

# “Will mutual fund managers follow the leaders?”

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## Will mutual fund managers follow the leaders?

### Abstract

After controlling for stock returns and turnover, empirical evidence shows that the changes in portfolio weights of the leaders were an important determinant of the holding changes for the followers in the subsequent month. However, the leading funds tended to avoid the stocks held by the follower funds. The portfolio strategy that follows the transactions of the best funds did not provide positive returns in subsequent periods.

**Keywords:** follow the leader, mimic behavior, mutual fund.

**JEL Classification:** G10, G11.

### Introduction

Investors are found to actively chase funds with outstanding past performance (e.g., Chevalier and Ellison, 1997; Sirri and Tufano, 1998). Will fund managers behave in the same fashion and follow the stock picking record of super-performing funds (the leaders thereafter)? If a fund manager learns about recent choices of other fund managers, he may tilt his portfolio towards their allocations. The higher the performance of the best-performing funds is, the higher is the incentive of the remaining fund managers (the followers thereafter) to mimic them. This phenomenon is regarded as “follow the leader”.

To the extent that the best-performing funds’ managers are perceived to possess superior skill, fund managers may choose to follow them due to information-based consideration (Froot, Scharfstein and Stein, 1992; Hirshleifer, Subrahmanyam and Titman, 1994; Sias, 2004). Specifically, the followers copy the strategies of the leaders in an attempt to take advantage of the higher expertise of the best funds. The additional benefit from doing so is that they can free-ride on the research expenses of the leaders. The cost of mimicking the leaders’ portfolio is likely to be reasonably low if they obtain the information regarding the stock holdings of the best funds through the media or the regular reports to the public (Pomorski, 2006). In addition to information-based consideration, funds may mimic stock selections of the leaders because of reputational concerns if investors use holdings data to estimate fund managers’ skills (Cohen, Coval, and Pastor, 2005).

The best funds are likely to initiate a trend by buying or selling certain stocks. As that information becomes public through mutual funds’ regular periodical reports, news given to the media, etc., the remaining funds follow the pattern by investing in the same securities. The followers are likely to do that with a lag since it takes them time to find out what stocks the best funds held.

To examine whether fund managers will follow the strategies of the best funds, we classify funds as leaders and followers. The leaders (the best funds) are the funds with returns in the top 10% of the cross-sectional distribution, while the followers are the remaining (other) funds. We find that the changes in portfolio weights of the leaders were an important determinant of the subsequent changes in portfolio weights. An interesting complement of these results is the fact that the best funds do not follow the remaining funds. That is, the “following behavior” acts only in one direction. Funds indeed follow the best funds, but the best funds actually reverse the previous trades of the funds with the lowest performance.

Moreover, to mimic the trades of the best mutual funds may be a profitable trading strategy. The reason is that some fund managers are inherent with skill and industry-related knowledge, or their complexes have long-term relationship with some companies. Therefore, they can forecast the companies’ future earning levels more accurately. The existence of managerial skill and short-term persistence in superior performance is supported by Hendricks et al. (1993, 1997), Goetzman and Ibbotson (1994), Brown and Goetzmann (1995), Elton et al. (1996), Gruber (1996), and Bollen and Busse (2005), etc.<sup>1</sup> Though many researches have found evidence of fund performance persistence over periods as short as one year, Grinblatt, Titman, and Wermers (1995) and Carhart (1997) argue that the superior performance of top funds is a result of the momentum effect of Jegadeesh and Titman (1993). In addition, Malkiel (1995) posits that survivorship bias accounts for a significant amount of performance persistence. Porter and Trifts (1998) present evidence that inferior performance is more likely to persist

<sup>1</sup> Although many papers have investigated the herding behavior among mutual funds, they are different. Specifically, the herding behavior usually investigates if trades are correlated in a given period for the reason that mutual fund managers simultaneously respond to a common shock and trading at the same time, which leads to cross-correlations. On the other hand, the “follow the leader” behavior states that current trades of a group of funds are correlated with future trades of other funds, which involves cross-autocorrelations.

than superior performance. Above evidence implies that the returns to persistence-based investment strategies may be overstated. Therefore, we also examine if it is a profitable strategy to mimic the trading of leaders. The results show that it is not profitable to follow the strategies of the best funds. In addition, although the average three- and six-month returns are significantly positive for portfolios composed of longing the stocks with the largest weight increases of the best funds and shorting the stocks with the largest weight decreases of the best funds, they become insignificant when the evaluation period is extended to one year. This result is consistent with the view that this performance persistence of the mutual fund is not due to managerial ability, but due to the factors such as momentum in stock prices, expenses and transaction costs (Blake, Elton, and Gruber, 1993; Carhart, 1997; Daniel, Grinblatt, Titman and Wermers, 1997; Wermers, 2000). Therefore, even though the leaders have any information edge, it is very short-term, and following the leaders may not be beneficial.

The remainder of the paper is structured as follows. The next section exhibits and discusses evidence that mutual funds tilt their portfolios towards stocks previously chosen by the industry leaders. Section 2 investigates if the mimicking behavior makes economic sense. The last Section concludes.

## 1. Do funds follow their industry leaders?

The mutual fund sample was obtained from the Taiwan Economic Journal, a private data vendor. The TEJ database contains data on daily net asset value, fees, load, year of origin, fund category, and other characteristics of the fund. In this study, open-end equity funds of the data period covering 1996 to

2007 were examined. On each month-end, the database provided the name and identifier of each security held and numbers of shares held. We estimate monthly fund trades for each fund by tracking changes in holding shares from month to month.

**1.1. Proxy for leader (best fund) actions.** To choose the leaders we first rank funds on their returns and select the top funds. We accumulate returns based on the three-month, six-month, and one-year intervals since there is evidence of short-term fund performance persistence, rather than long-term one. The “best” funds (the leaders) are defined to be those within the top 10% of the current cross-sectional distribution, and the remaining funds are defined as the followers<sup>1</sup>. The reason that we use raw returns rather than risk-adjusted returns is that a bunch of literature posits that the key element of affecting investors to pour money into which funds is raw returns, instead of risk-adjusted returns (Gruber, 1996; Chevalier and Ellison, 1997; Sirri and Tufano, 1998; Del Guercio and Tkac, 2002).

Table 1 reports the summary statistics about the leading funds and the following funds. In the full sample, the number of funds assigned to the “best fund” status is small. The average numbers for the best funds ranked based on prior three-month, six-month, and one-year performance are 10.625, 10.650, and 10.650, respectively. These figures are almost equal to adopting the top (bottom) 10 funds as the best (remaining) funds. Moreover, no matter the intervals of the performance measurement are, the leaders have greater assets under managements. With regard to the performance, the leaders truly seem superior to the remaining funds. Their average monthly returns are more than two times of the remaining funds.

Table 1. Summary statistics of different groups of funds

Each month, funds are ranked on their three-month, six-month, and one-year returns. The best funds are defined as those with returns in the top 10%; the remaining funds are the remnants of the funds. Top 10 funds are 10 funds with the highest cumulative returns. “Above median” are those whose returns are ranked between the 50<sup>th</sup> and the 90<sup>th</sup> percentile of the performance distribution. Assets are reported in thousands of dollars. Returns are monthly averages computed over three months, six months, and one year.

	Best funds (top 10%)	Remaining funds (not in top 90%)	Top 10 funds	Above median funds (50%-90%)
Panel A: The best funds are defined based on prior three-month cumulative returns				
Average assets	2,185,836	1,936,757	2,098,566	1,840,665
Median assets	1,745,291	1,272,251	1,796,254	1,150,008
Number of funds	10.6250	100.7500	10.0000	45.7500
Avg. one-year market-adjusted returns	0.0205	0.0067	0.0201	0.0109
Avg. two-year market-adjusted returns	0.0294	0.0110	0.0286	0.0168
Avg. three-year market-adjusted returns	0.0295	0.0126	0.0291	0.0171

<sup>1</sup> Due to limited attention and capital, fund managers can pay special attention to some funds with super-performance.

Table 1 (cont.). Summary statistics of different groups of funds

	Best funds (top 10%)	Remaining funds (not in top 90%)	Top 10 funds	Above median funds (50%-90%)
Panel B: The best funds are defined based on prior six-month cumulative returns				
Average assets	1,937,713	2,097,227	2,087,368	1,991,364
Median assets	1,525,329	1,312,539	1,511,175	1,266,967
Number of funds	10.6500	98.2500	10.0000	43.3750
Avg. one-year market-adjusted returns	0.0130	0.0041	0.0128	0.0064
Avg. two-year market-adjusted returns	0.0171	0.0052	0.0144	0.0084
Avg. three-year market-adjusted returns	0.0191	0.0047	0.0187	0.0083
Panel C: The best funds are defined based on prior one-year cumulative returns				
Average assets	2,233,175	2,012,913	2,192,152	1,864,446
Median assets	1,768,038	1,264,991	1,802,044	1,199,407
Number of funds	10.6500	100.2250	10.0000	43.9000
Avg. one-year market-adjusted returns	0.0106	0.0021	0.0106	0.0045
Avg. two-year market-adjusted returns	0.0140	0.0032	0.0134	0.0063
Avg. three-year market-adjusted returns	0.0161	0.0027	0.0157	0.0062

**1.2. Methodology.** To examine if the trades of the best funds are an important determinant of portfolio decisions of other funds, we first calculate the change in portfolio weight a fund allocates to a given stock, average across all best funds, which represents the leaders' interest in this given stock. We compute fund  $k$ ' change of weight on stock  $i$  between months  $t-1$  and  $t$  using the following equation:

$$\Delta w_{i,k,t} = \frac{n_{i,t} P_{i,t}}{\sum_j n_{j,t} P_{j,t}} - \frac{n_{i,t-1} P_{i,t-1}}{\sum_j n_{j,t-1} P_{j,t-1}}, \quad (1)$$

where  $P_{i,t}$  is stock  $i$ 's price at time  $t$ , and  $n_{i,t}$  is the fund  $k$ 's holdings of stock  $i$  held by fund  $k$ . Then we

$$\Delta w_{i,t}^{other} = \alpha + \gamma \Delta w_{i,t-1}^{best} + \delta \Delta w_{i,t-1}^{other} + \sum_{\tau=0}^T \beta_{\tau}^R R_{i,t-1} + \sum_{\tau=0}^T \beta_{\tau}^V V_{i,t-1} + \varepsilon_{i,t}, \quad (2)$$

where  $R_{i,t}$  and  $V_{i,t}$  are returns and turnover ratio of stock  $i$  at time  $t$ , respectively. Returns are included in the regression to control for the impact of positive feedback trading, while turnover is included to capture overall interest in the stock in the given month. We used the approach of Fama and MacBeth (1973) to compute the estimates of the regression parameters, and use the Newey-West weighting scheme to obtain standard errors corrected for the potential autocorrelation and heteroskedasticity of the cross-sectional estimates.

**1.3. Empirical results.** Table 2 summarizes the estimates of the above specification. The three columns report the results for best funds denoted based on the past three-month, six-month, and one-year returns, respectively. As shown, the coefficients of  $\Delta w_{i,t-1}^{best}$  are significantly positive, regardless of

average weight changes for a given stock over all the best funds. That is:  $\Delta w_{i,t}^{best} = (\sum_{k=1}^K \Delta w_{i,k,t}) / K$ ,

where  $K$  is the number of the best funds during period  $t$ . Following the same procedure, we can calculate the average weight changes for a given stock over all the remaining funds,  $\Delta w_{i,t}^{other}$ .

Given the definition of the best funds and the proxy for their actions, we can test whether the remaining funds will take advantage of the portfolio weights changes of the best funds to make subsequent portfolio choices. We test the mimicking hypothesis using the regression framework:

performance measure intervals. This indicates that mutual fund managers tend to follow funds which outperform other funds during the past three months and one year. However, the insignificant coefficient of  $\Delta w_{i,t-1}^{best}$  for the best funds defined based on past six-month returns reveals that fund managers do not mimic the trading strategies of the best-performing funds during the past six months. The way mutual funds rebalance their portfolios is significantly related to what the best funds did in the previous period. The following funds move towards stocks that the best funds increase weights and away from those whose weights went down. Since we have controlled for the effects from positive feedback trading, short-term momentum and hot hand effects, the "follow the leader" hypothesis is strongly supported.

Table 2. Funds follow leaders in their portfolio decisions

This table reports the results from the following regression:

$$\Delta W_{i,t}^{other} = \alpha + \gamma \Delta W_{i,t-1}^{best} + \delta W_{i,t-1}^{other} + \sum_{\tau=0}^T \beta_{\tau}^R R_{i,t-1} + \sum_{\tau=0}^T \beta_{\tau}^V V_{i,t-1} + \varepsilon_{i,t},$$

where  $\Delta W_{i,t}^{other}$  is portfolio weight changes, measured between the end of months  $t - 1$  and  $t$  and averaged over follower funds. The explanatory variable  $\Delta W_{i,t-1}^{best}$  is portfolio weight changes, measured between the end of months  $t-2$  and  $t-1$  and averaged over leader funds.  $W_{i,t-1}^{other}$  is lagged portfolio weights, averaged over follower funds. Other explanatory variables include returns and turnover. Coefficient estimates are from the Fama-MacBeth procedure; Newey-West corrected t-statistics are in parentheses.

Intercept	Three-month		Six-month		One-year	
	coefficients	p-value	coefficients	p-value	coefficients	p-value
	0.0105	0.1900	0.0131	0.0981	0.0065	0.4080
$\Delta W_{i,t-1}^{best}$	0.0203	0.0031	-0.0069	0.2499	0.0154	0.0128
$W_{i,t-1}^{other}$	-0.2050	0.0000	-0.1474	0.0000	-0.1885	0.0000
$R_{i,t}$	0.0077	0.0000	0.0078	0.0000	0.0076	0.0000
$R_{i,t-1}$	0.0015	0.0000	0.0012	0.0000	0.0014	0.0000
$R_{i,t-2}$	0.0004	0.0263	0.0005	0.0140	0.0004	0.0508
$R_{i,t-3}$	-0.0005	0.0053	-0.0005	0.0145	-0.0005	0.0067
$V_{i,t}$	0.0043	0.0000	0.0043	0.0000	0.0044	0.0000
$V_{i,t-1}$	-0.0038	0.0000	-0.0039	0.0000	-0.0036	0.0000
$V_{i,t-2}$	-0.0007	0.0290	-0.0004	0.2363	-0.0006	0.0558
$V_{i,t-3}$	-0.0007	0.0185	-0.0011	0.0004	-0.0011	0.0006

Moreover, all coefficients of  $\Delta W_{i,t-1}^{other}$  are significantly negative no matter the definition of the best funds is. This indicates that the following funds, in response to prior worse-performance, change their portfolios by selling part of (or all) existing stocks in an attempt to catch up with the markets. As a result, there is a negative relationship between portfolio

weight changes today and the average portfolio weight the following funds had in the previous month.

To examine whether the best funds themselves mimic the worse-performing funds, we regress the best fund weight changes on the lagged weight changes of the “other” funds. The regression is as follows:

$$\Delta W_{i,t}^{best} = \alpha + \gamma \Delta W_{i,t-1}^{other} + \delta \Delta W_{i,t-1}^{best} + \sum_{\tau=0}^T \beta_{\tau}^R R_{i,t-1} + \sum_{\tau=0}^T \beta_{\tau}^V V_{i,t-1} + \varepsilon_{i,t}. \tag{3}$$

The results, shown in Table 3, indicate that there is little evidence of the leaders mimicking the followers. By contrast, the significantly negative coefficients suggest that the best funds will avoid stocks previously chosen by the worst funds. Interesting,

the mimicking behavior is one-way direction. Worse-performing funds follow the strategies of the best-performing funds and not just herd into stocks other arbitrarily chosen funds traded in the previous periods.

Table 3. Leader funds do not follow other funds

This table reports the results from the following regression:

$$\Delta W_{i,t}^{best} = \alpha + \gamma \Delta W_{i,t-1}^{other} + \delta W_{i,t-1}^{best} + \sum_{\tau=0}^T \beta_{\tau}^R R_{i,t-1} + \sum_{\tau=0}^T \beta_{\tau}^V V_{i,t-1} + \varepsilon_{i,t},$$

where  $\Delta W_{i,t}^{other}$  is portfolio weight changes, measured between the end of months  $t - 1$  and  $t$  and averaged over follower funds. The explanatory variable  $\Delta W_{i,t-1}^{best}$  is portfolio weight changes, measured between the end of months  $t-2$  and  $t-1$  and averaged over leader funds.  $W_{i,t-1}^{other}$  is lagged portfolio weights, averaged over follower funds. Other explanatory variables include returns and turnover. Coefficient estimates are from the Fama-MacBeth procedure; Newey-West corrected t-statistics are in parentheses.



Intercept	Three-month		Six-month		One-year	
	coefficients	p-value	coefficients	p-value	coefficients	p-value
	0.0086	0.2478	0.0046	0.5810	0.0116	0.1438
$W_{i,t-1}^{other}$	-0.1685	0.0000	-0.1182	0.0000	-0.1757	0.0000
$\Delta W_{i,t-1}^{best}$	-0.0469	0.0000	-0.0699	0.0000	-0.0369	0.0000
$R_{i,t}$	0.0047	0.0000	0.0046	0.0000	0.0049	0.0000
$R_{i,t-1}$	-0.0003	0.0352	-0.0005	0.0252	-0.0004	0.0713
$R_{i,t-2}$	-0.0006	0.0104	-0.0005	0.0114	-0.0007	0.0011
$R_{i,t-3}$	-0.0003	0.0090	-0.0004	0.0316	-0.0005	0.0040
$V_{i,t}$	0.0011	0.0066	0.0014	0.0000	0.0008	0.0080
$V_{i,t-1}$	-0.0012	0.0020	-0.0015	0.0000	-0.0010	0.0036
$V_{i,t-2}$	0.0001	0.6758	-0.0001	0.7671	0.0002	0.6339
$V_{i,t-3}$	-0.0008	0.0055	-0.0009	0.0075	-0.0011	0.0005

## 2. Performance of mimicking the best funds' portfolio strategies

The previous section provides evidence that funds pay attention to what their best-performing funds are doing and use the information in making portfolio decisions. A number of empirical studies have demonstrated that the relative performance of mutual funds persists. For example, Lehmann and Modest (1987), Hendricks, Patel and Zeckhauser (1993), Goetzmann and Ibbotson (1994), Brown and Goetzmann (1995) and Elton et al. (1996) have found evidence on fund performance persistence over periods as short as one year. Bollen and Busse (2005) focus on a relatively short measurement period of three months, and provide evidence regarding short-term persistence. In particular, the top fund managers exhibit short-term stock selection and market timing ability, they suffer from perverse factor timing over a longer horizon. These studies lend support to the convention wisdom that the track record of a fund manager contains information about future performance. However, Grinblatt, Titman, and Wermers (1995) and Carhart (1997) argue that the superior performance of top funds is a result of the momentum effect of Jegadeesh and Titman (1993). Motivated by these researches, a natural

question that arises here is whether this behavior is profitable. Intuitively, if the superior performance of top funds is a result of the momentum effect, the strategy of following the leaders will be unprofitable. Even the leaders have any information edge, if it is very short-term, following the leaders will not be beneficial. Only when the leaders have long-term information edge, it is possible to profit from this mimicking strategy.

To investigate this issue, we construct a portfolio strategy based on the best funds' trades and study its performance. In particular, at the end of each month, stocks are ranked according to the best fund weight changes. Five value-weighted quintile-based portfolios are then formed based on this sort. We then calculate the subsequent three-month returns of these portfolios. Table 4 reports the three-month cumulative returns of these five portfolios. For the case that the best funds are formed based on past three-month and one-year returns, the returns on the fourth portfolio (corresponding to the second-highest weight changes) are the highest. As for the six-month evaluation period, it is the fifth portfolio that provides the highest returns. The first portfolio (the fifth portfolio) yields average returns that are the lowest for three-month and six-month (one-year) definitions.

Table 4. Monthly performance of leader-fund based portfolios

At the end of each month, stocks are ranked on the leaders' weight changes ( $\Delta W_{j,t}^{best}$ ), where leaders are funds with returns in the top 10%. The ranked stocks are split into five portfolios. Lowest and highest denote the portfolios with the lowest and highest changes in portfolio weights. The subsequent three-month returns are calculated. The first portfolio corresponds to the lowest weight changes, and the fifth portfolio corresponds to the highest weight changes. \* and \*\* denote significance at the 10% and 5% levels, respectively.

Portfolio	1 (lowest)	2	3 (medium)	4	5 (highest)	5-1
Panel A: The best funds are defined based on prior three-month returns						
Avg. returns	3.2828	4.5585	3.9898	5.2929	3.7596	0.4768

Table 4 (cont.). Monthly performance of leader-fund based portfolios

Portfolio	1 (lowest)	2	3 (medium)	4	5 (highest)	5-1
t-value	0.8731	1.4151	1.1992	1.6305	1.3730	0.1025
Market-adjusted returns	1.0925	2.4468	1.8140	3.0463	1.4680	0.3683
t-value	0.5614	1.2051	0.8319	1.6348	1.0368	0.1560
Panel B: The best funds are defined based on prior six-month returns						
Avg. returns	2.2972	2.8070	3.9420	2.7704	6.1219	3.8246
t-value	4.2161**	5.1044**	7.5357**	5.1813**	10.0088**	0.7382
Market-adjusted returns	1.2223	1.7420	2.9123	1.8907	4.9814	3.7591
t-value	3.8194**	5.5981**	10.0350**	7.5136**	13.7653**	1.2304
Panel C: The best funds are defined based on prior one-year returns						
Avg. returns	3.4758	5.4093	3.5578	5.6560	2.9110	-0.5648
t-value	0.9540	1.4685	1.1163	1.5694	0.9248	-0.1183
Market-adjusted returns	1.5963	3.5318	1.6703	3.7680	1.0173	-0.5790
t-value	0.9108	1.9049 <sup>†</sup>	1.0365	2.5125 <sup>†</sup>	0.7390	-0.2596

The last column shows the performance of the long fifth-short first spread portfolio, which long stocks with the highest best-fund weight changes and short stocks with the lowest best-fund weight changes. This zero-investment portfolio earns average returns of 0.4768%, 3.8246%, -0.5648% per month for the best funds formed based on prior three-month, six-month, and one-year performance, respectively. All the return differences between the fifth portfolio and the first portfolio are insignificant. Hence, the strategy of mimicking the best funds fails to make profits. This is similar to Bikhchandani and Sharma (2001) that the information-based herding lasts only for a short time and quickly disappears. The reason is that as funds invest in the stocks previously traded by leaders, they move their prices because of temporary liquidity shortages, which thereby reduces the profitability of this strategy that long stocks are held by the best funds and short stocks are sold by the best funds.

In addition, the average returns for each long fifth-short first spread portfolio in the case of three- and six-month measurement periods are significantly positive. But it becomes insignificant when the evaluation period is extended to one year. This reveals that some of the performance of these five portfolios is attributable to momentum; therefore the

portfolio performance deteriorates when the forming periods are extended to one year. This confirms Blake, Elton, and Gruber (1993) and Daniel, Grinblatt, Titman and Wermers (1997), who argue that most of this performance persistence is not due to managerial ability, but due to factors such as momentum in stock prices. Therefore, it's not a profitable strategy to follow the trading behavior of the leaders.

### Conclusion

This paper provides evidence of cross-autocorrelations between the trades of the best-performing mutual funds and those of the worse performing mutual funds. That is, funds "follow the leaders". Specifically, the trades of the best funds have a significant effect on the determinants of subsequent portfolio decisions of the remaining fund managers. On the contrary, the best funds tend to avoid the stocks previously held by the worse performing funds. The portfolio strategy that long stocks are held by the best funds and short ones are sold by the best funds fails to provide significantly positive returns. This evidence is consistent with the view that the leaders have a short-term information edge, and following the leaders may not be beneficial.

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