

A Comparative Analysis of the Expense Ratios of Domestic and International Open-End and Closed-End Equity Funds

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Since it is difficult to determine whether fund performance is due to skill or luck, investors should use fees as a criterion when selecting funds because fees reduce returns. This study provides comparisons of expense ratios of domestic and international open-end and closed-end equity funds. A univariate analysis of expense ratios indicates that domestic open-end funds generally have higher expense ratios than domestic closed-end funds. This is accounted for by the existence of loads and 12b-1 plans. Among international funds, closed-end funds always have higher expenses. Regression analysis shows a weak relationship between level of expenses and returns.

Key words: *Mutual funds, Equity funds, Expense ratios*

Introduction

Since the returns for most funds are volatile, it is difficult for the investor to distinguish between the portion of fund performance that is due to the skill of the fund manager and the portion due to luck. Fund expenses are less volatile. In fact, since expense percentages are the only aspect of fund investing that an investor can predict with any degree of certainty, it is important to understand how expense ratios vary among types of investment companies. This is especially important at times when the stock market is not performing well and fund returns have fallen. Therefore, one motivation for this study is to determine whether significant differences exist in the expense ratios of open-end and closed-end funds so that appropriate decisions can be made by investors. Other studies have considered the expenses of open-end and closed-end funds separately. This study considers both fund types together to allow a quick comparison. Significant differences exist in the investment objectives among mutual funds and closed-end funds. However, our objective is to analyze the overall situation rather than to examine expenses with respect to investment objective. A second motivation is that the increasing number of funds from which the investor has to choose makes it desirable to have better selection criteria.

This study uses comparative analysis and regression analysis to investigate differences in expense ratios of open-end and closed-end funds from 1989 through 1997.

This paper has seven sections. Section II gives background information on funds and their fees. Section III provides a review of the pertinent literature. Section IV discusses data sources. Section V presents our methodology. Section VI is an analysis of the empirical findings. Finally, section VII presents conclusions and summarizes the study.

Background Information on Fund Fees

Investment companies pool the funds of many small investors, which are then invested by the fund manager in stocks, bonds, and other financial claims. Investment companies can be of two types: open-end funds and closed-end funds. Most investment companies are open-end funds or mutual funds. Open-end funds continuously stand ready to sell new shares and redeem old shares. Consequently, open-end funds may have new money to put into the fund, or money may be taken out if there are net redemptions of shares. Closed-end funds make an initial offering of shares and usually do not issue new shares after the initial public offering. Existing shares of closed-end funds cannot be redeemed. A distinctive feature of closed-end funds is that their shares trade on the open market at prices that may differ from their net asset values.

Fund investors, both open-end and closed-end, pay a variety of charges and fees related to both the administration of a fund and management of its assets. In addition, there are fees for the marketing and

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distribution of shares. For instance, many open-end funds have distribution fees such as load charges and annual 12b-1 fees. Other charges to the shareholder involve the annual cost of running the fund including fees paid to managers. Similarly, a closed-end fund has an initial distribution cost built into the price of the fund's shares which is charged to the investor at the time of the initial public offering or subsequent secondary offerings. In addition, there are commissions on trades of closed-end fund shares in the secondary market, which are analogous to having both a front-end and a back-end load fee. While there are some differences between closed-end and open-end funds related to marketing and distribution costs, both types of funds are similar in regard to operating and management costs.

Usually, in the selection of a mutual fund, investors consider historic performance, risk, the investment objective of the fund, and/or the investment manager's style. In the case of a closed-end fund, the investor would also look at the discount or premium from the net asset value of the fund. In recent years discounts have been large and have increased the attractiveness of closed-end funds as an investment. While performance, risk, objective, and premium/discount from the net asset value of the fund are important factors to consider in selecting a fund, studies such as those of Chance and Ferris (1991) and Malhotra and McLeod (2000) highlight the importance of analyzing a fund's expense structure as an additional criterion for open- and closed-end fund selection, respectively.

A numerical example will illustrate the importance of fund expenses. Compare a managed fund with relatively high 1.3% annual expenses to an index fund with 0.2% annual expenses. Both funds have returns for the year of 10% before expenses. The high-expense fund will have an 8.7% return after expenses while the low-expense fund will have a return of 9.8%. This one-year difference in return would be important for an investor with sizeable savings. The difference becomes even more important when extended over many years and compounding of earnings has an impact. So, investors should consider the effect of fund expenses when deciding where to invest.

Previous Studies

A. Closed-end Funds

Research on closed-end funds primarily focuses on explaining the deviation of closed-end funds' market prices from their net asset values. Malkiel (1977) and Mendelson (1978) conclude that the discounts from net

asset value of typical closed-end funds are largely due to market inefficiencies. Malkiel (1977) also finds that discounts are not related to performance, portfolio turnover, or management fees. Kumar and Noronha (1992) re-examine the role of expenses in explaining closed-end fund discounts. They find that expenses are a significant variable in explaining variations in discounts of closed-end funds. Malhotra and McLeod (2000) examine closed-end fund expenses over the period of 1989 through 1996. They construct a model of closed-end fund expenses and document that the expense ratio of closed-end bond funds shows a declining trend while the expense ratio of closed-end stock funds exhibits a rising trend. In addition, foreign closed-end funds exhibit a higher expense ratio than U.S. closed-end funds.

B. Open-end Funds

Studies by Ferris and Chance (1987); Chance and Ferris (1990); Trcinzka and Zweig (1990); McLeod and Malhotra (1994); and Malhotra and McLeod (1997) analyze the expense ratios of mutual funds. In each study, the findings are that both older and larger funds have lower expense ratios. Further, funds with 12b-1 plans have a higher expense ratio than funds without a 12b-1 plan. This finding might be expected but was worth investigating. It was not known if funds just pass on the newer 12b-1 expenses or adjust downward total expenses for investors to bear because this new expense was created.

Studies by Hooks (1996) and Latzko (1999) concern other points of view on the expenses of open-end funds. Hooks (1996) finds that low expense funds significantly outperform funds with high expenses. Latzko (1999) finds that economies of scale exist in the administration of open-end funds.

Data

The data sets for open-end funds are from the *Business Week Mutual Fund Scoreboard* and *Morningstar Mutual Funds Onfloppy*. The data set for closed-end funds is taken from the *Morningstar Closed-end Sourcebook*. For both types of funds, the data include annual expense ratios and annual total return. In some cases these data items were missing for funds in the databases. Funds with missing data items were removed for the calculations of this study.

Annual expense ratios give the percentage of assets deducted each fiscal year for operation of the fund. The amount deducted includes management fees,

administrative fees, operating costs, and all other asset-based costs incurred by the fund. Expense ratios are computed as the ratio of expenses to average net assets. Brokerage commissions on portfolio transactions are not included in the expense ratio, but they are deducted before reporting the gross return. Load charges are not included among expenses.

The number of funds of both types in the data sets increased dramatically from 1989 to 1997. Domestic open-end equity funds rise from 592 to 3,389, international open-end funds increase from 62 to 1,050, domestic closed-end funds increase from 23 to 50, and international closed-end funds increase from 15 to 81. Some of this growth occurred as a result of increased retirement saving by baby-boomers. Increased investing led to more funds being established and the expansion of existing funds.

Methodology

Asset-weighted expense ratios are calculated for all funds in the data sets. They are used because they provide a more realistic view of the expenses for a fund in relation to fund size. The annual asset-weighted expense ratio (AWEXR) for individual funds is calculated by multiplying the fund expense ratio by a weight. The weight is the percentage of total assets for the group of funds for the year represented by the fund in question. The asset-weighted expense ratio for a group of funds is thus a weighted average of the expense ratios of individual funds in the group.

As mentioned before, both open-end and closed-end funds are divided into domestic and international groups. This division is made because previous studies have shown that expenses for international funds are higher than those for domestic funds. International funds incur higher expenses in trading stocks from other countries.

A univariate comparison of data items is done for open-end versus closed-end funds. This involves comparing one data item at a time for two groups of funds. For example, in Table 1 asset-weighted expense ratios for domestic open-end funds are compared to the same ratio for domestic closed-end funds. Standard deviations of the ratios are given. And, a t-statistic is given to show whether a significant difference in population means exists. Data items compared are expense ratios, asset-weighted expense ratios, and net asset value returns. Domestic and international open-end funds are analyzed in total groups for each year. They are also analyzed in the previously mentioned subsets

pertaining to the existence of loads and 12b-1 plans for comparison to closed-end funds. Results are shown in Tables 1, 2, and 3 below.

Regression analysis is used for two purposes: (1) explore the relationship between open- or closed-end status and level of expenses and (2) explore the relationship between level of expenses and net asset value return. The independent variable for the first of these regression models is a dummy variable for open- or closed-end status. Results are shown in Table 4.

Empirical Analysis

Inspection of domestic fund information in Table 1 and Figures 1 and 2 reveals that asset-weighted expense ratios for closed-end funds are significantly lower than those of open-end funds for six years of the sample period. Statistical significance for univariate comparisons in this study is based on a two-tailed t-statistic test for the difference between sample means where the population variances are not equal. The significance level is 5%. Most differences in expense ratios and returns are not significant.

Figure 1.
Domestic Funds: Comparison of Expense Ratios for Open-end and Closed-end Equity Funds

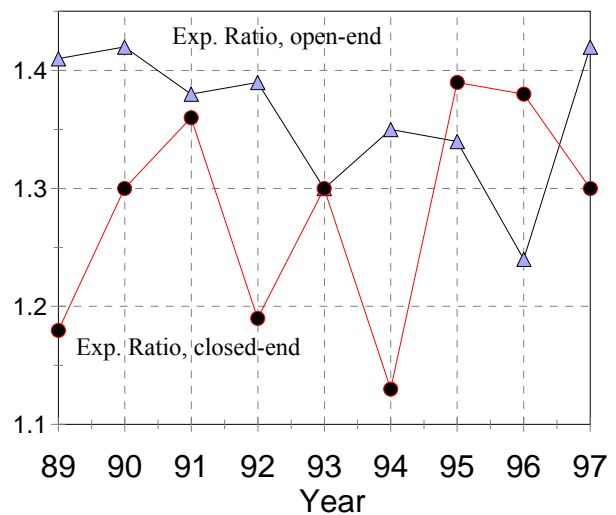


Figure 2.
Domestic Funds: Comparison of Asset-weighted Expense Ratios for Open-end and Closed-end Equity Funds

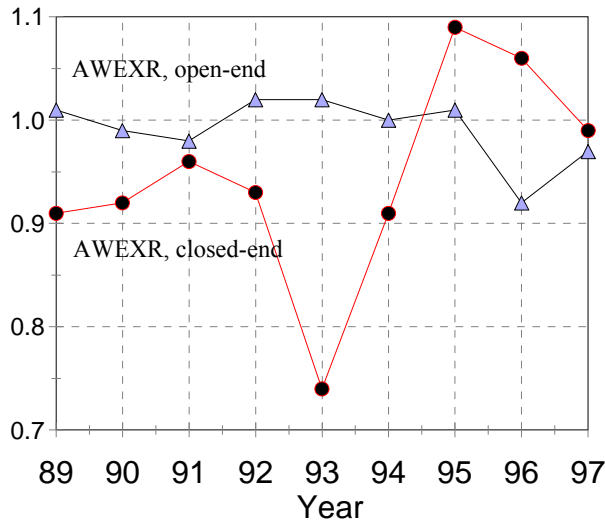
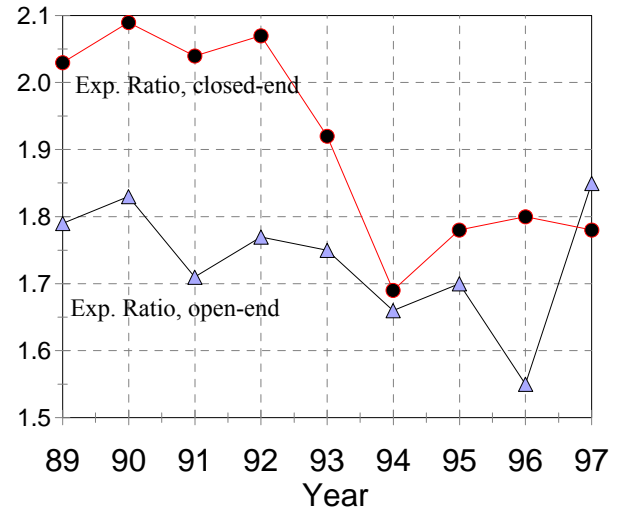


Figure 3.
International Funds: Comparison of Expense Ratios for Open-end and Closed-end Equity Funds



Differences between open-end and closed-end funds as to expenses and returns may be affected by the existence of sales charges (loads) and 12b-1 plans for some open-end funds. The following two sections explore the effect of loads and 12b-1 plans.

International funds show an opposite situation with expenses and asset-weighted expense ratios. Expense ratios and asset-weighted expense ratios are higher for closed-end international funds where they were lower for closed-end domestic funds. This result can be seen in the columns on the right side of Table 1 and in Figures 3 and 4.

International fund returns for the total sample are a mixed picture. Open-end funds had higher returns in five years while closed-end funds had higher returns in four. Some of the differences are statistically significant. So, lower expenses here do not necessarily lead to superior performance.

No-Load Open-end Funds and Closed-end Funds

It is expected that no-load open-end funds will have lower expenses relative to those of closed-end funds even though loads are not part of expense ratios. It is also expected that adoption of a 12b-1 plan may lead to increased expense ratios for open-end funds since they are included in the computation of the expense ratio. To investigate these effects, no-load open-end equity funds are separated according to the existence of 12b-1 plans. Since closed-end funds do not have 12b-1 plans or loads, we compare the expense ratios of no-load open-end funds with and without 12b-1 plans to the expense ratios of all closed-end funds in the sample. Table 2 allows the comparisons with these divisions.

Inspection of domestic fund results shows that open-end funds without sales charges (loads) or 12b-1 plans nearly always have the advantage in asset-weighted expense ratios. This result is the reverse of the findings in Table 3 for the total sample of domestic funds. This finding is evidence of economies of scale resulting from continuing sales of shares and possibly greater efficiency otherwise for open-end funds. Differences in expense ratios are mostly not statistically significant. The asset-weighted

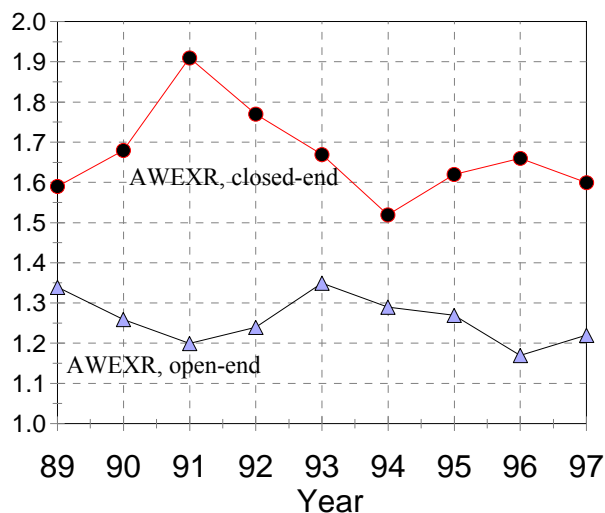
expense ratio advantage for domestic open-end funds did not lead to a significant advantage in returns.

When 12b-1 plans are adopted by domestic open-end funds, the results are completely reversed. The 12b-1 columns in Table 2 for domestic funds show that in all years no-load open-end domestic funds with 12b-1 plans had higher expense ratios and higher asset-weighted expense ratios than closed-end funds. All of the differences in asset-weighted expense ratios are highly statistically significant. There is little relation between these expense ratio results and the results for returns. In six of the years, closed-end funds had higher returns but the differences are not statistically significant.

but the advantage is reduced. This can be seen in the columns on the right side of Table 2. These open-end funds have higher returns in five years and all the differences are statistically significant.

The adoption of Rule 12b-1 in 1987 by the SEC for open-end funds has apparently contributed to an increase in the expenses of open-end funds. This finding can be seen in Table 2 as higher expense ratios and asset-weighted expense ratios for open-end funds in comparison to closed-end funds. In 1993, the SEC imposed a cap on 12b-1 fees, which may have caused a decline in the mean expense ratio and mean asset-weighted expense ratio of open-end funds beginning in that year.

Figure 4.
International Funds: Comparison of asset-weighted expense ratios for open-end and closed-end equity funds



Load Open-end Funds and Closed-end Funds

Table 3 shows a comparison of the expense ratios of load open-end equity funds with and without a 12b-1 plan to the expense ratios of the same closed-end funds used for Table 2 statistics.

Comparing the results in Table 3 for non-12b-1 domestic funds to those in Table 2, we see that the addition of loads accompanies a loss of the asset-weighted expense ratio advantage that no-load open-end domestic funds had.

Expense ratios are higher for domestic funds but the differences are not statistically significant.

An almost identical result is found in Table 3 for load domestic funds with 12b-1 plans compared to the results in Table 2 for no-load domestic funds with 12b-1 plans. The addition of 12b-1 plans by open-end funds should reduce returns for shareholders. This reduction is confirmed by the results in the returns column for domestic open-end funds with 12b-1 plans although the differences are not statistically different.

Table 2 also shows that international open-end funds without loads or 12b-1 plans have an even greater advantage in terms of expenses over international closed-end funds. Again, these results do not have a direct impact on performance as measured by returns. The results for returns are mixed.

International open-end funds without loads but with 12b-1 plans still have the overall advantage in expenses

Table 1.

A comparison of open-end and closed-end equity funds on the basis of expense ratio, asset-weighted expense ratio, and return of the funds

			Domestic Funds			International Funds		
			Expense Ratio	AWEXR	Return	Expense Ratio	AWEXR	Return
1989	Open-end Funds	Mean	1.41	0.96	24.76	1.79	1.34	24.71
		Std. Dev.	0.72	0.00	9.94	0.73	0.02	10.77
	Closed-end Funds	Mean	1.18	0.86	25.38	2.03	1.59	58.15
		Std. Dev.	0.05	0.03	12.79	0.59	0.05	52.58
	t-statistic		2.11*	15.65*	-0.23	-1.33	-17.60*	-2.45*
1990	Open-end Funds	Mean	1.42	0.94	-6.10	1.83	1.26	-10.41
		Std. Dev.	0.72	0.00	8.48	0.71	0.02	8.39
	Closed-end Funds	Mean	1.30	0.87	-5.72	2.09	1.68	-15.23
		Std. Dev.	0.61	0.03	14.47	0.66	0.05	24.66
	t-statistic		0.95	10.64*	-0.13	-1.49	-35.65*	0.80
1991	Open-end Funds	Mean	1.38	0.93	29.73	1.71	1.20	33.30
		Std. Dev.	0.70	0.00	14.98	0.77	0.01	22.96
	Closed-end Funds	Mean	1.36	0.91	39.92	2.04	1.91	31.47
		Std. Dev.	0.83	0.03	21.92	0.52	0.05	39.85
	t-statistic		0.08	2.97*	-2.26*	-2.95*	-69.37*	0.23
1992	Open-end Funds	Mean	1.39	0.97	8.04	1.77	1.24	-4.37
		Std. Dev.	0.76	0.00	9.38	0.67	0.02	6.93
	Closed-end Funds	Mean	1.19	0.88	12.74	2.07	1.77	4.28
		Std. Dev.	0.50	0.04	21.49	0.51	0.05	16.12
	t-statistic		1.99	11.96*	-1.09	-2.64*	-52.71*	-2.69*
1993	Open-end Funds	Mean	1.30	0.97	12.94	1.75	1.35	38.48
		Std. Dev.	0.60	0.00	8.50	0.65	0.01	17.28
	Closed-end Funds	Mean	1.30	0.69	12.97	1.92	1.67	53.95
		Std. Dev.	0.77	0.04	12.75	0.44	0.08	29.37
	t-statistic		0.01	27.61*	-0.01	-1.47	-17.87*	-2.21*
1994	Open-end Funds	Mean	1.35	0.95	-1.84	1.66	1.29	-3.12
		Std. Dev.	0.70	0.00	6.00	0.57	0.01	7.94
	Closed-end Funds	Mean	1.13	0.86	-1.03	1.69	1.52	-3.15
		Std. Dev.	0.45	0.04	6.17	0.44	0.03	22.51
	t-statistic		2.55*	12.05*	-0.62	-0.37	-57.73*	0.01
1995	Open-end Funds	Mean	1.34	0.96	29.84	1.70	1.27	10.18
		Std. Dev.	0.72	0.00	9.73	0.60	0.01	9.45
	Closed-end Funds	Mean	1.39	1.04	31.06	1.78	1.62	0.95
		Std. Dev.	1.04	0.04	12.99	0.53	0.02	18.03
	t-statistic		-0.29	-11.10*	-0.49	-1.05	-105.55*	3.59*
1996	Open-end Funds	Mean	1.24	0.87	17.98	1.55	1.17	13.32
		Std. Dev.	0.72	0.00	7.64	0.54	0.01	8.48
	Closed-end Funds	Mean	1.38	1.01	17.18	1.80	1.66	13.74
		Std. Dev.	0.88	0.02	10.05	0.46	0.02	20.51
	t-statistic		-1.11	-39.26*	0.56	-4.22*	-260.59*	-0.18
1997	Open-end Funds	Mean	1.42	0.92	22.32	1.85	1.22	1.89
		Std. Dev.	0.68	0.00	11.96	0.66	0.00	17.10
	Closed-end Funds	Mean	1.30	0.94	21.75	1.78	1.60	1.07
		Std. Dev.	0.64	0.02	13.49	0.47	0.02	36.24
	t-statistic		1.31	-4.57*	0.30	1.21	-210.20*	0.20

* Statistically significant at the 5% level. AWEXR stands for asset-weighted expense ratio

Table 2.

A comparison of no-load open-end and closed-end equity funds. Funds are classified as domestic or international. Open-end funds are classified as 12b-1 or non-12b-1.

			Domestic Funds						International Funds					
			No-Load, Non-12b-1			No-Load, 12b-1			No-Load, Non-12b-1			No-Load, 12b-1		
			Exp. Ratio	AWEXR	Return	Exp. Ratio	AWEXR	Return	Exp. Ratio	AWEXR	Return	Exp. Ratio	AWEXR	Return
1989	Open End	Mean	1.18	0.83	24.96	1.67	1.55	23.66	1.30	0.96	26.28	1.60	1.56	23.17
		SD	0.59	0.01	10.60	0.56	0.06	11.31	0.54	0.07	7.87	0.50	0.14	1.56
	Closed End	Mean	1.18	0.86	25.38	1.18	0.86	25.38	2.03	1.59	58.15	2.03	1.59	58.15
		SD	0.50	0.03	12.79	0.50	0.03	12.79	0.59	0.05	52.58	0.59	0.05	52.58
	t-stat		0.01	-3.87*	-0.15	3.57*	60.02*	-0.54	-3.41*	-25.6*	-2.32*	-1.85	-0.62	-2.57*
1990	Open End	Mean	1.14	0.79	-6.07	1.73	1.09	-7.32	1.45	1.02	-11.10	1.85	1.60	-1.93
		SD	0.58	0.01	8.71	1.20	0.04	8.74	0.53	0.06	6.62	0.58	0.24	12.40
	Closed End	Mean	1.30	0.87	-5.72	1.30	0.87	-5.72	2.09	1.68	-15.23	2.09	1.68	-15.23
		SD	0.61	0.03	14.47	0.61	0.03	14.47	0.66	0.05	24.66	0.66	0.05	24.66
	t-stat		-1.31	-12.90*	-0.12	2.11*	26.95*	-0.51	-3.24*	-37.19*	0.67	-0.73	-0.72	1.54
1991	Open End	Mean	1.12	0.77	29.90	1.71	1.24	29.85	1.32	0.99	32.40	2.01	1.53	34.86
		SD	0.52	0.01	15.24	1.11	0.03	15.97	0.65	0.02	23.90	1.40	0.06	21.58
	Closed End	Mean	1.36	0.91	39.92	1.36	0.91	39.92	2.04	1.91	31.47	2.04	1.91	31.47
		SD	0.83	0.03	21.92	0.83	0.03	21.92	0.52	0.05	39.85	0.52	0.05	39.85
	t-stat		-1.42	-19.4*	-2.16*	1.51	38.88*	-2.02	-5.76*	-88.90*	0.11	-0.10	-22.65*	0.37
1992	Open End	Mean	1.10	0.76	8.78	1.94	1.39	23.27	1.33	1.00	-5.90	2.12	1.64	-4.50
		SD	0.57	0.01	8.79	1.52	0.03	85.87	0.58	0.04	7.42	0.74	0.14	3.36
	Closed End	Mean	1.19	0.88	12.74	1.19	0.88	12.74	2.07	1.77	4.28	2.07	1.77	4.28
		SD	0.50	0.04	21.49	0.50	0.04	21.49	0.51	0.05	16.12	0.51	0.05	16.12
	t-stat		-0.86	-17.30*	-0.91	3.46*	63.34*	0.90	-5.37*	-59.40*	-3.00*	0.20	-2.64*	-2.62*
1993	Open End	Mean	1.03	0.78	12.26	1.51	1.14	12.98	1.34	1.18	39.09	2.11	1.83	27.91
		SD	0.50	0.00	7.26	0.83	0.02	8.95	0.49	0.02	16.57	0.71	0.17	28.21
	Closed End	Mean	1.30	0.69	12.97	1.30	0.69	12.97	1.92	1.67	53.95	1.92	1.67	53.95
		SD	0.77	0.04	12.75	0.77	0.04	12.75	0.44	0.08	29.37	0.44	0.08	29.37
	t-stat		-1.23	9.10*	-0.20	0.95	43.99*	0.00	-4.87*	-26.64*	-2.07	0.80	3.03*	-2.44*
1994	Open End	Mean	1.05	0.76	-1.36	1.44	1.25	-2.24	1.26	1.10	-1.73	1.85	1.75	-3.06
		SD	0.53	0.00	5.64	1.05	0.02	6.09	0.40	0.02	7.85	0.48	0.01	10.63
	Closed End	Mean	1.13	0.86	-1.03	1.13	0.86	-1.03	1.69	1.52	-3.15	1.69	1.52	-3.15
		SD	0.45	0.04	6.17	0.45	0.04	6.17	0.44	0.03	22.51	0.44	0.03	22.51
	t-stat		-0.88	-12.52*	-0.25	2.47*	48.19*	-0.87	-5.58*	-99.48*	0.40	1.42	53.57*	0.02
1995	Open End	Mean	1.01	0.71	30.13	1.68	1.42	28.63	1.28	1.09	8.63	2.25	2.10	14.72
		SD	0.47	0.00	9.04	1.40	0.03	9.45	0.42	0.01	9.07	0.63	0.18	9.47
	Closed End	Mean	1.39	1.04	31.06	1.39	1.04	31.06	1.78	1.62	0.95	1.78	1.62	0.95
		SD	1.04	0.04	12.99	1.04	0.04	12.99	0.53	0.02	18.03	0.53	0.02	18.03
	t-stat		-1.92	-45.0*	-0.37	1.25	51.40*	-0.93	-6.18*	-156.9*	2.92*	3.25*	13.48*	4.39*
1996	Open End	Mean	0.98	0.67	18.97	1.61	1.36	17.86	1.21	1.00	12.95	1.98	1.68	13.72
		SD	0.48	0.00	7.16	1.62	0.03	6.40	0.40	0.02	9.20	0.67	0.15	12.06
	Closed End	Mean	1.38	1.01	17.18	1.38	1.01	17.18	1.80	1.66	13.74	1.80	1.66	13.74
		SD	0.88	0.02	10.05	0.88	0.02	10.05	0.46	0.02	20.51	0.46	0.02	20.51
	t-stat		-3.23*	-100.20*	1.23	1.17	82.60*	0.44	-9.39*	-278.2*	-0.33	1.02	0.72	0.00
1997	Open End	Mean	0.99	0.68	23.96	1.51	1.25	20.90	1.30	1.03	1.94	1.83	1.56	2.31
		SD	0.43	0.00	11.13	1.00	0.01	13.57	0.42	0.01	16.11	0.49	0.03	19.64
	Closed End	Mean	1.30	0.94	21.75	1.30	0.94	21.75	1.78	1.60	1.07	1.78	1.60	1.07
		SD	0.64	0.02	13.49	0.64	0.02	13.49	0.47	0.02	36.24	0.47	0.02	36.24
	t-stat		-3.32*	-75.06*	1.14	2.04*	87.40*	-0.42	-8.45*	-310.40*	0.21	0.63	-11.93*	0.27

* Statistically significant at the 5% level. AWEXR stands for asset-weighted expense ratio.

Inspection of the columns on the right side of Table 3 shows that international open-end funds with loads but without 12b-1 plans have significantly lower expenses compared to international closed-end funds in eight of the nine years. On an asset-weighted expense ratio basis, the differences are more pronounced for the same eight years. So, the addition of a load for open-end international funds did not accompany a loss in expense advantage over closed-end international funds. Open-end international funds with loads may also benefit from economies of scale or closed-end international funds may truly have a problem in controlling expenses. The effect of adding sales charges left a mixed picture with respect to returns with most differences being insignificant.

When international open-end funds have loads and 12b-1 plans, they still have the advantage in expenses, but the differences are reduced. They retain their advantage on an asset-weighted expense ratio basis.

The effect on the returns of open-end international funds for having loads and 12b-1 plans is not clear. In five of the nine years, they had higher returns in relation to closed-end international funds but the differences are insignificant. When closed-end funds had higher returns, all of the differences are statistically significant. The question of the relation between expenses and returns is addressed further in the regression analysis below.

International Fund Expenses vs. Domestic Fund Expenses

The separation of the total sample of funds into domestic and international groups was apparently appropriate. In Table 2 and Table 3, it can be seen that international funds generally have higher expense ratios and higher asset-weighted expense ratios than domestic funds. So, the expenses associated with acquiring and trading international stocks are higher.

Regression Analysis

Regression analysis is used to further investigate two relationships: (1) the relation between open- or closed-end status and the level of expense ratios and (2) the relation between expense ratios and net asset value returns.

For the first of these tests, a dummy variable for open- or closed-end status is regressed on expense ratios. The dummy variable has a value of one if the fund is closed-end and zero if open-end. Regression is done for each year's data separately. Funds are still separated

according to domestic or international investment objectives. Equation 1 below is the regression equation. Regression results are in Table 4, Panels A and B.

$$\text{Expense Ratio} = \alpha + \beta (\text{Open/Closed}) \quad (1)$$

Adjusted R² results in Panels A and B indicate that open/closed status explains only a small portion of the level of expenses for domestic and international funds. For domestic funds, t-statistics for the regression coefficient of the dummy variable indicate that open or closed status is not significant in explaining expense ratios in any of the years. For international funds, t-statistics indicate that open or closed status is significant in explaining a portion of the level of expenses for only one of the nine years.

A question that can arise from the comparative analysis above is whether the level of expense ratios is an important determinant of fund performance. To investigate this effect, expense ratios for the total annual samples of open-end and closed-end equity funds are regressed onto net asset value returns. Equation 2 is the regression equation and the regression results are presented in Table 6, Panels C and D.

$$\text{NAV Return} = \alpha + \beta (\text{Expense Ratio}) \quad (2)$$

Adjusted R² results are small, meaning that expense ratios explain only a small portion of fund performance. Most of the coefficients of the expense ratio variable have negative signs. This result means that as expense ratios increase, net asset value returns decline. T-statistics show that the relationship is significant for seven years for domestic funds and for two years for international funds.

Summary and Conclusions

This study compares the expense ratios and asset-weighted expense ratios of domestic and international open- and closed-end funds. Our analysis of the total sample of domestic equity funds shows that closed-end funds generally have the advantage in both expense ratios. For international funds, we find that the opposite is true: open-end funds have lower expense ratios and asset-weighted expense ratios.

To make further comparisons of open-end to closed-end equity funds, the sample of open-end funds is divided into smaller groups. Funds are divided into load and no-load groups for both the domestic and international funds. And finally, the domestic and international

groups are divided according to the existence of a 12b-1 plan.

Table 3.

A comparison of load open-end and closed-end equity funds. Funds are classified as domestic or international. Open-end funds are classified as 12b-1 or non-12b-1.

			Domestic Funds						International Funds					
			Load, Non-12b-1			Load, 12b-1			Load, Non-12b-1			Load, 12b-1		
			Exp. Ratio	AWEXR	Return	Exp. Ratio	AWEXR	Return	Exp. Ratio	AWEXR	Return	Exp. Ratio	AWEXR	Return
1989	Open End	Mean	1.34	0.88	25.02	1.62	1.12	24.58	1.36	1.20	24.08	2.24	1.97	24.44
		SD	0.88	0.01	10.99	0.61	0.01	7.80	0.40	0.09	10.91	0.68	0.07	12.57
	Closed End	Mean	1.18	0.86	25.38	1.18	0.86	25.38	2.03	1.59	58.15	2.03	1.59	58.15
		SD	0.50	0.03	12.79	0.50	0.03	12.79	0.59	0.05	52.58	0.59	0.05	52.58
	t-stat		1.27	3.24*	-0.13	3.83*	38.82*	-0.29	-3.54*	-14.20*	-2.45*	1.05	19.72*	-2.45*
1990	Open End	Mean	1.31	0.88	-5.95	1.64	1.08	-5.98	1.35	0.98	-9.21	2.14	1.76	-11.20
		SD	0.62	0.01	9.74	0.66	0.01	7.17	0.41	0.07	8.42	0.70	0.06	8.52
	Closed End	Mean	1.30	0.87	-5.72	1.30	0.87	-5.72	2.09	1.68	-15.23	2.09	1.38	-15.23
		SD	0.61	0.03	14.47	0.61	0.03	14.47	0.66	0.05	24.66	0.66	0.05	24.66
	t-stat		0.05	1.49	-0.08	2.65*	32.34*	-0.09	-4.22*	-43.55*	0.98	0.33	6.44*	0.67
1991	Open End	Mean	1.13	0.90	30.01	1.59	1.02	29.46	1.65	1.02	35.37	1.98	1.54	32.04
		SD	0.58	0.03	14.98	0.64	0.01	14.69	0.66	0.02	22.10	0.65	0.02	23.87
	Closed End	Mean	1.36	0.91	39.92	1.36	0.91	39.92	2.04	1.91	31.47	2.04	1.91	31.47
		SD	0.83	0.03	21.92	0.83	0.03	21.92	0.52	0.05	39.85	0.52	0.05	39.85
	t-stat		-1.32	-1.12	-2.12*	1.28	16.47*	-2.29*	-3.22*	-85.61*	0.47	-0.57	-35.47*	0.07
1992	Open End	Mean	1.31	0.94	8.28	1.52	1.00	7.60	1.61	1.36	-2.44	1.99	1.29	-4.03
		SD	0.58	0.02	12.93	0.57	0.01	8.22	0.42	0.09	7.60	0.64	0.03	6.80
	Closed End	Mean	1.19	0.88	12.74	1.19	0.88	12.74	2.07	1.77	4.28	2.07	1.77	4.28
		SD	0.50	0.04	21.49	0.50	0.04	21.49	0.51	0.05	16.12	0.51	0.05	16.12
	t-stat		1.10	7.92*	-1.01	3.22*	16.77*	-1.19	-3.21*	-16.52*	-1.83	-0.63	-44.20*	-2.54*
1993	Open End	Mean	1.55	1.21	13.66	1.33	0.94	13.11	2.12	1.85	39.75	1.84	1.30	38.61
		SD	0.60	0.00	13.68	0.51	0.01	9.59	0.61	0.04	19.20	0.61	0.03	15.96
	Closed End	Mean	1.30	0.69	12.97	1.30	0.69	12.97	1.92	1.67	53.95	1.92	1.67	53.95
		SD	0.77	0.04	12.75	0.77	0.04	12.75	0.44	0.08	29.37	0.44	0.08	29.37
	t-stat		1.17	51.22*	0.19	0.16	25.09*	0.04	1.49	9.41*	-1.92	-0.69	-20.32*	-2.15*
1994	Open End	Mean	1.25	0.94	-1.22	1.62	1.22	-2.34	1.48	1.34	-2.68	1.93	1.41	-4.13
		SD	0.77	0.02	6.97	0.59	0.00	5.97	0.31	0.04	9.47	0.54	0.02	7.20
	Closed End	Mean	1.13	0.86	-1.03	1.13	0.86	-1.03	1.69	1.52	-3.15	1.69	1.52	-3.15
		SD	0.45	0.04	6.17	0.45	0.04	6.17	0.44	0.03	22.51	0.44	0.03	22.51
	t-stat		1.05	10.10*	-0.14	4.97*	45.24*	-0.99	-2.41*	-24.67*	0.12	3.13	-26.25*	-0.28
1995	Open End	Mean	1.35	0.95	29.16	1.58	1.20	30.01	1.43	1.26	10.94	1.99	1.40	10.61
		SD	0.61	0.02	11.55	0.57	0.00	9.92	0.33	0.04	10.82	0.51	0.02	9.28
	Closed End	Mean	1.39	1.04	31.06	1.39	1.04	31.06	1.78	1.62	0.95	1.78	1.62	0.95
		SD	1.04	0.04	12.99	1.04	0.04	12.99	0.53	0.02	18.03	0.53	0.02	18.03
	t-stat		-0.72	-10.98*	-0.72	0.93	22.55*	-0.42	-3.80*	-45.79*	3.21*	2.57*	-62.04*	3.70*
1996	Open End	Mean	1.30	0.83	17.31	1.43	1.11	17.16	1.31	1.16	11.46	1.84	1.30	13.92
		SD	0.65	0.02	9.56	0.47	0.01	7.69	0.30	0.06	8.61	0.45	0.03	7.18
	Closed End	Mean	1.38	1.01	17.18	1.38	1.01	17.18	1.80	1.66	13.74	1.80	1.66	13.74
		SD	0.88	0.02	10.05	0.88	0.02	10.05	0.46	0.02	20.51	0.46	0.02	20.51
	t-stat		-0.63	-46.53*	0.08	0.33	30.66*	-0.01	-5.91*	-38.15*	-0.77	0.55	-118.7*	0.08
1997	Open End	Mean	1.27	0.80	20.46	1.71	1.21	21.70	1.46	1.19	0.64	2.20	1.39	1.89
		SD	0.88	0.01	15.40	0.52	0.00	11.52	0.44	0.04	20.39	0.56	0.01	17.00
	Closed End	Mean	1.30	0.94	21.75	1.30	0.94	21.75	1.78	1.60	1.07	1.78	1.60	1.07
		SD	0.64	0.02	13.49	0.64	0.02	13.49	0.47	0.02	36.24	0.47	0.02	36.24

	t-stat		-0.22	-38.79*	-0.59	4.56*	78.97*	-0.03	-3.83*	-69.24*	-0.09	7.29*	-116.3*	0.20
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* Statistically significant at the 5% level. AWEXR stands for asset-weighted expense ratio.

Table 4.
Regression Analysis.

Panel A: Domestic Funds					
Regression of dummy variable for open- or closed-end status onto expense ratio					
Year	Adj R ²	Intercept	t-statistic	Regr. Coeff.	t-statistic
1989	1.4337	0.0021	47.78	-0.2297	-1.50
1990	-0.0005	1.4212	53.50	-0.1176	-0.81
1991	-0.0016	1.3777	48.00	-0.0131	-0.09
1992	0.0008	1.3932	56.67	-0.2036	-1.32
1993	-0.0008	1.2974	74.18	-0.0013	-0.01
1994	0.0006	1.3484	82.36	-0.2175	-1.46
1995	-0.0005	1.3364	77.19	0.0584	0.42
1996	0.0006	1.2441	61.40	0.1403	1.35
1997	0.0002	1.4177	121.55	-0.1197	-1.24
Panel B: International Funds					
Regression of dummy variable for open- or closed-end status onto expense ratio					
Year	Adj R ²	Intercept	t-statistic	Regr. Coeff.	t-statistic
1989	0.0050	1.7891	19.20	0.2375	1.16
1990	0.0085	1.8261	26.10	0.2592	1.41
1991	0.0096	1.7135	40.93	0.3293	2.10
1992	0.0232	1.7664	30.89	0.3056	2.15
1993	0.0005	1.7540	41.30	0.1671	1.06
1994	-0.0019	1.6616	61.85	0.0272	0.30
1995	-0.0002	1.6984	57.48	0.0848	0.96
1996	0.0386	1.5510	48.60	0.2531	3.87
1997	-0.0002	1.8478	92.75	-0.0668	-0.89
Panel C: Domestic Funds					
Regression of expense ratio onto net asset value return					
Year	Adj R ²	Intercept	t-statistic	Regr. Coeff.	t-statistic
1989	0.0089	26.7985	30.30	-1.4348	-2.55
1990	0.0362	-2.7494	-3.98	-2.3542	-5.41
1991	0.0034	32.2449	23.82	-1.5446	-1.76
1992	0.0211	10.8475	16.65	-1.9334	-4.69
1993	0.0006	12.2372	20.90	0.5422	1.32
1994	0.0433	0.6029	2.01	-1.8085	-9.13
1995	0.0393	33.4626	70.25	-2.6934	-8.60
1996	0.0348	20.4753	49.07	-2.0183	-6.98
1997	0.0412	27.3915	59.2	-3.5917	-12.19
Panel D: International Funds					
Regression of expense ratio onto net asset value return					
Year	Adj R ²	Intercept	t-statistic	Regr. Coeff.	t-statistic
1989	-0.0118	27.9675	2.93	2.0174	0.42
1990	-0.0034	-8.7851	-2.75	-1.2474	-0.78
1991	-0.0025	34.1841	10.49	-0.5845	-0.34
1992	-0.0064	-2.5590	-1.11	-0.2203	-0.19
1993	-0.0041	39.7009	11.27	-0.0507	-0.03
1994	0.0337	2.5118	1.77	-3.3869	-4.19
1995	0.0077	12.3783	7.68	-1.8856	-2.11
1996	-0.0029	13.3270	6.24	0.0459	0.04
1997	0.0128	8.2120	4.81	-3.4616	-3.96

Within the no-load category, domestic open-end,

non-12b-1 funds have lower expenses than closed-funds. When a 12b-1 plan is added the reverse is true. Within the load category, domestic open-end, non-12b-1 funds lose the expenses advantage in comparison to closed-end funds. Addition of a 12b-1 plan in the load category brings the same result as with no-load funds: open-end funds have higher expenses. The results here indicate that the overall expenses advantage for closed-end funds is due to the fact that some subsets of open-end funds having loads and 12b-1 plans raise the average expenses for all open-end funds. Sales charges (loads) are not part of expense ratios, but the existence of loads accompanies higher expense ratios.

International closed-end funds generally have higher expenses than international open-end funds. The existence of loads and 12b-1 plans for open-end funds did not alter this finding. Thus, an investor should carefully weigh the benefit of discounts from the net asset value for closed-end equity funds against the difference in expense ratios of open- and closed-end equity funds before investing.

Given that fund expenses are a direct charge against earnings and can be determined with greater accuracy, investors should consider placing funds in investment companies that have low expenses for their investment objective. Our analysis indicates that domestic and international equity funds that meet a low expense requirement will likely be open-end, no-load, and will not have a 12b-1 plan.

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