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THE COST OF MUTUAL FUND DISTRIBUTION FEES

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Abstract

Many individuals purchase shares in mutual funds as investments. With a lack of evidence supporting performance persistence in fund returns, investors should consider expenses as a fund-selection tool since fund expenses have a negative effect on fund returns. One of the largest expenses incurred by fund investors is distribution expenses, which include both load charges and annual fees. Close to two-thirds of all equity funds charge investors for fund distribution. The true cost of these distribution fees to investors is hard to measure because a myriad of distribution arrangements have evolved that vary both the timing and magnitude of distribution charges. We derive a simple methodology that expresses the present value of distribution costs as a percentage of the original investment in fund shares for any expected holding period. This methodology allows direct comparison of the effect on investors of distribution fees for mutual funds with different types of sales arrangements.

I. Introduction

Studies of mutual fund expenses are increasingly prevalent in the academic finance literature as well as the popular financial press. This rising popularity is driven by the continued inability of finance academicians and practitioners to demonstrate reliably that fund managers can consistently outperform market indices. The lack of evidence to support positive performance persistence diminishes the usefulness of prior performance as an investment-selection tool. Expenses are a logical fund characteristic to consider since they directly affect fund returns. Mutual fund expenses primarily consist of management fees, distribution fees, and turnover costs. Distribution fees are a unique expense in that several

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arrangements have evolved in the mutual fund industry for paying these expenses. In this paper we develop a straightforward approach for analyzing the wealth effects of the distribution fee arrangements that characterize the mutual fund industry.

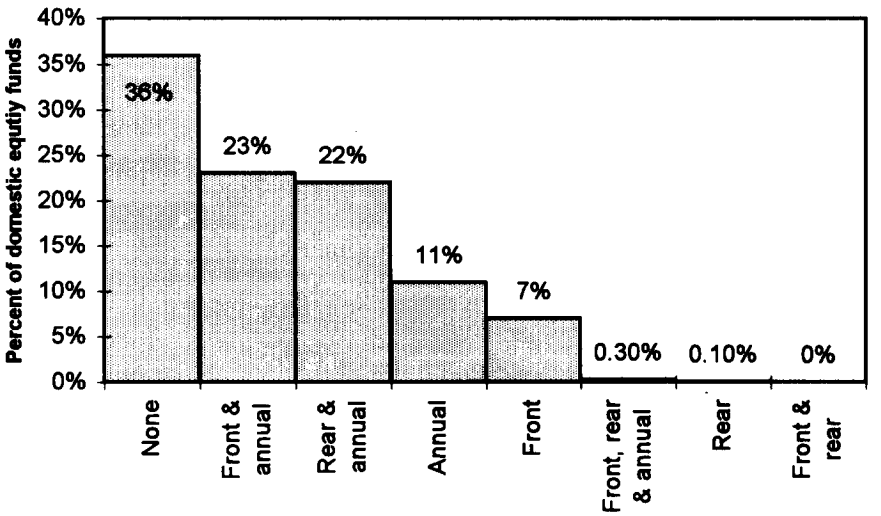
Mutual fund shares can be purchased either directly from the fund company or through a dealer. For all dealer-sold funds and for some direct-marketed funds, investors incur distribution expenses that are earmarked to cover the costs of marketing fund shares or servicing fund accounts. Distribution fees detract from the net-of-expense performance of fund shares. However, the extent to which an investor's wealth is affected by the payment of such fees is difficult to determine because fund companies have developed distribution arrangements that differ in both the magnitude and timing of fees paid. While there are bounded continua of the magnitudes of distribution fees that funds may charge, the timing of fees fall into three categories: when shares are purchased (front-end load), when shares are redeemed (a back-end or rear-end load), or annually (often called a 12b-1 fee for the Securities and Exchange Commission (SEC) rule that allows them). Some funds use only one of these arrangements, while others combine the annual fee with either a front-end or rear-end fee.

The existence of dissimilar distribution arrangements across mutual funds forces fund investors to compare the effects of these arrangements on investor wealth. In this paper we document the most common types of distribution arrangements and derive a methodology for quantifying the present value wealth effects for any distribution arrangement. We express the present value as a single quantity calculated as a percentage of the original investment. This methodology allows a direct comparison of distribution-related fees for any set of potential mutual fund investments.

II. Previous Literature

Several studies look at the relation between mutual fund expense ratios and 12b-1 fees. Ferris and Chance (1987) and Trzcinka and Zweig (1990), among others, find that 12b-1 fees increase expense ratios. Chance and Ferris (1991) and McLeod and Malhotra (1994) present evidence that 12b-1 fees are increasing over time. These studies do not analyze how different distribution plans affect investors. Grinblatt and Titman (1994), Elton, Gruber, Das, and Hlavka (1993), and Elton, Gruber, and Blake consider the effect loads have on mutual fund performance. In general, load status is unrelated to performance, although Elton, Gruber, and Blake (1996) find that funds that switch from no-load to load are typically underperformers.

Malhotra and McLeod (1997) relate fund expense ratios to fund characteristics. They document that equity fund expense ratios are positively related



Note: The sample is 2,062 domestic equity funds from Morningstar Ondisc, June 1996.

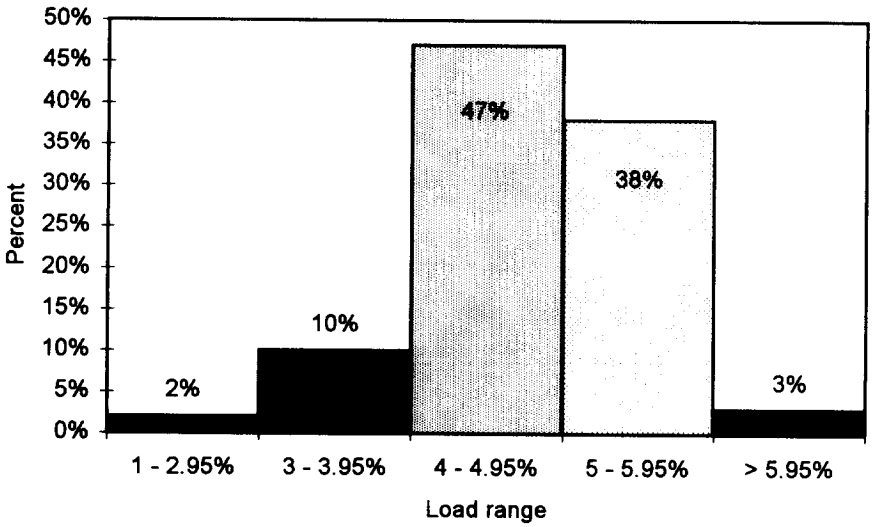
Figure I. Frequency of Mutual Fund Distribution Arrangements: Combinations of Front, Rear, and Annual Fees.

to turnover and the existence of a 12b-1 fee and negatively related to fund size, fund age, and fund complex size. Kihn (1996) performs a similar analysis with loads and finds in general that higher loads and distribution charges are correlated with higher levels of investor services offered (i.e., low initial purchases allowed, telephone switching, toll-free service number, etc.). Livingston and O'Neal (1996) use fund brokerage commissions to proxy for turnover costs. They find that commissions are unrelated to the load status of the fund but are positively correlated with fund expense ratio.

The prior studies find no difference in returns between load and no-load funds. Therefore, we explore the effect of different distribution structures on investor wealth without considering pre-expense returns for different distribution arrangements.

III. Typical Distribution Arrangements

Figure I shows the frequency of several combinations of distribution fees for the 2,062 domestic equity funds tracked by Morningstar as of June 1996. It shows that 36 percent of funds charge no loads or distribution fees, while 64 percent



Note: The sample is 626 domestic equity funds with front-end loads from Morningstar Ondisc, June 1996.

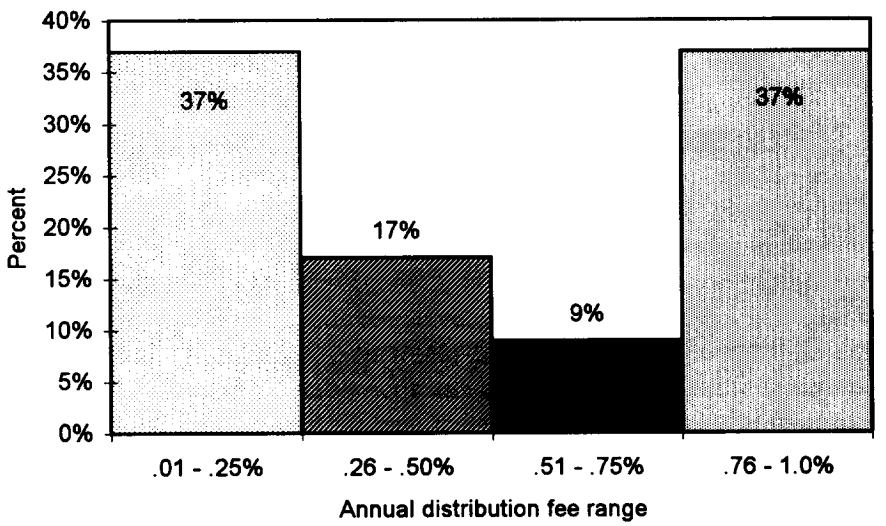
Figure II. Frequency and Ranges of Front-End Loads.

of all domestic equity funds charge distribution expenses. In addition, 23 percent have front-end and annual fees, 22 percent have rear-end and annual fees, 11 percent have annual fees only, and 7 percent have front-end fees only.

Most funds charging front-end loads also charge annual distribution fees. Maximum front-end loads vary from 1 percent to 8.50 percent, although funds often follow a graduated load reduction for progressively larger initial investments. For very large investments (usually between $500,000 and $1,000,000), front-end loads may be waived. Figure II presents a histogram of the ranges of maximum front-end loads for domestic equity funds that charge front-end loads. Most of these front-end loads range from 4 percent to 6 percent.

Rear-end loads are usually combined with annual distribution fees. Typically, rear-end loads decrease as the redemption date becomes more distant. The longer the investor holds the shares, the lower the load is when the shares are redeemed. Beyond some holding period, the rear-end load typically decreases to zero. A rear-end load with these characteristics is designated by the SEC as a contingent deferred sales charge (CDSC) and is allowed under the Investment Company Act of 1940 by rule 6c-10.

Some mutual funds charge annual distribution fees only, but more typically the annual fees are combined with front-end or rear-end loads. SEC rule 12b-1 under the Investment Company Act of 1940 allows funds to collect fees for



Note: The sample is 1,165 domestic equity funds with annual distribution fees from Morningstar Ondisc, June 1996.

Figure III. Frequency and Ranges of Annual Distribution Fees.

distribution directly out of fund assets. The rule specifies that a maximum annual fee of 0.75 percent of fund assets may be deducted for distribution and an additional 0.25 percent of fund assets may be deducted annually for servicing existing mutual fund accounts. Thus, the maximum deductible amount under the rule is 1 percent of fund assets. Of the domestic equity funds with annual distribution fees tracked by Morningstar as of July, 1996, 36 percent charge the maximum of 1 percent annually, although annual distribution fees range from 0.05 percent to 1.0 percent for domestic equity funds. Figure III shows the frequency distribution of annual distribution fees.

In February 1995, the SEC adopted rule 18f-3 under the Investment Company Act to allow mutual fund companies to sell mutual funds with the same underlying assets but different load classes. These multiple-class shares differ mainly with respect to distribution fees, although the services offered may differ for each class of fund shares. Fund companies offer as many as four classes of shares in the same fund, although most fund companies with multiple-share complexes offer two or three classes. For companies offering three classes, the most common class structure is to have one class with high front-end loads and low annual fees; a second class with high but decreasing rear-end loads and low annual fees; and a third class with a low, declining rear-end load and high annual fees. In some cases,

fund companies offer an additional class that is available to fund company and/or fund dealer employees. O'Neal (1998) describes multiple-class fund-share arrangements and documents the adverse dealer incentives they promote.

IV. Cost of Distribution Fees as a Percentage of Investment

Figures I through III illustrate the variety of distribution arrangements and fee magnitudes that make comparison of funds difficult. In this section we derive a formula for comparing distribution arrangements. The formula derivation is grounded on the premise that an investor should consider the present-value effects of the distribution arrangements of alternative mutual fund investments. To calculate the present value, we require an appropriate discount rate. We posit that the required or expected return on the mutual fund investment is the appropriate discount rate since an investor forgoes this return on the portion of the investment paid in distribution fees. We discount the distribution fees per dollar invested, allowing us to express the present value of fees as a percentage of the original investment and simplifying the comparison between investment choices.

The case of front-end loads is straightforward. Since the load is a one-time fee and is paid when the investment is initially purchased, the present value of the front-end load is simply the load itself. In the subsequent analysis, we use the abbreviation *fe* to denote front-end load.

Rear-end fees and annual distribution fees are deferred charges. To assess the present value of these fees, we must know the magnitude of the fee and when the fees occur. SEC rules require rear-end loads to be charged as a percentage of the initial investment or as a percentage of the then-current total value of fund shares, whichever is less. Since expected returns to mutual fund investments are generally positive, the expected rear-end load is calculated as a percentage of the original investment (which is less than the subsequent value of fund shares experiencing positive returns). For rear-end loads, the percentage charged decreases as the investor's holding period increases according to a stipulated schedule. We denote the rear-end load as re_n, where n is the period when redemption occurs. Let the rate of return on the individual mutual fund be R over n periods. The present value of the rear-end fees is expressed as a fraction of the initial investment and is simply the fee discounted back n periods as shown in equation (1).

$$PV\ Rear\text{-}End = \frac{re_n}{(1+R)^n} \tag{1}$$

If a fund has a front-end fee and a rear-end fee, the present value of total distribution cost is shown in equation (2).

$$PV\,Cost = fe + (1 - fe)\left[\frac{re_n}{(1+R)^n}\right] \tag{2}$$

As an example, assume $10,000 is invested in a fund that charges a 5 percent front-end load and a 1 percent back-end load regardless of when redemption occurs. Further, assume the investor expects a 10 percent average annual return and expects to hold the fund for five years. The present value of distribution costs from equation (2) is calculated as $PV\,Cost = .05 + (1 - .05)*[.01/(1+.10)^5] = .0559$. The present value of all distribution fees paid over the five-year holding period is 5.59 percent of the original investment, or $559.

Let the annual distribution fee be denoted by d. We initially assume this fee to be a constant percentage every year. Since the fee is levied on the total asset value each year it is assessed, the expected present value of future distribution fees depends on the level of expected returns and the proportion of the returns that are reinvested. Let p percent of returns be reinvested. Assuming an investor holds a fund over n periods, the present value of annual distribution fees is shown in equation (3).[1]

$$PV\,Annual = \sum_{j=1}^{n} \frac{(1+Rp)^j\,(1-d)^{j-1}\,d}{(1+R)^j} \tag{3}$$

This equation can be transformed and rewritten without the summation sign as in equation (4).

$$PV\,Annual = \left[\frac{d(1+Rp)}{d+R[1-p(1-d)]}\right]\left[1 - \frac{(1+Rp)^n\,(1-d)^n}{(1+R)^n}\right] \tag{4}$$

If the proportion of returns reinvested is 100 percent (i.e., $p = 1$), this formula reduces to equation (5).

$$PV\,Annual = 1 - (1-d)^n \tag{5}$$

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[1]Equation (3) is derived as follows. The present value of the annual distribution fee paid at time 1 is $d(1+Rp)^1/(1+R)^1$. After the distribution fee is paid, the investor is left with $(1-d)(1+Rp)$. The present value of the fee paid in period 2 is $d(1-d)(1+Rp)^2/(1+R)^2$. For period j, the present value of the fee paid equals $d(1-d)^{j-1}(1+Rp)^j/(1+R)^j$. Summing the present values of fees paid in periods 1 through n yields equation (3).

This present value is closely approximated by n times d.

If front-end, rear-end, and annual distribution fees are all charged, we combine equations (2) and (4) to produce the present value of total distribution cost shown in equation (6).

$$PV\,Cost = fe + (1 - fe)\left[\frac{re_n}{(1+R)^n} + \sum_{j=1}^{n} \frac{(1+Rp)^j\,(1-d)^{j-1}\,d}{(1+R)^j}\right] \tag{6}$$

With full reinvestment of all returns ($p = 1$), we are left with equation (7).

$$PV\,Cost = fe + (1 - fe)\left[\frac{re_n}{(1+R)^n} + [1 - (1-d)^n]\right] \tag{7}$$

Several mutual funds have years, $n1$, where there is a declining rear-end load and an annual distribution fee of $d1$. After year $n1$, there is no rear-end load, and the annual distribution fee changes to $d2$. In this case, the present value of total distribution cost is shown in equation (8).

$$\begin{aligned} PV\,Cost = {} & fe + (1 - fe)\left[\frac{re_n}{(1+R)^n}\right] \\ & + (1 - fe)\left[\sum_{j=1}^{n1} \frac{(1+Rp)^j\,(1-d1)^{j-1}\,d1}{(1+R)^j}\right. \\ & \left. + (1-d1)^{n1-1} \sum_{j=n1+1}^{n} \frac{(1+Rp)^j\,(1-d2)^{j-n1}\,d2}{(1+R)^j}\right] \end{aligned} \tag{8}$$

If full reinvestment of returns is assumed, the equation simplifies to equation (9) or (10) depending on the expected holding period. Equation (9) represents present value of costs for holding periods greater than $n1$; equation (10), for holding periods less than or equal to $n1$.

$$\begin{aligned} PV\,Cost_{n>n1} = {} & fe + (1 - fe)\left[\frac{re_n}{(1+R)^n} + \left[1 - (1-d1)^{n1}\right]\right. \\ & \left. + (1-d1)^{n1-1}\left[1 - (1-d2)^{n-n1}\right]\right] \end{aligned} \tag{9}$$

TABLE 1. Three Typical Multiple-Class Fee Arrangements.

Share Type	Description	Front Load (%)	Back Load Charged When Redeemed Each Year After Investment (%)	Annual Distribution Fee (%)
A[a]	High front load, low annual distribution fees	5.75	—	0.25
B[b]	High, decreasing back-end load, conversion feature	—	5,4,3,3,2,1,0	1.00% first 8 years 0.25% after 8 years
C[c]	Low, decreasing back-end load, high annual distribution fee	—	1,0	1.00

[a]Examples of growth funds with this distribution arrangement are the class-A shares of the following funds: Oppenheimer Fund, Oppenheimer Growth Fund, Oppenheimer Quest for Value Fund, Colonial US Fund for Growth, Van Kampen American Capital Pace, Van Kampen American Capital Enterprise, Ivy Growth, and Pioneer Mid-Cap Fund Growth.
[b]Examples of growth funds with this distribution arrangement are the class-B shares of the following funds: Seligman Growth Fund, Seligman Capital Fund, and Ivy Growth Fund.
[c]Examples of growth funds with this distribution arrangement are the class-C shares of the following funds: PIMCO Advisor Growth Fund, PIMCO Advisor Target Fund, Merrill Lynch Fund for Tomorrow, MFS Value Fund, Paine Webber Growth Fund, Prudential Growth Fund, Pioneer Mid-Cap Fund, Ivy Growth Fund, and Colonial US Fund for Growth.

$$PV\,Cost_{n \le n1} = fe + (1 - fe)\left[\frac{re_n}{(1+R)^n} + \left[1 - (1 - d1)^n\right]\right] \qquad (10)$$

Equation (8) or equations (9) and (10) can be employed to find the present value of distribution-related expenses for any mutual fund. In the following subsections, we look at several typical distribution arrangements and calculate the present value of distribution expenses for different holding periods.

Present Value of Typical Multiple-Class Mutual Fund Fees

Several load structures are common for funds having multiple-class fees. Table 1 presents one example of each of the three most common multiple-class fee structures. Share type A combines a high front-end load with low annual distribution fees. Share type B has a contingent deferred sales charge, which is 5 percent if shares are redeemed in the first year and decreases to zero percent over six years. These shares charge a 1 percent annual 12b-1 fee for the first eight years, after which the shares convert to class-A shares with a .25 percent annual 12b-1 fee. Share type C has a 1 percent deferred sales charge that is paid if the shares are

TABLE 2. Present Value of Distribution Costs as a Fraction of Original Investment for Multiple-Class Fees.

Holding Period	Share Class A	Share Class B	Share Class C
1	.0599	.0555	.0191
2	.0622	.0530	.0199
3	.0646	.0522	.0297
4	.0669	.0599	.0394
5	.0692	.0614	.0490
6	.0715	.0642	.0585
7	.0739	.0679	.0679
8	.0762	.0773	.0772
9	.0785	.0796	.0864
10	.0808	.0819	.0956
11	.0831	.0842	.1047
12	.0854	.0865	.1136
13	.0877	.0888	.1225
14	.0900	.0911	.1313
15	.0922	.0934	.1399
16	.0945	.0957	.1485
17	.0968	.0980	.1571
18	.0990	.1003	.1655
19	.1012	.1026	.1738
20	.1035	.1048	.1821

Notes: Assumes 10 percent annual return ($R = 0.1$) and reinvestment of all distributions ($p = 1$).

redeemed within the first year. This sales charge reduces to zero after the first year. Share type C charges a 1 percent annual 12b-1 fee for the entire life of the investment.

Table 2 shows the present value of fees for various holding periods for each share class, assuming an expected return of 10 percent per year ($R = 0.1$) and all returns reinvested ($p = 1$). Assuming an investor is indifferent between the three funds represented by these share classes, the investor should choose the share class with the lowest present value of fees. Under these three distribution arrangements, the investor is better off with B shares than with A shares for holding periods between one and seven years. The C shares are more attractive than either B or A shares for expected holding periods of less than seven years. For longer holding periods, B and A shares both dominate C shares, though A shares are slightly more attractive than B shares. The table illustrates that the C-share-type arrangements become costly as the holding period increases. Each marginal year after year 8 that an investor holds C shares costs the investor .75 percent more of his or her original investment than holding B shares. These results are robust to different assumed values of the discount rate. The only results in the table that are sensitive to the discount rate are the first six years of the B shares and the first year of the C shares. For any discount rate greater than 1 percent per year, the preference ordering of share classes for each holding period remains the same.

This analysis is easily applied if the investor has a prespecified holding period. Although this scenario is likely for some investments (such as college savings plans), it may not be the case for other investments. On the other hand, the only information about holding period necessary for selecting the appropriate share class in this example is whether the holding period is greater than seven years. Thus, even with partial information about the likely holding period, a particular share class may be shown to dominate.

Present Value of Fees for Domestic Equity Funds

Figure I shows that fees for most domestic equity funds can be divided into four varieties: (I) front and annual fee shares, (II) back and annual shares with conversion features, (III) front-fee-only shares, and (IV) annual-fee-only shares. To provide a summary of the magnitude and range of fees for each of the four fee structures, we calculate the present value of fees for every domestic equity fund for holding periods from one to twenty years. The following assumptions are made:

1. Rear-end loads are assumed to decline by 1 percent per year until they are zero.
2. The discount rate is 10 percent ($R = 0.1$).
3. All returns are reinvested ($p = 1$).

For each of the four fee structures, the present value of fees is ranked from lowest (1st percentile) to highest (100th percentile) for each holding period. Table 3 displays the 10th, 50th, and 90th percentile for each of the four fee varieties for each holding period. Note that the front-only fees are invariant to the number of years in the holding period.

Table 3 reveals, first, that the fees as a percentage of initial investment increase as the holding period increases except for front-only fees (category III). Second, for any holding period, the dispersion of fees across funds is high for front and annual fees (category I) and annual-only fees (category IV), and this dispersion increases with holding period. For back and annual fees (category II) and front-only fees (category III), the dispersion for a given holding period is relatively small. For investors with long anticipated holding periods, the choice of fee structure is especially important.

For funds with back and annual fees (category II), the columns for the 50th and 90th percentiles are identical. This occurs because of the large number of funds (typically denoted as C shares) that have the exact fee structure denoted for the C-share fund type in Table 1. The 10th and 50th percentiles for the annual-fee-only funds are also identical. Most of the funds that charge only an annual fee set the fee at 25 basis points. This common setup is likely driven by the NASD rule that allows a fund to call itself a no-load fund if it charges a 12b-1 fee equal to or less than 25

TABLE 3. Present Value of Distribution Cost Percentiles for All Domestic Equity Funds: July 1996.

	I. Front and Annual Fees			II. Back and Annual with Conversion Features			III. Front Only			IV. Annual Only		
Holding Period	10th	50th	90th	10th	50th	90th	10th	50th	90th	10th	50th	90th
1	.0424	.0503	.0599	.0446	.0535	.0535	.03	.0475	.0575	.0025	.0025	.0100
2	.0448	.0532	.0622	.0437	.0517	.0517	.03	.0475	.0575	.0050	.0050	.0199
3	.0472	.0570	.0649	.0442	.0507	.0507	.03	.0475	.0575	.0075	.0075	.0297
4	.0496	.0595	.0688	.0463	.0515	.0515	.03	.0475	.0575	.0100	.0100	.0394
5	.0519	.0638	.0735	.0499	.0537	.0537	.03	.0475	.0575	.0124	.0124	.0490
6	.0543	.0666	.0771	.0598	.0578	.0578	.03	.0475	.0575	.0149	.0149	.0585
7	.0567	.0690	.0804	.0522	.0677	.0677	.03	.0475	.0575	.0174	.0174	.0678
8	.0590	.0726	.0848	.0547	.0702	.0702	.03	.0475	.0575	.0198	.0198	.0773
9	.0614	.0753	.0875	.0571	.0726	.0726	.03	.0475	.0575	.0223	.0223	.0864
10	.0637	.0781	.0917	.0594	.0749	.0749	.03	.0475	.0575	.0247	.0247	.0956
11	.0661	.0807	.0962	.0618	.0773	.0773	.03	.0475	.0575	.0272	.0272	.1047
12	.0684	.0830	.1008	.0642	.0797	.0797	.03	.0475	.0575	.0296	.0296	.1136
13	.0707	.0853	.1053	.0665	.0820	.0820	.03	.0475	.0575	.0320	.0320	.1224
14	.0731	.0875	.1097	.0689	.0843	.0843	.03	.0475	.0575	.0344	.0344	.1312
15	.0754	.0898	.1141	.0712	.0867	.0867	.03	.0475	.0575	.0369	.0369	.1399
16	.0777	.0922	.1186	.0735	.0890	.0890	.03	.0475	.0575	.0393	.0393	.1485
17	.0800	.0949	.1230	.0758	.0913	.0913	.03	.0475	.0575	.0417	.0417	.1571
18	.0823	.0976	.1274	.0781	.0936	.0936	.03	.0475	.0575	.0441	.0441	.1655
19	.0846	.1003	.1318	.0804	.0959	.0959	.03	.0475	.0575	.0464	.0464	.1738
20	.0869	.1031	.1361	.0826	.0981	.0981	.03	.0475	.0575	.0488	.0488	.1821

Notes: Costs are calculated as a percentage of original investment and assume an annual gross of expense return of 10 percent ($R = 0.1$) and reinvestment of all distributions ($p = 1$).

basis points as long as there are no front- or back-end loads. The clustering of fee arrangements is evident at the family level. For most families with distribution arrangements, all equity fund distribution plans are the same (see O'Neal (1998)).

The evidence presented in Table 3 illustrates the importance of scrutinizing distribution-fee arrangements from an investor standpoint. Not only are there several types of distribution arrangements, the total cost to investors of these arrangements is variable. With no logical reason to expect a positive correlation between distribution fees and performance, investors should consider the significant and negative effect that different distribution arrangements have on mutual fund investment returns.

V. Conclusion

We develop a straightforward approach for assessing the effect that different mutual fund distribution arrangements have on investor wealth. A general expression for the present value of distribution costs is developed that can be applied to different fee structures and different holding periods. This expression reduces all of the distribution costs to a single quantity, expressed as a percentage of the original investment. The individual classes of the typical multiple-class fund are shown to have substantially different distribution costs. The analysis is extended to show that not only do there exist different basic types of distribution arrangements in the mutual fund industry, but that structurally similar arrangements can produce a considerable range of costs to investors. With an estimate of expected holding period, an investor can calculate the present value of future distribution fees. For investors who do not know precisely their expected holding period, the analysis still has value as an input into the final investment decision. Distribution-related fees have a considerable effect on investor wealth. All else being equal, an investor should purchase the class of shares that has the lowest present value of distribution costs.

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