An Analysis of the Determinants and Shareholder Wealth Effects of Mutual Fund Mergers

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ABSTRACT

This study examines the determinants of mutual fund mergers and their subsequent wealth impact on shareholders of acquiring and target funds. Results indicate significant improvements in post-merger performance and a reduction in expense ratios for target fund shareholders. In contrast, shareholders of the acquiring fund experience a significant deterioration in post-merger performance. In the pre-merger period, both acquiring and target funds experience negative net asset flows, which continue to remain negative for the combined fund in the year after the merger. The likelihood of a fund merger is inversely related to fund size for both within- and across-family mergers. However, poor past performance is a significant determinant for within-family mergers but not for across-family mergers.

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This paper contributes to the growing literature on mutual fund organization and governance with an empirical examination of the determinants of mutual fund mergers and their subsequent impact on fund shareholders. Mergers among mutual funds are a relatively recent phenomenon, but given the dramatic growth in the fund industry, their emergence is not surprising. Rapid industry growth has increased the number of mutual funds, and mergers are one means of reducing what may be perceived as an excess supply.[1] In addition, the ongoing consolidation of the financial services industry has provided an incentive for firms to combine entire fund families, and reduce the number of fund offerings with similar objectives.

Although many issues related to corporate mergers have been addressed in existing research, little is known about the determinants and shareholder wealth effects of mergers in the mutual fund industry. Our paper aims to fill this void in the literature. Examining the reasons for fund mergers and their subsequent effect on shareholders is important for several reasons. First, it contributes to the existing body of knowledge on corporate restructurings and business combinations. Second, regulatory agencies such as the Securities and Exchange Commission (SEC) can obtain a better understanding of the determinants of such mergers and their subsequent impact on fund performance, fund flows, and expenses. Finally, fund mergers may have important implications for investors if significant industry consolidation reduces the available selection of funds in the investment opportunity set.

Using a sample of 742 open-end mutual fund mergers during the 1994-1997 period, we find that in the pre-merger period, target funds perform poorly compared to acquiring funds. In addition, target funds are significantly smaller in asset size and incur higher expense ratios than acquiring funds, suggesting that fund mergers may be partly motivated by a desire to achieve economies of scale.

The target fund shareholders appear to be the major beneficiaries of these combinations, as their fund's performance improves in the year after the merger. In contrast, the performance of the acquiring fund deteriorates. Another benefit of the merger for target fund shareholders is a reduction in expense ratio they incur. By comparison, the expense ratio for the combined fund in the year after the merger is similar to that of the acquiring fund before the merger. However, the acquiring fund shareholders do

experience a decline in the expense ratio two years following the merger. Examination of fund portfolio turnover indicates no significant differences between target and acquiring funds before or after the merger.

Recent research documents an asymmetric relation between fund performance and asset inflows. Specifically, funds that generate high returns tend to attract additional investment, but poorly performing funds do not experience significant redemptions (see Sirri and Tufano (1998)). Since fund mergers represent an alternative for a fund family to acquire additional assets or retain existing assets, we examine the net asset flows of acquiring and target funds around mergers. We find that in the year before the merger, both acquiring and target funds experience negative net asset flows, suggesting that the funds involved in mergers experience *net redemptions* prior to the combination. However, the target funds experience significantly greater net redemptions than their acquiring fund counterparts. These redemptions may merely reflect a change in investment preferences among shareholders. For example, during the period of the study, it may have been the case that investors tended to shun bond funds in favor of equity funds, or moved assets within equity funds, say, from value funds to growth funds. However, the asset flows of both target and acquiring funds are also negative on an *objective-adjusted* basis, i.e., they are more negative than the average flows in their corresponding investment objective. Hence, the desire to eliminate poorly performing target funds is complemented by a need of the acquiring funds to attract additional assets.

The results on flows prior to the merger suggest that funds participating in mergers tend to be shrinking both in size and market share. Fund mergers, however, do not appear to remedy the problem of net redemptions experienced by the acquiring funds, since asset flows tend to become even more negative in the year after the merger. This result is not surprising, since the merger itself is not likely to attract additional assets, unless it results in superior performance. However, such dramatic improvements in performance are not likely over a short-term horizon.

Our sample consists of two main categories of fund mergers: within-family mergers, which involve a combination of two funds within the same family, and across-family mergers, in which the target fund

and the acquiring fund belong to separate fund families. The aforementioned differences in performance and expense ratios between the acquiring and target funds are more pronounced for within-family mergers than for across-family mergers.

Results of multinomial logistic regression models used to study the determinants of mutual fund mergers suggest that poor past performance is a significant determinant of a within-family merger. This finding is consistent with the notion that in an effort to preserve their record of superior performance, which is critical in light of the positive relation between performance and subsequent asset inflows, investment advisors tend to eliminate poorly performing funds within the family. In contrast, our results indicate that poor prior fund performance is not a significant determinant of across-family mergers. Lagged net asset flows are also not a significant determinant of either within- or across-family mergers. In addition to the results on performance and flows, we find that funds with higher expense ratios are more likely to be the target of a within-family merger.

Overall, our empirical tests indicate that while within-family mergers appear to be motivated by the need to disguise poor fund performance and eliminate funds with high cost structures, across-family mergers are more likely to be driven by strategic reasons. In addition, we find an inverse relation between merger probability and fund size for both types of mergers. This suggests that mergers in general are partly driven by a desire to achieve economies of scale in fund operations. Finally, fund families with a greater number of investment objectives are more likely to engage in a within-family merger, but less likely to engage in an across-family merger. The positive coefficient for within-family mergers is consistent with the notion that fund families with a large number of available funds and investment objectives try to preserve or enhance their reputation by eliminating weak funds within the family. Given the large size of these families, they are in a better position to consolidate their product offerings without adversely affecting the investment choices available to their shareholders. In contrast, the negative coefficient for across-family mergers is consistent with the goal of more focused fund families (in terms of the range of currently available product offerings) to build market share by offering prospective investors a larger set of investment objectives.

The remainder of the paper is organized as follows. Section I describes the types of mergers, the related literature, and testable hypotheses. Section II describes the data, sample construction procedure, and empirical methodology. Section III contains the results and Section IV concludes. The appendix describes the legal requirements and other institutional details of fund mergers.

I. Types of Fund Mergers and Testable Hypotheses

Mergers in the mutual fund industry may take several different forms. First, a merger can occur across two fund families, such as the merger between the Keystone Hartwell Emerging Growth Fund and the Evergreen Aggressive Growth Fund. We refer to these mergers as "across-family" mergers. In contrast, a "within-family" merger involves the combination of two funds within the same fund family. An example would be the merger between the Aetna Asian Growth Fund and the Aetna International Growth Fund. A third type of merger can result due to the combination of different classes of shares of a single fund. These different classes usually represent ownership in the same fund but with different underlying fee structures. An example of a "within-class" merger is the combination of the Van Eck International Investors Gold A and C shares. In the case of a within-class merger, a fund's Class A shares and Class C shares will differ in the magnitude of the associated front-end load or other charges.[2] These different share classes are created to broaden the fund's appeal to investors with similar investment objectives but different investment time horizons or tax situations.

A number of fund-specific factors can be used to explain the underlying motives for engaging in a merger, and the factors may differ for within- and across-family mergers. First, significant underperformance of a fund within a family can lead the investment advisor to merge the poorly performing fund with another fund in the same family. To the extent that there is a positive relation between fund performance and subsequent asset inflows and that management fees are computed as a percentage of the fund's assets, it would be rational for the family to eliminate the performance record of the poorly performing fund via a merger. Another possible motivation for fund mergers is that they allow an investment company to merge a fund with a relatively low asset base and limited growth potential into

another fund with superior growth potential. In addition to performance and growth, fund families may want to achieve of economies of scale and merge two funds with similar investment objectives. These and other motives for fund mergers are examined in greater detail in the following sections.

A. Fund Performance

One potential motivation for fund mergers is that they provide an expedient method of terminating a fund that has performed poorly. When two funds merge, current SEC rules require that only the surviving fund's record be reported. To the extent that mergers are motivated by poor fund performance, one would expect to find that target funds tend to perform poorly relative to acquiring funds in the period prior to the merger. Such a finding would be consistent with the empirical evidence on corporate mergers. For example, Palepu (1986) documents an inverse relation between firm performance and the probability of an acquisition.

We hypothesize that the motives for undertaking a within-family merger may be different than those for an across-family merger. In the case of a within-family merger, the fund family that previously controlled the assets transfers them to another fund within the family, thereby retaining the associated management fees and the relationship with the fund shareholder. This is not the case for an across-family merger. The ability to retain assets within the family while eliminating poorly performing funds suggests that fund performance would be a significant motivation for a within-family fund merger. In contrast, performance is less likely to be an important determinant of across-family mergers.

B. Fund Flows

Research on mutual fund flows by Ippolito (1992), Chevalier and Ellison (1997), and Sirri and Tufano (1998) suggests the presence of an asymmetric flow-performance relationship. These studies find that superior performance in a given time period is followed by significantly higher asset inflows in the subsequent period, but inferior performance is not followed by asset outflows. Goetzmann and Peles (1997) argue that investor psychology plays a crucial role in the fund switching decision. Specifically,

they suggest that aversion on the part of mutual fund investors to switch away from poorly performing funds can be attributed to an overly optimistic perception of past fund performance.

In light of the asymmetric flow-performance relation, the hypothesized underperformance of target funds may not necessarily result in net redemptions. However, if target funds do in fact perform worse than acquiring funds, they are likely to experience smaller fund flows. The extent of improvement or deterioration in post-merger performance may impact subsequent net asset inflows into the combined fund. If performance does not improve due to the inability of the manager to liquidate poorly performing assets that were held by the target fund, then post-merger flows may remain unchanged or even decline. However, significant post-merger improvements in performance are likely to result in an increase in net inflows into the combined fund.

Although poor performance may not result in significant redemptions by shareholders, it is likely to result in a relative loss of market share compared to other funds. A fund merger can serve to mitigate this loss by eliminating a poorly performing fund within a family. It is therefore quite plausible that objective-adjusted net asset flows may be significant in predicting the likelihood of a within-family fund merger.

C. Potential to Exploit Economies of Scale

One of the most common explanations provided for fund mergers is the desire to achieve economies of scale. Much of the existing academic research on economies of scale in financial services firms has focused on bank mergers. Rhoades (1993) examines horizontal mergers among banks over the period 1981-1986 and finds that bank mergers do not result in efficiency gains. Goldberg, et al. (1991) examine efficiencies among securities firms and document that small firms tend to exhibit economies of scale, whereas large firms tend to exhibit diseconomies of scale. Similarly, various studies of industrial firms (for example, Palepu (1986), Morck, Shleifer, and Vishny (1988), and Mikkelson and Partch (1989)) have documented the presence of an inverse relation between firm size and the probability of an acquisition, suggesting that corporate mergers may also be driven in part by a desire to achieve greater operating efficiency.

Previous studies of efficiency in the mutual fund industry have examined the presence of economies of scale at the aggregate family level. For instance, Collins and Mack (1997) analyze the relation between a family's expenses and underlying assets for U.S. mutual funds in 1994 to determine the optimal size of a mutual fund complex (family). They find that complexes of bond funds with assets below a level of $4 billion could achieve economies of scale, as could complexes of equity funds with assets below a level of $600 million. They also find that very large fund complexes tend to exhibit diseconomies of scale. Perold and Salomon (1991) suggest that increasing the amount of assets under management may result in economies of scale related to fixed costs associated with operating a fund, but very large funds may exhibit diseconomies of scale due to increased transactions costs. Higher transactions costs result from greater market price impacts of large trades, or from increased opportunity costs due to patient trading programs designed to mitigate the greater price impacts. In a study of French mutual funds, Dermine and Röller (1992) find that economies of scale and scope exist for smaller institutions, whereas diseconomies exist for larger ones. Khorana and Servaes (1999) examine the tendency of fund families to originate new funds and find that one of the important determinants of fund starts is the ability to exploit economies of scale.

If fund mergers are driven in part by a desire to achieve economies of scale, it is likely that the probability of a merger is inversely related to the size of the fund, and positively related to a fund's expense ratio. Furthermore, if mergers result in economies of scale and some of the resulting benefits are passed on to the fund's shareholders, we would expect to observe a decline in the combined fund's expense ratio after the merger.

D. Differences between Large and Small Fund Families

The motivations for fund mergers may differ for large and small fund families. In addition, the size of the fund family may play a different role for within-family mergers than it does for across-family mergers. One can argue that larger fund families are likely to be more sensitive to poor performance, given the potentially greater effects on their reputation. In addition, given the large number of funds

offered by these families, they are more likely to have multiple funds with similar investment objectives and consequently exhibit a greater need (and have more alternatives available) to eliminate redundant funds via a within-family merger. In contrast, smaller fund families may be less able to maintain a fund that performs poorly, since such a fund may represent a greater percentage of total assets under management at a smaller family than it would at a larger family. However, smaller fund families may choose not to eliminate poorly performing funds via a merger, if these funds allow investors to diversify across objectives within the fund family. As long as there are other superior performing funds in the family, investors may be willing to tolerate a certain level of underperformance due to high search costs and switching costs.[3] Nevertheless, since smaller fund families will have fewer "partner" funds available to combine with a poorly performing fund, they may exhibit a greater likelihood to participate in an across-family merger. Khorana and Servaes (2000) document that families with a more diverse range of investment objectives have higher market share, which suggests that families with fewer objectives will acquire funds from other families and create non-overlapping objectives via a merger. In our analysis, we use the number of objectives in a fund family as a proxy for family size and also to measure the diversity of its product offerings.

II. Data, Methodology, and Sample Description

A. Data

We obtain data on all mutual fund mergers from CDA/Wiesenberger during the period October 1994 through December 1997.[4] The total sample consists of 742 fund mergers. For each merger, a target fund and an acquiring fund are identified, along with a termination date for the target fund. The additional data fields consist of the fund name, fund family, manager name, and fund inception date. The data also include the total return for each month, and the fund's assets, expense ratio, and portfolio turnover at the end of each quarter. The monthly and quarterly data begin in December 1989 or at the inception date of the fund, whichever is later, and end at the fund's termination date or in December 1999, whichever is earlier. In addition, for the purpose of constructing objective-adjusted performance benchmarks, we

obtain monthly returns for the entire population of funds in each investment objective represented in the sample. To estimate multi-factor models of fund performance, we obtain monthly returns on the value-weighted market index from the CRSP files, returns on Treasury bond and corporate bond indices from Lehman Brothers, and returns on the Fama-French factors from Mark Carhart.

B. Methodology

Consistent with other fund performance measurement studies, we employ Sharpe's (1964) 1-factor Capital Asset Pricing Model and the Fama and French (1992) 3-factor model to evaluate an equity fund's performance. Specifically, for equity funds, the following model specifications are used:

$$R_{it} = \alpha_{it} + \beta_{1,it} VWRF_t + \varepsilon_{it} \tag{1}$$

$$R_{it} = \alpha_{it} + \beta_{1,it} RMRF_t + \beta_{2,it} SMB_t + \beta_{3,it} HML_t + \varepsilon_{it} \tag{2}$$

where R_{it} is the fund return in excess of the monthly T-Bill return; *VWRF* is the excess return on the CRSP value-weighted index; *RMRF* is the value-weighted market return on all NYSE/AMEX/NASDAQ firms in excess of the risk free rate; *SMB* (small minus big) is the difference in returns across small and big stock portfolios controlling for the same weighted average book-to-market equity in the two portfolios; and *HML* (high minus low) is the difference in returns between high and low book-to-market equity portfolios.

For bond funds, we use 1-factor and a 4-factor models to compute the risk-adjusted excess return for each fund. The following model specifications are employed:

$$R_{it} = \alpha_{it} + \beta_{1,it} GOVCORP_t + \varepsilon_{it} \tag{3}$$

$$R_{it} = \alpha_{it} + \beta_{1,it} GOVCORP_t + \beta_{2,it} MBS_t + \beta_{3,it} LONGGOVT_t + \beta_{4,it} INTGOVT_t + \varepsilon_{it} \tag{4}$$

where R_{it} is the fund return in excess of the monthly T-Bill return; *GOVCORP* is the excess return on the Lehman Brothers Government/Corporate bond index and is a weighted market average of government and investment grade corporate issues that have more than one year until maturity; *MBS* is the excess return on the Lehman Brothers Mortgage-Backed securities index; *LONGGOVT* is the excess return on the Lehman Brothers Long Term Government Bond index; *INTGOVT* is the excess return on the Lehman Brothers Intermediate Term Government Bond index. These model specifications are consistent with those in Blake, Elton and Gruber (1993). For both the equity and bond fund regressions, we use 24 months of return data to estimate the regression parameters.

In addition to the single- and multi-factor alphas, we analyze fund performance in the years surrounding the merger by compounding monthly returns to compute annual holding period returns for each of the two years preceding the effective date of the merger and for two years after the merger. Objective-adjusted annual holding period returns (*OAR*s), which are defined as the annual return of the fund less the corresponding annual return of the benchmark portfolio of other funds within the same investment objective, are then computed for each fund as follows:

$$OAR_i = \left[\prod_{t=1}^{12}\left(1+R_{i,t}\right)-1\right]-\left[\prod_{t=1}^{12}\left(1+R_{o,t}\right)-1\right] \tag{5}$$

where $R_{i,t}$ is the return of fund i in month t and $R_{o,t}$ is the average return of all funds in the same investment objective in month t. These *OAR*s measure fund performance relative to other funds in their peer group, and are computed for years –2, –1, +1, and +2 relative to the month of the merger. This performance measure implicitly adjusts for sector, industry, or style-specific factors that may exogenously affect all funds in the same investment category.

We measure the magnitude of asset flows in the pre- and post-merger periods using data on fund assets and returns. Since assets are affected by both the returns generated by the portfolio manager during the year and by actual net asset inflows and outflows, we compute inflows net of returns (*Net Asset* $Flow_{i,t}$), using the following approach:

$$Net\ Asset\ Flow_{i,t} = [Assets_{i,\,t} - Assets_{i,\,t-1} * (1 + R_{i,\,t})] / Assets_{i,\,t-1} \quad (6)$$

where $Assets_{i,t}$ is total assets in fund i at the end of year t and $R_{i,t}$ is the return of fund i during year t. Based on the above computation, the *Net asset flow* variable measures the difference between additional contributions into the fund and redemptions out of the fund. In addition, we construct an objective-adjusted measure as the *Net asset flow* of fund i less the average flow into all funds in the corresponding investment objective. We refer to this as the *Objective-adjusted net asset flow* measure. We use both flow variables in our empirical analysis.

To analyze the effects of fund mergers on subsequent asset flows in a multivariate setting, we use a pooled time-series cross-sectional specification. Specifically, for all target and acquiring funds, we run the following regression:

$$(Net\ asset\ flow)_{i,t} = \gamma_0 + \gamma_1(Objective\ flow)_{i,t} + \gamma_2(Performance)_{i,t-1} + \gamma_3(Fund\ Size)_{i,t-1} + \gamma_4(Expense\ Ratio)_{i,t-1} + \gamma_5(Merger\ Dummy)_{i,t-1} + \varepsilon_{i,t} \quad (7)$$

where *Net asset flow* is the net asset flow in a fund in year t, *Objective flow* is the average net asset flow for all funds in the corresponding investment objective over the same period, *Performance* is measured as the annual holding period return of the fund in year *t-1*, *Fund Size* is the log of total net assets for the fund in year *t-1*, *Expense Ratio* is measured as the fund's expense ratio in year *t-1*, and *Merger Dummy* is an indicator variable which is set equal to one if the fund was involved in a merger in the previous year and zero otherwise. This regression specification is similar in spirit to the flow-performance tests conducted by Sirri and Tufano (1998).

We run two variations of the above specification. In the first case, for the pre-merger period we aggregate the flows of the target and acquiring funds. We also combine the assets of the target and acquirer, and compute a weighted average of the return and expense ratio variables. This specification examines the effects of mergers on subsequent flows from the perspective of the combined entity. In the

second specification, we use only the data of the acquiring fund prior to the merger and the combined fund after the merger.

To study the relation between the likelihood of a merger and underlying fund-specific factors, we estimate the following logistic regression specification:

$$Probability\ (Fund\ Merger)_{i,t} = \alpha_0 + \beta_1(Performance)_{i,t-1} + \beta_2(Asset\ Flows)_{i,t-1} + \beta_3(Fund\ Size)_{i,t-1} + \beta_4(Expense\ Ratio)_{i,t-1} + \beta_5(Stock\ Dummy)_i + \beta_6(Number\ of\ objectives\ in\ family)_{i,t-1} \quad (8)$$

where *Performance* is measured as the annual holding period return of the fund in excess of the average return for all funds in the same investment objective, *Asset Flows* are the objective-adjusted net asset flows in a fund, *Fund Size* is the log of total net assets for the fund, *Expense Ratio* is measured as the fund's expense ratio minus the average expense ratio for all funds in the same investment objective, *Stock Dummy* is an indicator variable which is set equal to one for stock funds and zero for bond funds, and *Number of objectives in family* is measured as the number of investment objectives in a family in the year preceding the merger.

The dichotomous dependent variable for the logistic regressions is constructed beginning with the universe of all funds reported by Morningstar as of June 30, 1995. The dependent variable equals one if the fund is acquired in the subsequent 12-month period, i.e., July 1995 to June 1996, and zero otherwise. Fund-specific data over the July 1994 to June 1995 period are used to predict the likelihood of a merger. We then repeat the construction procedure for the universe of all funds as of June 30, 1996. In this instance, the dependent variable takes on a value of one if a fund is acquired in the subsequent 12-month period of July 1996 to June 1997 and fund specific data over the July 1995 to June 1996 period is used in the regression models.

To examine the possibility that the underlying motives for within- versus across-family mergers may differ, we also estimate multinomial logistic models with three outcomes: no merger, a within-family merger, and an across-family merger. The multinomial logistic models include the same explanatory

variables described above for the dichotomous logistic specification.

C. Sample Description

Table I reports the number of fund mergers by year and investment objective. The mergers are distributed fairly evenly over the calendar years 1995, 1996, and 1997. Single-state municipal bond funds are the most widely represented objective, with 155 mergers, or 21% of the total sample. Other bond fund objectives also represent significant components of the total sample. There are 77 mergers among corporate bond funds, 80 mergers among government securities funds, and 58 mergers among multi-state municipal bond funds. In total, bond funds have undertaken 434 mergers, representing 59% of the sample.[5] Among the equity objectives, there are 82 mergers in the long-term growth fund category, 53 mergers in the international equity category, and 43 mergers in the growth and income category. The total number of stock fund mergers is 260, representing 35% of the sample. The remaining 6% of the sample consists of mergers in the asset allocation, balanced, flexible income and "other" objectives, which cannot be classified as either equity or bond funds.[6]

We also divide the sample into three groups, based on the type of merger: the first group consists of 219 across-family mergers; the second group consists of 471 within-family mergers; and the third group consists of 52 within-class mergers, which occurred as a result of the consolidation of two classes of shares of the same fund into a single entity.

III. Results

A. Pre- versus Post-Merger Performance Effects

Table II presents median fund performance measures based on alphas from single- and multi-factor models. We also report the objective-adjusted returns for each of the four years surrounding the merger. Full sample and subsample results for within-family, across-family, stock fund, and bond fund mergers are provided in separate panels.[7]

For the full sample, we find that acquiring funds perform better than target funds in the pre-merger

period. However, both types of funds exhibit negative risk-adjusted performance. For the acquiring funds, the median single-factor (multi-factor) alphas are –0.68% (–1.00%) in year –2 and –0.49% (–0.73%) in year –1. Although the acquiring funds exhibit negative alphas, their objective-adjusted return (OAR) is positive, with median values of 0.15% in year –2 and 0.55% in year –1. By comparison, target funds tend to exhibit more severe underperformance, with single-factor (multi-factor) alphas of –1.14% (–1.39%) and –1.05% (–1.41%) in years –2 and –1. The objective-adjusted return (OAR) of the target funds is –0.42% in year –2 and –0.45% in year –1. The performance differential across the sample of acquiring and target funds in each of the pre-merger years is statistically significant (p-value = 0.00). This difference also holds for stock and bond mergers with one exception; the multi-factor alphas for bond funds are not significantly different across the acquiring and target funds in the pre-merger years. Also, the difference in performance is more pronounced for stock fund mergers. In the year preceding the merger, a significant performance differential exists for within-family mergers (based on all three performance measures) but not for across-family mergers.

In the post-merger period, the performance of the combined fund suggests that target fund shareholders are the major beneficiaries of the merger. Specifically, they experience significant improvements in performance after the merger is completed. The median single-factor alpha of the target funds of –1.05% in the year preceding the merger improves to –0.68% and –0.89% in years +1 and +2 respectively. A primary source of this improvement is likely to be the potentially superior assets of the acquiring fund and the skills of the surviving fund manager, who in most cases is likely to be the manager of the acquiring fund. The lack of a significant performance difference for across-family mergers further suggests that these mergers are not motivated by the poor performance of the target fund.

For the sample of acquiring funds, we find that the median single and multi-factor alphas of -0.49% and –0.73% in year –1 decline significantly to –0.68% and –0.95% in year +1. This deterioration in performance may be due to the inability of the manager to liquidate poorly performing assets that were held by the target fund prior to the merger. If this inability is the sole explanation for this decrease in performance, then the return of the combined fund after the merger should be approximately equal to the

weighted average return of -0.59% (-0.86%) of the target and acquiring funds before the merger based on single-factor (multi-factor) alphas. Our results suggest that this is indeed the case. The acquiring funds' performance using single-factor (multi-factor) alphas declines to -0.68% (-0.95%) in year +1, implying an additional reduction of only 9 (9) basis points in aggregate fund performance. Similar computations based on objective-adjusted returns shows a decline of 12 basis points in year +1 for the acquiring fund. This finding is in contrast to the results of Agrawal, Jaffe, and Mandelker (1992). They study the performance of acquiring firms following corporate mergers and report that shareholders of acquiring firms experienced a wealth loss of 10% over a five-year period following the acquisition. Our limited post-merger data prevents us from doing a similar long-term analysis.

The deterioration in performance noted above is largely attributable to the subsample of within-family mergers. The within-family results provide support for the argument that one of the primary motivations for mergers is to eliminate poorly performing funds, while retaining the associated assets and management fees. However, these results do not suggest that all mergers are motivated merely by the need to eliminate redundant funds within the same fund family. In general, we find no significant difference in pre- versus post-merger performance for acquiring funds in across-family mergers. The finding that performance does not change around across-family mergers, combined with the similarity in returns for acquiring and target funds before the merger, suggests that across-family mergers may be driven not by performance, but instead by a desire on the part of the acquiring family to achieve a strategic realignment of its product offerings.

An important caveat for our study is that we are only tracking performance and other fund characteristics for two years subsequent to the merger, due to the lack of additional post-merger data. Hence, the longer-term consequences of the merger are not part of our analysis.

B. Pre- versus Post-Merger Flow Effects

Table III presents the median net and objective-adjusted net asset inflows, for the acquiring and target funds over the four-year period surrounding the merger. The full sample results indicate that in the pre-

merger period, target funds realize significantly lower asset flows than acquiring funds. Median net (objective-adjusted net) asset inflows for the target funds in year –2 and –1 are –4.62% (-7.48%) and –10.91% (–12.34%) respectively. The corresponding figure for the acquiring fund shareholders is +0.54% (–0.37%) and –4.47% (–4.22%). The difference in asset inflows across target and acquiring funds is significant in each of the pre-merger years. Given the poor performance of the target funds in the pre-merger period, the significantly negative asset inflows are not surprising. The flow differential across the target and acquiring funds in year –1 holds for all subsamples. It is also noteworthy that acquiring funds experience negative objective-adjusted net asset flows in the year before the merger, suggesting that the desire to eliminate the poor performance of the target fund is complemented by a need of the acquiring fund to attract additional assets. This suggests that mergers may be motivated by the desire to renew interest in funds that shareholders seem to have sidestepped in favor of other similar funds.

The post-merger asset flow analysis indicates that asset flows continue to remain negative in the years subsequent to the merger. For the full sample, the net (objective-adjusted net) asset flows are –7.51% (–9.06%) and –3.06% (-7.27%) in years +1 and +2 respectively. These negative fund flows in the post-merger period suggest that the merger itself is not sufficient to reverse the pattern of net redemptions. The negative flows may result from acquiring fund shareholders withdrawing assets due to either the increase in the fund's expense ratio or the deterioration in performance after the merger. In addition, although target fund shareholders tend to experience improvements in performance, the merger may cause them to reevaluate their investment strategies and select a different fund.

As mentioned earlier, we also analyze the effects of fund mergers on subsequent asset flows in a multivariate setting. We examine the effect of mergers on subsequent flows both from the perspective of the combined acquiring and target funds and the acquiring fund by itself. Since the results of the flow regressions from the perspective of the combined entity and the acquiring fund are qualitatively similar, we only discuss and report the first set of results. The estimated regression coefficients along with the p-values in parentheses are as follows:

$$(Net\ asset\ flow)_{i,t} = 4.67 - 1.39\ (Objective\ flow)_{i,t} - 3.43\ (Performance)_{i,t-1} - 0.49\ (Fund\ Size)_{i,\,t-1}$$
$$(0.00)\quad (0.28)\qquad\qquad (0.15)\qquad\qquad (0.00)$$
$$- 1.00\ (Expense\ Ratio)_{i,\,t-1} - 0.84\ (Merger\ Dummy)_{i,\,t-1}$$
$$(0.02)\qquad\qquad (0.07)$$

(9)

The coefficient on the objective flows is not significant, suggesting that flows in funds involved in mergers are not strongly influenced by sectoral flows. In addition, we do not find a significant relation between fund flows and lagged fund performance. Sirri and Tufano (1998) note that the flow-performance relation is asymmetric, with a positive relation between flows and good performance but an insignificant relation between flows and poor performance. The funds in our merger sample tend to be poor performers, which may explain the lack of significance. We find that fund flows are strongly inversely related to fund size, suggesting that smaller funds experience larger inflows in percentage terms. Fund flows are also inversely related to expenses, suggesting that investors avoid funds with higher fees. We also find that the coefficient on the indicator variable used to differentiate between pre- versus post-merger flows, i.e. the merger dummy, is negative and statistically significant (p-value = 0.07), suggesting that asset flows do indeed decline in the year after the fund merger. In summary, the merger does not appear to reverse the trend of declining assets experienced by the acquiring and target fund prior to the merger.

C. Other Fund Characteristics Surrounding the Merger

Table IV presents the median asset size, expense ratio, and portfolio turnover for the acquiring and target funds. In the years preceding the merger, the size of the target fund is significantly smaller than that of the acquiring fund. For the full sample, the median size of the acquiring fund is $52.3 million in year –2; the corresponding figure for the target fund is $14.7 million and the difference is statistically significant (p-value = 0.00). The asset size differential between the target and acquiring fund holds for all categories of mergers.

After the merger, the size of the acquiring fund increases significantly. The median size of the

acquiring fund is $52.3 million in year –2 and $102.6 million ($112.7) million for the combined fund in year +1 (year +2). This increase is partly attributable to the acquisition of the assets of the target fund and is prevalent across all subsamples. These results provide preliminary evidence suggesting that the need to achieve economics of scale may be an important motivation for undertaking a fund merger.

If fund mergers do in fact result in economies of scale in operations, then the expense ratio of the combined fund may decline following the merger. On the other hand, a reduction in operating costs may not necessarily imply a reduction in expense ratios, if the fund adviser uses the cost savings to increase marketing efforts. Interestingly, for the full sample, the expense ratio of the acquiring fund is significantly lower than that of the target fund in the year prior to the merger. The median expense ratio of the acquiring fund is 1.15%, compared to 1.32% for the target fund. This difference also holds for all subsamples, and suggests that target funds have higher cost structures than their acquirers.

We find no significant change in the expense ratio of the acquiring fund in the year subsequent to the merger. The median pre-merger expense ratio is 1.15%, versus 1.16% in the post-merger year. However, in year +2, the expense ratio declines significantly to 1.04%. This reduction holds for all subsamples, suggesting that the efficiency gains resulting from the merger do indeed manifest themselves in later years, and are passed on to the fund's shareholders in the form of lower expenses. An even greater reduction in expenses is realized by the shareholders of the target fund, due to their significantly higher cost structure in the pre-merger period. Between year –1 and year +2, expenses for the target funds decline significantly from 1.32% to 1.04%. In summary, the evidence on expense ratios is consistent with economies of scale arising from mutual fund mergers. These benefits are reaped by shareholders of both the target and acquiring funds.

The portfolio turnover for the full sample is not significantly different across acquiring and target funds. However, for the subsample of stock fund mergers, the median portfolio turnover of 65.9% for target funds in the year preceding the merger is significantly higher than the median turnover of 51.9% for acquiring funds (p-value = 0.04). This difference may be driven partly by window dressing behavior on the part of the target fund managers to prevent dismissal due to poor fund performance. These results are

consistent with those of Khorana (1996), who documents a significant increase in portfolio turnover activity preceding managerial replacement.

We also find no significant difference in portfolio turnover activity in the years surrounding the merger. The lack of a difference in pre- versus post-merger portfolio turnover rates across most subsamples may suggest that the portfolio managers of the acquiring funds tend to retain the assets of the target funds after the merger. Alternatively, the managers may actively dispose of the target fund's assets, but reduce the turnover among their other holdings while doing so. In other words, the managers' focus may temporarily shift away from their usual security selection efforts as they focus their attention on selling the poorly performing assets of the target fund, resulting in no perceptible change in turnover.

D. Determinants of Fund Mergers

As noted above, we expect that funds exhibiting significant underperformance would be more likely to be the target of a merger. Even though underperforming funds do not typically experience significant asset outflows, they are likely to experience a loss in market share relative to other funds. To the extent that a fund merger can potentially limit this loss, there may exist an inverse relation between asset flows and the likelihood of a fund merger. The inability of poorly performing funds to attract a substantial amount of new assets can also result in diseconomies of scale. One would therefore expect that smaller funds would be more likely to be acquired.

It is likely that inefficiencies in fund management, whether they accrue in the form of higher administrative costs or excessive portfolio turnover on the part of fund managers, will be manifested in higher expense ratios. If the mutual fund industry is efficient in eliminating such inefficiencies, we would expect to find a negative relation between a fund's expense ratio and the likelihood of a merger.

As discussed earlier, the probability of a merger may differ for funds in large versus small families. To the extent that large fund families are more likely to have multiple funds within a particular investment objective and can merge similar funds without adversely affecting the diversity of product offerings, they may be more likely to engage in a within-family merger. Smaller families, on the other

hand, may engage in across-family mergers to bolster the potential choice of funds and investment objectives to prospective investors. We use the number of objectives offered as a proxy for the size of the fund family.

Panel A of Table V presents the results of our logistic regressions, in which the dichotomous dependent variable equals one if a fund is merged out of existence and zero if the fund remains as an independent entity. Consistent with our priors, we find a negative and statistically significant relation between fund performance and the likelihood of a merger (p-value = 0.01). Similarly, across all model specifications, we find a negative relation between fund size and the likelihood of a merger (p-value = 0.00).

In Models (iii) and (iv) we find the presence of a marginally significant inverse relation between asset flows and the likelihood of a merger (p-value=0.11 and 0.10, respectively). However, in Models (v) and (vi), where we include both performance and asset flows in the same regression, the performance variable continues to remain negative and statistically significant, but the flow variable loses its significance. This suggests that the performance effect tends to dominate the flow effect as a determinant of fund mergers.

In all model specifications, we find that funds with higher objective-adjusted expense ratios are more likely to be acquired. These results suggest that mutual fund complexes tend to eliminate inefficient funds with high underlying cost structures.

Since a majority of the mergers in our sample involve bond funds (59% of the sample), we also include a stock fund indicator variable to capture any differences in merger probabilities between stock funds and bond funds. The coefficient on the stock dummy is negative and significant, suggesting that the probability of a merger is greater for bond funds.

We also find a significantly positive coefficient on the variable measuring the number of objectives in a family (Model (ii)). However, this variable is not significant in Models (iv) and (vi). Hence, for the aggregate sample, the evidence is only partially supportive of the argument that in an attempt to maintain their reputational capital, large fund families may exhibit a greater tendency to engage in a merger and hence eliminate poorly performing funds within the family.

To examine differences in the determinants of within- versus across-family mergers, in Panel A of Table VI we report the results of multinomial logistic regressions. As mentioned earlier, the dependent variable can have three possible outcomes: no merger, a within-family merger, and an across-family merger. Consistent with the univariate results, we find that the negative and statistically significant relation between fund performance and the likelihood of a fund merger is driven by the subsample of within-family mergers. In contrast, the performance-merger likelihood relation is insignificant for across-family mergers. This is consistent with our hypothesis that across-family mergers are driven more by strategic reasons, whereas within-family mergers are most likely driven by the need to eliminate the performance record of an inferior fund within a fund family. However, for both subsamples, we do not find any evidence of a significant relation between asset flows and the likelihood of a fund merger.

Fund size is a significant determinant of a merger for both the within-family and across-family subsamples. The negative coefficient on the fund size variable suggests that smaller funds are more likely to be merger targets. Also, for the within-family sample, the fund's expense ratio tends to have a positive effect on the likelihood of a fund merger. Hence, within a fund family, there seems to be a greater desire on the part of the investment advisors to eliminate funds with higher underlying cost structures.

The logistic regression results in Table V provided weak evidence of a positive relation between merger probability and the number of objectives in a fund family. However, results of the multinomial specifications in Table VI indicate that the relation between the number of family-objectives and likelihood of a merger differs for within-family versus across-family mergers. We find evidence of a significantly positive relation for within-family mergers and a negative relation for across-family mergers. The positive coefficient for within-family mergers is consistent with our priors that large families are more likely to have multiple funds in the same objective category and hence may exhibit a greater desire to eliminate redundant and/or underperforming funds within the family. The negative coefficient for across-family mergers is consistent with the argument that such mergers are partly motivated by the desire on the part of fund families to increase the choice of investment objectives available to their clients. The evidence is consistent with the findings of Khorana and Servaes (2000), who argue that product

differentiation appears to drive the market share of fund families. It is therefore quite plausible that families with fewer objectives are more likely to acquire funds from other families and create non-overlapping objectives via a fund merger.

The coefficient on the stock fund indicator variable is negative and significant for within-family mergers, reflecting a broad-based consolidation of bond funds at the level of the fund family. Given the superior performance of stock funds compared to bond funds over the sample period and a consequent diversion in asset flows from the bond to the equity category, within-family bond fund mergers are likely to be motivated by the need to achieve economies of scale in fund operations. This is consistent with the descriptive statistics in Table I, and the observation that although bond funds comprise a minority of the fund universe, they represent a majority of our merger sample.

To examine the goodness-of-fit of the logistic regressions, we compare the actual merger frequency with predicted takeover probabilities estimated from the models in Table V and VI. These findings are reported in Panel B of each table. In the interest of brevity, we will only discuss the results from Table VI. In Model (i), the actual merger frequency for within-family mergers is 2.4%, versus 0.9% for across-family mergers. The mean (median) predicted probability is 2.4% (1.8%) and 0.9% (0.7%) for the two samples, respectively. Similar results are obtained for Models (ii) and (iii). Hence, the mean and median predicted probabilities are very similar to the actual merger frequencies, suggesting that the models fit the data quite well.

Additionally, in Table VII we report the implied probability separately for each quartile computed based on performance (objective-adjusted returns), fund size ($ value of assets), and asset flows (objective-adjusted net asset flows), using the coefficients from Model (iii) of Table VI. These results are presented for both the within-family and across-family subsamples. We use the median value of the variable of interest within each quartile and median values for all other variables to obtain the implied probabilities. Not surprisingly, for within-family mergers, we find a monotonic decrease in the implied merger probability as we go from the smallest to the largest performance quartile (Table VII; Panel A). For across-family mergers, the decline in the implied probabilities is not as dramatic. For quartiles

computed based on fund size (Table VII; Panel B), we find evidence of a dramatic decline in the implied merger probabilities from the smallest to the largest size quartile, for both subsamples. For within-family mergers (across-family mergers), the implied merger probability declines from 4.8% (1.7%) for the smallest quartile to 1.3% (0.5%) for the largest quartile computed based on fund size. This confirms our earlier finding that fund size is an important determinant of both within- and across-family mergers. Consistent with our earlier result that objective-adjusted net asset flows are not a significant determinant of fund mergers, we do no find any dramatic change in the merger probability from the smallest to the largest quartile for either subsample (Table VII; Panel C).

In summary, we find evidence suggesting that poorly performing funds, smaller funds, funds with higher expense ratios and funds belonging to large families are more likely to be the target of a within-family merger. However, only fund size and the number of objectives in the fund family are significant determinants of an across-family merger.

IV. Conclusion

This study examines the determinants of mutual fund mergers and their subsequent impact on fund shareholders, using a sample of 742 open-end mutual fund mergers over the 1994-1997 period. Prior to the merger, acquiring funds tend to be significantly larger, perform better, experience relatively higher asset flows, and have lower expense ratios than target funds. While shareholders of the target fund realize significant improvements in performance after the merger, shareholders of the acquiring fund experience a significant deterioration in performance. These performance changes provide some evidence of a wealth transfer effect from shareholders of the acquiring fund to the target fund. The target fund shareholders also benefit from a reduction in their fund's expense ratio after the merger.

Although median asset flows are higher for acquiring funds than for target funds, they are negative for both groups. This suggests that both acquiring funds and target funds experience net redemptions prior to the merger. From the perspective of acquiring funds, mergers do not appear to remedy the problem of net redemptions since asset flows tend to become even more negative in the year after the

merger. This result is not surprising, since the merger itself is not likely to attract additional assets, unless it results in superior performance.

The overall evidence suggests that fund mergers may be motivated by a desire to achieve economies of scale and by a need to eliminate funds with poor performance. Logistic regressions suggest that the likelihood of a fund merger is inversely related to the size and positively related to the expense ratio of the target fund. We also find that poor past performance increases the probability of a fund merger. Lagged asset flows, however, are not a significant determinant of a fund merger. Multinomial logistic results suggest that the inverse relation between fund performance and the likelihood of a merger is driven by the subsample of within-family mergers. In contrast, performance does not appear to be a determinant of across-family mergers, which may be motivated instead by strategic reasons. This is supported by our finding that fund families with a smaller number of available investment objectives are more likely to engage in an across-family merger, which would have the effect of increasing the choice of funds and investment objectives for both existing and prospective shareholders.

We believe that our study raises a number of interesting questions for future research. As more data becomes available, it would be interesting to examine the longer-term effects of fund mergers. Mergers appear to be a natural consequence of the dramatic growth in the mutual fund industry, and the optimal structure of this industry may not yet be determined. At what degree of industry consolidation do antitrust concerns become relevant? Do small funds or small fund complexes have a role in investors' portfolios? If not, why do some funds merge while others remain independent? With the emergence of mutual fund "supermarkets" and the ease of investing in several fund families from a single brokerage account, do investors need fund complexes to offer diverse product offerings? Another interesting issue is the valuation of fund assets, especially for across-family mergers. Are premiums paid over and above net asset value when a fund family buys another family's assets? Answers to these and other questions should be of interest to fund managers, regulators, and investors.

APPENDIX

Legal Aspects and other Institutional Details of Mutual Fund Mergers [8]

In general, the merger process begins with a proposal by the manager of the investment company to its board of directors. Occasionally, the board itself may also initiate the merger. It may indeed be required to do so based on the directors' fiduciary duties to their shareholders. The board has the ultimate responsibility to determine whether the proposed merger is in the best interest of the investment company and its shareholders. The agreement and the plan to merge two funds needs to be approved by a majority of board members. Some of the factors considered by the board in determining the efficacy of the merger include: (i) the terms of the merger and the impact on per share expenses and costs, (ii) whether the combination would achieve economies of scale and may result in greater portfolio diversification for investors, (iii) whether the firm's shareholders' stake would be diluted, (iv) the growth rate and performance of both the acquiring and acquired funds, (v) comparative benefits between merging and not merging, (vi) whether the merger will result in the recognition of any gain or loss for federal income tax purposes either to the acquiring firm or the acquired firm or to the shareholders of the acquiring and acquired firm, and (vii) any possible alternatives to the reorganization.

Mutual fund mergers need to conform to a number of legal requirements. However, according to Douglas J. Scheidt, Associate Director and Chief Counsel of the SEC, the SEC ruling on mutual fund mergers provides only "loose guidance."[9] The reorganization comes under the jurisdiction of three major securities laws: (i) the Investment Company Act of 1940, which regulates all of the activities of investment companies; (ii) the Securities Act of 1933, which may treat the proposed merger as offering to the current shareholders a "new" security; and (iii) the Securities Exchange Act of 1934, which may require the issuance of a proxy statement related to the shareholder vote. In addition to the aforementioned federal laws, state corporate and securities laws may also be relevant.

Shareholder quorum and voting requirements for accomplishing the transaction should conform to appropriate state laws. Typically, the holders of record of a majority of the acquired fund shares on the selected record date constitute a quorum (either being present in person or represented through a proxy).

The approval of the merger has to be done by a majority of the outstanding voting securities at a special shareholder meeting.

One of the most critical issues in mutual fund mergers concerns the performance records of the merging funds. The Division of Investment Management of the SEC examines the characteristics of the two combining funds to determine which fund's performance record should continue and which one should cease to exist. The performance record of the fund that most closely resembles the merged fund is used and whose performance disclosure enables investors to make the most meaningful comparisons with other funds. The factors that are considered in making this decision include the relative size of the funds, which investment advisor is the surviving advisor, and which fund's investment objective is closest to that of the combined fund.

The costs related to the merger process can be significant, and regulations do not specify who should bear them. Usually, the manager of the acquiring firm agrees to pay the costs to motivate the acquired fund to adopt the merger. Other issues, such as which company will bear the costs of disposal of assets that are deemed to be incompatible with the investment policies of the acquiror have to be resolved early in the process. In addition, fund mergers are intended to be "tax-free" transactions. It is expected that the merger will not result in the recognition of any gain or loss to the acquiring fund, the acquired fund, the shareholders of the acquiring fund, or the shareholders of the acquired fund.

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NOTES

[1] In 1990, there were 3,086 funds controlling $1,065 billion in total assets. In 1998, this number increased to 7,314 funds with a total asset base of $5,525 billion.

[2] Van Eck International Investors Gold A shares have a maximum sales charge of 5.75% and Van Eck International Investors Gold C shares have a 1% redemption charge in the first year. As another example, the Minnesota Tax-Free Intermediate Fund has three separate classes of shares. The Class A shares have a maximum front-end sales charge of 2.75%. The Class B shares have a deferred sales change which is: (i) 4% if the shares are redeemed within two years of purchase, (ii) 3% if the shares are redeemed during the third and fourth year following the purchase, (iii) 2% if the shares are redeemed during the fifth year following the purchase, (iv) 1% if the shares are redeemed during the sixth year following the purchase, and (v) 0% thereafter. Class C shares have a deferred sales charge of 1% if the shares are redeemed within 12 months of purchase.

[3] Sirri and Tufano (1998) document that mutual fund flows are sensitive to investors' search costs. Specifically, funds that charge higher fees, and as a consequence spend more on marketing and advertising, exhibit a stronger performance-flow relationship.

[4] We initially requested data for a longer time period from CDA/Weisenberger. However, their dataset did not contain fund mergers before October 1994, which is the beginning of our sample period.

[5] The predominance of bond funds in the merger sample may be due to a lack of investor interest resulting from the strong equity market performance during the sample period.

[6] The bond sample includes the corporate bond, corporate high yield, government mortgage, government securities, international bond, municipal bond, municipal high yield, and municipal single state categories. The equity sample includes funds in the following objectives: energy, equity income, gold metals, growth and income, international equity, long-term growth, maximum capital gain, small company growth, technology, and utilities.

[7] The 52 within-class mergers are excluded from the analysis in Tables II through IV, since for this category of mergers the acquiring and target funds have identical performance records and differ only with respect to their front-end loads or other charges.

[8] Much of the discussion in this section is drawn from a review article by Sapir and Bernstein (1995).

[9] The *New York Times*, August 16, 1998, Section 3, Page 11, Column 1.

Table I
Distribution of Mutual Fund Mergers by Investment Objective and Year

This table lists the full sample of 742 mutual fund mergers identified by CDA/Wiesenberger over the period October 1994-December 1997 by investment objective and year.

Objective	1994	1995	1996	1997	Objective Total	% of total sample
Asset Allocation	0	2	0	10	12	1.6
Balanced	1	4	12	11	28	3.8
Corporate Bond	0	29	26	22	77	10.4
Corporate High Yield	0	0	1	4	5	0.7
Energy	0	3	2	1	6	0.8
Equity Income	0	7	5	5	17	2.3
Flexible Income	0	4	3	0	7	0.9
Gold Metals	0	0	2	4	6	0.8
Government Mortgage	1	19	8	5	33	4.4
Government Securities	2	27	31	20	80	10.8
Growth and Income	0	12	14	17	43	5.8
International Bonds	0	11	5	9	25	3.4
International Equity	3	18	16	16	53	7.1
Long-Term Growth	0	25	28	29	82	11.0
Maximum Capital Gain	1	4	7	10	22	3.0
Municipal Bond	1	16	19	22	58	7.8
Municipal High Yield	0	1	0	0	1	0.1
Municipal Single State	2	46	47	60	155	20.9
Small Company Growth	0	3	8	6	17	2.3
Technology	0	1	0	1	2	0.3
Utilities	1	6	3	2	12	1.6
Other	1	0	0	0	1	0.1
Total	13	238	237	254	742	100.0

Table II
Performance of Acquiring and Target Funds around Mutual Fund Mergers

This table presents the median alphas estimated from single- and multi-factor models for acquiring and target funds for the four-year period surrounding the merger. Performance is also measured in terms of objective-adjusted returns. For stock funds, single-factor alphas are estimated from a standard market model (with the excess return on the CRSP value weighted index as the benchmark), and multi-factor alphas are estimated using the three-factor Fama-French model. For bond funds, single-factor alphas are estimated from a standard market model (with the excess return on the Lehman Brothers Government/Corporate bond index as the benchmark), and multi-factor alphas are estimated using a four-factor model. Objective-adjusted returns are computed as the difference between a fund's annual return and the average return on all funds in that investment objective. *p-values* report the significance of the difference in medians across the target and acquiring funds in the years preceding the merger, and over various event windows surrounding the merger.

		Annualized performance (in %) Year relative to merger				*p-values* for changes Year relative to merger	
		-2	-1	+1	+2	-1 to +1	-1 to +2
Full sample (N=690)							
Single-factor alpha	Target funds	-1.14	-1.05	-0.68	-0.89	0.08	0.56
	Acquiring funds	-0.68	-0.49			0.00	0.00
	p-value	0.00	0.00				
Multi-factor alpha	Target funds	-1.39	-1.41	-0.95	-0.97	0.01	0.12
	Acquiring funds	-1.00	-0.73			0.14	0.02
	p-value	0.02	0.00				
Objective-adjusted return	Target funds	-0.42	-0.45	0.25	0.50	0.00	0.00
	Acquiring funds	0.15	0.55			0.01	0.92
	p-value	0.00	0.00				
Within-family mergers (N=471)							
Single-factor alpha	Target funds	-1.09	-1.35	-0.67	-1.00	0.01	0.47
	Acquiring funds	-0.91	-0.44			0.03	0.00
	p-value	0.20	0.00				
Multi-factor alpha	Target funds	-1.45	-1.43	-0.73	-1.29	0.01	0.67
	Acquiring funds	-1.21	-0.65			0.40	0.00
	p-value	0.41	0.00				
Objective-adjusted return	Target funds	-0.41	-0.44	0.27	0.50	0.02	0.00
	Acquiring funds	0.03	0.66			0.00	0.67
	p-value	0.00	0.00				
Across-family mergers (N=219)							
Single-factor alpha	Target funds	-1.23	-0.71	-0.75	-0.63	0.59	0.84
	Acquiring funds	-0.29	-0.64			0.03	0.17
	p-value	0.00	0.09				
Multi-factor alpha	Target funds	-1.35	-1.37	-1.25	-0.66	0.88	0.02
	Acquiring funds	-0.63	-0.97			0.17	0.33
	p-value	0.00	0.13				
Objective-adjusted return	Target funds	-0.47	-0.45	0.07	0.51	0.18	0.01
	Acquiring funds	0.62	0.26			0.67	0.40
	p-value	0.00	0.11				

Table II (continued)

		Annualized performance (in %) Year relative to merger				*p-values* for changes Year relative to merger	
		-2	-1	+1	+2	-1 to +1	-1 to +2
Stock fund mergers (N=243)							
Single-factor alpha	Target funds	-2.03	-3.76	-3.00	-3.32	0.22	0.95
	Acquiring funds	-1.05	-0.72			0.01	0.00
	p-value	0.04	0.00				
Multi-factor alpha	Target funds	-2.12	-4.67	-3.55	-2.59	0.13	0.08
	Acquiring funds	-0.07	-1.83			0.01	0.12
	p-value	0.02	0.00				
Objective-adjusted return	Target funds	-2.03	-1.32	0.26	2.40	0.01	0.00
	Acquiring funds	0.99	2.07			0.03	0.84
	p-value	0.00	0.00				
Bond fund mergers (N=390)							
Single-factor alpha	Target funds	-1.06	-0.75	-0.45	-0.67	0.04	0.69
	Acquiring funds	-0.60	-0.42			0.15	0.00
	p-value	0.00	0.00				
Multi-factor alpha	Target funds	-1.29	-0.89	-0.51	-0.76	0.01	0.79
	Acquiring funds	-1.06	-0.63			0.55	0.02
	p-value	0.30	0.11				
Objective-adjusted return	Target funds	-0.24	-0.29	0.28	0.47	0.00	0.00
	Acquiring funds	0.07	0.34			0.70	0.08
	p-value	0.06	0.00				

Table III
Asset Flows around Mutual Fund Mergers

This table presents the median net asset flows and objective-adjusted net asset flows (in %) for acquiring and target funds for the four-year period surrounding the merger. Objective-adjusted flows are computed as the difference between a fund's annual asset flow and the average flow of all funds in that investment objective. *p-values* report the significance of the difference in medians across the target and acquiring funds in the years preceding the merger, and over various event windows surrounding the merger.

		Annual asset inflows, % Year relative to merger				*p-values* for changes Year relative to merger	
		-2	-1	+1	+2	-1 to +1	-1 to +2
Full sample (N=690)							
Net asset flows	Target funds	-4.62	-10.91	-7.51	-3.06	0.01	0.01
	Acquiring funds	0.54	-4.47			0.01	0.47
	p-value	0.04	0.00				
Objective-adjusted Net asset flows	Target funds	-7.48	-12.34	-9.06	-7.27	0.02	0.05
	Acquiring funds	-0.37	-4.22			0.00	0.15
	p-value	0.00	0.00				
Within-family mergers (N=471)							
Net asset flows	Target funds	-2.80	-10.96	-7.47	-1.79	0.01	0.02
	Acquiring funds	1.96	-6.38			0.30	0.83
	p-value	0.34	0.00				
Objective-adjusted Net asset flows	Target funds	-3.45	-12.03	-8.15	-6.50	0.02	0.14
	Acquiring funds	1.86	-5.57			0.08	0.26
	p-value	0.07	0.00				
Across-family mergers (N=219)							
Net asset flows	Target funds	-10.49	-10.48	-7.91	-4.43	0.40	0.23
	Acquiring funds	-2.02	-0.10			0.00	0.26
	p-value	0.02	0.00				
Objective-adjusted Net asset flows	Target funds	-13.33	-14.18	-10.15	-9.18	0.29	0.14
	Acquiring funds	-4.06	-2.90			0.00	0.41
	p-value	0.02	0.00				
Stock fund mergers (N=243)							
Net asset flows	Target funds	-6.07	-11.37	2.37	-3.05	0.00	0.28
	Acquiring funds	10.32	11.62			0.04	0.00
	p-value	0.00	0.00				
Objective-adjusted Net asset flows	Target funds	-23.38	-26.11	-12.48	-17.42	0.01	0.41
	Acquiring funds	-4.06	-2.71			0.01	0.00
	p-value	0.00	0.00				
Bond fund mergers (N=390)							
Net asset flows	Target funds	-4.09	-12.28	-10.94	-9.61	0.14	0.01
	Acquiring funds	-5.17	-9.29			0.25	0.30
	p-value	0.91	0.01				
Objective-adjusted Net asset flows	Target funds	-0.39	-10.31	-7.88	-3.61	0.08	0.01
	Acquiring funds	-0.38	-6.39			0.27	0.24
	p-value	0.90	0.00				

Table IV
Characteristics of Acquiring and Target Funds around Mutual Fund Mergers

This table presents the median assets, expense ratios, and portfolio turnover for acquiring and target funds for the four-year period surrounding the merger. *p-values* report the significance of the difference in medians across the target and acquiring funds in the years preceding the merger, and over various event windows surrounding the merger.

		Year relative to merger				*p-values* for changes Year relative to merger	
		-2	-1	+1	+2	-1 to +1	-1 to +2
Full sample (N=690)							
Assets, $ million	Target funds	14.7	11.7	102.6	112.7	0.00	0.00
	Acquiring funds	52.3	51.9			0.00	0.00
	p-value	0.00	0.00				
Expense ratio, %	Target funds	1.25	1.32	1.16	1.04	0.00	0.00
	Acquiring funds	1.06	1.15			0.76	0.01
	p-value	0.00	0.00				
Turnover, %	Target funds	57.7	63.7	75.0	62.0	0.02	0.80
	Acquiring funds	59.4	63.9			0.11	0.54
	p-value	0.72	0.46				
Within-family mergers (N=471)							
Assets, $ million	Target funds	12.0	11.0	94.0	108.8	0.00	0.00
	Acquiring funds	47.8	46.9			0.00	0.00
	p-value	0.00	0.00				
Expense ratio, %	Target funds	1.36	1.40	1.21	1.18	0.00	0.00
	Acquiring funds	1.18	1.23			0.89	0.07
	p-value	0.00	0.00				
Turnover, %	Target funds	59.9	65.5	79.3	69.0	0.02	0.35
	Acquiring funds	56.4	68.0			0.07	0.71
	p-value	0.46	0.63				
Across-family mergers (N=219)							
Assets, $ million	Target funds	19.8	14.0	107.0	122.5	0.00	0.00
	Acquiring funds	68.3	64.9			0.00	0.00
	p-value	0.00	0.00				
Expense ratio, %	Target funds	1.02	1.05	1.00	0.95	0.08	0.00
	Acquiring funds	0.98	1.01			0.72	0.03
	p-value	0.02	0.02				
Turnover, %	Target funds	46.8	56.0	63.0	41.0	0.30	0.62
	Acquiring funds	71.6	51.0			0.73	0.22
	p-value	0.13	0.42				

Table IV (continued)

		Year relative to merger				*p-values* for changes Year relative to merger	
		-2	-1	+1	+2	-1 to +1	-1 to +2
Stock fund mergers (N=243)							
Assets, $ million	Target funds	23.9	20.0	121.6	143.7	0.00	0.00
	Acquiring funds	65.2	59.6			0.00	0.00
	p-value	0.00	0.00				
Expense ratio, %	Target funds	1.59	1.57	1.40	1.22	0.05	0.00
	Acquiring funds	1.30	1.33			0.33	0.07
	p-value	0.00	0.00				
Turnover, %	Target funds	64.7	65.9	69.0	69.0	0.16	0.92
	Acquiring funds	59.4	51.9			0.51	0.06
	p-value	0.12	0.04				
Bond fund mergers (N=390)							
Assets, $ million	Target funds	10.5	9.6	86.6	89.0	0.00	0.00
	Acquiring funds	51.3	47.05			0.00	0.00
	p-value	0.00	0.00				
Expense ratio, %	Target funds	1.03	1.12	0.99	0.91	0.09	0.00
	Acquiring funds	0.96	1.00			0.38	0.11
	p-value	0.03	0.01				
Turnover, %	Target funds	49.4	58.6	85.0	53.0	0.01	0.56
	Acquiring funds	60.0	73.0			0.78	0.06
	p-value	0.06	0.01				

Table V
The Determinants of Mutual Fund Mergers: Logistic Regression Results

This table reports the results of a logistic regression examining the determinants of a fund merger. *Performance* is measured as the annual holding period return of the fund in excess of the average return for all funds in the same investment objective; *Asset Flows* are the objective-adjusted net asset flows in a fund; *Fund Size* is the log of total net assets for the fund; *Expense Ratio* is measured as the fund's expense ratio minus the average expense ratio for all funds in the same investment objective; *Stock dummy* is an indicator variable which is set equal to one if it is a stock fund merger and zero otherwise; *Number of objectives in the family* is measured as the number of investment objectives in a family in the year preceding the merger. Numbers in parentheses are *p-values*.

Model: Probability (Fund Merger)$_{i,t} = \alpha_0 + \beta_1$*(Performance)*$_{i,t-1} + \beta_2$*(Asset Flows)*$_{i,t-1}$
$+ \beta_3$*(Fund Size)*$_{i,t-1} + \beta_4$*(Expense Ratio)*$_{i,t-1} + \beta_5$*(Stock Dummy)*$_i$
$+ \beta_6$*(Number of objectives in family)*$_{i,t-1}$

Panel A: Regression coefficients						
Independent Variables	Model (i)	Model (ii)	Model (iii)	Model (iv)	Model (v)	Model (vi)
Intercept	-2.056 (0.00)	-2.264 (0.00)	-2.171 (0.00)	-2.321 (0.00)	-2.056 (0.00)	-2.269 (0.00)
Performance	-0.012 (0.01)	-0.013 (0.01)			-0.012 (0.01)	-0.013 (0.01)
Asset Flows			-0.049 (0.11)	-0.053 (0.10)	-0.034 (0.23)	-0.037 (0.21)
Fund Size	-0.269 (0.00)	-0.275 (0.00)	-0.273 (0.00)	-0.276 (0.00)	-0.273 (0.00)	-0.279 (0.00)
Expense Ratio	0.152 (0.04)	0.149 (0.04)	0.186 (0.01)	0.187 (0.01)	0.152 (0.04)	0.150 (0.04)
Stock dummy	-0.641 (0.00)	-0.639 (0.00)	-0.467 (0.00)	-0.465 (0.00)	-0.630 (0.00)	-0.627 (0.00)
Number of objectives in the family		0.017 (0.02)		0.011 (0.10)		0.017 (0.12)
Number of Observations	8,566	8,562	8,588	8,584	8,566	8,562
p-value of Regression	0.00	0.00	0.00	0.00	0.00	0.00
Panel B: Actual and implied merger probabilities						
Actual Merger Frequency	0.036	0.036	0.036	0.036	0.036	0.036
Mean Implied Probability	0.033	0.033	0.036	0.036	0.033	0.033
Median Implied Probability	0.027	0.026	0.029	0.029	0.027	0.026

Table VI
The Determinants of Mutual Fund Mergers: Multinomial Logistic Results

This table reports the results of multinomial logistic regressions examining the determinants of a fund merger. The results of the multinomial logistic specification are reported separately for within-family and across-family mergers. *Performance* is measured as the annual holding period return of the fund in excess of the average return for all funds in the same investment objective; *Asset Flows* are the objective-adjusted net asset flows in a fund; *Fund Size* is the log of total net assets for the fund; *Expense Ratio* is measured as the fund's expense ratio minus the average expense ratio for all funds in the same investment objective; *Stock dummy* is an indicator variable which is set equal to one if it is a stock fund merger and zero otherwise; *Number of objectives in the family* is measured as the number of investment objectives in a family in the year preceding the merger. Numbers in parentheses are *p-values*.

Panel A: Regression coefficients						
Independent Variables	Model (i)		Model (ii)		Model (iii)	
	Within-family mergers	Across-family mergers	Within-family mergers	Across-family mergers	Within-family mergers	Across-family mergers
Intercept	-2.819	-2.943	-2.890	-2.954	-2.822	-2.954
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Performance	-0.015	-0.007			-0.012	-0.007
	(0.01)	(0.40)			(0.01)	(0.44)
Asset Flows			-0.047	-0.077	-0.031	-0.061
			(0.19)	(0.32)	(0.33)	(0.40)
Fund Size	-0.283	-0.262	-0.279	-0.268	-0.286	-0.267
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Expense Ratio	0.211	-0.124	0.239	-0.004	0.211	-0.117
	(0.00)	(0.53)	(0.00)	(0.98)	(0.01)	(0.55)
Stock dummy	-0.732	-0.400	-0.528	-0.296	-0.722	-0.385
	(0.00)	(0.10)	(0.00)	(0.21)	(0.00)	(0.12)
Number of objectives in the family	0.037	-0.047	0.030	-0.048	0.037	-0.045
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
Number of Observations	8,562		8,584		8,562	
p-value of Regression	0.00		0.00		0.00	
Panel B: Actual and implied merger probabilities						
Actual Merger Frequency	0.024	0.009	0.026	0.009	0.024	0.009
Mean Implied Probability	0.024	0.009	0.026	0.009	0.024	0.009
Median Implied Probability	0.018	0.007	0.020	0.008	0.018	0.007

Table VII
Implied Probabilities of Fund Mergers across Quartiles of Performance, Fund Size, and Asset Flows

This table reports the implied probabilities based on Model (iii) in Table VI. Performance is measured based on objective-adjusted returns, fund size is measured as the value of assets in the fund, and asset flows are measured as the objective-adjusted net asset flows (in %) in a fund. The median value of the variable of interest within each quartile and median values for all other variables are used in computing the implied probabilities.

Panel A: Quartiles based on performance		
	Implied probability	
	Within family mergers	Across-family mergers
Quartile 1 (smallest)	0.029	0.010
Quartile 2	0.027	0.009
Quartile 3	0.022	0.008
Quartile 4 (largest)	0.019	0.008
All funds	0.024	0.009
Panel B: Quartiles based on fund size		
	Implied probability	
	Within family mergers	Across-family mergers
Quartile 1 (smallest)	0.048	0.017
Quartile 2	0.029	0.011
Quartile 3	0.020	0.008
Quartile 4 (largest)	0.013	0.005
All funds	0.024	0.009
Panel C: Quartiles based on asset flows		
	Implied probability	
	Within family mergers	Across-family mergers
Quartile 1 (smallest)	0.025	0.009
Quartile 2	0.024	0.009
Quartile 3	0.024	0.009
Quartile 4 (largest)	0.023	0.009
All funds	0.024	0.009