

12/21/06

**Identification and Performance of Equity Mutual Funds
with High Management Fees and Expense Ratios**

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JEL Classification: G200

Key words: Mutual funds, expense ratios, performance measurement

October 23, 2006

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Abstract

We apply a simple statistical method to identify domestic equity mutual funds with high management fees and expense ratios. The identified funds with management fees and expense ratios in the two highest standard deviation classes each represent 1.5% of Morningstar's total sample of 6,179 funds. We also examine the association of management fees and expense ratios to descriptive performance measures by Morningstar categories and overall across each of four standard deviation classes. We find a negative association between each performance measure and fund expense ratios in the Morningstar category overall but mixed results for management fees.

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1. Introduction

With over \$9 trillion in assets, the mutual fund industry affects the lives of millions of investors. Because strong price competition is not a characteristic of this industry, fund expenses, especially for actively managed funds, are likely to be high. Investors who place their money in funds having high expenses are also likely to experience lower returns. For example, Carhart (1997) finds a negative correlation between net returns and expense levels, which are typically much higher for actively managed funds. In addition, Carhart finds that the more actively a fund manager trades, the lower the fund's benchmark-adjusted net return to investors.¹ Yet, investors continue to pour money into actively managed funds in pursuit of performance. To date, the courts have rejected the various methodological approaches that financial economists have made to identify funds with high advisory fees.

Our purpose in conducting this study is threefold. First, we provide a simple, yet probabilistic, method for identifying equity mutual funds with varying degrees of statistically high management fees and expense ratios. Next, we identify the specific funds with varying degrees of statistically high management fees and expense ratios. Finally, we identify the association of statistical classes of high management fees and expense ratios to selected performance attributes.

¹ Numerous studies examine the issue of whether mutual fund managers who actively trade stocks add value. Studies by Jensen (1968), Malkiel (1995), Gruber (1996), and Carhart (1997), which examine net return of funds by taking into account expenses and transactions costs incurred from active management, indicate that active managers actually destroy value. Thus, investors are better off holding broad market indices.

The first motivation for this analysis lies in the urgent need to provide a measure of high mutual fund management fees and expense ratios that will meet the legal standard. Our hope is that the legal precedents that have so far blocked all arguments purporting to demonstrate high advisory fees might be amenable to this statistical approach. The second motivation is to identify funds with varying degrees of statistically high management fees and expense ratios, and their relationship to major performance measures. These measures are the Sharpe ratio, Jensen's alpha, Morningstar star ratings, and annualized total returns. Overall, the results of our study should be of interest individual investors, fund researchers, members of the business media, investment advisers, financial planners, and regulators.

2. Background

2.1. Conflict between law and reality

While financial economists argue whether mutual fund management fees and expense ratios are increasing, decreasing, or just too high, federal courts have adopted precepts precluding demonstrations to the effect that particular funds have high fees. Freeman and Brown (2001) provide a critical review of the legal issues.

The seminal *Gartenberg v. Merrill Lynch Asset Management* case developed the precepts subsequently adopted by the courts. The Gartenberg judge dismissed the plaintiff's claim that Merrill Lynch Ready Assets Trust (money fund) captured the savings from economies of scale in higher profits, which it should have passed to shareholders in the form of lower costs and higher rates of return.

The first of these legal precepts holds that for a mutual fund adviser to be guilty of a legal violation, the adviser must charge an advisory fee that is so disproportionately large that it bears no relationship to the services rendered. Moreover, the size of the

advisory fee could not have resulted from arm's-length bargaining. In other words, the advisory fee must be "unreasonably unreasonable." Thus far, the courts have held that no plaintiff has satisfied this precept. On the other side, fund advisers are not required to prove fairness.

The Gartenberg case established three other precepts. Determining whether the first precept has been met requires weighing the following factors: (1) the nature and quality of mutual fund services; (2) the profitability of the fund to the adviser; (3) economies of scale; (4) comparative fee structures; and (5) trustee independence and conscientiousness.

Next, the court found that the normally "unseverable" relationship between mutual fund advisers and their funds weakens the weight of the argument provided by comparing the fees charged by advisers of similar funds. The court also rejected the argument that the lower fees charged by advisers to pension funds apply to funds as a measure of fairness.

Despite the consistently negative news from the courts, the legal findings nonetheless provide a small opening. As reported in SEC (2000), the federal judge in *Saxe v. Brady* noted that advisory "... profits are certainly approaching the point where they are outstripping any reasonable relationship to expenses and effort even in a legal sense." Further, "... the business community might reasonably expect that at some point those representing the fund would see that the management fee was adjusted to reflect the diminution of the cost factor."

2.2. Market structure and competition

The market structure of the mutual fund industry most resembles monopolistic competition. Characteristics of this structure include a large number of firms, ease of market entry, and product differentiation based on product features, quality, and service.

The existence of product differentiation allows firms to charge prices that differ from those of their competitors. Thus, industry prices are not market determined as they would be in perfectly competitive markets with homogenized products. The GAO (2000) report provides a useful discussion of these issues.

In the case of mutual funds, competition generally focuses on product attributes other than expense ratios. Sirri and Tufano (1993) describe fund “products” as close, but imperfect substitutes. Funds attempt to differentiate their products to limit product substitutability and provide more control over prices in their defined market niches. Product differentiation behavior is especially strong among actively managed equity funds and “boutique shops,” and less so among index, bond, and money market funds. These three types of funds offer more commodity-like products and therefore may face more price competition. Consequently, their expenses are much smaller relative to returns than in funds with more differentiated products.

Mutual funds provide product differentiation in the way they package basic service advantages, such as diversification, professional investment management, investment objectives, investment strategy, investment style, and shareholder liquidity. In addition, funds often advertise their “superstar managers” and recent performance. Haslem (2003) provides in-depth treatments of fund service advantages and disadvantages.

2.3 Evidence of non-price competition

If mutual funds competed in a competitive environment based on price, the market would determine their prices. According to Haslem (2004a), fund “prices” include the expenses, costs, and fees (“expenses” for short) charged shareholders for managing portfolios sold at market value. These prices include those expenses disclosed correctly and incorrectly as well as those not disclosed at all.

With the relative ease of market entry and the large number of mutual funds, the presence of a competitive market would place pressure on funds to account for and correctly measure each type of expense and to provide transparent disclosure. Most of all, competitive pressure would force fund expenses downward, especially as funds get larger and economies of scale continue.

The facts are otherwise. The mutual fund industry's performance incentive structure also reflects lack of strong price competition. Congress has also contributed to the use of non-performance based management fees. As Golec (2003) notes, performance-oriented funds are required to have symmetrical penalties and bonuses for poor and superior performance, respectively. Not wanting to risk fee reductions, many performance-driven funds increased their fee levels and joined marketing-oriented funds with single asset based fees.

Several additional observations suggest a lack of strong price competition in the mutual fund industry. First, during the recent and earlier stock market booms, fund advertising focused on two related issues that lack long-term consistency: high fund performance and superstar portfolio managers. The aim of fund advertising was to turn investor attention to the current hot performers at the expense of consistent performing, low-cost funds.

Second, the external governance structure of mutual funds provides an implicit conflict of interest that does not favor fund shareholders. The dual role of fund managers underlies funds as externally controlled "shells" and magnifies the likelihood that their behavior will not be aligned with fund shareholder interests. As separate entities, fund management companies give first priority to their own profits and secondarily to those of their funds and fund shareholders. Evidence of fact appears in the relative size of returns to management companies and the funds they manage. Fund managers receive payment before their shareholders.

This behavior is not surprising. Why else would mutual fund management companies create funds to manage? The answer may also lie in the size of the salaries that fund and portfolio managers receive. Money management is one of the nation's most profitable businesses, if not the most profitable. In the case of funds, managers owe a statutory fiduciary responsibility to their shareholders.

The "mutual" mutual funds form of organization offers great potential for reducing mutual fund expenses. Vanguard pioneered this lower cost alternative to traditional external fund management. In the Vanguard organization, shareholders own the funds that own the management company. Vanguard provides services at cost and staff bonuses reward expense savings. The fund industry has shown little interest in this cost-effective form of organization, which reflects the lack of strong price competition and the presence of self-interest.

The failure of mutual fund independent directors to act according to their legal mandate as shareholder "watchdogs" often implicitly supports the self-interest behavior of mutual fund managers. Greater alignment of interests would likely exist between independent directors and shareholders if management did not handpick directors, if directors invested a substantial portion of their wealth in the funds they oversee, and if directors received payment in fund shares.

The possible SEC requirement that mutual fund board chairpersons be independent directors would help to alleviate this problem. Yet, the generous compensation that independent directors receive also tends to meld their interests more so with fund managers than shareholders. Directors seldom replace fund managers for poor performance, but they routinely approve increases in fund expenses.

Third, most mutual fund managers have chosen not to offer funds that are both cost effective and provide near market returns -- index funds. Fund managers are able to avoid doing so because of the lack of strong price competition among fund providers. In

fact, some fund managers impose high expenses and sales fees on funds that carry the “index funds” label.

Fourth, the large profits mutual fund managers earn often reflect a focus on distribution (sales) and asset growth rather than on fund outperformance. Charging the same or slightly smaller expense ratios against increasingly larger fund assets provides enormous profits. In fact, some so-called actively managed funds charge large management fees for herding their portfolios around benchmark indexes -- closet index funds. Their high expense ratios are not an indicator of strong price competition among funds.

Fifth, large differences in mutual fund expense ratios exist within the same investment objectives and investment styles. These large differences also suggest a lack of strong industry price competition.

Finally, the mutual fund industry and its regulators have constructed a system for preparing and disclosing expenses (and costs and fees), characterized by incorrect, incomplete, missing, and misleading expense data and information. This system reflects fund vagaries in the preparation and disclosure of expenses and the lack of sound practice in accounting for them.

The complexity and shortcomings of the system inhibits the actions of investors seeking actual low-cost mutual funds. Such a system would not exist for long in practice if funds were competing on price. Haslem (2004b) provides a broad treatment of transparency and the normative data and information that are essential to make transparency effective for meeting the normative needs of shareholders.

A major example of this disclosure system is the lack of real disclosure of mutual fund brokerage commissions and trading costs. The failure to disclose fully these fees and costs reflects the ongoing industry practice of obfuscation, which reduces the ability of investors to make fund choices based on complete, actual, and competitive fees and

costs. Fund brokerage commissions and trading costs should have the same normative disclosure that would be appropriate for fund expense ratios. How else can investors choose funds with actual total low cost expenses, fees, and costs? This lack of disclosure would not exist if funds were price competitive.

To determine how substantial mutual fund brokerage commissions and implicit trading costs are, Karceski, Livingston, and O'Neal (2004) estimated them for a sample of large funds. Average brokerage commissions per trade were 10 basis points and implicit trading costs 20 basis points for the sample of large domestic equity funds with portfolio turnover of 57%. Together, the 30 basis points represent 43% of the average sample fund's expense ratio.

In fact, currently reported expense ratios are sometimes smaller than the total of brokerage commissions and implicit trading costs for high turnover funds, but mutual funds effectively hide the former and completely the latter from shareholders. Increases in portfolio turnover also lever up brokerage commissions and implicit trading costs. Total brokerage commissions, implicit trading costs, and expense ratios can vary substantially, both together and separately, between an actively managed fund and its actively managed and index benchmark funds.

2.4. Economies of scale

The lack of substantial sharing with mutual fund shareholders of the huge savings of fund scale economies is a major case of non-competitive pricing. According to Haslem (2004a), growth in fund assets provides a major source of scale economies due to the largely fixed nature of fund expenses. If fund expenses fully reflected the savings of economies of scale, the trend of fund expense ratios would decline markedly over the entire range of fund assets.

Latzko (1999) and others report the existence of mutual fund scale economies, where expenses decline over the full range of asset size. Yet, the largest reductions occur before \$3.5 billion in fund assets. While large funds generally have lower expense ratios than small funds, fund shareholders have not come close to fully sharing in the expense savings from scale economies. In an industry with more than \$9 trillion in assets, this benefit is more than large. The failure of fund managers to share economies of scale with shareholders reflects the lack of strong price competition in the funds industry.

2.5. Costly bad practices

According to Haslem (2004a), several SEC approved practices add to the cost burdens of mutual fund shareholders. These practices are inconsistent with strong price competition in the funds industry. First, there are Rule 12b-1 fees that allow fund managers to use fund assets to pay distribution expenses, including sales and brokerage commissions, customer servicing fees, administrative expenses, advertising, and promotion.

Although the stated purpose of these fees was to promote growth in mutual fund assets and the sharing of expense reductions from economies of scale, funds have not shared these expense savings with shareholders and 12b-1 fees have often proven to be “deadweight” expenses. The irony in 12b-1 fees is that fund managers have reaped the bonanza from larger funds -- larger amounts of investment advisory fees, 12b-1 fees, and expense savings from scale economies. Further, the justification for the use of multiple share classes rests on the weak foundation of 12b-1 fees.

Second, there are soft dollar arrangements in which mutual funds pay broker/dealers larger fees than required for trade execution only. The brokers use the excess fees -- the soft dollars -- to provide fund managers with in kind research

products/services. Soft dollars have no economic justification, but they do create inherent conflicts of interest between fund managers and fund shareholders. These arrangements result in higher than market determined brokerage commissions, higher than best execution trading costs, and misleading (lower) reported fund expenses.

Another costly bad practice is the "pay to play" agreements between mutual fund managers and broker/dealers. These agreements have two basic forms – directed brokerage and revenue sharing agreements. In directed brokerage agreements, fund managers direct specified dollar amounts of security trades and fees to brokers in return for the promotion and sale of fund shares. These payments also provide a conflict of interest for brokers in recommending these funds to their clients. The results of these brokerage agreements were higher than market-determined brokerage commissions, higher than best execution trading costs, and perhaps higher fund expenses. Funds imposed these stealth fees, costs, and expenses on current shareholders. The SEC just recently prohibited directed brokerage payments.

In revenue sharing agreements, mutual fund managers make specified direct dollar payments to broker/dealers in return for the promotion and sale of fund shares. They may not make these payments from the 12b-1 fees paid by shareholders. These payments also provide a conflict of interest for brokers in recommending these funds to their clients. The normal basis for revenue sharing payments is on a percentage of annual broker sales of fund shares and a percentage of dollars of fund shares held in broker customer accounts. Revenue sharing results in higher than operationally required fund expenses. Current shareholders bear the cost of these stealth 12b-1 type expenses.

2.6. Multiple share classes and higher expenses

The rationale for approval of multiple share classes followed the same path as that for 12b-1 fees, and with similar negative outcomes to shareholders. Mutual fund

managers argued that share classes would increase distribution and administrative efficiencies by using pooled rather than separate portfolios for each share class. Single pooled portfolios would be cheaper to manage and require only single boards of directors, one set of fund managers, integrated marketing efforts, and single regulatory filings and reports, among savings from custodial fees, transfer agent fees and legal fees.

The major argument was that multiple share classes would broaden the appeal of mutual funds and, thereby, greatly increase fund assets. Having multiple share classes would result in spreading fund expenses over a larger asset base, thus increasing the savings from scale economies and lowering of fund expenses. Funds have not passed on the latter benefit the shareholders, but retained to the benefit of fund advisers. Lower expenses translate to higher returns.

Lesseig, Long, and Smythe (2002) found that multiple share class mutual funds have higher expenses (expense ratios) than single class funds. The sample reported expense ratios of 1.03%, “other” (administrative) expenses of 0.35%, and management fees of 0.69%. Share class funds do benefit from administrative savings as seen in lower “other” expenses than single class funds. Unfortunately, these savings are smaller than the even larger increases in management fees of share class funds. Further, share class funds have a higher proportion of even larger 12b-1 fees. The result to share class fund shareholders is higher expense ratios with larger (much larger) profits to fund advisers.

Multiple share class mutual funds are required to have the same management fees across all share classes of a pooled portfolio. The funds were found to satisfy this requirement, but at consistently higher levels of management fees. The increases in management fees accrue in larger amounts to advisers of larger multiple share class funds. Management fees are larger for higher performing share class funds.

2.7. The competitive bottom line

The conclusion is that mutual fund expenses are higher than they would be in price competitive markets with homogenized products, such as index funds. The market lacks competitive pressure that would force fund expenses downward, especially as funds get larger and economies of scale continue. Despite claims by the industry's trade association, strong price competition does not characterize the fund industry. This general conclusion is consistent with our study's working hypothesis that large and significant differences exist among certain funds with respect to management fees and expense ratios.

2.8. Trends versus levels of mutual fund expenses

The trend of mutual fund expense ratios represents one of the major debates in the fund industry. Are ratios increasing or decreasing? Industry expense ratios increase by equally weighting each fund's ratio in the calculation. This approach considers that fund expense ratios should reflect the number of individual decision units making these decisions. This is especially relevant in our study where we identify individual high cost funds. However, expense ratios may decrease in some but not all years by weighting each fund's ratio by asset size (and not simply by new fund sales and the exclusion of 12b-1 fees). This approach considers that fund expenses should reflect those that affect the greatest number of shareholders by asset size.

Including the few huge low-cost mutual fund families, such as Vanguard, forces the asset weighted average expense ratios downward. Ironically, weighted expense ratios have benefited greatly from the tremendous growth in index fund assets. The initial purpose of index funds was to be low-cost alternatives to actively managed funds. Nonetheless, the GAO (2000) reviewed this issue and reported, "... some studies or

analyses that looked at the trend in fund fees found that fees are rising. These included analyses by academic researchers, industry research organizations, and regulators.”

Fosback (1999) found that this focus on the trend in mutual fund expenses misses most of the point. Without debating methodology, he concludes that “. . . leaving aside whether costs are down a little, flat, or up somewhat, the real scandal here is that expenses levied on shareholders, as a percent of assets under management, haven't declined dramatically.” Further, Fosback concludes that “[t]he fund industry has simply gotten fat . . . and with a tiny handful of exceptions . . ., most fund families have gone willingly along for the ride, content to fatten their profits at the expense . . . of the shareholders who have entrusted their wealth to them.” In addition, independent fund directors have simply gone along.

2.9. Mandate for control of expenses

While the evidence leads to the conclusion that mutual fund expenses are too high, one basic question remains. So what if expenses are too high? Investors apparently do not appear to find the cost issue a hindrance to fund investment to meet their financial needs and goals given that they have invested trillions of dollars in funds.

The source of the answer to this question is the Investment Company Act of 1940. Among several provisions relevant to answering the “so what” question, a 1970 amendment stands out. This amendment requires that independent directors have a fiduciary duty with respect to the reasonableness of mutual fund fees. Independent directors are not to approve increases in management fees, even with shareholder approval, if the increases provide no shareholder benefit. Further, a majority of independent directors must approve any changes in advisory contracts, and they are “under duty” to request what information is reasonably necessary to evaluate these contracts.

Despite these provisions, mutual fund independent directors have not generally followed their legal mandate as shareholder watchdogs. This dereliction of duty provides directors with self-interest benefits in the form of continued employment, generous pay and benefits, as well as financial bonanzas to fund managers. In these cases, the SEC regulation and shareholder suits (not yet successfully) without prior demand of fund directors may enforce the duty of fund independent directors.

3. Method

3.1. Measuring management fees and expense ratios

We use management fees and expense ratios both as a percent to measure mutual fund costs and standard deviations to identify funds with above average or varying degrees of high costs for one or both measures. As defined in SEC (2000), the expense ratio is total expenses divided by fund average net assets.² The ratio excludes sales loads and fees directly charged to shareholder accounts and security transaction costs (brokerage commissions, bid-ask spreads, and market impact costs) that reduce portfolio returns.

The mutual fund expense ratio has three components: (1) management fees, (2) Rule 12b-1 fees, and (3) “other” expenses. The management fees component constitutes the largest part of the expense ratio and includes investment advisory fees for portfolio management services and administrative or other fees paid to the investment adviser or its affiliates for services. The Rule 12b-1 fees component includes marketing,

² Several mutual fund attributes affect the size of expense ratios. According to SEC (2000), these attributes include asset size, fund family assets, number of fund family funds, fund category, index funds, institutional funds, front-end loads, 12b-1 fees, portfolio turnover, number of portfolio holdings, use of multiple-share class funds, and fund age.

distribution, and other fees adopted pursuant to this rule. These fees, rather than from sales loads, increasingly serve as the source of paying fund distribution and marketing expenses. Another component called “other” expenses may include transfer agent fees, securities custodian fees, shareholder accounting expenses, legal fees, auditor fees, and independent director fees.

3.2 Classifying mutual funds by standard deviation

The standard deviation provides an objective way to classify mutual funds. This quantitative measure enjoys wide acceptance. In this study, we use the distribution free Chebyshev’s inequality because no certainty exists that a normal distribution applies for the financial variables under consideration.

As discussed in DeFusco et al. (2004), Chebyshev’s inequality states that for any set of observations, whether sample or population data and regardless of the shape of the distribution, the percentage of the observations that lie within k standard deviations of the mean is at least $1 - 1/k^2$ for all k greater than 1. Given the standard deviation, we can use Chebyshev’s inequality to measure the maximum amount of dispersion for any distribution. Thus, the probability of observing one of these variables three standard deviations above or below the mean can be, at most, $1/k^2 = 1/3^2 \approx 0.11$. A one-tailed adaptation of Chebyshev’s inequality yields a maximum probability for two (three) standard deviations of about 0.20 (0.10).³ Hence, the likelihood of observing a management fee or expense ratio two or three standard deviations above the mean is relatively small, even if the variable is not normally distributed.

We apply the statistical methodology without a direct comparison to particular mutual funds or by use of other benchmarks and measures. This is especially important in the case of high cost funds because the courts have thus far rejected direct

³ See, for example, Bottomley (1999), for a discussion of a one-tailed version of Chebyshev’s inequality.

comparative analysis of the types that financial economists normally make. Legal precedents have thus far blocked arguments purporting to prove high advisory fees. However, these precedents should not block findings that provide probability statements concerning the degree to which fund management fees and expense ratios are too high.

3.1 Sample

The total sample comprises 6,179 domestic equity mutual funds that represent funds with single share classes, multiple share classes, and attributes from Morningstar (2004), as of December 31, 2003. The sample pools retail and institutional funds but screens out exchange-traded funds (ETFs). Each share class counts as a “fund” in the total, so the number of unique portfolios is fewer than 6,179. We split the total sample into nine sub-samples for each of the nine Morningstar equity style categories. Each Morningstar category represents a two-way combination of fund market capitalization (large, mid cap, or small) and investment style (growth, blend, or value).⁴

We also classify mutual funds with management fees and expense ratios that exceed the means of their Morningstar categories by the significance of these cost differences using standard deviations. The objective is to identify the specific funds with above average and high (to varying degrees) management fees and expense ratios. Given that expense ratios represent the actions of individual decision units, the analysis is cross-sectional and the individual fund cost ratios are unweighted.⁵

We use four standard deviation classes to indicate the significance of the differences in mutual fund management fees and expense ratios that exceed the means of their Morningstar categories and overall. The first standard deviation class identifies

⁴ For a discussion of Morningstar categories, see Haslem (2003).

⁵ We examine funds with costs lower than Morningstar category means in a separate study.

fund costs that exceed the means of their Morningstar categories and overall by less than one standard deviation. The other three standard deviation classes identify fund costs that exceed the means of their Morningstar categories and overall by 1σ , 2σ , and 3σ , respectively. We label fund management fees and expense ratios in each Morningstar category overall in each increasing class as (1) above average, (2) high, (3) very high, and (4) extremely high, respectively.

3.4 Descriptive performance measures

We examine the association of management fees and expense ratios to four descriptive performance measures and report each measure in the same Morningstar category by standard deviation class that corresponds to the costs of the same funds. We use the performance measure in the Morningstar category overall by each of the standard deviation classes to identify the nature of the association between costs and performance measures.

These performance measures are three-year Sharpe ratios and Jensen's alphas over the period January 2001 through December 2003 as well as five-year Morningstar star ratings and annualized total returns over the period January 1999 through December 2003.⁶ We hypothesize that a negative relationship typically exists between management fees as well as expense ratios and each of the performance measures. That is, we expect each performance measure to decrease as the management fees and expense ratios increase.

The Sharpe ratio uses the standard deviation of returns as the measure of risk. Thus, the Sharpe measure evaluates the portfolio manager based on both rate of return

⁶ For a discussion of these performance measures, see Reilly and Brown (2000) on pages 1114-1117 and 1139-1143.

performance and diversification. The Sharpe ratio is a type of reward-to-variability measure.

By contrast, Jensen's alpha is based on the capital asset pricing model, but allows for an intercept that measures any positive or negative difference from the model. Unlike the Sharpe measure, which examines the average returns for the total period for all variables, the Jensen measure requires using a different risk-free rate for each time interval during the measurement period, which for our study is three years. In addition, the Jensen measure does not directly consider the portfolio manager's ability to diversify. This is because the Jensen measure calculates risk premiums in terms of systematic risk (beta), not standard deviation.

Jensen's alpha is an absolute measure of a portfolio's risk-adjusted performance. An alpha value indicates whether the portfolio manager is superior (positive alpha) or inferior (negative alpha) in market timing and stock selection. Thus, alpha represents how much the rate of return on the portfolio is attributable to the manager's ability to derive above-average return adjusted for risk. For a portfolio manager with no forecasting ability, the performance would equal that of a naïve buy-any-hold policy.

Because of these differences between the performance measures, the possibility exists that the Sharpe ratio and Jensen's alpha may not produce the same relationship by Morningstar categories within each standard deviation class and overall. For example, as management fees increase, the Jensen measure may be positive if the portfolio managers, on average, have superior skills in market timing and stock selection. Similar arguments exist when using the Morningstar star ratings and five-year annualized returns. Positive associations would suggest that very high management fees might add managerial value to performance.

One strand of the literature finds that active managers exhibit some stock-picking talent. For example, studies by Grinblatt and Titman (1989, 1993), Grinblatt, Titman, and

Wermers (1995), Daniel et al. (1997), and Wermers (2000) find that mutual funds tend to select stocks that outperform a broad market index and outperform passive benchmarks of stocks with similar characteristics. These studies typically do not account for transaction costs or expenses. However, Wermers (2000) finds that funds pick stocks well enough to cover their costs. His evidence also supports the value of active fund portfolio management.

We use the one-way analysis of variance to determine whether the independent values contained in the four standard deviation classes by Morningstar category and overall are from different populations with respect to each descriptive performance measure. That is, we are testing whether a management fee or expense ratio class affects a specific performance measure. The null hypothesis is that there is no difference in the average performance (based on the Sharpe ratio, Jensen alpha, Morningstar star rating, or five-year annualized return) of equity mutual funds among management fee or expense ratio classes.

4. Empirical Results

The results of our study allow us to identify the highest cost domestic equity mutual funds in terms of management fees and expense ratios. We can also characterize the relationship between management fees or expense ratios and performance for Morningstar categories overall and specific categories.

4.1. Highest cost mutual funds

Table 1 identifies the specific mutual funds (and share classes) that have management fees and expense ratios relative to their Morningstar category means that are statistically very high ($+2\sigma$) and extremely high ($+3\sigma$). The 67 funds with very high and 23 funds with extremely high management fees represent 1.5% of total funds. There

are 66 funds with very high and 27 funds with extremely high expense ratios, representing 1.5% of total funds.⁷

(Insert Table 1 about here)

4.2. Management fees and expense ratios

Panel A of Table 2 shows that mutual fund management fees are smallest overall (0.79%) in the within $+1\sigma$ class. For comparison, mean management fees for all 6,179 funds are 0.65%. Within this standard deviation class, management fees are largest in the small value (0.97%) and smallest in the large blend (0.68%) Morningstar categories.

Panel B of Table 2 shows that expense ratios are smallest overall (1.83%) in the within $+1\sigma$ class. For comparison, mean expense ratios for all mutual funds are 1.49%. Within this standard deviation class, expense ratios are largest in the small growth (2.02%) and smallest in the large blend (1.61%) Morningstar categories.

The results in Table 2 show that the management fees and expense ratios in their Morningstar categories overall consistently increase in each of the successively larger standard deviation classes. More generally, costs vary in each Morningstar category for a given standard deviation class and by a given Morningstar category across all standard deviation classes.

(Insert Table 2 about here)

4.3. Performance measures

⁷ Due to space considerations, we omit the mutual funds whose management fees and expense ratios are less than two standard deviations above the mean for the fund's Morningstar category. Those omitted include 2,806 funds with above average and 580 funds with high management fees. In addition, we omit 1,798 funds with above average and 933 funds with high expense ratios. This list is available from the authors on request.

These more general findings also apply to the descriptive performance measures in the subsequent tables. Further, the negative or positive associations between mutual funds with high costs and performance measures are based on the Morningstar category overall performance values for each of the four standard deviation classes on the high cost side of the entire distribution.⁸

Table 3 identifies the association of the Sharpe ratio to management fees and expense ratios. Panel A presents the results for management fees. For comparison, the mean total sample Sharpe ratio is -0.26 . The Sharpe ratio is highest overall (-0.21) in the $+1\sigma$ standard deviation class, where the measure is highest in the small value (0.70) and lowest in the large growth (-0.65) Morningstar categories.

Analysis by Morningstar category overall across each of the four standard deviation classes finds that the Sharpe ratio has an inconsistent association with management fees. That is, the Sharpe ratio becomes less negative (and hence improves) from the within $+1\sigma$ class (-0.28) to the $+1\sigma$ (-0.21), becomes more negative in the $+2\sigma$ class (-0.31), and then becomes less negative again in the $+3\sigma$ class (-0.25). These mixed results are inconsistent with our expectations.

The ANOVA test indicates that the Sharpe ratio in the Morningstar category overall is significantly different across the four standard deviation classes at the 10%. The tests also indicate that the Sharpe ratios for the large growth, large value, and small growth Morningstar categories are also significantly different across several of the standard deviation classes (10% level).

⁸ For Tables 3 through 6, we conducted Wilcoxon two-sample tests using medians. The test results are qualitatively similar to those using means with Duncan's multiple range tests and are available from the authors upon request.

Panel B of Table 3 shows the results for the expense ratios. The Sharpe ratio is highest overall (-0.31) in the within $+1\sigma$ class. For expense ratios, the measure is highest in the small value (0.60) and lowest in the large growth (-0.78) Morningstar categories. Analysis by Morningstar category overall across each of the four standard deviation classes finds that the Sharpe ratio has a consistently increasing negative association with expense ratios. Yet, the ANOVA test indicates that the Sharpe ratio in the Morningstar category overall is not significantly different across the four standard deviation classes. The tests do show, however, that the Sharpe ratios in certain standard deviation categories (large blend, mid-cap blend, mid-cap growth, small growth, and small value Morningstar categories) are significantly different across the four standard deviation classes.

(Insert Table 3 about here)

Table 4 identifies the association of management fees and expense ratios to Jensen's alpha three-year performance. Panel A presents the results for management fees. The Jensen alpha is highest overall (2.56%) in the $+1\sigma$ class. For comparison, the mean total sample Jensen alpha is 1.76%. Within this standard deviation class, the alpha is highest in the small blend (22.17%) and lowest in the large growth (-5.09%) Morningstar categories. Analysis by Morningstar category overall across each of the four standard deviation classes finds that the Jensen alpha has a very uneven association with management fees. Again, this is inconsistent with our expectations.

The ANOVA test indicates that the Jensen alpha in the Morningstar category overall is significantly different across the four standard deviation classes at the 10% level. The tests also show that alphas differ across the standard deviation categories for the large growth, small blend, and small growth mutual funds.

Panel B of Table 4 presents the results for the expense ratios. Jensen's alpha is largest overall (0.89%) in the within $+1\sigma$ class, where the alpha is largest in the small

value (18.11%) and smallest in the large growth (-5.90%) Morningstar categories. Casual inspection of the overall sample reveals that the Jensen alpha tends to have negative association with expense ratio category. This interpretation is consistent with expectations. However, ANOVA does not support this observation statistically. The tests show that alphas in the large blend and growth, mid-cap blend and growth, and small growth and value Morningstar categories are significantly different across certain of the four standard deviation classes. In all but one of these cases, the direction of the relationship is as expected.

(Insert Table 4 about here)

Table 5 shows the association of management fees and expense ratios to Morningstar's star ratings from 1 (lowest) to 5 (highest). The total sample mean Morningstar rating is 2.96. Panel A of Table 5 presents the results for management fees. The star rating is highest overall (3.31) in the $+3\sigma$ class, where the rating is highest in the large blend (5.00) and lowest in the mid-cap blend (2.00) Morningstar categories.

Analysis by Morningstar category overall across each of the four standard deviation classes finds that Morningstar star ratings have a slightly inconsistent positive association with management fees. Thus, star ratings improve with increases in standard deviation classes. This finding is consistent with expectations. The ANOVA test indicates that the star ratings in the Morningstar category overall are not significantly different across the four standard deviation classes. Test results also indicate that star ratings in the large blend and growth and small growth Morningstar categories are significantly different across the four standard deviation classes.

Panel B of Table 5 presents the findings for the expense ratios. The Morningstar star rating is highest overall (2.86) in the within $+1\sigma$ class, where the star rating is highest in the mid-cap value (3.18) and lowest in the large blend (2.66) Morningstar categories.

Analysis for the overall sample across each of the four standard deviation classes finds that star ratings have a consistent negative association with expense ratios. Thus, star ratings decline as expense ratios increase. This finding is consistent with expectations. The ANOVA test indicates that star ratings in the Morningstar category overall are significantly different across the four standard deviation classes at the 10% level. In addition, the tests show that star ratings in the large blend, growth, and value as well as small blend Morningstar categories are significantly different across the four standard deviation classes.

(Insert Table 5 about here)

Table 6 identifies the association of management fees and expense ratios to five-year annualized total returns. For comparison, the mean total sample return is 2.74%. Panel A of Table 6 shows the results for management fees. Annualized total returns are highest overall (4.72%) in the $+3\sigma$ class, where returns are highest in the small growth (23.23%) and lowest in the large growth (-1.73%) Morningstar categories.

Analysis by Morningstar category overall across each of the four standard deviation classes finds that five-year annualized total returns have a consistent and increasingly positive association with management fees. Thus, total returns increase as management fees increase. The ANOVA test indicates that total returns in the small blend and growth Morningstar categories are significantly different across the four standard deviation classes. The ANOVA test indicates that the overall returns in the sample overall are not significantly different across the four standard deviation classes.

Panel B of Table 6 presents the findings for the expense ratios. Annualized total returns are highest overall (2.11%) in the within $+1\sigma$ standard deviation class, where returns are highest in the small value (12.89%) and lowest in the large growth (-3.32%) Morningstar categories.

Analysis by Morningstar category overall across each of the four standard deviation classes finds that five-year annualized total returns have a monotonically increasing negative association with expense ratios. This finding is consistent with expectations. The ANOVA test indicates that total returns in the Morningstar category overall are significantly different across the four standard deviation classes at the 10%. The tests also indicate that the returns for the large blend, growth, and value and mid-cap blend Morningstar categories differ significantly across the four expense ratio standard deviation classes.

(Insert Table 6 about here)

5. Conclusions

Because strong price competition does not characterize the mutual fund industry, we conclude that fund expenses are too high. This conclusion is consistent with the study's empirical findings that very large and significant differences exist among specifically identified funds with respect to management fees and expense ratios.

Yet, there remains the question of "so what" if mutual fund expenses are too high? No one forces investors to choose funds. We find the answer in the Investment Company Act of 1940 and its requirement that independent directors have a "fiduciary duty" with respect to the reasonableness of fund fees.

We identify 67 specific mutual funds with statistically very high and 23 funds with extremely high management fees. In addition, we identify 66 funds with very high and 27 funds with extremely high expense ratios. The number of funds in each of these two management fee and expense ratio standard deviation classes each represents 1.5% of total sample funds. Investors should consider these findings carefully, as should fund researchers, financial columnists and writers, investment advisers, financial planners and regulators.

We also examine the association of management fees and expense ratios to descriptive performance measures by Morningstar category overall across each of the four standard deviation classes. These measures are the Sharpe ratio, Jensen alpha, Morningstar star ratings, and five-year annualized total returns.

Management fees have a mixed association with each of the performance measures. Each performance measure is higher in the extremely high management fee class ($+3\sigma$) than in the above average management fee class (within $+1\sigma$). ANOVA tests only show significant differences for the Sharpe ratio and Jensen's alpha Morningstar categories overall across the four standard deviation classes. A potential implication of these results is that higher management fees may add value to active portfolio management and contribute to improved performance measures. These findings add fuel to the continuing debate over active versus passive portfolio management.

Expense ratios have the expected general negative associations with each of the performance measures. These findings are consistent with previous studies by Jensen (1968), Malkiel (1995), Gruber (1996), and Carhart (1997). Yet, ANOVA tests show significant differences only for the Morningstar star ratings and five-year annualized total returns by Morningstar category overall across the four standard deviation classes. Nonetheless, our results show that expense ratios maintain their negative associations with each of the performance measures despite the mixed associations of component management fees.

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Table 1 Equity mutual funds with “very high” and “extremely high” management fees and expense ratios by Morningstar category and fund name				
	Management Fees		Expense Ratios	
Morningstar Category/Fund Name	Very High +2σ	Extremely High +3σ	Very High +2σ	Extremely High +3σ
<i>Large Blend</i>				
AAM Equity	Fund			
AmCent Strat Alc	Agg C, Inv			
Delaware Core Equity			B, C	
*Eastern Point Adv Twenty		A, C		A, C
GAM American Focus			B, C	
JP Morgan Market Neutral		Inst		
Kelmoore Strategy			Lib C, C	
Lake Forest Core Equity	Fund			
Matterhorn Growth				Fund
MegaTrends			Fund	
Merrill Disciplined Equity			B, C	
Merriman Growth & Income	Fund			
Midas Special Equity				Fund
Principal Partners Large Blend			B	
Profit Value	Fund			
ProFunds Bull			Svc	
ProFunds UltraBull			Svc	
Quaker Aggressive Growth			C	
Reserve Large-Cap Growth	R			
Schwab US Market Masters	Fund			
Wisdom			B, C	
Total (Share Classes)	7(8)	2(3)	10(15)	3(4)
<i>Large Growth</i>				
AAL Aggressive Growth				B
AIM Opportunities III		A, B, C		
Alger Social Res Instl			R	I
AllianceBer SIS Premier	A, B, C			
*American Eagle Large Cap Growth	Fund		Fund	
*American Eagle Twenty	Fund			Fund
American Growth				A, B, C, D
Analysts Stock		Fund		
Baker 500 Growth			S	
*Boyle Marathon		Fund	Fund	
Dreyfus Founders Growth & Income			R	
*Gartmore Large Share Equity Plus		C	C	
GKM Growth	Fund			

Table 1
Equity mutual funds with “very high” and “extremely high” management fees and expense

ratios by Morningstar category and fund name - continued				
	Management Fees		Expense Ratios	
Morningstar Category/Fund Name	Very High +2 σ	Extremely High +3 σ	Very High +2 σ	Extremely High +3 σ
Large Growth (Continued)				
Jundt Growth			B, C	
*Jundt Opportunity	A, B, C		B, C	
*Jundt Twenty-Five	A, B, C		A	B, C
Kelmoore Strategy Eagle			C	
Kit Cole Strategic Growth	Fund			
Merrill Focus Twenty			B, C	
Pacific Adv Growth			C	
Reserve Capital Appreciation	R			
Reserve Informed Inv	R			
Spectra		A, N		
Touchstone Growth Opportunity			B	
W.P. Steward & Co Growth		Fund		
Total (Share Classes)	9(15)	6(9)	13(16)	5(9)
Large Value				
AmCent Capital Value Inv	Fund			
Auxier Focus		Fund		
Dean Large Cap Value			C	
Integrity Value				Fund
James Large Cap Plus	A			
Masters' Select Value	Fund			
Principal Ptrs Large Value			B	
ProFunds Large Cap Value			Svc	
ProFunds Ultra BasMat			Svc	
ProFunds Ultra Dow 30			Svc	
Purissima Pure American		Fund		
Riverfront Select Value Inv			B	
Total (Share Classes)	3(3)	2(2)	6(6)	1(1)
Mid-Cap Blend				
American Heritage Growth				Fund
Eagle Growth			Fund	
Volumetric		Fund		
Total (Share Classes)	0(0)	1(1)	1(1)	1(1)
Mid-Cap Growth				
AmCent New Opportunity	Inv			
AmCent Veedot	Inst, Inv			
*American Eagle Cap Appreciation	Fund		Fund	
*Avalon Capital Appreciation		Fund	Fund	
*Bender Growth		A	Y	

Table 1 Equity mutual funds with “very high” and “extremely high” management fees and expense ratios by Morningstar category and fund name - continued				
Morningstar Category/Fund Name	Management Fees		Expense Ratios	
	Very High +2σ	Extremely High +3σ	Very High +2σ	Extremely High +3σ
<i>Mid-Cap Growth</i>				
Dreyfus Founders MidCap			C	T
Federated Kaufmann	A			
Integrity Small Cap Growth			A	
IPO Plus Aftermarket	Fund			
IPS IFund	Fund			
IPS Millennium	Fund			
IPS New Frontier	Fund			
*Jundt Mid-Cap Growth	A, B, C, I			A, B, C, I
ProFunds Mid Cap Growth			Svc	
Riverfront Small Company Select				B
Sit Small Cap Growth	Fund			
Stonebridge Aggressive Growth			Fund	
Van Wagoner Growth Opportunities			Fund	
Wells Fargo Mont Mid Growth	A			
Total (Share Classes)	11(15)	2(2)	8(8)	3(6)
<i>Mid-Cap Value</i>				
Granum Value				Fund
ProFunds Mid Cap Value			Svc	
Quaker Mid-Cap Value			B, C	
STI Class Mid Value Equity	L, T			
Tweedy, Browne American	Fund			
Total (Share Classes)	2(3)	0(0)	2(3)	1(1)
<i>Small Blend</i>				
Marketocracy Masters 100	Fund			
Pacific Adv Small Cap				A, C
ProFunds Small Cap			Svc	
ProFunds UltraSmall-Cap			Svc	
*Quaker Small-Cap Value		A, B, C, I	B, C	
Royce Low-Priced Stock	Fund			
Royce Micro-Cap	Consult, Fin Inst, Inv			
Schwartz Value	Fund			
Wasatch Small Cap Value	Fund			
Total (Share Classes)	5(7)	1(4)	3(4)	1(2)
<i>Small Growth</i>				
AmCent New Opportunity II	A, B, C, Inv			
Aquila Rocky Mountain	A, C, Y			

Table 1 Equity mutual funds with “very high” and “extremely high” management fees and expense ratios by Morningstar category and fund name - continued				
Morningstar Category/Fund Name	Management Fees		Expense Ratios	
	Very High +2 σ	Extremely High +3 σ	Very High +2 σ	Extremely High +3 σ
Small Growth				
Dreyfus Premium Enterprise			T	B, C
Federated Kaufmann Small Cap			B, C	
Fremont U.S. Micro-Cap		Fund		
Jundt US Emerging Growth			B, C	
Nevis Fund	Fund			
ProFunds Small Cap Growth			Svc	
Prasad Growth	Fund			
Quaker Small Cap Growth			B, C	
Scudder Micro Cap	A, B, C, Inst, Inv			
Security Small Cap Growth			B, C	
Smith Barney Small Growth Opportunity			A	L
Van Wagoner Small Cap Growth	Fund			
Wasatch Micro Cap		Fund		
Total (Share Classes)	6(15)	2(2)	7(11)	2(3)
Small Value				
Kinetics Small Cap Opportunity			Fund	
ProFunds Small Cap Value			Svc	
Skyline Spec Equities	Fund			
Total (Share Classes)	1(1)	0(0)	2(2)	0(0)
Grand Total (Share Classes)	44(67)	16(23)	52(66)	17(27)

Note: This table presents equity mutual funds whose management fees and expense ratios are between two and three standard deviations above the mean (“very high”) and more than three standard deviations above the mean (“extremely high”) for the fund’s Morningstar category. Management fees are “actual” management fees, not contractual maximum management fees. For funds offered in more than one class, class names (A, B, etc.) are listed under expense Class. Single-class funds are listed as “Fund.” An asterisk precedes the names of funds appearing under both cost classes.

Table 2 Equity mutual fund management fees and expense ratios by Morningstar category and standard deviation class								
Standard Deviation Class								
	Above Average Within $+1\sigma$		High $+1\sigma$		Very High $+2\sigma$		Extremely High $+3\sigma$	
Morningstar Category	Mean	N	Mean	N	Mean	N	Mean	N
Panel A. Management Fees								
Large Blend	0.68%	625	0.96%	141	1.22%	8	1.50%	3
Large Growth	0.76	533	1.00	123	1.28	15	1.56	9
Large Value	0.73	377	0.94	109	1.11	3	1.43	2
Mid-Cap Blend	0.77	177	1.04	44			1.95	1
Mid-Cap Growth	0.85	426	1.12	33	1.38	15	1.78	2
Mid-Cap Value	0.79	95	1.01	60	1.25	3		
Small Blend	0.87	196	1.18	11	1.50	7	1.80	4
Small Growth	0.95	273	1.23	34	1.50	15	1.91	2
Small Value	0.97	104	1.21	25	1.47	1		
<i>Overall</i>	0.79	2,806	1.02	580	1.36	67	1.65	23
Panel B. Expense Ratios								
Large Blend	1.61%	388	2.16%	242	2.78%	15	4.74%	4
Large Growth	1.93	392	2.46	124	3.18	16	5.13	9
Large Value	1.69	238	2.15	188	2.75	6	3.64	1
Mid-Cap Blend	1.87	117	2.48	32	3.23	1	10.00	1
Mid-Cap Growth	2.00	254	2.46	97	3.04	8	4.16	6
Mid-Cap Value	1.82	75	2.28	45	2.91	3	3.26	1
Small Blend	1.79	108	2.40	49	3.13	4	5.24	2
Small Growth	2.02	185	2.51	101	3.12	11	3.65	3
Small Value	1.84	50	2.30	55	2.84	2		
<i>Overall</i>	1.83	1,798	2.30	933	3.00	66	4.76	27

Note: This table presents average management fees (Panel A) and expense ratios (Panel B) as a percent for equity mutual funds whose management fees or expense ratios are within one standard deviation above the fund's Morningstar category mean ("Within $+1\sigma$ "), and more than one, two or three standard deviations, respectively, above the mean for the fund's Morningstar category. Management fees are "actual" management fees, not contractual maximum management fees. Blank cells reflect sample sizes of zero, and italicized numbers indicate sample sizes of six or less.

Table 3 Equity mutual fund Sharpe ratios for management fees and expense ratios by Morningstar category and standard deviation class					
Standard Deviation Class					
Morningstar Category	Above Average Within $+1\sigma$	High $+1\sigma$	Very High $+2\sigma$	Extremely High $+3\sigma$	Duncan's MR
Panel A. Management Fees					
Large Blend	-0.42	-0.41	-0.33	-0.15	
Large Growth	-0.63	-0.65	-0.72	-0.83	W>3, 1>3
Large Value	-0.16	-0.14	-0.05	0.34	3>W, 3>1, 3>2
Mid-Cap Blend	0.12	0.23		-0.07	
Mid-Cap Growth	-0.46	-0.38	-0.60	-0.58	
Mid-Cap Value	0.31	0.25	0.41		
Small Blend	0.38	0.64	0.56	0.47	
Small Growth	-0.17	-0.01	0.02	0.42	3>W, 3>1, 3>2
Small Value	0.56	0.70	0.54		
<i>Overall</i>	-0.28	-0.21	-0.32	-0.25	1>W
Panel B. Expense Ratios					
Large Blend	-0.43	-0.48	-0.39	-0.46	W>1
Large Growth	-0.68	-0.68	-0.78	-0.73	
Large Value	-0.17	-0.18	-0.25	-0.28	
Mid-Cap Blend	0.09	0.06	0.41	-0.78	W>3, 1>3, 2>3
Mid-Cap Growth	-0.44	-0.56	-0.46	-0.51	W>1
Mid-Cap Value	0.24	0.13	0.41	0.08	
Small Blend	0.32	0.41	0.26	0.38	
Small Growth	-0.19	-0.27	-0.17	0.30	3>W, 3>1, 3>2
Small Value	0.58	0.47	0.60		W>1
<i>Overall</i>	-0.31	-0.32	-0.37	-0.40	

Note: This table presents Sharpe ratios for equity mutual funds whose management fees (Panel A) and expense ratios (Panel B) are within one standard deviation of the fund's Morningstar category mean ("Within $+1\sigma$ "), and more than one, two or three standard deviations, respectively, above the mean for the fund's Morningstar category. Management fees are "actual" management fees, not contractual maximum management fees. Blank cells reflect sample sizes of zero, and italicized numbers indicate sample sizes of six or less. In the case where analysis of variance (ANOVA) has judged the means to differ across the four classes, the rightmost column lists the specific pairs for which mean Sharpe ratios differ at the 10% level of significance, according to Duncan's multiple range test ("Duncan's MR").

Table 4 Equity mutual fund Jensen's alphas for management fees and expense ratios by Morningstar category and standard deviation class					
Morningstar Category	Above Average Within +1σ	High +1σ	Very High +2σ	Extremely High +3σ	Duncan's MR
Panel A. Management Fees					
Large Blend	-1.22%	-0.91%	-0.17%	2.27%	
Large Growth	-5.47	-5.09	-8.32	-7.84	W>2, W>3, 1>2, 1>3
Large Value	2.72	3.25	5.08	7.14	
Mid-Cap Blend	8.94	9.25		5.10	
Mid-Cap Growth	-2.15	-0.83	-6.37	-4.13	
Mid-Cap Value	10.50	10.24	2.78		
Small Blend	14.38	22.17	22.42	15.01	1>W, 1>3, 2>W, 2>3
Small Growth	4.34	9.35	7.91	21.47	3>W, 3>1, 3>2
Small Value	18.04	21.30	18.43		
<i>Overall</i>	1.33	2.56	0.22	2.19	1>W
Panel B. Expense Ratios					
Large Blend	-1.31%	-2.23%	-1.27%	-2.23%	W>1
Large Growth	-5.90	-6.14	-10.11	-7.75	W>2, 1>2
Large Value	2.73	2.49	1.81	1.08	
Mid-Cap Blend	8.76	6.68	7.52	-11.90	W>3, 1>3, 2>3
Mid-Cap Growth	-2.14	-4.75	-2.03	-4.32	W>1
Mid-Cap Value	9.55	9.44	20.21	3.35	
Small Blend	13.72	14.93	14.36	20.78	
Small Growth	3.99	2.35	4.52	17.50	3>W, 3>2, 3>1
Small Value	18.11	15.26	19.08		W>1
<i>Overall</i>	0.89	0.54	-0.82	-0.67	

Note: This table presents three-year Jensen's alphas as a percent for equity mutual funds whose management fees (Panel A) and Expense ratios (Panel B) are within one standard deviation of the fund's Morningstar category mean ("Within +1 σ "), and more than one, two or three standard deviations, respectively, above the mean for the fund's Morningstar Category. Management fees are "actual" management fees, not contractual maximum management fees. Blank cells reflect sample sizes of zero, and italicized numbers indicate sample sizes of six or less. In the case where analysis of variance (ANOVA) has judged the means to differ across the four classes, the rightmost column lists the specific pairs for which mean Jensen's alphas differ at the 10% level of significance, according to Duncan's multiple range test ("Duncan's MR").

Table 5 Equity mutual fund Morningstar star ratings for management fees and expense ratios by Morningstar category and standard deviation class					
Standard Deviation Class					
Morningstar Category	Above Average Within $+1\sigma$	High $+1\sigma$	Very High $+2\sigma$	Extremely High $+3\sigma$	Duncan's MR
Panel A. Management Fees					
Large Blend	2.73	3.07	3.38	5.00	3>W, 3>1, 3>2
Large Growth	2.90	2.86	2.00	3.20	W>2, 1>2, 3>2
Large Value	2.86	3.22		3.00	
Mid-Cap Blend	2.92	2.83		2.00	
Mid-Cap Growth	3.00	2.71	2.57	2.50	
Mid-Cap Value	3.15	3.00	2.00		
Small Blend	3.19	3.75	4.20	3.00	
Small Growth	2.91	3.33	3.18	4.50	3>W, 3>1, 3>2
Small Value	3.20	3.12	2.00		
<i>Overall</i>	2.91	3.03	2.89	3.31	
Panel B. Expense Ratios					
Large Blend	2.66	2.62	2.00	1.00	W>3, 1>3
Large Growth	2.88	2.28	2.38	1.33	W>3, 1>3, 2>3
Large Value	3.07	2.99	1.00	1.00	W>2, W>3, 1>2, 1>3
Mid-Cap Blend	2.90	2.55	3.00	1.00	
Mid-Cap Growth	2.87	2.71	2.75	1.50	
Mid-Cap Value	3.18	3.08		3.00	
Small Blend	2.85	3.16		1.00	W>3, 1>3
Small Growth	2.87	2.69	2.50		
Small Value	2.96	2.48			
<i>Overall</i>	2.86	2.72	2.27	1.33	W>2, W>3, 1>2, 1>3, 2>3

Note: This table presents five-year Morningstar star ratings for equity mutual funds whose management fees (Panel A) and expenses ratios (Panel B) are within one standard deviation of the fund's Morningstar category mean ("Within $+1\sigma$ "), and more than one, two or three standard deviations, respectively, above the mean for the fund's Morningstar category. Management fees are "actual" management fees, not contractual maximum management fees. Blank cells reflect sample sizes of zero or data unavailability, and italicized numbers indicate sample sizes of six or less. In the case where analysis of variance (ANOVA) has judged the means to differ across the four classes, the rightmost column lists the specific pairs for which mean Morningstar five-year star ratings differ at the 10% level of significance, according to Duncan's multiple range test ("Duncan's MR").

Table 6 Equity mutual fund five-year annualized total returns for management fees and expense ratios by Morningstar category and standard deviation class					
Morningstar Category	Above Average Within +1 σ	High +1 σ	Very High +2 σ	Extremely High +3 σ	Duncan's MR
Panel A. Management Fees					
Large Blend	-0.48%	0.28%	0.39%	2.61%	
Large Growth	-3.36	-3.21	-5.22	-1.73	
Large Value	2.55	3.38		2.16	
Mid-Cap Blend	8.29	7.38		2.53	
Mid-Cap Growth	3.30	1.07	1.14	2.76	
Mid-Cap Value	9.15	8.96	4.11		
Small Blend	11.79	16.24	17.00	10.74	
Small Growth	7.02	8.15	10.48	23.23	3>W, 3>2, 3>1
Small Value	14.01	14.10	9.87		
<i>Overall</i>	2.80	2.91	3.82	4.72	
Panel B. Expense Ratios					
Large Blend	-0.74%	-0.97%	-3.35%	-5.55%	W>3, 1>3
Large Growth	-3.32	-5.99	-5.16	-13.72	W>3, 1>3, 2>3
Large Value	2.87	2.73	-3.29	-1.20	W>2, 1>2
Mid-Cap Blend	8.08	5.84	7.05	-10.22	W>3, 1>3, 2>3
Mid-Cap Growth	2.24	0.57	2.69	-5.11	
Mid-Cap Value	8.99	9.58		5.50	
Small Blend	10.92	11.12		6.47	
Small Growth	6.20	4.78	2.35		
Small Value	12.89	11.46			
<i>Overall</i>	2.11	2.04	-1.70	-6.44	W>2, 1>2, W>3, 1>3, 2>3

Note: This table presents the five-year annualized total return as a percent for equity mutual funds whose management fees (Panel A) and expense ratios (Panel B) are within one standard deviation of the fund's Morningstar category mean ("Within +1 σ "), and more than one, two or three standard deviations, respectively, above the mean for the fund's Morningstar category. Blank cells reflect sample sizes of zero or data unavailability, and italicized numbers indicate sample sizes of six or less. . In the case where analysis of variance (ANOVA) has judged the means to differ across the four classes, the rightmost column lists the specific pairs for which mean five-year returns differ at the 10% level of significance, according to Duncan's multiple range test ("Duncan's MR").

