Investor Timing and Fund Distribution Channels

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Abstract

This study examines the investment timing performance of equity mutual fund investors and its relationship to the distribution arrangement of the fund. We find that investors who transact through investment professionals using conventional distribution arrangements experience substantially poorer timing performance than investors who purchase pure no-load funds. Investors in all three principal load-carrying retail share classes (A, B, and C) significantly underperform a buy-and-hold strategy. Among all load funds, Class B investors suffer from the poorest cash flow timing, underperforming a buy-and-hold strategy by 2.28% annually, compared with annual underperformance of 0.78% for investors in pure no-load funds. No-load index funds are the only funds found to show no evidence of poor investor timing. We discuss several potential explanations for the poorer timing performance of investors in load funds, such as broker incentives, fund advertising, and investor return-chasing behavior.

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Abstract

This study examines the investment timing performance of equity mutual fund investors and its relationship to the distribution arrangement of the fund. We find that investors who transact through investment professionals using conventional distribution arrangements experience substantially poorer timing performance than investors who purchase pure no-load funds. Investors in all three principal load-carrying retail share classes (A, B, and C) significantly underperform a buy-and-hold strategy. Among all load funds, Class B investors suffer from the poorest cash flow timing, underperforming a buy-and-hold strategy by 2.28% annually, compared with annual underperformance of 0.78% for investors in pure no-load funds. No-load index funds are the only funds found to show no evidence of poor investor timing. We discuss several potential explanations for the poorer timing performance of investors in load funds, such as broker incentives, fund advertising, and investor return-chasing behavior.

I. Introduction

The return performance of a mutual fund, net of expenses, is often assumed to represent the performance also obtained by the shareholders in the fund. In many cases, however, the actual performance experienced by shareholders differs substantially from the performance of the funds in which they invest. This discrepancy arises due to the timing of investor cash flows. Reported mutual fund performance reflects the return to a single investment held throughout the measurement period. Implicit is the assumption that no additional shares are purchased or sold. In reality, however, cash flows continue to enter and exit the fund, and this can lead to a substantial disparity between a fund's reported return and the performance experienced by the fund's investors.

To illustrate, consider Fund A with a single $1 million account at its inception and a shareholder who makes no subsequent purchases or redemptions. In Fund A's first year, its investment return is 200% – the same as the shareholder's return – and the fund increases in value to $3 million. At the beginning of the second year, 100 new shareholders invest $1 million each in Fund A, increasing the total value of assets from $3 million to $103 million. Suppose none of Fund A's shareholders make any subsequent purchases or redemptions, and during the second year the value of the fund declines 60% to $41.2 million. Fund A's average annual return for its first two years is a respectable 9.54 percent, which equals the average return for the initial investor, whose account value is now $1.2 million. The annualized return for the remaining 100 investors, however, is -60%. Notwithstanding the disastrous 60 percent loss suffered by virtually all of Fund A's shareholders, the Fund's annualized investment performance from its inception is 9.54 percent.

Poor investor timing is not limited to occasional, spectacular underperformance. In prior research, substantial gaps in performance have been measured for the fund industry as a whole (Braverman, Kandel, and Wohl, 2007), major categories of funds (Nesbitt, 1995), and for most individual funds in the equity fund universe (Friesen and Sapp, 2007). Overall, the evidence shows that the returns of mutual fund shareholders on average substantially lag the performance of the funds in which they invest. Investors tend to buy and sell at the wrong time, which leads to underperformance relative to a buy-and-hold strategy.

This study examines the timing performance of investors who purchase funds through investment professionals using conventional distribution channels. Fund shares that are distributed through a sales force generally charge a sales load, a 12b-1 fee, or both. These fees compensate intermediaries for providing guidance and advice to investors. However some studies have questioned whether intermediary relationships add value (Bullard and O'Neal, 2006; Bergstresser, Chalmers and Tufano, 2006). With respect to the issue of investment timing, intermediaries might be expected to add value by reducing the incidence of poor timing. Investment professionals are more likely to be aware of the riskiness of chasing recent performance and therefore less susceptible to its allure. Accordingly, investors who purchase shares through such professionals might be expected to experience less timing underperformance than other shareholders. We examine this question in detail.

Our review of 6,164 funds for the period 1991-2004 shows that investors in load funds and legal no-load funds (funds with no commission and a low 12b-1 fee) experience annual returns that lag the performance of the funds in which they invest by 1.82% and 1.91%, respectively. Class B fund shares in particular fare the worst, with investors underperforming a buy-and-hold strategy by 2.28% annually. In comparison, investors in pure no-load funds (funds

with no commission and no 12b-1 fee) experience an annual performance gap of 0.78%, representing an economically and statistically significant difference. Investors in pure no-load *index* funds experience no performance gap at all, suggesting that the smartest money is finding its way into these funds.

Overall, we find that investors who transact through investment professionals experience substantially poorer timing performance than investors who purchase pure no-load funds. We also discuss a number of potential explanations, such as broker incentives, fund advertising, and investor return-chasing, that help shed light on our results. Although investors are ultimately responsible for their own choices, these findings question the value, in terms of timing, added by investment professionals who sell mutual fund shares through conventional mutual fund distribution arrangements. Also, given the magnitude of performance sacrificed through poor timing that we document, our results highlight the relative appeal of a buy-and-hold strategy for the average fund investor.

II. Prior Research on Investor Timing Performance

Several studies compare the actual performance of mutual fund investors with the performance of a buy-and-hold strategy. Nesbitt (1995) examines 17 categories of funds, most of which are not pure equity funds, and finds timing underperformance in every category. The annual performance gaps over 1984-1994 range from 0.65% for the Global Equity category to 2.86% for the Flexible Portfolio category. Overall, he reports average annual fund investor underperformance of 1.08% due to cash flow timing. Dichev (2007) and Braverman, Kandel and Wohl (2007) examine aggregate equity mutual fund flows and similarly report that investors experience considerably lower returns.

Using cash flow data at the individual fund level for 7,125 equity mutual funds, Friesen and Sapp (2007) find that investors' returns are reduced by 1.56% annually due to poor market timing. They further report that the size of the performance gap varies substantially based on a variety of factors. High expenses, large size, high portfolio turnover, and active management all correlate positively with timing underperformance. Friesen and Sapp also find evidence of larger performance gaps for load funds than for no-load funds.

Nesbitt (1995) speculates that the investment industry's heavy advertising of short-term performance contributes to poor investor timing. Further evidence by Jain and Wu (2000) shows that fund advertisements found in publications such as *Barron's* or *Money* magazine contain no signal of future performance. While advertising may add fuel to the fire, Friesen and Sapp (2007) demonstrate that observed timing underperformance is consistent with return-chasing behavior in general: investors respond to recent extreme returns, which tend to be poor signals of future performance.

III. Research Design

One might expect investors who rely on the guidance of an investment professional to be less susceptible to the allure of market timing. These investors therefore should experience smaller performance gaps than investors in no-load funds. As noted by Friesen and Sapp (2007), however, load fund investors have larger performance gaps. Further elucidation of this finding may help private firms design better investment products and may aid regulators in developing more effective disclosure and other rules. Accordingly, this study explores the relationship between fund distribution arrangements and investment timing performance.

Many funds sell multiple classes of shares that differ only with respect to the distribution expenses paid in connection with each class. These funds are referred to as "load funds." Load funds often offer a menu of share classes that have fairly consistent features across different fund families.[1] Class A shares typically impose: (1) a front-end sales load that is deducted from the price when the fund shares are purchased and (2) an ongoing asset-based fee, known as a 12b-1 fee, of approximately 0.25 percent.[2] Class B shares typically impose: (1) a contingent deferred sales load (CDSL) that declines the longer that the shares are held and (2) a 12b-1 fee of approximately 1.00 percent.[3] After the CDSL declines to zero, Class B shares typically convert to Class A shares and thereafter pay a reduced 12b-1 fee. Class C shares typically charge a 12b-1 fee of approximately 1%, and often a 1% sales load on shares that are redeemed within one year.

Class A, B and C shares are similar in that they use a load structure to compensate brokers for providing investment-related services to their customers. Loads and 12b-1 fees are typically collected by the fund's principal underwriter, often an affiliate of the fund's manager, which then pays most or all of the loads and 12b-1 fees to the broker of record for the purchase. In theory, the broker of record provides value in return for the services provided, which would include professional guidance regarding the efficacy of market timing. Fund shareholders who purchase through load funds should therefore experience smaller performance gaps because they

[1] Some funds offer an extended range of share classes, but only A, B and C Class shares are studied for this analysis.

[2] A 12b-1 fee is named after rule 12b-1 under the Investment Company Act. The rule permits funds to deduct distribution expenses directly from fund assets on an ongoing basis. Some or all of the 12b-1 fee is paid to intermediaries for services provided to shareholders. The 0.25 percent cutoff is quite common and reflects regulatory considerations. First, the NASD limits service fees to 0.25 percent of assets. Second, the SEC and NASD take the position that a fund can describe itself as "no-load" if its 12b-1 fee does not exceed 0.25 percent (and it charges no other distribution fees).

[3] The 1.00 percent 12b-1 fee is quite common because the NASD does not permit the sale of fund shares that impose asset-based fees in excess of 1.00 percent.

have the advantage of advice from an investment professional. We address this issue by examining the timing performance of investors within each major share class.

Certain "no-load" shares also are sold through intermediaries. Regulators permit funds that charge a 12b-1 fee of 0.25 percent or less to be called "no-load funds," notwithstanding that the 12b-1 fee collected by the fund typically will be paid to the intermediary who is responsible for the sale.[4] We refer to funds that charge a 12b-1 fee of up to 0.25 percent as "legal" no-load funds, in contrast to funds that charge neither loads nor 12b-1 fees, which we refer to as "pure" no-load funds.

The classifications of load, legal no-load, and pure no-load funds provide a reasonable basis for distinguishing fund shares that are sold through intermediaries (load and legal no-load) from those that are not (pure no-load). As noted by the Investment Company Institute, "[l]oad classes generally serve investors who own fund shares purchased through financial advisers; no-load fund classes usually serve investors who purchase shares without the assistance of a financial adviser or who choose to compensate the financial adviser separately."[5] Even so, these categorizations are imperfect. For example, Class A shares are often purchased by large retirement plans for which the load is waived due to the size of the investment. Although these shares are arguably purchased by plan participants through an "intermediary" (the retirement plan itself), it is not an intermediary that is providing guidance in return for distribution compensation. However, due to their regular occurrence, these contributions are expected to be timing neutral. In other words, the resulting effect is to dilute the timing performance of the other

[4] According to the Investment Company Institute (2004), mutual funds primarily use 12b-1 fees as an alternative to front-end sales loads. Funds use 40 percent of 12b-1 fees to compensate financial advisers for assistance when investors purchase shares and 52 percent for the ongoing assistance and service that financial advisers and others provide to shareholders after the purchase.

[5] 2007 Investment Company Fact Book, p. 22. A "load," also known as a "commission," is a percentage of the investor's purchase amount.

fund flows as reflected in the reported mean. Thus, while approximate, we believe that our classification of funds is reasonable for providing insight on the timing performance of the bulk of investors who are paying for bundled advice versus those who are not.

IV. Data and Method

A. Sample Description

The data sample is taken from the CRSP Survivor-Bias Free U.S. Mutual Fund Database and includes domestic common stock funds that existed during 1991-2004. Funds with fewer than 12 monthly observations are excluded from the sample. We also exclude international, sector, balanced, and specialized funds, as the benchmarking models employed for performance evaluation may be inappropriate for these funds. Although most funds in the CRSP database have a share class identifier included with the fund name, a significant number of funds do not. Therefore, for purposes of this study, funds are classified according to their functional share class, which we define as follows. Class A shares include any fund with a front-end load. Class B shares include all funds with a deferred sales load in excess of 1%. Class C shares include funds with a deferred sales load of 1% or less, or with a 12b-1 fee in excess of 0.25%. Legal no-load funds have no loads and 12b-1 fees greater than 0% but not in excess of 0.25%. Pure no-load funds have no loads and no 12b-1 fees. Since our study focuses on retail funds, we exclude institutional share classes.[6] The final sample contains 6,164 funds. We identify 336 of these as index funds based on fund name.

[Insert Table 1 about here]

[6] Specifically, we exclude all funds identified in the CRSP database as Class I, Class Y, or "Inst".

Table 1 reports descriptive statistics for the fund sample, broken down by share class. While the average fund has about half a billion dollars under management, pure no-load funds tend to be the largest with average total net assets (TNA) of $809 million. Class A shares are the next largest on average with TNA of $617 million. The remaining share classes are about half the average size. We also note that Class B shares have the highest average expenses at 2.02% and pure no-load funds have the lowest average expenses at 1.03%.

B. Measurement of Returns and Cash Flows

We follow the approach of Friesen and Sapp (2007) in order to measure the cash flow timing performance of fund investors. Specifically, we compute the geometric return for each fund and compare it to the dollar-weighted return over the same time period. The geometric return measures fund manager performance and also gives the average return on a dollar invested during the entire sample period. If the return for fund j in month t is denoted r_{jt}, then the geometric average monthly return for fund j is calculated as

$$\bar{r}_j^g = \left(\prod_{t=1}^{T} \left(1 + r_{jt}\right) \right)^{1/T} - 1 \tag{1}$$

Note that the monthly fund return r_{jt} is net of fund expenses (operating expenses and 12b-1 fees), but does not reflect load charges (if any) that are deducted at the time of purchase or sale. Hence, load fees have no impact on any of our return calculations, enabling us to compare funds on a uniform basis. The dollar-weighted average return measures the return weighted by the amount of money invested at each point in time, and thus captures the average return earned by the fund's investors as a group. The dollar-weighted average monthly return for fund j is defined as the rate of return at which the accumulated value of the initial TNA, plus the accumulated value of net cash flows, equals the actual TNA at the end of the sample period:

$$\bar{r}_j^{dw} : TNA_0\left(1+\bar{r}_j^{dw}\right)^T + \sum_{t=1}^{T} NCF_t\left(1+\bar{r}_j^{dw}\right)^{(T-t)} = TNA_T \tag{2}$$

where

$$NCF_{j,t} = TNA_{j,t} - TNA_{j,t-1}\left(1+r_{j,t}\right) \tag{3}$$

Here, $NCF_{j,t}$ denotes the monthly net cash flow for fund *j* in month *t,* and $TNA_{j,t}$ is the total net assets for fund *j* at the end of month *t*. All investor cash flows are implicitly assumed to occur discretely at the end of each month. We follow Gruber (1996) and assume that investors in merged funds place their money in the surviving fund and continue to earn the return on the surviving fund. Because the holdings of the investor are identical to the holdings of the fund itself at any point in time, no risk adjustment is necessary in order to measure investor timing. As in Friesen and Sapp (2007), our measure of investor timing for fund *j* is referred to as the performance gap and is computed by subtracting the dollar-weighted return in equation 2 from the geometric fund return in equation 1:

$$Perf\ ormane\ Gap_j = \bar{r}_j^{g} - \bar{r}_j^{dw} \tag{4}$$

The timing performance gap captures the success (or lack thereof) of investor cash flows against a buy-and-hold strategy in the respective fund.[7]

C. Measurement of Fund Performance

For our cross-sectional analysis of investor timing ability, we classify funds according to their risk-adjusted performance. We evaluate fund performance using the Fama-French (1993) 3-factor model and the 4-factor extension of Carhart (1997). The Fama-French 3-factor benchmarking model is

[7] As noted in Ciccotello et al. (2007), some of this performance gap may be attributable to scale effects arising from the size of the cash flow. We control for scale effects in the regression analysis reported in Table 5, where we find that the performance gap is increasing with fund size.

$$r_{p,t} = \alpha_p + \beta_{1,p} RMRF_t + \beta_{2,p} SMB_t + \beta_{3,p} HML_t + e_{p,t} \quad (5)$$

Here, $r_{p,t}$ is the monthly return on fund p in excess of the one month T-bill return; RMRF is the excess return on a value-weighted market portfolio; and SMB and HML are returns on zero-investment factor-mimicking portfolios for size and book-to-market. The Carhart 4-factor model is given by

$$r_{p,t} = \alpha_p + \beta_{1,p} RMRF_t + \beta_{2,p} SMB_t + \beta_{3,p} HML_t + \beta_{4,p} UMD_t + e_{p,t} \quad (6)$$

where UMD is the return on the zero-investment factor-mimicking portfolio for one-year momentum in stock returns. In each model, alpha is a measure of abnormal return after controlling for fund risk and style. Alpha is computed for each fund from all available return data over the sample period, with a minimum of 12 return observations being required for estimation.

[Insert Table 2 about here]

V. Analysis and Findings

A. Timing Performance by Share Class

Timing performance gaps for various cuts of the mutual fund sample are reported in Table 2. We find an overall performance gap of 0.135% per month. This means that, on average, investors underperform a buy-and-hold strategy in their respective funds by an economically and statistically significant 1.62% annually due to poor cash flow timing. The average performance gap experienced by shareholders in load funds and legal no-load funds is more than double that of shareholders in pure no-load funds. Investors in load and legal no-load funds experience annual returns that lag the performance of the funds in which they invest by 1.82% and 1.91%, respectively. In comparison, investors in pure no-load funds experience an annual performance gap of 0.78%. These findings do not support the view that investors who purchase mutual fund

shares through intermediaries using conventional distribution channels benefit by avoiding the pitfalls of market timing. Investors who purchase through intermediaries, whether traditionally class-structured load funds or trailing 0.25% 12b-1 fee funds, experience far greater underperformance from market timing than do their largely self-directed peers in pure no-load funds.[8]

One potential explanation is that brokers seek to justify their compensation not only by helping their clients pick funds, but also by demonstrating their active monitoring through market timing advice. If this is the case, the evidence suggests that this advice, on average, is less than helpful. Another possible explanation is the well-documented psychological tendency of investors to overweight recent performance. Although investment professionals presumably are more aware of, and less susceptible to, a short-term performance bias, their clients might be more susceptible to this bias than self-directed investors. Those who seek out professional guidance may be less knowledgeable about investing and more inclined to expect or pressure their advisors to trade on short-term performance. A third explanation is that some brokers may be able to appeal to their unsophisticated clients' short-term performance bias in order to increase sales compensation. Thus, brokered shares may show evidence of (bad) timing because of client pressure, the broker's financial incentives, or both. To the extent that funds with recent exceptional returns are more heavily advertised, or brokers recommend such funds, investors will tend to put money in as the fund's performance is reverting back to the mean.

The additional expense of retaining investment professionals is often justified as a way to reduce information costs, and one category of such information is potential superior market timing advice. However, our findings suggest the opposite: investors pay brokers more, but

[8] In some cases, investors place their assets under the ongoing supervision of an investment professional, but the investment professional is paid directly by the client. This group of investors, in addition to self-directed investors, tends to be served by no-load funds.

receive less than helpful market timing information. This is consistent with research showing that investors who use brokers generally pay higher fees and experience lower returns than self-directed investors (see Bullard and O'Neal, 2006; and Bergstresser, Chalmers and Tufano, 2006). Perhaps clients of investment professionals would experience even worse timing performance on their own, but the smaller performance gap found for pure no-load funds tends to suggest otherwise.

We divide the sample of load funds by share class and report timing performance for Class A, B, and C shares separately. The results reveal a significant difference in the timing performance of Class A and C shareholders on the one hand, as compared to Class B shareholders on the other. Investors in Class B shares experience performance gaps that are 41 percent and 71 percent greater than the performance gaps of Class A and C shareholders, respectively.

Why do Class B shareholders fare so much worse? One reason might relate to questionable conduct by brokers. Class B shares often are an inferior choice for investors and have been the subject of a number of enforcement actions alleging misleading sales practices. Sales of Class B shares can provide higher compensation to a broker than other shares and therefore present an economic incentive to steer clients toward these shares.[9] For these reasons, some fund complexes have recently suspended or severely restricted the sale of Class B shares (Asci, 2007). It is possible that a broker who recommends Class B shares in order to maximize compensation may also tend to emphasize recent returns in order to allure investors. More

[9] One reason that Class B shares can be more lucrative is that Class A share sales loads typically decline with the size of the investment, whereas Class B share deferred sales loads do not. When a client invests a large amount, his broker therefore can receive a much higher payment by purchasing Class B shares instead of Class A shares. Some fund firms have addressed this concern by capping the size of Class B share purchases. Even when the client does not sell the shares and pay the deferred sales load, the broker often receives a commission because many funds' principal underwriters pay the broker a flat commission at the time of the Class B share sale, which the underwriter then finances from the 12b-1 fee income stream.

prudent advice would instead tend to emphasize long-term performance, but on this count Class B shares fare poorly. Another potential explanation is that the same group of less-sophisticated investors who buy Class B shares may simply be more prone to chasing recent returns than are other investors. Whatever the cause, the timing performance gap experienced by Class B shareholders is substantially greater than that of any other class of funds.

[Insert Table 3 about here]

Table 3 reports the differences in timing performance between each of the five share classes examined in this study. Although the performance gap for Class A shares is nominally larger than that of Class C shares, the difference of 0.024% is not statistically significant. However, these two share classes are subject to potentially different financial incentives of brokers. Class A shares are most appropriate for long-term investors because the longer the holding period, the greater the time over which the front-end load is spread. In contrast, Class C shares make more sense if the shares will not be held for a long period, which would suit a market timer's trading practices. Class C shares generally will result in the lower overall distribution expense if sold soon after they are purchased. Brokers who sell load shares stand to receive less compensation when investors engage in market timing with Class C shares,[10] and brokers therefore may prefer Class A shares to increase the benefit of frequent trading.

The difference in monthly timing performance between legal and pure no-load funds is a significant 0.094% (0.159% vs. 0.065%). Legal no-load funds encompass a variety of arrangements under which 12b-1 fees are used to pay for distribution. For example, these funds provide a convenient mechanism whereby an investment professional who manages client assets on an ongoing basis can be compensated. The receipt of the 12b-1 fees obviates billing the client

[10] Many fund complexes waive loads when investors switch funds within the complex, in which case the broker's financial incentive to engage in market timing is the same regardless of the class selected.

separately and triggering adverse tax effects if fund shares are sold to cover fees. Legal no-load structures also are used by funds that sell their shares through fund supermarkets. Fund supermarkets, such as Charles Schwab's OneSource, distribute funds offered by many different fund families. This enables investors to centralize their fund holdings in a single statement and process their transactions through a single broker.

The timing underperformance for legal no-load funds is comparable to that of load funds. To the extent that legal no-load funds are sold by investment professionals, as opposed to being sold through fund supermarkets, the same incentive to create the impression of adding value through active trading may apply as described above for load funds. Customers of investment professionals who sell legal no-load funds may even expect value to be added through skillful market timing. Investment professionals who sell legal no-load funds are different from those who sell load funds, however, in that they have less of a financial incentive to engage in frequent trading. They cannot increase their compensation by moving their clients from one legal no-load fund to another because they generally will continue to receive the same income stream from 12b-1 fees (as with sellers of Class C shares). However, if clients were induced to invest more money, perhaps based on recent performance results, this would lead to an increase in 12b-1 fees.

Although funds sold through fund supermarkets may be associated with generally higher expense ratios, there is no obvious reason why their shareholders would be more prone to poor market timing than those who invest in pure no-load funds. One possible explanation is that holding fund shares through a supermarket would make it easier to sell one fund and buy another within the supermarket platform. Overall, due to the presence of some fund supermarket investors in the legal no-load sample, we believe the cleanest standard of comparison to the

timing performance of the pure no-load investors is given by the three load share classes. As noted above, Class A, B, and C investors all show significantly greater timing performance gaps than pure no-load investors.

B. Timing Performance: Active vs. Index Funds

Investors who are willing to purchase actively managed funds may also be more prone to attempt market timing. However, it is also possible that the use of active funds could interfere with a self-directed market timer's strategy because the extent to which a fund's holdings reflect the timer's particular strategy would be more difficult for the investor to determine.[11] In Table 2 we report the timing performance of investors in actively managed funds separately from that of index fund investors.

The difference in timing performance is striking. Investors in actively managed funds suffer more than three times the underperformance of index fund investors; 0.142% versus 0.039%. Consistent with our earlier discussion of load funds, timing underperformance is worse for active load funds than active no-load funds. The most interesting result, however, is the timing performance of investors in no-load index funds. This is the only class of investors for which we find no evidence of poor timing. In fact, the average monthly performance gap is a *negative* 0.035%, though this estimate is not reliably different from zero. In sum, the use of actively managed funds is clearly correlated with worse investment timing performance.

C. Investor Fund Timing vs. Investor Fund Selection

Investors may earn superior returns either by advantageously timing their cash flows, or by selecting superior-performing mutual funds. While we have noted that those who invest in load funds and actively-managed funds experience poorer timing performance, it is possible that

[11] For this reason, exchange-traded funds may also serve as attractive investment vehicles for some market timers.

these investors may nonetheless enjoy superior overall performance due to the particular funds that their investment professionals recommend.[12] To explore this question further, we next examine whether there is any apparent relationship between timing performance and the quality of the fund selected by an investor. For this purpose we compute a risk-adjusted return, or alpha, according to both the Fama and French (1993) 3-factor and Carhart (1997) 4-factor benchmark models for each fund over the sample period. Fund performance results computed from both models are very similar, so we focus our discussion on the 4-factor alphas.

[Insert Table 4 about here]

The average monthly fund alpha and timing performance gap for each share class is reported in Panel A of Table 4. The average alpha for all five categories is negative, though pure no-load funds have the alpha closest to zero and the smallest timing performance gap. This finding is consistent with Bergstresser, Chalmers and Tufano (2006) who report that investment professionals do not appear to recommend superior funds. We also note that Class B shares have both the worst alpha and the worst investor timing performance.

In Panel B of Table 4 we look exclusively at the minority of funds in each share class which have a positive 4-factor alpha. We find that shareholders in these funds with superior risk-adjusted performance experience worse cash flow timing than investors who select poor funds. For example, 536 out of 1,956 total Class A shares have a positive alpha, with an average value of 0.196% per month. However, the performance gap for these funds due to poor timing is 0.186% per month. Thus, the additional return obtained by selecting a superior fund is generally surrendered in the form of greater timing underperformance. This result is especially pronounced in the case of Class B shares. Out of 1,893 total Class B funds, 370 funds have a positive alpha,

[12] The existing evidence is not encouraging. Frazzini and Lamont (2007) find that investors in actively managed equity mutual funds tend to reduce their investment returns by making poor re-allocation decisions among funds.

averaging 0.236%. However, the average timing performance gap is larger at 0.297% for these funds. Overall, the magnitude of investor underperformance due to poor timing largely offsets the risk-adjusted alpha gains offered by those funds which do in fact have a positive alpha. This finding is consistent with investors putting money into funds that have positive alphas due to exceptionally high returns over the recent past. If investors put money into positive alpha funds after the best returns are realized, they will underperform due to poor timing.

D. Determinants of the Performance Gap

We have examined investor timing performance by sorting the sample according to fund share class and fund alpha, and this has revealed a number of interesting results. However, the observed differences in timing performance between the fund share classes may be related to a number of other factors. For example, Ciccotello et al (2007) argue that performance gaps may be related to fund size through a scale effect in money under management. Similarly, if scale effects are present and there is a correlation between fund expenses and fund growth, then controlling for differences in expenses across funds is also important. We next use multiple regression to analyze the determinants of the performance gap. This enables us to simultaneously control for a number of fund characteristics such as fund size, expenses, load, turnover, volatility, share class, and alpha. Dummy variables are used to indicate the share class of the fund. Regression Models I and II in Table 5 include the fund 3-factor alpha as a measure of performance, and Models III-V use the 4-factor alpha. Model V also includes the fund's estimated factor loadings for size, book-to-market, and momentum in order to control for fund style.

[Insert Table 5 about here]

The regression results show that larger funds tend to have larger performance gaps, as seen in the positive coefficient estimate on the fund TNA. Fund volatility, as measured by the fund's tracking error, is also seen to be positively correlated with timing underperformance. We note that neither fund loads, expenses, nor turnover are significant predictors of timing performance after controlling for other fund characteristics. The expense and load structure of the fund is, however, captured by the share class dummy variables. Specifically, A, B, C, and legal no-load share classes all have performance gaps that are significantly larger than pure no-load funds, even after controlling for numerous other fund characteristics. Table 5 also confirms that the performance gap is greatest in funds with the best performance, whether alpha is measured by the 3-factor or 4-factor benchmark. This again highlights the fact that chasing returns can be a costly endeavor. Finally, we note that underperformance due to timing is negatively correlated with value-style funds, or in other words, is associated more with growth/glamour style funds.[13]

VI. Conclusion

We examine the relationship between fund distribution arrangements and investor timing performance. Our study expands on the finding that the timing of shareholders' trades causes their actual performance to lag behind the peformance of the funds in which they invest. We explore whether shareholders who rely on the advice of investment professionals benefit in terms of the timing of their investment cash flows.

[13] To examine the robustness of our conclusions, we have also re-run our analysis under each of the following conditions: (1) only for funds that achieve a size of $100M during the sample period, (2) only for funds that are always larger than $100M during the sample period, and (3) only for funds that survive through the end of the sample period. We find the results are all much stronger under these samples where a survivor bias is purposely imposed.

We find that investors who purchase load or legal no-load funds experience greater underperformance due to poor timing than investors who buy pure no-load funds. This finding persists whether the fund is actively or passively managed. Load fund Class B shares have the lowest alpha, reflecting relatively high annual expenses, and existing evidence suggests that B shares are generally a poor choice for investors. The finding that investors in Class B shares also experience the worst average timing performance casts these shares in a further bad light. However, it is worth highlighting that investors in all of the retail share classes, except no-load index funds, experience significant underperformance due to poor cash flow timing.

These results sound a warning to fund investors who are considering whether to attempt market timing, either on their own initiative or through their broker's advice. Rather than outperforming a given fund, the average active investor is more likely to underperform a passive dollar invested in the fund, and transacting with the aid of an investment professional is correlated with even worse investment timing performance.

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Table 1
Sample Statistics

The table presents summary statistics on the mutual fund sample obtained from the CRSP Survivor-Bias Free US Mutual Fund Database. The sample includes all U.S. equity mutual funds that existed at any time during January 1991 through December 2004 for which monthly total net assets (TNA) values exist. Sector funds, international funds, balanced funds and specialized funds are excluded. The final sample contains 6,164 funds, which were further classified as Class A, Class B, Class C, legal no-load, or pure no-load. Class A shares include any fund with a front-end load. Class B shares include all funds with a or deferred sales load in excess of 1%. Class C shares include funds with a deferred sales load of 1% or less, or a 12b-1 fee in excess of 0.25%. Legal no-load funds have no loads, and 12b-1 fees greater than 0% but not greater than 0.25%. Pure no-load funds have no loads and no 12b-1 fees. The monthly net cash flow for fund j in month t is $NCF_{j,t} = TNA_{j,t} - TNA_{j,t-1}(1 + r_{j,t})$, where $NCF_{j,t}$ denotes the monthly net cash flow for fund j in month t, and $TNA_{j,t}$ is the total net assets for fund j at the end of month t, and $r_{j,t}$ is the fund's return in month t. Turnover is defined as the minimum of aggregate purchases or sales of securities during the year, divided by the average TNA. Maximum front-end load is the maximum percent charges applied at the time of purchase, while maximum total load fees equals maximum front-end load fees plus maximum sales charges paid when withdrawing money from the fund. The expense ratio is the percentage of total investment that shareholders pay for the fund's operating expenses. The reported statistics are the time series averages of the 14 annual cross-sectional averages for each item.

	All funds	Class A	Class B	Class C	Legal No-Load	Pure No-load
Number of funds	6,164	1,956	1,893	933	242	1,140
Total net assets ($ mil)	509.83	616.75	220.59	258.64	207.84	809.81
Monthly net cash flow ($ mil)	2.15	2.77	2.54	2.89	1.17	4.60
Portfolio Turnover (%/year)	97.51	87.51	92.00	97.46	102.91	98.11
Maximum front-end load fee (%)	1.48	4.17	0.00	0.00	0.00	0.00
Maximum total load fee (%)	2.55	4.34	3.28	0.22	0.00	0.00
12b-1 fee (%)	0.41	0.28	0.88	0.34	0.12	0.00
Expense ratio (%/year)	1.53	1.37	2.02	1.49	1.33	1.03

Table 2
Timing Performance for Various Fund Types

The table reports the mean performance gap for funds classified by various characteristics. Returns are percent per month. T-statistics are reported in parentheses below the sample mean. Winsorized means are calculated by eliminating the smallest five percent and largest five percent of observations for each category. Estimates marked with an asterisk are significant at the 5% level or better.

N (obs)	Fund Type	Mean Performance Gap	Median Performance Gap	Winsorized Performance Gap	Std. Dev. of Performance Gap
6,164	All funds	0.136* (20.35)	0.109*	0.133*	0.526
1,956	Class A Shares	0.135* (11.96)	0.090*	0.130*	0.500
1,893	Class B Shares	0.190* (15.51)	0.161*	0.180*	0.533
933	Class C Shares	0.111* (5.79)	0.104*	0.116*	0.586
4,782	Class A,B,C Shares	0.152* (19.80)	0.121*	0.147*	0.532
242	Legal No-Load (“N”)	0.159* (4.54)	0.122*	0.146*	0.544
1,140	Pure No-Load (“P”)	0.065* (4.47)	0.062*	0.071*	0.494
1,382	Legal+Pure No-Load	0.082* (6.03)	0.068*	0.083*	0.504
5,828	All Active Funds	0.142* (29.88)	0.110*	0.140*	0.530
336	All Index Funds	0.039* (2.53)	0.064*	0.032*	0.457
4,588	Active Load Funds	0.155* (19.64)	0.122*	0.151*	0.533
194	Index Load Funds	0.093* (3.39)	0.088*	0.070*	0.484
1,240	Active No-Load Funds	0.095* (6.53)	0.070*	0.097*	0.513
142	Index No-Load Funds	-0.035 (-1.01)	0.033	-0.028	0.406

Table 3
Difference in Timing Performance by Share Class

The table reports the difference in timing performance between fund share classes with *t*-statistics in parentheses. N denotes legal no-load funds and P denotes pure no-load funds. Returns are percent per month. *T*-statistics marked with an asterisk are significant at the 5% level or better.

	-B	-C	-N	-P
A	-0.055 (-3.30)*	0.024 (1.15)	-0.024 (-0.68)	0.070 (3.75)*
B		0.079 (3.59)*	0.031 (0.87)	0.125 (6.40)*
C			-0.048 (-1.14)	0.046 (1.92)
N				0.094 (2.61)*

Table 4
Fund and Timing Performance by Share Class

Panel A reports the mean 3-factor alpha, 4-factor alpha, and performance gap for funds sorted by share class. Panel B reports the mean 4-factor alpha and the mean performance gap by share class only for funds that have a positive 4-factor alpha. Returns are percent per month.

Panel A

Share Class	3-factor Alpha	4-factor Alpha	Performance Gap
A	-0.168	-0.184	0.135
B	-0.243	-0.256	0.190
C	-0.181	-0.184	0.111
Legal No-Load	-0.183	-0.186	0.159
Pure No-Load	-0.138	-0.126	0.065

Panel B

Share Class	Number of alpha>0 funds	4-factor Alpha	Performance Gap
A	536	0.196	0.186
B	370	0.236	0.297
C	268	0.257	0.142
Legal No-Load	78	0.252	0.272
Pure No-Load	376	0.243	0.111

Table 5
Explaining the Performance Gap

For each equity mutual fund, we calculate the difference between geometric and dollar-weighted returns, which we label the fund's performance gap. The performance gap is the dependent variable in a linear regression on the fund characteristics listed in the first column of the table. For each fund, the mean level of each fund characteristic over the sample period is employed. Three-factor and four-factor alphas are estimated for each fund according to equations (5) and (6), respectively, in the text using all available fund returns in the sample period. The regression coefficients are reported with White heteroskedasticity-consistent *t*-statistics in parentheses. T-statistics marked with an asterisk are significant at the 5% level or better.

	Model				
	I	II	III	IV	V
Intercept	0.041 (1.11)	0.025 (0.76)	0.033 (0.88)	0.037 (1.05)	0.027 (1.18)
Log of Average TNA	0.026 (5.26)*	0.027 (5.87)*	0.028 (5.80)*	0.030 (6.71)*	0.030 (8.57)*
Average Fund Expenses	3.632 (1.13)	-0.642 (-0.18)	3.053 (0.91)	-1.387 (-0.37)	
Average Total Load	0.493 (1.38)	-0.640 (-1.37)	0.519 (1.43)	-0.709 (-1.53)	
Average Turnover	0.006 (1.43)	0.009 (2.04)*	0.006 (1.39)	0.007 (1.53)	0.006 (1.51)
3-Factor Alpha	12.683 (3.73)*	12.427 (3.68)*			
4-Factor Alpha			7.640 (2.32)*	6.756 (1.92)	7.028 (1.95)
3-Factor Tracking Error	0.069 (7.75)*	0.071 (8.03)*			
4-Factor Tracking Error			0.082 (7.83)*	0.083 (7.47)*	0.081 (7.08)*
Class A Share		0.103 (3.32)*		0.107 (3.39)*	0.071 (3.89)*
Class B Share		0.187 (4.55)*		0.194 (4.52)*	0.157 (8.22)*
Class C Share		0.088 (3.28)*		0.092 (3.39)*	0.085 (3.50)*
Legal No-Load Share		0.094 (2.43)*		0.086 (2.17)*	0.083 (2.15)*
SMB Factor Loading				-0.057 (-1.82)	-0.058 (-1.89)
HML Factor Loading				-0.075 (-2.27)*	-0.073 (-2.22)*
UMD Factor Loading				0.103 (1.64)	0.105 (1.66)
Adj. R^2	0.070	0.078	0.060	0.075	0.075

Table A1
Timing Performance for Various Fund Types

The table reports the mean performance gap for funds classified by various characteristics. Full sample means are repeated from Table 2. Row 2 statistics include all funds with TNA of at least $100 million at some point during the sample period. Row 3 includes funds with TNA of at least $100 million throughout the entire sample period. Row 4 includes all funds surviving through the end of the sample period. Number of funds in each category reported in parentheses.

Panel (a): Original Sample

	All Funds	Class A	Class B	Class C	Legal No-Load	Pure No-load
N. Obs	6164	1956	1893	933	242	1140
Geometric average return	0.583	0.572	0.477	0.668	0.695	0.682
Dollar-weighted return	0.446	0.437	0.287	0.557	0.536	0.616
Performance gap	0.136	0.135	0.190	0.111	0.159	0.065

Panel (b): TNA-filtered Sample

	All Funds	Class A	Class B	Class C	Legal No-Load	Pure No-load
N. Obs	2408	862	611	325	94	516
Geometric average return	0.713	0.708	0.507	0.916	0.877	0.803
Dollar-weighted return	0.558	0.564	0.287	0.795	0.788	0.676
Performance gap	0.155	0.143	0.220	0.122	0.089	0.127
	All Load Funds	All No-Load Funds				
N. Obs	1798	610				
Geometric average return	0.678	0.815				
Dollar-weighted return	0.512	0.693				
Performance gap	0.165	0.122				

Table A2
Difference in Timing Performance by Share Class for TNA-filtered Sample

The table reports the difference in timing performance between fund share classes with *t*-statistics in parentheses. N denotes legal no-load funds and P denotes pure no-load funds. Difference equals Performance Gap for fund class listed in left-hand column minus Performance Gap for fund class listed in top row. Sample includes only those return observations associated with Total Net Assets in excess of $100 million. Returns are percent per month. *T*-statistics marked to indicate statistical significance at the 5% (**) and 10% (*) levels.

	-B	-C	-N	-P
A	-0.077 (-3.77)**	0.021 (0.75)	-0.054 (1.16)	0.016 (0.63)
B		0.098 (3.40)**	0.013 (3.02)**	0.093 (6.65)**
C			0.034 (0.51)	-0.005 (-0.16)
N				0.038 (-0.67)

	No-Load	Pure No-Load
Load	0.044 (2.12)**	0.038 (1.74)*

Table A3
Explaining the Performance Gap – TNA Filtered Sample

Sample includes only those return observations associated with Total Net Assets in excess of $100 million.

	Model VI	Model VII
Intercept	0.052 (2.03)**	0.084 (3.55)**
Log of Average TNA	0.021 (3.30)**	0.028 (4.27)**
Average Fund Expenses		
Average Total Load		
Average Turnover	0.004 (0.86)	0.004 (0.87)
3-Factor Alpha		
4-Factor Alpha	1.331 (0.49)	0.587 (0.22)
3-Factor Tracking Error		
4-Factor Tracking Error	0.049 (5.24)**	0.048 (5.19)**
Class A Share	0.046 (2.17)**	
Class B Share	0.127 (5.42)**	
Class C Share	0.005 (0.17)	
Legal No-Load Share	-0.073 (-1.52)	
Load-Dummy (A,B,C)		0.119 (5.56)**
SMB Factor Loading	0.068 (1.96)**	0.055 (1.60)
HML Factor Loading	-0.122 (-3.74)**	-0.100 (-3.08)**
UMD Factor Loading	0.055 (0.91)	0.084 (1.38)
Adj. R^2	0.052	0.050