MANAGEMENT CHARACTERISTICS AND PERFORMANCE OF SMALL & MID CAP MUTUAL FUNDS

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ABSTRACT

Management Characteristics and Performances of Small & Mid-cap Mutual Funds

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This study examines whether small & mid cap fund performance is related to the characteristics of fund managers, such as gender, tenure, investment experience, education (MBA) and professional training (CFA). Applying statistical tests which consider fund performance, risk and expenses simultaneously, we find that some systematic cross-sectional differences in fund performance can be attributed to differences in manager characteristics.

Female managers are less willing to take risks in making investment decisions, while mid cap funds managed by men have low turnover and expense ratios, thereby delivering greater performance. Interestingly, MBAs can't out-perform those without. Better risk-adjusted performance can be expected from funds that are of small asset size. Hence, we also obtain the optimal size of managed mutual funds, which is US$1.43 billion from single index alpha equation, and US$3.89 billion from multi-index alpha equation. There are 88 percent of funds in our sample smaller than the optimal size of US$1.43 billion and 96 percent smaller than the optimal size of US $3.89 billion. Investors can avoid high risk by selecting low turnover, and small capitalization funds managed by fund managers who are female with less investment experience and with CFA degree, all else equal. In terms of expense and turnover, managers with MBAs and CFAs have lower rates of expenses. However, those with longer tenure and investment experience generate higher expense ratio. High turnover ratios are associated with female manager of shorter investment experience and CFA designation.

TABLE OF CONTENTS

LIST OF TABLES

I. Introduction

Information on mutual fund managers, hedge fund managers and individuals who manage portfolios is produced in prodigious amount and in various forms by the financial press. News of fund manager changes as well as and investment strategy/objective changes typically merit headline coverage in the financial press. The media often cast their spotlight on a few "star" mutual fund managers. This phenomenon suggests that manager characteristics do matter in generating portfolio returns. Despite the significant attention paid to investment managers and management companies by market regulators, the media, institutional and retail investors and fund rating agencies, empirical investigation is sparse with regards to the evaluation of performance differences on the basis of fund manager characteristics, particularly in the small and mid cap mutual funds context. A large number of previous papers have addressed the related questions of the measurement of portfolio performance and the persistence phenomenon over time. As investment managers make investment decisions based on personal capacities and risk preferences, the question of whether some small-cap mutual fund managers generate higher excess return than others can be addressed by probing the relationship between performance and manager characteristics. This paper aims to examine the effect of human capital characteristics on fund return performance, risk and management expenses to fill the gap in the literature concerning the extent to which small and mid cap mutual fund performance can be explained by specific manager characteristics.

There are other factors that contribute small and mid-cap mutual fund managers and fund performance. The size of assets delegated to professional individuals who manage funds is substantial. In Table 1, we note that mutual funds, pension funds, and

insurance funds account for approximately equal shares of total assets in global investment management industry. We can see from Table 1 that the US has relatively large mutual fund sector, estimated at US$6579.64 billion at 1999. The number of individual funds has grown from 3000 to approximately 8000. Between 1990 and 2000, the number of households owning mutual funds grew from US$ 23.4 million to US$ 50.6 million, the latter representing 49 percent of all US households. Second, as the complexity in the financial environment has increased, especially in the category of small and mid cap investment, individual investors and institutional investors are increasingly relying on professional investment consultation, including investing higher percentage of their wealth on managed funds. As more and more employees have taken responsibility for their personal investments which has been fueled by the rise in defined contribution or 401(k), pension assets, mutual funds have become the preferred investment vehicle for millions of Americans. Hence, selection and evaluation of investment managers are more significant than ever. Third, increasing attention of individual investors to small-cap mutual funds escalates the aggressive promotion activities by investment managers. Attempting to distinguish the performance from competitors perspicuously, asset management companies allocate significant resources in promoting the track record and the features of the leading portfolio managers. Consequently, it is often common for firms to promote themselves based on the experience in the industry and skills of portfolio managers are demonstrated by MBA degree and CFA designations. From Table 2, which is based on Capon, Fitzsimmons and Prince (1996), investment performance track record and fund manager reputation were shown to be the most two important information source and selection criteria for investors. Thus, academic research in

examining the relationship between the fund performance and manager characteristics is important.

(Table 1 and Table 2)

The performance of small capitalization corporations and investment funds specializing in small caps has attracted a great deal of attention of financial analysts, since the seminal work of Banz (1981) and Reinganum (1981a, 1981b) identified what was deemed to be an anomaly in the finance literature, that is inconsistent with market efficiency: that small firms, on average can consistently earn higher rates of return than large firms. The abnormal performance of small cap funds and investment funds specializing in small caps has been analyzed in several subsequent major studies, including Hawawini and Keim (1999), Christopherson, Ding and Greenwood (2002) and has been popularized as an investment strategy (e.g. Siegel (1998)). However, to date, little work has been done identifying the characteristics of management in affecting the performance of actual small cap (or mid cap) mutual funds. Christopherson, Ding, and Greenwood (2002) (CDG) suggest that a key factor in the U.S. affecting performance is assets under management. In particular, an inverse relationship is observed between assets under management and performance.

To date, however, little work has been presented on the relationship between management characteristics and fund performance. This study will attempt to provide new evidence on this score for U.S. small and mid-cap investment managers. We will investigate differential performance across funds may be attributable to management characteristics.

In this paper, a new approach departing from persistence phenomenon studies is adopted to address the question of whether some small and mid -cap mutual fund managers generate greater excess return than others by examining the relationship between performance and manager characteristics. Earlier studies consider relatively long time periods during which fund managers, risks, expenses and investment styles change accordingly. As suggested by Brown, Goetzmann, Ibbotson, and Ross (1992) that the cross sectional data and shorter sample period reduce the degree of fund changes and survivorship bias, we use cross-sectional small & mid cap fund data with sample period spanning only for 12 month to decrease the survivorship effect.

In the raw data analysis, we found that male fund managers manage more mid and small cap mutual funds in size than female managers. However, female managers are more willing to take risks in making investment decisions as they are holding high beta mutual funds. Low turnover ratios of the funds managed by men indicate that they are less overconfident in trading than women. Interestingly, managers with CFA charter are comparatively younger and have less overall work experience than MBAs in our sample.

We conduct detailed tests by performing the ordinary least square regression with heteroskedasticity-robust standard errors as well as robust regression. The estimates suggest that investors can expect better performance from managers with CFAs. A manager who is a CFA charter holder outperforms a non-CFA manager by 57.96 basis points per year on average. The regression coefficients of MBA indicate that fund performance also increases slightly with MBA dummies, but this effect is not statistically significantly at conventional significance level. Fund performance decreases significantly with funds of mid capitalization and value investment style.

Considering the fact that changes in fund performance, risk, and other fund characteristics are inclined to impact each other simultaneously, we use three-stage least squares (3SLS) to reduce the possibility of biased coefficient estimates from OLS regressions. In this study, we consider alpha, beta, expense ratios and turnover ratios as endogenous variables and tenure, investment experience, MBA dummy, CFA dummy, gender dummy, growth dummy, value dummy, capitalization size dummy and log of asset under management (square of log of AUM) as exogenous variables. Regression results using simultaneous equation differ somewhat from those derived from OLS. Expense ratio has significantly negative impact on the risk-adjusted return and MBAs can't out-perform other fund managers. However, male managers are able to deliver higher risk-adjusted return to investors. Furthermore, size of asset under management does matter. Investors can expect better risk-adjusted performance from mutual funds with relatively small asset under management. We find that the optimal size of managed mutual funds is US$1.43 billion from single index alpha equation, and US$3.89 billion from multi-index alpha equation respectively. It has been repeatedly argued that 1-factor asset-pricing model is insufficiently able to explain to cross-sectional expected stock returns. In 1997, Carhart suggests the addition of a momentum factor to existing models to capture persistence in fund performance. Other studies suggest that the multifactor models will be incrementally useful in explaining mutual fund returns if fund managers engage in style investment strategies significantly. We add momentum factor to the CAPM model to get risk-adjusted excess return from multifactor model. However, we find the coefficient estimates from 3SLS of fund performance suggest the same results as those from single index alpha.

With regard to systematic risk, funds with mid capitalization and value investment style are associated with a smaller fund beta. Investors can avoid high risk by selecting low turnover funds with mid capitalization investment objectives and choosing female managers with shorter investment experience. From the Beta 3SLS equations, managers with non-CFA are found to be more likely to manage high beta funds, all else equal.

In terms of fund expense, fund managers with longer tenure and investment experience manage funds with higher expense ratios. However, investment experience is significantly negatively related to turnover ratio, which indicate that an additional year of investment experience leads to a 2.16 percentage point decreases in fund turnover ratios in our sample. A significantly negative relationship between asset size and expenses and turnover is observed, consistent with economies of scale considerations. Finally, managers with MBA degree or hold CFA designations have lower expense ratios. However, female managers with CFAs trade more frequently than their non-CFA male cohort.

The remainder of this study is structured as follows. Section II presents a brief review of the literature. Section III describes the data employed in the analysis. Section IV outlines the methodology used in considering whether investment manager performance can be differentiated on the managerial characteristics variables and observable small & mid-cap fund characteristics such as expenses and turnover. Section V presents the empirical results, and the final section concludes the study.

II. Literature Review

A. Fund performance persistence

Overall, mutual fund persistence is well documented in finance literature. The survey of Giles, Wilsdon, and Worboys (2002) concludes that the evidence is fairly overwhelming evidence, on that persistence in fund performance, based on the results of 19 out of 21 recent U.S. studies. Short horizon studies include in Hendricks, Patel, and Zeckhauser (1993), Goetzmann and Ibbotson (1994), Brown and Goetzmann (1995), and Gruber (1996). Lehman and Modest (1987), Grinblatt and Titman (1992), Elton, Gruber, Das, and Hlavka (1993), and Elton, Gruber, Das, and Blake (1996) suggest that a fund's current performance can predict performance over longer horizons of 5 to 10 years into the future. The mutual fund return predictability over long term is attributed to manager differential information or stock-picking talent. In contrast, Malkiel (1995) concludes that mutual fund performance persistence was an important phenomenon in the 1970s, but broke down in the 1980s. In 1980s, it is hard to find that good subsequent performance follows favorable past performance. However, a large part of the performance persistence is attributable to persistence in fund expense ratios, such as Carhart (1992). It shows that persistence in expense ratios is the drive of long-term persistence in mutual fund performance. Hence, it poses the suspicion of whether we can also conclude that some funds have superior stock-picking ability.

B. Manager Characteristics vs. mutual fund performance

Though the literature has chiefly focused on the measurement of fund performance and the performance persistence over time, the extent to which performance is associated with investment manager characteristics has not received significant

attention in the academic literature. Capon, Fitzsimmons and Prince (1996) conduct a survey of investors regarding selection criteria of importance for mutual fund investments. These include investment performance track record, fund manager reputation, number of funds in the family, responsiveness to enquiries, management fees, investment management style, additional features (brokerage), confidentiality and community service. As for the criteria of fund manager, the track record of the portfolio manager, skills and experience of the investment team and leading manager are scrutinized by investors in the process of selecting mutual fund products.

The studies most closely related to the research topic of this paper provide arguments as to why and how certain characteristics of fund managers might impact performance. Relevant characteristics include the fund manager's age, tenure, academic performance and level of education. There are few empirical studies investigating managerial characteristics that distinguish mutual fund performance. The relationship between risk-adjusted returns and fund manager characteristics still remains at a nascent stage. Golec (1996) applies data sample spanning 1988 to 1990 and looks at the relationship between mutual fund manager characteristics and performance by looking at fund performance, risk and fees. He does not control for survivorship bias, although as the sample period is short, the negative effect survivorship bias is expected to be small. His results illustrate that younger managers holding MBA degrees, and those with longer tenure, generate superior risk-adjusted excess returns. Funds with low fees and more diversified portfolios exhibit better performance.

Chevalier and Ellison (1997, 1999a, 1999b) examine the relationship between mutual performance and the education and experience of investment personnel. Chevalier

and Ellison (1999) include the average SAT score of students at the manager's undergraduate institution. By applying a four-factor model to control for portfolio characteristics, they allow for style and stock selection differences. They find cross-sectional evidence that investment managers attending more selective undergraduate universities tend to exhibit higher raw excess returns after adjusting for behavioral differences between managers and selection biases. However, their results become less significant for risk-adjusted returns. They propose several plausible explanations for their findings, such as the correlation of high SAT scores and stock-selection ability, high-quality education or extensive social network benefiting investment career.

Gallagher (2003) uses a unique data set of investment manager information to examine the relationship between management characteristics and performance from January 1991 to December 2000. He examines 28 fund managers in Australian fixed income sector and 22 managers in the balanced sector and finds that performance of balanced funds is negatively related to the institution's age and the loyalty measured by the number of years service of non-senior investment staff and positively related to the bottom-up stock selection approach. In contrast to Chevalier and Ellison (1999), the educational attainment variable does not explain risk-adjusted excess returns.

Li, Zhang, and Zhao (2005) provide an empirical analysis on the relationship between manager characteristics and hedge fund performance. They employ a database spanning from 1994 to 2003 with more than 4,000 hedge funds. They adopt a wide variety of models on robustness check, such as Fama and French (1993) three-factor model, risk arbitrage strategy by Mitchell and pulvino (2001) and the trend following strategy by Fung and Hsieh (2001) to eliminate the negative impact on the lacking of

well-established risk-adjustment methods for hedge fund returns. They offer robust results that managers graduated from higher-SAT undergraduate institutes deliver higher raw and risk-adjusted returns for investors by taking less risk. Managers with longer industry experience are observed to have lower raw and risk-adjusted returns and are more risk-averse. They also find that for hedge funds, incentive structures, such as fund watermarks, which require managers to make up all previous losses before receiving incentive fees, have significant effects on managerial behavior. The positive effect of SAT on performance becomes 100% stronger for funds with a high watermark than those without it. Using a four-factor risk-adjustment model to examine fund returns over several years, Costa, Jakob and Porter (2006) show that fund managers significantly under-perform on a risk-adjusted basis during the bull market of 1990s. For some manager experience levels, they report significant positive risk-adjusted performance during the latest bear market. In contrast to other studies, they suggest that the level of risk-adjusted performance is not positively related to manager experience. The determinant factor of level of risk-adjusted returns generated by fund managers is market trends rather than tenure of the funds' managers. Hence, they suggest that investors should not pick mutual funds based exclusively on the tenure of mutual fund managers.

C. Investment style vs. Mutual fund performance

Given the huge amount of money invested in mutual funds that is allocated on the basis of the size-value style classification, it is important to evaluate whether fund manager "style" provides a meaningful description of fund managers' behavior. Mutual funds tend to systematically follow certain "styles," such as holding small stocks or growth stocks. Specifically, investment style categories are based on two dimensions:

market capitalization and value vs. growth orientation. The heightened attention to investment style raises two specific questions. The first concerns the usefulness of size and value vs. growth as style descriptors? The research focus of this paper, which addresses the influence of manager characteristics on performance, prompts a second question: Do differences in style while according to management characteristics also impact upon firm performance?

Chan, Chen and Lakonishok (2002) demonstrate that size and book-to-market are useful descriptors of fund styles because of their power as opposed to more complicated high-dimensional models and of relative consistency in funds' styles. Volkman and Wohar (1995) find performance persists in different scenarios: a significant positive relationship between the performance of a medium sized funds, versus negative persistence in performance for both small and large funds. This suggests that those small funds are risky, while large funds are inefficient. Brown and Goetzmann (1997) and Carhart (1997) shows that size and value help account for differences in fund performance. Other studies such as Elton et al. (1993), Gruber (1996), and Becker et al. (1999) endeavor to examine different investment style adopted by fund managers such as small-cap growth and large cap income funds will increase the possibility of generating superior returns for individual mutual fund investors.

Grinblatt and Titman (1993) also report that aggressive growth funds tend to earn significantly positive risk-adjusted returns. Daniel et al. (1997) present evidence that aggressive growth and growth funds are able to generate superior returns to investors after investment expenses, which are the highest of all fund categories. Chan, Chen and Lakonishok (2002) show that managers who select growth stocks in their portfolios on

average outperform managers who consistently hold value stocks by adjusting for investment style. Growth managers outperform value managers by roughly 1.2% per year after taking into consideration the Fama-French factors and a momentum factor. Wermers (2002) in contrast shows that mutual funds employing styles, in practice, might not deliver superior net returns to investors due to the possibly high costs of analyzing and implementing these investment styles.

D. Performance evaluation: active fund management adds value?

Another important part of mutual fund literature is the performance evaluation of actively managed funds to test if they outperform appropriate benchmark indices after adjusting for related risks. Empirical evidence has been mixed regarding the value of actively managed funds. Malkiel (1995), Gruber (1996), and Carhart (1997) conclude that actively managed fund can't earn excess risk-adjusted returns even before expenses are taken into consideration. However, Grinblatt and Titman (1989, 1993), Daniel et al. (1997), and Wermers (1997) provide evidence that fund managers are able to beat the benchmark before expenses or transaction costs are deducted.

However, more recently, studies are performed to reconcile the above two disparate results. Wermers (2000) examines the equity stockholdings and decomposes mutual fund returns into several components to analyze the returns and costs of portfolio management. He concludes that fund mangers generate sufficient excess returns to cover their expenses and transaction costs, which is consistent with Stiglitz's (1980) informational efficiency hypothesis. It suggests that the average active fund selects stocks in a manner that generate superior returns before costs; however funds under-perform after transaction costs and expenses are deducted.

III. Data

A. Data sources and statistical summary

The majority of investment performance data employed is obtained from Morningstar Inc[1]. From the premium member Morningstar website, we apply the function of Premium Fund Screener to set the criteria of Morningstar Category. From the Morningstar Category, we use as starting sample the set of small-capitalization growth, small-capitalization value, small-capitalization blend, mid-capitalization growth, mid-capitalization value, and mid-capitalization blend mutual funds listed on Morningstar website of December 2005. There were 1004 equity funds of the size and investment style mentioned above in Morningstar database at December 31, 2005. The style dimensions we use to filter our initial database are widely accepted in practice. Correspondingly, academic research by Fama and French (1992, 1993) and Chan, Karceski, and Lakonishok (1998) justify two dimensions: size, defined by the stock's equity market capitalization and value-growth (book-to-market value) by providing evidence that size and book-to-market are critical in capturing the variation in stock returns. For each of the funds examined, we obtain their annual returns, previous year annual return, expense ratio, assets under management, turnover ratios and beta, as well as information on their current leading manager. The variables are derived or defined by Morningstar in following ways:

1. Annual returns of funds in year 2004 and year 2005
2. Expense ratio is the percentage of fund assets spent on operating expenses.

[1] See www.morningstar.com.

3. Turnover ratios: the turnover ratios offered by Morningstar are incomplete. We complement the data by collecting the missing turnover ratio directly from the financial highlights of fund's annual report. For a couple of funds, we are not able to find the turnover ratio in annual report. We compute the turnover ratio by taking the lesser of purchases or sales and dividing it by average monthly net assets.
4. Fund assets are net year-end assets under management measured in millions.
5. The beta of funds is a component of modern portfolio theory statistics in the Morningstar category of risk measure. It is a measure of a fund's sensitivity to market movements, which describes relationship between a fund's excess return over T-bills and the excess return of the best-fit index. Morningstar first determines the fund's best-fit index and then regresses the fund's monthly excess returns against monthly excess returns of several well-known market indexes.
6. Capitalization dummy variable that takes the value of one for mid-size capitalization funds and zero for small-cap funds.
7. Value dummy variable that takes the value of one if the fund is value fund and the value of zero if the fund either growth fund or blend fund. The blend funds are comparison group.
8. Alpha is Jensen's measure of return performance adjusted for systematic risk, which is measured by beta. It is used as a criterion of judging whether managers are skillful or lucky enough to generate excess return over

benchmarks. Alpha measures the difference between a fund's actual returns and its expected performance, given its level of risk.

9. Manage tenure and investment experiences are measured in years, with 2004 as the end-year. When a management team manages the fund, the lead or more senior manager's characteristics are recorded.
10. MBA dummy variables that take value of one if the manager has an MBA degree and zero otherwise.
11. CFA dummy that equals one if the manager has a CFA designation and zero otherwise.
12. Gender dummy that equals one if the manager is a male and zero otherwise.

Table 3 and Table 4 list the sample statistics for the variables and the correlation matrix for all the variables of the models in this paper. Noteworthy is the fact that the average beta is more than one (1.41). The average simple excess return and average alpha are respectively 4.82 and 1.68 percent in year 2005. Turnover ratio, an important variable in fund characteristics, is on average 100.05 percent with great volatility. The average investment experience of managers is 19.9 year and they have 5.4 years tenure with fund companies. The average number of fund managers who hold MBA degree and CFA designation are 56 percent and 44 percent respectively. The typical fund has $801.17 million of assets under management, charges 1.39 of expense ratios and has a growth objective of nearly 50%. The relatively large portion of small-cap fund, which represents 55% of funds and growth funds in our sample, indicates the popularity of small-cap growth among investors.

For each fund, Morningstar lists the name(s) and start date of the fund's manager(s) along with a brief biography that includes incomplete information about the manager's working experience, undergraduate or graduate degrees received, whether Chartered Financial Analyst designation holder or not. Using the data from the biographical sketches, we create four manager characteristic variables, including an MBA dummy, CFA dummy, a manager tenure variable and total year of experience in investment industry. Using the data field for the fund manager's name, we labeled each fund that was managed by a female mutual fund manager. For the name of the manager which was ambiguous, we resort to the fund's prospectus and verify the gender by the description in manager's biography session.

Due to the insufficiency of managerial information provided by Morningstar, the construction of four variables is complicated and time consuming. To overcome the problem of fragmental, inconsistent or ambiguous information, we search related information of fund manager profiles from the website of each mutual fund company. As some fund management companies do not provide detailed biographical sketches on their websites, there is still over 15 percent of information on managerial characteristics missing. Further contacts were made to fund companies by posing questionnaire in electronic version via emails. The questionnaire required investment managers or customer service staff to provide detailed information pertaining to degree earned, qualifications held, tenure and investment experience. Most of the responses were checked against public information such as annual financial report and news. Lastly, data are compiled to create complete manager characteristic variables.

B. Do gender, CFA and MBA matter to performance: evidence from multivariate analysis?

In this section, we evaluate whether gender, CFA and MBA has an effect on fund manager performance, which is summarized from raw data.

Table 5 Panel 1 provides the breakdown of funds by manager gender. Approximately 10 percent of the fund managers are women. Table 5 Panel 1 also contains the average size of the funds under management in our sample. The assets managed by male managers are much larger in size than those by female managers. The average size of assets managed by men is $824.95 million US dollars, as opposed to $581.31 million US dollars by women.

There is some empirical evidence to support the hypothesis that women are more risk averse than men in dealing with financial risks. Jianakoplos and Bernasek (1998) in a survey by the US Federal Reserve Board that woman are inclined to hold more risk-free assets than men, thereby less willing to take any financial risk in investing risky assets. Barber and Odean (1999) examine account data for 35,000 households between 1991 and 1997. They find that men are more risk seeking than women in terms of portfolio volatility, beta, asset size and individual stock standard deviation. Based on these empirical regularities, we develop our hypotheses concerning the risk aversion of gender differences. The first hypothesis predicts that female small & mid-cap mutual fund managers will hold lower risk portfolios than male managers.

According to the Beta measure for our sample data, we find from Table 5 Panel 2 that women managers investing in more risky portfolios relative to the market index portfolios. Table 5 Panel 2 shows a statistically significant difference between female and male managers on the beta. It is significant at the 5 percent level according to the t-statistics. Therefore, they are taking more financial risk than male managers, which proves that they are less risk-averse than the men. The result from our sample differs from the household survey data, though it is consistent with Bliss and Potter (2002).

Another question concerning the gender differences in mutual fund management is turnover ratios and returns. Carhart (1997) provides some empirical support for the theoretical model in which investment results in poor performance because investors are overconfident enough to perform excessive trading. He finds that trading reduces performance by approximately 0.95 percent of the trade's market value. With regards to the gender differences in investment behavior of over-trading, most of the literature suggests that men trade more often than women. Barber and Odean (1999) find that excessive trading by men reduced annual net returns by 2.65 percentage points, versus 1.72 percentage points for women. Hence, evidence of differences in overconfidence on gender and its resulting low returns yield second hypothesis: female small & mid-cap mutual fund managers will trade less than male fund managers, thereby generating better performance than male managers. The results provided in Table 5 Panel 3 are based on the turnover ratio in Morningstar database. The turnover ratio for male managers is much lower than that of female mangers, which doesn't support the view that female managers engage in less trading. In our sample, small & mid cap female fund managers appear more overconfident than male managers and insofar as trading is concerned. As the men

trade less and incur fewer transaction costs, they outperform women by risk-adjusted excess return, which is measured by simple excess return. However, the difference is not statistically significant. The results of performance difference are shown in the Table 5 Panel 4.

Table 5 Panel 5 reports that approximately 56% of the small & mid-cap fund managers in the sample are CFA charter holders. According to the t-statistics, gender differences on turnover ratios, expense ratios, excess return and investment experience are statistically significant at the 5 percent level. The managers with CFA designation trade more frequently and help individual investors earn higher return than those other managers. CFA charter holders are comparatively younger and have less overall work experience. As for MBA degree, fund managers with high education are more sophisticated and work longer time for one fund. Mutual funds managed by MBA degree holders have lower expense ratios and higher risk.

(Table 5)

IV. Methodology

A. Measurement of performance

Consistent with other fund performance measurement studies, we employed three measures of performance in this study. These include:

(1) A measure of return relative to the market indices which is reflective of their investment styles.

(2) Sharpe's (1964) single-factor Capital Asset Pricing Model is employed to calculate the excess return from a single index model.

(3) Carhart's (1997) momentum factor is added into single-factor market model to calculate the risk-adjusted excess return from a multifactor performance model.

The first measure is simple risk-adjusted return. Our samples are partitioned into six primary investment objectives. Accounting for investment style aids performance evaluation by giving a comprehensive picture of a manager's stock selection skill. Chan, Chen and Lakonishok (2002) suggest that small cap fund managers may appear to under perform relative to a broad market index, while performance may be outstanding relative to a small stock benchmark. Therefore, managers must be evaluated relative to benchmarks that accurately reflect their investment styles. The market indices used in calculating excess returns for small-cap growth managers and mid-cap growth managers are [2]Russell 2000® Growth Index and Russell Midcap® Growth Index respectively. The Russell 2000® Value Index and Russell Midcap® Value Index are applicable in obtaining excess return of small-cap value managers and mid-cap value managers. For small cap blend managers and mid-cap blend managers, the Russell 2000® Index and Russell Midcap® Index would be pertinent in the calculation of excess returns.

The second performance measure is one-index model. For all funds in continuous existence during year 2005, funds' alpha measure of excess performance can be calculated through the CAPM model. Letting R_{Fd}, R_{MKT} and R_F stand for the funds, the market, and the risk-free return, the following model specifications are used for each of the funds in our sample:

$$R_{Fd} - R_F = \alpha + \beta^*(R_{MKT} - R_{F)} + \varepsilon_{Fd}$$

[2] See http://www.russell.com/us/indexes/us/default.asp

Positive α imply positive risk-adjusted performance. The risk-free rate is taken to be the three-month Treasury bill rate as reported by Ibbotson Associates.

The third performance measure is a multi-factor model, derived by adding a momentum factor to the second performance measure model. The momentum premium is calculated by subtracting the fund returns of year 2004 from those of year 2005.

$$R_{Fd} - R_F = \alpha + \beta 1*(R_{MKT} - R_{F)} + \beta 2*MOM + \varepsilon_{Fd}$$

B. Performance and manager characteristics

To examine the impact of manager characteristics on fund performance, we regress simple excess return of funds in year 2005 on the characteristics of the fund managers who are in charge of the fund on December 2004. The robust standard error is calculated for each regression.

The manager characteristics in this regression include: MBA dummy variable that takes the value of one if the manager undertook an MBA and zero otherwise, CFA dummy variable that takes the value of one if the manager is a Chartered Financial Analyst (CFA) charter holder and zero otherwise, gender dummy variable that takes the value of one if the manager is a male, the manager's tenure with the fund, the investment experience of managers. In order to control the characteristics of mutual funds, we also include a capitalization size dummy variable that takes the value of one for mid-cap funds and the value of zero for small-cap funds. As for the investment styles, we set a growth dummy variable which equals one if the fund is growth fund and the value of zero if the fund is either value fund or blend fund; Value dummy variable that equals the value of

one if the fund is value fund and the value of zero if the fund either growth fund or blend fund. The omitted category is blend funds, which is the comparison group.

The main disadvantage of least square fitting is its sensitivity to outliers. As squaring the residuals magnifies the effects of extreme data points, outliers have a large influence on the fit. Our data suggest that there may be some outlier[3]. To minimize the influence of outliers, we fit our data using robust least square regression, iteratively reweighted least squares. Robust regression assigns a weight to each observation with higher weights given to better-behaved observations. In another words, iteratively reweighted least squares calculate weights at each iteration by applying the bisquare function to the residuals from the previous iteration. The algorithm gives lower weight to points that do not fit well. For extremely deviant cases, which have Cook's D greater than 1, their weights are set to missing so that they are not included in the analysis at all.

C. Performance, Risk, Expense and Turnover: Simultaneous equations

Due to the fact that changes in fund performance, risk, and other fund characteristics such as management expenses tend to impact each other contemporaneously, we also apply three-stage least squares (3SLS) to solve this potential simultaneous equation bias problem, thereby reducing the possibility of biased or inconsistent OLS coefficient estimates. Fund characteristics variables are estimated by regressing on fixed exogenous variable. Actual values of characteristic variables are then replaced by their estimated values so that error in estimates of variables cannot be included in performance equation. 3SLS helps to eliminate the correlation between fund characteristics variables to and error terms. Golec (1996) adopts 3SLS in his research of relationship between fund risks and fees and mutual fund performance. He includes yield,

[3] There are 14 observations with Cook's D greater than 1.

Alpha, beta, residual standard deviation, expense ratio, management fee and turnover ratios as endogenous variables, manage age, tenure, years of education, MBA degree, team size, fund age, fund assets and load as exogenous variables. In our study, we consider excess return, alpha, beta, expense ratios and turnover ratios as endogenous variables and tenure, investment experience, MBA dummy, CFA dummy, growth dummy, value dummy, capitalization dummy and log of asset under management as exogenous variables. To estimate the simultaneous link between performance, risk and expense ratios, we examine the following 3SLS equation system. Our equations are specified for fund performance, beta, expense ratios and turnover.

Alpha – performance equation

Fund performance is determined by mutual fund expense ratios, turnover, size of assets under management, investment style, and fund managerial characteristics. Lamert (1986) suggests that expense ratios and turnover should be negatively related to alpha, all else equal. They represent costs or expenses that may be paid out of a funds' total cash flow. This amount could otherwise be included in shareholders' returns. In another words, shareholder returns decrease because of the deduction of fund expenses and turnover. Trueman (1988) maintains that turnover signals the positive information as it is incurred to help fund managers to make wise decisions. Lambert (1996) provides evidence that fund managers use the volume of capital investments as subtle demonstration of their investment skills. Studies on relationship between turnover and fund performance conclude a positive relationship. The majority of literature on mutual fund performance suggests that the size of assets under management has negative impact on fund return.

Mincer (1973) and Topel (1991) highlight the importance of education in performance. MBA or CFA designations, as well as, tenure and investment experience typically been postulated to be associated with better performance. MBA, especially CFA are specified education, which contributes to the advanced skills of fund managers. As for the gender differences, Barber and Odean (1999) find that excessive trading by men reduced annual net returns by 2.65 percentage points, versus 1.72 percentage points for women. Long tenure may imply that fund managers have high degree of job security that decreased short-term behavior. All factors contribute to the distinguished performance of funds in our sample.

To summarize, he 3SLS equation for mutual fund performance is described as:

ALPHA = a1 + a2*TURNOVER + a3*EXPENSE+a4*MBA + a5*CFA+a6*TENURE + a7 * EXPERIENCE + a8*LOGSIZE+a9*(LOGSIZE^2)+a11*GENDER +a10*VALUE+ε_1

Multifactor-index alpha:
[ALPHA2= A1 + A2*TURNOVER + A3*EXPENSE+A4*MKT+A5*MOM+A6*MBA + A7*CFA+A8*TENURE + A9* LOGSIZE + A10*(LOGSIZE^2) +A11*GENDER + ε_2

Since our paper is focused on the sample of small & mid capitalization funds, we tend to generate the optimal size from the simultaneous equation system. In order to get the optimal size, we take the first derivative of the above equations and obtain the optimal logsize equation, which is A9/(–2*A10) (or a8/(–2*a9)). From the optimal log(size), it is easy to generate the optimal asset size, that is, asset size*=10^[log(size)]*

Systematic risk equation

Mutual fund risk is determined by turnover, fund asset size, managerial characteristics and fund investment style. Risk and turnover are likely to be positively related suggested by Trueman (1998). High return offered to investors by stocks with

great risks boosts the trading volume. Literature suggests that tenure should have negative relationship with risk measures of funds. Investment firms are inclined to promote actively managed fund with less systematic and unsystematic risk. Brown, Harlow, and Starks (1996) offer evidence that fund managers have compensation incentives to manipulate their risk levels. Studies by Gibbons and Murphy (1992) find that managers with less investment experience are more afraid of having poor performance record as it might ruin their reputation and reduce future career opportunities. Hence, they take less risk than those with more investment experience.

As mentioned earlier, there is some empirical evidence to support the hypothesis that women are more risk averse than men in making investment decisions. Jianakoplos and Bernasek (1998) and Barber and Odean (1999) woman are inclined to hold more risk-free assets than men, thereby less willing to take any financial risk in investing risky assets.

To summarize, the systematic equation (beta) equation is:

$$BETA = B1 + B2*TURNOVER + B3*MBA + B4*CFA+B5*TENURE + B6*EXPERIENCE+B7*LOGSIZE + B8*CAPSIZE + B9*VALUE +B10*Gender+\varepsilon$$

Expense and turnover equations

Expense ratios of funds are attributable to turnover ratio, asset size, investment style and managerial characteristics, such as MBA, CFA and experience. The previous studies on the relationship between turnover and expense ratio are controversial. Golec (1996) finds insignificantly negative relationship between these two variables. High turnover costs must be offset by relatively low expense due to the fierce competition in mutual fund industry. On the other hand, Chevalier and Ellison (1999) obtain opposite results which are significantly different from zero at the 1 percent level. They justify their

results by explaining that high expenses and high turnover may mean that investors are paying much money on research. McGough (1993a) show that older, tenured fund managers are distinguished for reduction of the expense ratios so that they are able to increase their tenure and improve the fund survival rates.

With regards to the gender differences in over-trading, most of the literature suggests that men trade more often than women. Barber and Odean (1999) conclude that annual net returns are reduced because of overtrading. Excessive trading by men reduced annual net returns by 2.65 percentage points, versus 1.72 percentage points for women.

To summarize, the systematic equation (beta) equation is:

$$EXPENSE=C1+C2*TURNOVER+3*MBA+C4*CFA+C5*EXPERIENCE+ C6*LOGSIZE+C7*CAPSIZE+C8*VALUE+\varepsilon_4$$

$$TURNOVER = D1 + D2*MBA + D3*CFA + D4*TENURE + D5*LOGSIZE + D6*CAPSIZE + D7*GENDER+\varepsilon_5$$

V. Empirical Results

A. Do manager characteristics predict Returns?

In this section, we provide the empirical results on the relationship between performance and characteristics for mid to small capitalization mutual fund returns.

Table 6 shows the ordinary least square with heteroskedasticity-robust standard errors results. To eliminate the disadvantage of least square fitting, we perform the robust regression, which is iteratively reweighted least squares. Note that in this analysis both the coefficient and the standard errors differ from the original OLS regression. The robust regression results would be more reliable because the results are less sensitive to outliers in the data as compared with OLS regression.

The coefficient estimates suggest that investors can expect better risk-adjusted performance from managers with CFAs. The coefficients of CFA are significant at the 10

percent level. The CFA coefficient indicates that a manager who is a CFA charter holder outperforms a non-CFA manager by 57.96 basis points per year on average. Fund performance decreases significantly with funds of mid capitalization and value investment style. The regression coefficients of MBA indicate that fund performance also increases slightly with MBA dummies, but this effect is not statistically significantly at conventional significance level.

(Table 6)

B. Fund performance, Systematic Risk, Expense, Turnover

The above results suggest that a fund's performance is significantly impacted by its manager's characteristics. In this session, we probe the ultimate reason of different returns by managers with different characteristics. The specification of each 3SLS structural equation and its statistical results of estimated coefficients are presented in Table 7 and Table 8.

1. Alpha- Fund performances

Results for the alpha1 (excess return obtained from single index model) and alpha2 (performance measurement from multifactor equations) 3SLS regression reported in Table 7 show that alph1 and alpha2 are significantly negatively related to expense ratios, as expected. The negative relationship indicates that administration expenditure decreases risk-adjusted excess return. In our regression result, the expense ratio coefficient for alpha1 and alpha2 equations are –28.65 and –25.908 respectively, which indicates that one point increase in expenses decreases fund alpha by 28.65 percentage points and 25.91 percentage points. In contrast with Trueman (1988) and Lambert (1996), we do not observe statistically significant relationship between turnover and fund alpha.

Unlike the results supported by Grinblatt and Titman (1998), we find that the size of assets under management has negative impact on fund return. With the growth of fund assets, fund managers have less flexibility in making investment decisions and therefore funds under- perform. Table 7 illustrates significantly negative relationship between assets size and risk-adjusted excess returns.

From single index alpha regression, the optimal log(size) of the assets is US$3.15 million, which is obtained by the following equation: log(size)/{-2*[log(size)]^2} Therefore, the optimal size of the asset under management is US$1,425 million. In addition, the optimal log(size) of the assets and optimal size from multi-index alpha equation are US$3.60 million and $3,891 million respectively.

Somewhat surprisingly, we find that MBA and CFA designations have negative effects on fund risk-adjusted returns. Yet, only the MBA coefficient is statistically significant for all risk-adjusted alpha. For both alphas derived from single and multiple factor models, MBA decreases alpha by 3.878-percentage point and 2.129-percentage point annually. Unlike most of the studies concluding that female mutual fund managers will generate better performance than male managers, we find that male managers are able to deliver higher risk-adjusted excess return (single-index alpha) than female managers. The difference is statistically significant at 10 percent level.

As for manager's tenure, investment experience and fund style, we do not find significant impact of above variables on fund performance. Overall, funds with small size and low expense ratio, managed by male managers are more able to generate better performance.

The results of the coefficient on Momentum factor are consistent with the Carhart (1997)'s findings that return on stock exist momentum, which is, the stock return would be affected by the previous year return. We do find a significant impact of momentum factor on fund risk-adjusted excess returns. Mutual funds in our sample, which generate high risk-adjusted excess return last year, are able to offer persistent better performance next year.

(Table 7)

2. Beta – Systematic risk

As predicted by Trueman (1998), Table 8 shows that turnover and systematic risks of funds are positively related. It is statistically significant at the 5 percent level.

Our results on the relationship between tenure and funds' risk are not consistent with results reported by the previous studies (Brown, Harlow, and Starks (1996)) because we do not observe the significant impact of tenure on funds' risk. With regards to our regression result of investment experience, it has statistically significant positive relationship with fund systematic risk, which is consistent with the results of Gibbons and Murphy (1992). Senior managers have large stake in compensation and confidence in making portfolio decisions. Therefore, they are more inclined to take risks.

CFA coefficients are negatively related to beta. As predicted, most of CFAs have less overall work experience than other managers in our sample. Therefore, they are less likely to be able to try to outperform the market index by increasing beta. In addition, MBA coefficient has positive effect on the beta of the funds, which is consistent with our expectations. MBAs are more likely than other managers to attempt to outperform the market index by increasing beta of the funds because they embrace the conception that

only systematic risk pays as a compensation for the risk assumed. However, the MBA coefficient estimate is not statistically significant for our sample.

Concerning the risk aversion of gender differences, female small & mid-cap mutual fund managers will hold lower risk portfolios than male managers. Consistent with the conclusions from Barber and Odean (1999), the negative gender coefficient is statistically significant at 5 percent level.

The larger the capitalization of funds under management, the more securities of firms' managers are to invest in. Hence, the portfolio diversification will be improved and the risk reduced. As expected, the capitalization size dummy coefficient is 0.19, which has extremely small p value. The significant coefficient of capitalization dummy indicates that small capitalization funds produce a 0.19 percentage point greater beta than mid-size funds.

In summary, the most eminent result from beta regression is that female managers with less investment experience are more likely to manage lower beta funds, as they are more risk-averse in making investment decisions. CFAs are inclined to investing in low beta portfolio. Portfolio with small capitalization is associated with a larger fund beta.

(Table 8)

3. Expenses, turnover ratio and log of assets

Table 8 helps us to look at potential sources of differences in expenses and turnover ratios. Consistent with the results reported by Golec (1996), our estimate of turnover coefficient in expense regressions shows the positive relationship between them.

The more trading made by fund managers, the higher expenses and costs will be incurred. And, the coefficient estimate is statistically significant at 5 percent level.

From the expense regression, managers with longer tenure and investment experience are associated with higher expense funds. In turnover 3SLS regression, only investment experience is significantly negatively related to turnover ratio, which is consistent to human capital theory by McGough (1993a). An additional year of investment experience leads to a 2.16 percentage point decreases in fund turnover ratios.

Another observation from Table 8 is that managers with MBAs and CFAs have lower expense ratios. This result may suggest that these managers have benefited from their advanced education, such as graduate studies in business administration and advanced financial training. These courses emphasize the impact of low costs on great performance in investment courses. However, CFAs are more inclined to yield high turnover than other managers. One plausible explanation is that CFA charter holders are overconfident in making more transactions by believing in their strong and professional education background in financial investments.

Funds tend to generate lower expense ratios, as they grow in size, consistent with economies of scale. Table 8 reports a negative relationship between assets size and expenses. Similarly, asset size is negatively related to turnover ratios. Both of these effects are significantly different from zero at the 5 percent level. Hence, indirect benefit of working for larger funds is that such funds also have lower expenses. Funds with small capitalization investment style incur fewer expenses as opposed to mid-size funds. The significant coefficient of capitalization dummy indicates that small capitalization funds cause a 0.11 percentage point greater expenses than mid-size funds in our sample.

Gender coefficient is not statistically significant in expense ratio regression. Yet, female managers do trade more frequently than male managers, illustrated by the significant positive gender coefficient estimate. Therefore, overtrading behavior of female proves the conclusion in our performance results that men are able to generate higher return than female fund managers. With regard to the impact of the investment objective on fund turnover ratio, we find that mutual fund managers trade more frequently in growth funds.

In sum, the estimates imply that manager with MBA degree or hold CFA designations have lower expenses. Managers with longer tenures and investment experiences are associated with higher expense funds. Finally, managers who are CFAs or females with shorter investment experience implement trading more frequently than other managers. Funds with small capitalization incur fewer expenses and less trading as opposed to mid-size funds. Also, mutual fund managers trade more frequently in growth funds.

(Table 8)

C. Survivorship bias and performance measurement

The subject of the effect of survivorship bias on mutual fund performance received great attention in the academic literature. Elton, Gruber and Blake (1996) examine the impact of survivorship bias in two aspects: the frequency of mutual fund disappearance and its impact on investor return. Brown et al. (1992), Brown and Goetzmann (1995), Malkiel (1995) and Carhart (1997) emphasize that performance evaluation of mutual fund managers is subject to survivorship biases. Oftentimes, poorly performed mutual fund managers are likely to be fired under the pressure of investors and

fierce competition in mutual fund industry. Equivalently, the good managers who delivered superior risk-adjusted returns to investors are more likely to leave voluntarily to pursue better opportunities. Poorly performing mutual funds are more likely to liquidate or merge with other funds and their historical records are omitted. To study only funds that survive overstates the measured performance because the funds that disappear tend to perform poorly. Are the cross sectional patterns we observed so far partially affected by survivorship biases? As is described by Elton, Gruber and Blake (1996), the longer the sample period, the greater the survivorship bias. Furthermore, Brown, Goetzmann, Ibbotson, and Ross (1992) find evidence that the cross-sectional data and shorter sample period ensures less changes of fund and survivorship bias. Studies by Carhart, Carpenter, Lynch and Musto (2002) demonstrate both analytically and empirically that both the nature of the survival rule and the sample length are likely to be important when attempting to characterize survivorship biases. In their sample, they estimate the average bias to be economically small at 0.07% for one-year samples. Equivalently, as the sample period in this study is relatively short, which only spans for 12 month, the survivorship effect might be small.

One drawback of this study is that the data source only provides alpha measured using one-index model and multi-factor model by adding only a momentum factor. Though Ippolito (1989) and Goetzmann and Ibbotson (1994) use the S&P 500 to calculate alpha, most of the studies in mutual fund area has adopted multiple indexes, such as Fama-French three factor model to measure alphas. According to the majority of studies in mutual fund performance, average mutual fund performance varies with the index. However, our study focuses on cross-sectional analysis of manager characteristics

and fund performance. In this case, average performance differences are less important than relative performance between managers. The results of relative performance, which is proxied by performance ranks, will be biased if performance ranks are not stable over indexes or the wrong index is used in calculations. Consequently, improper ranking will produce less significant results. However, Patel, Hendricks and Zeckhauser (1993) provide evidence by attempting to test different single-index and multi-index models, that multiple-index characteristics based models produce similar performance rankings as single index models.

In terms of survivorship biases, the one-index model might be more proper as the estimates of bias for the one-index model are much smaller than for the three-index model. Elton, Gruber and Blake (1996) find that the bias produced by the one-index model is very similar to the results using the three-index model under the assumption of reinvestment. Without the reinvestment assumption, estimates of bias for the one-index model are much smaller.

VI. Conclusions

The study examines the relationship between the manager characteristics, such as gender, tenure, investment experience, education and professional training and performance of small & mid cap funds. We use data with a sample period spanning only for two years to reduce the survivorship effect. The results suggest that there are some systematic cross-sectional differences in fund performance that can be attributed to differences in manager characteristics. We summarize our results in light of their implications for investors choosing among funds and fund managers.

In terms of gender, male managers are in charge of funds with much larger size than their counterparts. However, by holding high beta actively managed funds, female managers are more willing to take risks in making investment decisions. Low turnover ratios of the funds managed by men indicate that they are less overconfident in trading than women, and they deliver greater performance. Interestingly, another conclusion from the raw data analysis is that managers with CFA charter are comparatively younger and have less overall work experience than MBAs.

First, we perform the ordinary least square regression. In addition, heteroskedasticity-robust standard errors are calculated. To eliminate the disadvantage of least square fitting, we use the robust regression: iteratively reweighted least squares. The point estimates suggest that CFAs are expected to deliver investors higher risk-adjusted return. The regression coefficients of MBA indicate that fund performance also increases slightly with MBA dummies, but this effect is not statistically significantly at standard confidence level. In addition, funds of mid capitalization and value objective decrease performance significantly.

Considering the fact that changes in fund performance, risk, and other fund characteristics tend to impact each other contemporaneously, we apply three-stage least squares (3SLS) to reduce the possibility of biased or inconsistent OLS coefficient estimates. This study analyzes small & mid cap mutual fund performance, beta risk, expense ratio and turnover as endogenous variables in a system of simultaneous equations. There are perplexing issues identified by 3SLS, with regression results different from those derived from OLS.

In particular, we find that MBAs do not out-perform their cohorts without this degree. There are potential explanations for contradictory findings. Managers with MBA degree are more likely to take on extra risk by investing in high beta funds, which is shown by beta 3SLS regressions. Risk adjusted excess return suffers from high risk and high expense ratio. The negative relationship indicates that administration expenditure decreases risk-adjusted excess return. Male managers tend to generate higher risk-adjusted excess return (single-index alpha) than female managers.

Investors can expect better risk-adjusted performance from funds which are small size of asset under management. We also obtain the optimal size of funds under management, which is US$1,425 million from single index alpha regression, and US$3,890 million from multi-index alpha equation. There are 88 percent of funds in our sample smaller than the optimal size of US$1.43 billion and 96 percent smaller than the optimal size of US $3.89 billion.

With regard to systematic risk, non-CFAs are more likely to manage high beta funds, all else equal. High risk can be avoided by selecting female fund managers with less investment experience and with CFA designations. In addition, funds with mid capitalization have low risks as opposed to funds of other investment styles.

In terms of fund characteristics: expense and turnover, managers with longer tenure and investment experience contribute to higher expenses of funds. Only investment experience is significantly negatively related to turnover ratio, which is consistent to human capital theory. An additional year of investment experience leads to a 2.16 percentage point decreases in fund turnover ratios.

Managers with MBAs and CFAs have lower rates of expenses, which may suggest that these managers are fully aware of the significance of low costs on fund performance. This low cost conception is obtained from their advanced education in investment. However, CFAs are more inclined to yield high turnover than other managers. One plausible reason that account for the high turnover from CFAs is that they are overconfident in trading frequently by believing in their strong education background in finance. Consistent with the economy of scales, the smaller the size of assets under management, the lower expense and turnover will be for funds of our sample. Finally, small capitalization funds incur fewer expenses and less trading as opposed to mid-size funds. Also, mutual fund managers trade more frequently in growth funds.

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Table 1: Asset under Management for eight countries in 1999

	Pension funds	Insurance Companies	Mutual Funds
Country			
France	66	830	705
Germany	129	673	515
Ireland	47	32	150
Italy	65	169	412
Netherlands	397	220	83
Spain	32	62	219
UK	1270	1266	345
Total Euro-7	2006	3252	2429
USA	7225	2403	6388

Source: Frank, Mayer & da Silva (2003)

Table 2: Importance of selection criteria in mutual fund investments

Selection criteria	Mean	(Standard deviation)
Investment Performance Track Record	4.62	(0.64)
Fund Manager Reputation	4.00	(0.77)
Scope (Number of funds in the family)	3.94	(1.06)
Responsiveness to Enquiries	2.30	(1.08)
Management Fees	2.28	(1.31)
Investment Management Style	1.68	(1.12)
Additional Features (Checking, brokerage)	1.38	(0.92)
Confidentiality	1.35	(0.83)
Community Service/Charity Record	1.09	(0.48)

Source: Capon, Fitzsimmons and Prince (1996); A 5 point scale is used: 1=not at all important; 5= extremely important. Each variable is significantly different from its adjacent variable at $p<0.01$; the wording of the question was as follows: How important were the following selection criteria to you in purchasing mutual funds? Please respond with a number from 1 to 5 based on how important the information source was to you, where: 1= not at all important; 5=extremely important.

Table 3: Summary statistics

Summary statistics for all of the variables used in the analysis are presented. The observations are fund-years. The manager characteristics variables include MBA dummy variables that take value of one if the manager has an MBA degree and zero otherwise, a CFA dummy that equals one if the manager has a CFA designation and zero otherwise, a gender dummy that equals one if the manager is male and zero otherwise, the manager's tenure and how many years of investment experience the manager has. Beta measures the relationship between a fund's excess return over T-bills and the excess return of the best-fit index. By the definition of Morningstar, the fund's monthly excess returns are regressed against monthly excess returns of several well-known market indexes. Funds' excess return is calculated by using the specific investment style index as the benchmark index for equity funds. The current return of the 90-day T-bill is deducted from the total return of both the fund and the benchmark index. The difference is the fund's alpha. Other fund characteristics utilized are the log of total fund assets under management, the fund's expense and turnover ratio in percentage terms, a dummy variable that takes the value of one for mid-size capitalization funds and zero for small-cap funds. Expense ratio is the percentage of fund assets spent on operating expenses. Turnover ratios are computed by taking the lesser of purchases or sales and dividing it by average monthly net assets.

Variable	Mean	Median	Standard deviation	Maximum	Minimum	Skewness	Kurtosis
Fund Returns							
Yearly return (%)	7.8114	7.9700	6.4820	33.5000	-68.2000	-2.4422	24.6468
Simple excess return (%)	-2.2135	-1.8668	6.6240	27.1332	-74.3246	-1.8359	17.9861
Alpha	1.6765	1.9583	6.7360	27.7172	-73.0929	-2.2860	20.4078
Alpha2	4.8314	5.0100	6.4852	30.5200	-71.1800	-2.4422	24.6468
Manager Characteristics							
MBA	0.5608	1.0000	0.4966	1.0000	0.0000	-0.2452	-1.9437
CFA	0.5627	1.0000	0.4963	1.0000	0.0000	-0.2534	-1.9397
EXPERIENCE (yrs)	19.9149	19.0000	8.4823	50.0000	3.0000	0.7800	0.6120
Gender	0.9024	1.0000	0.2971	1.0000	0.0000	-2.7157	5.3858
TENURE (yrs)	5.3654	4.2500	4.6274	45.0000	0.1000	2.1461	8.8438
Fund Characteristics							
Asset size (million)	801.1688	198.5000	2166.6758	38350.0000	0.0900	8.4698	108.3206
LOGSIZE	2.2668	2.2967	0.8131	4.5838	-1.0458	-0.4070	0.5452
SQRLOGSIZE	5.7987	5.2747	3.5662	21.0109	0.0000	0.7352	0.5171
CAPSIZE	0.4592	0.0000	0.4985	1.0000	0.0000	0.1641	-1.9770
GROWTH	0.4950	0.0000	0.5002	1.0000	0.0000	0.0200	-2.0036
VALUE	0.1873	0.0000	0.3897	1.0000	0.0000	1.6058	0.5797
EXPENSE	1.3875	1.3400	0.7551	14.7800	0.0000	8.9329	132.8889
TURNOVER	100.0450	71.0000	122.9312	1293.0000	0.0000	4.9563	33.9540
BETA	1.4154	1.4100	0.2652	3.2300	-0.5800	0.2864	6.6816

Table 4: Correlation Matrix
Pearson Correlation Coefficients

	GROWTH	VALUE	ER	EXPS	TURNOVER	LOGSIZE	LOGSIZE^2	TENURE	MBA	CFA	EXP	Gender	Alpha1	Alpha2
GROWTH	1													
VALUE	-0.475	1												
ER	0.002	-0.064	1											
EXPENSE	0.081	-0.052	-0.233 **	1										
TURNOVEI	0.150 **	-0.109	-0.023	0.140 **	1									
LOGSIZE	-0.095	0.060	0.218	-0.374 *	-0.206 **	1							*	
LOGSIZE^2	-0.094	0.052	0.141	-0.301	-0.202	0.958 **	1							
TENURE	-0.065	0.036	-0.030	-0.001	-0.116	0.232	0.278	1						
MBA	-0.011	0.034	0.053	-0.082 **	-0.002	0.007	-0.014	0.036	1					
CFA	0.033	-0.004	0.073	-0.076 **	0.066 **	0.024	0.003	-0.021	-0.011	1				
EXP	-0.022	0.002	0.001	0.086 **	-0.161	0.000	0.033	0.311	0.020	-0.068 **	1			
Gender	-0.044	0.080	0.018 **	-0.036	-0.100 **	0.069	0.059	0.080	0.013	-0.053	0.035	1		
Alpha1	-0.079	0.062	-0.048 *	-0.053 **	-0.024	0.067	0.065 **	0.030	-0.057 **	0.040	-0.024	0.178 **	1	
Alpha2	-0.004	-0.015 *	0.836	-0.289 **	-0.029	0.248	0.177 **	-0.028	0.070	0.059	-0.036 *	0.038 **	0.107	1

** Significant at 5 percent level; * significant at 10 percent level

Table 5: Management characteristics vs. fund characteristics

Panel 1: Fund type and gender

	Total	Male	Female	t-statistics
Observations	1,004	906(90.24%)	98(9.76%)	
Average Fund Size(millions)		824.951	581.306	-1.058

Panel 2: Risk and gender

	Male	Female	t-statistics
Beta	1.395	1.601	7.486**

Panel 3: Frequency of trading and gender

	Male	Female	t-statistics
Turnover Ratio (%)	95.99	137.51	3.192**
Expense Ratio	1.38	1.47	1.141

Panel 4: Performance and gender

	Male	Female	t-statistics
Excess return (%)	-2.18	-2.58	-0.574
Alpha	-2.07	-1.97	-5.726**

Panel 5: CFA, MBA and fund characteristics

	CFA=1 (CFA)	**CFA=0 (Non-CFA)**	**t-statistics**	**MBA=1 (MBA)**	**MBA=0 (Non-CFA)**	**t-statistics**
Number of Observations	565 (56.27%)	439 (43.73%)		563 (56.08%)	441 (43.92%)	
Fund Size	808.94	791.17	-0.129	825.33	770.32	-0.399
Turnover ratio	107.16	90.89	-2.086**	99.79	100.37	-0.074
Expense ratio	1.34	1.45	2.418**	1.33	1.46	2.606**
Beta	1.41	1.42	0.066	1.43	1.39	-2.089**
Excess return	-1.80	-2.76	-2.314**	-1.91	-2.62	-1.666**
Tenure	5.28	5.47	0.654	5.51	5.18	-1.150
Investment experience	19.41	20.57	2.150**	20.06	19.73	-0.626

** t-statistics significant at the 5% level.

Table 6: Mutual fund performance and manager characteristics

The dependent variable, simple excess return of year 2005 is regressed on a set of manager characteristics and fund characteristics. Manager characteristics include three dummy variables that equal one if the manager is a male or has an MBA degree or CFA and of zero other wise respectively, the manager's tenure with the fund, the working experience of manager. Fund characteristics include three dummy variables: (1) capitalization size dummy variable that equals one if the fund is of mid capitalization and the value of zero is the fund of small capitalization; (2) Growth dummy variable which equals one if the fund is growth fund and the value of zero if the fund is either value fund or blend fund; (3) Value dummy variable that equals the value of one if the fund is value fund and the value of zero if the fund either growth fund or blend fund. Combining the second and third dummy variables, when both of them are zero, the blend fund equals one. Heteroskedasticity robust standard errors are in parentheses. In addition, robust regression, iteratively reweighted least square is performed.

	Robust Standard Error		Iteratively Reweighted Least Squares (IRLS)	
Independent variables	Coefficients		Coefficients	
Constant	-1.3484	(1.1793)	-0.1684	(0.7231)
Capitalization size dummy	-4.1664**	(0.3891)	-4.2588**	(0.3157)
Growth dummy	-0.2022	(0.4777)	0.1046	(0.3574)
Value dummy	-1.4722**	(0.5234)	-1.2796**	(0.4571)
Manager Tenure	-0.0499	(0.0441)	-0.0053	(0.0358)
Manager MBA	-0.8509**	(0.4152)	0.1905	(0.3157)
Manager CFA	0.8748**	(0.4245)	0.5796*	(0.3169)
Working experience	-0.0004	(0.0264)	0.0076	(0.0195)
Manager Gender	0.8081	(0.9963)	-0.2192	(0.7231)
R Square	0.1130		0.1760	
No. of Observations	1004		1004	

- **significant at the 5 percent level
- *significant at the 10 percent level.

Table 7: Three stage least square regressions of fund performance

The fund characteristics include beta, log of assets, square of log of assets, expense ratio and turnover ratios. The variables used to proxy manager characteristics include three dummy variables that equal one if the manager has an MBA degree or CFA or is male and of zero other wise respectively, the manager's tenure with the fund, the working experience of managers. Fund characteristics include three dummy variables: (1) capitalization size dummy variable that equals one if the fund is of mid capitalization and the value of zero is the fund of small capitalization; (2) Growth dummy variable which equals one if the fund is growth fund and the value of zero if the fund is either value fund or blend fund; (3) Value dummy variable that equals the value of one if the fund is value fund and the value of zero if the fund either growth fund or blend fund. Combining the second and third dummy variables, when both of them are zero, the blend fund equals one. The observations are fund-years. In this study, we consider alpha, beta, expense ratios and turnover ratios as endogenous variables and tenure, investment experience, MBA dummy, CFA dummy and log of asset under management as exogenous variables.

ALPHA = a1 + a2*TURNOVER + a3*EXPENSE+a4*MBA + a5*CFA+a6*TENURE + a7 * EXPERIENCE + a8* LOGSIZE +a9*(LOGSIZE^2)+a11*GENDER+a10*VALUE+ε_1

Multifactor-index alpha:

[ER= A1 + A2*TURNOVER + A3*EXPENSE+A4*MKT+A5*MOM+A6*MBA + A7*CFA+A8*TENURE + A9* LOGSIZE + A10*(LOGSIZE^2)+A11*GENDER + ε_2

BETA = B1 + B2*TURNOVER + B3*MBA + B4*CFA+B5*TENURE + B6*EXPERIENCE+B7*LOGSIZE + B8*CAPSIZE + B9*VALUE+B10*Gender+ε_3

EXPENSE=C1+C2*TURNOVER+3*MBA+C4*CFA+C5*EXPERIENCE+ C6*LOGSIZE+C7*CAPSIZE+C8*VALUE +ε_4

TURNOVER = D1 + D2*MBA + D3*CFA + D4*TENURE + D5*LOGSIZE + D6*CAPSIZE +D7* GENDER+ε_5

	Alpha Regressions		***Multifactor Alpha Regressions***	
Endogenous Variables	coefficient	p-value	coefficient	p-value
Intercept	61.128	0.02	80.154	0.00
Expense Ratio (%)	-28.650	0.01	-25.908	0.00
Turnover Ratio (%)	0.057	0.40	-0.033	0.24
Exogenous Variables				
Market Factor			0.193	0.00
Momentum Factor			0.249	0.01
Tenure (years)	0.224	0.21	0.223	0.13
Investment Experience (years)	0.232	0.23		
MBA dummy	-3.878	0.03	-2.129	0.09
CFA dummy	-2.414	0.24	-1.450	0.27
Gender dummy	4.863	0.10	-1.469	0.50
LOGSIZE^2	3.805	0.01	2.920	0.00
Logsize	-24.001	0.01	-20.971	0.00
Fund investment style				
Growth				
Value	1.141	0.64		
Capsize dummy				
R-squared	0.1106		0.1147	

Table 8: Three stage least square regressions of fund risk, expense ratios and turnover

	Beta regressions		***Expense Ratio Regressions***		***Turnover Regressions***	
Endogenous Variables	coefficient	p-value	coefficient	p-value	coefficient	p-value
Intercept	0.721	0.05	1.617	0.00	216.669	0.00
Expense Ratio (%)						
Turnover Ratio (%)	0.004	0.01	0.003	0.07		
Exogenous Variables						
Tenure (years)	0.004	0.29	0.013	0.02	-0.302	0.73
Investment Experience (years)	0.009	0.03	0.011	0.01	-2.160	0.00
MBA dummy	0.036	0.29	-0.128	0.01	1.579	0.83
CFA dummy	-0.069	0.08	-0.137	0.01	13.047	0.08
Gender dummy	-0.190	0.00	0.040	0.66	-29.279	0.02
Logsize	0.114	0.02	-0.277	0.00	-28.301	0.00
Fund investment style						
Growth					25.228	0.00
Value	-0.011	0.45			-13.294	0.22
Capsize dummy	-0.185	0.00	-0.106	0.02	0.797	0.92
R-squared	0.2256		0.1697		0.8950	