Active investment manager portfolios and preferences for stock characteristics: Australian evidence*

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Abstract

This paper investigates the stock characteristic preferences of active Australian equity managers. We examine the following characteristics: stock price variance, momentum, size, transaction costs, earnings yield, analyst coverage and the standard deviation of analyst forecasts. In aggregate we find that active managers exhibit preferences for stocks exhibiting high price variance, large market capitalisation, low transaction costs, value-oriented stocks, greater levels of analyst coverage, and stocks with less variability in analyst earnings forecasts. The study also recognises the importance of tracking error in portfolio management by examining stock preferences with respect to both small and large stocks. We find evidence of momentum trading in large stocks, and higher volatility and wider analyst coverage amongst small stocks. Active managers are also evaluated on the basis of size and investment style. Small investment managers exhibit a preference for stocks with higher volatility and analyst coverage (including consensus of forecasts). Finally we find evidence of an industry effect, where GICS classifications have an important impact on the stockholdings of Australian institutional investment managers.

Keywords: Stock preferences; Managed fund performance; Equity portfolio characteristics, Market efficiency, Tracking error

JEL classification: G12, G14, G23

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1. Introduction

This study examines the portfolio preferences for stock characteristics of active Australian institutional equity managers. Empirical studies for U.S. and Australian markets suggest that stock characteristics, beyond traditional proxies for risk, capture a wider spectrum of factors that also explain the inclusion of stocks in fund portfolios (Badrinath, Gay and Kale (1989), Del

Guercio (1996), Covrig, Lau and Ng (2001), Chan, Chen and Lakonishok (2002), Falkenstein (1996), Gompers and Metrick (2001), Pinnuck (2003)). Specifically, this study documents the preferences of active Australian institutional equity managers with respect to transaction costs, stock size, return variance, momentum, investment style and the degree of analyst coverage.

The inclusion of a security in a fund manager's active portfolio is a function of three important decisions (Pinnuck, 2003). These are identified as (1) the types of stocks the portfolio manager should have exposure to (i.e. stock characteristic preferences) in achieving the investment objective of the fund, (2) the role of prudential management in stock selection decisions and (3) the suitability of holding a stock given the manager's private information set. This research provides attention to the first two components of the decision-making process as a means of understanding the composition of active portfolios and the preferences for stock characteristics.

Firstly, given the assumption of frictionless capital markets, Modern Portfolio Theory (MPT) assumes the decision-making function of investors is performed using two dimensions – the expected return of securities and the variance of asset returns. Accordingly, the theory leads investors to concentrate on only the first two moments of the return distribution, and to construct portfolios in terms of mean and variance. Given the CAPM framework, a well-diversified investor is only rewarded for holding systematic risk, and therefore selects their portfolio holdings according to their individual risk preferences by allocating their wealth to incorporate both risky assets and the risk-free asset. The market portfolio of risky assets, measured in terms of a value-weighted index of all the stocks in the equity universe, forms an important benchmark against which professional equity managers are compared. However, if the assumption of frictionless capital markets does not hold, it becomes clear that certain investors may have a competitive advantage in implementing their stock selection decisions which exploit these market frictions (e.g. transaction costs, information asymmetries and historical return patterns). Accordingly, where market imperfections arise, professional active equity managers (as a distinct class of 'informed' investors) will be expected to bias their portfolio towards specific stocks in an attempt to outperform the market-weighted benchmark which is formed using a decision rule that incorporates zero information. Therefore, evaluating how active managers select stocks into portfolios, and the characteristics of stocks held (as a subset of the aggregate index), will determine both the sources of value derived and the risks inherent in the portfolio.

Secondly, investment managers have a fiduciary responsibility to investors, and this responsibility is expected to be fulfilled in their portfolio construction decisions. Risk control and compliance practices are likely to have implications for the performance of the fund manager, as well as having an important bearing on the portfolio allocation decision. These

prudent-man investment constraints may give rise to an additional preference for stock characteristics implemented by active managers (Badrinath *et al.* (1989), Del Guercio (1996), Gompers and Metrick (2001), Chan *et al.* (2002), Pinnuck (2003b)). It is a requirement of fiduciaries to undertake prudent investments both at the portfolio level as well as at the individual stock level. Therefore, fiduciaries have a legal requirement to ensure all components of their portfolio management activities are managed in a prudent manner (Del Guercio, 1996).

Recognising that active portfolio decisions expose the portfolio to tracking error, an individual stock's contribution to portfolio tracking error risk should be considered in light of an active manager's preferences for such stocks. Since tracking error contribution is a function of stock size, it follows that small stocks may be included in a portfolio for different reasons than large stocks. This reflects the different level of tracking error risk associated with including large or small firms in a portfolio. For example, large stocks cannot easily be removed (or significantly underweighted relative to the Index), since even small movements in a large stock can generate significant over/under performance. Whereas lower tracking error contribution stocks can be more easily removed given they exhibit lower tracking risk. Therefore, one may expect that the sensitivity of each manager to stock characteristics is likely to be dependent on stock size. Accordingly, small stocks are more likely to be *included* for private information reasons, whereas large stocks should be *included* and well represented in a manager's portfolio irrespective of the manager's information set for such securities. This study investigates the decision making process of active equity managers in light of the tracking error implications of stocks, and the preferences active managers exhibit given a dichotomy between large and small securities. This is of particular interest in the Australian context, given the concentrated nature of stocks which comprise S&P/ASX benchmark indices.[1]

Given that stock characteristic preferences are likely to be important, and that different preferences may arise depending on stock size, unique preferences may also arise given the investment style of an active manager. Our sample is partitioned on the basis of style in light of the fact that the types of stocks held by the fund are important determinants of investment performance. Chan *et al.* (2002) find that managers executing various investment styles perform differently to other funds, and this result can be explained by the characteristics of stocks held by unique portfolios. Specifically, Chan *et al.* (2002) document superior performance being derived by growth funds (relative to value funds), for which size and momentum effects are suggested as possible explanations.

The size of the institution (in terms of their funds under management) may imply

[1] The top 20 stocks (ranked by market capitalisation) comprise 62.25% of the S&P/ASX 300 as at 31 March 2002.

organisational features which affect the investment decision making process. In the U.S., Grinblatt and Titman (1993) and Gorman (1991) document that fund size has a significant impact on investment performance. Dahlquist, Engstrom and Soderlind (2000) observe a negative relationship between fund size and performance for Swedish mutual funds. Australian findings contradict those of the U.S., where Bird, Chin and McCrae (1983) find no evidence of a relationship for Australian superannuation funds. However, Drew, Stanford and Hoffman (2002) document that size is an important determinant of performance for retail funds between 1991 and 1999, and this is also confirmed by Sawicki and Finn (2002) for wholesale balanced pooled superannuation funds. Therefore, differential preferences for stock characteristics may also be important determinants according to an institution's total assets under management.

Our study also extends the literature by examining the stock selection process of active investment managers on an individual manager basis, in addition to the approach adopted by Falkenstein (1996), Badrinath *et al.* (1989), Del Guercio (1996), Covrig *et al.* (2001), Gompers and Metrick (2001) and Pinnuck (2003), who evaluate preferences for stock characteristics at an aggregate level. Accordingly, individual manager data results in improved granularity and helps to avoid aggregation errors. In other words, an evaluation at the individual manager level provides improved understanding of the diversity of stock characteristics preferences amongst individual portfolio managers. The study also examines the role of GICS industry classifications in the design of a portfolio and whether active managers exhibit preferences for certain industries relative to others. Covrig, Lau and Ng (2001) evaluate domestic and foreign fund equity holdings in 11 developed countries and find that a majority of industry coefficients are significant, indicating that an industry preference exists.

An investigation of the behaviour of institutional equity fund managers, with respect to their portfolio management decisions, should result in improved alignment of an investor's risk-return preferences in light of the manager selection problem. Utilizing a unique database of portfolio holdings, this study finds that active equity managers exhibit preferences for stocks with higher stock price variance, lower transaction costs, larger market capitalisation, preferences toward value stocks, higher analyst following, and a lower standard deviation in analyst forecasts. The study also documents managers engaging in momentum trading in large stocks, as well as stock volatility and analyst coverage being of greater importance for small stock holdings. Smaller managers (by assets) exhibit preferences for stocks with higher volatility and higher analyst coverage (including low variation in the forecasts of these analysts). We also find evidence of differences in stockholdings on the basis of industry exposures, demonstrating the existence of managerial preferences according to industry dimensions.

This paper is structured as follows. Section 2 presents a theoretical discussion motivating

research into the stock characteristic preferences of portfolio managers. The next section describes the data and Section 4 outlines the research design employed. Section 5 presents the empirical results, and the final section concludes the study and makes suggestion for future research.

2. Theory

This section outlines a theoretical discussion of the expected factors explaining portfolio preferences for stock characteristics of active equity managers. The discussion below considers the portfolio management process with respect to both portfolio management decisions and stock characteristic preferences. In particular, this section develops the hypotheses by considering portfolio design which relates to (1) investment performance and (2) prudential requirements.

2.1 Investment performance

In a world where capital market frictions exist, stock characteristic preferences may be affected by the following considerations; transaction costs, information asymmetries, and historical returns. These are each discussed below.

2.1.1 Transaction costs

Keim and Madhavan (1998) provide a comprehensive review of the trading expenses literature and identify costs as being attributable to both implicit and explicit sources. Explicit transaction costs include brokerage fees and taxes. Implicit costs are indirect costs such as market impact costs and the opportunity cost associated with trades not occurring in a timely manner. Studies show that transaction costs are related to both trader related factors, such as skill and reputation (Keim and Madhavan (1998)) and stock related factors such as stock price level, and more importantly, liquidity (Aitken and Frino (1996), Keim and Madhavan (1998)). These costs adversely affect portfolio performance in two main ways. Firstly, trading costs erode the net performance of the fund and, therefore, a manager wishing to maximise after cost performance will, *ceteris paribus*, choose to invest in stocks that offer lower transaction costs. Secondly, higher transaction costs can increase the risk of incorrect stock selection decisions. This is because reversing a prior decision will require physical trading to liquidate the stock holding. Therefore, due to these disincentives to invest in high transaction cost stocks, *a priori* one would expect managers to exhibit a preference for highly liquid stocks with low transaction

costs.

A number of authors find evidence that managers prefer liquid stocks with a high volume of trading. For example, Falkenstein (1996) examines U.S. mutual fund manager portfolio holdings and finds that managers prefer stocks with high liquidity (trading volume). Covrig, Lau and Ng (2001) study the manager preferences of 11 developed countries and find both foreign and domestic fund managers exhibit preferences for stocks with high daily equity turnover (a proxy for transaction costs). However, these authors also noted that in smaller markets (including Australia), equity turnover is a more important preference compared to larger markets (like the U.S., the U.K. and Japan). Covrig *et al.* (2001) suggest this may be due to larger markets being dominated by large global stocks, with generally higher trade volumes and therefore lower trading costs.

2.1.2 Information asymmetries

In a perfect market, information is costless and all market participants have access to all available information. Relaxing this assumption, however, forces active managers to resolve a resource allocation problem. They must expend resources to obtain costly information, as a means of executing stock picking decisions which enhance fund returns. Accordingly, it is clear that active managers will prefer stocks with lower information search costs. Furthermore, these stocks should have lower information asymmetries *vis-a-vis* the gap in price sensitive information between the active manager and insiders. Therefore, due to information search costs and the information asymmetry between managers and insiders, it is hypothesized that managers prefer stocks with a high degree of low cost publicly available information.

Falkenstein (1996) examines the issue of information and shows that managers prefer stocks with lower information asymmetries. Specifically, Falkenstein (1996) finds that aggregate manager holdings are positively related to the age of a stock and the number of news articles published regarding the stock. Kang and Stultz (1994) investigate information asymmetries by classifying portfolio managers as either domestic or foreign and demonstrate that foreign investors exhibit a bias towards large firms. Covrig, Lau and Ng (2001) find similar results, showing that foreigners tend to invest in stocks that are widely covered by market analysts, however, this tendency is not as strong for domestic managers.

While wider news and analyst coverage should translate into lower information asymmetries, it is arguable that outperforming based on such public information should be more difficult. If markets are not semi-strong efficient, and their efficiency is related to the level of publicly available information, then outperformance driven by public news is unlikely. This

argument can be demonstrated in light of the Grossman and Stiglitz (1980) information equilibrium model. Grossman and Stiglitz (1980) conjecture, firstly, that the more costly information becomes, the fewer individuals would be willing to incur the cost of obtaining such information. Secondly, the lower the number of informed agents, the less informative the price system becomes. Taken together, these conjectures suggest that as information becomes more costly, equilibrium prices do not reflect information fully, and arbitrage opportunities exist for those holding valuable information. Conversely, as information becomes less costly (as is the case for stocks with a high degree of media and analyst coverage), the more informative the price system becomes, this should result in a more efficient capital market.

Furthermore, higher levels of public news coverage need not necessarily translate into higher levels of ownership, if such information is employed in an attempt to outperform the market. This is because news can be good, bad or neutral and so should be used as a reason to take relatively large or small positions depending on the nature of the news. Thus, the question of how public news should influence a portfolio manager's preferences to hold particular stocks remains an empirical issue.

2.1.3 Historical returns

Jegadeesh and Titman (1993) document the existence of positive serial correlation among U.S short term security returns, suggesting the potential of exploiting momentum strategies. To date, studies support investment managers employing a momentum strategy, tending to purchase stocks with a track record of good performance (for example, Grinblatt *et al.* (1995), Chan *et al*. (2002), Jegadeesh and Titman (1993, 2001) and Chen *et al.* (2000)). Grinblatt *et al.* (1995) demonstrate that U.S. mutual fund managers tend to purchase past winners, however they note that the momentum effect did not extend to the selling of past losers. This momentum strategy produced significant abnormal returns, while contrarian strategies produced little or no outperformance. Chan *et al.* (2002) investigate momentum within an investment style context, and find that managers generally hold stocks close to benchmark (S&P 500) weights, however, they are more likely to over or underweight the stock if it is a past winner or is growth-oriented. Chen *et al.* (2000) also document similar results.

If markets are not perceived to be fully efficient, active portfolio managers would be expected to strategically hold a subset of the market portfolio which biases the portfolio's constituents in favour of either value or growth stocks. Existing research documents superior one-year-ahead performance for value stocks (Halliwell, Heaney and Sawicki (1999)), suggesting that managers would exhibit a preference toward stocks with high book-to-market

ratios. Gompers and Metrick (2001) find supporting evidence for this amongst U.S. institutional investors. Pinnuck (2003) finds no evidence of preferences for either growth or value stocks among Australian equity managers, and Chan *et al.* (2002) find evidence of U.S. mutual funds exhibiting preferences for growth stocks. Stickel (1997) suggests that this may be a function of the increased analyst coverage of glamour stocks, and Chan *et al.* (2002) also confirm this finding, in addition to identifying the tendency for value strategies requiring longer time intervals to yield superior profits. This study employs the earnings yield variable *EPSY* to test possible preference differences between active manager investment styles.

2.2 Prudency Constraints

Investment managers have a fiduciary responsibility to investors, which may direct them to make portfolio construction decisions that are not always directly related to investment performance. These prudent-man type investment constraints may give rise to an additional selection of potentially relevant stock characteristics for which managers have preferences. Fiduciaries are required to ensure all investment decisions are prudent with respect to portfolio design and composition. Thus, fiduciaries have an incentive to ensure each component of the portfolio is considered a prudent and defendable investment decision in the instance of extreme poor performance (Del Guercio, 1996). Badrinath, Gay and Kale (1989) make reference to the managerial 'safety-net' hypothesis, claiming that in such times of inferior performance a 'safety net' is provided to managers provided they can demonstrate soundness of judgment with respect to their investment decision making process. Del Guercio (1996) and Badrinath *et al.* (1989) document evidence of this for U.S. institutional investors, finding a tendency for this group of investors to tilt their portfolios toward high quality or prudent stocks.

Where individual portfolio decisions are examined in conjunction with the overall portfolio, it is clear that the former will motivate managers to limit the loss making potential of any one investment decision. Therefore, it is expected that funds will exhibit a negative preference for stock return volatility. Institutional investors have been observed to exhibit higher levels of ownership in lower risk securities in the U.S. (Badrinath *et al*., 1989) as well as in Australia (Pinnuck (2003b)). However, Falkenstein (1996) documents a preference by U.S. mutual funds for high volatility stocks which may be a consequence of an agency problem existing between these funds and their investors. The observation therefore is that performance asymmetrically affects fund flows, in the sense that high ranking funds (on the basis of non-risk-adjusted performance) receive positive inflows and the poorly performing are not necessarily penalized to the same degree by outflows. This effectively provides managers with a call option, as

compensation tends to be based on the level of funds under management, implying a high risk strategy is the rational response. Furthermore, where there exists a divergence in opinions concerning the price of a security among market participants, the price series of such a security is likely to exhibit greater variability than for a security for which there is a high degree of consensus in valuation. Thus, managers may be expected to exploit mispricing in stocks which exhibit a high degree of return variance.

Stock size has been previously identified as a prudent management variable by Del Guercio (1996). This is motivated by the observations of Shefrin and Statman (1995) and Lakonishok *et al*. (1994), where large stocks are considered are to be 'good' by investment managers. A preference for large stocks has been documented in the majority of markets and fund types (Badrinath *et al.* (1989), Gompers and Metrick (2001), Del Guercio (1996), Falkenstein (1996) and Pinnuck (2003b)).

A number of the previously defined variables may also be influenced by prudential management considerations. The degree of analyst coverage can also be related to prudent investment decision making. A stock with a high degree of analyst coverage, as well as consensus among the earnings forecasts of these analysts (measured by the standard deviation of analyst forecasts), provides the manager with external validation for selection of the security. Given that a prudent investment is one that is deemed appropriate by other investment professionals, a security with high levels of positive analyst reports should satisfy this condition. Although in this study we are unable to determine the direction of the forecast, it is still preferable that for a stock to be included in a portfolio, it have a reasonable degree of market attention. Additionally, a momentum variable may also be influenced by prudential management concerns. It is conceivable that inclusion of a stock with good performance track record is easier than for a stock where the reverse is the case.

3. Data

The sample consists of the monthly portfolio holdings of a sample of 37 active Australian institutional equity manager portfolios over the period 30 September 1998 to 30 September 2001. The data is sourced from the *Portfolio Analytics Database.* The fund holdings information includes all stocks, option securities, futures contracts and cash positions, the relative proportions is reported in Table 1. The database was formed using an 'invitation' approach to the largest Australian equity managers in Australia, measured on the basis of total funds under management. In aggregate, 45 individual data requests were dispatched to the investment managers, and the number of participating equity managers numbered 30, which accounted for 37 active Australian

equity funds. The definition of 'active' fund was explicitly defined as funds exhibiting a target *ex-ante* tracking error greater than 100 basis points per annum. The largest fund is most representative of the investment process executed by the investment firm in the management of domestic equity assets. It is also important to note that each of the investment managers offer only a few unit trust vehicles in the institutional market per asset class, and the use of the 'largest' fund helped to ensure that managers could not select an alternate fund.

Table 1 shows the average size of the funds in the sample in terms of funds under management, as well as the size of the aggregate sample. Ranked by funds under management, the sample represents five of the top 10 managers from the Australian institutional fund manager population, four ranked 11-20, five ranked 21-30 and 16 outside the largest 30 managers. Table 1 also reports the self-stated investment style of each of the funds in the sample; managers are classified as being value, growth, growth at a reasonable price (GARP) or style neutral.

<< Insert Table 1>>

Given that the manager holdings data was collected from the institutions at a common time period, a degree of survivorship bias is present. However, after comparing the performance of the funds in the *Portfolio Analytics Database* to the performance of the survivorship free population of funds in the Mercer Investment Consulting *Manager Performance Analytics* (MPA) database, it appears that this bias is limited. An important feature of the *Portfolio Analytics Database* is the inclusion of options positions in a manager's holding data. Although U.S. and Australian fund managers hold exchange traded options, U.S. mutual fund data only reports the physical stock holdings. Consequently, by ignoring options positions U.S. studies have not captured the entire exposure to stocks. In this study, options are accounted for by determining the equivalent number of ordinary shares (using the option's delta) and adding this to the manager's stock holding, consistent with the method adopted by Pinnuck (2003a,b).

The study uses stock price information sourced from the ASX Stock Exchange Automated Trading System (SEATS). This database was access via SIRCA. The SEATS data contains stock characteristics data including stock codes, bid-ask information, stock prices, and other data permitting measurement of the variables empirically considered in the analysis of stock characteristic preferences. In terms of the sufficiency of historical data to be employed in the analysis, securities are required to have one full-year of price history as at each of the dates examined. The analyst coverage data is provided by the Thomson Financial subsidiary company - Institutional Brokers Estimate System (I/B/E/S) – as part of their academic research program. Our data also includes the ASX and S&P/ASX benchmark index weights for stocks that are

constituents of the ASX All Ordinaries Accumulation Index (pre April 2000) and the S&P/ASX 100, 200 and 300 Accumulation Indices (post April 2000). This information is provided by SIRCA. In our sample, 2 managers are benchmarked to ASX 100, 6 to the ASX 200 and 28 the ASX 300.

4. Empirical Design

4.1 Regression Analysis

4.1.1 Aggregate Holdings

This research employs a cross-sectional regression model in order to evaluate manager preferences for stock characteristics. The analysis is performed as at September 30 for the years 1998 – 2001. Observations are aggregated across the 37 managers in the sample following the methodology adopted by Falkenstein (1996), Chen *et al.* (2000), Covrig *et al.* (2001) and Pinnuck (2003b). The dependent variable consists of the aggregate holdings in each stock and is defined as:

$$PIH_{it} = \frac{AGGNUM_{it}}{TOTNUM_{it}} \tag{1}$$

where PIH_i measures the fractional ownership of individual stocks at time t, $AGGNUM_{it}$ is the aggregate number of shares of stock i owned by all funds at the given date. $TOTNUM_{it}$ the total number of outstanding shares of stock i at that date. Given the censored nature of the dependent variable a Tobit regression model is employed in the estimation process. Use of ordinary least squares (OLS) would give rise to biased and inconsistent coefficient estimates.

The regression is specified as follows:

$$PIH_{it} = \beta_0 + \beta_1 Momentum_{it} + \beta_2 Variance_{it} + \beta_3 EPSY_{it} + \beta_4 Spread_{it} + \beta_5 Size_{it} + \beta_6 IBES_{it} + \beta_7 IBESSD_{it} + e_{it} \tag{2}$$

where *Momentum* denotes the percentage change in stock price over the prior 12 months. *Var* represents the variance of daily stock returns for the month. *EPSY* equates to the earnings per share as a percentage of share price (or earnings yield). *Spread* provides the stock's monthly

time-weighted relative bid-ask spread, calculated using the methodology of McInish and Wood (1992). *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index. *IBES* represents the number of analysts covering the stock and *IBES SD* the standard deviation of analyst forecasts. This variable serves as a proxy for stock visibility in the market.

4.1.2 Disaggregate Holdings

In contrast to the above method, which examines aggregate manager holdings data in the evaluation of manager preferences, the individual stock selection decisions of active managers are examined. This improves granularity in the analysis and avoids distortions in the aggregation process. For example, distortions may arise in the aggregation of manager holdings where a single manager with a high allocation to a small stock is indistinguishable from a population-wide overweight allocation to the same small stock. The following cross-sectional regression is performed at each of the four points of time relevant to the study:

$$Holding_{it} = \beta_0 + \beta_1 Momentum_{it} + \beta_2 Variance_{it} + \beta_3 EPSY_{it} + \beta_4 Spread_{it} + \beta_5 Size_{it} + \beta_6 IBES_{it} + \beta_7 IBESSD_{it} + \sum_{i=1}^{J} D_{7+i} M_{it} + e_{it} \quad (3)$$

The study evaluates only non-zero stock positions of active equity managers, given the analysis is concerned with identifying preferences for actual portfolio holdings. *Holding* represents the actual portfolio holdings provided by each manager in the sample (in terms of the percentage weight that individual stocks constituted in the aggregate portfolio). The actual holdings are used in preference over a relative measure based on a benchmark index since the inclusion of the intercept and the *Size* variable on the right hand side of the equation is a less restrictive definition.[2] The explanatory variables are identical to those observed in the earlier aggregate regression, with the addition of a set of *j* manager dummy variables, where *j* refers to the number of managers in the sample at the analysis point.[3] Given the censored nature of the dependent variable a Tobit regression model is employed in the estimation procedure.

4.2 Hypotheses

[2] Using (holdings – benchmark) assumes the coefficient of size is one.
[3] Although manager dummy variables are included in the regression model their coefficients are not reported in the results section.

The variables employed in this study evaluating characteristic preferences are categorised into two broad categories (investment performance and prudence constraints) that are expected to influence an active fund manager's decision to allocate a weighting to a stock in their portfolio. Hypotheses relating to *Momentum, Variance, Earnings Yield (EPSY),* transaction costs (*Spread), Size* and analyst coverage (*IBES)* are considered. Consistent with the theory outlined previously, the following hypotheses are outlined:

H_1 *Given the evidence of one-year momentum in stock returns (Jegadeesh and Titman (1993)) and the greater ease with which stocks with positive past returns can be justified in terms of prudential portfolio management the Momentum variable is hypothesised to be positive.*

H_2 *Given the sample consists of institutional managers it is hypothesised that prudential management concerns will dominate and thus the volatility of stock returns variable will be negative. This is further justified by the previous findings of Pinnuck (2003b) for Australian equity funds.*

H_3 *Given the findings of Halliwell, Heaney and Sawicki (1999) of superior performance of Australian value stocks it is hypothesised that the coefficient of earnings per share yield variable will be positive.*

H_4 *Performance maximising managers would be expected, ceteris paribus, to invest in stocks with low transaction costs, i.e. those that have low Spread.*

H_5 *The size variable is hypothesised to be positive given the impact of prudence constraints on stock preferences.*

H_6 *On the basis of previous findings (Falkenstein, 1996) and prudence considerations it is hypothesised that managers will prefer stocks with high degrees of analysts coverage and low levels of forecast standard deviation.*

5. Empirical Results

5.1 Regression Results

Our analysis commences with an examination of the stock characteristic preferences of all active managers in our sample. Table 2 reports both the disaggregate (Panel A) and aggregate (Panel B) results of the Tobit regression for all active managers and all stocks as at 30 September for each of the years 1998-2001. The Wald tests for each of the regressions are highly significant, showing the explanatory variables are jointly significantly different from zero. The coefficients on the *Momentum* variable are of mixed signs for the disaggregate regressions and insignificant for the aggregate regressions, suggesting that the active managers in our sample do not follow momentum strategies. The results are also consistent with previous Australian findings, where Pinnuck (2003b) finds Australian equity managers do not rely on momentum strategies. Gompers and Metrick (2001) examine U.S. institutional funds and also find that managers are not momentum investors, in fact the evidence suggests that they employ contrarian strategies.

Our findings are inconsistent with H_1, which suggests that given evidence of positive serial correlations among stock returns over intermediate horizons (Jegadeesh and Titman (1993)), active managers are expected to follow momentum strategies. Furthermore, in relation to prudence considerations, the ease with which investment decisions are based on stocks with good track records also suggested a positive coefficient on the *Momentum* variable. The findings are also inconsistent with the U.S. evidence of Badrinath *et al.* (1989) who find higher levels of institutional ownership among those firms with good past performance. Additionally, Chan *et al.* (2002) find that although funds tend to cluster around the benchmark index, there is a preference for stocks with good track records among the active funds that do deviate from the index.

The coefficient *Variance* is positive and highly significant across all years and for both the disaggregate and aggregate regressions, reported in Table 2. This indicates that active managers prefer to hold more volatile stocks. Similar findings are also documented for U.S. mutual funds (Falkenstein, 1996). The results may be a consequence of the asymmetric performance/flow relation (Ippolito (1992) and Sirri and Tufano (1998)), whereby managers receive positive inflows following good performance but are not penalised to the same extent by outflows following periods of poor performance. In this situation, active managers are effectively presented with a call option, as compensation is generally related to the aggregate level of funds under management. A preference for volatility is also consistent with managers exploiting mispricing for stocks for which there is little consensus in valuation. However, these findings are inconsistent with H_2 and suggest that prudency constraints are not driving preferences concerning stock return variance. Prudency constraints would imply a preference for low risk securities, as managers are concerned with limiting the loss making potential of the portfolio, both at the aggregate and individual security level. Badrinath *et al.* (1989) and Del

Guercio (1996) find evidence to support this conjecture among U.S. institutional investors as does Pinnuck (2003b) for active Australian equity funds.

The *EPSY* coefficient is positive and significant for all of the aggregate regressions and positive for three of the four disaggregate regressions (the remaining regression is negative but insignificant). This suggests that active managers prefer value stocks relative to growth. This finding is consistent with H_3 and indicates that managers have taken advantage of the historically superior returns of value stocks in Australia (Halliwell, Heaney and Sawicki (1999)). Previous Australian evidence does not find evidence of preference for either growth or value stocks (see Pinnuck (2003b)).

<< Insert Table 2 >>

Table 2 also shows that managers have a preference for stocks with low spreads, indicated by the negative and significant coefficients across all disaggregate and aggregate regressions. This is consistent with H_4 which states that performance maximising managers are expected to invest in stocks with low transaction costs. This finding is confirmed by Gompers and Metrick (2001), Falkenstein (1996), Del Guercio (1996), Badrinath *et al.* (1989) in the U.S., and Pinnuck (2003b) in an Australian context. Managers in the sample exhibit preferences for stocks with larger market capitalisations, as evidenced by the coefficients on the *Size* variable being greater than one, which are highly significant across all years in the disaggregate regressions. Although the coefficients for the aggregate regressions are negative, three of the four years are insignificant, and thus we cannot draw broad conclusions from these results.[4] The disaggregate regression results are consistent with H_5, suggesting that managers are indeed concerned with prudential considerations. A preference for large stocks has also been documented in the majority of markets and fund types (Badrinath, Gay and Kale (1989), Gompers and Metrick (2001), Del Guercio (1996), Falkenstein (1996) and Pinnuck (2003b)).

The coefficients on the *IBES* variable are positive and significant across all years, and both regression forms finding evidence in favor of H_6 that managers prefer stocks with analyst coverage and therefore lower information asymmetries. Similar results are documented by Covrig *et al.* (2001) who find also find a positive relationship between aggregate fund holdings and the number of analysts following the security. Falkenstein (1996) proxies information asymmetries with the number of major news articles and the number of months since listing on the exchange, finding that funds tend to avoid stocks for which there is little information. This is

[4] For a sample of passive managers (i.e. with no size preference) we would expect a coefficient of zero, thus this variable is interpreted in terms of deviations from zero in the aggregate regressions.

also consistent with prudency issues identified previously, where the inclusion of a security in a portfolio that is followed by an analyst is likely to be much easier to justify. *IBES SD* measures the standard deviation of analyst earnings forecasts over the prior year. This coefficient is negative for all of the disaggregate and aggregate regressions, and all coefficients are significant for the former, and one of four significant for the latter. These results suggest that active managers prefer stocks for which there is a higher degree of consensus among the earnings forecasts of analysts. These results are also consistent with H_6.

5.2 Stock Size

To capture the importance of tracking error risk in portfolio construction, an individual stock's contribution to portfolio tracking error should be taken into consideration in the examination of a manager's preferences. Due to the nature of the value-weighted index to which managers in the sample are benchmarked, tracking error contribution is a function of stock size. As a consequence, small stocks may be included in a portfolio for different reasons than large stocks, and preferences are likely to depend on stock size. In order to capture these tracking error effects, we also partition the sample based on stock size. Table 3 reports the regression results for holdings that are ranked in the Top 50 (i.e. largest) stocks on the Australian Stock Exchange (on the basis of market capitalisation) and Table 4 reports results for those stocks ranked outside the Top 50.

<< Insert Table 3 >>

The coefficient on *Momentum* for Top 50 stocks is positive for the majority of regressions; however for the ex-Top 50 stocks this variable is of mixed sign and largely insignificant. This suggests that managers are momentum traders for larger stocks, however it is inconclusive which strategies are employed for smaller stocks. This may imply that there are greater opportunities to profit on smaller stocks through the exploitation of private information that the manager possesses, whereas these opportunities are not apparent for larger stocks and hence the inclusion of larger stocks is justified on the basis of superior past performance. The latter observation is consistent with the prudency constraints outlined in Section 2.2.

Variance is significant and positive for ex-Top 50 stocks; however there is no significant preference for volatility amongst Top 50 stocks, as the coefficients are largely insignificant for these regressions. This suggests that managers view historical return variance as an indicator of mispricing for smaller stocks and that this represents an opportunity for them to exploit.

Additionally, where active managers are responding to option-like incentives, given the performance/flow relationship, it appears that managers increase portfolio risk with the inclusion of more volatile smaller stocks. The *Size* variables are significant and greater than one for both stock size partitions in the disaggregate regressions, indicating a preference for larger stocks within each sub-sample of securities (i.e. Top 50 and ex-Top 50). This result can be reconciled given the inclusion of zero-positions in our analysis of manager holdings. The *Size* coefficient is particularly large for the ex-Top 50 sample, signifying that when active managers include small stocks in their portfolios, they are heavily overweight relative to benchmark weight. This is not surprising given that these stocks each comprise relatively small parts of the index, and managers may also need to trade these smaller stocks in round-lot quantities.

The findings relating to analyst coverage for the entire sample are consistent with those relating to small stocks. The coefficients on the *IBES* variable are positive and significant across all years, suggesting that managers prefer stocks with analyst coverage and thus lower information asymmetries. Perhaps of greater interest is the prudency issue. The ease of justification for a security that is covered by an analyst is likely to be far more relevant for smaller stocks, especially given the previous observation that investors demonstrate a preference for volatile small stocks. The *IBES SD* variable is negative for the ex-Top 50 regressions, suggesting that managers prefer stocks for which there is a higher degree of consensus among analysts. Again, this is understandable from a prudency perspective, where active managers are concerned with the need to justify the inclusion of a stock in the portfolio. The results for large stocks suggest that analyst coverage and consensus in forecasts is not as important. This is not surprising given the belief that large stocks represent a more prudent investment.

5.3 Investment Style

It is expected that certain investment manager characteristics may impact on the stock characteristic preferences of active funds, specifically the investment style adopted. Chan *et al.* (2002) find that managers pursuing certain investment styles perform differently on a style-adjusted basis, and this can be explained by the differing characteristics of stocks in the portfolios of fund managers. To account for this, we partition the sample into four groups on the basis of a manager's self-stated investment style - value, growth, GARP and other (includes style neutral). These results are presented in Tables 5 to 8.

Variation in the *Momentum* coefficients across investment style groups is limited, although there is evidence that value managers employ contrarian strategies. Growth, GARP and other managers do not implement momentum or contrarian strategies, and the coefficients for this

variable are mixed in terms of sign and largely insignificant. This is not consistent with the findings of Chan *et al.* (2002), who observe the use of momentum strategies by growth managers. However, Chan *et al.* (2002) do report poorer performance for value managers in their sample of U.S. mutual funds, due to them not holding momentum-oriented stocks.

Value managers exhibit a preference for value stocks, as illustrated by the positive and generally significant coefficients on the earnings yield variable. Surprisingly, there is only weak evidence that growth managers exhibit a preference for stocks with negative *EPSY* (most of the coefficients are insignificant), however this could be due to the limited number of growth managers in our sample. Managers classified as either GARP or 'other' do not have an identifiable preference for growth or value stocks, and this is interesting given that these fund types blend both value and growth styles. Growth managers have a preference for stocks with higher volatility than any of the other investment styles.

Consistent with the entire sample, there is a strong preference for stocks with low transaction costs across all style groups, evidenced by the negative and significant coefficients on the *Spread* variable. Similarly, the coefficients for *Size* indicate a preference for large stocks across all investment styles. Preferences for the degree of analyst coverage and consensus of forecasts do not vary across investment styles.

<< Insert Tables 5-8 >>

5.4 Manager Size

Size partitions are also performed on the basis of funds under management as at the point of analysis. The active manager sample is divided into two equal size partitions, with one group containing the top half of funds ranked by fund size, while the other partition contains the remaining smaller funds. It is conceivable that small and large managers exhibit different preferences for stock characteristics on the basis of their organisational structure. The results for the size partition are presented in Tables 9 and 10.

The important differences between large and small managers relate to the *Variance* and *IBES* variables. Small firms exhibit a preference for more volatile securities. This is likely to be as a result of smaller managers being less concerned with prudential constraints and taking the opportunity to profit from mispricing opportunities. Smaller managers also have a preference for stocks with high levels of analyst coverage and low standard deviation of forecasts (i.e. consensus among analysts). This may be related to the stock volatility finding for small managers (i.e. a preference for more volatile stocks). Consistent with prudency concerns, if

smaller managers are including more volatile securities in their portfolios, they may require stocks that are well followed by analysts in order to justify the inclusion of such securities. There are no significant differences in the preferences of large and small managers for momentum, transaction costs, stock size and earnings yield. Falkenstein (1996) also partitions the sample on the basis of fund size, however no variation in the preferences of the two sub-samples is reported. This may be a reflection of the difference in the nature of funds examined; Falkenstein (1996) employs a sample of U.S. mutual (i.e. non-pension) funds whereas this study describes the preferences of Australian institutional (i.e. pension-oriented) funds. It is conceivable that our sample of institutional funds are more susceptible to prudency concerns, as U.S. evidence suggests that mutual funds exhibit little concern with prudent portfolio management (Del Guercio (1996)).

5.5 Industry Classification

To determine whether an industry effect exists in the stock characteristic preferences for our sample of managers, we have included eight sector dummy variables in the regressions (see equations 2 and 3). Firms are classified into one of nine Global Industry Classification System (GICS) sectors, descriptions for each of the sectors can be seen in Table 11. Although the data we obtained classified firms into one of 24 ASX industry classifications, it was determined that the GICS sectors better reflected the industry composition of the ASX. The 24 ASX industries were reallocated on the basis of their descriptions into one of nine GICS sectors. The reallocations are outlined in Table 11.

Table 12 shows that for the disaggregate regressions, all coefficients on the sector dummies are significant. The results for the aggregate regressions are also consistent with Panel A (disaggregate analysis). We therefore conclude that industry effects on the stock holdings of Australian institutional investors are indeed present and understandably important. That is, active managers exhibit preferences for specific industries. Not all stocks have been classified into industries by the ASX; the fact that close to all of the coefficients are positive indicates that managers have a preference for those stocks classified into industries by the ASX. This confirms that industry classifications are also important tools in the portfolio construction process. The other stock characteristic variables remain largely unchanged, the addition of the industry variables simply adds to the explanatory power of the model, increases the Wald statistic for three of the four models. The industry coefficients are similar in magnitude for each of the years examined, thus preferences for any particular industry cannot be identified.

6. Conclusions and Future Research Directions

This study examines the portfolio preferences for stock characteristics of actively managed Australian equity managers in the institutional market. The literature suggests that stock characteristics, beyond traditional proxies for risk, capture a wider spectrum of factors which explain the inclusion of stocks in active fund portfolios (Chan *et al.* (1996), Falkenstein (1996), Gompers and Metrick (2001), and Pinnuck (2003b)). Our study examines the decision to include a security in a fund manager's portfolio on the basis of performance and prudential factors. First, stock characteristics are expected to be key drivers of fund performance, and second, security selection decisions associated with prudent investment management are expected requirements for portfolio managers to adhere to. Specifically, we examine the preferences of investment managers with respect to transaction costs, stock size, return variance, momentum, investment style and the degree of analyst coverage.

Performance maximising managers are expected, *ceteris paribus*, to invest in stocks with lower transaction costs. Consistent with theory, we find evidence that active managers indeed exhibit a significant preference for stocks with small relative bid/ask spreads. It is apparent that managers prefer stocks with high levels of analyst coverage and thus lower information asymmetries. This is also consistent with prudent management concerns, where the inclusion of a security also having analyst coverage is likely to be much easier to justify. Furthermore, we report the existence of preferences for stocks where a higher degree of consensus (earnings) exists among analysts. Despite the findings of Jegadeesh and Titman (1993), relating to the existence of positive serial correlation among U.S short term security returns, the active funds in our sample do employ momentum strategies in large stocks (but not across their entire portfolios). Consistent with Falkenstein (1996), we also document preferences for higher volatility stocks, which is potentially due to the asymmetric performance/flow relationship documented for investment funds. In addition, this may reflect divergent opinions concerning the price of a security among market analysts, and managers may be attempting to exploit stock mispricings.

Active managers are found to prefer stocks with larger market capitalizations, suggesting that managers are concerned with both prudence considerations and portfolio tracking error. A preference for large stocks has been documented in the majority of markets and fund types. Our study also finds that active managers are momentum traders for large stocks and are neither momentum nor contrarian traders in small stocks. Variance is of greater importance among smaller stocks, suggesting managers view historical return variance as an indicator of mispricing for smaller stocks. A higher degree of analyst coverage as well as consensus in earnings

forecasts appear to be of greater importance for smaller stocks, perhaps reflecting the need to justify the inclusion of such securities in the portfolio. Small firms have a preference for more volatile securities, likely to be due to fewer concerns regarding prudential portfolio management. However, active managers also have a preference for stocks with high levels of analyst coverage and consensus of forecasts, which is likely to be linked to the finding relating to stock volatility. Finally, we confirm the existence of an industry effect across Australian institutional investors, whereby active managers exhibit preferences for stocks classified according to the GICS industry classification system.

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Table 1

Descriptive Statistics for Portfolio Analytics Database

This table shows the aggregate and average funds under management for the sample as at September 30, 1998-2001. *n* is the number of funds comprising the sample at the corresponding date. Value, Growth, GARP and Style Neutral refer to the self-stated investment style of the fund. Equity, Options (net position), Futures (net position) and Other refer to the average proportion of fund size (in percent) delegated to equities, options, futures, cash and other securities.

Date	1998	1999	2000	2001
n	26	29	36	36
Average FUM ($M)	380.003	493.432	544.367	645.112
Aggregate FUM ($M)	9880.210	14310.640	19597.224	23224.389
Value	8	8	11	11
Growth	4	4	4	4
GARP	6	6	10	10
Other	8	11	11	11
Equity	96.190	97.160	96.815	97.023
Options	0.020	0.012	0.012	0.010
Futures	0.000	0.000	0.000	0.000
Cash	0.793	1.215	1.094	1.185
Other	2.997	1.613	2.079	1.782

Table 2

Regressions of Active Equity Manager Portfolio Holdings

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.0829	-15.85***	-0.0837	-17.97***	-0.0743	-23.30***	-0.0699	-25.42***
Momentum	0.0038	3.22***	-0.0028	-4.70***	-0.0040	-5.44***	0.0010	1.59
Variance	0.0083	13.57***	0.0069	12.99***	0.0061	14.54***	0.0043	13.56***
EPSY	-0.0003	-0.64	0.0001	0.37	0.0004	1.23	0.0007	2.38**
Spread	-0.0132	-16.51***	-0.0137	-17.28***	-0.0112	-17.15***	-0.0098	-18.96***
Size	2.2241	12.12***	2.9833	17.99***	2.7455	18.29***	3.0140	28.08***
IBES	0.0001	8.51***	0.0002	10.78***	0.0002	11.38***	0.0002	13.14***
IBES SD	-0.1322	-4.85***	-0.1179	-4.73***	-0.0689	-4.85***	-0.1513	-7.48***
Wald Chi^2	1135.84		1897.41		2209.67		2976.51	
P-Value	0.000		0.000		0.000		0.000	
N Obs	10890		14970		17892		19304	
Panel B (Aggregate Results)								
Intercept	-0.5993	-1.92*	-0.6825	-1.29	-0.2021	-0.34	0.3331	0.57
Momentum	-0.0177	-0.40	-0.0303	-0.72	-0.0858	-1.63	0.0650	1.04
Variance	0.0831	2.92***	0.1362	3.01***	0.1766	3.79***	0.1748	4.76***
EPSY	0.0587	2.74***	0.0824	2.66***	0.0707	2.17**	0.0898	2.75***
Spread	-0.1717	-2.09**	-0.2706	-2.14**	-0.2385	-2.72***	-0.2704	-3.14***
Size	-0.0117	-0.36	-0.0313	-0.60	-0.0422	-0.87	-0.0825	-1.67*
IBES	0.0032	1.81*	0.0064	2.00**	0.0090	2.37**	0.0116	2.47**
IBES SD	-2.2445	-2.28**	-1.9933	-1.17	-1.3091	-1.17	-2.7547	-1.53
Wald Chi^2	56.09		65.52		82.21		98.01	
P-Value	0.000		0.000		0.000		0.000	
N Obs	492		497		492		504	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 3

Regressions of Active Equity Manager Portfolio Holdings of Large Stocks

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	***t*-stat**
Panel A (Disaggregate Results)								
Intercept	-0.0614	-4.51***	-0.0693	-6.45***	-0.1007	-10.09***	-0.0723	-10.82***
Momentum	0.0059	0.99	0.0365	5.17***	0.0065	1.90**	0.0019	0.98
Variance	0.0212	8.22***	0.0025	1.45	0.0020	1.09	-0.0015	-0.88
EPSY	-0.0089	-7.05***	-0.0030	-2.57***	0.0013	1.15	-0.0001	-0.16
Spread	-0.0204	-9.88***	-0.0125	-9.26***	-0.0189	-12.77***	-0.0123	-10.42***
Size	1.3032	4.53***	3.2547	13.97***	2.0531	11.26***	2.8325	12.07***
IBES	0.0001	1.41	0.0000	0.33	-0.0001	-4.00***	-0.0002	-3.78***
IBES SD	0.0480	0.28	0.0047	0.07	0.1064	2.34**	0.1356	3.21***
Wald Chi^2	326.33		723.74		1312.37		1046.34	
P-Value	0.000		0.000		0.000		0.000	
N Obs	462		600		648		684	
Panel B (Aggregate Results)								
Intercept	0.9134	0.69	1.0605	1.62	-3.3056	-2.09**	0.8162	0.41
Momentum	0.1781	2.63***	0.2550	3.24***	0.0450	0.32	0.0425	0.51
Variance	0.0418	0.83	0.0901	1.97**	0.0418	0.55	0.1188	1.60
EPSY	0.0336	1.40	0.0175	0.48	0.1339	2.62***	0.0817	1.18
Spread	-0.1044	-3.26***	-0.1369	-3.49***	-0.2216	-3.84***	-0.2059	-2.17**
Size	-0.0617	-1.07	-0.0683	-2.19**	0.0890	1.30	-0.0835	-0.78
IBES	0.0001	0.22	-0.0009	-1.84*	-0.0008	-0.68	0.0008	0.57
IBES SD	-0.6615	-1.53	1.0762	1.60	1.3343	1.51	0.7459	0.35
Wald Chi^2	17.51		47.85		167.39		52.04	
P-Value	0.014		0.000		0.000		0.000	
N Obs	41		39		32		36	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 4

Regressions of Active Equity Manager Portfolio Holdings of Small Stocks

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.0599	-9.81***	-0.0869	-12.45***	-0.0564	-17.24***	-0.0595	-18.38***
Momentum	0.0012	1.24	-0.0027	-3.90***	-0.0036	-4.71***	0.0007	1.01
Variance	0.0037	8.48***	0.0062	8.79***	0.0054	11.41***	0.0034	10.26***
EPSY	0.0007	1.65*	0.0004	0.89	-0.0001	-0.34	0.0006	1.73*
Spread	-0.0058	-7.97***	-0.0120	-10.17***	-0.0069	-10.85***	-0.0064	-11.45***
Size	15.5785	8.59***	14.5255	8.92***	14.9509	9.36***	12.8413	10.51***
IBES	0.0001	6.26***	0.0004	10.86***	0.0003	10.59***	0.0004	13.85***
IBES SD	-0.1745	-5.20***	-0.2909	-6.96***	-0.0930	-5.19***	-0.1774	-6.99***
Wald Chi^2	363.83		502.81		609.59		676.98	
P-Value	0.000		0.000		0.000		0.000	
N Obs	9922		13740		16560		17784	
Panel B (Aggregate Results)								
Intercept	-0.6113	-2.28**	-0.8573	-1.89*	-0.1332	-0.25	0.5702	1.01
Momentum	-0.0353	-0.82	-0.0221	-0.54	-0.0927	-1.77*	0.0727	1.12
Variance	0.0791	2.78***	0.1183	2.77***	0.1728	3.65***	0.1746	4.66***
EPSY	0.0568	2.57**	0.0816	2.57**	0.0629	1.98**	0.0833	2.56**
Spread	-0.1346	-1.95*	-0.2098	-1.93*	-0.2001	-2.48**	-0.2398	-2.89***
Size	-0.0041	-0.16	-0.0122	-0.29	-0.0378	-0.87	-0.0898	-1.89*
IBES	0.0027	1.61	0.0060	1.88*	0.0084	2.23**	0.0109	2.31**
IBES SD	-2.1726	-2.20**	-1.9970	-1.12	-2.0072	-1.49	-3.4445	-1.60
Wald Chi^2	39.88		45.72		52.75		65.08	
P-Value	0.000		0.000		0.000		0.000	
N Obs	492		497		492		504	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 5

Regressions of Active Value Equity Manager Portfolio Holdings

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.0936	-10.94***	-0.0936	-10.94***	-0.0914	-12.09***	-0.0948	-15.52***
Momentum	-0.0076	-5.47***	-0.0076	-5.47***	-0.0125	-5.46***	-0.0011	-0.87
Variance	0.0073	7.32***	0.0073	7.32***	0.0062	6.97***	0.0020	3.57***
EPSY	0.0007	0.96	0.0007	0.96	0.0015	1.85**	0.0017	2.57**
Spread	-0.0137	-9.33***	-0.0137	-9.33***	-0.0133	-9.56***	-0.0133	-13.50***
Size	2.8072	8.40***	2.8072	8.40***	2.7910	8.85***	3.0252	14.60***
IBES	0.0002	5.85***	0.0002	5.85***	0.0002	5.35***	0.0002	5.94***
IBES SD	-0.0990	-2.01**	-0.0990	-2.01**	-0.1258	-3.65***	-0.2567	-5.44***
Wald Chi^2	362.28		517.62		620.20		861.92	
P-Value	0.000		0.000		0.000		0.000	
N Obs	3960		4491		5467		6096	
Panel B (Aggregate Results)								
Intercept	-0.8248	-2.94***	-1.5420	-3.47***	-0.9530	-1.64	-0.3489	-0.66
Momentum	-0.0268	-0.66	-0.0727	-1.86*	-0.1927	-2.29**	0.0149	0.23
Variance	0.0725	3.04***	0.1043	2.35**	0.1706	3.05***	0.1130	2.75***
EPSY	0.0547	2.67***	0.0603	1.98**	0.0831	1.95*	0.1044	2.72***
Spread	-0.1043	-2.00**	-0.2052	-1.92*	-0.1953	-2.06**	-0.3175	-3.31***
Size	0.0100	0.44	0.0188	0.45	-0.0105	-0.22	-0.0742	-1.58
IBES	0.0019	1.75*	0.0047	1.95*	0.0090	2.29**	0.0106	2.33**
IBES SD	-1.7350	-1.97**	-1.8578	-1.18	-3.3832	-1.96**	-7.5681	-2.21**
Wald Chi^2	73.78		52.61		46.53		504	
P-Value	0.000		0.000		0.000		0.000	
N Obs	492		497		492		52.95	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 6

Regressions of Active Growth Equity Manager Portfolio Holdings

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.1584	-8.09***	-0.1310	-7.38***	-0.0941	-9.13***	-0.0831	-6.51***
Momentum	0.0238	5.12***	-0.0021	-0.97	-0.0047	-2.44**	-0.0048	-1.33
Variance	0.0183	7.22***	0.0146	6.04***	0.0126	8.64**	0.0139	8.99***
EPSY	-0.0021	-0.91	-0.0016	-0.81	-0.0024	-1.76*	-0.0017	-1.14
Spread	-0.0286	-8.84***	-0.0237	-6.99***	-0.0167	-8.60***	-0.0123	-4.73***
Size	2.1476	4.48***	3.2785	8.31***	2.8887	9.01***	2.7182	5.81***
IBES	0.0002	3.93***	0.0002	3.63***	0.0002	3.97***	0.0003	5.28***
IBES SD	-0.1595	-2.03**	-0.3198	-2.99***	-0.0120	-0.35	-0.1093	-1.92*
Wald Chi^2	298.18		439.90		366.75		238.56	
P-Value	0.000		0.000		0.000		0.000	
N Obs	1972		2000		1992		2040	
Panel B (Aggregate Results)								
Intercept	-0.9878	-3.09***	-2.4954	-2.46**	-2.4808	-4.03***	-1.5963	-1.32
Momentum	0.0720	2.35**	0.0150	0.15	-0.0826	-0.69	0.0234	0.14
Variance	0.0213	1.42	0.3673	2.87***	0.3341	2.42**	0.3916	4.27***
EPSY	0.0042	0.36	0.0425	0.62	-0.0045	-0.05	0.0567	0.69
Spread	-0.1020	-2.00**	-0.7646	-2.18***	-0.3538	-2.18**	-0.4630	-2.03**
Size	0.0190	2.18**	-0.0847	-0.72	0.0269	0.60	-0.0780	-0.74
IBES	0.0007	1.54	0.0110	1.85*	0.0086	2.10**	0.0170	2.90***
IBES SD	-0.5266	-1.42	-11.6544	-2.03**	-2.5119	-1.16	-4.8650	-1.36
Wald Chi^2	56.10		43.25		30.61		48.81	
P-Value	0.000		0.000		0.000		0.000	
N Obs	492		495		492		504	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 7

Regressions of Active GARP Equity Manager Portfolio Holdings

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.0587	-8.39***	-0.0604	-6.02***	-0.0585	-2.41***	-0.0505	-2.96***
Momentum	-0.0008	-0.40	-0.0014	-1.49	-0.0025	-2.42**	0.0011	1.11
Variance	0.0052	5.53***	0.0050	6.41***	0.0050	8.40***	0.0043	9.11***
EPSY	-0.0006	-0.87	0.0000	0.00	0.0005	0.89	0.0003	0.61
Spread	-0.0095	-7.73***	-0.0095	-8.30***	-0.0086	-9.15***	-0.0069	-9.48***
Size	2.0766	5.31***	2.4176	7.12***	2.1843	8.29***	2.8943	16.13***
IBES	0.0001	3.23***	0.0001	3.97***	0.0001	5.73***	0.0002	7.02***
IBES SD	-0.1116	-2.49**	-0.0219	-0.58	-0.0341	-1.71*	-0.0884	-3.14***
Wald Chi^2	175.23		334.42		558.43		996.87	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	1980		2994		2994		5588	
Panel B (Aggregate Results)								
Intercept	-0.7051	-2.34**	-0.1933	-0.36	-0.1154	-0.25	0.0690	0.14
Momentum	-0.0266	-0.59	-0.0369	-0.86	-0.0938	-1.59	0.0899	1.60
Variance	0.0689	2.50**	0.1376	2.67***	0.1357	3.13***	0.1178	3.69***
EPSY	0.0162	0.94	0.0448	1.62	0.0270	1.06	0.0380	1.34
Spread	-0.1941	-1.68*	-0.2991	-2.10**	-0.1914	-2.19**	-0.2010	-2.29**
Size	-0.0146	-0.41	-0.0657	-1.15	-0.0400	-0.93	-0.0607	-1.31
IBES	0.0029	1.52	0.0059	1.96**	0.0074	2.06**	0.0096	2.27**
IBES SD	-1.7125	-1.72*	-0.8447	-0.61	-1.1016	-0.97	-1.4662	-1.02
Wald Chi^2	28.70		36.35		47.70		60.28	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	492		497		492		504	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 8

Regressions of Active Other Equity Manager Portfolio Holdings

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the natural log of the market capitalisation of stock *i* in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N. Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.0730	-11.38***	-0.0897	-11.76***	-0.0730	-11.38***	-0.0646	-11.94***
Momentum	-0.0014	-1.28	-0.0013	-1.41	-0.0014	-1.28	0.0036	3.43***
Variance	0.0062	8.33***	0.0069	7.85***	0.0062	8.33***	0.0047	8.19***
EPSY	-0.0008	-1.29	-0.0009	-1.30	-0.0008	-1.29	0.0001	0.20
Spread	-0.0118	-9.92***	-0.0152	-11.19***	-0.0118	-9.92***	-0.0096	-10.36***
Size	3.0076	13.67***	3.0811	12.38***	3.0076	13.67***	3.0884	17.48***
IBES	0.0002	8.25***	0.0002	7.80***	0.0002	8.25***	0.0003	9.60***
IBES SD	-0.0872	-3.39***	-0.1866	-4.46***	-0.0872	-3.39***	-0.1715	-5.16***
Wald Chi^2	421.93		839.55		818.21		1053.05	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	2970		5489		5467		5588	
Panel B (Aggregate Results)								
Intercept	-0.9485	-4.11***	-1.2218	-3.29***	-0.7627	-2.12**	-0.4235	-1.04
Momentum	0.0690	1.32	0.0079	0.23	0.0083	0.21	0.1197	1.88*
Variance	0.0451	1.94**	0.1057	2.40**	0.1188	2.58**	0.0896	2.85***
EPSY	-0.0020	-0.15	-0.0238	-1.01	-0.0088	-0.35	0.0105	0.39
Spread	-0.1725	-1.46	-0.2571	-1.83*	-0.2008	-1.98**	-0.2413	-2.01**
Size	0.0001	0.00	-0.0022	-0.05	-0.0143	-0.37	-0.0503	-1.04
IBES	0.0017	1.32	0.0047	1.81*	0.0063	2.06**	0.0094	2.21**
IBES SD	-1.0708	-1.38	-2.8576	-1.46	-1.5824	-1.36	-3.6608	-1.72*
Wald Chi^2	31.78		38.40		37.40		36.67	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	492		497		492		504	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 9
Regressions of Large Active Equity Manager Portfolio Holdings

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N. Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.0730	-11.38***	-0.0897	-11.76***	-0.0730	-11.38***	-0.0730	-11.38***
Momentum	-0.0014	-1.28	-0.0013	-1.41	-0.0014	-1.28	-0.0014	-1.28
Variance	0.0062	8.33***	0.0069	7.85***	0.0062	8.33***	0.0062	8.33***
EPSY	-0.0008	-1.29	-0.0009	-1.30	-0.0008	-1.29	-0.0008	-1.29
Spread	-0.0118	-9.92***	-0.0152	-11.19***	-0.0118	-9.92***	-0.0118	-9.92***
Size	3.0076	13.67***	3.0811	12.38***	3.0076	13.67***	3.0076	13.67***
IBES	0.0001	8.25***	0.0001	7.80***	0.0001	8.25***	0.0002	8.25***
IBES SD	-0.0872	-3.39***	-0.1866	-4.46***	-0.0872	-3.39***	-0.0872	-3.39***
Wald Chi^2	421.93		839.55		818.21		818.21	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	2970		5489		5467		5467	
Panel B (Aggregate Results)								
Intercept	-0.9485	-4.11***	-1.2218	-3.29***	-0.7627	-2.12**	-0.4235	-1.04
Momentum	0.0690	1.32	0.0079	0.23	0.0083	0.21	0.1197	1.88*
Variance	0.0451	1.94**	0.1057	2.40**	0.1188	2.58**	0.0896	2.85***
EPSY	-0.0020	-0.15	-0.0238	-1.01	-0.0088	-0.35	0.0105	0.39
Spread	-0.1725	-1.46	-0.2571	-1.83*	-0.2008	-1.98**	-0.2413	-2.01**
Size	0.0001	0.00	-0.0022	-0.05	-0.0143	-0.37	-0.0503	-1.04
IBES	0.0017	1.32	0.0047	1.81*	0.0063	2.06**	0.0094	2.21**
IBES SD	-1.0708	-1.38	-2.8576	-1.46	-1.5824	-1.36	-3.6608	-1.72*
Wald Chi^2	31.78		38.40		37.40		36.67	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	492		497		492		504	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 10

Regressions of Small Active Equity Manager Portfolio Holdings

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the natural log of the market capitalisation of stock *i* in Panel A and the log of market capitalisation in Panel B. *BM* is the natural log of the book to market ratio of stock. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N. Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.0719	-11.99***	-0.0929	-13.42***	-0.0872	-13.46***	-0.0814	-15.32***
Momentum	0.0050	3.58***	-0.0013	-1.55	-0.0035	-2.76***	0.0018	1.71*
Variance	0.0076	9.67***	0.0072	8.74***	0.0075	10.28***	0.0076	8.64***
EPSY	-0.0005	-0.81	-0.0006	-1.03	0.0000	0.07	0.0005	0.89
Spread	-0.0116	-12.08***	-0.0156	-12.95***	-0.0134	-11.05***	-0.0118	-13.50***
Size	2.1883	9.73***	3.0650	13.81***	2.8799	12.66***	3.1283	18.42***
IBES	0.0001	6.65***	0.0002	9.38***	0.0002	9.04***	0.0003	10.02***
IBES SD	-0.1034	-3.54***	-0.1806	-5.17***	-0.1162	-4.61***	-0.1888	-5.51***
Wald Chi^2	617.62		1075.66		1080.47		1570.80	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	5445		7485		8449		9652	
Panel B (Aggregate Results)								
Intercept	-0.3263	-2.82***	-0.8136	-2.93***	-0.4782	-1.74*	-0.3120	-1.05
Momentum	-0.0081	-0.44	0.0007	0.03	-0.0400	-1.03	0.0273	0.63
Variance	0.0347	2.00**	0.0719	2.10**	0.0892	2.61***	0.0512	2.44**
EPSY	0.0119	1.27	-0.0249	-1.43	-0.0072	-0.39	0.0206	0.95
Spread	-0.0671	-1.49	-0.2157	-1.84*	-0.1639	-1.98**	-0.1715	-2.05**
Size	-0.0024	-0.16	-0.0122	-0.37	-0.0166	-0.54	-0.0357	-1.00
IBES	0.0014	1.49	0.0041	1.82*	0.0055	2.03**	0.0067	2.04**
IBES SD	-0.7642	-1.62	-1.4053	-1.11	-1.5988	-1.75*	-1.1680	-0.96
Wald Chi^2	28.02		33.47		36.75		39.36	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	492		497		492		504	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.

Table 11

Industry and Sector Classifications

Securities are classified into 1 of 24 industries and 1 of 9 sectors. The 24 industries are based on the ASX industry classification system that was in effect at the time in which the analysis is conducted. The 24 industries are further subdivided as appears in the 9 sector classification on the basis of the GICS (Global Industry Classification) system. Weights of each industry and sector are reported according to their average representation in the S&P/ASX 300 over the period January 1995 - December 2001.

9 Sector Classification	Weight (%)	24 Industry ASX Classification	Weight (%)
Energy	2.957	Energy	2.957
Materials	18.188	Gold	2.798
		Other Metals	5.251
		Diversified Resources	7.854
		Chemicals	0.794
		Study and Packaging	1.489
Industrials	10.8974	Developers and Contractors	2.888
		Building and Materials	3.115
		Engineering	0.4792
		Transport	2.794
		Miscellaneous Industrials	1.457
		Diversified Industrials	0.1616
Consumer Discretionary	11.177	Retail	1.489
		Media	7.758
		Tourism and Leisure	1.929
Consumer Staples	5.715	Alcohol and Tobacco	2.791
		Food and Household	2.923
Healthcare	1.905	Healthcare and Biotechnology	1.905
Financials	32.145	Banks and Finance	19.48
		Insurance	3.828
		Investments and Financial Services	1.810
		Property Trusts	7.024
Telecommunication Services	4.753	Telecommunication	4.753
Utilities	4.246	Infrastructure and Utilities	4.246

Table 12

Industry Effect for Regressions of Active Equity Manager Portfolio Holdings

The regression model is as follows:

$$Holding_i = \beta_0 + \beta_1 Momentum_i + \beta_2 Variance_i + \beta_3 EPSY_i + \beta_4 Spread_i + \beta_5 Size_i + \beta_6 IBES_i + \beta_7 IBESSD_i + e_i$$

Momentum is the percentage change in the price of stock *i* over the previous 12 months. *Var* is the natural log of the variance of daily stock price returns of stock *i* in the previous month. *EPSY* is the natural log of the earnings per share for stock *i* as a percentage of share price. *Spread* is the time weighted relative bid/ask spread for the month of September. *Size* is the market capitalisation of stocks expressed as a percentage of the S&P/ASX All Ordinaries Index in Panel A and the log of market capitalisation in Panel B. *IBES* is the number of analysts covering the stock and *IBES SD* the standard deviation of the forecasts of these analysts. *N. Obs* is the number of observations in the sample. *t*-statistics are calculated based on White's heteroskedastic consistent standard errors. Panel A refers to disaggregate regressions where *Holding* is the percentage weight of stock *i* in each of the manager's portfolios. Panel B refers to aggregate regressions where the dependent variable (*Holding*) consists of the aggregate number of shares of stock *i* owned by all funds at the given date divided by the total number of outstanding shares of stock *i* at that date.

	September 1998		September 1999		September 2000		September 2001	
Variable	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat
Panel A (Disaggregate Results)								
Intercept	-0.0873	-15.51***	-0.0850	-21.18***	-0.0731	-22.67***	-0.0723	-25.00***
Momentum	0.0031	2.59***	-0.0029	-4.25***	-0.0038	-5.14***	0.0014	2.29**
Variance	0.0068	11.26***	0.0064	10.93***	0.0057	13.92***	0.0037	11.05***
EPSY	-0.0004	-0.87	-0.0003	-0.61	0.0003	0.78	0.0010	3.19***
Spread	-0.0095	-10.93***	-0.0118	-16.12***	-0.0091	-14.09***	-0.0083	-15.33***
Size	2.6800	15.38***	3.0167	17.42***	2.7254	18.63***	3.2063	28.38***
IBES	0.0001	3.68***	0.0001	7.30***	0.0001	8.34***	0.0001	7.08***
IBES SD	-0.0235	-7.10***	-0.0085	-3.52***	-0.0149	-7.33***	-0.0075	-3.69***
SECTOR1	0.0240	9.11***	0.0120	6.42***	0.0134	8.31***	0.0132	8.83***
SECTOR2	0.0242	10.14***	0.0122	7.54***	0.0095	7.00***	0.0114	9.72***
SECTOR3	0.0238	8.88***	0.0151	8.66***	0.0104	6.53***	0.0095	6.67***
SECTOR4	0.0285	9.78***	0.0126	5.44***	0.0137	6.59***	0.0102	5.89***
SECTOR5	0.0244	7.03***	0.0061	2.32***	0.0095	4.68***	0.0097	5.64***
SECTOR6	0.0217	9.08***	0.0114	6.83***	0.0142	9.52***	0.0067	4.97***
SECTOR7	-0.0072	-0.75	0.0173	4.38***	0.0108	4.13***	0.0251	9.20***
SECTOR8	0.03006	6.64***	0.0113	2.67***	0.0108	3.54***	0.0156	5.51***
Wald Chi^2	1148.85		1801.77		2345.70		3130.22	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	10890		14970		17892		19304	
Panel B (Aggregate Results)								
Intercept	-0.3259	-0.81	-0.4985	-0.84	-0.2060	-0.35	0.4280	0.74
Momentum	0.0282	0.46	-0.0013	-0.02	-0.0738	-1.44	0.0929	1.59
Variance	0.0713	2.75***	0.1264	2.89***	0.1630	4.02***	0.1589	4.47***
EPSY	0.0530	2.75***	0.0747	2.62***	0.0653	1.88*	0.1013	2.98***
Spread	-0.1357	-1.94*	-0.2216	-2.02**	-0.1940	-2.46*	-0.2343	-2.82***
Size	-0.0316	-0.79	-0.0414	-0.77	-0.0421	-0.87	-0.0929	-1.88*
IBES	0.0016	1.31	0.0043	1.87*	0.0074	2.34**	0.0084	2.28**
IBES SD	0.1585	0.98	0.0360	0.22	0.1558	0.97	0.1684	0.94
SECTOR1	0.3657	2.78***	0.3428	2.59**	0.1792	1.58	0.1343	0.99
SECTOR2	0.5042	2.30**	0.4837	2.16**	0.3626	2.19**	0.3158	2.16**
SECTOR3	0.4058	2.70***	0.4683	2.67***	0.3504	2.66***	0.4170	3.12***
SECTOR4	0.4208	2.12**	0.4283	2.03**	0.3482	2.02**	0.2877	2.07**

SECTOR5	0.4398	2.74***	0.3584	2.14**	0.3118	1.53	0.2838	1.31
SECTOR6	0.2675	1.94*	0.3271	2.18**	0.2792	2.22**	0.1428	1.07
SECTOR7	0.2381	0.76	0.7313	1.24	0.5556	1.34	0.8216	1.64
SECTOR8	0.3876	2.37**	0.3888	1.94*	0.0368	0.19	0.1273	0.66
Wald Chi^2	79.81		83.01		109.89		112.78	
P-Value	0.000		0.000		0.000		0.000	
N. Obs	492		497		492		512	

***,**,* indicates statistical significance at the 1 percent, 5 percent, and 10 percent levels respectively.