

# PERSPECTIVE

Vol. 5 / No. 5  
December 1999

Perspective is a series of occasional papers published by the Investment Company Institute, the national association of the American investment company industry.

John Rea,  
executive editor;  
Craig Tyle,  
executive editor;  
Sue Duncan,  
managing editor.

1401 H Street, NW  
Suite 1200  
Washington, DC 20005

[www.ici.org](http://www.ici.org)

## Operating Expense Ratios, Assets, and Economies of Scale in Equity Mutual Funds

by John D. Rea, Brian K. Reid,  
and Kimberlee W. Millar<sup>1</sup>

### OVERVIEW

Recent issues of *Perspective* have analyzed trends in mutual fund fees, finding that the cost of investing in equity, bond, and money market mutual funds has declined substantially over the past two decades.<sup>2</sup> This issue of *Perspective* considers a related subject, the relationship between the assets of a fund and its operating expense ratio. More precisely, the paper examines the extent to which assets of individual equity funds are inversely correlated with their operating

expense ratios.<sup>3</sup> A fund exhibiting such a relationship is often said to be subject to economies of scale.

The analysis in the paper focuses on the relationship between fund assets and operating expenses, which consist of all fees and expenses relating to the management and administration of the fund. Operating expenses do not include sales loads paid by fund investors or Rule 12b-1 fees paid by the fund, both of which are primarily used to compensate sales professionals for advice and assistance given to buyers of fund shares. As such, they are distinct from expenses arising from a fund's investment management activities.<sup>4</sup>

The main findings of the analysis follow.

### **Variation in Operating Expense Ratios Across Equity Funds**

- ▶ Large equity funds generally have lower operating expense ratios than small equity funds.

<sup>1</sup> John Rea is Vice President and Chief Economist, Brian Reid is Assistant Vice President and Director of Industry and Financial Analysis, and Kimberlee Millar is Senior Research Associate at the Investment Company Institute. Anne Schafer, Natalia Parmly, Travis Lee, and Brady Edholm prepared the data used in the analysis.

<sup>2</sup> Between 1980 and 1998, the estimated cost declined 40 percent for equity funds, 29 percent for bond funds, and 24 percent for money market funds. See John D. Rea, Brian K. Reid, and Travis Lee, "Mutual Fund Costs, 1980-1998," *Perspective*, 5 (September 1999), pp. 1-11. Also see John D. Rea and Brian K. Reid, "Trends in Ownership Cost of Equity Mutual Funds," *Perspective*, 4 (November 1998), pp. 1-15 and John D. Rea and Brian K. Reid, "Total Shareholder Cost of Bond and Money Market Mutual Funds," *Perspective*, 5 (March 1999), pp. 1-8. All issues of *Perspective* are available on the Investment Company Institute's website at [www.ici.org/economy/perspective.html](http://www.ici.org/economy/perspective.html).

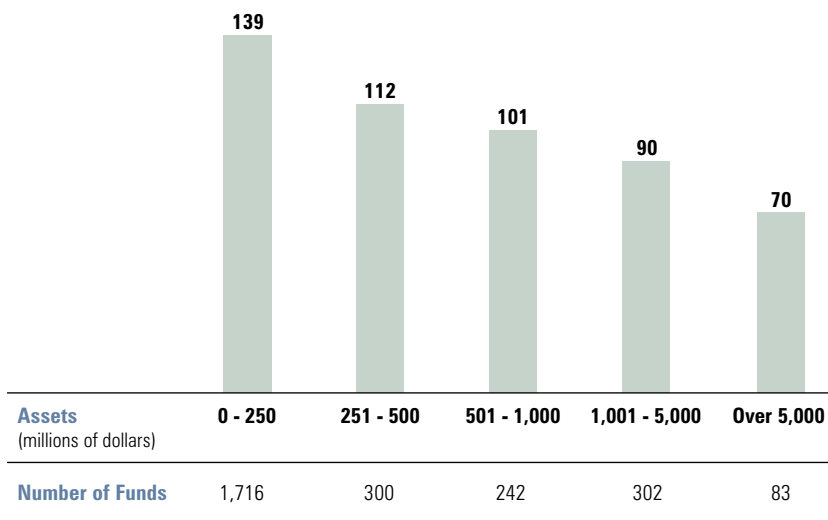
<sup>3</sup> Rea and Reid, "Trends in the Ownership Cost," pp. 13-14 examined the relationship between operating expense ratios and assets in equity funds. The findings are consistent with those reported below.

<sup>4</sup> Distribution expenses—the combination of 12b-1 fees and sales loads—have declined sharply over the past two decades for equity funds. See Rea, Reid, and Lee, "Mutual Fund Costs," p. 7.

FIGURE 1

**Average Operating Expense Ratio for Equity Mutual Funds,<sup>1</sup> by Assets, 1998**

(basis points)



<sup>1</sup> Excludes equity funds in variable annuity subaccounts.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberg Investment Companies Service; Wiesenberg Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource & © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

- ▶ The average operating expense ratio for funds with \$5 billion or more in assets was 70 basis points in 1998, compared with an average of 139 basis points for funds with assets of \$250 million or less (Figure 1).
- ▶ The inverse relationship between operating expense ratios and assets across funds also exists for groups of equity funds. For example, large actively managed retail funds, which exclude index and institutional funds, typically have lower operating expense ratios than small actively managed retail funds. The inverse relationship also is evident within investment objectives.

**Variation in Operating Expense Ratios Across Time**

- ▶ Operating expense ratios of equity funds have generally declined with significant asset growth.
- ▶ For a group of 497 equity funds with assets in excess of \$500 million in 1998, 368 or 74 percent had lower operating expense ratios in 1998 than in their first full year of operation when they were appreciably smaller in size (Figure 2). One hundred six or 21 percent had higher operating expense ratios, while operating expense ratios were unchanged at the remaining 23 funds.
- ▶ Reductions in operating expense ratios among the 497 funds tended to be large, whereas increases tended to be modest. Sixty-one percent of the reductions in operating expense ratios were 20 basis points or more; in contrast, 71 percent of the increases were under 20 basis points.

These findings suggest the presence of economies of scale as equity fund assets grow. The empirical analysis used in this paper, however, does not quantify the magnitude of scale economies. Nor does the analysis explore the limits of scale economies, that is, the extent to which they may diminish with fund size. Thus, the results should not be used to draw inferences about the level of the operating expense ratio for a given fund. Furthermore, the results should not be taken to mean that changes in a particular fund's operating expense ratio associated with asset growth should conform to the averages presented in the paper.

Assets are not the sole determinant of operating expense ratios. Other factors can cause operating expense ratios to vary from fund to fund or affect the association between changes in assets and operating expense ratios. An analysis incorporating the full range of determinants of fund expenses is beyond the scope of this paper. Such an analysis would involve estimating econometric models of fund expenses. These models have been estimated by others and, like the approach used in this paper, have found evidence of economies of scale in mutual funds.<sup>5</sup>

The remainder of the paper is organized as follows. The next section focuses on the principal ways in which fund assets can affect the operating expense ratio. This discussion serves as a backdrop for the following two sections that contain findings on the empirical relationship between equity fund assets and operating expense ratios. The first of these sections presents the results of a cross-sectional analysis of equity funds in 1998, showing that large funds generally have significantly lower operating expense ratios than small funds. The next section presents a time-series analysis of changes in operating expense ratios of large equity funds, showing that operating expense ratios generally decline with asset growth. The final section presents conclusions.

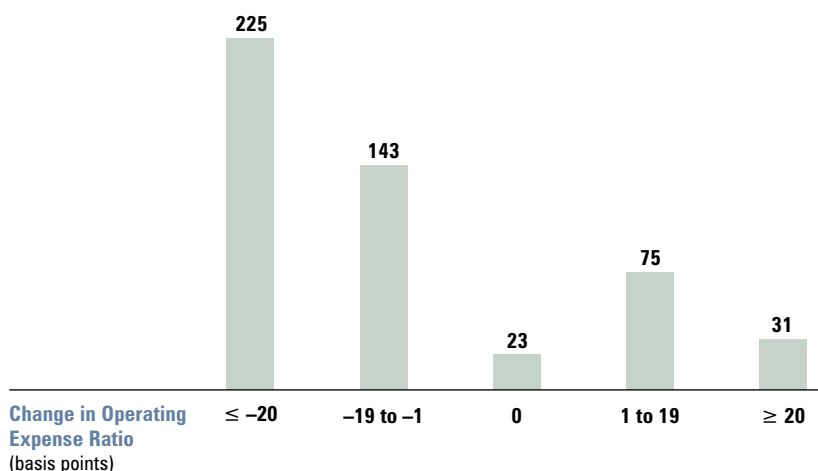
## FUND EXPENSES, FUND ASSETS, AND ECONOMIES OF SCALE

The principal business activity of a mutual fund is to manage assets of individual investors through the pooling of their investments. A mutual fund also provides shareholders with a variety of administrative, custodial, transaction, recordkeeping, tax, and investment services. In addition, some funds package the sale of their shares with investment advice to buyers of fund shares from professional consultants and advisers.

FIGURE 2

### Distribution of Changes in Operating Expense Ratios of 497 Equity Funds with \$500 Million or More in Assets in 1998<sup>1</sup>

(number of funds)



<sup>1</sup> See pp. 10-11 in the text for a discussion of procedure used to select funds. Excludes equity funds in variable annuity subaccounts. The change in the operating expense ratio is measured between the first full fiscal year of operation and 1998.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenerger Investment Companies Service; Wiesenerger Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource & © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

<sup>5</sup> See Stephen P. Ferris and Don M. Chance, "The Effect of 12b-1 Plans on Mutual Fund Expense Ratios: A Note," *The Journal of Finance*, 42 (1987), p. 1081; Don M. Chance and Stephen P. Ferris, "Mutual Fund Distribution Fees: An Empirical Analysis of the Impact of Regulation," *Journal of Financial Services Research*, 5 (1991), p. 39; Charles Trzcinka and Robert Zweig, "An Economic Analysis of the Cost and Benefits of S.E.C. Rule 12b-1," *Monograph Series in Finance and Economics*, Salomon Brothers Center for the Study of Financial Institutions, New York University, Monograph 1990-1, p. 22; Peter Tufano and Matthew Sevick, "Board Structure and Fee-Setting in the U.S. Mutual Fund Industry," *Journal of Financial Economics*, 46 (1997), p. 347; D. K. Malhotra and Robert W. MacLeod, "An Empirical Analysis of Mutual Fund Expenses," *The Journal of Financial Research*, 20 (1998), pp. 185-186; and Nicolaj Siggelkow, "Expense Shifting: An Empirical Study of Agency Costs in the Mutual Fund Industry," Working Paper, Wharton School, January 1999, p. 18. Scale economies for fund complexes were found by William J. Baumol, Steven M. Goldfeld, Lilli A. Gordon, and Michael F. Koehn, *The Economics of the Mutual Fund Markets: Competition versus Regulation*, Boston: Kluwer Academic Publisher, 1990, p. 192 and by Sean Collins and Phillip Mack, "The Optimal Amount of Assets under Management in the Mutual Fund Industry," *Financial Analysts Journal*, 53 (1997), pp. 70-71.

Virtually every mutual fund is externally managed and thus relies upon outside businesses to provide these services to shareholders. The typical fund has no employees, other than corporate officers, no physical building, and no capital equipment. As a result, business expenses incurred by a fund depend directly upon contractual arrangements with service providers and indirectly upon service providers' costs and demands for their services.<sup>6</sup>

This section describes relationships between fund expenses and fund assets arising from contractual agreements with the fund's principal service providers. For this purpose, fund expenses are those arising from the fund's primary activity of providing investment management services. These expenses, called operating expenses, do not include Rule 12b-1 fees. Like sales loads, 12b-1 fees are primarily used to compensate sales professionals for assistance given to buyers of fund shares and thus differ from expenses associated with the fund's asset management activities.<sup>7</sup>

### **Advisory and Administrative Fees<sup>8</sup>**

Fund expenses for advisory and administrative services make up the largest share of operating expenses, accounting for 70 percent of the total for all funds in 1998.<sup>9</sup> The investment adviser manages the fund's portfolio, while the administrator is responsible for legal, regulatory, tax, accounting, and other operational matters arising from the fund's investment management activities.<sup>10</sup>

Advisory and administrative fees are determined by contract<sup>11</sup> and typically are computed as a percentage of assets.<sup>12</sup> Many funds employ a declining rate structure in which the percentage fee rate decreases in steps or at designated breakpoints as assets increase.<sup>13</sup> That is, as assets increase beyond a given breakpoint, a new and lower percentage fee rate is applied to the increment in assets up to the next breakpoint. At that point, a lower rate applies to further increases in assets.

The declining rate schedule reflects the expectation that cost efficiencies or scale economies will be realized in the management and administration of the fund's portfolio and operations as the fund grows. Such efficiencies do not generally arise from the spreading of fixed management costs across larger asset levels, as is often assumed. In fact, fund asset growth typically necessitates additional resources for portfolio management, investment research, and fund administration. Thus, the declining fee schedule results from

<sup>6</sup> Fund expenses are charges to the fund by the service providers. Although fund expenses reflect the underlying costs of providing the services to a particular fund, they also may reflect other economic factors, including the interaction between the demand for and supply of the services of mutual funds.

<sup>7</sup> Rule 12b-1 fees are sometimes used for other distribution-related expenses, such as advertising and marketing materials, or for compensating sales professionals and other third parties for providing ongoing services to the fund.

<sup>8</sup> The background information for the remainder of this section was obtained through conversations with individuals at mutual fund sponsors, transfer agents, and custodial banks. For further discussion of fund organization, see "The Organization and Operation of a Mutual Fund," Investment Company Institute, Washington, D.C., 1997, available at [www.ici.org/issues/organization\\_operation.html](http://www.ici.org/issues/organization_operation.html).

<sup>9</sup> "Advisory Fee Analysis with a Focus on Variable Annuities and Sub-Advisory Contracts," *Strategic Insight Overview*, Strategic Insight Mutual Fund Research and Consulting, LLC, New York, April 1999, p. iv.

<sup>10</sup> The fund's adviser is typically its sponsor or organizer. The adviser and administrator may be combined into a single entity, often referred to as the management company. Where the adviser and administrator are separate organizations, the administrator is often an affiliate of the adviser, although some funds use independent administrators. The use of independent administrators is more common among small and mid-sized fund complexes than among larger complexes.

<sup>11</sup> Fund directors, including independent directors, must review and approve the management contract annually.

<sup>12</sup> N-SAR filings made by mutual funds with the Securities and Exchange Commission indicate that at least 80 percent of all mutual funds (excluding variable annuities), representing 86 percent of fund assets, had asset-based advisory fees in 1998. Many of the remaining funds also indirectly had asset-based fees. These funds were part of a master-feeder structure in which the "feeder" fund invests in a "master" portfolio that, in turn, makes direct purchases of securities.

The advisory fee may depend upon other criteria, such as investment performance or total assets of the family to which a fund belongs. When used, such components are typically combined with an asset-based fee. (The source of the filings is SimfundPlus, Strategic Insight Mutual Fund Research and Consulting, LLC, New York.)

<sup>13</sup> See "Industry-Wide Expense Trends: Should Industry Asset Growth Necessarily Translate Into Lower Average Expense Ratios?" Financial Research Corporation, January 5, 1998 and "Advisory Fee Contracts: Recent Trends and Issues," *Strategic Insight Overview*, May 1998, pp. ii-v.

anticipated efficiencies in the processes of the adviser and administrator as they add labor and capital to expand the scale of their operations.<sup>14</sup> In this context, the contractual schedule reflects the expected long-run cost of managing and operating a fund at different asset levels, taking into account the necessary adjustments in scale made by the adviser and administrator.

Asset-based advisory and administrative fees also can take the form of a single fee rate applied to all assets of the fund. For these funds, fee rates may be reduced as assets grow, but the decision to make such reductions is based on an ongoing assessment of costs and asset growth rather than a predetermined schedule of breakpoints. In some cases, funds may be organized initially with a single fee rate and then later may adopt a declining fee rate schedule.

Besides assets, the level of fee rates may be affected by the fund's portfolio management approach and by its investment strategy. Actively managed portfolios are more expensive to manage than indexed portfolios, partly owing to more complex research requirements. As a result, actively managed funds tend to have higher management fee rates than index funds. Similarly, fee rates tend to be higher for certain equity funds,

such as small-cap funds, sector funds, and international funds, again partly attributable to higher research expenses.<sup>15</sup>

### **Custodial and Transfer Agent Fees**

Custodians and transfer agents are the two other major service providers to mutual funds. The custodian holds the fund's securities in safekeeping, settles securities transactions for the fund, collects interest and dividends paid on securities, and records information on stock splits and other corporate actions. The custodial fee typically is based both on the level of fund assets and on the volume of securities transactions. The fee also reflects the complexity and scope of the custodial services. Custody of foreign securities, for example, is considerably more expensive than custody of domestic issues.

The transfer agent maintains records of shareholders' accounts and transactions, disburses and receives funds from shareholder transactions, prepares and distributes account statements and tax information, handles shareholder communication, and provides shareholder transaction services. These services are billed to the fund under a variety of arrangements, but average account size is, in most cases, the most important determinant of transfer agent billings.<sup>16</sup> In particular, the larger the average account size, the lower the transfer agent expenses per dollar of assets. This largely explains why institutional funds with high minimum balances tend to have lower transfer agent expenses than retail funds.<sup>17</sup>

The volume of transactions and use of shareholder services by the average investor in the fund also can affect transfer agent expenses: the higher the volume or usage, the higher the fee. Funds with a high volume of transactions because of monthly dividend distributions tend to incur

---

<sup>14</sup> This is the traditional interpretation of economies of scale in the economics of the firm: A firm having economies of scale is able to increase output with a less than proportional increase in labor and capital inputs by relying on efficiencies in the production process. Applying standard concepts of the firm to a financial organization, including a mutual fund, is not straightforward because of difficulty in defining and measuring output. Assets are the typical measure of output, but they may not capture the full range of services provided by a mutual fund.

<sup>15</sup> The management fee may depend directly or indirectly upon assets of all funds in the complex or assets of a group of funds. This effect of complex size on individual fund operating expense ratios reflects economies of scope, which are cost efficiencies arising from advising and administering multiple funds by the management company. All funds in the complex or group share common resources; as a result, an increase in the overall size of the complex could permit each fund to incur lower expenses than they otherwise would achieve as stand-alone entities. Stand-alone funds and funds within small complexes also may indirectly capture economies of scope by using unaffiliated administrators that serve a number of fund families. Baumol et. al. *The Economics of the Mutual Fund Markets*, pp. 192 and Collins and Mack, "The Optimal Amount of Assets," pp. 70-71 found evidence of scope economies.

<sup>16</sup> A common arrangement is a fixed, annual fee per account. Other arrangements include asset-based fees and transaction-based fees. These fees typically cover basic recordkeeping and shareholder services. Out-of-pocket charges, such as postage, forms, and telephone lines, typically are often billed to the fund separately. In addition, costs incurred in connection with certain transactions, such as wire transfers and checks, may be charged directly to individual shareholders.

<sup>17</sup> At the end of 1998, the average account size of institutional equity funds contained in the Investment Company Institute's master file of mutual funds was \$76,160. In contrast, the average account size of retail equity funds was \$19,050.

FIGURE 3

**Comparison of ICI Expense Database with the ICI Universe of Equity Funds,<sup>1</sup> 1998**

	ICI Expense Database	ICI Universe <sup>2</sup>	ICI Expense Database as a Percent of ICI Universe
<b>Funds</b>	2,643	2,826	93.5
<b>Share Classes</b>	5,131	5,932	86.5
<b>Assets</b> (billions of dollars) <sup>3</sup>	\$2,160	\$2,283	94.6
<b>Sales</b> (billions of dollars) <sup>4</sup>	\$604	\$619	97.6
<b>Shareholder Accounts</b> (thousands) <sup>5</sup>	114,950	116,121	99.0

<sup>1</sup> Excludes equity funds in variable annuity subaccounts.

<sup>2</sup> The universe is the ICI's masterfile of mutual funds.

<sup>3</sup> Fund assets in the expense database are average assets for the 1998 fiscal year. Assets in universe are the average of the funds' assets at year-end 1997 and 1998.

<sup>4</sup> Excludes reinvested distributions and exchanges. Sales are for the 1998 calendar year.

<sup>5</sup> The number of shareholder accounts in the expense database and in the universe is an average of the quarter-ends for calendar year 1998.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberger Investment Companies Service; Wiesenberger Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

FIGURE 4

**Characteristics of Equity Funds in Expense Database, by Asset Group, 1998**

	Asset Group (millions of dollars)					Total <sup>2</sup>
	0 - 250	251 - 500	501 - 1,000	1,001 - 5,000	> 5,000	
<b>Number of</b>						
Funds	1,716	300	242	302	83	2,643
Share Classes <sup>1</sup>	3,022	679	581	685	164	5,131
Shareholder Accounts (thousands)	7,298	6,551	8,631	34,287	58,183	114,950
<b>Fund Assets</b> (millions of dollars)						
Mean	69	356	704	2,109	13,585	817
Median	45	345	672	1,786	9,215	121
Total	118,287	106,882	170,396	636,997	1,127,532	2,160,094
<b>Fund Sales</b> (millions of dollars)						
Mean	37	148	263	674	2,758	229
Median	15	98	173	472	2,086	38
Total	63,402	44,524	63,682	203,698	228,946	604,253
<b>Percent of Total<sup>2</sup></b>						
Funds	65	11	9	11	3	100
Share Classes <sup>1</sup>	59	13	11	13	3	100
Accounts	6	6	8	30	51	100
Sales	10	7	11	34	38	100
Assets	5	5	8	29	52	100

<sup>1</sup> Number of share classes of funds in the group.

<sup>2</sup> Components may not sum to 100 because of rounding.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberger Investment Companies Service; Wiesenberger Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.



higher charges than funds that distribute dividends less frequently. In addition, as funds have established share classes to serve different distribution channels, transfer agents may bill each share class separately to reflect differences in shareholders in these classes. Finally, transfer agents of directly marketed funds typically have greater contact with shareholders than sales-force distributed funds, which rely on financial advisors for contact with shareholders. Transfer agents for directly marketed funds thus are likely to incur a higher cost per account, which will be reflected in charges to the funds.<sup>18</sup>

## OPERATING EXPENSE RATIOS FOR EQUITY FUNDS IN 1998

The contractual arrangements between a fund and its service providers suggest that operating expense ratios generally should be lower for large funds than for small funds, all else being equal. Empirical evidence of an inverse relationship between operating expense ratios and assets for a group of funds would thus be consistent with the presence of economies of scale.

This section examines this proposition for the 2,643 equity funds contained in the Investment Company Institute's expense database for 1998.<sup>19</sup> These funds represent 94 percent of all equity funds in 1998, 87 percent of all equity fund share classes,<sup>20</sup> and 95 percent of equity fund assets (Figure 3). Although most of the funds

are small, with 65 percent having assets of no more than \$250 million, large funds are well represented (Figure 4).

## Relationship of Operating Expense Ratios to Fund Assets

An examination of operating expense ratios by asset size reveals the presence of a strong inverse relationship, which is consistent with the expectation that larger funds should typically be less expensive to operate per dollar of assets than smaller funds, all other factors being equal. For the group of equity funds in 1998 with assets of \$250 million or less, the

FIGURE 5

### Operating Expense Ratios for Equity Fund Share Classes, by Fund Assets, 1998

(basis points)

Fund Assets (millions of dollars)	Operating Expense Ratios Within Corresponding Asset Group			
	Mean	10th	50th	90th
0 - 250	139	85	130	198
251 - 500	112	76	108	149
501 - 1,000	101	64	101	140
1,001 - 5,000	90	60	88	128
Over 5,000	70	39	72	97

<sup>1</sup> The percentiles represent the ranking of mutual fund operating expense ratios within each asset category. The 10th percentile represents the operating expense ratio for which 90 percent of the funds in the asset category have a higher expense ratio. Similarly, the 90th percentile represents the operating expense ratio for which 10 percent of the funds in the asset category have a higher expense ratio.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberg Investment Companies Service; Wiesenberg Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource & © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

<sup>18</sup> In addition to advisory, administration, custodial, and transfer agent fees, other operating expenses include directors' fees, federal and state registration fees, insurance premiums, legal fees, auditing fees, postage, printing expenses, taxes, interest, shareholder meeting expenses, amortized organizational expenses, and other miscellaneous expenses.

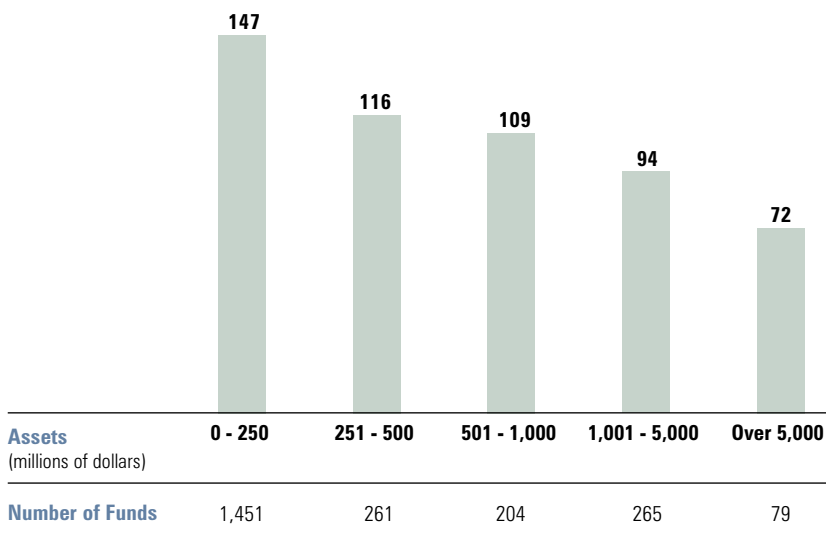
<sup>19</sup> This database has been used in previous studies of mutual fund fees and expenses and is more fully described in Rea, Reid, and Lee, "Mutual Fund Costs," p. 11. Equity funds in variable annuity subaccounts are not included.

<sup>20</sup> Of the 2,643 funds, 1,397 are single-class funds and 1,246 are multi-class funds.

FIGURE 6

**Average Operating Expense Ratio for Actively Managed Retail Equity Funds, by Assets, 1998**

(basis points)



Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberger Investment Companies Service; Wiesenberger Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

average operating expense ratio is 139 basis points (Figure 5).<sup>21</sup> As asset size increases, the average operating expense ratio declines steadily, reaching 70 basis points for the group of funds with over \$5 billion in assets. The inverse relationship is not attributable to a few funds within each asset category. For example, the operating expense ratio at the 10th percentile in each asset category declines from 85 basis points for funds in the smallest category to 39 basis points for funds in the largest asset category. A similar pattern also is evident in the 50th and 90th percentiles.<sup>22</sup>

**Controlling for Fund Characteristics**

Although the inverse relationship points to operational efficiencies associated with fund size, consideration should be given to determining the extent to which the observed relationship may be affected by other influences on operating expense ratios. Of particular importance are the effects of indexed and actively managed funds, retail and institutional funds, and investment objectives. An analysis of their effects is necessary, as some or all of the inverse relationship between operating expense ratios and assets might be due, for example, to a high concentration of low-expense index funds, institutional funds, or large-cap funds in the larger asset groups.

Controlling for these three effects does not eliminate the inverse relationship between operating expense ratios and assets across equity funds. This can be seen by removing index and institutional funds, which account for 21 percent of the share classes. The average operating expense ratio for the remaining actively managed, retail funds decreases sharply as assets increase. For the group with assets of \$250 million or less, the average ratio is 147 basis points, as compared with an average of 72 basis points for the group with more than \$5 billion in assets (Figure 6).

<sup>21</sup> The operating expense ratio is the difference between total expenses (net of fee waivers and reimbursements) and 12b-1 fees, expressed as a percentage of average assets. For a multi-class fund, the operating expense ratio for each share class is included in the analysis and is assigned to an asset group according to the assets of the fund and not the assets of the share class. As a consequence, multi-class funds are represented more than once in the analysis. Multi-class funds are treated in this manner for two reasons. First, a fund-level operating expense ratio is not meaningful, as operating expense ratios typically vary across classes. Second, although each share class may have a different operating expense ratio, portfolio expenses and most administrative expenses are incurred at the fund level and prorated to share classes based upon share-class assets. As these expenses typically constitute the majority of operating expenses, fund assets are likely to be a better indicator of share class operating expense ratios than share class assets. Feeder funds should be treated similarly, with assets of the master funds used instead of those of the feeder funds. A lack of asset data for master funds, however, necessitated the use of feeder fund assets.

<sup>22</sup> To examine the sensitivity of the findings to the inclusion of operating expense ratios of every share class of a multi-class fund, separate analyses were performed on single-class funds and on multi-class funds. The results were essentially unchanged from those shown in Figures 5-7. In addition, the analysis was performed using only one share class for each multi-class fund. The share class chosen was that with the highest operating expense ratio. The results were again similar to those reported in Figures 5-7.



The inverse relationship continues to hold when actively managed, retail funds are divided into investment objectives. For this purpose, three broad investment objectives are used: total return, capital appreciation, and international/global. Funds with a total return objective primarily invest in large-cap, domestic equities with a potential for returns from both income and asset appreciation. Capital appreciation funds have an objective of producing returns principally through capital appreciation by investing in growth stocks. Finally, international/global funds have substantial holdings of foreign equity securities.

Investment objectives have a significant effect on operating expense ratios. Total return funds have the lowest average ratios within each asset group, followed by capital appreciation funds and international/global funds (Figure 7).<sup>23</sup> For example, for the group of funds with \$250 million or less in assets, the average operating expense ratio is 120 basis points for total return funds, 141 basis points for capital appreciation funds, and 171 basis points for international/global funds. The differences in average operating expense ratios across investment objectives largely reflect differences in advisory and custodial expenses.

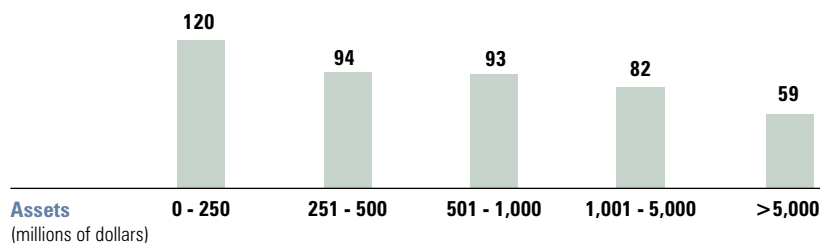
Within each investment objective, the average operating expense ratio of actively managed retail funds falls sharply as assets increase. For example, the average operating expense ratio for actively managed retail funds with a total return objective is 120 basis points for the smallest asset group, compared to 59 basis points for the largest asset group. Similar declining patterns characterize

FIGURE 7

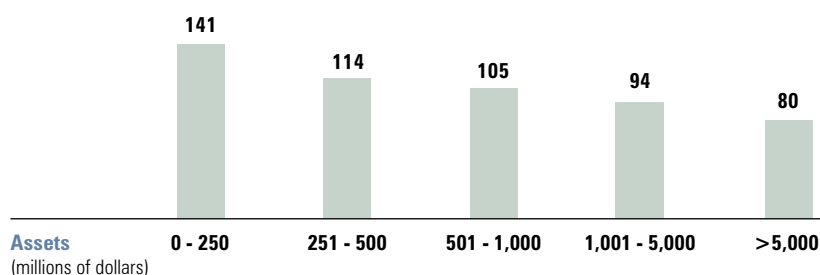
**Average Operating Expense Ratio for Actively Managed, Retail Equity Fund Share Classes, by Asset Size and Investment Objective, 1998**

(basis points)

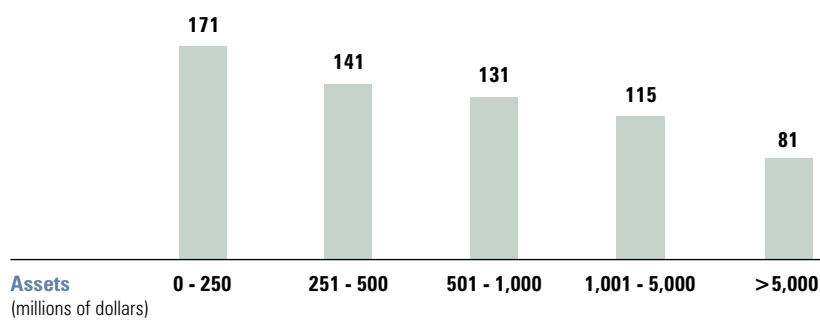
**Total Return**



**Capital Appreciation**



**International/Global**



Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberger Investment Companies Service; Wiesenberger Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource & © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

<sup>23</sup> Each investment objective has subcategories. The average expense ratios within each subcategory for a given asset group were not statistically different from one another.

FIGURE 8

**Characteristics of 497 Equity Funds with \$500 Million or More in Assets in 1998<sup>1</sup>**

<b>Number of Funds, 1998</b>	497
<b>Average Assets, 1998</b> (millions)	\$ 3,275
<b>Average Sales, 1998</b> (millions)	\$ 844
<b>Average Number of Shareholder Accounts, 1998</b> (thousands)	174
<b>Ratio to ICI Universe, 1998</b> (percent)	
Number of Funds	18 %
Assets	71
Sales	68
Number of Shareholder Accounts	74
<b>Change in Assets from First Full Fiscal Year of Operation</b> (millions)	
10th Percentile	\$ 473
Median	1,179
90th Percentile	7,077
Average	3,151
<b>Year of Initial Public Offering</b> (percent of funds)	
1924 - 1969	11 %
1970 - 1979	7
1980 - 1989	37
1990 - 1996	45
<b>Investment Objective</b> (percent of funds)	
Capital Appreciation	54 %
Total Return	27
International/Global	19
<b>Operating Expense Ratio, 1998</b> (basis points)	
10th Percentile	44 bp
Median	91
90th Percentile	130
Unweighted Average	91
Asset-weighted Average	72

<sup>1</sup> See pp. 10-11 in the text for a discussion of the procedure used to select funds and Figure 3 on page 6 for descriptions of assets, sales, and shareholder accounts.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberg Investment Companies Service; Wiesenberg Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

capital appreciation and international/global funds, although the level of the averages differs.<sup>24</sup>

**CHANGES IN OPERATING EXPENSE RATIOS OVER TIME FOR LARGE EQUITY FUNDS**

The previous section examined variation in operating expense ratios across equity funds, finding that large funds generally are less expensive to operate than small funds. This section complements that analysis by considering how operating expense ratios of individual equity funds change over time with asset growth. For this purpose, the analysis focuses on equity funds with at least \$500 million in assets in 1998. These funds are an ideal group for study because they have experienced significant asset growth during their lifetimes and may have reached sufficient size to have realized scale economies.

This section begins with a discussion of the criteria for selecting the funds used in the analysis and describes their characteristics. The analysis then examines changes that have occurred over time in their operating expense ratios and identifies patterns and relationships that can be observed in the changes.

**Fund Selection and Characteristics**

A total of 627 equity funds had \$500 million or more in assets in 1998. Of these, 130 are not included in the analysis for several reasons. Asset or expense data are not available at the beginning of the operating history for 111 funds. These funds are removed to ensure that the

<sup>24</sup> The negative relationship between assets and the operating expense ratio is consistent with the econometric models of expense ratios estimated for cross sections of equity funds. (See note 5 on p. 3 for the papers containing econometric models.) These models typically use the total expense ratio rather than the operating expense ratio but control for the effect of 12b-1 fees on the total expense ratio. These models also control for a much larger number of other influences on expense ratios. Estimates of the relationship between assets and expense ratios vary across these studies, showing that the decrease in the operating expense ratio associated, for example, with a doubling of fund assets generally is between 3 and 15 basis points. Thus, even though a negative relationship between fund assets and fund expense ratios is consistently found in these models, the quantitative magnitude has not been firmly established.

Collins and Mack ("The Optimal Amount of Assets," p. 70) found that scale economies also are present for fund complexes. The magnitude, however, diminishes as fund complexes increase in size. In fact, Collins and Mack estimated that growth in complex assets beyond \$20 billion to \$40 billion produced no additional scale economies.

FIGURE 9

**Change in the Operating Expense Ratios of 497 Equity Funds with \$500 Million or More in Assets in 1998<sup>1</sup>**

	All Funds	Funds with	
		Operating Expense Ratios that have Declined	Operating Expense Ratios that have Increased
<b>Number of Funds</b>	497	368	106
Percent of Funds		74%	21%
<b>Change in Operating Expense Ratio<sup>2</sup> (basis points)</b>			
Average	-26	-40	18
Median	-16	-28	10
<b>Percent Change in Operating Expense Ratio<sup>2</sup> (percent)</b>			
Average	-13	-28	33
Median	-15	-25	12

<sup>1</sup> See pp. 10-11 in the text for a discussion of the procedure used to select funds.

<sup>2</sup> Change measured between the first full fiscal year of operation and 1998.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberg Investment Companies Service; Wiesenberg Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

measurement of changes in operating expenses and assets of the funds used in the analysis have a common starting point in their operating lives, which is the first full fiscal year of their operation.<sup>25</sup> Inclusion of funds with an incomplete record would introduce an arbitrary element in the measurement of changes that would reflect the date of the first available data rather than the full life cycle of the fund.

For each fund in the analysis, changes in assets and operating expense ratio are measured between the first full fiscal year in the fund's

operation and 1998, the last year in the expense database. This measurement method results in the elimination of 13 funds for which the first complete year is 1998. In addition, 6 funds with lower assets in 1998 than at the start of their operation are not included, as the focus is on changes in operating expenses in the presence of asset growth.<sup>26</sup>

The remaining 497 equity funds used in the analysis are a broad mix of funds.<sup>27</sup> Although representing only 18 percent of the equity funds in 1998, they account for at least 68 percent of assets, sales, and accounts (Figure 8). The vast majority have experienced substantial asset growth, with 90 percent having increases of at least \$474 million between the first full year of operation and 1998. The majority of the funds were first offered to the public in the 1980s and 1990s, but an appreciable

<sup>25</sup> Many funds began operation in the middle of their fiscal year and thus the first reported expense data are for less than a full year. To avoid distortions arising from a partial year, the first complete fiscal year is used as the initial observation.

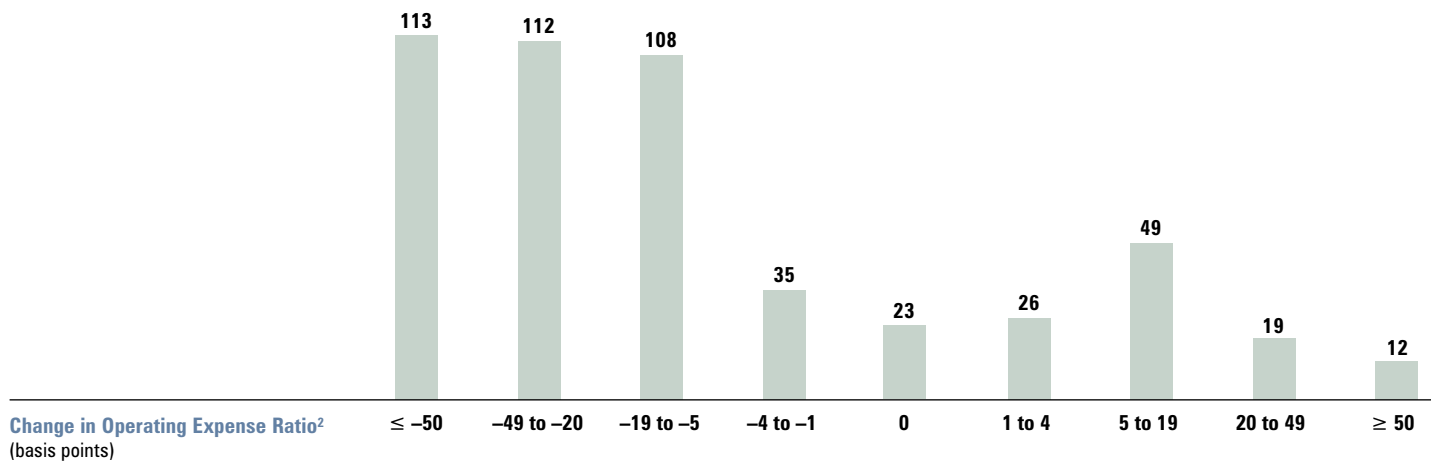
<sup>26</sup> Using only those mutual funds in existence in 1998 ignores those large funds that did not survive and thus could introduce a survivorship bias. In total, nine funds not in existence in 1998 had at least \$500 million in assets at some time during their operation. All of these, however, had been merged into surviving funds and consequently are indirectly included in the analysis.

<sup>27</sup> Only one share class is included for each multi-class fund. The share class selected is the oldest, as it provides the longest interval of time and the largest increase in assets in which to observe changes in the operating expense ratio.

FIGURE 10

**Distribution of Changes in Operating Expense Ratios of 497 Equity Funds with \$500 Million or More in Assets in 1998<sup>1</sup>**

(Number of Funds)



<sup>1</sup> See pp. 10-11 in the text for a discussion of the procedure used to select funds.

<sup>2</sup> Change measured between the first full fiscal year of operation and 1998.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberger Investment Companies Service; Wiesenberger Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource & © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

number were established before 1980. All three major investment objectives—capital appreciation, total return, and international/global—are represented. Finally, 80 percent of the operating expense ratios in 1998 are between 44 and 130 basis points. The median operating expense ratio and the unweighted average are both 91 basis points, and the asset-weighted average is 72 basis points.

**Changes in Operating Expense Ratios**

Lower operating expense ratios have generally accompanied the asset growth of the 497 equity funds. Comparing 1998 operating expense ratios to expense ratios in the first full fiscal year of operation shows that 368 or 74 percent of the funds recorded lower operating expense ratios, whereas 106 or 21 percent of the funds posted higher ratios (Figure 9). Operating expense ratios were unchanged at 23 funds. For all 497 funds,

the average change in the operating expense ratio was -26 basis points<sup>28</sup> and the median change was -16 basis points. In percentage terms, the average change per fund was -13 percent, while the median change was -15 percent.

Reductions in operating expense ratios generally were large, while increases tended to be of a small-to-moderate magnitude. For the 368 funds posting reductions, the decrease amounted to at least 50 basis points for 113 or 31 percent of the funds and was 20 or more basis points for 61 percent of the funds (Figure 10). Another 108 funds posted moderate declines ranging between 5 and 19 basis points. For all these funds, the

<sup>28</sup> The change in the asset-weighted average was -27 basis points.

median decrease in the operating expense ratio was 28 basis points and the median percentage decrease was 25 percent (Figure 9).

Among the 106 funds with higher operating expense ratios, 26 posted increases of no more than 4 basis points and 49 had increases between 5 and 19 basis points (Figure 10). For only 12 of the funds was the increase as much as 50 basis points or more. For all funds with higher operating expense ratios, the median increase was 10 basis points and the median percentage increase was 12 percent (Figure 9).<sup>29</sup>

Many of those funds posting increases in operating expense ratios of one-to-four basis points were either institutional or index funds, as were a number of those funds with either no change or a decrease of up to 4 basis points. In fact, more than half of the 84 funds with changes in their operating expense ratio between -4 and 4 basis points were institutional or index funds. The high concentration of institutional and index funds within the range reflects the use of flat fee structures by these funds.

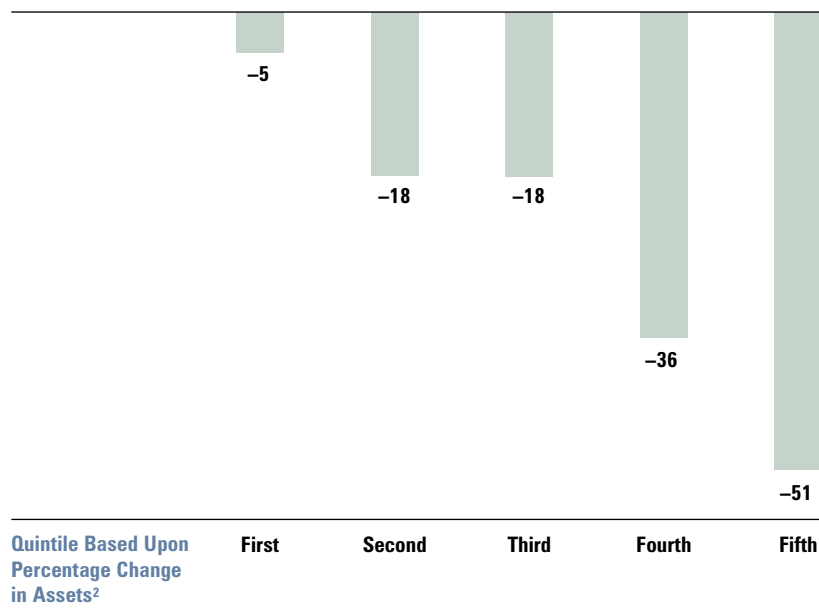
### Changes in Operating Expense Ratios Relative to Asset Growth

The change in the operating expense ratio of the 497 equity funds is correlated with asset growth. Funds with large percentage increases in assets have, on average, experienced large declines in operating expense ratios, whereas funds with small asset increases have tended to post small decreases. This can be seen by dividing the funds into quintiles based upon the percentage change

FIGURE 11

### Average Change in Operating Expense Ratio of 497 Equity Funds with \$500 Million or More in Assets in 1998,<sup>1</sup> by Percentage Change in Assets

(basis points)



<sup>1</sup> See pp. 10-11 in the text for a discussion of the procedure used to select funds.

<sup>2</sup> The first quintile contains the 99 funds with the smallest percent changes in assets. The second quintile contains the 99 with the next largest percent changes in assets. The remaining quintiles are similarly defined.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberger Investment Companies Service; Wiesenberger Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource & © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

in assets between the initial period and 1998 and then by calculating the average change in the operating expense ratios for the funds within each quintile. The average change for funds in the first quintile, which contains the 99 funds with the smallest asset changes, is -5 basis points (Figure 11). The magnitude of average change in the operating expense ratio generally rises, with the average change reaching -51 basis points for funds with the largest percentage increase in assets.

<sup>29</sup> Several funds with a performance component in the advisory fee incurred lower expenses in 1998 because of returns that did not exceed benchmarks. Removing the 43 funds in the sample with a performance fee component, however, does not materially affect the results reported in Figure 9.

FIGURE 12

**Average Change in Operating Expense Ratio of 497 Equity Funds with \$500 Million or More in Assets in 1998,<sup>1</sup> by Operating Expense Ratio in Initial Period**

(basis points)

Quintile, Based on Operating Expense Ratio in the Initial Period <sup>2</sup>	Average Change in Operating Expense Ratio	Average Operating Expense Ratio in Initial Period
First	7	50
Second	-7	91
Third	-15	112
Fourth	-38	142
Fifth	-76	186

<sup>1</sup> See pp. 10-11 in the text for a discussion of the procedure used to select funds.

<sup>2</sup> The first quintile contains the 99 funds with the lowest operating expense ratios in the initial period. The second quintile contains the 99 with the next lowest operating expense ratios in the initial period. The remaining quintiles are similarly defined.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberg Investment Companies Service; Wiesenberg Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource & © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

**Changes in Operating Expense Ratios Relative to Their Initial Levels**

The change in the operating expense ratio also is related to the level of the operating expense ratio in the initial period. Funds that started out with relatively low operating expense ratios have tended, on average, either to post increases in their operating expense ratios or to record small decreases. In contrast, funds with relatively high initial ratios have tended to experience large decreases. These tendencies are evident in the average changes in operating expense ratios within quintiles based upon the initial level of the operating expense ratio. On average, the change in the operating expense

ratio for funds in the first quintile is 7 basis points (Figure 12). The average change turns negative in the second quintile and continues to drop with successive quintiles, reaching -76 basis points in the fifth.

The same tendencies also are evident in the distribution of changes in operating expense ratios across quintiles. Of the 99 funds in the first quintile with the lowest initial operating expense ratios, nearly half posted increases in operating expense ratios, as did 34 of the funds in the second quintile (Figure 13). In contrast, only four of the funds in the fourth quintile and one in the fifth posted increases.

Two circumstances contribute to the concentration of increases in operating expense ratios among funds with low initial operating expense ratios. One is the presence of funds established in the 1960s and earlier, well before the expansion of shareholder services during the 1980s and 1990s.<sup>30</sup> The enhancement of services by established funds placed upward pressure on their expense ratios, whose original levels reflected a limited offering of services. In addition, many of these funds broadened their investments to foreign markets and new industries, contributing to the upward pressure on expenses. Thirty-five percent of these older funds posted higher operating expense ratios, compared with 20 percent of the funds established in 1970 or later.

<sup>30</sup> Important service enhancements included telephone and internet access to accounts, consolidated statements, cost basis accounting, checkwriting, automated transactions, individual and defined contribution retirement accounts, and investment, financial planning, and market information.



Fee waivers are a second element behind the concentration of increases in operating expense ratios among funds with low initial ratios. Waivers typically are put in place when a fund is newly established and small. Their purpose is to ensure that expenses are at a competitive level. Lifting of a waiver can initially produce an upward movement in the operating expense ratio. However, this action also means that fund assets have likely grown to a level at which the waiver is no longer needed to maintain a competitive operating expense ratio.<sup>31</sup>

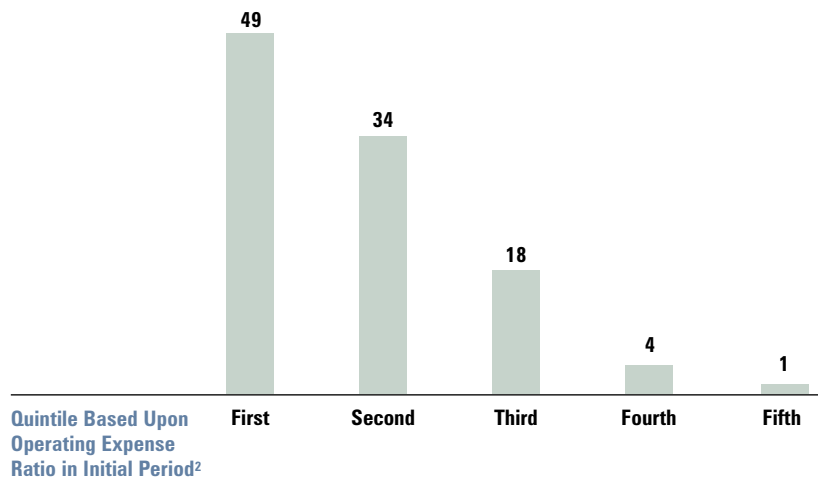
## CONCLUSION

The purpose of this paper has been to examine empirically the relationship between operating expense ratios and fund assets. The findings in the paper point strongly to the presence of an inverse relationship between the two at the fund level. Large equity funds in 1998 have significantly lower operating expense ratios than small funds. In addition, the majority of the large funds in 1998 have lower operating expense ratios than in earlier years when they were considerably smaller. That is, reductions in operating expense ratios have generally accompanied asset growth.

These results flow from the contractual agreements between mutual funds and their service providers that govern fund expenses. These contracts generally allow for reductions

FIGURE 13

### Number of Equity Funds with an Increase in Operating Expense Ratio,<sup>1</sup> by Quintile Based Upon Initial Level of Operating Expense Ratio for All 497 Equity Funds with 1998 Assets of at Least \$500 Million



<sup>1</sup> See pp. 10-11 in the text for a discussion of the procedure used to select funds.

<sup>2</sup> The first quintile contains the 99 funds with the lowest operating expense ratios in the initial period. The second quintile contains the 99 with the next lowest operating expense ratios in the initial period. The remaining quintiles are similarly defined.

Source: Investment Company Institute; Morningstar, Inc.; Lipper Analytical Services, Inc.; Value Line Publishing, Inc.; CDA/Wiesenberger Investment Companies Service; Wiesenberger Investment Companies Service; © CRSP University of Chicago, used with permission, all rights reserved (773.702.7467/www.crsp.com); Primary datasource & © Standard & Poor's Micropal, Inc. 1998 (617.451.1585/www.micropal.com); and Strategic Insight Mutual Fund Research and Consulting, LLC.

in fund expenses per dollar of assets as assets grow. These reductions are not the result of fixed costs or fixed resources at the service providers. Rather, they result from efficiencies and productivity gains passed on by service providers as they expand the scale of their operations.

<sup>31</sup> For comparison, the time-series analysis was performed on the 111 funds that had been dropped because of a lack of data for the year after their initial public offering. The initial year for these funds was the first year in which data were available, which represented various points in their development. Further data limitations reduced the number to 98 funds. The findings reported in the text for the 497 funds with complete records generally carried over to the 98 funds. Sixty-five percent posted lower operating expense ratios, while 32 percent had higher ratios. Partly reflecting the later start dates, the magnitude of the changes in operating expense ratios tended to be smaller. For example, a somewhat larger proportion of the funds had changes within the range of -19 to 19 basis points and fewer funds with changes in excess of 50 basis points in magnitude. Funds with the largest asset growth rates continued to show the largest declines in operating expense ratios, and funds with low initial ratios tended to have smaller decreases in operating expense ratios than those with high initial ratios.

---

Back issues of *Perspective*, written by Institute staff, leading scholars, and other contributors, address public policy issues of importance to mutual funds and their shareholders. Contact the Institute's Public Information Department at 202/326-5945 for more information. All issues of *Perspective* are also available on the Institute's website; for an online index of issues, see <http://www.ici.org/economy/perspective.html>.

Vol. 1, No. 1, July 1995:	<i>"Mutual Fund Shareholder Response to Market Disruptions"</i>	Richard Marcis, Sandra West, Victoria Leonard-Chambers
Vol. 1, No. 2, November 1995:	<i>"Improving Mutual Fund Risk Disclosure"</i>	Paul Schott Stevens, Amy Lancellotta
Vol. 2, No. 1, January 1996:	<i>"Mutual Fund Regulation: Forging a New Federal and State Partnership"</i>	Matthew P. Fink
Vol. 2, No. 2, March 1996:	<i>"Mutual Fund Shareholder Activity During U.S. Stock Market Cycles, 1944-95"</i>	John D. Rea, Richard Marcis
Vol. 2, No. 3, April 1996:	<i>"The Coming Crisis in Social Security"</i>	Dr. John B. Shoven
Vol. 2, No. 4, May 1996:	<i>"Investing the Assets of the Social Security Trust Funds in Equity Securities: An Analysis"</i>	Lawrence J. White
Vol. 2, No. 5, June 1996:	<i>"Helping America Save for the Future"</i>	Sen. Robert J. Kerrey, Jon S. Fossel, Matthew P. Fink
Vol. 2, No. 6, December 1996:	<i>"U.S. Emerging Market Funds: Hot Money or Stable Source of Investment Capital?"</i>	John D. Rea
Vol. 3, No. 1, March 1997:	<i>"Mutual Fund Developments in 1996"</i>	Brian K. Reid
Vol. 3, No. 2, June 1997:	<i>"Growth and Development of Bond Mutual Funds"</i>	Brian K. Reid
Vol. 3, No. 3, July 1997:	<i>"Continuing a Tradition of Integrity"</i>	Barry P. Barbash, Don Powell, Matthew P. Fink
Vol. 3, No. 4, August 1997:	<i>"Selected Issues in International Taxation of Retirement Savings"</i>	Paul Schott Stevens
Vol. 3, No. 5, December 1997:	<i>"Stock Markets, Economic Development, and Capital Control Liberalization"</i>	Ross Levine
Vol. 4, No. 1, March 1998:	<i>"Mutual Fund Developments in 1997"</i>	Brian K. Reid, Samuel Ankrah, Kimberlee Millar
Vol. 4, No. 2, June 1998:	<i>"U.S. Emerging Market Equity Funds and the 1997 Crisis in Asian Financial Markets"</i>	Mitchell A. Post, Kimberlee Millar
Vol. 4, No. 3, November 1998:	<i>"Trends in the Ownership Cost of Equity Mutual Funds"</i>	John D. Rea, Brian K. Reid
Vol. 5, No. 1, January 1999:	<i>"401(k) Plan Activity: Asset Allocation, Account Balances, and Loan Activity"</i>	Jack VanDerhei, Russell Galer, Carol Quick, John D. Rea
Vol. 5, No. 2, February 1999:	<i>"Mutual Fund Developments in 1998"</i>	Brian K. Reid, Kimberlee Millar
Vol. 5, No. 3, March 1999:	<i>"Total Shareholder Cost of Bond and Money Market Funds"</i>	John D. Rea, Brian K. Reid
Vol. 5, No. 4, September 1999:	<i>"Mutual Fund Costs, 1980-1998"</i>	John D. Rea, Brian K. Reid Travis Lee

---

Although information or data provided by independent sources is believed to be reliable, the Investment Company Institute is not responsible for its accuracy, completeness, or timeliness. Opinions expressed by independent sources are not necessarily those of the Institute. If you have questions or comments about this material, please contact the source directly.