020* | 1.038<br>*0.890* | 0.996<br>*0.680* |
| | PP | 1.048<br>*0.850* | 1.057<br>*0.910* | 1.075<br>*1.030* | 0.991<br>*0.805* |
| Number of observations | | | | | |
| | NP | 25 | 31 | 20 | 20 |
| | PP | 29 | 27 | 18 | 18 |

***Panel B: Changes in the Level of Expense Ratios and Managerial Replacement***

| | | Years with respect to top managerial turnover | | | | | |
|---|---|---|---|---|---|---|---|
| | | -1 to 0 | -1 to 1 | -1 to 2 | 0 to 1 | 0 to 2 | 1 to 2 |
| Expense Ratio (in % p.a.) | NP | -0.003<br>*0.000* | -0.058<br>*-0.045* | -0.124**<br>*-0.150*** | -0.048<br>*-0.195* | -0.106**<br>*-0.420*** | -0.056*<br>*-0.290** |
| | PP | -0.016<br>*0.040* | -0.011<br>*0.200* | -0.052<br>*-0.035* | -0.012<br>*0.080* | -0.030<br>*-0.070* | -0.012<br>*-0.225* |

*, **, *** represent statistically significant differences at the 10%, 5%, and 1% levels respectively

## Table 6
## Flow Regressions

Panel A reports the OLS regression results of all funds and Panel B reports the regression results of Australian equity funds. The NetFlow regressions use following general model:

$$NETFLOW_{i,t} = f\begin{pmatrix} ObjectiveFlows_t; FundPerformance_{i,t-1}; Risk_{i,t-1}; Log(Assets)_{i,t-1}; \\ NegativePerformanceDummy; Pre-ReplacementDummy; InteractionEffects \end{pmatrix}$$

NetFlow is defined as:

$$NETFLOW_{i,t} = [ASSETS_{i,m,t} - ASSETS_{i,m,t-1} * (1 + R_{i,m,t})] / ASSETS_{i,m,t-1}$$

$Assets_{i,m,t}$ is the size of fund *i* at the end of month *m* in year *t;* $Assets_{i,m,t-1}$ is the size of fund *i* at the end of month *m* in year *t-1;* $R_{i,t}$ = return of fund *i* from month *m*, year *t-1* to month *m*, year *t*. $Objectiveflows_t$ is the average asset inflows into all other investment management firms with the same investment style as the firm which experienced replacement. Fund Performance $_{i,t-1}$ is the lagged 1-factor alpha for all funds, and the lagged 4-factor alpha for equity funds only. Risk $_{i,t-1}$ is the annualized standard deviation of monthly returns. Log(Assets) $_{i,t-1}$ is the lagged fund size. The positive risk adjusted performance variable is calculated by leaving the positive performance measures (1-factor and 4 factor alpha) as is and setting the negative performance measures to zero. Likewise the negative risk adjusted performance variable is calculated by leaving the negative performance measures as is and setting the positive performance measures to zero. NPD is the negative performance dummy variable and takes on the value of 1 if the fund is from the NP sample and 0 if the fund is from PP sample. PRE is the pre-replacement dummy variable and takes on the value of 1 for flows in Year -1 and Year 0, and 0 for flows in Year 1 and Year 2. NPD*PRE represents an interaction term. The *p*-values of the parameter estimates are reported in parentheses.

***Panel A: Flow Regressions for All Funds***

| Independent Variables | Model (1) | Model (2) | Model (3) | Model (4) |
|---|---|---|---|---|
| Intercept | 0.080 | 0.040 | 0.125 | 0.174 |
| | (0.47) | (0.72) | (0.32) | (0.18) |
| Objective Flow | 0.000 | 0.000 | 0.000 | -0.001 |
| | (0.99) | (0.95) | (0.78) | (0.48) |
| Standard Deviation | -0.004 | -0.011 | -0.005 | -0.012 |
| | (0.49) | (0.07) | (0.78) | (0.05) |
| Log(Assets) | 0.001 | 0.006 | 0.000 | 0.006 |
| | (0.93) | (0.70) | (0.99) | (0.73) |
| 1-Factor alpha | 0.517 | | | |
| | (0.00) | | | |
| Positive risk-adjusted performance variable | | 0.838 | | |
| | | (0.00) | | |
| Negative risk-adjusted performance variable | | | 0.511 | |
| | | | (0.01) | |
| Negative performance indicator variable | | | | -0.115 |
| (NPD) | | | | (0.11) |
| Pre-replacement indicator variable | | | | 0.389 |
| (PRE) | | | | (0.00) |
| NPD * PRE | | | | -0.219 |
| | | | | (0.13) |
| Adjusted $R^2$ | 0.078 | 0.095 | 0.011 | 0.080 |
| Number of observations | 259 | 259 | 259 | 259 |

| *Panel B: Flow Regressions for Australian Equity Funds* | | | | | | | |
|---|---|---|---|---|---|---|---|
| Independent Variables | Model (1) | Model (2) | Model (3) | Model (4) | Model (5) | Model (6) | Model (7) |
| Intercept | -0.016<br>(0.92) | -0.133<br>(0.45) | 0.047<br>(0.79) | -0.011<br>(0.94) | -0.082<br>(0.65) | 0.040<br>(0.82) | 0.052<br>(0.78) |
| Objective Flow | 0.000<br>(0.87) | 0.000<br>(0.78) | 0.000<br>(0.81) | 0.000<br>(0.74) | 0.001<br>(0.58) | 0.000<br>(0.83) | -0.001<br>(0.40) |
| Standard Deviation | -0.016<br>(0.12) | -0.013<br>(0.20) | -0.019<br>(0.07) | -0.016<br>(0.13) | -0.016<br>(0.12) | -0.018<br>(0.09) | -0.025<br>(0.02) |
| Log(Assets) | 0.054<br>(0.00) | 0.052<br>(0.01) | 0.057<br>(0.00) | 0.052<br>(0.00) | 0.055<br>(0.00) | 0.054<br>(0.00) | 0.055<br>(0.00) |
| 1-Factor alpha | 0.269<br>(0.01) | | | | | | |
| 4-Factor alpha | | | | 0.223<br>(0.01) | | | |
| Positive risk-adjusted performance variable | | 0.532<br>(0.00) | | | 0.423<br>(0.01) | | |
| Negative risk-adjusted performance variable | | | 0.180<br>(0.29) | | | 0.200<br>(0.13) | |
| Negative performance indicator variable (NPD) | | | | | | | -0.060<br>(0.44) |
| Pre-replacement indicator variable (PRE) | | | | | | | 0.399<br>(0.00) |
| NPD * PRE | | | | | | | -0.314<br>(0.07) |
| Adjusted $R^2$ | 0.077 | 0.109 | 0.032 | 0.063 | 0.076 | 0.034 | 0.141 |
| Number of observations | 121 | 121 | 121 | 121 | 121 | 121 | 121 |