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INVESTMENT COMPANY INSTITUTE

MATTHEW P. FINK
PRESIDENT

May 24, 2004

The Honorable William H. Donaldson
Chairman
U.S. Securities and Exchange Commission
450 Fifth Street, N.W.
Washington, D.C. 20549

Dear Chairman Donaldson:

The Commission recently requested public comment on whether it should propose changes to Rule 12b-1 under the Investment Company Act of 1940 to address issues that have arisen under the rule, or propose to rescind the rule. The Investment Company Institute[1] supports the Commission's reevaluation of the rule. We are particularly pleased that the Commission is soliciting the views of all interested parties before determining what, if any, changes to propose, and have submitted our specific recommendations for modernizing the rule in a separate letter.[2]

As our earlier letter indicated, mutual fund distribution practices have changed dramatically since Rule 12b-1 was adopted in 1980. Indeed, it is because of these changes that we think it is timely and prudent for the Commission to reexamine the rule. Most notably, the predominant use of 12b-1 fees for most of their history has been as a substitute for front-end sales loads and/or to pay for administrative and shareholder services that benefit existing fund shareholders. Although these uses were not anticipated when the rule was first adopted, they are consistent with the Commission's stated intent that the rule be sufficiently flexible to cover new distribution financing methods that the industry might develop.

A recent article in the Wall Street Journal that highlighted an academic paper by an SEC staff economist unfortunately presented an unbalanced view of the purpose of 12b-1 fees.[3] The article stated that the paper (described in the article as an "SEC study") examined 12b-1 fees "from both the vantage point of the original purpose [of the fees] and their current use." As reported in the article, however, the paper dismissed the use of 12b-1 fees as a substitute for

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[1] The Investment Company Institute is the national association of the American investment company industry. Its membership includes 8,632 open-end investment companies ("mutual funds"), 621 closed-end investment companies, 126 exchange-traded funds and 5 sponsors of unit investment trusts. Its mutual fund members manage assets of about $7.545 trillion. These assets account for more than 95% of assets of all U.S. mutual funds. Individual owners represented by ICI member firms number 86.6 million as of mid 2003, representing 50.6 million households.

[2] Letter from Amy B.R. Lancellotta, Acting General Counsel, Investment Company Institute, to Jonathan G. Katz, Secretary, U.S. Securities and Exchange Commission, dated May 10, 2004.

[3] Tom Lauricella, *Mutual-Funds Sales Fees Just Enrich Firms, SEC Study Says*, Wall Street Journal, May 13, 2004 (discussing Lori Walsh, "The Costs and Benefits to Fund Shareholders of 12b-1 Plans: An Examination of Fund Flows, Expenses and Returns," 2004).

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front-end sales loads as "inappropriate."[4] Thus, the paper's economic analysis and findings are based on the premise that the purpose of 12b-1 fees is to produce lower overall expense ratios through asset growth and economies of scale – a premise that ignores the current uses of these fees. In discussing the paper's findings, the article leaves a negative impression about the impact of 12b-1 fees on fund shareholders. But in fact, because it disregards how 12b-1 fees are currently used, the paper has little bearing on whether investors benefit from them.

We wish to point out that other well-regarded researchers have recognized for some time that 12b-1 fees serve primarily as an alternative to front-end loads and that this use of the fees can provide additional choices and benefits to fund shareholders.[5] The Commission itself as well as its staff also have acknowledged the current uses of 12b-1 fees on many occasions. Indeed, the use of 12b-1 fees as an alternative to front-end loads and/or to pay for ongoing services provided to fund shareholders could not have succeeded without several Commission regulatory actions that helped build the infrastructure to support their use in these ways. Undoubtedly, the Commission took these actions only after concluding that doing so was consistent with the interests of investors. Contrary to the implications of the article, experience demonstrates that these uses of 12b-1 fees benefit investors in several ways – by allowing them the option of paying distribution costs over time, by giving those who choose to own funds through a particular distribution channel access to funds that otherwise might not be available to them and, where used to pay for ongoing services to shareholders, by acting as an incentive for financial professionals to continue to provide such services. Even a prominent industry critic has recognized these benefits.[6]

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[4] The arguments put forth in support of this position contain factual inaccuracies and omit important, relevant information. For example, as noted in the article, the paper cites "a significant difference in the level of transparency between loads and 12b-1 fees." In this regard, the paper asserts that the load charge is clearly stated on the confirmation statement that the investor receives from his broker, whereas the investor is never explicitly told the total amount of 12b-1 fees that he has paid. In fact, disclosure of mutual fund sales loads on confirmation statements is not currently required. The Commission has issued a proposal that would impose such a requirement, which the Institute supports. As part of the same proposal, broker-dealers would be required to provide quantitative disclosure of 12b-1 fees to investors both before a mutual fund purchase and on confirmation statements. The Institute also supports this aspect of the Commission's proposal.

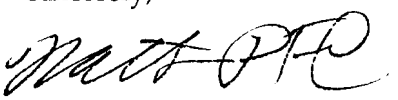
The article also notes the paper's claim that 12b-1 fees can be charged as long as an investor owns a fund. There is no mention in the paper or the article of NASD rules that impose maximum caps on 12b-1 fees based on a percentage of fund sales, or the fact that investors in funds that pay 12b-1 fees as an alternative to a front-end sales load typically convert to another class of shares with no or a low 12b-1 fee after several years. Moreover, in cases where 12b-1 fees are paid to compensate intermediaries for providing ongoing services to fund shareholders, it is entirely appropriate for the fee to continue as long as an investor owns the fund. The paper completely ignores the use of 12b-1 fees to pay for ongoing services to fund shareholders.

[5] *See, e.g.*, Jeffry L. Davis, "A New Look at SEC Rule 12b-1," *Securities Regulation Law Journal*, 1995, Vol. 23, 184-210; See Edward S. O'Neal, "Mutual Fund Share Classes and Broker Incentives," *Financial Analysts Journal*, Sep/Oct 1999, 55(5), 76-87. An Institute Senior Economist also has analyzed 12b-1 fees taking into account their role as a substitute for front-end loads. *See* S. Collins, "The Effect of 12b-1 Plans on Mutual Funds, Revisited," March 2004. A copy of this paper is enclosed.

[6] *See* "12b-1 Fees: Politics and Policy," Fund Democracy Insights, Vol. 1, Issue 4 (Sept. 2001)("Fund Democracy Insights").

As the Commission continues to consider possible changes to Rule 12b-1 and the public debate of these issues proceeds, we reiterate our recommendation that any reevaluation of Rule 12b-1 should take into account the benefits of the current uses of 12b-1 fees.

Sincerely,



Matthew P. Fink
President

Enclosure

cc: The Honorable Paul S. Atkins
The Honorable Roel C. Campos
The Honorable Cynthia A. Glassman
The Honorable Harvey J. Goldschmid

Paul F. Roye, Director
Division of Investment Management

The Effect of 12b-1 Plans on Mutual Fund Investors, Revisited

Sean Collins[1,2]
Investment Company Institute
Washington DC

JEL classification: G000, G200, G230

This draft: March 2004

[1] Correspondence address: Sean Collins, Investment Company Institute, 1401 H Street NW, Washington DC, 20005; phone: (202) 326-5882; email: scollins@ici.org. I thank Brian Reid and John Rea for helpful comments.
[2] The views expressed in this paper are those of the author. As such, they do not represent the views of the Investment Company Institute, its Board, or its membership.

Abstract

Rule 12b-1, adopted by the SEC in 1980, allows mutual funds, under specified circumstances, to assess asset-based fees in order to support distribution and advertising or other marketing costs. 12b-1 fees are usually used in combination with a back-end load as an alternative to a front-end sales load for compensating professionals for advice and assistance provided to investors.

Although 12b-1 plans are used widely by mutual funds, their benefits have been questioned. A number of papers (Ferris and Chance, 1987; Trzcinka and Zweig, 1990; McLeod and Malhotra, 1994; Sigglekow, 2000) have found a positive correlation between a fund's 12b-1 fee and its expense ratio, leading some to conclude that 12b-1 fees impose a deadweight loss on mutual fund investors. However, these papers did not take into account the linkages between 12b-1 fees and front- and back-end loads. Today, 12b-1 fees are used primarily to support distribution, and, as a result, serve mainly as a substitute for front load fees. A proper analysis of the influence of 12b-1 fees on shareholder welfare must take such linkages into account.

One way to do that is to analyze the holding-period returns to investors from mutual funds. A few recent papers (Clark, 1995; Livingston and O'Neal, 1998; O'Neal, 1999) have investigated the influence of 12b-1 fees, as well as front- and back-loads, on the holding-period returns to investors from mutual funds. These papers take it as given that some investors pay to receive professional investment advice and assistance by purchasing load funds. They suggest that for load funds the relationship between a fund's 12b-1 fee and shareholder welfare is complex. For example, among load funds, one with a high 12b-1 fee may offer an investor a high holding-period return (at least over some horizon) because it has a low front load. A limitation of these papers is that they analyzed holding-period returns of *hypothetical* mutual funds, rather than those of actual mutual funds.

This paper adds to the literature on mutual funds by tying together these two strands of literature. As with Clark (1995), Livingston and O'Neal (1998), and O'Neal (1999), the paper takes it as given that some mutual fund investors seek and pay for investment advice and assistance in selecting funds by purchasing load funds. The paper examines the holding-period returns to investors of equity and bond load funds over the ten-year period 1993 to 2002. The analysis incorporates the influence of holding-period returns of 12b-1 fees, and also front and back load fees, other fund expenses, and fund trading costs. Consistent with Clark (1995), Livingston and O'Neal (1998), and O'Neal (1999), the paper finds that among those investors who purchase load funds, those with a relatively short investment horizon (8 years or less) would have earned a higher holding-period return between 1993 and 2002 by investing in share classes of funds that combined low front-end loads with higher-than-average 12b-1 fees. Generally speaking, investors with longer horizons earned higher holding-period returns by investing in share classes that combined a front-end load with low 12b-1 fees, but there is considerable variation across funds in load fee arrangements, and small changes can easily alter the investor's calculus.

The paper's primary insight is that a detailed knowledge of the role and structure of share classes and their associated fees is essential for analyzing and interpreting the expense ratios, load fees, market structure, and performance of mutual funds. Given these considerations, earlier papers that found a positive correlation between fund expense ratios and 12b-1 fees have little implication for the welfare of mutual fund investors, at least not given the today's fee arrangements.

1 Introduction

Rule 12b-1, approved by the Securities and Exchange Commission (SEC) in 1980, allows mutual funds, under specified circumstances, to assess asset-based fees in order to support distribution, cover administrative expenses, and pay for advertising or other marketing costs. Since 1980, 12b-1 plans have been widely adopted by mutual funds. They are usually used in combination with a back-end sales load as an alternative to front loads for compensating professionals for advice and assistance provided to investors. Mutual funds also use 12b-1 fees to support record-keeping, some kinds of customer service provided by third-parties, and to a much lesser extent advertising.[3]

Since their inception, 12b-1 fees have been somewhat contentious. Rule 12b-1 was adopted by the SEC at a time when mutual funds were seeing net outflows. Among other things, mutual fund advisers believed that 12b-1 fees would help to stem outflows from funds by providing a source of revenue to support distribution and advertising. 12b-1 fees would therefore benefit existing shareholders: reduced outflows would buffer levels of assets under management and therefore, by virtue of economies of scale, temper rises in expense ratios that shareholders might otherwise have experienced.

Research has tended to dispute that view. A number of studies have examined the correlation between 12b-1 fees and the expense ratios of mutual funds using a range of data sets and time periods (Ferris and Chance, 1987; Trzcinka and Zweig, 1990; McLeod and Malhotra, 1994; Sigglekow, 2000). These papers have found a positive correlation between a fund's 12b-1 fee and its expense ratio, indicating that 12b-1 fees raise a fund's expense ratio. This has led some to conclude that 12b-1 fees impose a "deadweight loss" on investors and thus "do not benefit shareholders."[4]

However, since the time when most of these papers were written, the structure of mutual fund fees and expenses has changed markedly, as has the mutual fund industry. An important rationale initially offered in support of 12b-1 fee plans is that they would allow greater variety in the fee structures offered by mutual funds. That is precisely what has happened since the adoption of rule 12b-1 in 1980. 12b-1 fees have evolved into an alternative means of collecting loads from investors to compensate investment professionals for their sales efforts, and for the advice, assistance and ongoing service they provide to clients. Thus, as Davis (1995) notes, 12b-1 fees can be thought of as a means of "financing the load." Consistent with this view, the vast majority of retail mutual funds with 12b-1 fees are "load funds."[5]

Load funds usually offer investors a menu of choices with which to pay load fees. These choices are structured as "share classes," classes of securities within the same fund that are all claims on the fund's underlying portfolio, but which differ in terms of their fees. In order to appeal to a

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[3] See Investment Company Institute (1999).

[4] These quotes are from Ferris and Chance (1987) and Trzcinka and Zweig (1990).

[5] Funds may call themselves "no-load funds" and are listed in Morningstar's Principia Pro database as "true no-load funds" if they have 12b-1 fees of 25 basis points or less. As of December 2002, Morningstar's Principia Pro database has a total of 14,372 bond and equity fund share classes, which compares with the universe of 17,031 share classes reporting to the ICI as of the same date. Of these 14,372 share classes, 9,020 had 12b-1 fees. However, of these 9,020 share classes with 12b-1 fees, only 999 were classified as "true no-load." However, many of these 999 "true no-load" share classes were unavailable to retail investors, in that their were either limited to institutional clients, had "qualified access" (which usually means that the share class is available only through purchase of a bank trust department), or had initial minimum in excess of $100,000. In addition, a significant fraction of the remaining "true" no-load share classes can be purchased only through a registered investment advisor, a qualified retirement plan, or a 529 savings plans, leaving just 567 share classes (6% of all share classes) with 12b-1 fees.

wide range of investors, the share classes of a given fund have differing front loads, back-end loads (also known as contingent deferred sales loads, or CDSLs), and 12b-1 fees. Most commonly, funds offer retail investors three share classes: (a) *A* shares, which combine a front load with a low 12b-1 fee; (b) *B* shares, which combine a CDSL with a higher 12b-1 fee, with a reduction at some point in the 12b-1 fee to the level of that on the *A* shares; (c) a "level load" in which the investor pays a moderate 12b-1 fee on an ongoing basis (*C* shares). Reflecting this structure, those who have decided to seek advice and assistance in selecting mutual funds, and are therefore willing to purchase load funds, face a tradeoff between paying front loads and 12b-1 fees.

The structure of load fees importantly affects the calculation and interpretation of fund expense ratios and net returns. Mutual fund expense ratios include 12b-1 fees but exclude fund loads and CDSLs. As an extreme example, suppose that the mutual fund industry were composed of load funds only, each of which offered two share classes: (1) an *A* share with a front-load of 100% and no 12b-1 fee; (2) a *C* share with no front load but an ongoing 12b-1 fee of 100 basis points. An analysis of the expense ratios of this hypothetical industry would indicate that *C* shares incur higher-than-average expense ratios. Consequently, if shareholder welfare were assessed only on the basis of expense ratios, those who purchased *C* shares would be deemed worse off.[6] But, faced with a choice of purchasing *A* shares or *C* shares, all rational investors would choose *C* shares (because the *A* shares have a net return of –100%).

This problem can be avoided by examining a measure of the cost of owning mutual funds that is more general than the expense ratio. A range of papers have constructed measures that incorporate the influence of front loads and CDSLs on the cost of owning mutual funds. Sirri and Tufano (1998) examine the response of investors' demands for mutual funds to "total fund fees", measured as the expense ratio plus one-seventh of any front load. This measure, which has been used increasingly in the literature, improves greatly on the raw use of a fund's expense ratio, but is not without limitations. It ignores CDSLs and assumes that all investors have a seven year holding-period. Rea and Reid's (1998) "total shareholder cost", which builds on Sirri and Tufano's work, takes into account front loads, 12b-1 fees, and CDSLs. In addition, it amortizes front loads and CDSLs using the interest rates prevailing during the year that fund shares were purchased, and then weights those amortized costs by the probability that a shareholder redeems those shares in any particular year.[7] Rea and Reid's (1998) approach is difficult to calculate, which perhaps explains why

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[6] Generally speaking, the expense ratio of different share classes of the same fund can differ either because of 12b-1 fees, account-based (transfer agent) fees, differences in net assets, or fee waivers. By law, the management fees of the various share classes of a given fund must be the same, and therefore is not a source of differences in expense ratios of various share classes. This example assumes that there are no fee waivers, and that the *A* and *C* share classes pay identical transfer agent fees, and that the share classes are equal in size.

[7] The weighting scheme, explained in detail in Rea and Reid (1998), is similar to, though more elaborate than, the logic used by Sirri and Tufano (1998) to conclude that they should add one-seventh of the front-end to the fund's expense ratio. They arrive at this one-seventh figure by estimating that the holding period of the average shareholder is seven years. This estimate is found by inverting the average redemption rate for mutual funds, as reported by the Investment Company Institute. However, one can show arithmetically that inverting a fund's redemption rate will accurately portray the holding period of the fund's average shareholder only if all shareholders in the fund have identical holding periods. This is typically not the case, however. If anything, available statistics suggest that a very small number of shareholders seem to account for the bulk of mutual fund redemptions, whereas most shareholders redeem very infrequently (see Investment Company Institute (2001). Thus, in their weighting scheme, Rea and Reid (1998) use redemption rates compiled by The Wyatt Company in a survey entitled "Investment Company Persistence Study Conducted for the National Association of

it has not achieved widespread acceptance. However, Morey (2002, 2003) compares the performance of load and no-load funds using a simplified version of "total shareholder cost" in which all investors are assumed to have holding-periods of five years.

A difficulty with these earlier, albeit much improved, measures of the cost of owning mutual funds is that solid estimates of investors' holding-periods are hard to come by. A reasonable alternative is to study the influence of mutual fund load fees on investor costs or returns at each possible holding-period. Davis (1995), Livingston and O'Neal (1998), and O'Neal (1999) examine the influence of front loads, CDSLs, and 12b-1 fees on net returns to mutual fund investors for holding-periods ranging from one to as much as twenty years. These papers indicate that an investor whose horizon is relatively short — less than 5 to 8 years — will usually earn a higher holding-period return (net of the effects of front loads, CDSLs, and 12b-1 fees) by purchasing *C* shares, thereby avoiding a front load or CDSL.[8] On the other hand, an investor whose horizon is longer will typically earn a higher holding-period return by investing in either *A* or *B* shares. These results indicate that short-term investors will maximize their holding-period returns (net of all fees and expenses) by paying lower-than-average 12b-1 fees, and therefore incurring higher-than-average expense ratios. This would seem to run counter to earlier studies which concluded that a positive correlation between 12b-1 fees and fund expenses means that 12b-1 fees impose a deadweight loss on fund shareholders.

However, Davis (1995), Livingston and O'Neal (1998), and O'Neal (1999) all studied the holding-period returns to investors from *hypothetical* mutual funds. In their hypothetical examples, fund expense ratios (net of 12b-1 fees) are constant across time and are identical across share classes of the same fund. In reality, expense ratios can vary over time owing to fee waivers (Christoffersen, 2001), explicit changes in 12b-1 or management fees, and (via economies of scale) changes in the level of assets under management. In addition, because of the way some kinds of fund expenses are assessed (notably transfer agent fees), disparity in the numbers of shareholders across the share classes of a given fund can lead to variation in expense ratios (net of 12b-1 fees) across those share classes.[9] In short, while hypothetical examples offer powerful insights, it seems appropriate to investigate whether those insights are confirmed by the historical record.

This paper adds to the literature on mutual fund fees, expenses, and returns — as well as to the literature on optimal investment strategies for individuals — by examining the influence of mutual fund load fees on holding-period returns. The paper takes it as given that some investors seek and are willing to pay a load fee for investment advice and service from a financial professional

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Securities Dealers", January 1990. That survey avoids the problems associated with inverting a fund's redemption rate by reconstructing actual holding periods for individual investors from account level data provided by mutual funds.

[8] As Davis points out, investors do not always know their investment horizon with certainty. Investors might nominally intend to leave their investments untouched for 15 years, only to be faced with an emergency need for liquidity four years down the road. Consequently, even investors who have a stated holding-period of 9 years or more may evince a preference for the low up-front costs of investing in *C* shares relative to *A* shares.

[9] For example, if the *B* share class of a given fund has more assets than the *A* share class of the same fund, the expense ratio of the *B* shares (net of the 12b-1 fee) may be lower than that of the *A* shares (also net of the 12b-1fee). This is because, while management fees must be identical across share classes of the same fund, other kinds of fees need not be. In particular, transfer agent fees tend to vary across share classes of the same fund. Transfer agent fees are usually assessed as a fixed dollar fee per account, say $25 per account. Thus, if two share classes of the same fund have the same number of accounts, but one share class has a higher average account balance, that share class will typically have a lower expense ratio. Thus, differences in assets across fund share classes can translate into differences in expense ratios.

in helping them choose mutual funds.[10] Given that, the question for an investors becomes: What it the best way to pay for the load? The paper examines holding-period returns to investors in bond and equity mutual funds over the ten-year period 1993 to 2002. Holding-period returns are "all-in" in that they are measured net of the influence of front loads, CDSLs, 12b-1 fees, operating expenses (net of 12b-1 fees), redemption fees, brokerage fees, and trading impact costs.

The results indicate that the historical record is consistent with the implications of Davis (1995), Livingston and O'Neal (1998), and O'Neal (1999). Investors with a relatively short horizon — 8 years or less — typically earned higher holding-period returns between 1993 and 2002 by investing in fund share classes that combined low front-end loads with higher-than-average 12b-1 fees (*C* shares in other words). That advantage diminished as the investor's holding period lengthened, and investors with horizons greater than 8 years would typically have done better in share classes that combined a front load with a low 12b-1 fee (*A* shares). However, there is considerable variation in fee structures across funds. As a result, for a significant minority of funds, long-term investors would have earned higher holding-period returns by selecting a share class with a CDSL (*B* shares) over *A* or *C* shares.

Consequently, the paper's primary insight is the influence of 12b-1 fees on shareholder welfare cannot be examined in isolation from front loads and CDSLs. Although fund investors do (and should) care about fund expense ratios, a fund's expense ratio captures only part of the cost of investing in a fund. Thus, it makes sense to examine holding-period returns, rather than (or at least in addition to) fund expense ratios. When correlations between 12b-1 fees and holding-period returns are examined — *taking full account of the links between 12b-1 fees and front loads and CDSLs* — it is apparent that the link between 12b-1 fees and shareholder welfare is considerably more complex than earlier papers have indicated; the link varies across types of share classes and holding-periods. As the results in the paper demonstrate, some investors may benefit by incurring a higher-than-average 12b-1 fee, and thus a higher-than-average expense ratio, because doing so allows them to forego a front load fee. Thus, a finding of a positive correlation between 12b-1 fees and fund expense ratios does not necessarily have any implication for shareholder welfare, at least not given the mutual fund fee arrangements now in place.

The remainder of the paper is structured as follows. Section 2 provides an overview of the structure of mutual fund charges, providing a detailed look at the current structure of the array of fund share classes with front-end, back-end, and 12b-1 fees. Section 3 summarizes earlier research on mutual fund fees and expenses, pointing out some hitherto unrecognized difficulties with the research examining the influence of 12b-1 fees on mutual fund expenses. Section 4 lays out an empirical framework that helps to avoid these difficulties by focusing on the influence of 12b-1 fees on holding-period returns rather than fund expenses. Section 5 presents the main results. Section 6 discusses the results and emphasizes the need for those who pursue research into mutual funds to have a detailed understanding of load fee arrangements. Section 7 concludes.

2 The Structure of Mutual Fund Fees and Expenses: An Overview

[10] The paper is agnostic about what investors *should* do. That is, no judgment is offered as to whether investors should pay for professional investment advice or whether they should simply purchase no-load funds.

Historically, the SEC had been opposed to allowing funds to use assets to support distribution of fund shares. SEC opposition stemmed in part from concerns about conflicts of interest that might arise between a fund and its adviser if fund assets were used to finance distribution. In particular, the SEC believed that "[s]ince the adviser's compensation is typically based on the size of the fund, ...the [fund's] adviser might be inclined to spend excessive amounts on the distribution of fund shares in an effort to increase fund assets and its own compensation."[11]

However, by the mid-1970s the SEC began to reconsider its position. In a limited number of cases the SEC had allowed, or considered allowing, funds to pay for distribution out of fund assets. In addition, mutual funds were experiencing outflows due to the long bear market, and it was suggested that allowing funds to use assets to support distribution could bolster sales and thus fund assets. That could in turn provide benefits to shareholders through better-timed purchases and sales of fund portfolio securities, provide a buffer against ongoing redemptions. In addition, because funds are typically subject to economies of scale, bolstering fund assets might limit increases in expense ratios that shareholders would otherwise have experienced as fund assets shrank. It was noted that the then-existing regulatory scheme precluded fee structures that might be attractive to some investors and restricted the ability of mutual funds to compete with other financial market products. These and other concerns prompted the SEC to revisit the issue.[12]

After lengthy study, the SEC adopted Rule 12b-1, allowing funds to use assets to support distribution and marketing subject to a number of stipulations. Funds could adopt so-called 12b-1 plans if they were (a) written (b) initially approved by a majority of fund directors, independent directors, and shareholders; (c) annually re-approved by a majority of fund directors and independent directors; (d) terminable at any time by a majority of independent directors or fund shareholders. These restrictions were intended to limit any conflicts of interest that might arise on the part of fund advisers.

For the first few years after 1980, 12b-1 fee plans saw rather limited expansion (figure 1). However, the growth of 12b-1 fee plans was aided by additional developments. In 1982, the SEC began to permit funds to offer shares with contingent deferred sales loads (CDSLs), loads payable only if fund shares are redeemed within a specified number of years after the date of purchase.[13] In addition, starting in 1985, the SEC began to issue exemptive orders allowing funds to offer multiple share class arrangements. These arrangements were codified in 1995 in Rule 18f-3, which allows funds to issue multiple classes of securities that represent claims on the same underlying portfolio of securities but differ as to distribution fees. For example, a single fund might offer a share class that is subject to a front-load but has no asset-based 12b-1 fee, and another class that is subject to an asset-based 12b-1 fee but bears no front-load. Another fund might offer two share classes of the same fund, the first share class with a front-load and the second with a CDSL.

Reflecting these developments, the use of 12b-1 fee plans expanded more widely after 1985. By 1990, more than half of all load fund share classes had 12b-1 fee plans, and by 2002 the share

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[11] Securities and Exchange Commission, *New SEC Rulings: Mutual Fund Distribution Expenses*, Federal Securities Law Reports, 84,243, June 22, 1988.

[12] See the discussions in the official transcripts of the proceedings before the SEC on "The Bearing of Distribution Expenses by Mutual Funds," File No. 4-186, 1976.

[13] For this reason, CDSLs are sometimes referred to as "back-end loads."

classes of almost all load funds had 12b-1 fees (Figure 2). In contrast, although "no-load" funds were initially quicker to adopt 12b-1 fees after 1980, the usage of 12b-1 fees by no-load funds has increased very little since 1985.[14] Indeed, by 2003, less than 20 percent of no-load share classes had 12b-1 fees (Figure 3). Thus, 12b-1 fees are primarily an attribute of load funds.[15]

2.1 The structure of mutual fund load fees

This paper takes it as given that some retail investors seek and are willing to pay for investment advice and assistance, and are thus willing to purchase "load funds." Load funds are offered to individuals through broker-dealers, independent financial planners and advisors, banks and S&Ls, and insurance agents Investment professionals associated with these entities help clients to initially select appropriate mutual funds, but advice may go well beyond that to retirement planning, tax management, estate planning, and ongoing portfolio management advice (such as on asset allocation and portfolio rebalancing). In addition, investment professionals may provide ongoing service, such as maintaining records, distribute fund literature, and respond to shareholders' inquiries about their mutual funds.

A common load fee arrangement offers the investor the choice of paying for the advice he or she receives using one of three share classes: (a) *A* shares, which combine a front load with a low 12b-1 fee; (b) *B* shares, which combine a contingent deferred sales load with a higher 12b-1 fee; usually the CDSL declines as a percent of the initial investment for each additional year the shares are held and ultimately drops to zero and, in addition the 12b-1 fee is usually reduced at some point to the level of that on *A* shares (at which point the *B* shares are said to "convert" to *A* shares); (c) a "level load" in which the investor pays neither a front load or CDSL but incurs a 12b-1 fee on an ongoing basis (*C* shares).[16] Share classes of such funds are considered to be "load funds" irrespective of whether they are *A, B,* or *C* shares.[17]

Given the fund's gross portfolio return, its expense ratio (net of 12b-1 fees), and an assumed holding-period, it is possible to evaluate the influence of these fees on an investor's holding period return. O'Neal (1999) provides formulas that apply when a fund's expense ratio and the return on the portfolio are constant. To analyze cases where these assumptions do not hold, O'Neal's (1999) formulas must be modified as follows:

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[14] No-load share classes are defined to be those with no front-end load, no CDSL, and a 12b-1 fee of 25 basis points or less. By definition, all remaining share classes have loads.

[15] The "no-load" share classes in Figure 3 include institutional share classes of funds within traditional load fee complexes. The percent of *retail* no-load share classes with 12b-1 fees is estimated to be somewhat higher, roughly 30 percent.

[16] Load funds often have a wide array of share classes, such as share classes devoted to retail investors, institutional clients, trust clients, retirement vehicles, and so on. These share classes are usually differentiated from other share classes of the same fund by being assigned a letter of the alphabet. Across funds, the letters assigned to these share classes run the gamut from A to Z, and there is generally no consistency across fund complexes in labeling. However, almost all fund complexes use the letters *A, B,* and *C* as described in the text.

[17] *A, B,* and, *C* share classes have rough parallels in the ways that a consumer can pay for a new automobile. He or she may pay for the car outright, similar to purchasing mutual funds through a front-load (*A*) share class. He or she may choose to finance the purchase over the life of the vehicle, similar to purchasing a *C* share, which in effect finances the payment for investment advice and assistance over the life of the investment. Finally, there are *B* shares, which are similar in some sense to auto lease arrangements. Lease arrangements usually carry low down payments, finance charges, and the option of returning the vehicle to the dealer at a future date. *B* share investors pay nothing up-front, but incur 12b-1 fees ("finance charges"), and may be required to make a lump sum payment if the shares are "returned" to the fund before a given date.

$$HPR_{A,t} = \{(1 - Load_A)\prod_{t=1}^{T}[(1 + R_{p,t})(1 - e_{A,t})]\}^{1/t} - 1 \quad (1)$$

$$HPR_{B,t} = \{\prod_{t=1}^{T}[(1 + R_{p,t})(1 - e_{B,t})] - CDSC_{B,t}\}^{1/t} - 1, \ t < T^* \quad (2a)$$

$$HPR_{B,t} = \{\prod_{t=1}^{T}[(1 + R_{p,t})\prod_{t=1}^{T^*}(1 - e_{B,t})\prod_{t=T^*+1}^{T}(1 - e_{A,t})]\}^{1/t} - 1, \ t \geq T^* \quad (2b)$$

$$HPR_{C,t} = \{\prod_{t=1}^{T}[(1 + R_{p,t})(1 - e_{C,t})] - CDSC_{C,t}\}^{1/t} - 1 \quad (3)$$

where t is the investor's holding period, $HPR_{A,t}$, $HPR_{B,t}$, $HPR_{C,t}$, are the holding periods returns on A, B, C shares, respectively. $R_{p,t}$ is the return on the fund's portfolio, $Load_A$ if the front-load paid to invest in A shares, $CDSC_{B,t}$ is any contingent deferred sales load paid on B shares held to t, $CDSC_{C,t}$ is any contingent deferred sales load paid on C shares held to time t, and $e_{A,t}$ $e_{B,t}$ $e_{C,t}$, are the total expense ratios associated with each of these share classes (inclusive of any 12b-1 fee). For B shares, T^* is the year in which they convert to A shares.

However, there are a number of important wrinkles to fee arrangements that can influence an investor's holding-period return.[18] Most funds offer to reduce or waive front loads on A shares for quantity purchases. Funds report in their prospectuses the specific dollar values (sometimes called "breakpoints") required to achieve a given reduction in the front load. Purchases of A shares of $1 million or more will rarely bear a front load. In addition, funds often waive front loads on purchases of A shares made through 401(k) plans or IRA rollovers.

Another complication is that, contrary to views sometimes advanced, the function of the CDSL on a B share is not to stem outflows or reduce trading in and out of the fund: most load funds have arrangements that allow investors to trade from one share class of a particular fund into the same kind of share class of another fund within the fund complex. Thus, an investor in a B share class of an equity fund may usually trade back and forth between the B share of a money fund within the same complex at no cost.

Another twist is that the arrangements used by registered investment advisers (RIAs). RIAs typically receive compensation of 100 basis points per year for managing the assets of their clients. RIAs sometimes place their clients in the C shares of load funds and are compensated, indirectly, for their services by a payment from the fund's distributor. Other times, RIAs place their clients in no-load funds and receive compensation by charging their clients 100 basis points directly for services rendered. The choice between investing in no-load funds and C shares of load funds is therefore less obvious than it seems at first glance.

[18] For an in-depth discussion of load arrangements, and more details on these kinds of issues, see Reid and Rea (2003).

A final complication is that *A, B,* and *C* share arrangements and fees vary importantly across funds. For example, not all load funds offer *A, B,* and *C* shares. In addition, there is meaningful variation in front loads, CDSLs and 12b-1 fees across mutual funds (Figure 4). For example, the modal front load fee for the *A* shares of all equity funds is 5.75 percent, but the median is 5.5 percent, and a significant fraction of equity funds charge front loads of 5.25 percent or less.[19] Most *A* shares have a 12b-1 fees of 25 basis points. However, a significant fraction charges less than that while a significant fraction charges more. Among equity fund *B* shares, the CDSL charged to an investor who redeems shares within the first year has a mode of 5 percent, but a significant number of *B* shares charge only 4 percent. As another example, most *C* shares pay a 12b-1 fee of 100 basis points, but a significant fraction pay only 75 basis points. Another subtlety is that the year in which *B* shares convert to *A* shares differs across funds. In the majority of cases (67 percent), *B* shares convert to *A* shares after they have been held for eight years (Figure 5). However, nearly 30 percent of all *B* shares convert in year 8 or earlier.

A hypothetical example illustrates the influence of some of these factors on holding-period returns to the investor. Assume that load funds have three retail share classes (*A, B,* and *C)* whose fees are identical to the modal fees shown in Figure 4.[20] *A* shares thus have a front-end load of 5.75% and an ongoing 12b-1 fee of .25% (see Figure 6). *B* shares have a CDSL of 5.00% if shares are redeemed in the first year. The CDSL declines for shares redeemed in subsequent years, and is zero for shares redeemed after the 6th year of ownership (in other words, if shares are redeemed in year 7 or later, no back-end load is assessed). *B* shares have an ongoing 12b-1 fee of 1%, but the *B* shares "convert" to *A* shares after 8 years, with the result that the 12b-1 fee drops to .25%. *C* shares have an ongoing 12b-1 fee of 1% and a CDSL of 1% if shares are redeemed in the first year of ownership.

Figure 7 presents holding-period returns for those who invest in *A, B, C* share classes of the hypothetical fund whose fees are given in Figure 6.[21] The holding-period returns are calculated using equations (1) through (3), and are shown for investment horizons of one to fifteen years. The calculations assume that the fund's gross portfolio return is 10% in each year. In addition, expenses for operating the fund ("operating expenses") are assumed to be 80 basis points per year.[22] Loads (i.e. front-load fees), CDSLs, and 12b-1 fees are those assumed above. The total expense ratio for each share class ("Total expense ratio") is the sum of the fund's operating expense ratio and the associated 12b-1 fee for the relevant share class. Holding-period returns (*"HPR")* for the three share classes are reported in the right-most columns of the table.

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[19] Figure 4 analyzes the maximum front load that an investor might pay on *A* shares. Thus, the figure assumes that the investor's purchase is too small to exceed the initial front load fee "breakpoint." In common parlance, the fund's maximum front load is referred to as *the* front load (even though lower front load fees may be obtainable for quantity purchases).

[20] We ignore institutional share classes because their restrictions — high minimums or qualified access — mean that they are not generally purchased by retail customers outside of employer-sponsored retirement plans.

[21] By law, management fees must be identical for different share classes of the same fund. Administrative fees may vary across different share classes of the same fund but are generally similar. Thus, in this example, which is intended only to be illustrative, the assumption that operating expenses are identical across fund share classes is innocuous. In reality, operating expenses can differ across share classes of the same fund, for example because administrative expense ratios may differ, or because the fund is waiving some of the expenses of a particular share class. Thus, when we later examine the actual historical record, it is important to take such differences into account.

[22] Operating expenses are the fund's total expense ratio before 12b-1 fees. Operating expenses thus comprise a fund's management fees, transfer agent fees, and other fees paid directly, such as audit fees, registration fees, directors's fees, and others.

As seen in the top panel of the figure, an investor's preference for *A, B*, or *C* shares will depend on his or her horizon. An investor whose horizon is less than seven years earns a higher holding-period return by purchasing *C* shares, and the advantage of *C* shares is especially pronounced in the first three years. Conversely, longer-term investors do better by purchasing *A* or *B* shares. However the choice for a long-term investor between *A* and *B* shares is less obvious. In the top panel of the table, holding-period returns are essentially identical for *A* and *B* shares for each and every year, differing by at most 3 basis points, and by just one basis point at a 15-year horizon. Thus, a long-term investor would be essentially indifferent between the *A* and *B* shares of this hypothetical mutual fund.

The choice between *A* and *B* shares is sometimes more obvious. For example, long-term investors who plan to make large purchases will usually prefer *A* shares because of the quantity discounts available on front-end loads. The middle panel of Figure 7 considers a case where an investor has enough dollars to invest that he or she faces a front-load of just 3.00%, which would on average be the case for an individual who expects to invest $100,000 to $500,000. In that case, the holding period on *A* shares exceeds that on *B* shares at all horizons.

On the other hand, *B* shares will sometimes dominate for long-term investors. As noted, front load fees, CDSLs, and 12b-1 structures are not identical across funds, and small changes may tip the balance in favor of *B* shares. As noted, not all *B* shares convert to *A* shares in the same year. The bottom panel of Figure 7 considers a case where *B* shares convert in year 7 rather than in year 9. The holding-period return of the *B* shares now dominates that of *A* shares. In short, a long-term investor must consider the details of the fees of a particular fund in order to know whether *A* or *B* shares dominate.[23]

Finally, it is evident from Figure 7, that the relationship between 12b-1 fees and shareholder welfare cannot be summarized by examining the expense ratio. For example, in the top panel of Figure 7, the *A* shares have a lower 12b-1 fee than *B* shares and, in turn, a lower total expense ratio.[24] However, as noted, the holding-period returns of the two share classes are essentially identical in each and every year. Thus, in this example, although the expense ratios of the *A* and *B* share classes differ, little can be said about shareholder welfare.

The next section demonstrates that these issues are not innocuous. Indeed, they can be crucial in interpreting the finding that 12b-1 fees are positively correlated with fund expense ratios.

3 Correlation between 12b-1 fees and fund expense ratios

A range of papers has examined the correlation between the level of funds' 12b-1 fees and their expense ratios.[25] The rationale for studying this correlation, established by Ferris and Chance (1987), is asserted to be that if a "12b-1 plan offers economic value to shareholders, its benefits should

[23] Ultimately, the *A* shares deliver essentially the same holding period return as the *B* shares. However, the holding-period return on *B* shares exceeds that on *A* shares by more than 5 basis points even at a 30 year horizon.

[24] It should be noted that the expense ratio that funds report for *B* shares in their prospectuses and to Morningstar and other data providers (such as Lipper Associates, Inc.) comprises the 12b-1 fee that an investor pays until the investor's shares convert to *A* shares.

[25] See, for instance, (Ferris and Chance (1987), Trczinka and Zweig (1988), Chance and Ferris (199xa), McLeod and Malhotra, 1994, Malhotra and McLeod (1997), Rao (1996), and Sigglekow (2000).

outweigh its costs and the net effect should be a reduced expense ratio."[26] This stems from the claim that a 12b-1 plan, if beneficial to fund shareholders, will stimulate the demand for a fund's assets and thus through economies of scale, lead indirectly to a reduction in the fund's expense ratio.

Commonly these papers undertake regressions of the form:

$$e_i = \alpha_0 + \alpha_1 \ln A_i + \gamma Dummy_i^{12b1} + X_i\beta \quad (4)$$

$$e_i = \alpha_0 + \alpha_1 \ln A_i + \gamma' 12b1_i + X_i\beta \quad (5)$$

$$e_i = \alpha_0 + \tilde{\gamma} 12b1_i + X_i\beta \quad (6)$$

In earlier papers, the unit of analysis was at the fund level. However, more recently and most commonly, the unit of analysis is at the fund share class level. Thus, e_i is expense ratio of the share class, $\ln A_i$ is the log-level of share class assets, and $X_i\beta$ are other attributes thought to influence the expense ratio. The expense ratio e_i comprises investment management fees, transfer agent fees, administrative expenses, as well as the 12b-1 fee associated with the share class. Also reflected in the expense ratio are any fee waivers that may apply.

Of these three regressions, equation (4) has perhaps been the most widely used. In it, $Dummy_i^{12b1}$ equals 1.0 if the fund share class has a 12b-1 fee, and is zero otherwise. The assets of the share class are included to allow for economies of scale, which are present if $\alpha_1 < 0$.[27] The second regression, first used by Trzcinka and Zweig (1988), replaces the dummy variable $Dummy_i^{12b1}$ with the *level* of the 12b-1 fee. Although equation (4) has been more widely used, equation (5) uses more information and thus provides a better measure of the correlation between fund 12b-1 fees and expense ratios.[28] Equation (6), used by Sigglekow (2000), includes the level of the 12b-1 fee but *excludes* the level of assets. Sigglekow argues that it is unclear whether equations (4) and (5) identify demand curves for mutual fund investments, supply curves for the same, or some mix of the two. He thus favors equation (6) on the view that it avoids this problem.[29]

Whatever form the regression takes, the correlation between the 12b-1 fee and expense ratio of a fund (or fund share class) is tested by the sign on the variable representing the 12b-1 fee. It is

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[26] Ferris and Chance (1987), p. 1082.

[27] Many studies have indicated that mutual funds face economies of scale. See, for example, Baumol et al. (1990), Dermine and Röller (1992), Collins and Mack (1997), Latzko (1999) and Rea, Reid, and Millar (1999).

[28] The level of the 12b-1 fee must be given in a fund's prospectus, and hence is always known to the econometrician. Equation (4), which translates the level of the 12b-1 fee into a zero-one variable, therefore throws information away relative to equation (5).

[29] To see this, suppose that the demand for mutual fund assets is given by $\ln A_i = \delta_0 - \delta_1 e_i + \delta_2 12b1_i + u_i$. Demand depends negatively on the fund's overall expense ratio e_i, but positively on the portion due to the 12b-1 fee. If $\delta_2 > \delta_1$ imposing a 12b-1 fee will boost fund assets (presumably because the marketing efforts of broker/dealers that are supported by the 12b-1 fee outweigh the influence on investors of a higher expense ratio). Suppose, in addition, that the supply curve is given by $e_i = \theta_0 - \theta_1 \ln A_i + 12b1_i$. Here, the expense ratio falls as assets rise because of economies of scale. Funds (or share classes of funds) with 12b-1 fees will, mechanically, have higher expense ratios than other funds for any given level of assets (the 12b-1 fee has the same effect on a mutual fund's supply curve as, say, a processing fee would have on the supply price of an airline ticket, in that they both raise the supply price one-for-one). As specified, the supply and demand curves have all their variables in common and are unidentified without additional information. Sigglekow (2000) tries to avoid this problem by dropping the log of assets from equation (2) to arrive at equation (3), and then estimating equation (3) by two-stage least squares.

asserted that a 12b-1 plan benefits shareholders if γ, γ', or $\tilde{\gamma}$ are negative. Empirical work has found the reverse, namely a positive correlation between 12b-1 fees and fund expense ratios. For example, as Figure 8 shows, estimates of γ have ranged from .05 to .53. The estimates of γ' and $\tilde{\gamma}$, which use more information about 12b-1 fees and are therefore be more efficient, are higher, centering around 1.0. In short, earlier work has indicated that 12b-1 fees are positively correlated with fund expense ratios. It is this correlation which has led some to conclude that 12b-1 fees are a deadweight cost to shareholders.

3.1 Are 12b-1 fees and expense ratios still positively correlated?

The vast changes in the mutual fund industry in the 1990s may have caused the correlation between 12b-1 fees and fund expense ratios to change. As a check, equations (4), (5), and (6) were estimated cross-sectionally using the data reported by Morningstar for all bond and equity funds as of December 2002. As in most research on 12b-1 fees, the unit of analysis is the fund share class, as opposed to the fund itself.[30] Equations (4) and (5) are estimated using the assets of the share class to represent A_i.[31] In addition, each regression includes dummy variables for fund investment objective ("Morningstar category") and fund family (complex, that is). Each of the three equations is estimated using ordinary least squares.

The results are in Figure 9. The correlation between 12b-1 fees and expense ratios remains positive, statistically significant, and similar to estimates reported in earlier work. For example, γ is positive but less than one. The estimates of γ' and $\tilde{\gamma}$ are closer to 1.0. However, in contrast with the results of Sigglekow (2000), the estimate of $\tilde{\gamma}$ is not substantially greater than 1.0.[32]

The positive correlation between 12b-1 fees and fund expense ratios does not hinge on load status. Nearly identical results hold if one examines only load funds (Figure 10).[33] The estimates of the estimates of γ, γ', and $\tilde{\gamma}$ are still positive, significantly different from zero, and of comparable, albeit slightly smaller, size than their corresponding estimates in Figure 9. For example, the coefficient on γ' drops from .90 in Table 9 to .871 in Table 10.

Thus, the evidence indicates that a strong positive correlation still exists between 12b-1 fees and expense ratios. The weight of the evidence is that the expense ratio of a particular fund share

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[30] Money market funds are excluded from the analysis. Also excluded are institutional funds and institutional share classes of funds. An alternative would have been to include institutional funds and share classes and introduce dummy variables for them. Experimentation with this alternative indicated little substantive difference in the results.

[31] One could instead have used assets of the fund or fund family.

[32] The difference between our results and those of Sigglekow (2000) could arise for a number of reasons. First, our regressors are not identical in all respects to his. Second, we are using data for 2002, whereas his data ended in 1996. We use ordinary least squares, while Sigglekow (2000) uses instrumental variables. However, there may also be some anomalies. For example, Sigglekow reports a total of 3363 observations available for his 1993 regression. We are able to reproduce identically the number of observations from CRSP for 1993 that Sigglekow reports. However, to undertake his instrumental variables regression requires the use of the lagged level of the 12b-1 fee. It is unclear whether he takes this to be the value reported by CRSP in 1992, or the value reported by CRSP for an earlier quarter in 1993. If it is the former, it is unclear how Sigglekow arrives at 3363 observations for 1993, because CRSP reports 12b-1 fees for only 2722 funds in 1992. If it is the latter, simultaneity would still be an issue; a fund's reported expense ratios entails expenditure throughout the year and thus will be correlated with the level of the 12b-1 fee prevailing in each of the four quarters of its fiscal year.

[33] Load funds are defined as those share classes that have either: (a) a front-end load; (b) a CDSC; (c) a 12b-1 fee greater than 25 basis points.

class is higher, perhaps one-for-one, as its 12b-1 fee is higher. Importantly, the relationship holds true whether one considers all funds or load funds in isolation. The balance of the paper takes these as established facts. What remains at issue is whether these facts have any implication for the welfare of fund shareholders. The remainder of the paper argues that the answer is no.

3.2 A simulation counter-example

Suppose, hypothetically, that the mutual fund industry is composed of 1000 load mutual funds whose assets (in millions of dollars) under management are either \$10, \$100, \$1,000, \$10,000, or \$100,000. As in reality, small funds are more common than large funds: 500 funds have assets under management of \$10 million, 250 funds have assets of \$100 million, and the remaining 250 funds have (in equal proportions) millions of dollars of assets of \$1,000, \$10,000, or \$100,000. Suppose also that each of these 1000 funds offers *A* and *B* shares only, and that the fees on these share classes are identical to those in Figure 6. That is, *A* shares have a front-load of 5.75% and a 25 basis point 12b-1 fee. *B* shares have a CDSC that is 5.0% for the first year, and declines to 0% in the 8th year of ownership. *B* shares also have a 12b-1 fee of 1 percent.

The expense ratios of these 2000 share classes (1000 funds times 2 share classes each) are generated from the following equations:

$$e_i = mgtfee_i^F + othfee_i + 12b1_i \tag{7}$$

$$mgtfee_i^F = .5 - .05 \ln A_i^F + \varepsilon_i \tag{8}$$

$$othfee_i = .5 - .1 \ln A_i^S + \nu_i \tag{9}$$

The expense ratio e_i of a fund share class is the sum of the management fee $mgtfee_i^F$, other fees $othfee_i$, and the 12b-1 fee.[34] Management fees cover management of the fund's portfolio securities and are determined by equation (8). Other fees comprise all other operating expenses such as those that support fund accounting, shareholder services, audits, and fees paid to fund directors, and are determined by equation (9). Economies of scale are present in both management and other fees, but are assumed to be greater for other fees as has been suggested by empirical work.[35] Random normal errors ε_i and ν_i are added to equations (8) and (9), respectively.

What would regressions similar to those used in previous work on 12b-1 fees show using simulated data? The answer depends on how the fund's assets are distributed across share classes within the fund (Figure 11). Initially, assume that the fund's assets are split equally between the fund's *A* and *B* share classes. On that assumption, equations (7), (8), and (9) were used to simulate data for 2000 share classes. These 2000 simulated observations were then used to estimate equations (5) and (6).[36] This exercise is repeated 500 times and the estimates of $\hat{\gamma}^1$, and $\hat{\hat{\gamma}}$ are from each round

[34] These fees are all measured as a percent of assets.

[35] See for instance, Latzko (2001). Larger economies of scale in the administrative fees of mutual funds could reflect the fact that administrative fees have a larger fixed component than do management fees.

[36] Equation (1) is ignored because, as indicated earlier, it provides an inferior estimate of the correlation between a fund's 12b-1 fee and its expense ratio.

are stored. $\hat{\gamma}'$ and $\hat{\tilde{\gamma}}$ center around 1.0, much as in previous work. We next assume that fund assets are skewed toward the *A* shares, with the *A* shares having 75% of fund assets and *B* shares have the remaining 25%. In this case, the estimates of $\hat{\gamma}'$ are now somewhat less than 1.0 while estimates of $\hat{\tilde{\gamma}}$ are greater than 10 (as in Figure 8). Results are just the reverse when *A* shares have 25% of fund assets and *B* shares have 75%. Thus, the relative sizes of $\hat{\gamma}'$, and $\hat{\tilde{\gamma}}$ depends on the distribution of fund assets across the share classes in the fund.

In short, it is easy to reproduce the results reported elsewhere that coefficient estimates $\hat{\gamma}'$ and $\hat{\tilde{\gamma}}$ center around 1.0, but may be greater or less than 1.0. The usual interpretation is that higher 12b-1 fees lead to reduced shareholder welfare. However, that is not true here. In the simulation example *B* shares have a higher 12b-1 fee, and thus a higher expense ratio, than *A* shares. However, investors should be essentially indifferent between the two share classes because their holding-period returns are essentially identical (by construction). Thus, regression like (4), (5) and (6) cannot be used to make inferences about the influence of 12b-1 fees on shareholder welfare.

4 An empirical analysis of the influence of 12b-1 fees on holding-period returns to mutual fund investors

An alternative way to analyze the influence of 12b-1 fees on shareholder welfare is to examine their effects on holding-period returns. An investor should be most directly interested in the net holding-period return offered by a fund (or fund share class) rather than its expense ratio. Holding-period returns are influenced by 12b-1 fees, but also by front-loads, CDSLs, fund management fees and administrative costs, transfer agent fees, brokerage fees, implicit trading costs ("impact costs" of securities trades), soft-dollar arrangements, and gross portfolio returns.

Holding-period returns automatically comprise all of the explicit costs of investing in a mutual fund, including fund expense ratios, *as well as* front-end loads and CDSLs. The effects of brokerage fees, trading costs, and soft-dollar arrangements are incorporated through their effects on the fund's gross portfolio return. Also, using holding-period returns to examine the influence of 12b-1 fees on shareholder welfare allows one to encompass difficult issues associated with the value of active versus passive fund management.[37] Last, but not least, studying the influence of 12b-1 fees on holding-period return fits better with optimal portfolio theory: while investors should and do care about fund expense ratios, it is ultimately net (risk-adjusted) holding-period returns which they care most about.

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[37] Past studies on the influence of 12b-1 fees on shareholder welfare — by their focus on the link between fund expense ratios and 12b-1 fees — implicitly assume that active management lends nothing, neither on net *nor* on gross, to the return on a fund's portfolio. Suppose, for example, that fund X can hire a portfolio manager who, through superior skills, is able to generate a gross portfolio return 100 basis points higher than that of fund Y, which has a similar investment style. Suppose also that labor markets are efficient and that fund X must pay the superior manager his marginal value (100 basis points) to retain his services. Finally, assume that the value of the manager's services are fully passed through to the management fee, and thus expense ratio, of fund X. Given these assumptions, an investor would be indifferent between funds X and Y because the two funds have identical *net* holding-period returns. If one instead focused on the expense ratios of these two funds, one would incorrectly conclude that the shareholder would always prefer fund Y.

Consider a regression similar to equations (5) and (6) but that replaces the expense ratio of the fund share class with its holding-period return:

$$(HPR_{i,h} - r) = \alpha_0 + \alpha_1 \ln A_{i,h} + \gamma_{i,h} 12b1_i + \delta_h (R_h - r_h) + X_i \beta \qquad (10)$$

where $HPR_{i,h}$ is the holding-period return on fund share class i when the investor has a holding-period of h years, $\ln A_{i,h}$ is the average level of (log) assets fund share class i, $12b1_i$ is the 12b-1 fee associated with a particular fund share class [38], X_i are other variables that may influence the fund's holding-period return, and R_h and r_h are the market and risk-free rates of return, respectively, over holding-period h.

Although equation (10) resembles equations (5) and (6), there are important differences. First, the expense ratio is replaced on the left-hand side by the net holding-period return of the fund share class. Second, in keeping with the CAPM model, holding-period return is measured relative to the risk-free rate r_h. Third, because the dependent variable is fund return rather than expense ratio, it is appropriate to add as an explanatory variable the excess holding-period return of the market, namely $(R_h - r_h)$. Finally, although the level of the 12b-1 fee still appears as a regressor, the correlation between 12b-1 fees and holding period returns is allowed to vary across holding-period and type of share class by allowing $\gamma_{i,h}$ to differ across holding-period and type of share class (either *A*, *B*, or *C*).

To obtain a single regression equation, the observations for all holding-periods and share classes can be stacked as follows:

$$(HPR_{i,h} - r) = \alpha_0 + \alpha_1 \ln A_{i,h} + \delta (R_h - r_h) + X_i \beta + \sum_{i=A,B,C} \sum_{h=1}^{H} \gamma_{i,h} D_i D_h 12b1_i \quad (11)$$

The variable D_i is a dummy that equals 1.0 if the observation under consideration is of share class type i and is zero otherwise. Similarly, the variable D_h is a dummy that is one if the observation relates to holding-period h and is zero otherwise. Thus, for example, the correlation between the 5-

[38] Note that the variable $12b1_{i,j}$ is the 12b-1 fee *initially* assessed on a particular share class. .For *A* and *C* share classes, the distinction between 12b-1 fees *initially* or *subsequently* assessed has little meaning. However, for *B* shares, which (**usually?**) convert at some point to *A* shares, 12b-1 fees are not necessarily constant across the life of the investment. As a result, equation (11) can only approximate the true holding-period return of a *B* share. However, it is convenient to use the *initial* 12b-1 fee for two reasons. First, doing so allows the analysis to maintain rough comparability with the previous analyses of 12b-1 fees, all of which have been based on the *initial* 12b-1 fee associated with *B* shares. Second, it greatly simplifies the effort that must be spent on data collection. To our knowledge, there is no good source of historical data on the 12b-1 fees and CDSC schedules, both initial *and* subsequent associated with *B* shares. For instance, CRSP reports only initial 12b-1 and CDSC fees for *B* shares. In principle, it might be possible to collect such data from past issues of Morningstar CDs and diskettes, and that would be a useful although time-intensive extension to this paper. Thus, for purposes of this paper, equation (11) is an approximation to reality, but one that nevertheless does allow for variation in 12b-1 fees and CDSCs of *B* shares over time. For example, if all *B* shares converted to *A* shares in the same year and all *B* shares had CDSC schedules that declined at the same rate from the same initial CDSC, equation (11) would be exact. To the extent that that is not true, equation (11) must be viewed as an approximation to reality.

year holding-period return of A shares and their 12b-1 fees is picked up by the term $\sum_{i=A,B,C} \sum_{h=1}^{H} \gamma_{i,h} D_i D_h = \gamma_{A,5}$.

The hypothetical results in section 2 suggest that for short- to medium-term holding-periods, one should expect a *positive* correlation between the level of the 12b-1 fee and the holding-period returns of C shares relative to those of A and B shares. In other words, C shares will appear to *benefit* from a relatively *higher* 12b-1 fee at shorter investment horizons. Ultimately, as the investment horizon lengthens, the relative benefits of C shares should diminish and perhaps be reversed. In contrast, one would suspect that the advantage of B shares to A shares (or A shares to B shares) is relatively marginal at essentially any investment horizon.

However, as noted in the introduction, for several reasons (fee waivers for instance) practice may diverge from theory. Thus, it is appropriate to consider how closely the actual data accord with theory. This is taken up in the next section.

5 Results

This section first describes the data used to estimate equation (11), and then goes on to present and interpret regression results.

Data

Holding-period returns could be calculated from data reported in CRSP or other sources. However a ready-made source is available in Morningstar. In addition to reporting the net returns of funds, Morningstar calculates and reports a measure called "load-adjusted return" for horizons of 1, 3, 5, and 10 years. This measure is in fact essentially identical to the holding-period returns that one would calculate for a fund share class using the formulas in section 2. The measure adjusts the returns of fund share classes for front-end loads and CDSLs.[39] In addition, Morningstar applies the CDSL relevant to the particular holding-period.[40] Finally, Morningstar calculation correctly adjusts for redemption fees[41] and the influence of front loads and CDSLs on dividend reinvestments.[42] For these reasons, and also because the Morningstar measure is widely available, we use it as a measure of

[39] Thus, the term "load-adjusted return" perhaps gives the misimpression that the adjustment simply deducts the front-end load from the fund's net return.

[40] For example, suppose that the B shares of fund i have a contingent deferred sales charge that is 5 percent if shares are redeemed in the first year, and declines 1 percentage point in each ensuing year until the CDSL vanishes. Thus, the Morningstar "load-adjusted" measure would deduct from the net return of the share class a 5 percent CDSL for shares redeemed within the first year, a 4 percent CDSL for shares redeemed within the second year, and so on.

[41] Redemption fees are sometimes confused with contingent deferred sales charges. Redemption fees are imposed by funds in order to reduce short-term trading. As a result, redemption fees tend to be of very limited duration, usually extending at most to holding-periods of a few months to a year. In addition, redemption fees are paid back into the fund. In contrast, the bulk of a CDSL is usually used to compensate the fund's distributor for sales commissions already advanced to the selling broker. Moreover, unlike CDSLs, redemption fees are normally charged on exchanges within a fund complex while CDSLs are not. Thus, for example, if an investor redeems shares in fund j of complex X and moves the money to fund k in complex X he may pay a redemption fee for short-term trading but is unlikely to pay a CDSL.

[42] The Morningstar measures assume that no sales load, either front-end or contingent deferred, applies to reinvested dividends. Generally speaking, most funds do not charge front-end or contingent deferred sales loads on reinvested dividends. In addition, under NASD rule 2830, front loads and CDSLs cannot be applied to funds created after April 1, 2000.

the 1, 3, 5, and 10-year holding-period returns for fund share classes. The data comprise essentially all *A*, *B*, and *C* share classes of load funds.[43]

To estimate equation (11), we also require figures on the assets and initial 12b-1 fee of each share class. In addition, we require risk-free and market rates of return. The risk-free rate of return is taken to be the yield on the 3-month Treasury bill. In contrast with most studies of fund returns, it is not assumed that the market rate of return for all funds is simply that of a broad market index such as the S&P 500 or the Wilshire 5000. Instead, market indexes are selected that are more in keeping with the specific investment objectives of each fund. Thus, for example, a large cap value fund is assumed to have the S&P 500 as its relevant market rate of return, but for a small cap value fund the relevant market rate of return is taken to be the Wilshire small cap value index.[44] Finally, we include dummy variables for fund category, as well as for fund family. These are based on the categories assigned by Morningstar to each fund (so-called "Morningstar categories").

Least squares estimates of equation (11) are shown in Figure 12. Economies of scale are evident, in that holding-period (in excess of the risk-free rate) returns are higher for share classes with greater assets (that is $\alpha_1 > 0$), likely reflecting the fact that larger funds or share classes have lower expense ratios (net of 12b-1 fees) and thus higher net returns, all else equal. Excess holding-period returns are linked nearly one-for-one with the excess market rate of return, which indicates nothing more than the fact that a fund should have a beta of 1.0 when matched with an appropriate market index.

We now turn to the estimates of $\gamma_{i,j}$. Generally speaking, the sizes and signs of the $\gamma_{i,j}$ support the theoretical results suggested in section 2. First, the $\gamma_{i,j}$ are highly statistically significant. More the correlation between the holding-period return and the 12b-1 fee is sometimes negative (as indicated by $\gamma_{i,j} < 0$) but often positive (as indicated by $\gamma_{i,j} > 0$). The latter case indicates that a *higher* 12b-1 fee is associated with a *higher* holding-period return at the horizon in question. The reason is simple: shareholders incur higher 12b-1 fees on *B* and *C* shares, but the effect is offset (at least at short horizons) by virtue of paying no front load. Thus, as the hypothetical examples in section 2 suggest, the relationship between the level of the 12b-1 fee and shareholder welfare is more complex than most earlier papers on 12b-1 fees have allowed for.

Perhaps the easiest way to summarize the varying correlations between 12b-1 fees and holding-period returns is to plot them. The estimated equation (11) is used to predict the holding-period returns for all of the *A*, *B*, and *C* share classes in the data set for 1, 3, 5, and 10 year holding-periods. The market returns R_i vary substantially across holding-periods and investment objectives. Consequently, in order to put the predictions on a comparable basis, as well as to aid in the

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[43] Thus, the analysis excludes all no-load funds and no-load share classes of load funds (the latter are mainly institutional share classes of load funds or are share classes to which access is restricted such as those sold only through bank trust departments). In so far as the analysis at hand is concerned, this is appropriate. As noted earlier, this paper takes it as given that some investors seek and are willing to pay for advice in selecting and investing in mutual funds, that is that they are willing to purchase load funds. The point of the paper is not to argue whether investors should or should not invest in load funds, but to demonstrate that the relationship between 12b-1 fees and shareholder welfare is considerably more complicated than has typically been suggested in the past. Because 12b-1 fees are primarily a feature of load funds, it therefore is appropriate to focus on load funds alone.

[44] A full list of the market indexes used and how the are matched with Morningstar categories is given in Appendix C.

interpretations, the predictions are normalized by subtracting off the expected effect of the relevant (excess) market return, in other words $(\widehat{HPR_{i,h} - r}) - \hat{\delta}(R_h - r_h)$.

Predicted holding-period returns for individual share classes are then averaged across all observations for a particular share class and holding-period.[45]

The results, shown in Figure 13, are broadly consistent with the hypothetical examples in section 2.[46] For short investment horizons, *C* shares dominate *A* shares even though *C* shares typically have considerably higher 12b-1 fees. On the other hand, at short horizons *C* shares dominate *B* shares even though they usually have identical 12b-1 fees (until the *B* share convert to *A* shares, that is). *A* and *B* shares come to dominate *C* shares as the holding-period lengthens. Indeed, a "cross-over" point occurs at a holding-period of about 8 years, at which time *A*, *B*, and *C* shares are about equally favorable. Past that point, *A* and *B* shares dominate. According to the model predictions, differences between the relative holding-period returns of *A* and *B* shares have been smaller. *B* shares have had the upper hand for holding-periods of 2 to 8 years, after which point *A* shares dominate. For example, the point predictions suggest that at a horizon of ten years, other factors the same, *A* shares have outperformed *B* shares, albeit at a relatively modest 10 basis points.

Surprisingly, *A* shares appear to outperform *B* shares at a horizon of one year. As indicated in section 2, the front load on *A* shares is normally higher than the initial *CDSL* on *B* shares (a modal front load of 5.75% percent a modal CDSL of 5%). This would typically boost the returns of *B* share relative to *A* shares in the first year. However, there are other considerations. For example, *A* shares typically have the bulk of the assets in load funds, roughly 80 percent according to Reid and Rea (2003). By virtue of economies of scale, notably in fees charged for shareholder servicing, share classes with higher levels of assets will have lower expense ratios. Thus, normally, because of their greater size, *A* shares will have a slight advantage in terms of expense ratio, all else equal.

When an adjustment is made for differences in asset levels across share classes, the advantage of the *A* shares at a 1 year horizon largely vanishes. This adjustment is made by taking the holding-period returns predicted by the model and subtracting off the expected influence of *both* excess market returns and asset levels, in other words, by forming $(\widehat{HPR_{i,h} - r}) - \hat{\alpha}_1 \ln A_{i,h} - \hat{\delta}(R_h - r_h)$. The result is shown in Figure 14. As can be seen the holding-period returns of *A* and *B* shares at a 1 year horizon are now nearly identical. In addition, the relative advantage of the *A* shares diminishes at every holding-period. In fact, formally speaking, *B* and *C* shares now appear to dominate *A* shares at every holding-period, although the difference is relatively small at the ten year horizon. While there are a number of reasons to be cautious about the differences between Figures 13 and 14, they at least indicate that part of the holding-period advantage of *A* shares stems from the fact that, historically, they have been around longer and have been more popular with investors, and thus have more assets and lower expenses than *B* and *C* shares.

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[45] For example, if the regression predicts a holding-period return for an *A* share at a holding-period of 3 years of $\widehat{HPR}_{A,3}$ the point plotted in the figure is $\widehat{HPR}_{A,3} - \hat{\alpha}_1 R_3$.

[46] The predicted relationships are all negative, owing to the influence of fund management and administrative fees, as well as to distribution costs (namely front-load fees, CDSLs, and 12b-1 fees). This in turn just indicates that fund management and administration is not costless, nor is investment advice and assistance (which is supported by distribution fees).

6 Discussion

Some caveats must be offered with respect to the empirical results in section 5.

One criticism is that the data are a cross-sectional "snapshot" taken from a single Morningstar CD. As a result, the data are subject to survivorship bias. Thus, it could be that the results in the previous section hinge quantitatively on the influence of surviving mutual funds, whose returns have been better than average. Having said that, it seems unlikely that the paper's main result owe substantively and qualitatively to survivorship bias. The main empirical results, which are portrayed in Figures 13 and 14, match the hypothetical results in Figure 7 in broad qualitative terms. Namely, in all three figures holding-period returns on *C* shares outperform those on *A* and *B* shares in early years. Also, holding-period returns on *B* shares outperform those on *A* share in earlier years. In later years *A* shares tend to outperform, with a "cross-over" date occurring after a number of years. However, the results in Figure 7, which are based on hypothetical funds, are *not* subject to survivorship bias. Given the results in Figures 13 and 14 are qualitatively similar to those in Figure 7 there is little reason to suspect that survivorship bias would meaningfully alter the paper's main conclusions.

Indeed, if anything, the results in the previous section are more likely to be influenced by what might be called "creation bias." In the early 1990s, *B* shares were less widespread than today, and there were few *C* shares. As that decade progressed, *B* and *C* shares became much more common, and today almost all load funds offer *A, B,* and *C* shares simultaneously. Thus, the data on which Figures 13 and 14 are based, embody considerably fewer *B* and *C* shares at a holding-period of 10 years (which corresponds to the ten year period running from 1993 to 2002). In contrast, the proportion of *B* and *C* shares is higher for 1, 3, and 5 year holding-periods (which correspond to the 1, 3, and 5 year periods running, respectively from 2001 to 2002, 2000 to 2002, and 1998 to 2002). This so-called "creation bias" might account for a peculiarity in the results, namely that *B* shares should tend to dominated *A* shares at a one-year horizon (as they in fact do in the top third to Figure 7), but they do not in Figures 13 and 14. In addition, because of the relative paucity of *B* and *C* shares at the ten-year horizon, one must be careful about attaching too much significance to rankings of *A, B,* and *C* shares at that horizon.

With these caveats in mind, it nevertheless seems reasonable to conclude that the results based on actual fund outcomes are broadly consistent with the hypothetical examples in section 2. From this, two implications follow.

First, earlier studies on 12b-1 fees arguably have little implication for the welfare of mutual fund investors today. Most earlier studies examine the correlation between 12b-1 fees and fund expense ratios, but ignored the relationship between 12b-1 fees and front loads. Although investors do (and should) care about expense ratios, a fund's expense ratio captures only part of the cost of investing in a fund. Thus, it makes sense to examine holding-period returns, rather than expense ratios, because the former comprise the "all-in" cost of investing in a mutual fund. When correlations between 12b-1 fees and holding-period return are examined, it is apparent that the relationship is complex, varying across types of fund share classes and holding-periods. Over certain horizons, share classes with higher-than-average 12b-1 fees, and thus higher than average expense

ratios, offer investors better returns. Thus, no blanket statement can be made about investor welfare by examining a fund's 12b-1 fee in isolation.

Second, at a deeper level, it should be apparent that the analysis and interpretation of fund expense ratios, load fees, and performance can depend importantly on the role and structure of fund share classes and their associated fees. Thus, it is arguably essential to have a detailed knowledge of the role and structure of share classes and their associated fees. Lacking that, one is at significant risk of drawing inappropriate inferences and conclusions.

7 Conclusion

The mutual fund industry has expanded tremendously in the past two decades, in terms of assets managed, investors served, and products and services offered. In part reflecting these influences, the fee arrangements of mutual funds have evolved markedly. In 1980, most mutual funds offered only a single share class. Most of these were either front-load funds sold through broker/dealers or were no-load funds sold directly to investors by fund companies. Now, most load funds offer an array of share classes that differ as to their front loads, CDSLs, and 12b-1 fees. This paper has argued that a detailed understanding of load fee arrangements is necessary to analyze the influence of 12b-1 fees on shareholder welfare. In particular, the paper has presented evidence that the relationship between 12b-1 fees and investor welfare (as measured by holding-period return) is complex, depending on the precise fee schedule that a fund charges and the investor's holding-period. In light of this finding, past studies that have found a positive correlation between 12b-1 fees and fund expense ratios may have little implication for shareholder welfare, at least not given the load fee arrangements in place today.

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Figure 1: Long-term Share Classes with a 12b-1 Fee

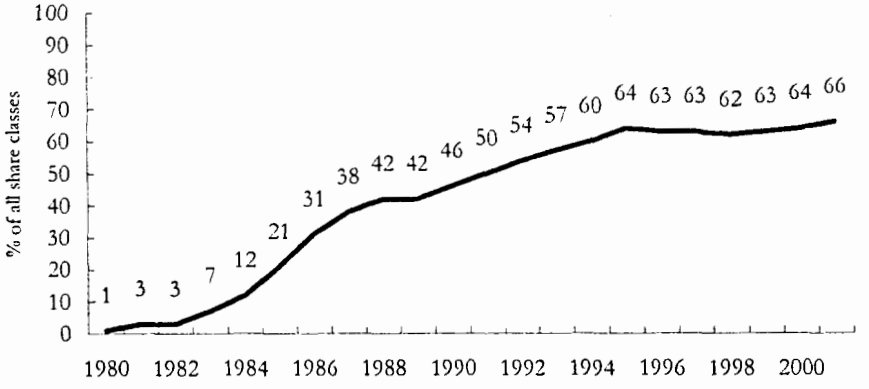


Figure 2: Load Share Classes with a 12b-1 Fee

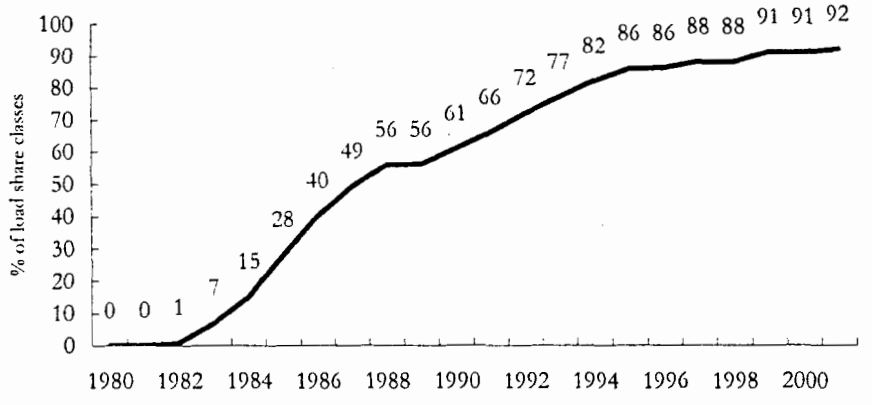


Figure 3: No-load Share Classes with a 12b-1 Fee

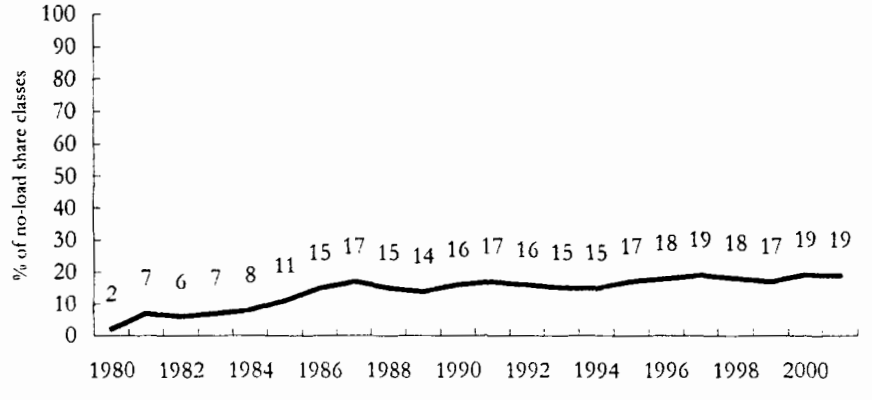


Figure 4: Front Loads, CDSLs, and 12b-1 fees of Equity Mutual Fund *A, B,* and *C* share classes

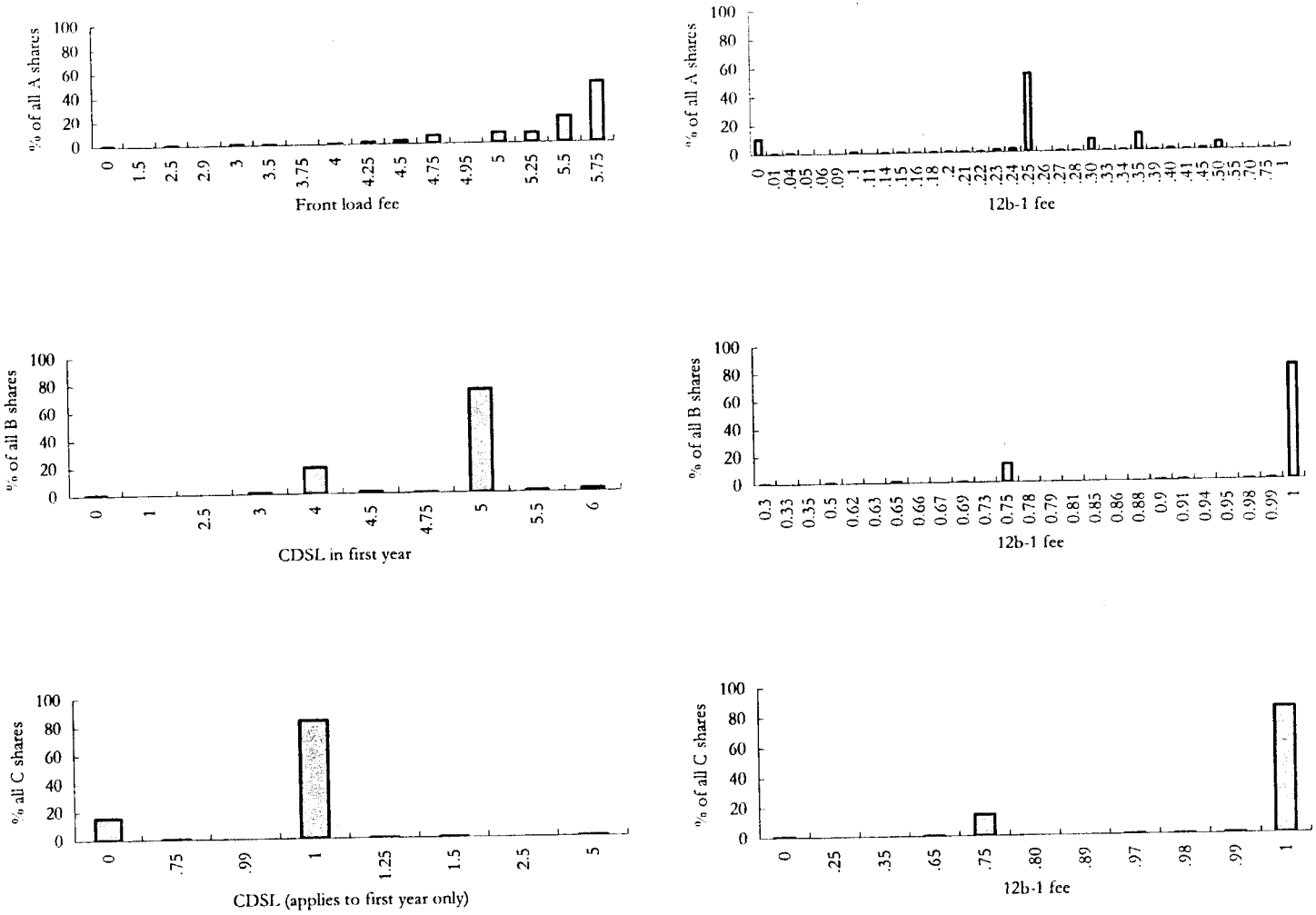
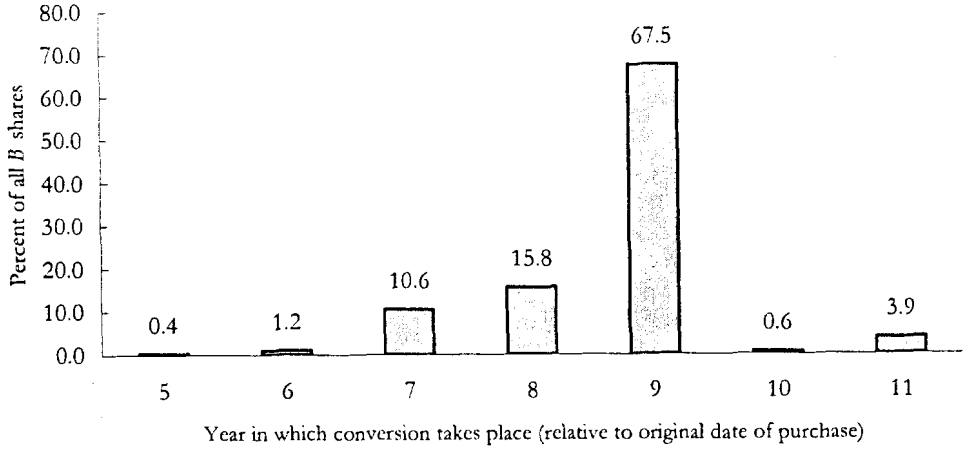


Figure 5: Year in which funds convert from B shares to A shares[1,2]



[1] Source: Morningstar Principia Pro

[2] Note: the figure shows the year in which conversion takes place, relative to the original date of purchase. For example, if conversion takes place in year 9 for fund X, an investor who originally purchased *B* class shares of that fund on January 1, 2000 who find his or her shares converted to *A* class on January 1, 2009

Figure 6: Fee structure for retail share classes of a typical load mutual fund

Share class type	*Holding-period (years)*	*Front-load*	*CDSL*	*12b-1 fee*[2]
A	1 and over	5.75%	0.00%	.25%
B	1		5.00%	1.00%
	2		4.00%	1.00%
	3		3.00%	1.00%
	4		2.00%	1.00%
	5		2.00%	1.00%
	6		1.00%	1.00%
	7		0.00%	1.00%
	8		0.00%	1.00%
	9 and over		0.00%	.25%
C	1		1.00%	1.00%
	2 and over		0.00%	1.00%

Figure 7: Holding-period Returns for *A*, *B*, and *C* (% annual rate)

Holding Period (years)	R_m	operating expense ratio	*Load*	*CDSL*	*CDSL*	*12b-1*	*12b-1*	*12b-1*	*Total expense ratio*	*Total expense ratio*	*Total expense ratio*	*HPR*	*HPR*	*HPR*
			A	*B*	*C*	*A*	*B*	*C*	*A*	*B*	*C*	*A*	*B*	*C*
1	10%	.8%	5.75%	5.00%	1.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	2.59%	3.02%	7.02%
2	10%	.8%	5.75%	4.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	5.67%	6.15%	8.02%
3	10%	.8%	5.75%	3.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	6.72%	7.16%	8.02%
4	10%	.8%	5.75%	2.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.25%	7.62%	8.02%
5	10%	.8%	5.75%	2.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.56%	7.73%	8.02%
6	10%	.8%	5.75%	1.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.78%	7.91%	8.02%
7	10%	.8%	5.75%	0.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.93%	8.02%	8.02%
8	10%	.8%	5.75%	0.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	8.04%	8.02%	8.02%
9	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.13%	8.11%	8.02%
10	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.20%	8.19%	8.02%
11	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.26%	8.25%	8.02%
12	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.31%	8.30%	8.02%
13	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.35%	8.34%	8.02%
14	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.39%	8.37%	8.02%
15	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.42%	8.41%	8.02%
1	10%	.8%	3.00%	5.00%	1.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	5.58%	3.02%	7.02%
2	10%	.8%	3.00%	4.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.20%	6.15%	8.02%
3	10%	.8%	3.00%	3.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.75%	7.16%	8.02%
4	10%	.8%	3.00%	2.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	8.02%	7.62%	8.02%
5	10%	.8%	3.00%	2.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	8.18%	7.73%	8.02%
6	10%	.8%	3.00%	1.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	8.29%	7.91%	8.02%
7	10%	.8%	3.00%	0.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	8.37%	8.02%	8.02%
8	10%	.8%	3.00%	0.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	8.43%	8.02%	8.02%
9	10%	.8%	3.00%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.48%	8.11%	8.02%
10	10%	.8%	3.00%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.51%	8.19%	8.02%
11	10%	.8%	3.00%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.55%	8.25%	8.02%
12	10%	.8%	3.00%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.57%	8.30%	8.02%
13	10%	.8%	3.00%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.59%	8.34%	8.02%
14	10%	.8%	3.00%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.61%	8.37%	8.02%
15	10%	.8%	3.00%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.63%	8.41%	8.02%
1	10%	.8%	5.75%	5.00%	1.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	2.59%	3.02%	7.02%
2	10%	.8%	5.75%	4.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	5.67%	6.15%	8.02%
3	10%	.8%	5.75%	3.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	6.72%	7.16%	8.02%
4	10%	.8%	5.75%	2.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.25%	7.62%	8.02%
5	10%	.8%	5.75%	2.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.56%	7.73%	8.02%
6	10%	.8%	5.75%	1.00%	0.00%	0.25%	1.00%	1.00%	1.05%	1.80%	1.80%	7.78%	7.91%	8.02%
7	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	7.93%	8.14%	8.02%
8	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.04%	8.23%	8.02%
9	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.13%	8.30%	8.02%
10	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.20%	8.35%	8.02%
11	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.26%	8.40%	8.02%
12	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.31%	8.43%	8.02%
13	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.35%	8.46%	8.02%
14	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.39%	8.49%	8.02%
15	10%	.8%	5.75%	0.00%	0.00%	0.25%	0.25%	1.00%	1.05%	1.05%	1.80%	8.42%	8.52%	8.02%

Figure 8: Estimated Effects of 12b-1 Fees on Mutual Fund Expense Ratios

Regression→	$e_t = \alpha_0 + \alpha_1 \ln A_t + \gamma Dummy_t^{12b1} + X_t\beta$					$e_t = \alpha_0 + \alpha_1 \ln A_t + \gamma' 12b1 + X_t\beta$		$e_t = \alpha_0 + \tilde{\gamma} 12b1_t + X_t\beta$
Coefficient→	$\hat{\gamma}$					$\hat{\gamma}'$		$\hat{\tilde{\gamma}}$
Estimate for year ↓	*Ferris and Chance (1987)*	*Trzcinka and Zweig (1991)*	*McLeod and Malhotra (1994)*	*Malhotra and McLeod (1997)*	*Rao (1996)*	*Trzcinka and Zweig (1991)*	*Berkowitz and Kotowitz (1997)*	*Siggelkow (2000)*
1984	.05							
1985	.18							
1986		.27				.71		
1987		.37				.90		
1988			.33					
1989			.31					
1990			.36					
1991			.37					
1992				.32				
1993				.30				1.30
1994					.53			1.29
1995								1.18
1996							.86 to 1.05	1.11

Figure 9: Updated Estimates of Equations (4), (5), and (6) [47]

		Equation (4): $e_i = \alpha_0 + \alpha_1 \ln A_i + \gamma Dummy_i^{12b1} + X_i\beta$		*Equation (5):* $e_i = \alpha_0 + \alpha_1 \ln A_i + \gamma' 12b1 + X_i\beta$		*Equation (6):* $e_i = \alpha_0 + \tilde{\gamma} 12b1 + X_i\beta$	
Variable	*Coefficient*	*Estimate*	*t-value*	*Estimate*	*t-value*	*Estimate*	*t-value*
Constant	α_0	1.416	25.919	1.179	29.658	1.049	26.194
ln *Assets*	α_1	-.076	-32.939	-.034	-19.632		
Dummy^{12b1}	γ	**.483**	37.704				
12b-1	γ'			**.900**	101.352		
	$\tilde{\gamma}$					**.954**	110.513
R^2		.49		.68		.66	
Nobs		9386		9386		9386	

Figure 10: Updated Estimates of Equations (4), (5), and (6) using Load Funds Only[48]

		Equation (4): $e_i = \alpha_0 + \alpha_1 \ln A_i + \gamma Dummy_i^{12b1} + X_i\beta$		*Equation (5):* $e_i = \alpha_0 + \alpha_1 \ln A_i + \gamma' 12b1 + X_i\beta$		*Equation (6):* $e_i = \alpha_0 + \tilde{\gamma} 12b1 + X_i\beta$	
Variable	*Coefficient*	*Estimate*	*t-value*	*Estimate*	*t-value*	*Estimate*	*t-value*
Constant	α_0	1.538	25.012	1.182	27.764	1.044	24.472
ln *Assets*	α_1	-0.094	-33.233	-0.036	-16.971		
Dummy^{12b1}	γ	**.421**	22.287				
12b-1	γ'			**.871**	87.288		
	$\tilde{\gamma}$					**.930**	97.393
R^2		.43		.66		.64	
Nobs		6988		6988		6988	

[47] Data are from Morningstar, as reported in the December 2002. In keeping with earlier work, the analysis is conducted at the level of fund share class. Thus, e_i is the expense ratio of a particular share class, ln A is its assets. Each regression includes dummy variables for Morningstar fund category and fund complex; for brevity these are not reported but are available on request. Institutional funds and institutional share classes are excluded from all of the regressions.

[48] Load funds are defined as those a 12b-1 fee or more than 25 basis points per year, or with a front-load or CDSC.

Figure 11: Summary Statistics for simulated values of $\hat{\gamma}'$ and $\hat{\tilde{\gamma}}$ [1]

$$mgt_i^F = .5 - .05 \ln A_i^F + \varepsilon_i^F$$

True relationship: $othfee_i = .5 - .1 \ln A_i^S + \varepsilon_i^S$

$$e_i = mgt_i^F + othfee_i + 12b1_i$$

		Estimated Relationship							
		$e_i = \alpha + \beta \ln A_i^S + \gamma' 12b1_i$ (equation 5)				$e_i = \alpha + \tilde{\gamma} 12b1_i$ (equation 6)			
Assets of fund are split as:		$\hat{\gamma}'$				$\hat{\tilde{\gamma}}$			
A share	*B* share	mean	std dev	min	max	mean	std dev	min	max
50%	50%	1.00	.06	.77	1.23	1.00	.06	.77	1.23
75%	25%	.93	.07	.72	1.08	1.14	.07	.95	1.31
25%	75%	1.07	.07	.90	1.28	.86	.06	.68	1.06

[1]Summary statistics are based on 500 simulations. Each simulation has 1000 funds, each of which has an *A* and a *B* share class, for a total of 2000 observations (1000 funds times 2 share classes) per simulation. For each simulation, fund operating expense ratios are generated using the "true relationship", where the total expense ratio e_i for a particular share class i of fund F is given by $e_i = mgtfee_i^F + othfee_i^S + 12b1_i^S$, where e_i is the sum of the management fee (which is common to all share classes of the fund), other fees (which can differ across fund share classes depending on the assets of the share class), and the 12b-1 fee applicable to the particular share class. The first regression uses the assets of the share class as that is the variable that has commonly been used in studies of 12b-1 fees.

Figure 12: Regressions using Holding-period Returns for A, B, and C Share Classes [49]

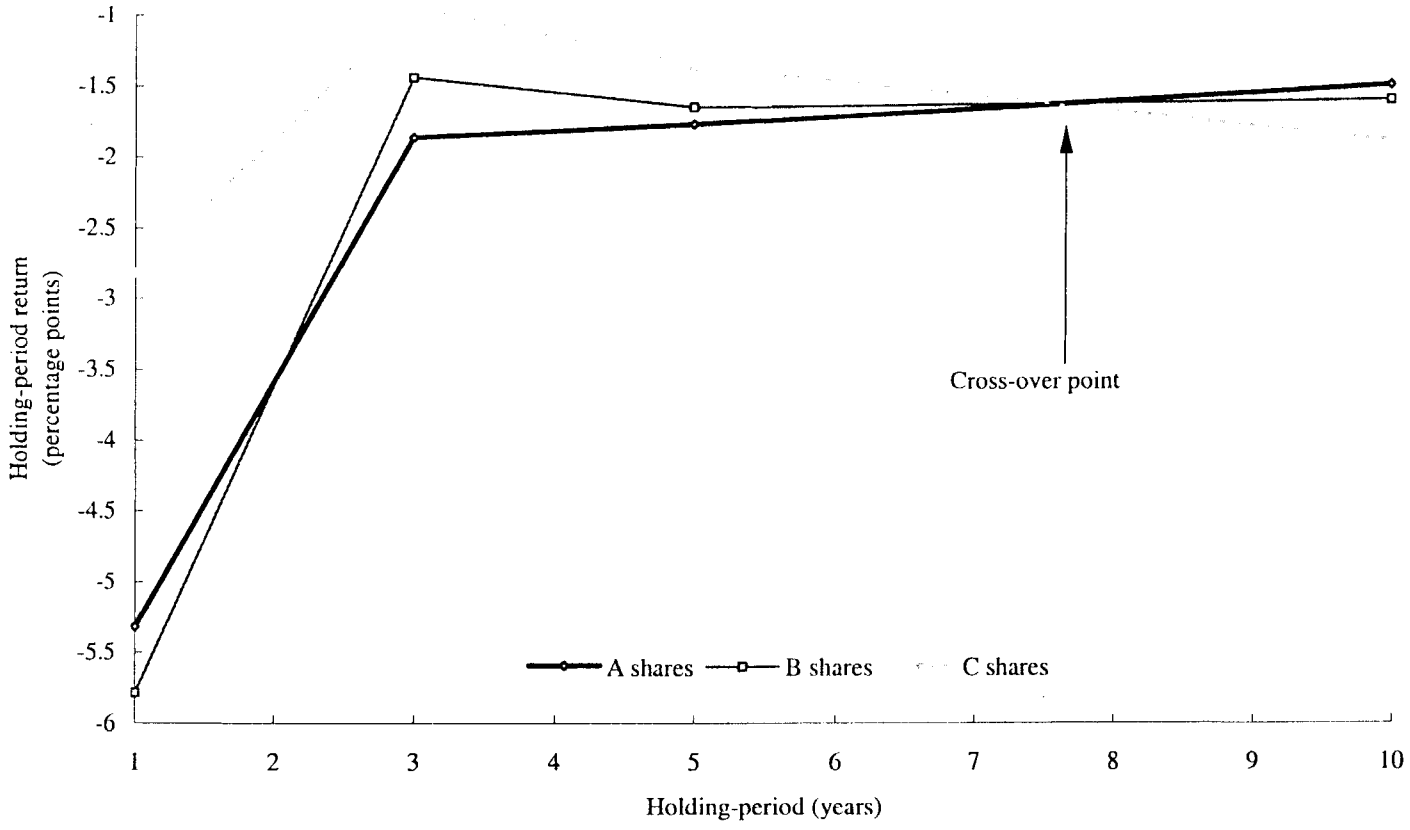
Equation (12):

$$(HPR_{i,h} - r) = \alpha_0 + \alpha_1 \ln A_{i,h} + \delta(R_h - r_h) + X_i\beta + \sum_{i=A,B,C} \sum_{h=1}^{H} \gamma_{i,j} D_i D_j 12b1_i$$

Variable	*Coefficient*	*Estimate*	*t-value*
Constant	α_0	-2.78	-2.77
ln *Assets*	α_1	0.33	13.80
$(R_h - r_h)$	δ	0.95	147.37
12b1	$\gamma_{A,1}$	-9.02	-16.15
	$\gamma_{A,3}$	5.32	9.01
	$\gamma_{A,5}$	5.44	8.60
	$\gamma_{A,10}$	6.18	7.35
	$\gamma_{B,1}$	-2.48	-14.58
	$\gamma_{B,3}$	2.15	12.11
	$\gamma_{B,5}$	1.89	9.80
	$\gamma_{B,10}$	2.11	6.09
	$\gamma_{C,1}$	1.05	5.75
	$\gamma_{C,3}$	3.05	15.83
	$\gamma_{C,5}$	2.37	10.78
	$\gamma_{C,10}$	1.85	2.68
	R^2	.89	
	Nobs	16,961	

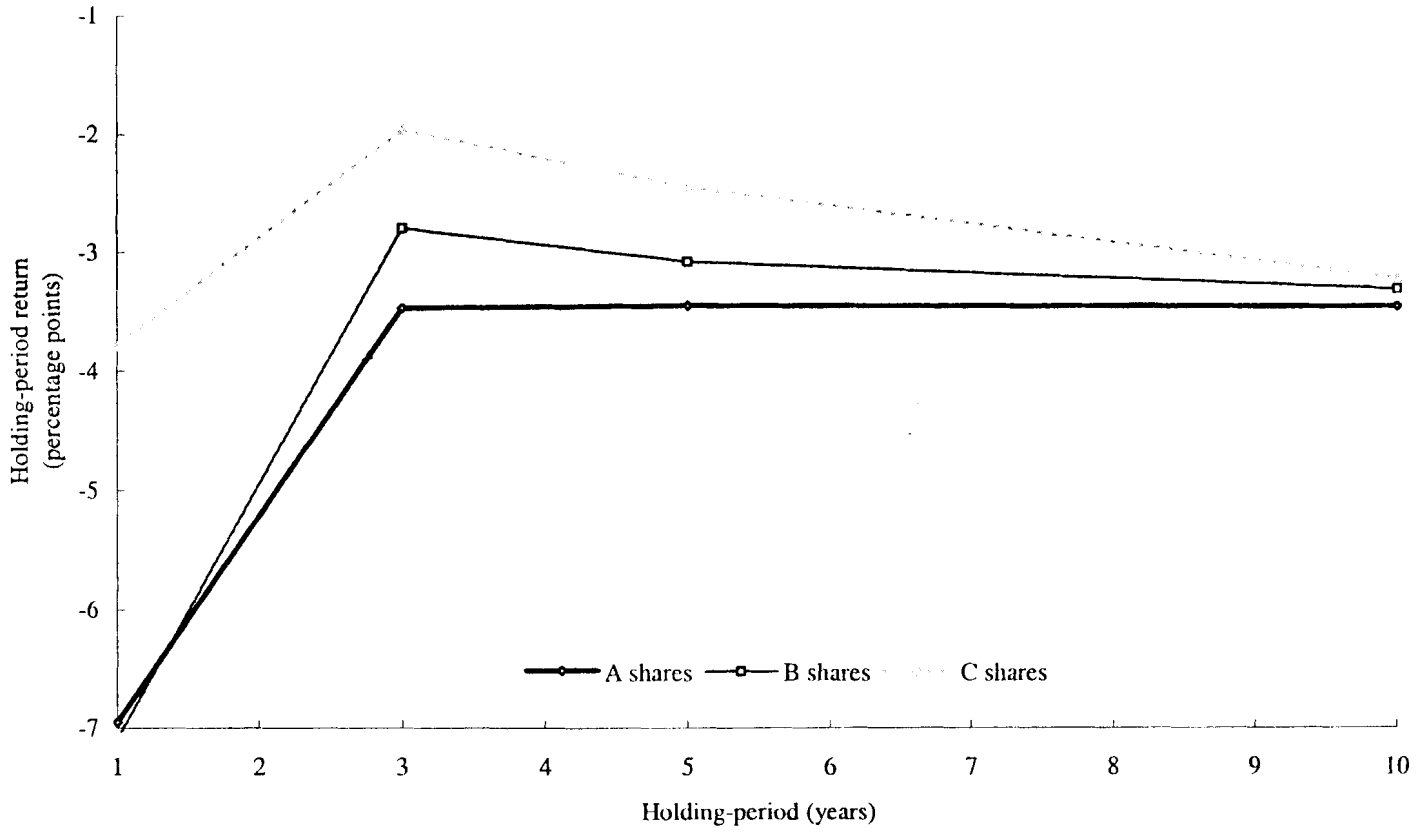
[49] Data are from Morningstar, as reported in the December 2002. In keeping with earlier work, the analysis is conducted at the level of fund share class. Thus, e_i is the expense ratio of a particular share class, ln A is its assets. Each regression includes dummy variables for Morningstar fund category and fund complex; for brevity these are not reported but are available on request. Institutional funds and institutional share classes are excluded from all of the regressions.

Figure 13: Projected Differences in Holding-period Returns for A, B, and C Share Classes[50]



[50] Predicted holding-period returns are based on the estimated regression coefficients reported in table 8. Predictions are formed for all of the share classes in the data base and are then averaged across 1, 3, 5, and 10 year holding-periods. The average predictions plotted in the figure are measured relative to the relevant market rate of return R for a particular share class. Thus, for example, if the regression predicts a holding-period return for an A share at a holding period of 3 years of $\widehat{HPR}_{A,3}$ the point plotted in the figure is $\widehat{HPR}_{A,3} - \hat{\beta}R$. Figures for 2, 4, 6, 7, 8, and 9 year holding-periods are formed by linear interpolation.

Figure 14: Projected Differences in Holding-period Returns for A, B, and C Share Classes[51]
(adjusted for differences in asset levels)



[51] Predicted holding-period returns are based on the estimated regression coefficients reported in table 8. Predictions are formed for all of the share classes in the data base and are then averaged across 1, 3, 5, and 10 year holding-periods. The average predictions plotted in the figure are measured relative to the relevant market rate of return R for a particular share class. Thus, for example, if the regression predicts a holding-period return for an A share at a holding period of 3 years of $\widehat{HPR}_{A,3}$ the point plotted in the figure is $\widehat{HPR}_{A,3} - \hat{\beta}R$. Figures for 2, 4, 6, 7, 8, and 9 year holding-periods are formed by linear interpolation.