INVESTMENT COMPANY INSTITUTE®

PERSPECTIVE

Trends in the Ownership Cost of Equity Mutual Funds

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ABSTRACT

Most discussions of the cost of investing in equity mutual funds focus on one component of cost, the expense ratio, and ignore another significant cost, sales loads. As a result, conclusions about the total cost of mutual fund investing have often been incomplete or misleading. This paper analyzes trends in the cost of investing in equity mutual funds from 1980 to 1997 using a measure called "total shareholder cost." This measure includes all major costs of investing in a mutual fund and is comparable to the fee and expense information required by the U.S. Securities and Exchange Commission in the mutual fund prospectus. The paper finds that the average cost of investing in equity mutual funds has dropped by more than one-third since 1980. The paper also finds evidence of economies of scale among equity funds.

I. OVERVIEW AND SUMMARY

Mutual fund fees and expenses have been a subject of ongoing public discussion. Recent attention, in particular, has focused on the level and trend in the average cost of investing in mutual funds. Conclusions, however, have varied, largely because of the lack of a standard framework for analyzing the total cost of investing in mutual funds. Of the cost measures commonly used, most fail to account for the full range of mutual fund investment costs and thus misrepresent the actual cost incurred by the "average" buyer of a mutual fund.

This paper examines the level and trend in mutual fund fees and expenses using a measure of ownership cost that overcomes the limitations of other measures. This measure, called *total shareholder cost*, represents the cost that an investor would expect to incur in purchasing and holding mutual fund shares. It accounts for all major fees and expenses relevant to investment decision-making and, in this regard, is comparable to the fee and expense information required by the U.S. Securities and Exchange Commission (SEC) in every mutual fund prospectus.[2] Fees and expenses included in total shareholder cost consist of fund operating expenses, 12b-1 fees, and sales loads. In contrast, most other measures used to analyze mutual fund ownership cost do not incorporate all of these costs.

The paper provides estimates of total shareholder cost for equity funds over the 18-year period from 1980 to 1997. Equity funds, rather than all funds, were selected for the analysis because their fees and expenses are the most frequent subject of discussion.

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[1] Travis Lee and Kimberlee Millar assisted in the analysis of the data. Anne Schafer, Natalia Parmly, Linda Turner, James Erceg, Michael Bogdan, Monica Bennsky, Aaron Silverman, Jennifer Smith, and Scott Alston assisted in the collection and preparation of the database. Brady Edholm prepared the charts and tables. We would like to thank Mitchell A. Post and Lawrence J. White for comments on previous drafts of the paper.

[2] Total shareholder cost also is similar to the cost concept used by Erik R. Sirri and Peter Tufano, "Competition and Change in the Mutual Fund Industry," in *Financial Services: Perspectives and Challenges*, edited by Samuel L. Hayes, III, Boston: Harvard Business School Press, 1993, pp.199-202 and by Peter Tufano and Matthew Sevick, "Board Structure and Fee-Setting in the U.S. Mutual Fund Industry," *Journal of Financial Economics*, 46 (1997), pp. 339-342.

The principal findings from the analysis are as follows.

Total Shareholder Cost

- The total shareholder cost for equity funds decreased more than one-third between 1980 and 1997, from 2.25 percent of new investments in equity funds in 1980 to 1.49 percent of new investments in 1997 (Figure 1).
- The decrease in the total shareholder cost ratio for equity funds was the result of lower distribution costs (sales loads and 12b-1 fees), which are the components of total shareholder cost used primarily to compensate sales professionals for advice and service provided to fund investors.

Investor Choice

- A wide range of total shareholder cost ratios has been available to equity fund investors throughout the 1980s and 1990s.
- Investors have concentrated their purchases and holdings in lower-cost equity funds.

Economies of Scale

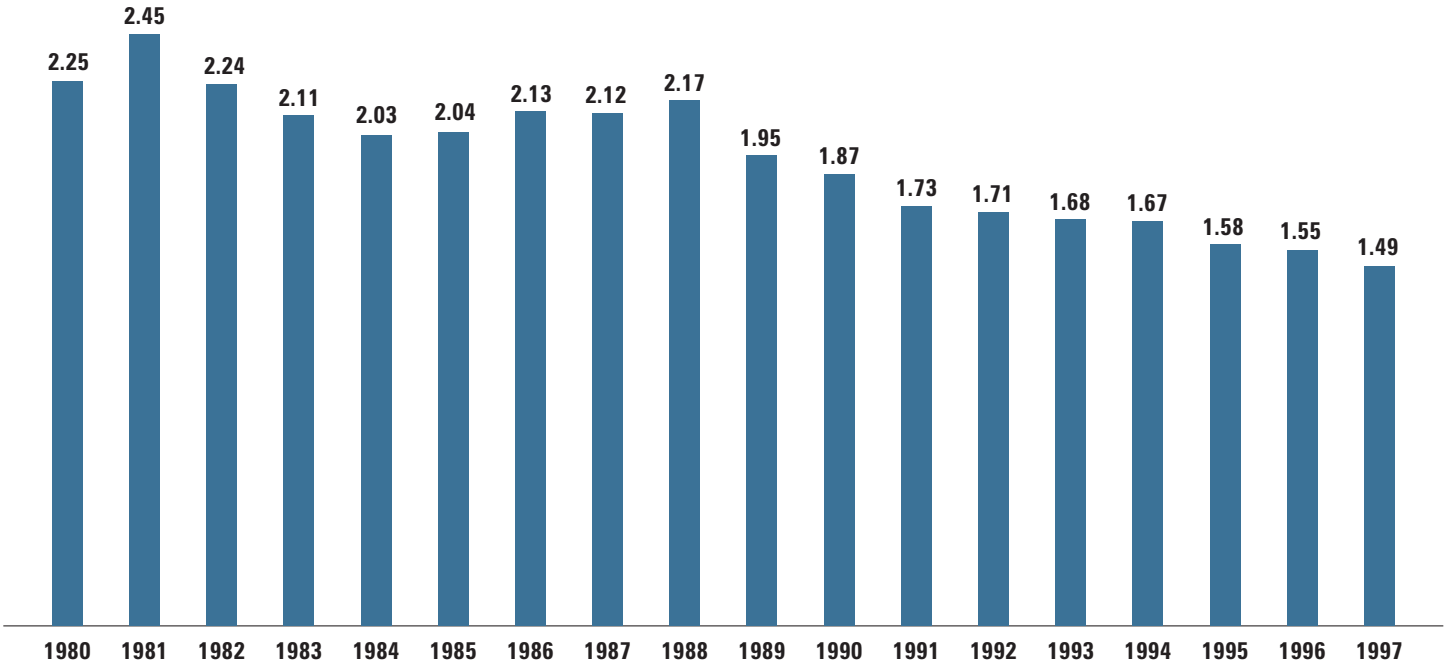
- For equity funds grouped by asset size, operating expense ratios declined as assets increased, indicating the presence of economies of scale.
- The 100 largest equity funds in 1997 in continuous existence since 1980 experienced substantial asset growth and recorded significant decreases in operating expense ratios between 1980 and 1997.
- Of the 100 largest funds, those with the largest increases in assets generally registered the largest decreases in operating expense ratios during the period.

The remainder of the paper is organized as follows.

Section II discusses and analyzes the concept of total shareholder cost and contrasts it with two other measures of ownership cost. The section

FIGURE 1

Total Shareholder Cost Ratio for Equity Funds,[1] 1980-1997
(percent)



[1] *Sales-weighted average of total shareholder cost ratios for individual equity funds.*

Source: Investment Company Institute; 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); Strategic Insight Mutual Fund Research and Consulting, LLC; and The Wyatt Company.

concludes that total shareholder cost is the best measure for assessing the overall cost of investing in mutual funds. Total shareholder cost incorporates all major fund fees and expenses and is therefore a relevant gauge for investment decision-making. In contrast, one of the other measures—the expense ratio—omits an important cost, the sales load. The other measure—the cost incurred by all existing owners of mutual funds—is subject to distortions that limit its usefulness as an indicator of the cost of investing in mutual fund shares.

Section III describes the method used for constructing estimates of total shareholder cost. Measurement of total shareholder cost requires combining sales loads with expense ratios. Because sales loads are one-time payments, they cannot be added directly to the recurrent, annual expense ratio. Instead, the sales load must be converted to the equivalent of an annual charge over the estimated life of the investment. This section describes the procedure used to accomplish this task. It starts with an explanation of the method for calculating the specific components of the cost incurred by a single equity fund investor, and it then generalizes the method to all new investors in a fund and to all equity funds. Readers not wishing to review the technical aspects of constructing such a methodology may wish to turn directly to Section IV.

Section IV analyzes levels and trends in total shareholder cost for equity funds over the 1980-1997 period. This analysis finds that the total cost of investing in equity mutual funds fell more than one-third over the 18-year period. The section also analyzes the factors that led to the decline in total shareholder cost during this period: investor preferences for lower-cost funds and actions by fund companies to lower fees and expenses. Finally, the section reviews evidence that points strongly to the presence of economies of scale among individual equity funds.

II. THE CONCEPT OF TOTAL SHAREHOLDER COST

The paper's principal objective is to analyze trends in the cost of owning equity mutual funds. For the analysis, ownership cost is defined as all the costs set by a fund organization that an investor would expect to incur in purchasing and holding fund shares over the life of his or her investment in the fund.[3] This concept of ownership cost is called total shareholder cost.

Total shareholder cost has two important features. First, it is an appropriate measure for investors to use in making purchase decisions. In fact, it is based upon the same considerations that underlie the figures required by the SEC in the example section of the fee table in the mutual fund prospectus. These figures show the cumulative dollar cost that a buyer would incur over one-, three-, five-, and 10-year investment periods on a $10,000 initial investment that returns 5 percent per year. Total shareholder cost provides essentially the same information but converts the cumulative dollar cost to the equivalent of a constant, annual payment spread over the life of the shareholder's investment.

The second feature of total shareholder cost is that it represents the price at which the fund is offering its investment management and other services to investors. Thus, total shareholder cost reflects any action taken by a fund company to change the price of those services through higher or lower fees and expenses.

This section provides further detail about the definition of total shareholder cost. In addition, total shareholder cost is contrasted with two other approaches to measuring fund ownership cost.

Costs Included in Total Shareholder Cost

Total shareholder cost includes the two principal types of costs incurred by an investor purchasing and holding shares of a mutual fund: fund expenses and sales charges. A fund incurs expenses for services such as managing portfolio investments, maintaining and servicing shareholder accounts, and distributing or marketing shares under a Rule 12b-1 plan.[4] Because the fund pays these expenses directly out of its assets, shareholders in the

[3] A mutual fund owner may pay fees not set by the mutual fund organization. For example, an investor acquiring a fund through a wrap program, a fee-based financial advisor, or a personal trust would pay an annual fee based upon all of the investor's assets held in the program. Because these costs are not set or determined by fund companies, they are not included in total shareholder cost.

[4] The 12b-1 fee can be used to pay advertising and marketing expenses and to compensate sales professionals and others for assisting investors during the sale of shares. The fee also may be used to compensate third parties for servicing shareholder accounts.

fund indirectly bear the cost. These fund expenses are aggregated and typically presented as a percentage of assets, known as the expense ratio.[5]

Investors in load funds also directly pay a one-time sales charge. These charges are paid when the shares are either purchased or redeemed. The former arrangement is known as a front-end sales load; the latter a deferred sales load. Both the front-end sales load and the deferred sales load are expressed as a percentage of the purchase price of the shares. Deferred sales loads typically decrease with the length of time the shares are held and eventually reach zero. (Thus, they are referred to as contingent deferred sales loads.) Sales loads primarily compensate sales professionals for assistance and advice provided to investors.[6]

Computation of Total Shareholder Cost

Total shareholder cost is measured as the dollar value of fees, expenses, and sales loads incurred during a given year by buyers of a fund in that year, expressed as a percentage of the amount invested in the fund. For a no-load fund, the expense ratio is the sole component of cost, since no sales load is incurred. For a load fund, the sales load must be included along with the expense ratio. Since the sales load is a one-time payment, it cannot be directly added to the recurrent, annual expense ratio. Rather, it must be converted to the equivalent of annual payments spread over the period the investor holds the fund. The annualized or "annuitized" sales load, expressed as a percent of fund sales, can then be added to the expense ratio to calculate the total cost of investing for load fund purchasers.

Other Measures of Ownership Cost

Total shareholder cost captures all annual fees, including the annuitized load, paid by investors purchasing fund shares. For any fund, this measure is the price at which the fund offers its services to investors, and it can be used to track trends in fees and expenses that reflect actions of the fund. Although other measures have been used to determine the annual cost borne by an average shareholder, these approaches have shortcomings that are not shared by the total shareholder cost measurement. Two of these measures are identified below and contrasted with total shareholder cost.

Expense ratio. The expense ratio is frequently used to measure and analyze the cost of mutual fund ownership. The expense ratio, however, has a significant limitation: It does not include sales loads. This is a critical omission, as survey evidence shows that roughly two-thirds of retail investors buy mutual funds primarily through sources offering load funds.[7] Furthermore, load funds accounted for more than half of all new sales of equity funds in 1997 and represented 60 percent of equity fund assets at the end of 1997.[8] Consequently, the expense ratio is not a representative measure of the cost of fund ownership. Its use to characterize trends in ownership cost, unless restricted to no-load funds, is likely to be misleading.

Costs incurred by existing owners of a fund. Another approach to analyzing ownership cost is measuring all fees paid by *existing* shareholders who hold a fund in a particular year. This approach estimates the dollar amount of fund expenses and any annuitized sales loads paid by existing shareholders, expressed as a percentage of total assets.

This measurement has two shortcomings. First, it includes loads paid by buyers in previous years, in addition to loads incurred by current buyers. The loads of previous buyers, however, may differ from loads available to current buyers. As a result, this measure could be a misleading indicator of the current terms on which the fund is offering shares to the public. Second, for a load fund, the measure could suggest that ownership costs were changing even when loads and expense ratios were not. For example, an increase in sales, and hence an increase in the dollar amount of sales loads, could cause the measured cost of ownership for all the fund's

[5] Brokerage commissions and other securities transactions costs relating to fund portfolio securities, such as the bid-ask spread, are reflected in securities prices and thus not included directly in fund expenses. Data and information on such costs are not easily obtained for the period analyzed in the paper and thus are not included in the measurement of total shareholder cost.

[6] Shareholders also may make direct payment for account maintenance fees and for services such as checkwriting. Data on such payments are not available and thus not included in the measurement of total shareholder cost. Some funds also charge redemption fees payable to the fund that are applied to the value of the shares at the time of the redemption. These charges generally affect only short-term investors. Information on redemption fees is not readily available and thus is not included in the measurement of total shareholder cost. The likely effect of all such fees on total shareholder cost would, in any event, be *de minimis*.

[7] *Mutual Fund Shareholders: People Behind the Growth*, Investment Company Institute, Washington, DC, 1996, p. 43.

[8] Investment Company Institute, unpublished data from mutual fund database.

investors to increase even though the fund had not changed its sales load or altered its expense ratio. Similarly, a drop in sales could produce a lower ownership cost even though the fund had not changed, or may have even raised, its sales load or expense ratio.

III. DEVELOPMENT OF THE TOTAL SHAREHOLDER COST MEASURE

By definition, total shareholder cost is the sum of the expense ratio and the annuitized load. In this section, detailed consideration is given to the measurement and estimation of these two components of shareholder cost.

The section begins with an explanation of the procedure for calculating total shareholder cost and its two components for a single investor purchasing mutual fund shares. It then discusses the application of the procedure to all new investors in the fund and describes the use of a sales-weighted average of total shareholder costs for individual funds to form a cost measure for all equity funds. The analysis uses a sales-weighted average because total shareholder cost only measures the cost to buyers in a particular year. The sales-weighted average also reflects actual investment choices made by investors. The section concludes with a description of the sources of the data used in the estimation of total shareholder cost.

The material in this section is technical. Readers not interested in such aspects of the estimation method may wish to proceed to Section IV on page 9, which contains the findings.

Annuitized Sales Load for a New Investor with a Fixed Holding Period

Annuitizing the sales load is most simply illustrated by considering an investor who buys and holds load fund shares for a fixed number of years without making any partial redemptions. Under these conditions, the annuitization procedure depends upon whether the sales charge is a front-end load or contingent deferred load.

Annuitizing the front-end load. An investor buying a fund with a front-end load pays the load in a lump sum at the time of purchase. To spread the load across the period the shares are held, assume the investor is allowed to pay the load in equal, annual installments rather than in one lump sum. In effect, the investor is borrowing the cash necessary to pay the front-end load and repaying the loan over the life of the investment. The annual loan payment reflects both the amount borrowed and interest on the loan.

To illustrate the cost of the load over the life of the investment, assume an investor purchased $100 worth of shares from a fund with a 5 percent front-end load and held the shares for 10 years. At an interest rate of 6 percent, paying the $5.00 sales load up front is equivalent to making annual payments of $0.68 over the 10-year period.[9] Put another way, the annuitized value of the 5 percent sales load, as a percentage of the investor's initial $100 purchase, is 0.68 percent per year over the 10-year holding period.[10] If the fund had an annual expense ratio of 1.10 percent, the investor would have an annual total cost of fund ownership of 1.78 percent.[11]

Annuitizing the contingent deferred load. The procedure used to annuitize a contingent deferred sales load differs from that used for a front-end load. The difference is that payment of the sales charge does not occur at the time of the purchase but at the end of the holding period. To convert the deferred sales load to an annual payment, the investor is treated as though he or she prepays the load in equal annual installments. The amount of the annual prepayment reflects the sales load less interest earned on the prepayments.

[9] See Figure 2 for the formula.

[10] The original investment in the fund is not $100 but $95. As a percentage of $95, the annuitized sales charge would be 0.72 percent. In the estimates presented in Section IV, annuitized loads are based upon the actual amount invested.

[11] The definition of total shareholder cost implies that a prospective investor forms an expectation of cost over the entire life of the investment. The annuitized load reflects that multi-year expectation. If the investor assumes that the expense ratio is constant over the holding period, then the total shareholder cost ratio is the appropriate measure for investment decisions. The SEC-required cumulative cost figures in the prospectus similarly assume that the expense ratio is constant through time, as do Tufano and Sevick, "Board Structure and Fee-Setting," p. 342.

For example, assuming an interest rate of 6 percent, the annuitized load for an investor purchasing $100 worth of shares from a fund with a 4 percent contingent deferred load and a five-year holding period would be $0.67 per year, or 0.67 percent of the initial investment.[12] If the fund's expense ratio were 0.90 percent, the investor would incur an annual total ownership cost of 1.57 percent.

Effect of the holding period and the interest rate. The value of the annuitized load depends upon the length of the holding period and the interest rate. A decrease in the holding period raises both the annuitized front-end load and the annuitized deferred load, because the single load payment is spread over a shorter period (Figure 2).[13] An increase in the interest rate leads to a higher annuitized front-end load since the annual payment must cover larger interest payments. A higher interest rate, however, decreases the annuitized deferred load, as the increase in interest income can be used to meet the future load payment.

FIGURE 2

Annuitized Sales Loads for Selected Holding Periods and Interest Rates

(percent of net asset value of shares)

Holding Period (years)	Front-end Sales Load of 5 Percent[1] and Interest Rate of:		Contingent Deferred Sales Load of 5 Percent[2] and Interest Rate of:	
	6 percent	12 percent	6 percent	12 percent
1	5.30	5.60	4.72	4.46
2	2.73	2.96	1.83	1.68
3	1.87	2.08	0.89	0.79
4	1.44	1.65	0.43	0.37
5	1.19	1.39	0.17	0.14
6	1.02	1.22	0.00	0.00
7	0.90	1.10	0.00	0.00
8	0.81	1.01	0.00	0.00
9	0.74	0.94	0.00	0.00
10	0.68	0.88	0.00	0.00
11	0.63	0.84	0.00	0.00
12	0.60	0.81	0.00	0.00
13	0.56	0.78	0.00	0.00
14	0.54	0.75	0.00	0.00
15	0.51	0.73	0.00	0.00

[1] *The annuitized front-end sales load* f^a *is the solution to the equation:* $f = f^a \sum_{j=1}^{h} (1+r)^{-j}$ *, where* f *is the front-end sales load,* r *is the annual interest rate, and* h *is the length of the holding period.*

[2] *The annuitized contingent deferred sales load* d^a *is the solution to the equation:* $d = d^a \sum_{j=1}^{h} (1+r)^{j}$ *, where* d *is the contingent deferred sales load. The figures in the table assume that the 5 percent contingent deferred sales load applies to redemptions in the first year and declines one percentage point per year through the fifth year. Thereafter, the deferred load is zero.*

[12] See Figure 2 for the formula. The example simplifies the computation by assuming that the contingent deferred load does not decline with the length of the holding period. In actuality, a 4 percent deferred load would decline in equal, annual increments, ultimately reaching zero after a stipulated number of years. In the estimates presented in Section IV, allowance is made for the decline that occurs in the level of the contingent deferred sales load as the holding period increases.

[13] As noted above, the shorter holding period also would raise the level of a contingent deferred sales load.

Annuitized Sales Load and Total Shareholder Cost for All New Investors in a Fund

The annuitized sales load forms the basis for estimating the annual load cost for all new investors in the fund. Extending the calculation from a single investor to numerous new investors, however, requires consideration of different investor holding periods.

Annuitized load for investors with different holding periods. Investors purchasing fund shares are likely to have different holding periods; thus, the annuitized loads they incur vary accordingly.[14] To illustrate, assume that buyers of a fund in a particular year hold shares for either one or two years. Further, suppose they redeem 75 percent of the purchased shares at the end of the first year and the remaining 25 percent at the end of the second year. Finally, assume that the aggregate volume of new share purchases is $100, the annuitized load for the one-year holding period is 5.30 percent, and the annuitized load for the two-year holding period is 2.73 percent.

The pattern of redemptions implies that $75 of the $100 of new sales are held for just one year and thus incur a cost to these investors of $3.98, calculated as the one-year annuitized load of 5.30 percent times $75 of shares held for one year. The remaining $25 is held for two years and thus incurs an annual cost of $0.68, calculated as the two-year annuitized load of 2.73 percent times $25. Summing the costs associated with the two holding periods produces an annual load cost of $4.66 to new investors, representing 4.66 percent of the initial investment of $100.

Source of estimated redemption rates. As the example illustrates, calculating the annuitized load for all buyers in a particular year requires information on the rates at which those share purchases are likely to be redeemed in subsequent years. The analysis uses estimates prepared in 1990 by The Wyatt Company for the National Association of Securities Dealers.[15] Based upon a random sample of equity and bond fund accounts opened in 1974 at funds with front-end loads, Wyatt determined the percentage of the original share purchases that was redeemed in each of the subsequent 15 years.[16] The percentages for equity funds are used to form the annuitized load for the 15 holding periods in a manner analogous to that for the two holding periods in the example (Figure 3).[17, 18]

FIGURE 3

Redemption Rates for Equity Funds in Years Following Initial Purchase in 1974

Year	Redemption Rate[1] (percent)
1	14.3
2	12.9
3	7.6
4	8.8
5	6.5
6	4.2
7	4.5
8	2.4
9	2.6
10	2.4
11	2.0
12	1.7
13	2.9
14	1.7
15	1.4

[1] *The redemption rate is the percent of the original shares purchased in 1974 that were redeemed in subsequent years.*

Source: The Wyatt Company, "Investment Company Persistency Study Conducted for the National Association of Securities Dealers," January 1990, Exhibit 1a.

[14] Some investors also may make partial redemptions. The procedure for allowing for different holding periods across investors implicitly accounts for partial redemptions.

[15] The Wyatt Company, "Investment Company Persistency Study Conducted for the National Association of Securities Dealers," January 1990.

[16] The sample consisted of 1,460 accounts at 31 mutual funds. Of these, 748 accounts were in equity funds, and 712 were in bond funds. Based upon an earlier pilot study, Wyatt determined that the number of accounts in the sample was large enough to ensure the accuracy of the estimates with 95 percent certainty.

[17] In computing annuitized loads, the same set of redemption rates is applied to each fund and each year. The sensitivity of the annuitized loads to variation in redemption rates is discussed further in the Appendix. The Wyatt study truncated the redemption rates at 15 years even though 24 percent of the initial investments remained after 15 years. No adjustment is made in the empirical analysis for holding periods beyond 15 years, because the annuitized loads and redemption rates for longer holding periods are small and their products would be negligible.

[18] The interest rate used in the computation is the yield on the five-year Treasury note. A five-year rate was chosen because the redemption rates imply that one-half of the share purchases was redeemed after five years.

FIGURE 4

Actual and Maximum Front-end Sales Loads[1]
(percent)

	Average Actual Load	Average Maximum Load
1960	7.0	n.a.
1970	5.7	n.a.
1982	4.9	7.0
1989	4.4	5.5
1991	3.6	4.9
1997	2.3	5.0

[1] *Average of actual and maximum loads for a sample of stock and bond funds with a maximum front-end sales load greater than 3 percent. The maximum is the highest front-end load the fund is allowed to charge as set forth in the prospectus.*

Source: Maximum loads—Investment Company Institute. Actual loads—Investment Company Institute, 1960, 1970, 1982, 1989, 1991; Strategic Insight Mutual Fund Research and Consulting, LLC, 1997.

Front-end loads actually paid by investors. For funds with front-end loads, the annuitized load is initially computed using the maximum front-end load that each fund is allowed to charge, as set forth in the prospectus. Many funds, however, reduce or waive front-end loads for large-sized sales and for sales in 401(k) plans and wrap programs. These waivers have resulted, at times, in the load actually paid by investors being considerably below the maximum sales load permitted by the prospectus (Figure 4). To correct for the upward bias imparted by use of the maximum load, the initial estimate of the annuitized front-end load is scaled downward by an estimate of the ratio of the average actual load to the average maximum load.[19]

Aggregate Total Shareholder Cost Ratio for All Equity Funds

An aggregate of total shareholder cost ratios for individual funds is needed to analyze the overall level and trend in the ownership cost for equity funds. Given that the total shareholder cost ratio represents the cost to buyers of fund shares, the appropriate aggregation method is a sales-weighted average. This average is computed by first multiplying (or weighting) each fund's total shareholder cost ratio by its share of total sales of all funds. The sum of the weighted cost ratios is the sales-weighted average.

By weighting cost ratios proportionately to a fund's sales, the sales-weighted average reflects cost ratios actually chosen by investors. A fund with a small volume of sales would carry little weight in computing the average, whereas a fund with a large volume of sales would be counted heavily. In contrast, a simple average—the sum of all shareholder cost ratios divided by the number of funds—gives equal weight to each ratio: The weight assigned to each fund is one divided by the number of funds. As a result of the equal weighting given to funds with large or small sales, the simple average provides no information about the cost ratios actually chosen by investors.

Using the sales-weighted average to compute an aggregate total shareholder cost ratio makes it possible for changes in investor preferences to be reflected in the aggregate ratio. A shift by investors, for example, to low-cost funds would cause the aggregate ratio to decline even if fund companies had taken no action to reduce loads or expenses. For the most part, the effect that investor preferences have on the aggregate cost ratio can be distinguished from actions taken by funds.

Data Sources

The analysis estimates total shareholder cost ratios for equity funds for the 1980-97 period.[20] The primary source of data on fund expense ratios is Lipper Analytical Services, Inc. Data on maximum sales loads and new sales were taken from the Investment Company Institute's data files.[21] In

[19] The scaling factors are based, in part, upon unpublished surveys conducted by the Investment Company Institute in 1982, 1989, and 1991. The surveys involved a sample of equity and bond funds that had a maximum front-end load greater than 3 percent and had no active 12b-1 plan. Information on actual and maximum loads was combined for equity and bond funds. Consequently, scaling factors for equity funds alone are not available. The scaling factor for 1997 was constructed from data on actual sales loads in SimfundPlus from Strategic Insight Mutual Fund Research and Consulting, LLC. Strategic Insight obtains information from semiannual financial statements filed by mutual funds with the U.S. Securities and Exchange Commission. For other years in the 1982-97 period, values for the ratio of the average actual load to the average maximum load were obtained by a linear interpolation between two years with known values. Values for 1980 and 1981 were extrapolated along the line formed between values in 1982 and 1989.

[20] The unit of observation in the expense database is share class. Equity funds include balanced and other hybrid funds.

[21] Lipper Analytical Services, Inc. is the source of maximum sales loads for 1997.

addition, data and information from Wiesenberger,[22] CDA/Wiesenberger,[23] Center for Research in Security Prices (CRSP),[24] and Value Line[25] were used to fill in missing observations.

A fund is included in the analysis only if it has a complete record dating from the later of 1980 or its inception date.[26] Funds that went out of existence during the data period may not be included because Lipper Analytical was able to supply only expense data for funds in existence at the time the data were acquired.[27] Supplementary data from Wiesenberger, CDA/Wiesenberger, CRSP, and Value Line were used to fill some of the gaps, but any remaining missing funds could introduce a "survivorship" bias in the results. For example, if the non-surviving funds had higher fees and expenses than surviving funds, then the aggregate total shareholder cost ratio would be higher than that estimated from the funds in the database.

Despite the loss of funds, the coverage of the database is high. Based upon the number of funds, assets, and sales, it appears broadly representative of equity funds in the 1980s and 1990s. The number of equity funds in the expense database used in the analysis ranges between 62 percent and 82 percent of those in Investment Company Institute's database, which contains historical records for virtually the entire universe of mutual funds. Assets in the expense database are between 78 percent and 95 percent of those in the ICI database, while sales are between 72 percent and 92 percent.

IV. TOTAL SHAREHOLDER COST RATIO FOR EQUITY FUNDS, 1980-1997

This section reports estimates of the trend and range of total shareholder cost ratios for equity funds between 1980 and 1997. It also discusses distribution costs (loads and 12b-1 fees), operating expenses, and economies of scale.

The Trend and Range of Shareholder Cost Ratios

Trend from 1980 to 1997. The total shareholder cost ratio for equity funds trended downward in the 18 years between 1980 and 1997.[28] Buyers of equity funds in 1980 incurred a cost amounting, on average, to 2.25 percent of their initial investments (Figure 5). The average cost in 1997 was 1.49 percent, about one-third less than that in 1980.

FIGURE 5

Total Shareholder Cost Ratio for Equity Funds, 1980 and 1997
(percent)

	Level		
	1980	1997	Change
Sales-weighted average	2.25	1.49	-0.76
Asset-weighted average	2.31	1.44	-0.87
Simple average	2.37	1.99	-0.38
Median	2.88	1.96	-0.92
10th percentile	0.71	0.90	0.19
90th percentile	3.45	3.15	-0.30
Memo: Number of funds	233	3,739	3,506

Source: Investment Company Institute; 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); Strategic Insight Mutual Fund Research and Consulting, LLC; and The Wyatt Company.

[22] *Investment Companies,* Wiesenberger Investment Companies Service, New York, various issues.

[23] *Investment Companies Yearbook*, CDA/Wiesenberger Investment Companies Service, Rockville, MD, various issues.

[24] *CRSP Survivor Bias Free US Mutual Fund Data Base*, Center for Research in Security Prices, Graduate School of Business, University of Chicago, Chicago, IL.

[25] *Value Line Mutual Fund Survey for Windows*, Value Line Publishing, Inc., New York, September 1998.

[26] In some cases, complete records do not begin until after the inception date.

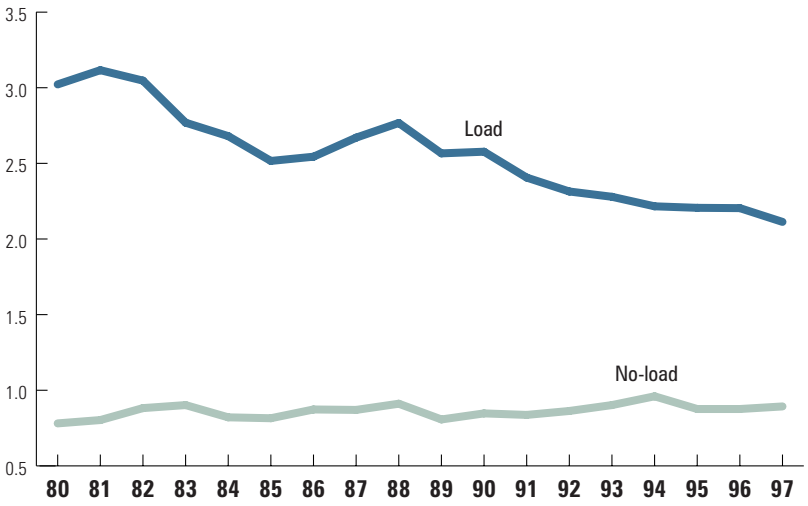
[27] Data were obtained from Lipper Analytical in 1991, 1994, 1995, 1996, and 1997. Consequently, funds that went out of existence before 1990 or in 1992 and 1993 were not included.

[28] The downward trend also was evident in the total shareholder cost ratio using maximum, rather than actual, front-end loads. Using a cost measure similar to total shareholder cost, Sirri and Tufano, "Competition and Change," p. 200, observed a downward trend in total ownership cost between 1970 and 1989 for equity funds.

FIGURE 6

Total Shareholder Cost Ratio for Load and No-load Equity Funds,[1] 1980-1997

(percent)



[1] *Sales-weighted average.*

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The decrease in ownership cost also is evident in other statistical measures. The asset-weighted average of total shareholder cost ratios declined nearly 40 percent, from 2.31 percent in 1980 to 1.44 percent in 1997.[29] In addition, the simple average fell from 2.37 percent to 1.99 percent, while the median of the total cost ratio dropped from 2.88 percent to 1.96 percent. In sum, all of these measures point to the conclusion that the cost of investing in equity funds declined significantly between 1980 and 1997.

Effect of investor and fund company actions on the total shareholder cost ratio. Decisions by investors to purchase lower-cost funds and actions by fund companies to lower fees and expenses each contributed to the decrease in the total shareholder cost ratio.

Between 1980 and 1997, growth in sales of no-load equity funds outpaced those of load funds.[30] Load funds have higher shareholder cost ratios than no-load funds, reflecting the advice and assistance component of their costs (Figure 6). Thus, the relative increase in sales of no-load funds contributed to the overall decline in the total shareholder cost ratio for all equity funds.[31] In fact, the relative shift by investors to no-load funds would have caused the aggregate total shareholder cost ratio to fall 0.38 percentage points between 1980 and 1997, assuming that total shareholder cost ratios for load and no-load funds had not changed.[32]

The shift to no-load funds was not the only source of the downward trend in the total shareholder cost ratio. In addition, the cost ratio for load funds moved sharply lower between 1980 and 1997, falling from 3.02 percent to 2.11 percent.[33] In contrast, the total shareholder cost ratio for no-load funds increased from 0.78 percent to 0.89 percent. Overall, the net effect of the changes in the cost ratios at load and no-load funds would have reduced the total shareholder cost ratio of all funds by 0.56

[29] The similarity between the asset-weighted and sales-weighted cost ratios means that a potential limitation of the sales-weighted average ratio is not significant. The limitation would occur if, for example, a large fund substantially raised its expense ratio but had virtually no sales. The higher expense ratio would impose a significant cost on existing shareholders but the action of the fund would not show up in the aggregate because of the small volume of sales. In contrast, an asset-weighted average of cost ratios would reflect the higher expense ratio. The similarity of the results from the two weighted averages, however, indicates that such actions are not significant.

[30] Sales of load funds were 66 percent of total equity fund sales in 1980 and were 49 percent in 1997. A load fund is defined as a fund that either has a sales load or a 12b-1 fee in excess of 0.25 percent; a no-load fund is a fund that has no sales load and a 12b-1 fee of 0.25 percent or less. The sales-weighted average of the 12b-1 fees for no-load equity funds has been consistently small, ranging between 0.00 percent and 0.03 percent during the period.

[31] Some purchasers of no-load funds may have paid for advice if the shares were purchased through wrap programs, fee-based advisors, or personal trusts. As discussed in footnote 3, these payments are not reflected in the analysis because the fees are not set by or under the control of mutual fund companies.

[32] This figure is computed by first calculating the total shareholder cost ratio that would have prevailed in 1997 if total shareholder cost ratios for load and no-load sales had been at their 1980 values. The value of this hypothetical cost ratio in 1997 is 1.87 percent. The difference between the actual value of 2.25 percent for the aggregate ratio in 1980 and 1.87 percent represents the change in the aggregate ratio due to the relative shift in sales from load to no-load funds.

[33] Sirri and Tufano, "Competition and Change," pp. 200-201, attribute the decline in the cost of load funds to competition between load and no-load funds.

percentage points, assuming that the composition of sales between load and no-load funds had been unchanged over the period.[34]

Range of total shareholder cost ratios. Throughout the 1980s and 1990s, equity fund investors could choose from a wide range of cost ratios. For example, after eliminating outliers by focusing on cost ratios between the tenth and ninetieth percentiles, investors could select from 186 funds in 1980 with cost ratios between 0.71 percent and 3.45 percent (Figure 5). By 1997, the range had narrowed from 0.90 percent at the tenth percentile to 3.15 percent at the ninetieth percentile, but the number of funds was considerably larger at 2,991. Despite the increase of the value at the tenth percentile, more than seven times as many equity funds in 1997 had total shareholder cost ratios below 1980's tenth percentile of 0.71 percent.

During these years, investors tended to purchase and hold less expensive equity funds. This tendency is shown by the relationship between the sales-weighted and simple averages of the total shareholder cost ratios. In 1997, for example, the sales-weighted average stood at 1.49 percent, compared with the simple average of 1.99 percent. The smaller value of the sales-weighted average can only occur because funds with low cost ratios have large weights. This reduces the weighted average relative to the simple average, which assigns the same weight to all cost ratios. Thus, the smaller value of the sales-weighted average indicates that investors purchased, on average, relatively less costly funds in 1997.[35] This conclusion holds for 1980 as well, when the sales-weighted average was below the simple average.[36]

Trends in Distribution Costs

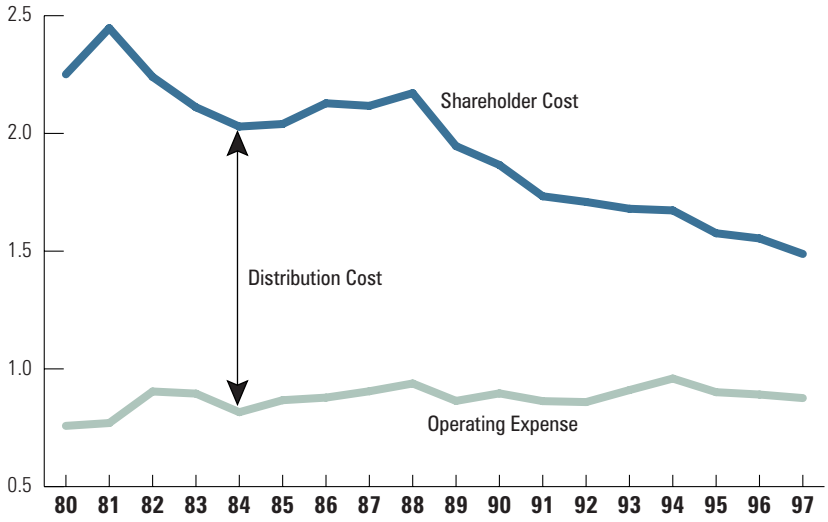
The decline in the total shareholder cost ratio—from 2.25 percent in 1980 to 1.49 percent in 1997—reflected lower distribution costs.[37] Distribution cost is one of the two components of the total shareholder cost ratio, the other being operating expenses. It is measured as the sum of the annuitized load and the 12b-1 fee.

Between 1980 and 1997, the distribution cost ratio declined from 1.49 percent to 0.61 percent (Figure 7). Some of the decline reflected the shift, noted above, by investors from load to no-load funds. In addition, the

FIGURE 7

Components of Total Shareholder Cost Ratio for Equity Funds,[1] 1980-1997

(percent)



[1] *Sales-weighted average.*

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[34] If the shares of sales of load and no-load funds in 1997 were at their 1980 values, the aggregate total shareholder cost ratio would have been 1.69 percent. The difference between the actual value of 2.25 percent for the aggregate ratio in 1980 and 1.69 represents the change in the aggregate ratio due to the change in total shareholder cost ratios for load and no-load funds.

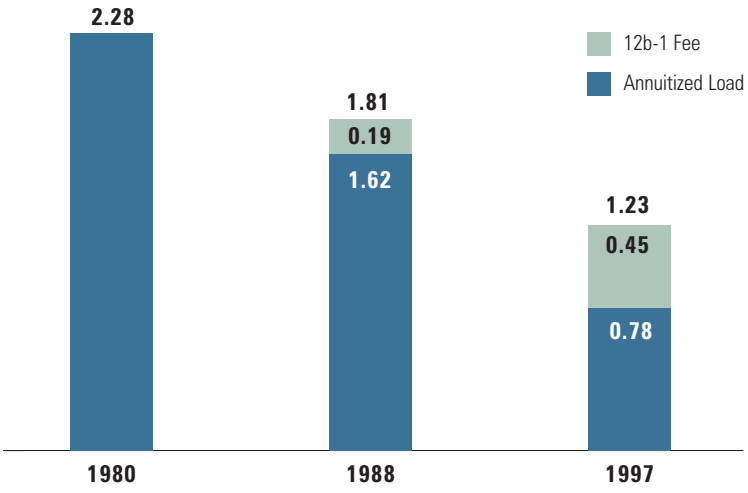
[35] See Matthew P. Fink, Statement Before the Subcommittee on Finance and Hazardous Materials, Committee on Commerce, U.S. House of Representatives, September 29, 1998, pp. 7-10. The smaller values of the asset-weighted and sales-weighted averages relative to the median point to the same conclusion.

[36] Erik R. Sirri and Peter Tufano, "Costly Search and Mutual Fund Flows," *The Journal of Finance*, 53 (1998), p. 1590, find evidence of mutual fund flows being sensitive to fee levels and reductions in fees.

[37] These figures are sales-weighted averages.

FIGURE 8

Distribution Cost Ratio for Equity Load Funds,[1] 1980, 1988, and 1997
(percent)



[1] *Sales-weighted average.*

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distribution costs of load funds fell significantly, from 2.28 percent to 1.23 percent (Figure 8).

The decline in distribution costs at load funds also was accompanied by a significant change in their composition. In 1980, virtually all distribution costs arose from front-end loads, as the SEC had only authorized 12b-1 plans late in that year. Subsequently, fund companies combined lower front-end loads with small 12b-1 fees and offered investors alternatives to front-end loads that combined contingent deferred sales loads with 12b-1 fees.[38] As funds adopted 12b-1 plans and expanded distribution payment options, front-end loads declined sharply, while 12b-1 fees absorbed a larger portion of the distribution cost. By 1997, 12b-1 fees amounted to 37 percent of the total distribution cost of load funds. Overall, however, the decline in loads more than offset growth in 12b-1 fees, leading to the substantial decline in distribution costs.

Operating Expenses and Economies of Scale

The operating expense ratio for all equity funds, the second component of the total shareholder cost ratio, rose modestly from 0.76 percent in 1980 to 0.88 percent in 1997.[39] Evidence, however, points strongly to the existence of economies of scale among individual equity funds. Econometric research has consistently found that large funds have lower expense ratios than small funds.[40] A similar inverse relationship between assets and operating expenses also is evident among equity funds included in the analysis in the paper. For funds grouped by asset size, the simple average of operating expense ratios declined sharply as assets increased (Figure 9). For example, in 1997, the average operating expense ratio for funds with less than $250 million in assets was 1.25 percent. In contrast, the average for those funds with assets greater than $5 billion was 0.64 percent. The

[38] The alternatives give investors the opportunity to reduce the overall cost for advice and service. See Jeffry L. Davis, "A New Look at SEC Rule 12b-1," *Securities Regulation Law Journal*, 23 (1995), pp. 184, and Miles Livingston and Edward S. O'Neal, "The Cost of Mutual Fund Distribution Fees," *The Journal of Financial Research*, 21 (1998), p. 214.

[39] These figures are sales-weighted averages.

[40] See Tufano and Sevick, "Board Structure and Fee-Setting," p. 347; Don M. Chance and Stephen P. Ferris, "Mutual Fund Distribution Fees: An Empirical Analysis of the Impact of Deregulation," *Journal of Financial Services Research*, 5 (1991), p. 39; 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; and 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, Leonard School of Business, New York University, Monograph 1990-1, p. 22. Scale economies were found for fund complexes by William J. Baumol, Steven M. Goldfeld, Lilli A. Gordon, and Michael F. Koehn, *The Economics of 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.

FIGURE 9

Operating Expense Ratio for Equity Funds, by Asset Size and Fund Age, 1997

Asset Size (millions of dollars)	Operating Expense Ratio[1]			Memo: Number of Funds		
	All Funds	Old Funds[2]	New Funds[3]	All Funds	Old Funds[2]	New Funds[3]
0 - 250	1.25	1.23	1.25	2,955	105	2,685
251 - 500	1.03	1.05	1.01	300	63	186
501 - 1,000	0.96	0.90	0.97	206	62	110
1,001 - 5,000	0.84	0.78	0.96	219	99	56
Greater than 5,000	0.64	0.61	0.76	59	42	5
All Funds	**1.18**	**0.95**	**1.22**	**3,739**	**371**	**3,042**

[1] *Simple average.*

[2] *Established before 1987.*

[3] *Established between 1991 and 1997.*

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negative relationship is evident both among old and new funds.[41]

Additional evidence of economies of scale is provided by the 100 largest funds in 1997 that also were in existence in 1980. Assets of these funds grew rapidly between 1980 and 1997, with the average per fund rising from $282 million to $5.8 billion. Over the same period, the simple average of the operating expense ratios of these 100 funds declined 14.6 percent, from 0.82 percent to 0.70 percent (Figure 10). Decreases also occurred in the sales-weighted and asset-weighted averages and in the median operating expense ratio. Moreover, those funds with the largest increases in assets generally posted the largest decreases in operating expense ratios (Figure 11).

FIGURE 10

Operating Expense Ratio for the 100 Largest Equity Funds in 1997 Established Before 1980

(percent)

	Operating Expense Ratio	
	1980	1997
Simple average	0.82	0.70
Sales-weighted average	0.70	0.56
Asset-weighted average	0.62	0.57
Median	0.75	0.72

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[41] Old funds were established before 1987; new funds were established between 1991 and 1997.

FIGURE 11

Change in Assets and Operating Expense Ratios Between 1980 and 1997 for the 100 Largest Equity Funds in 1997 Established Before 1980

Quintile Group by Change in Assets[1]	Change in Assets[2] (billions of dollars)	Change in Operating Expense Ratio[2] (percent)
First	1.00	0.07
Second	1.50	-0.10
Third	2.30	-0.14
Fourth	4.70	-0.13
Fifth	18.20	-0.28

[1] *The first quintile contains the 20 funds with the smallest change in assets. The second quintile contains the 20 funds with the next largest change in assets. Other quintiles are defined similarly.*

[2] *Simple average.*

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The aggregate or industry average operating expense ratio is not a reliable means for determining the presence or absence of economies of scale. Economies of scale are a property of individual funds.[42] The average operating expense ratio, however, cuts across individual funds, potentially masking the presence of economies of scale. As a result, the average operating expense ratio may not necessarily decline as total assets of all equity funds increase. The average operating expense ratio is affected by factors other than economies of scale. In particular, investment decisions by fund owners can change the average operating expense ratio. For example, more than half the increase in the sales-weighted operating expense ratio between 1980 and 1997 resulted from investors directing a larger proportion of share purchases to higher-cost international funds and aggressive growth funds.[43]

CONCLUSION

This paper estimates and analyzes trends in the total cost of investing in equity funds. Total cost includes all major fees and expenses incurred by investors purchasing fund shares in a particular year. The paper finds that this cost, measured by the total shareholder cost ratio, declined significantly between 1980 and 1997. The average cost of investing in equity funds in 1980 was 2.25 percent of each dollar invested; by 1997, that cost had dropped more than one-third to 1.49 percent.

The examination of the total shareholder cost ratio produced a number of other important findings. It appears that investors have been sensitive to cost. Equity funds offered a wide range of cost ratios throughout the 1980-1997 period, and investors tended to concentrate their purchases among lower-cost equity funds.

The decline in the total shareholder cost ratio between 1980 and 1997 was the result of lower distribution costs (the sum of annuitized sales loads and 12b-1 fees). Investors contributed to the decline by shifting fund purchases toward no-load funds. In addition, load funds substantially reduced distribution charges during the 18-year period.

Evidence also was found showing economies of scale in equity funds. Funds with large assets had substantially lower operating expense ratios than funds with small assets. This inverse relationship between assets and cost ratios similarly existed for newly established funds and older funds. In addition, the 100 largest funds in 1997 that were established before 1980 experienced both rapid growth and falling operating expense ratios between 1980 and 1997. Finally, among the 100 largest funds, those with the largest asset increases also posted the largest reductions in operating expense ratios.

[42] Economies of scale also may be a characteristic at fund families. See Baumol, et al., *The Economics of Mutual Fund Markets,* p. 166.

[43] The higher operating expenses of these international and aggressive growth funds reflect greater investment research and more complex legal and administrative issues. This assumes that the operating expense ratios for each investment objective were unchanged over the 1980-97 period.

APPENDIX

Sensitivity of the Total Shareholder Cost Ratio to Redemption Rate Assumptions

The use of the Wyatt study redemption rates to calculate the annuitized load means that the same set of redemption rates is applied to every equity fund in every year. The Wyatt study found no statistical difference between the redemption rates in the 1974 sample of accounts and another sample of accounts opened in 1984.[44] Nonetheless, other data point to some variation in redemption rates between 1980 and 1997. In particular, the ratio of total redemptions to assets for equity funds was higher in the mid 1980s and mid 1990s than at other times in the period. Higher redemption rates would decrease the effective holding period of new buyers and thus raise the total shareholder cost ratio.

FIGURE 12

Redemption Rates Used to Calculate Annuitized Loads for Equity Funds
(percent)

Year	Wyatt Study	Accelerated
1	14.3	17.9
2	12.9	16.0
3	7.6	11.0
4	8.8	9.5
5	6.5	6.3
6	4.2	4.1
7	4.5	4.4
8	2.4	2.3
9	2.6	2.5
10	2.4	2.4
11	2.0	1.9
12	1.7	1.7
13	2.9	2.8
14	1.7	1.7
15	1.4	1.4

Source: The Wyatt Company, "Investment Company Persistency Study Conducted for the National Association of Securities Dealers," January 1990, Exhibit 1a and Investment Company Institute.

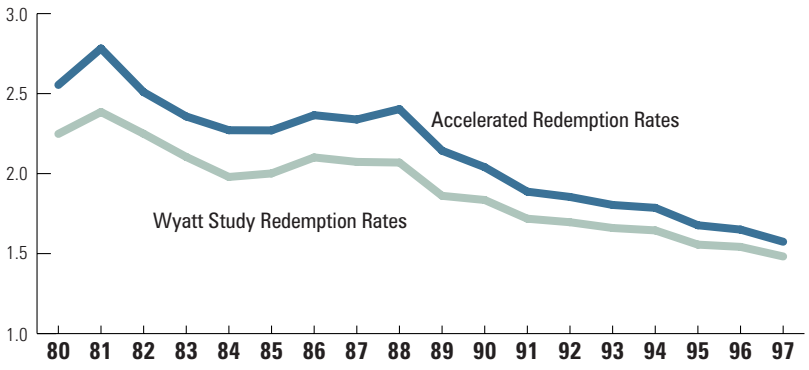
This appendix examines the sensitivity of estimated total shareholder cost ratios to the assumption of constant redemption rates. To do so, the sales-weighted average for the total shareholder cost ratio is re-estimated each year between 1980 and 1997 using redemption rates that reduce the average holding period by about 30 percent (Figure 12). The higher redemption rates are consistent with changes implied by aggregate redemption statistics.

The higher redemption rates raise shareholder cost ratios in each year but do not alter the downward trend (Figure 13). The effect of the higher redemption rates is largest in the early 1980s, amounting up to 0.30 percentage points. The difference between the two sets of cost ratios narrows over time, falling to 0.08 percentage points in 1997. The narrowing reflects the overall decrease in annuitized loads and the relative shift to no-load funds. That is, annuitized loads have become a smaller portion of total shareholder cost, diminishing the impact of higher redemption rates in recent years.

These results indicate that even more rapid rates of redemption would not alter the downward trend in the total shareholder cost ratio. In addition, a blending of higher redemption rates in the mid 1980s and in the mid 1990s would not have eliminated or reversed the downward trend unless redemption rates were increased well beyond historical experience.

FIGURE 13

Total Shareholder Cost Ratio Estimated for Two Sets of Redemption Rates,[1] 1980-1997
(percent of initial investment)



[1] *Sales-weighted average.*

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[44] The Wyatt Company, "Investment Company Persistency," p. 20.

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