Managerial Tenure and Other Determinants of Mutual Fund Performance: Correlations and Implications

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Abstract

Performance evaluation of mutual funds has been a center piece of attention to both the investors and the finance services professionals. This study analyzes the role of managerial tenure on fund's excessive performance over the period 1999-2007. In addition to examining the performance, this study also analyzes correlation among various fund specific variables that are very critical to fund performance. Results indicate that managerial tenure plays a vital role in explaining fund performance and this relationship is dramatically different among subcategories of equity funds. Findings also reveal that fund specific variables such as fund size, investment in best ideas of fund manager, turnover ratio of fund, expense ratio of fund, average tenure of fund manager and median market cap of fund's holdings are heavily correlated with each other and the direction of this correlation changes with types of funds. The findings of this study also offer trading strategies to mutual fund investors.

Key Words: Mutual Funds, Managerial Tenure, Performance

JEL Classification: G23, G10, G11

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1. Introduction

Investment in mutual funds is a large portion of the U.S. household investment portfolio. According to ICI fact book, approximately 21% U.S. households have some type of investment in actively managed mutual funds at the end of the year 2007. In fact, 2007 saw new net inflow to all mutual funds amounting to a mammoth $878 billion which was the highest new net cash flow over the last 15 years. Overall, mutual funds managed roughly $12.9 trillion assets by the end of year 2007[1]. One of the important reasons that households invest their monies in actively managed mutual fund is to obtain expert management. Many investors have an idea of which industries to invest in, however, they are not sure which stocks to pick. Many retail investors are not sophisticated or informed investors; therefore they rely on fund managers to pick stocks for them. Another important reason to invest in mutual fund is of course attaining diversification. However, expert management and diversification are not free; investors pay a part of their investment return as load and fees also known as expense ratio. Carhart (1997) has shown empirically that actively managed mutual funds underperform passive market such as S&P 500 by an average of 1.54% per year after incorporating expenses. Other studies, for example Wermers (2000)[2], have shown similar results. Moreover the extraordinary growth in passively managed exchange trading funds (ETFs) in the recent years further strengthen the argument that actively managed funds underperform market benchmarks even though their "raw returns" may be superior to that of the market[3]. These facts raise a very important concern; why do investors still flock to mutual funds and pay hefty fees to fund managers? Such investor behavior implies their continued confidence in the abilities and skills of fund managers. Of course, there are star fund managers such as Bill Gross, Andrew Feltus, and Kevin Murphy and others who are able to outperform the passive benchmarks consistently over many years; however, most fund managers have failed to outperform the market or have been unable to outperform the market for any considerable time period. Jensen (1968) argued that markets are efficient and fund managers cannot beat the market and any outperformance is "mere luck". Similar results were found in later studies as well (for example Grossman and Stiglitz (1980), Malkiel (1995) to name a few).

This study analyzes the critical relationship between fund's managerial tenure and fund's abnormal performance. Managers are important, but a more important issue is their

[1] Investment Company Institute (ICI) fact book.

[2] Wermers (2000) documents that funds that generate a positive 1.3% excess return over passive market end up with -1% excess return after incorporating expenses and other fees.

[3] According to ICI fact book, ETF's were managing only $12 billion worth of assets by the end of year 1999 that increased to roughly $150 billion by the end of year 2007, an astounding average growth of 143.75% per year.

association with the mutual fund. Even though managers of any mutual fund follow specific guidelines outlined in fund's objective, a shift in manger also shifts the selection process. In other words, portfolio is rebalanced when a new manager takes charge even if that rebalancing follows prospectus guidelines. This change in control has two implications a) an impact on fund's overall performance and b) an extra cost (rebalancing cost) to fund's investors. This study analyzes this critical relationship between fund's overall performance and tenure of fund's manager. It also analyzes correlation among fund specific variables that are critical to a fund's overall abnormal performance. Correlation is important because performance is a function of many factors and singling out only one factor may not tell the whole truth[4]. Correlation shows how well the combination of many factors contributes to the overall result. Correlation can be negative or positive or zero. Nobel Laureate Harry M. Markowitz proved that stand-alone risk could be diversified to zero if a portfolio is a basket of negatively correlated securities. An efficient frontier optimal portfolio is the one that can maximize returns at a given level of risk. This can be achieved through diversification, i.e. having a mix of less than perfectly positively correlated securities. Theory of diversification shows that correlation is critical when deciding a portfolio's constituents. Mutual funds are nothing more than a portfolio of various stocks and therefore fund's specific variables that are so critical in explaining fund's abnormal performance should also be analyzed in terms of their correlation with each other. This study examines the correlation among six major fund specific variables to evaluate what matters when we seek investment in mutual funds.

This study further segregates equity funds in three different categories—large cap, mid-cap and small cap to analyze whether these relationships hold i.e. remain same in direction and magnitude. Results (explained in section 4) indicate that a) the variables display strong correlation and the direction changes with the types of funds and b) cross-sectional regressions show that managerial tenure plays a significant role in explaining fund's performance after controlling for the effects of other known variables and this relationship changes with the types of funds.

2. Data and Methodology

Fund specific variables such as average tenure of fund manager, annual expense ratio, annual turnover ratio, median market cap of securities, investment in top 10 percent holding, net assets under management and Sharpe ratios are taken from Morningstar Principia annual CDs over the period 1999-2007. This article analyzes only domestic equity funds; therefore other types of funds such as foreign equity, ETFs, balanced funds, bond funds and specialty funds are eliminated. The final sample consists of 21,950 fund month observations over the period 1999-2007.

[4] For example if a small cap fund (fund that invests in stocks of firms with market cap between $300 million and $2 billion) is earning abnormal positive returns and there is a negative and significant correlation between size and turnover then it can be inferred that a small cap low turnover ratio big size fund is a better investment than a small cap low turnover ratio small fund.

Selection of Variables:

Net Assets (Fund Size): Size of a fund is very important variable in explaining fund's performance. Many times, investors like to buy stocks of mutual funds that maintain large portfolio (Sirri and Tufano (1998) demonstrate that larger funds attract more funds). Numerous studies, for example (Madden, Nunn, and Wiemann (1986), Droms and Walker (1995), Grinblatt and Titman (1989 and 1993) among others), have shown that fund size negatively affects fund performance. Moreover, in many instances fund managers compensation is linked to the size of fund they manage.

Manager Tenure: This is the prime variable of this study. Managers run the funds and it is important to know how long they stay with the same fund. Managerial tenure affects not only the fund performance, but also reflects stability of fund and the cost of fund to the investors. Ding and Wermers (2005) indicate that manger tenure can be a good signal, especially for large funds with relatively long tenure managers. Chevalier and Ellison (1999) argue that managers with longer tenure tend to take less risk.

Top 10 percent Holdings: This is also known as the best ideas of fund managers and, as such, should improve the fund performance. However, if managers become passive and continue to invest only in their best ideas then it is possible that ownership costs of these stocks outweigh the benefits and decrease fund's performance. Pollet and Wilson (2008) argue that managers tend to invest in these ideas as long as their ownership costs do not outweigh their benefits.

Expense Ratio: This is the compensation to managers or the cost to the investors. Investors' net return is reduced by this cost. Research (for example Wermers (2000)) has shown that it is this cost that causes mutual funds to underperform the passive market.

Turnover Ratio: Defined as the minimum of aggregated sales or aggregated purchases of securities divided by the average 12-month total net assets of the fund; also used as a proxy for transaction costs associated with rebalancing the portfolio. Turnover has substantial cost; however, it can be worthwhile if the benefits of rebalancing exceed the costs of rebalancing. If managers rebalance their portfolio based on information, i.e. sell overvalued stocks and buy undervalued stocks they can substantially improve fund's performance; however, if managers act as speculators and rebalance the portfolio to mimic others the rebalancing may add substantial costs to the investors.

Median Market Cap: The median market cap of all the holdings of a mutual fund. Shawky and Smith (2001) argue that a higher median cap may cause a manager to invest in a smaller number of stocks because doing so allows managers to manage a large (net assets) fund despite the number of holdings. It can also improve performance; managers may concentrate on a few holdings and can still manage a large fund. It can also negatively affect fund performance as managers may buy overvalued stocks of large firms in order to maintain fund size.

Sharpe ratio: This variable assesses a fund's real (risk adjusted) performance. The Sharpe ratio is calculated as the excess return (portfolio minus the Treasury-bill rate) divided by the standard deviation of returns and provides a measure of excess return per unit of risk. It can be positive or negative. A negative Sharpe ratio is indicative of poor portfolio performance and suggests that investment in risk free asset is a better investment than investing in that risky asset.

2A. Cross-sectional Model

$$SR_{it} = \beta_0 + \beta_1*\text{Expenses}_{it} + \beta_2*\text{Medmktcap}_{it} + \beta_3*\text{Size}_{it} + \beta_4*\text{Top}_{it} + \beta_5*\text{Turnover}_{it} + \beta_6*\text{Managertenure}_{it} + \varepsilon_{it} \quad (1)$$

Where:

SR is the annual Sharpe ratio of fund *i* at time *t*. It is the dependent variable.
Expenses is the annual expense ratio of fund *i* at time *t.*
Medmktcap is the median market cap of the holdings of fund *i* at time *t*. Since this variable is reported in dollar (million) therefore following the standard practice, I took natural log of this variable to normalize this data point.
Size is the natural log of net assets under management of fund *i* at time *t*.
Top is the fund's investment in its top 10 most heavily holdings of fund *i* at time *t.*
Turnover is the annual turnover ratio of the fund *i* at time *t.*
Managertenure is the average tenure of manager(s) with the fund *i* at time *t.*

3. Descriptive Statistics

Information in Table 1 shows that manager tenure is consistent throughout the time period of this study. Longest average manager tenure is 4.1 years in the year 2004 with an overall average of 3.23 per year over nine years. Expense ratio is also quite consistent at approximately 1.30 percent per year, however, turnover ratio and net assets under management show declining trend over the period of this study. Median market cap of holdings declines in the beginning years and increases sharply over the later years. Declining size of funds and increasing median market cap of holdings indicate that on average funds are focused on a few holdings while managing a few large firms to maintain optimal fund size. Decreasing net assets also resonates with the fact that stocks lost value during the first decade of this century.

Table 1: Descriptive Statistics

Following table shows the mean values per year of six key variables of mutual fund over the period 1999-2007. Last column reflects the average annual value of each variable over the entire time period of nine years. Size is the net assets under management and is reported in $ millions, Manager Tenure is the average number of years managers stay with the fund, Top 10 holdings which is also known as manager's best ideas is investment of fund in its top 10 most heavily weighted holdings, Expense ratio is the average expenses investors pay as percentage of their investment, Median market cap is the median value of fund's combined holdings, and Turnover ratio is the fund's annual turnover ratio.

Variable	1999	2000	2001	2002	2003	2004	2005	2006	2007	Overall Average
Size (in millions)	40.90	40.90	33.00	29.40	31.30	33.05	33.90	34.60	34.40	34.61
Manager Tenure (in years)	3.00	3.00	3.00	3.00	3.20	4.10	3.60	3.10	3.10	3.23
Top 10 Holdings (%)	32.16	33.09	32.31	28.16	25.96	26.46	28.37	28.73	29.94	29.46

Expense Ratio (%)	1.28	1.29	1.30	1.31	1.30	1.35	1.34	1.30	1.26	1.30
Median Market Cap (in millions)	13.73	18.42	15.06	13.02	13.57	17.23	19.58	21.52	22.69	17.20
Turnover Ratio (%)	65.00	68.00	71.00	70.00	62.00	61.00	55.00	55.00	54.00	62.33

4. Results

4A. Correlation Matrix

Table 2 (panels A, B, C, and D) shows a strong correlation among all major variables. Manager tenure is positively related to net assets under management, median market cap of holdings, fund's investment in top 10 holdings also known as manager's best ideas whereas manager tenure is negatively related to expense ratio and turnover ratio. All these correlations are highly significant. These results further strengthen the argument that longer the tenure of manager with fund, higher the probability of conservative style of management, i.e. more investment in the best ideas of fund manager and less investment in new stocks, more visibility of value (large) firms and larger fund size. This relationship holds for all categories of equity funds except tenure of manager of large cap funds which is significantly and negatively related to investment in top 10 percent holdings. This negative correlation between manager tenure and investment in top 10 percent holdings for large cap funds may find support from theories of liquidity constraints and ownership costs[5]. This negative correlation also suggests that continuous investment in large firm stocks drives their prices up and decreases the return on these investments.

Table 2: Correlation Matrix

The table shows correlation among six key fund variables that play a critical role in explaining fund's excess return (abnormal performance). A negative relationship indicates negative correlation between the variables whereas a positive sign indicates positive correlation between the variables. All these fund variables are explained in the model section of the paper. Second part of table shows the p-value assigned with each coefficient. p-value shows the probability that coefficient is not reliable. For example p-value of 0.05 means there are 5% chances that coefficient is not significant or there is 95% confidence that coefficient is correct in magnitude and direction. N is number of the monthly fund observations.

Panel A: Shows the correlation matrix for the entire sample

	managertenure	expenses	size	top	turnover	medmktcap
managertenure		-0.02996	0.26056	0.01558	-0.09133	0.04706
(p-value)	1	(<.0001)	(<.0001)	(0.0006)	(<.0001)	(<.0001)
expenses	-0.02996		-0.3053	0.06273	0.10554	-0.14858
(p-value)	(<.0001)	1	(<.0001)	(<.0001)	(<.0001)	(<.0001)
size	0.26056	-0.3053	1	-0.07164	-0.09082	0.06995

[5] Pollet and Wilson (2008) suggest that managers keep on investing in best ideas as long as ownership costs of those stocks are not exorbitantly high.

(p-value)	(<.0001)	(<.0001)		(<.0001)	(<.0001)	(<.0001)
top	0.01558	0.06273	-0.07164		0.02647	0.24916
(p-value)	(0.0006)	(<.0001)	(<.0001)	1	(<.0001)	(<.0001)
turnover	-0.09133	0.10554	-0.09082	0.02647		-0.07694
(p-value)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	1	(<.0001)
medmktcap	0.04706	-0.14858	0.06995	0.24916	-0.07694	
(p-value)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	1

Panel B: Correlation matrix for large cap funds

	managertenure	expenses	size	top	turnover	medmktcap
managertenure		-0.02521	0.24697	-0.03157	-0.07523	0.02819
(p-value)	1	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
expenses	-0.02521		-0.32998	0.09322	0.11059	-0.09328
(p-value)	(<.0001)	1	(<.0001)	(<.0001)	(<.0001)	(<.0001)
size	0.24697	-0.32998		-0.10418	-0.08396	0.07351
(p-value)	(<.0001)	(<.0001)	1	(<.0001)	(<.0001)	(<.0001)
top	-0.03157	0.09322	-0.10418		0.04382	-0.12862
(p-value)	<.0001	<.0001	<.0001	1	<.0001	(<.0001)
turnover	-0.07523	0.11059	-0.08396	0.04382		-0.11431
(p-value)	<.0001	<.0001	<.0001	<.0001	1	(<.0001)
medmktcap	0.02819	-0.09328	0.07351	-0.12862	-0.11431	
(p-value)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	(<.0001)	1

Panel C: Correlation matrix for mid-cap funds

	managertenure	expenses	size	top	turnover	medmktcap
managertenure		-0.05379	0.30122	0.23371	-0.1305	0.16143
(p-value)	1	(0.005)	(<.0001)	(<.0001)	(<.0001)	(<.0001)
expenses	-0.05379		-0.24734	0.02673	0.09731	-0.06957
(p-value)	(0.005)	1	(<.0001)	(0.1606)	(<.0001)	(0.0003)
size	0.30122	-0.24734		-0.0162	-0.12387	0.11075
(p-value)	(<.0001)	(<.0001)	1	(0.4012)	(<.0001)	(<.0001)
top	0.23371	0.02673	-0.0162		0.06772	0.04538
(p-value)	(<.0001)	(0.1606)	(0.4012)	1	(0.0005)	(0.0137)
turnover	-0.1305	0.09731	-0.12387	0.06772		-0.05261
(p-value)	(<.0001)	(<.0001)	(<.0001)	(0.0005)	1	(0.0069)
medmktcap	0.16143	-0.06957	0.11075	0.04538	-0.05261	
(p-value)	(<.0001)	(0.0003)	(<.0001)	(0.0137)	(0.0069)	1

Panel D: Correlation matrix for small cap funds

	managertenure	expenses	size	top	turnover	medmktcap
managertenure		-0.02451	0.29596	0.12536	-0.13453	-0.00456
(p-value)	1	(0.0086)	(<.0001)	(<.0001)	(<.0001)	(0.6171)
expenses	-0.02451		-0.2647	0.18332	0.08945	-0.13017
(p-value)	(0.0086)	1	(<.0001)	(<.0001)	(<.0001)	(<.0001)
size	0.29596	-0.2647		-0.03855	-0.10187	0.09725
(p-value)	(<.0001)	(<.0001)	1	(<.0001)	(<.0001)	(<.0001)
top	0.12536	0.18332	-0.03855		0.02033	-0.09905
(p-value)	(<.0001)	(<.0001)	(<.0001)	1	(0.0286)	(<.0001)
turnover	-0.13453	0.08945	-0.10187	0.02033		0.01597
(p-value)	(<.0001)	(<.0001)	(<.0001)	(0.0286)	1	(0.086)
medmktcap	-0.00456	-0.13017	0.09725	-0.09905	0.01597	
(p-value)	(0.6171)	(<.0001)	(<.0001)	(<.0001)	(0.086)	1

4B. Cross-sectional Results

Results in Table 3 (panels A, B, C, and D) show the impact of various fund specific variables on fund's risk adjusted performance. It is interesting to see that managerial tenure positively and significantly affects fund's overall performance after controlling the effects of other variables. Fund's overall performance increases by 0.6 basis points per year for every one year increase in tenure of fund manager. Expenses negatively and significantly affect fund's performance. For every 100 basis points increase in fund's expenses reduces fund's overall performance by 600 basis points. This relationship between fund's risk adjusted performance and managerial tenure & expenses and results from Table 2 (correlation results) suggest an interesting matrix. Since fund's managerial tenure and expenses are negatively correlated and as shown by cross-sectional results that performance improves with managerial tenure and decreases with fund's expenses, it can

be inferred that, in general, funds with longer managerial tenure should be able to perform better than the fund with shorter managerial tenure.

Relationship between managerial tenure and abnormal performance is even stronger for mid-cap and small cap funds. For every one year increase in manager tenure, fund's overall performance improves by 11 basis points for small cap funds whereas it deteriorates by 12 basis points for mid-cap funds. Results of this study are consistent with the findings of earlier studies that expenses decrease fund's overall abnormal performance and it is consistent across all categories of equity funds. The most adverse impact is felt for large cap funds where every 100 basis points increase in expense ratio reduces fund's risk adjusted performance by 750 basis points. Investment in top 10 weighted holdings also improves performance overall, however, this relationship holds only for large cap funds. Turnover ratio reduces performance across the board which suggests that trading costs overweigh the informational advantage obtained from rebalancing the portfolio. Interestingly, size (net assets under management) and median market cap of holdings improve fund's performance across all categories suggesting that during the period of this study funds with larger holdings or larger size enjoy higher return per unit of risk.

Table 3: Cross-sectional Results

Following table shows the cross-sectional regression results. Table indicates which variable affects the abnormal performance, i.e. the magnitude and coefficient. Table also shows corresponding t and p values. P-value of 0.10 or less or t-value of 1.76 and above reflects the significance of the variable. Fund's annual Sharpe ratio is the dependent variable. Explanatory variables are explained in table 1 and data and methodology section of the paper. Adjusted R^2 shows the explanatory power of the model whereas N is the number of fund month observations.

Panel A: Cross-sectional results for entire sample

Variable	**Parameter Estimate**	**t -value**	**p-value**
Intercept	0.67977***	24.82	<.0001
Managertenure	0.00603***	6.04	<.0001
expenses	-6.01283***	-10.1	<.0001
size	0.01002***	5.81	<.0001
top	0.09085***	3.64	0.0003
turnover	-0.0381***	-13.48	<.0001
medmktcap	-0.02636***	-10.5	<.0001
Adj. R^2	0.0153		
N	17,085		

Panel B: Cross-sectional results for large cap funds

Variable	Parameter Estimate	t Value	p-value
Intercept	-0.53818***	-5.38	<.0001
Managertenure	0.00729***	5.95	<.0001
expenses	-7.59142***	-8.72	<.0001

size	0.0048**	2.21	0.027
top	0.2768***	9.09	<.0001
turnover	-0.02978***	-8.44	<.0001
medmktcap	0.08492***	9.21	<.0001
Adj. R^2	0.0176		
N	11,936		

***, **, and * represent statistical significance at 1%, 5%, and 10% level respectively.

Panel C: Cross-sectional results for mid-cap funds

Variable	Parameter Estimate	t -value	p-value
Intercept	-0.36106*	-1.80	0.0725
Managertenure	-0.01246***	-3.59	0.0003
expenses	-5.74484***	-2.64	0.0083
size	0.02955***	4.96	<.0001
top	-0.58703***	-5.99	<.0001
turnover	-0.03209***	-3.56	0.0004
medmktcap	0.13871***	6.19	<.0001
Adj. R^2	0.0728		
N	1,958		

Panel D: Cross-sectional results for small cap funds

Variable	Parameter Estimate	t -value	p-value
Intercept	-1.14123***	-13.57	<.0001
Managertenure	0.01165***	6.53	<.0001
expenses	-2.07794**	-3.00	0.0027
size	0.01583***	5.57	<.0001
ttop	-0.11731**	-2.37	0.018
turnover	-0.05363***	-10.91	<.0001
medmktcap	0.23403***	20.25	<.0001
Adj. R^2	0.0789		
N	8,793		

***, **, and * represent statistical significance at 1%, 5%, and 10% level respectively.

5. Conclusion and Implications

This study analyzes correlation among important fund specific variables and the impact of these variables on fund's performance. Managerial tenure is the prime variable. Whatever may be the objectives of a fund, the most important issue is the proper implementation of those objectives. Therefore, managerial tenure is critical in explaining the fund's abnormal performance. A shift in managers also shifts the selection process regardless of fund's size or fund's objective. This study finds that managerial tenure, fund size, median market cap of holdings, turnover ratio, investment in top 10 holdings and expense ratio are heavily correlated with each other and these relationships change with the types of funds. This study also finds that the longer the tenure of fund manager, the better the performance of the fund. Results also offer trading strategies to investors and financial advisors. Mid-cap size fund investors can earn superior returns by investing in a fund that has shorter managerial tenure, less investment in fund's top 10 investments, less turnover and large size. For investors aspiring to invest in large-cap funds, a fund with more conservative style (higher investment in top 10 holdings), longer managerial tenure, bigger size and low turnover ratio can be a better investment.

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