ELSEVIER

Journal of Economics and Business 56 (2004) 331–346

Journal of Economics & Business

# The value of active portfolio management

Ravi Shukla*

*Finance Department, Martin J. Whitman School of Management, Syracuse University, Syracuse, NY 13244-2130, USA*

Received in revised form 8 January 2004; accepted 31 January 2004

**Abstract**

We calculate the value of interim portfolio revision, an integral component of active management of mutual funds by comparing the returns on actively managed mutual fund portfolios with the returns the fund portfolios would have earned had there been no interim revision. The results show that, on an average, excess returns from interim portfolio revision do not cover the incremental trading costs, even over holding periods as long as 6 months. Across mutual funds, we find evidence of a positive relationship between the excess returns and mutual fund expense ratios suggesting that those managers who generate higher excess returns charge higher fees from the stockholders.


*JEL classification:* G23; G11; G12

*Keywords:* Mutual funds; Performance evaluation; Portfolio management

## 1. Introduction

Actively managed mutual funds attempt to add value to their shareholders in two ways: (a) selecting a portfolio of securities expected to provide a superior risk-return trade-off; and (b) monitoring and revising their portfolios continuously in response to the market conditions. Mutual fund managers claim to have skills in both these departments that enable them to provide higher returns to their shareholders compared to other mutual funds or benchmarks such as the S&P 500 index. Active management is expensive and would benefit the shareholders only if the excess returns on actively managed portfolios are larger than the incremental cost incurred by the shareholders.

* Tel.: +1-315-443-3576; fax: +1-315-443-5457.
*E-mail address:* rkshukla@syr.edu (R. Shukla).

0148-6195/$ – see front matter © 2004 Elsevier Inc. All rights reserved.
doi:10.1016/j.jeconbus.2004.01.002

Academic finance literature is full of studies that attempt to measure and analyze the performance of active portfolio management. Shukla and Trzcinka (1992) review the literature on performance evaluation and conclude that active management does not provide a net benefit to the investors. Recent research, however, has provided mixed evidence on this issue. Keim (1999) finds that the '9–10 Fund' from Dimensional Fund Advisors provided a 2.2% annual premium over the CRSP 9–10 Index on which the fund is based. He concludes that investment strategy and trading rules components of the fund's design contributed to this premium. Chen, Jegadeesh, and Wermers (2000) show that stocks purchased by mutual funds outperform the stocks sold by them, and that funds that have higher turnover also have better stock selection skills. Wermers (2000) compares the returns earned by the stocks in the mutual fund portfolios to the expense ratios and transaction costs and concludes that funds pick stocks well enough to cover their costs. Weigand, Belden, and Zwirlein (2003), on the other hand, find that stocks weighted heavily in mutual funds significantly underperform those weighted lightly. Furthermore, Day, Wang, and Xu (2001) conclude that the portfolio weights for stocks selected by the mutual fund managers are generally inefficient.

Conclusions of performance evaluation literature are based primarily on the risk-adjusted measures calculated using returns reported by mutual funds. Calculating risk-adjusted performance measures is subject to numerous pitfalls. As summarized in Grinblatt and Titman (1989b), these problems may be attributed to the inappropriateness of the benchmark and the managers' effort to time the market, which alters the linear relationship between the fund and the benchmark returns. Using simulation, Kothari and Warner (2001) conclude that traditional portfolio performance measures may not be able to detect abnormal performance. They argue that portfolio composition based measures have significantly higher power. Cornell (1979) proposed a performance evaluation methodology that is based solely on portfolio composition and is not subject to many of the pitfalls associated with benchmarks. Cornell's methodology assesses selectivity skills of fund managers by determining whether fund managers place high weights on securities that provide positive abnormal returns during the holding period relative to some "normal" period. Cornell's methodology found only a limited application because of the lack of availability of portfolio composition data. Mutual funds are required to report their portfolios twice a year though many mutual funds report their portfolio compositions on a quarterly basis. Only recently have these data been available in a machine-readable form.

Grinblatt and Titman, in a series of papers, have used portfolio-based measures of performance. In Grinblatt and Titman (1989a), they calculate a time series of hypothetical returns for mutual funds as the weighted average return on the CRSP-listed equity portion of the portfolio. Then they estimate the total transaction costs incurred by the mutual fund investors as the difference between the Jensen measures for the hypothetical portfolio returns and actual returns realized by the mutual fund shareholders. The total transaction costs consist of the expenses charged by the fund plus the trading costs associated with active portfolio management which are not explicitly charged but are reflected in the return of the actively managed mutual fund portfolio. In Grinblatt and Titman (1993), they propose a portfolio change measure for performance evaluation. This measure is based on the relationship between the portfolio weights and the ensuing returns on the securities: an informed manager will increase weights on securities that perform well subsequently and decrease weights on securities that perform poorly. Consequently, a positive covariance

between portfolio weights and security returns is an indicator of superior selectivity. Ferson and Khang (2002) extend Grinblatt and Titman's portfolio change measure to incorporate the situations where the fund manager's decisions about portfolio weights are conditioned on prior information related to the security returns.

Grinblatt and Titman's unconditional as well as Ferson and Khang's conditional weight based measures do not fully incorporate the effect of interim trading between the two portfolio composition dates and may give biased estimates of performance if there is excessive interim trading in the portfolio (Ferson & Khang (2002), p. 255). It is generally acknowledged that mutual fund portfolios trade frequently. In fact, for many fund managers, trading is a sign of active management. Trading causes high turnover in the mutual fund portfolios. For example, the average turnover rate for 2,315 actively managed U.S. equity mutual funds covered in Morningstar Principia's July 2003 database is 103%. While not an indisputable evidence of frequent trading, such a high turnover would usually result from frequent revisions of mutual fund portfolios.

The objective of this study is to measure the value of these interim portfolio revisions. Regardless of the fees charged for active management, interim revisions would add value to mutual fund shareholders only if the return on a frequently revised portfolio, net of the added trading costs, is higher than the return on the unrevised portfolio. We calculate the excess return attributable to portfolio revision as the difference between the actual return on the portfolio and the buy-and-hold return, i.e., the return that would have been earned had the portfolio not been revised. Results show that the average excess return is not significantly different from zero, even for holding periods as long as 6 months. This means that mutual fund shareholders are not getting any return for the expenses associated with the frequent portfolio revision component of active management. There is a high degree of variation in the fund managers' ability to produce excess portfolio returns, and some mutual funds do produce positive excess returns. Higher excess returns, however, are associated with higher expense ratios. As a result, the beneficiaries of higher excess returns, if any, are the mutual fund managers rather than the shareholders.

The rest of the paper is organized as follows: in the next section, we provide a formal definition of the excess return we use to measure the value of portfolio revisions. Sections 3 and 4 describe the data and methodology. Section 5 describes the results of the analysis. Section 6 concludes the paper.

## 2. Measuring the excess return due to portfolio revision

Let $r_r^a$ be the reported return on an actively managed mutual fund during a holding period. This is the return mutual fund shareholders earn on their investments. The reported return is net of the expenses charged by the mutual fund. Therefore, the return on the fund portfolio before expenses are subtracted ($r_a^p$) can be written as:[1]

$$r_a^p = r_a^r + e_a, \tag{1}$$

[1] For ease of exposition, we ignore compounding here but the actual calculation of excess return is based on the compound interest principles as shown in Eq. (8).

where $e_a$ is the expense ratio of the mutual fund over the holding period. The expense ratio includes management fee (portfolio advisory fees), administrative fees, and distribution and marketing fees, but does not include the trading costs associated with buying and selling of securities (U.S. Securities and Exchange Commission (2000)). The trading costs are absorbed into the portfolio return even before the expenses are subtracted from it. Therefore, the portfolio return $r_a^p$ is net of the trading costs associated with the portfolio. Denoting the trading costs associated with the actively managed portfolio as $t_a$, and the gross return on the portfolio (before subtracting the transaction costs) as $r_a^g$, we can write the return on the actively managed portfolio net of trading costs as:

$$r_a^p = r_a^g - t_a. \tag{2}$$

If there were no portfolio revision during the holding period, i.e., once created the portfolio weights were held unchanged during the holding period, the portfolio's gross return would be $r_p^g = \sum x_i r_i$ where $x_i$'s are portfolio weights at the beginning of the holding period and $r_i$'s are the security returns during the holding period. The return on the passive portfolio net of its trading costs can be written along the lines of Eq. (2) as:

$$r_p^p = r_p^g - t_p. \tag{3}$$

Furthermore, if the expense ratio for the passively held fund were $e_p$, the reported return on the passive portfolio would be:

$$r_p^r = r_p^p - e_p. \tag{4}$$

The excess return on the actively managed portfolio due to interim revision is the difference between the returns on the actively managed and the passively held portfolios:

$$\mathrm{er}^p \begin{cases} = r_p^a - r_p^p, \\ = (r_a^g - t_a) - (r_p^g - t_p), \\ = (r_a^g - r_g^p) - (t_a - t_p). \end{cases} \tag{5}$$

This excess return measures the increase in the portfolio return due to interim revision less the incremental trading costs associated with the revision, and is the focus of this paper. The benefit of portfolio revision to the mutual fund shareholders is the difference between the corresponding reported returns:

$$\mathrm{er}^r = r_a^r - r_p^r \cong (r_a^p - r_p^p) - (e_a - e_p), \tag{6}$$

which is the excess return on the actively managed mutual fund portfolio less the extra expenses (management fee) charged for monitoring and revising the portfolio.

Using the observable returns and expenses, the excess return on the portfolio may be written as:

$$\mathrm{er}^p \begin{cases} = r_a^p - r_p^p, \\ = (r_a^r + e_a) - (r_p^g - t_p), \\ = (r_a^r + e_a - r_p^g) + t_p, \\ = (r_a^r + e_a - \sum x_i r_i) + t_p, \\ \cong (r_a^r + e_a - \sum x_i r_i). \end{cases} \tag{7}$$

The last step leading to Eq. (7) requires the assumption that the trading costs associated with the passive portfolio are negligible. While it is not possible to estimate these costs precisely since a passively managed fund is a theoretical construct, it is reasonable to assume that the trading costs for a passive fund will be comparable to that of an index fund. Wermers (2000) reports that the transaction costs for Vanguard Index 500 Fund averaged 0.03% per year or 0.0025% per month during 1990–1994. Also, Wermers (2000) as well as Chalmers, Edelen, and Kadlec (2001) report a downward trend in the transaction costs during the 1990s. This means that the average transaction costs for a passive fund would likely be lower in our sample that spans the late 1990s and the early 2000s.

To actually calculate the excess return, $\mathrm{er}^p$, we use the following compound interest counterpart to Eq. (7):

$$\mathrm{er}^p = \frac{(1 + r_a^r)(1 + e_a)}{(1 + \sum x_i r_i)} - 1. \tag{8}$$

The performance evaluation literature, for the most part, has focused on measuring the benefit of active management to the mutual fund shareholders calculated in Eq. (6). This quantity is not measurable in our framework since the expense ratio of a passively managed portfolio is unobservable. Furthermore, we are only measuring the impact of frequent revision of a mutual fund portfolio, while the literature on performance evaluation measures the impact of all aspects of active management.

Our interest in this paper is to answer a more fundamental question: Does frequent revision of the mutual fund portfolio generate excess portfolio returns net of the increased trading costs (as measured by Eq. (8))? Only if this excess return is positive, can the mutual fund provide its shareholders some value by charging them a fraction of this excess return as a fee.

The portfolio excess return calculated in Eq. (8) may be contaminated by differences in the risks of the original portfolio and the rebalanced portfolio. Unlike the traditional performance evaluation literature, which uses an external portfolio as the benchmark, we use the initial mutual fund composition as the benchmark. Over time, as the portfolio is rebalanced, the risk of the rebalanced portfolio may deviate substantially from the original portfolio. There is a fair amount of empirical evidence that mutual fund managers attempt to unsuccessfully time the market by changing the risk of their portfolios over time (see Chang & Lewellen (1984) and Henriksson (1984) for example). To keep the divergence between risk of the original and the rebalanced portfolios to the minimum, the holding period would be kept relatively short.

## 3. Data

Our data comes from two sources: Portfolio compositions and reported returns for mutual funds are taken from Morningstar Principia CD-ROMs and security returns are taken from the Center for Research in Security Prices (CRSP) monthly returns file. Our collection of quarterly updated Morningstar Principia CD-ROMs begins in April 1995. Using the various Principia CD-ROMs, we create a database of portfolio snapshots for actively managed distinct funds. A portfolio snapshot is defined as the portfolio composition for a mutual fund on a particular date. So, the March 31, 1997 and June 30, 1997 portfolios of Acorn

USA funds constitute two different portfolio snapshots. By distinct, we mean that if a fund has multiple share classes, only one of those share classes is included in the sample. Since expense ratio is needed to calculate the excess returns on the mutual fund portfolios, we eliminate those snapshots for which expense ratio is not available in a nearby release of Morningstar Principia. We also restrict our sample to fund portfolio snapshots consisting of at least 10 securities and portfolio dates at the end of the month.[2]

The securities in the portfolio snapshots are matched with the stocks in the CRSP database.[3] Only those portfolio snapshots where all the holdings are successfully matched with CRSP stocks are used for further analysis.[4] Other studies that use portfolio composition to calculate the passive portfolio return (Grinblatt & Titman (1989a) and Chalmers et al. (2001)) use only the returns on the subset of securities that are identified in the CRSP database. The cash position in the portfolio is assumed to earn the rate of return on the 90-day U.S. Treasury bill.

## 4. Sample description

The sample consists of 1117 portfolio snapshots of 458 mutual funds. Fig. 1 shows that portfolios snapshots are distributed over 81 dates between August 1995 and November 2002. Almost 50% of the portfolio snapshots fall at the end of the quarters (March, June, September and December).

Table 1 shows some descriptive statistics for the sample. Panel A shows the distribution of portfolio snapshots by mutual funds. Of the 458 funds, 222 appear only once in the sample, 94 funds have two snapshots, 45 funds have three, etc. Panel B shows that a wide range of fund objectives are included in the sample. The majority of snapshots, however, are concentrated in Growth, Growth and Income, and Small Company. The Specialty category is an aggregate of various specialty objectives viz., Communications, Financial, Health, Natural Resources, Real Estate, Technology, Utilities and Unaligned.

Table 2 shows selected attributes of the sample. The first four attributes are calculated from the portfolio composition. The last two attributes are obtained from the quarterly release of Morningstar Principia nearest to the snapshot date. TMV is the total market value, in millions of dollars, of the stocks and cash in the portfolio. It is calculated using the market values of stocks reported in the portfolio composition. Our sample represents a wide range of mutual funds from as small as US$ 0.09 million in assets to over US$ 8 billion. NSec is the number of stocks in the portfolios. The number of stocks ranges from the restricted minimum of 10–254 with the average being around 40. StockWt is the total

[2] The requirement on the number of securities reduces the sample size by 1.5%, but eliminates many portfolios with extremely high or low returns which otherwise distort the results of the study. The end of the month requirement makes it convenient to use the monthly CRSP returns data. Since most funds report their portfolios at the end of the month, there was no noticeable attrition of sample due to this requirement.

[3] The security matching process ballooned into a time consuming and labor intensive project, which resulted in the creation of a database table linking Morningstar holdings with CRSP PERMNOs.

[4] We are quite certain of our matches as a security was considered to be matched not only if its name, ticker, and share class matched between the two databases, but also the prices on the portfolio snapshot date are within 2% of each other.

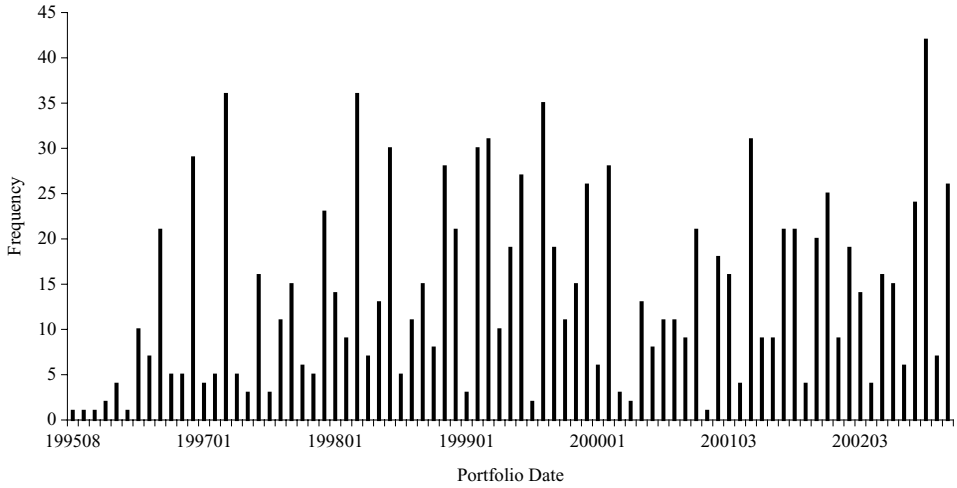


Fig. 1. Frequency distribution of the dates of mutual fund portfolio snapshots.

weight of stocks in the portfolio. On an average, stocks account for 93% of the portfolio. Top10Wt, the weight of top 10 stocks in the portfolio, a measure of portfolio concentration, averages at 42%. The median expense ratio (Exp.) of 1.30% per year is representative of the mutual fund industry. Turnover is a measure of the trading activity in the portfolio. For some funds, the turnover is missing in Morningstar Principia and that explains the smaller $N$ in that column. The median turnover in our sample is 49% though the sample includes funds with significantly higher levels of turnover.

## 5. Results

We calculate portfolio excess returns net of transaction costs ($\mathrm{er}^p$) as shown in Eq. (8) using the compositions of the portfolio snapshots, security returns, reported mutual fund returns and expense ratios. For holding periods longer than 1 month, security returns are first compounded to calculate holding period returns and then multiplied by the portfolio weights to obtain the passive return ($r_p^p$) for the holding period. Similarly, reported monthly mutual fund returns ($r_a^r$) are compounded to obtain the holding period return. Returns for all holding periods are converted to monthly units for comparability across the various holding periods. The excess return is then calculated by applying Eq. (8) to the holding period returns expressed in the monthly units.

### 5.1. One-month holding period

Fig. 2 shows the histogram for the excess return for a 1-month holding period. The distribution is centered on zero and the tails of the distribution are fat because of a small number of funds that earned extremely high or low excess returns.

Table 1
Details of the mutual fund portfolio snapshots. This table shows the descriptive details of the sample of mutual fund portfolios snapshots. Panel A shows the number of repeated snapshots by mutual funds and Panel B the number of snapshots for various prospectus-stated objectives

| Funds | Snapshots |
|---|---|
| Panel A: snapshots by funds | |
| 222 | 1 |
| 94 | 2 |
| 45 | 3 |
| 31 | 4 |
| 21 | 5 |
| 19 | 6 |
| 7 | 7 |
| 7 | 8 |
| 4 | 9 |
| 2 | 10 |
| 4 | 11 |
| 2 | 12 |
| 458 | |
| Objective | |
| Panel B: stated objectives | |
| Aggressive Growth | 36 |
| Asset Allocation | 12 |
| Balanced | 12 |
| Equity Income | 33 |
| Growth | 626 |
| Growth and Income | 118 |
| Small Company | 122 |
| Specialty | 158 |
| | 1117 |

Table 2
Attributes of the mutual fund portfolio snapshots. This table shows selected attributes of the portfolios snapshots in the sample. TMV is the total market value of the fund in millions of dollars. NSec is the number of securities in the portfolio, StockWt is the total weight of the stocks in the portfolio, Top10Wt is the weight of the top 10 securities in the portfolio. Exp. and Turnover, expressed in % per year, are the expense ratio and turnover, respectively

| | TMV | NSec | SumWt | Top10Wt | Exp. | Turnover |
|---|---|---|---|---|---|---|
| *N* | 1117 | 1117 | 1117 | 1117 | 1117 | 994 |
| Maximum | 8108.12 | 254 | 100.00% | 98.10% | 7.34% | 3243.00% |
| Minimum | 0.09 | 10 | 34.70% | 10.20% | 0.10% | 0.00% |
| Median | 57.67 | 38.00 | 96.00% | 39.50% | 1.30% | 49.00% |
| Average | 187.65 | 41.51 | 93.53% | 41.80% | 1.35% | 89.63% |
| S.D. | 489.06 | 21.01 | 8.44% | 13.63% | 0.48% | 208.46% |

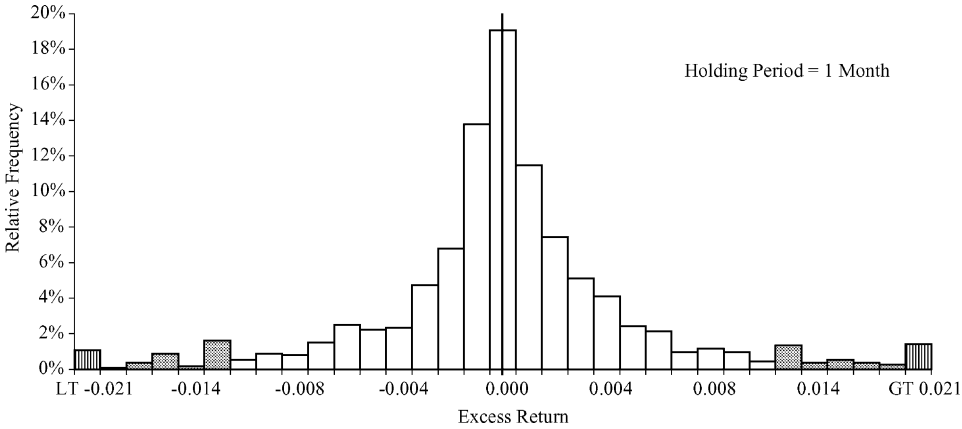


Fig. 2. Frequency distribution of 1-month excess return. This histogram shows the frequency distribution of excess return for a 1-month holding period. The histogram uses three different scales to capture the entire range of values: In the mid range (between −0.01 and +0.01, indicated by no shading), an interval of 0.001 is used. In the outer range (between −0.021 and −0.01 and between +0.01 and +0.021 indicated by the light shading), an interval of 0.002 is used. The two outermost bars cover the remaining values.

Table 3 shows the statistical summary for excess returns for the 1-month holding period. The results are reported in two columns. The first column shows the statistics for the full sample, which, as we saw in the histogram in Fig. 2, includes some outliers. The second column reports the statistics for a trimmed sample that excludes the portfolio snapshots that comprise 5% extreme values of excess returns (2.5% at each end). The kurtosis of the full sample is unusually large at 20.16 while that of the trimmed sample is much closer to the 3, the kurtosis for a normal distribution. In the rest of the paper, we report the results from trimmed samples.

Table 3
Statistics for 1-month excess return. This table shows the statistics for excess return ($er^p$) for the mutual fund portfolio snapshots in the sample

| | Full sample | Trimmed sample |
|---|---|---|
| *N* | 1117 | 1063 |
| Maximum | 0.0528 | 0.0151 |
| Minimum | −0.0718 | −0.0143 |
| Positive | 49.78% | 49.76% |
| Median | 0.0000 | 0.0000 |
| Average | 0.0001 | 0.0001 |
| S.D. | 0.007614 | 0.004119 |
| Skewness | −0.08 | 0.04 |
| Kurtosis | 20.16 | 2.07 |
| S.E. | | 0.000123 |
| *t* | | 0.55 |
| *P* | | 0.29 |

Excess returns are positive for 49.76% of portfolios. There is large variability in the excess returns across the sample with the range being almost 3% per month. The median and average excess returns, however, are zero. The *t*-test on the average excess return fails to reject the hypothesis of zero average excess return. The *P*-values reported in this table and throughout the paper are for one-tailed tests since the hypothesis to be tested is that the excess return is positive.

The result of zero average excess return suggests that portfolio revision does generate extra return, but all of it is wiped out by the incremental trading costs. The portfolio return, on an average, would not be any different if the managers had left their portfolios alone. Since mutual funds charge their shareholders a fee for this activity in the form of a higher expense ratio, the shareholders pay the price without getting anything in return. These findings are consistent with Chalmers et al. (2001) who find that the average trading costs for mutual funds are not recovered by the funds through higher gross returns on their portfolios.

### *5.2. Longer holding periods*

To investigate the possibility that portfolio revisions made by the fund managers might be strategic and yield results in the long run rather than in the 1-month holding period examined above, we extend the excess return calculation process to longer holding periods of up to 6 months. We do not consider it appropriate to extend the holding period beyond 6 months since the excess return calculation is based on the assumption that the risk of actively managed portfolio is equal to that of the passively held portfolio and this assumption is not likely to be valid for longer holding periods.

Fig. 3 shows the frequency distribution for the excess returns for longer holding period. To conserve space, we only show the graphs for 3- and 6-month holding periods. The histograms for other holding periods are virtually identical to the ones shown here: symmetrically distributed around zero. The range of excess returns does not change as with the holding period.

Table 4 shows the statistics for the excess returns for the longer holding periods. It is immediately noticeable that as the holding period increases, the sample size drops. This is due to the unavailability of either the reported mutual fund return or because the passive return could not be calculated because the returns on one or more securities in the portfolio are unavailable. Detailed examination of the data reveals that 80% of the cases dropped are because the CRSP database does not have returns for at least one of the stocks in the portfolio. Less than 3% of the cases excluded are because the fund ceased to exist. In 17% of the cases, the fund ceased to exist as well as the return for one of the stocks is unavailable. Almost all of the cases where the fund ceased to exist, however, are near the end of our data period (November 2002), and therefore do not indicate the disappearance of the fund. Based on these statistics, we are quite confident that our long-term results do not suffer from a significant survivorship bias in the sense that long-term results for a large number of funds are unavailable because they ceased to exist due to poor performance.

As we go to longer holding periods, the median and average excess returns become negative. The average excess returns for holding periods of 5 and 6 months are negative and statistically significant. This means that on an average, unrevised portfolio would have

Table 4
Excess returns for a holding periods of various lengths. This table shows the statistics for excess returns of all snapshots for holding periods of various lengths

| | Holding period (months) | | | | | | Trend |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | |
| *N* | 1063 | 948 | 838 | 707 | 600 | 520 | 520 |
| Maximum | 0.0151 | 0.0154 | 0.0125 | 0.0132 | 0.0137 | 0.0131 | 0.0070 |
| Minimum | −0.0143 | −0.0154 | −0.0150 | −0.0173 | −0.0160 | −0.0165 | −0.0085 |
| Positive | 49.76% | 52.74% | 48.93% | 48.94% | 48.67% | 45.96% | 47.69% |
| Median | 0.0000 | 0.0001 | −0.0001 | −0.0001 | −0.0001 | −0.0002 | −0.0001 |
| Average | 0.0001 | 0.0002 | 0.0000 | −0.0002 | −0.0003 | −0.0005 | −0.0001 |
| S.D. | 0.004119 | 0.004068 | 0.004058 | 0.004083 | 0.004215 | 0.004259 | 0.001393 |
| S.E. | 0.000123 | 0.000129 | 0.000137 | 0.000150 | 0.000168 | 0.000182 | 0.000061 |
| *t* | 0.55 | 1.55 | −0.36 | −1.18 | −1.81 | −2.88 | −1.55 |
| *P* | 0.29 | 0.06 | 0.36 | 0.12 | 0.03 | 0.00 | 0.06 |

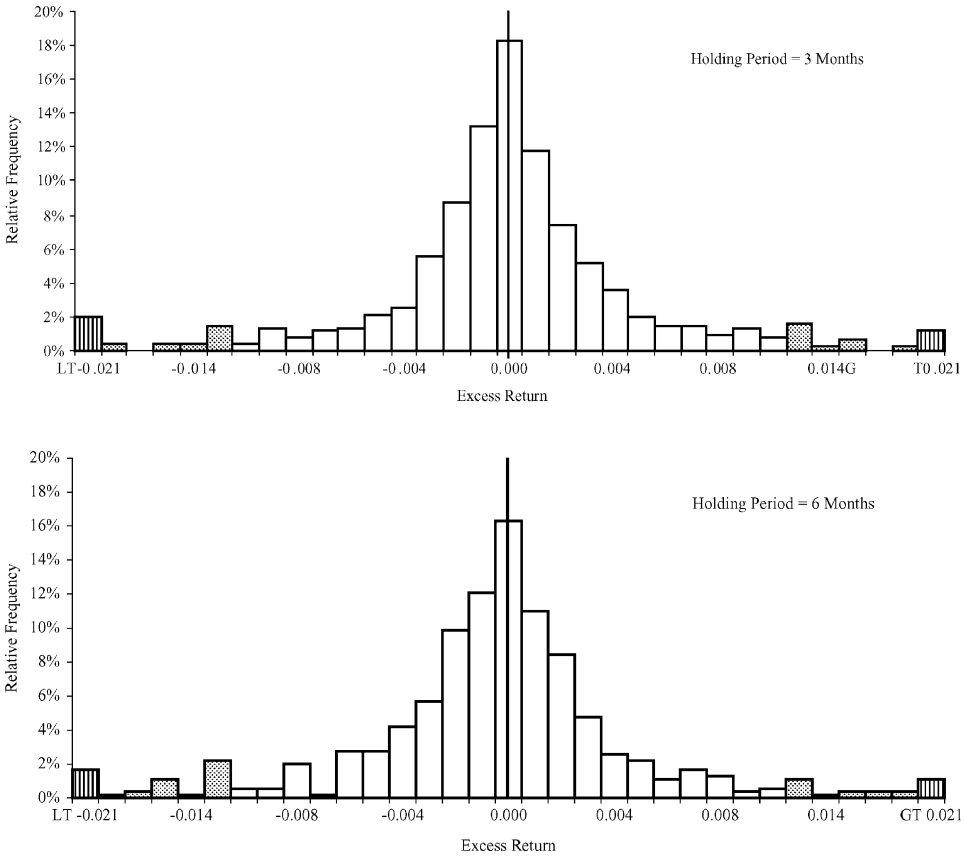


Fig. 3. Frequency distribution of excess returns for various holding periods.

performed better than the actively managed portfolios even as far into the future as 6 months, and the longer the holding period, the more statistically significant this phenomenon becomes. The last column, labeled Trend, shows the statistics for trend in excess return for the 520 snapshots for which holding period returns could be calculated for each holding period. The statistics for Trend confirm our conclusion from the average excess returns for various holding periods: The trend is negative with a *P*-value of 0.06 (one-tailed test).

The long-term holding period results go against the basic principle of portfolio management that an efficient portfolio left unrevised will become inefficient in the long run. Even if the initial fund portfolio is not efficient (see Day, Wang, & Xu (2001)), portfolio revision by informed managers should improve the performance of the fund. Our results show that portfolio revision actually hurts the returns compared to a buy-and-hold strategy in the long run.

The trend towards increasingly negative excess returns as the holding period increases is puzzling. The mutual fund industry cannot survive if on an average, the longer mutual funds operate, the more damage they do to their portfolios. We do not have an explanation for this unusual result.

Table 5
Average excess returns for various stated objective groups. This table shows the average excess returns for the portfolio snapshots grouped by their stated objectives. The "Specialty" group is a collection of various specialty objectives

| Objective | Holding period (months) | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| Aggressive growth | −0.0017** | −0.0001 | −0.0005 | −0.0011 | −0.0014 | −0.0016 |
| Asset allocation | −0.0003 | −0.0007 | −0.0004 | −0.0005 | −0.0004 | −0.0014 |
| Balanced | 0.0003 | 0.0001 | −0.0010 | −0.0003 | −0.0002 | −0.0002 |
| Equity income | 0.0001 | −0.0010 | −0.0015** | −0.0016** | −0.0008 | −0.0019** |
| Growth | 0.0002 | 0.0003** | 0.0000 | 0.0001 | −0.0002 | −0.0005** |
| Growth and income | −0.0004 | −0.0003 | 0.0001 | −0.0001 | −0.0002 | −0.0002 |
| Small company | 0.0003 | 0.0008** | −0.0001 | −0.0008 | 0.0003 | −0.0004 |
| Specialty | 0.0000 | 0.0000 | 0.0002 | −0.0002 | −0.0006 | −0.0003 |

** Denotes significance at the 5% level.

### 5.3. *Excess returns and mutual fund attributes*

Table 5 shows the average excess returns for various stated objective groups. The only objective group to ever display positive and statistically significant excess return is Growth. Other than that, every excess return is either not statistically different from zero, or negative. Analysis of variance on the seven main objective groups (Aggressive Growth, Asset Allocation, Balanced, Equity Income, Growth, Growth and Income, and Small Company) shows that the mean excess returns of these objective groups are indistinguishable from each other. These results contradict some previous studies that have reported positive risk-adjusted performance, at the shareholder level, from aggressive growth and growth funds (see, for example, McDonald (1974) and Connor & Korajczyk (1991)).

To study the relationship between 1-month excess returns and mutual fund attributes, snapshots for various funds are aggregated to calculate average excess returns and the attributes for each mutual fund in the sample. The mutual funds are grouped into deciles according to the fund attributes one at a time. We find that the grouping by expense ratio gives the most statistically significant results and these results are reported in Table 6.

There is a positive and statistically significant relationship between expense ratios and excess returns. This is consistent with the argument that in a well functioning market for mutual fund management, managers who are able to earn higher excess returns on the portfolios they manage, would be able to charge higher fees for their services, leaving little net excess return for the mutual fund shareholders. As noted by Gruber (1996) and others, higher fees by skilled portfolio managers would result in no observable relationship between the returns realized by the mutual fund shareholders and the expenses paid by them. The column labeled $r_r^p$ shows the reported returns realized by the mutual fund shareholders, and as we can see from the regression results reported at the bottom of the table, there is no statistically significant relationship between the reported returns and expense ratios.

Table 6 highlights several other patterns as well. Funds that charge higher expenses and earn higher excess returns on their portfolios, have smaller market values, fewer securities, invest less of their capital in stocks, and invest more in their top 10 stocks than funds who do

Table 6
Fund attributes for expense ratio deciles. This table shows the average attributes and average excess returns for the mutual fund deciles sorted by the expense ratios. The bottom part of the table shows the results from regressing the decile average value in that column on the decile average excess returns. For example, based on the first two columns, the regression equation between total market value (TMV) and expense ratio (Exp.) is: $\text{TMV} = 518.84_{(5.44)} - 21108.03_{(-3.23)}\,\text{Exp.}$ $R^2 = 0.57$

| Decile | Exp. (%) | TMV | NSec | SumWt | Top10Wt | $r_r^a$ | $r_p^p$ | $\text{er}^p$ | Turnover |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.69 | 429.87 | 53.65 | 0.94 | 0.38 | 0.001932 | 0.002501 | −0.000046 | 72.49 |
| 2 | 0.96 | 322.01 | 54.31 | 0.95 | 0.37 | 0.014881 | 0.015672 | 0.000027 | 90.38 |
| 3 | 1.06 | 486.74 | 49.61 | 0.93 | 0.35 | 0.007707 | 0.008795 | −0.000196 | 65.66 |
| 4 | 1.17 | 163.14 | 47.49 | 0.95 | 0.37 | 0.015899 | 0.016591 | 0.000315 | 69.42 |
| 5 | 1.26 | 152.98 | 44.03 | 0.93 | 0.39 | 0.015040 | 0.016252 | −0.000168 | 78.94 |
| 6 | 1.35 | 221.78 | 44.77 | 0.94 | 0.41 | 0.009706 | 0.011439 | −0.000573 | 82.64 |
| 7 | 1.45 | 182.37 | 40.32 | 0.94 | 0.43 | 0.014057 | 0.015312 | −0.000007 | 164.82 |
| 8 | 1.56 | 136.14 | 42.74 | 0.94 | 0.42 | 0.005349 | 0.006365 | 0.000252 | 145.35 |
| 9 | 1.83 | 92.36 | 40.17 | 0.92 | 0.42 | 0.021898 | 0.023458 | −0.000021 | 122.65 |
| 10 | 2.46 | 88.43 | 40.76 | 0.91 | 0.42 | 0.007857 | 0.008958 | 0.001001 | 101.33 |
| Intercept | | 518.84 (5.44)** | 57.72 (17.99)** | 0.96 (112.03)** | 0.34 (16.61)** | 0.008434 (1.39) | 0.009066 (1.46) | −0.000671 (−2.03)** | 57.14 (1.80) |
| Slope | | −21108.03 (−3.23)** | −865.32 (−3.93)** | −1.86 (−3.16)** | 4.28 (3.08)** | 0.217329 (0.52) | 0.251345 (0.59) | 0.052855 (2.34)** | 3060.40 (1.41) |
| $R^2$ | | 0.57 | 0.66 | 0.55 | 0.54 | 0.03 | 0.04 | 0.41 | 0.20 |

** Denotes significance at the 5% level.

not generate high excess returns. While these funds also have generally higher turnover, the relationship between turnover and excess returns is not statistically significant. Specifically, the highest turnover occurs not in the highest deciles but close to the mid-deciles. Table 6 also shows that the passive return ($r_p^p$) on the portfolios of best performers would not be high. Interim rebalancing by the fund managers is instrumental in the high excess returns these funds generate.

## 6. Conclusion

We find that interim revision of a mutual fund portfolio, on average, does not generate an excess return net of the trading costs. Surprisingly, this is true even for holding periods as long as 6 months. There is a wide dispersion in the portfolio excess returns across mutual funds and some funds do produce large positive excess returns. Funds that generate the highest excess returns have small and more concentrated portfolios, and do not have the highest turnover. Furthermore, there is a positive relationship between excess returns and expense ratios, suggesting that fund managers who are able to generate higher excess return on their portfolios charge higher fees from their shareholders. Our results suggest, therefore, that the benefits of active management do not go to the mutual fund shareholders.

## Acknowledgments

I am grateful for helpful comments from Amber Anand, Fernando Diz, Thomas Finucane, David Harris, Kenneth Kopecky and participants at the Finance Workshop at Syracuse University. The paper has also benefited from the presentation at the Eastern Finance Meetings Association Meetings in 2000. This work was partly supported by a research grant from the School of Management, Syracuse University.

## References

Chalmers, J. M. R., Edelen, R. M., & Kadlec, G. B. (2001). Fund returns and trading expenses: Evidence on the value of active fund management. Unpublished manuscript. http://lcb1.uoregon.edu/jchalmer/Research/cek1_jb_v1.pdf.

Chang, E. C. & Lewellen, W. G. (1984). Market timing and mutual fund investment performance. *Journal of Business, 57*(1), Part 1, 57–72.

Chen, H.-L., Jegadeesh, N., & Wermers, R. (2000, September). The value of active mutual fund management: An examination of the stockholdings and trades of fund managers. *Journal of Financial and Quantitative Analysis, 35*(3), 343–368.

Connor, G., & Korajczyk, R. A. (1991). The attributes, behavior and performance of US mutual funds. *Review of Quantitative Finance and Accounting, 1*(1), 5–26.

Cornell, B. (1979, July). Asymmetric information and portfolio performance measurement. *Journal of Financial Economics, 7*(4), 381–390.

Day, T. E., Wang, Y., & Xu, Y. (2001). Investigating underperformance by mutual fund portfolios. Unpublished manuscript. Available: http://www.utdallas.edu/yexiaoxu/Mfd.PDF.

Ferson, W., & Khang, K. (2002, August). Conditional performance measurement using portfolio weights: Evidence for pension funds. *Journal of Financial Economics, 65*(2), 249–282.

Grinblatt, M., & Titman, S. (1989a). Mutual fund performance: An analysis of quarterly portfolio holdings. *Journal of Business, 62*(3), 393–416.

Grinblatt, M., & Titman, S. (1989b, Fall). Portfolio performance evaluation: Old issues and new insights. *Review of Financial Studies, 2*(3), 393–421.

Grinblatt, M., & Titman, S. (1993, January). Performance measurement without benchmarks: An examination of mutual fund returns. *Journal of Business, 66*(1), 47–68.

Gruber, M. J. (1996). Another puzzle: The growth in actively managed mutual funds. *Journal of Finance, 51*(3), 783–810.

Henriksson, R. D. (1984). Market timing and mutual fund performance: An empirical investigation. *Journal of Business, 57*(1), Part 1, 73–96.

Keim, D. B. (1999, February). An analysis of mutual fund design: The case of investing in small-cap stocks. *Journal of Financial Economics, 51*(2), 173–194.

Kothari, S. P., & Warner, J. B. (2001, October). Evaluating mutual fund performance. *Journal of Finance, 56*(5), 1985–2010.

McDonald, J. G. (1974, June). Objectives and performance of mutual funds, 1960–1969. *Journal of Financial and Quantitative Analysis, 9*(3), 311–333.

Shukla, R. K., & Trzcinka, C. A. (1992). Performance measurement of managed portfolios. *Financial Markets, Institutions & Instruments, 1*(4), 1–58.

U.S. Securities and Exchange Commission (2000). Report on mutual fund fees and expenses. Available: http://www.sec.gov/news/studies/feestudy.htm.

Weigand, R. A., Belden, S. & Zwirlein, T. J. (2003). Stock selection based on mutual fund holdings: Evidence from large-cap funds. Unpublished manuscript. Available: http://web.uccs.edu/rweigand/Belden-Weigand-Zwirlein-3.pdf.

Wermers, R. (2000, August). Mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses. *Journal of Finance, 55*(4), 1655–1695.