

Mergers of Closed-End Funds: An Analysis of Discount and Expense Ratio Reduction

1. Introduction

The purpose of this study is to examine the pricing behavior and the discount of U.S. within-family closed-end funds merger, i.e., mergers between acquiring and target funds belonging to same fund families. There is no specific research on this issue since limited number of previous studies examines the determinants of open-end fund mergers and their subsequent wealth impact on shareholders of target and acquiring funds (Jayaraman, Khorana and Nelling (2002); Zhao (2005); and Ding (2006)) and the relationship between mergers and board structures (Khorana, Tufano, and Wedge (2007)). Considering the fact that exit decision literature for open-end funds is still growing, it is not surprising that no previous work addressed these issues in the context of closed-end funds whose total market value is approximately one fortieth of their open-end counterparts.¹

This paper contributes to the growing literature on merger and closed-end funds with an empirical examination of discounts and expense ratios of both target and acquiring closed-end funds around the merger announcement which is critical to understanding observed discounts on both parties as such announcements might have impact on shareholders' wealth through fluctuating discounts. Closed-end fund management companies would be better off by knowing whether economies of scale can be achieved through mergers. Finally, as stated in Ding (2006),

¹ According to Investment Company Institute, as of the end of 2006, total assets of the 646 closed-end funds are \$298.3 billion compared to 8,117 open-end funds whose total value is \$10,413.7 billion.

from an institutional perspective, the consequences of such mergers might guide Securities and Exchange Commission (SEC) regulations.²

Most of the early work on mutual funds was focused on various aspects of their performance on both fund level and family level.³ Other issues associated with the fund management include fee structure (Chordia (1996)), board of directors (Tufano and Sevick (1997)), manager incentives (Chevalier and Ellison (1997, 1999)), ownership (Cremers, Driessen, Maenhout, and Weinbaum (2006)), and managerial turnover (Khorana (1996, 2001)).

Among the recent papers examining the underlying drivers of mutual fund merger and liquidation decisions, Jayaraman, Khorana and Nelling (2002) analyze the determinants of mutual fund mergers and their subsequent wealth impact on shareholders of target and acquiring funds. They conclude that the likelihood of a fund merger is inversely related to fund size for both in-family and across-family mergers, and that poor past performance is a significant determinant only for in-family mergers. Jayaraman, Khorana and Nelling (2002) also report that differences in performance and expense ratios between the target and acquiring funds are more pronounced for within-family mutual fund mergers than across-family mutual fund mergers. Thus, we expect to observe even more significant differences in discounts and expense ratios of target and acquiring closed-end funds since our sample consists of only within-family mergers.

2 An example of regulation proposal can be found at <http://www.sec.gov/rules/proposed/ic-25259.htm>.

3 See Jensen (1968); Grinblatt and Titman (1989); Grinblatt, Titman, and Wermers (1995); Brown and Goetzmann (1995); Elton, Gruber, and Blake (1996); Gruber (1996); Carhart (1997); Wermers (2000) for fund level studies. Some of the family level works include Khorana and Servaes (1999), who study the decision by families to open new funds; Nanda, Wang, and Zheng (2004) and Ivkovich (2002) who examine performance spillover effects across funds within a family; and Massa (2003) who study the relation between the performance of the fund family and the degree of differentiation of the objectives in which the fund families operate.

Zhao (2005) first examines the similarities and differences in the determinants of the three mutual fund exit forms—liquidation, within family merger, and across-family merger. He finds that portfolio size and investment objective conditions play a central role in all three exit forms. Both within-family mergers and across-family mergers are more likely to occur in smaller investment objectives in which consolidation can more easily lead to larger market share. Zhao (2005) also reports that a fund family is willing to liquidate a portfolio if the portfolio has fewer share classes, but more likely to merge a portfolio within the family if it offers more share classes. The family does not want to lose the valuable client sources and distribution channels linked to multiple share classes. Moreover, portfolios merged within a family have considerably longer histories.

Ding (2006) investigates the determinants and consequences of mutual fund mergers. He finds that the target funds are smaller and younger compared to acquiring funds, underperform persistently, and experience net outflows whereas acquiring funds' performance is above average in the pre-merger period, but gradually deteriorates after mergers. He also documents that the acquiring fund's expense ratio remains unchanged around the merger. Given the deterioration of performance and no significant decrease in expense ratio resulting from the merger, Ding (2006) concludes that the acquiring fund shareholders do not seem to gain from the merger.

Finally, in their forthcoming paper, Khorana, Tufano, and Wedge (2007) examine the relation between mergers and board structure with an emphasis on target funds in across-family mergers. They find that fund mergers—especially across-family fund mergers—tend to be value enhancing for target fund shareholders. However, highly paid target boards are less likely to approve across-family mergers, because these mergers tend to be associated with significant wealth losses for the board members of the target fund. Consistent with previous works, they

report that fund mergers occur when a target is smaller, underperforms its peers, and experiences asset outflows.

Evidence presented by Baumol, Goldfeld, Gordon, and Koehn (1980) indicates that there are economies of scale and scope in the U.S. mutual fund industry.⁴ This implies that family size has an important effect on profitability. Among the many possible explanations for the increasing level of mutual fund mergers, economies of scale made consolidation of the financial service industry a dominant strategy providing an incentive for firms to combine entire fund families, and reducing the supply of funds with similar objectives.

This trend can also be observed for closed-end funds. An influential 2006 Herzfeld Annual report predicts further consolidation in closed-end funds, particularly among smaller funds merging with similar issues managed by the same advisor.⁵ In fact, several such deals are already pending shareholder approval. New regulatory requirements have made it difficult for funds of less than \$100 million in assets to operate economically, spurring the reorganizations which promise economies of scale as well as a more liquid trading environment for the resulting larger fund.

The only exit decisions examined in the U.S. closed-end fund industry is open-ending through liquidation, conversion to an open-end fund, or merging with an open-end fund. In these papers, Brauer (1984) and Brickley and Schallheim (1985) conclude that open-ending U.S. closed-end funds eliminates the discount, and thus generates an increase in value captured by shareholders.

⁴ For additional evidence see also Latzko (1999); Rea, Reid, and Millar (1999); and Collins and Mack (1997, 1999).

⁵ Source: www.herzfeldresearch.com

By using a sample of 90 U.S. closed-end funds within-family mergers during the 1994 – 2005 period, we examine the discounts of both target and acquiring funds before and after the merger announcement. We document a significant average abnormal return of 0.37% during the announcement period to the merger announcement. Consistent with the hypothesis that target funds' shareholders will be the major beneficiaries of merger, we observe a reduction of 0.66% in the target funds discounts from pre-announcement to pre-merger. In contrast, the discount of the acquiring funds widened by 1.51% on average during the same period. Following the merger, the average expense ratio of the surviving funds increases significantly by 0.14%.

Cross-sectional analysis reveals that the announcement return is positively related to the size of the discount. However, the announcement reaction is not related to the volatility of the discount.

The organization of the paper is as follows: Section 2 provides a brief section about salient characteristics of closed-end funds, describes institutional details of mergers, discusses similarities between fund mergers and corporate mergers, and addresses how economies of scale can be achieved through fund mergers. Section 3 outlines the data, provides summary statistics and describes the event-study methodology. The results are presented in Section 4. Section 5 provides cross-sectional analyses and Section 6 concludes.

2. Literature Review

2.1. Salient Characteristics of Closed-End Funds

Mutual funds are investment companies with a distinctive organizational structure. They pool capital from shareholders, the owners of the funds with voting rights, and invest it in a

diversified portfolio of assets. Shareholders prefer funds which meet their underlying investment objective and board of directors represents their interest.⁶

Typically, the number of shares increases and decreases as money comes in and leaves the fund, and each share is priced at net asset value (NAV). Closed-end funds, on the other hand, have a fixed number of shares that trade in the market like other publicly traded companies, and the market price can be different from NAV. In both the United States and the United Kingdom, closed-end funds have shared a very strange characteristic. When they are created, the price is typically set at a premium on the NAV per share⁷. As they trade, the market price tends to drop below NAV and stay there⁸. Discounts seem to continue, with wide fluctuations over time, until the termination of the fund. Following the termination of the closed-end fund share price rise, and thus the discount diminishes (Brickley and Schallheim, 1985). Lee, Shleifer and Thaler (1990) summarize the puzzles associated with closed-end funds. Among the four puzzles are the persistent discount and its disappearance when the fund is terminated.

6 Some of the studies examining board related issues in different contexts are as follows: Yermack (1996) finds an inverse relationship between board size and measures of firm value. Tufano and Sevick (1997); and Del Guercio, Dann, and Partch (2003) report that funds with smaller boards and boards that consist of more independent directors have lower expense ratios. Zitzewitz (2003) concludes that more independent boards are more likely to take action to prevent market timing via the adoption of fair value pricing practices. Ding and Wermers (2005) find a positive relationship between board independence and future performance in US equity funds. Khorana, Tufano, and Wedge (2007) find that more independent boards are less tolerant of poor performance when initiating fund merger decisions.

7 Dimson and Minio-Kozerski (1999) report that both American and British closed-end funds are issued at a premium to their NAV of up to 10% and 5% respectively. This premium is associated with underwriting fees and start-up costs.

8 Weiss (1989) finds that U.S. funds trade at a significant average discount of 10% relative to NAV within 24 weeks following the initial public offering (IPO).

2.2. Institutional Details of Mergers

In their review article Sapir and Bernstein (1995) study the reorganization of two or more investment companies. Accordingly, the mergers serve as an exit mechanism for mutual funds and they come under the jurisdiction of three major securities laws: The Investment Company Act of 1940, which regulates all of the activities of investment companies including mergers; the Securities Act of 1933, which may treat a merger to shareholders of the target fund as an offering of a new security; and the Securities Exchange Act of 1934, which requires the issuance of a proxy rule related to the shareholder vote. Mergers of funds are not governed only by federal laws mentioned, but also by state corporate or other law under which funds are organized.

According to Sapir and Bernstein (1995), the advantages of mergers are twofold: First, a merger may enable investment companies to “redomesticate” (i.e., to redomicile a company in a different state or to reorganize a company in a different form; for example, from a Maryland corporation to a Delaware business trust) in order to reduce the costs and scope of state regulatory constraints or to take advantage of more favorable tax treatment provided by other states.. Second, mutual funds may use a reorganization as a means of achieving greater economies of scale by merging out “redundant” funds (i.e., consolidating two mutual funds in the same fund complex that have similar investment objectives) or “stunted” funds (i.e., constructing a fund with a larger asset base).

Drawing from Sapir and Bernstein (1995), the merger process typically starts with the proposal of the fund adviser to the board of directors and it might take four to eight months (or longer) to complete. The board of directors also may initiate a merger when the fiduciary duties

of the directors require it. It is the responsibility of the board to determine whether the proposed reorganization is in the best interest of the fund and its shareholders. When deciding, some of the factors that the board considers are cost – benefit analysis and the terms of the merger; whether the economies of scale will be achieved; and whether the interests of existing shareholders will be diluted.⁹

The approvals of the boards of both target and acquiring funds are required before the shareholder voting under the general corporate laws. In some cases (within-family mergers), the two boards consist of the same set of members. Typically, the merger agreement between the merging funds requires the approval of no less than a majority of directors, including a majority of independent directors.

State corporate law generally requires that the disposition of target fund assets must be approved by the shareholders of the acquired fund. Therefore, the target fund should arrange a shareholder meeting to vote on the proposed merger following the approval by the board. In general, acquiring fund shareholders' approval is not necessary if the merger does not cause to the acquiring fund any material changes in the fundamental fund policies such as investment objectives.

More specifically, under Rule 17a-8 of the SEC, the target fund needs to obtain approval of a majority of its shareholders if: (1) any policy of the acquired fund that, under section 13 of the Act, could not be changed without a vote of a majority of its outstanding voting securities is materially different from a policy of the acquiring fund; or (2) the acquiring fund's advisory contract is materially different from that of the acquired fund, except for the identity of the funds

⁹ Jayaraman, Khorana and Nelling (2002) provide additional factors in the appendix of their paper.

as parties to the contract; or (3) after the merger, directors of the acquired fund who are not interested persons of the acquired fund and who were elected by its shareholders will not comprise a majority of the directors of the acquiring fund who are not interested persons of the acquiring fund; or (4) after the merger, the acquiring fund will be authorized to pay charges under a plan that provides for use of fund assets for distribution (“rule 12b-1 plan”) that are greater than charges authorized to be paid by the acquired fund under such a plan.

Concerning the merger structure, the most frequently used method for carrying out an investment company reorganization is to transfer the assets of the disappearing merging company to the surviving company in exchange for the assumption of the liabilities of the acquired fund by the acquiring fund and for the new shares of the acquiring fund having aggregate value equal to the total net assets of the acquired fund at the closing of merger date. The new shares of the acquiring fund are then distributed to the target shareholders on a pro rata basis and the acquired fund is terminated. Another merger structure that is infrequently used is called the “statutory merger” where the surviving fund acquires all of the property and assets of the merging fund, and the merging company is merged with and into the surviving fund.

Finally, Sapir and Bernstein (1995) argue that the rights of the shareholders of the target fund throughout the entire merger process must be safeguarded conscientiously by their directors. The role of the target fund directors in a merger remains that of a “watchdog” for the interests of the shareholders of the acquired company.¹⁰

¹⁰ Meschke (2006) examines to what extent board independence and director incentives are related to fund expenses, performance, and compliance. He finds that funds with higher director ownership and lower unexplained compensation charge lower fees and deliver higher returns. His findings are consistent with both the watchdog hypothesis, stating that greater independence and better incentive alignment causes boards to bargain harder with fund advisors, and the clientele hypothesis, suggesting that some sponsors strive to attract assets from relatively sophisticated investors who are concerned about conflicts of interest and sensitive to expenses.

2.3. Economies of Scale

If mergers are driven by a desire to achieve economies of scale, the probability of merger will be negatively related to the size of the fund and positively related to the expense ratio of the fund. Furthermore, if mergers succeed in creating economies of scale, then we expect to observe a decline in the surviving fund's expense ratio after the merger. Jayaraman, Khorana and Nelling (2002) find that in open-end funds merger, 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 experience a decline in the expense ratio two years following the merger. They also report that portfolio turnover indicates no significant differences between target and acquiring funds before or after the merger.

Sapir&Bernstein (1995) argue that achieving the economies of scale associated with a larger asset base through investment company reorganization should enable the successor company to realize the potential for greater diversification of portfolio investments and reduced per-share expenses. Furthermore, a merger of two investment companies with similar investment objectives and policies also may enable the resulting larger company to achieve enhanced investment performance and distribution capability as well as certain attendant savings in costs to both the resulting larger company and its shareholders. According to Ding (2006), a merger between two mutual funds can save operating costs by eliminating duplicative costs such as administration, accounting, and registration fees, and by reducing per unit research costs and the commissions paid to brokers.

Indro et al. (1999) and Perold and Salomon (1991) document that a portfolio that is too small fails to achieve economies of scale. Therefore, if a portfolio is small in size or generates low inflows that might lead to a small size, the fund family is more likely to terminate the portfolio to avoid net losses (Zhao (2005)). This is also consistent with the findings that firms with lower profitability have a higher probability of exit.¹¹

Typically, a fund adviser cites the existence of economies of scale as a major motivation for the merger in its proxy statement to shareholders for approval of a merger.

3. Data and Methodology

3.1. Sample

Using the investment company funds listed on the Center for Research in Security Prices (CRSP) files, all delisting codes for closed-end funds were scrutinized. The process resulted in 307 closed-end funds which were delisted between the period 1973 and 2005.

An additional data set from 1981 to 2005 of 1,480 financial companies merger is created using SDC Thompson Merger Database. The data set covers all financial companies including closed-end funds. Finally, Applications of Deregistration of Certain Financial Companies – Mergers (40-8F-M) filings from Security Exchange Commission (SEC) archives are compiled where closed-end funds are identified.

Press releases associated with these incidences were searched thorough Lexis-Nexis, Bloomberg and Wall Street Journal Indexes. Thus, a sample of 90 mergers between closed-end funds is obtained. For each merger, a target fund, an acquiring fund, an announcement date for the merger, and a termination date for the target fund are identified. The data also includes fund

¹¹ See Doi 1999; Siegfried and Evans 1994; Deily 1988; Reynolds 1988

family, inception date, fund type, expense ratio, and portfolio turnover ratio. These variables are available on SEC Annual Reports (10-K). The NAVs and discounts or premiums for pre-announcement, post-announcement and post-merger are compiled from Wall Street Journal.

Panel A in Table 1 presents time distribution of these merger announcements. The majority of mergers occurred in years 1994 (14%), 1995 (13%), 2000 (31%), and 2005 (16%). There are no mergers observed in years 2003 and 2004.

The Wall Street Journal in its weekly columns classifies closed-end funds into several categories. Panel B of Table 1 divides the sample into broad categories based partly on the Wall Street Journal classification. Our sample is dominated by seventy five (83% of the sample) mergers between muni bonds, most of which investing in single states (67% of the sample). Among the other bond funds, we have four different types of funds including high yield bond funds, government bond funds, world income funds and other domestic taxable income funds. There are only four equity funds in the sample out of which three are international equity funds and one is domestic equity fund. Thus, out of the total, we have eighty four (93% of the sample) domestic and six international funds.

Panel C of Table 1 presents types of the sixty surviving funds. Some of the closed-end funds in the sample are acquired by the same company. In each case, target fund and surviving fund belong the same fund family. There are only three mergers where the investment purpose changes from U.S. government fund to global income fund. Investment objective of the funds remain the same after the merger for the remaining eighty seven observations. Accordingly, surviving fund sample also is dominated by fifty one (85% of the surviving funds sample) muni bond funds, forty of which investing in single states.

3.2. Descriptive Statistics

Panel A in Table 2 provides summaries of size and price related variables, number of days between the announcement and the merger, and age of the target funds for the 90 mergers in the sample. Market value of the target funds has an average (median) of \$87.66 million (\$67.02 million) at announcement date ranging between \$20.41 million and \$557.36 million. The average number of outstanding shares is 8.49 million (median of 5.6 million). The price of the shares ranges from \$3.82 to \$16.50 with a mean of \$11.79 (median of \$12.13). The net asset values corresponding to announcement date averages \$12.87 with a median of \$13.

The number of trading days between the announcement and open-ending is on average 128.33 days (median of 124 days) with a minimum and maximum value of 9 and 266, respectively. The age of the target funds in the sample has an average of 5.39 years (median of 3 years) at the merger date.

Panel B in Table 2 provides summaries of size and price related variables, and age of the sixty surviving funds in the sample. Market value of the surviving funds has an average (median) of \$185.07 million (\$123.56 million) at announcement date ranging between \$65.22 million and \$632.62 million implying that smaller funds are more likely to be acquired. The average number of outstanding shares is 16.17 million (median of 10.37 million). The price of the shares ranges from \$7.56 to \$16.50 with a mean of \$12.71 (median of \$13.19). The net asset values corresponding to announcement date averages \$12.53 with a median of \$13. The age of the surviving funds in the sample has an average of 6.31 years (median of 5 years) at the merger date, which indicates that target funds are younger than their surviving counterparts.

3.3. Discounts

The pre-announcement discount values, all highly significant, are summarized for target funds in Panel A in Table 3. The change in the discount prior to merger announcement is not significant. Following the announcement, the gap between the net asset value and the share price narrows slightly (0.17% on average). The last observable discount for target funds has an average of 6.80% (median of 6.35%). Accordingly the discount shrinks on average by 0.49% from the week following the announcement to the merger. Average NAVs for the same period drops by 0.57% whereas the market prices increase by 0.47%.

Panel B in Table 3 summarizes discount values for the sample of 60 acquiring funds for the same period and after the merger. Following the merger announcement, average (median) discount increases from 6.20% (6.19%) to 6.38% (7.08%). The gap between the net asset value and the share price of the target funds worsens further after the merger. The average (median) discount for week subsequent the merger is 7.71% (7.46%) implying a significant increase of 1.51% on average from the week of pre-announcement. In the following three months the merger, the discount continues to widen for acquiring funds and it takes six months to reach its pre-announcement level.

3.4. Expense Ratios

Expense ratio values are presented for both target and acquiring funds in Table 4. Target funds have an average (median) expense ratio of 1.29% (1.22) whereas acquiring funds exhibit 1.15% on average (1.14% median). This difference of 0.14% for the pre-announcement period between target and acquiring funds is economically and statistically significant. Following the merger, the average (median) expense ratio of the surviving funds increases to pre-merger target funds level of 1.29% (1.21%).

If mergers succeed in creating economies of scale, then we would expect to observe a decline in the surviving fund's expense ratio after the merger. Jayaraman, Khorana and Nelling (2002) report that in open-end funds merger, 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 experience a decline in the expense ratio two years following the merger. They also report that differences in performance and expense ratios between the target and acquiring funds are more pronounced for within-family mutual fund mergers than across-family mutual fund mergers. Since our sample consists of only within-family mergers, it is not surprising to observe even more significant differences in discounts and expense ratios of target and acquiring closed-end funds.

3.5. Measurement of Abnormal Returns

The event study methodology is followed to obtain the average daily abnormal return to the announcement of merger. The market model using equally-weighted market returns is estimated for the period, -250 to -31 in event time. Abnormal returns are computed as the difference between the actual returns and the expected returns.¹² The average daily abnormal return of closed-end funds merging with other closed-end funds is:

$$AAR = \frac{1}{n} \sum_{i=1}^n AR_{i,t}$$

12 Our results are robust when we employ the CRSP value weighted index. To the extent that the share of a closed-end fund responds to the broad market movement, irrespective of the nature of the fund portfolio, our use of the CRSP index is reasonable. However, there is a possibility of an omitted index when we obtain the abnormal returns of international funds and bonds funds by only using the CRSP index.

where n is the sample size, and $AR_{i,t}$ is the abnormal return of the i^{th} closed-end fund at time t . The cumulative average abnormal daily return over a period is:

$$CAR_{t_0}^T = \sum_{t_0}^T AR_t$$

To examine the statistical significance of the abnormal returns a z – statistic is computed: , where n is the sample size, and \bar{SAR}_t is the average standardized abnormal return on day t .¹³

4. Results

4.1. Announcement Date Abnormal Returns

The portfolio returns around the announcement date for the sample of 90 mergers are shown in Table 5. First column identifies the trading day relative to the event day (day 0), second column presents the portfolio average daily abnormal returns, and third column reports the z -statistic values. Column 4 and 5 in Panel A report the percentage of positive and negative returns; and the binomial z -statistic corresponding to the percentage of positive observations, respectively.

Panel A in Table 5 summarizes announcement day abnormal returns for the closed-end funds announcing merger for a period of 21 days surrounding the announcement date. The mean announcement day abnormal return for the sample is 0.26% with a significant z -value of 2.10. Abnormal return ranges from a low of –2.87% to a high of 5.64%. Fifty-eight (64%) exhibit

$\frac{SAR_t}{\sqrt{\frac{1}{n} \sum SAR_t^2}}$ is the standard deviation of the residuals in the market model estimation period; the number of days in the estimation period; the return to the equally –weighted market portfolio on day t , and the mean return to the market portfolio over the estimation period. The standardized abnormal return (SAR) on day t is computed as:

positive abnormal returns, and thirty-two funds (36%) experience negative abnormal returns with the corresponding, highly significant z-statistic of 2.74 for percent positive¹⁴.

The day following the announcement date shows an average abnormal return of 0.12% which is not significant.

Day 0 and day 1 are designated the announcement period. Panel B in Table 5 cumulates the average abnormal return on the portfolio and reveals that the announcement period has an abnormal return of 0.37% with a significant z-statistic value of 2.23. The 10-days period surrounding the post-announcement period shows a significant cumulative abnormal return of 1.01%.

Unreported results for the portfolio returns around the announcement date for the sample of 60 acquiring funds exhibit an average abnormal return of -0.18%, which is not significant.

5. Cross-Sectional Analysis

5.1. Variables

In this section, we examine the cross-sectional variation in the information content revealed by the announcement of merger. The selection of some of the variables is motivated by previous research on closed-end funds open market stock repurchases and liquidations.

The variable called Expected Return is computed based on the pre-announcement discount as the ratio of Discount / (1 – Discount). The Expected Return variable has a mean (median) of

¹⁴ Binomial z-statistic is computed as: $z = \frac{p - p_0}{\sqrt{p_0(1-p_0)/n}}$; where p is the percentage positive observations, p_0 is the expected percentage positive (50%) under the null, and n is the sample size.

8.46% (7.70%) and ranges between 34.34% and -4.73%. We expect a positive relationship between abnormal returns and *Expected Returns*.

Turnover is measured as the average market activity ratio of a fund as average of the ratio of daily volume divided by number of outstanding shares over the estimation period. We expect a negative relation between trading turnover and abnormal return. The more liquid funds will get lower abnormal returns than the less liquid funds.

Fund Size is measured as the log of the market value of equity on the day before the merger announcement. Jayaraman, Khorana and Nelling (2002) find that target funds are significantly smaller in asset size than acquiring funds. Thus, we expect *Fund Size* to be negatively related to the abnormal return.

Discount Volatility is computed as the standard deviation of the discounts in the 12 months preceding the announcement. We expect that if a fund exhibits a relatively high level of variation in discount over time, such variations may be due to relative uncertainty of valuation of assets. That is, a high degree of discount variation may suggest illiquid assets in the closed-end fund's portfolio. Abnormal returns should be lower if the asset quality is doubtful. We expect a negative relationship between abnormal returns and Standardized Discount Volatility.

Age is the natural logarithm of fund age computed in years. Assuming that older funds will be more established and well-known in the market, we expect to observe a negative relationship between the age of the fund and abnormal return.

In open-end fund mergers, target companies are found to incur higher expense ratios than acquiring funds. We expect to find the same relationship for closed-end funds. Thus, *Expense Ratio* variable is expected to be negatively related to the abnormal return.

Our model is:

$$AR = \alpha + \beta_1 \text{Expected Return} + \beta_2 \text{Turnover} + \beta_3 \text{Size} + \beta_4 \text{Discount Volatility} + \beta_5 \text{Age} + \beta_6 \text{Expense Ratio}$$

We expect a positive coefficient estimates for β_1 and negative for the remaining variables.

5.2. Discussion of Results

The cross-sectional regression results are presented in Table 6, with robust standard errors reported below the coefficients. The *Expected Return* variable is positive, and significantly different from zero. The *Turnover* variable is negative, but not statistically significant in both models. However the negative coefficient suggests that lower turnover stocks gain more upon announcement compared to higher turnover stocks. Information gets impounded into the more actively traded stocks more rapidly. The negative *Turnover* coefficient suggests the potential for informational asymmetry and agency considerations in the lower turnover stocks.

The coefficient estimates for *Fund Size* is not significantly different from zero but its sign is as expected. The *Standardized Discount Variability* is negative and insignificant; suggesting that greater variability in discounts induces a higher abnormal return response. The *Age* variable is negative and insignificant; suggesting that younger funds exhibit higher abnormal returns. Lastly, the coefficient estimates for *Expense Ratio* of the target funds is positive and insignificant.

These results indicate that the price increase for the sample of closed-end funds from the announcement of merger is directly related to the magnitude of percentage discount. In other words, abnormal returns from merger announcements are associated with the value derived from capturing the discount.

6. Conclusion

Despite the importance of exit decisions to the mutual fund industry, Jayaraman, Khorana, and Nelling (2002) and Zhao (2005) are the only published studies dedicated exclusively to the topic. There is no specific research on closed-end funds.

This paper examines discounts and expense ratios of the closed-end funds of within family mergers exit form. Using a sample of 90 U.S. closed-end funds merger announcements between 1994 and 2005, this study documents a significant average abnormal return of 0.37 % during the announcement period. The average discounts of the target closed-end funds in the sample is reduced from a discount of 7.46% prior to the announcement to a discount of 6.80% prior to the merger while the average discounts of the acquiring funds increased from 6.20% to 7.71% for the same period. Following the merger, the average expense ratio of the surviving funds increases to pre-merger target funds level of 1.29%.

Cross-sectional analysis reveals that the announcement return is positively related to the size of the discount. However, the announcement reaction is not related to the volatility of the discount.

Table 1: Distribution of Sample

The sample consists of 90 mergers of exchange-listed closed-end funds with other closed-end funds from 1994 to 2005. The time distribution of the sample is shown in Panel A. Panel B indicates the number of target funds belonging to different broad classes by investments. Panel C presents the number of surviving funds belonging to different broad classes by investments.

Panel A	
Year	Frequency
1994	13
1995	12
1996	3
1997	5
1998	3
1999	1
2000	28
2001	8
2002	3
2003	0
2004	0
2005	14
Total	90

Panel B	
Type	Frequency
Single State Muni Bond	60
National Muni Bond Fund	15
High Yield Bond Fund	4
US Government Bond	3
World Equity Fund	3
World Income Fund	3
Other Domestic Taxable Bonds	1
Specialized Equity Funds	1
Total	90

Panel C	
Type	Frequency
Single State Muni Bond	40
National Muni Bond Fund	11
High Yield Bond Fund	1
US Government Bond	1
World Equity Fund	1
World Income Fund	4
Other Domestic Taxable Bonds	1
Mortgage Fund	1
Total	60

Table 2: Size and Price Statistics

Panel A presents summary statistics regarding the size, price, NAV, number of days between announcement and merger dates, and age for the target funds at the announcement date. Panel B presents summary statistics regarding the size, price, NAV, and age for the surviving funds.

Panel A					
Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Market value of equity (millions of \$)	87.66	67.02	85.49	20.41	557.36
Shares outstanding (millions)	8.49	5.60	11.44	1.68	78.23
Price per share (\$)	11.79	12.13	2.37	3.82	16.50
Net asset value (\$)	12.87	13.00	2.66	3.77	19.37
Number of days between announcement and merger	128.33	124	66.97	9	266
Age of the fund (years)	5.39	3	5.15	1	17

Panel B					
Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Market value of equity (millions of \$)	185.07	123.56	147.49	65.22	632.62
Shares outstanding (millions)	16.17	10.37	15.26	4.42	58.70
Price per share (\$)	12.71	13.19	2.61	7.56	16.50
Net asset value (\$)	12.53	13.00	2.39	5.06	16.11
Age of the fund (years)	6.31	5	4.44	1	17

Table 3: Summary of Closed-End Fund Discounts

Panel A presents the pre-announcement discounts summarized for the 90 closed-ended funds that announced merger during the 1994 to 2005 period. Panel B presents the pre-announcement and post-merger discounts summarized for the 60 closed-ended funds survived.

Panel A: Target Funds					
Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Discount 12 months prior to announcement (%)	5.97	6.61	7.78	-17.86	23.71
Discount 6 months prior to announcement (%)	6.54	5.72	6.40	-13.62	24.83
Discount 1 month prior to announcement (%)	7.18	6.92	5.98	-5.60	29.35
Discount for week prior to announcement (%)	7.46	7.15	5.55	-4.97	25.56
Discount for week subsequent the announcement (%)	7.29	7.37	5.22	-3.98	24.28
Discount for week prior to merger (%)	6.80	6.35	5.14	-6.32	24.72
Panel B: Surviving Funds					
Discount 12 months prior to announcement (%)	3.64	4.18	6.69	-11.65	22.45
Discount 6 months prior to announcement (%)	4.26	3.49	5.98	-12.16	25.84
Discount 1 month prior to announcement (%)	6.99	6.56	5.67	-5.26	25.91
Discount for week prior to announcement (%)	6.20	6.19	5.89	-14.09	25.84
Discount for week subsequent to announcement (%)	6.38	7.08	5.94	-8.81	25.57
Discount for week prior to merger (%)	6.54	7.08	5.86	-13.92	26.51
Discount for week subsequent to merger (%)	7.71	7.46	6.28	-9.23	25.08
Discount for week 1 month subsequent to merger (%)	8.15	9.34	6.55	-7.03	22.41
Discount for week 3 months subsequent to merger (%)	8.26	8.93	5.84	-7.56	22.12
Discount for week 6 months subsequent to merger (%)	6.56	7.37	6.23	-19.62	20.49
Discount for week 12 months subsequent to merger (%)	4.64	7.53	8.77	-32.07	18.75

Table 4: Expense Ratios

The table presents expense ratios before the merger announcement, after the merger and their differences for target and surviving funds. Expense ratios net of interest expenses are collected from annual reports in the Edgar Archives (forms N-30D and N-CSR). Parentheses contain p-values; ***, **, * denote significance levels of 1%, 5% and 10%, respectively.

	Mean	Median	Standard Deviation	Minimum	Maximum
Target pre-announcement (T)	1.29	1.22	0.49	0.63	3.36
Surviving pre-announcement (S_{pre})	1.15	1.14	0.36	0.48	2.54
Difference ($T - S_{pre}$)	0.14*** (<0.00)	0.11	0.40	-1.33	2.16
Surviving Post-merger (S_{post})	1.29	1.21	0.49	0.51	3.06
Change ($S_{post} - S_{pre}$)	0.14*** (<0.00)	0.05	0.34	-0.38	1.67

Table 5: Abnormal Announcement Returns

This table presents the event study results relative to the merger announcement day for a sample of 90 closed-ended funds that announced merger with other closed-end funds during the 1994 to 2005 period. The market model with equally-weighted market return is estimated over the period -250 to -31. Panel A presents the abnormal portfolio return, z-statistics, percentage of positive and negative observations, and binomial z-statistics for positive abnormal returns. Panel B shows the summary CAAR and the corresponding z-statistics; and ***, **, * denote significance levels of 1%, 5% and 10%, respectively.

Panel A				
Day	Average Abnormal Return (%)	z-stat	Percentage of positive: negative	Binomial z-stat of percentage positive
-10	0.014	0.41	54: 46	0.84
-9	0.093	0.87	51: 49	0.21
-8	-0.006	-0.70	50: 50	0.00
-7	-0.077	-0.71	44: 56	-1.05
-6	-0.022	-0.41	44: 56	-1.05
-5	0.039	0.09	50: 50	0.00
-4	-0.029	-0.47	50: 50	0.00
-3	-0.059	-0.29	49: 51	-0.21
-2	-0.072	-0.93	44: 56	-1.05
-1	0.158	1.16	57: 43	1.26
0	0.256	2.10**	64: 36	2.74***
1	0.118	1.05	47: 53	-0.63
2	0.297	2.57***	66: 34	2.95***
3	0.015	0.31	59: 41	1.69*
4	0.082	0.59	53: 47	0.63
5	-0.048	0.47	50: 50	0.00
6	0.043	-0.53	51: 49	0.21
7	0.142	0.89	54: 46	0.84
8	0.207	1.18	56: 44	1.05
9	0.106	0.78	61: 39	2.11**
10	0.217	1.72*	58: 42	1.48

Panel B		
Period	Cumulative Average Abnormal Return (%)	z-stat
(-10, -1)	0.039	-0.31
(0, 1)	0.374	2.23**
(2, 10)	1.061	2.66

Table 6: Cross-Sectional Analysis of Announcement Returns

Expected Return computed as $\text{Discount}/(1 - \text{Discount})$ by using the discount observed one week prior to the announcement date; Turnover is calculated as the average of the ratio of daily volume to shares outstanding in the estimation period; Fund Size is log of total market value of equity; Discount Volatility is the standard deviation of discounts in the 12 months preceding the announcement; Age is log of age of the closed-end fund at the time of merger announcement; Target Expense Ratio is the expense ratio of the target fund before the merger announcement. Robust standard errors for the regression coefficients are shown in parentheses; and ***, **, * denote significance levels of 1%, 5% and 10%, respectively.

	Robust OLS
Intercept	1.75 (2.05)
Expected Return	6.04** (3.05)
Turnover	-0.07 (0.16)
Fund Size	-0.17 (0.18)
Discount Volatility	-1.50 (1.62)
Age	-0.08 (0.09)
Target Expense Ratio	0.05 (0.30)
Adjusted R ²	11.91%
F-value	1.87*
Probability	0.09

References

Baumol, William J., Stephen M. Goldfeld, Lilli A. Gordon, and Michael F. Koehn, 1980, *The economics of mutual fund markets: Competition versus regulation*, Kluwer Academic, Boston.

Brauer, Gregory A. Open-Ending Closed-End Funds, *Journal of Financial Economics* 13 (1984), 491-507.

Brickley, James A. and James S Schallheim. Lifting the Lid on Closed-End Investment Companies: A Case of Abnormal Returns, *Journal of Financial and Quantitative Analysis* 20 (1985), 107-117.

Brown, S., and W. Goetzmann, 1995, Performance persistence, *Journal of Finance* 50, 679-698.

Carhart, Mark M., 1997, On Persistence in Mutual Fund Performance, *Journal of Finance* 52.

Carhart, Mark M., 1997, On Persistence in Mutual Fund Performance, *Journal of Finance* 52.

Chevalier, Judith, and Glenn Ellison, 1997, Risk Taking by Mutual Funds as a Response to Incentives, *Journal of Political Economy* 105, 1167–1200.

Chevalier, Judith, and Glenn Ellison, 1999, Career Concerns of Mutual Fund Managers, *Quarterly Journal of Economics* 114, 389–432.

Chordia, Tarun, 1996, The Structure of Mutual Fund Charges, *Journal of Financial Economics* 41, 3–39.

Collins, Sean, and Phillip Mack, 1999, Some Evidence on Scope, Scale, and X-Efficiency in U.S. Mutual Funds, Working Paper, Reserve Bank of New Zealand.

Cremers, M., Driessen, J., Maenhout, P., Weinbaum, D., 2006. Does skin in the game matter? Director incentives and governance in the mutual fund industry, Working Paper, Yale University.

Deily, M. E. 1988. Investment activity and the exit decision. *Review of Economics and Statistics*, 70, 595–602.

Del Guercio, Diane, Larry Dann, and Megan Partch. Governance and Boards of Directors in Closed-End Investment Companies, *Journal of Financial Economics* 69 (2003), 111-152.

Ding, B. 2006, Mutual Fund Mergers: A Long-Term Analysis, working paper, State University of New York at Albany.

Ding, B. 2006, Mutual Fund Mergers: A Long-Term Analysis, working paper, State University of New York at Albany.

Ding, B., Wermers, R., 2005. Mutual fund performance and governance structure: The role of portfolio managers and boards of directors, Working Paper, State University of New York at Albany and University of Maryland.

Dimson, Elroy and Carolina Minio-Kozerski. Closed-End Funds: A Survey. *Financial Markets, Institutions and Instruments* 18 (1999), 1-41.

Doi, N. 1999. The determinants of firm exit in Japanese manufacturing industries. *Small Business Economics*, 13, 331–37.

Elton, Edwin J., Martin J. Gruber, and Christopher R. Blake, 1996, Survivorship Bias and Mutual Fund Performance, *Review of Financial Studies* 9, 1097–1120.

Grinblatt, Mark, and Sheridan Titman, 1989, Mutual fund performance: an analysis of quarterly portfolio holdings, *Journal of Business* 62, 393–416.

Grinblatt, Mark, Sheridan Titman, and Russ Wermers, 1995, Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior, *American Economic Review*, 85, 1088-1105.

Gruber, Martin. J., 1996, Another Puzzle: The Growth in Actively Managed Mutual Funds, *Journal of Finance* 51, 783–810.

Indro, D.; Jiang, C.; Hu, M.; and Lee, W. 1999. Mutual fund performance: Does fund size matter? *Financial Analysts Journal*, 55, 74–87.

Ivkovich, Z. 2002, Spillover in Mutual Fund Families: Is Blood Thicker than Water, working paper, University of Illinois.

Jayaraman, Narayanan, Ajay Khorana, and Edward F. Nelling, 2002, An Analysis of the Determinants and Shareholder Wealth Effects of Mutual Fund Mergers, *Journal of Finance*, 57, 1521–1551

Jensen, Michael C., 1968, The Performance of Mutual Funds in the Period 1945-1964., *Journal of Finance*, 23, 389–416.

Khorana, Ajay, 1996, Top Management Turnover: An Empirical Investigation of Mutual Fund Managers, *Journal of Financial Economics*, 40, 403–427.

Khorana, Ajay, 2001, Performance Change Following Top Management Turnover: Evidence from Open-End Mutual Funds, *Journal of Financial and Quantitative Analysis*, 36, 371–394.

Khorana, A, and H. Servaes, 1999, The determinants of mutual fund starts, *Review of Financial Studies*, 12, 1521-1551.

Khorana, Ajay, Peter Tufano, and Lei Wedge, 2007, Board structure, mergers, and shareholder wealth: A study of the mutual fund industry. *Journal of Financial Economics*, forthcoming.

Latzko, David. Economies of Scale in Mutual Fund Administration, *Journal of Financial Research* 22 (1999), 331-339.

Massa, Massimo, 2003, How do family strategies affect fund performance? When performance maximization is not the only game in town, *Journal of Financial Economics* 67, 249–304.

Meschke, Felix, 2006, An Empirical Examination of Mutual Fund Boards, Working Paper, University of Minnesota.

Nanda, Vikram, Jay Wang, and Lu Zheng, 2004, The abcs of mutual funds: A natural experiment on fund flows and performance, working paper, University of Michigan.

Perold, A. and Salomon, R. 1991. The right amount of assets under management. *Financial Analysts Journal*, 47, 31–39.

Rea, John D., Brian K. Reid, and Kimberlee W. Millar, 1999, Operating Expense Ratios, Assets, and Economies of Scale in Equity Mutual Funds, *Investment Company Institute Perspective* 5, 1–16.

Reynolds, S. S. 1998. Plant closings and exit behavior in declining industries. *Economica*, 55, 493–503.

Sapir, Michael L., and James A. Bernstein, 1995, Reorganization of Investment Companies, *The Business Lawyer* 50, 817–877.

Siegfried, J. J. and Evans, L. B. 1994. Empirical studies of entry and exit: A survey of the evidence. *Review of Industrial Organization*, 9, 121–55. Smith, Clifford W. Investment Banking and the Capital Acquisition Process, *Journal of Financial Economics*, 15 (1986), 3-29.

Tufano, Peter, and Matthew Sevick, 1997, Board Structure and Fee-Setting in the U.S. Mutual Fund Industry, *Journal of Financial Economics* 46, 321–355.

Weiss, Kathleen. ,1989, The Post-Offering Price Performance of Closed-End Funds, *Financial Management*, 18, 57-67.

Wermers, Russ, 2000, Mutual Fund Performance: An Empirical Decomposition Into Stock-Picking Talent, Style, Transaction Costs, and Expenses, *Journal of Finance* 55, 1655–1695.

Yermack, David, 1996, Higher market valuation of companies with a small board of directors, *Journal of Financial Economics* 40, 185–211.

Zhao, Xinge. 2005. Exit Decisions in the U.S. Mutual Fund Industry, *Journal of Business*, 78, 4, 1365-1401.

Zitzewitz, Eric, 2003, Who cares about shareholders? Arbitrage-proofing mutual funds, *Journal of Law, Economics, and Organization* 19, 245–281.