Good Stewards, Cheap Talkers, or Family Men? The Impact of Mutual Fund Closures on Fund Managers, Flows, Fees, and Performance

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We examine a sample of 125 equity mutual funds that closed to new investment between 1993 and 2004. We find that funds close following a period of superior performance and abnormal fund inflows. Fund managers raise their fees when they close to compensate managers for losses in income due to the restrictions in size imposed by the fund closure decision. Managers reopen when fund size declines. However, they do not earn superior returns after reopening, suggesting that the fund closure decision does not provide information about superior fund managers. (*JEL* G14, G23)

"Go away" isn't what you want to hear from a company with which you'd like to do business. But in the case of mutual fund managers who are turning away potential investors in their funds, that message may be a signal to consider a firm's other offerings or watch for future reopenings. . . ."Closing funds is one of the better indicators that a fund company is putting fund investors' long-term interests ahead of its own short-term profit goals," says Russel Kinnel, director of fund research at Morningstar Inc. in Chicago. . . .

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> A willingness of fund managers to close portfolios before they become too bloated is one factor Morningstar considers in assigning what it calls stewardship ratings that are intended to reflect how well a fund serves shareholders. At the 10 largest fund firms with at least half of their funds closed to new investors, all the funds that have been assigned those relatively new ratings are rated A or B on the A-to-F scale.[1]

Why would a mutual fund manager choose to close a fund? Mutual fund managers are typically compensated as a percentage of assets under management, so at first blush it appears that by closing their funds, managers are reducing their compensation. Managers typically claim that they close funds to protect investor returns.[2] The above quote suggests that rating agencies such as Morningstar also view fund closures as beneficial to investors. In reality, however, this claim is implausible. Any mutual fund can increase investor returns by decreasing its size, so if that really was the mutual fund's objective, all funds would be closed. Why then do mutual funds close?

In this article, we hand-collect a unique and comprehensive sample of 125 open-ended equity funds that closed to new investors between January 1993 and December 2004, a total of 140 closing events, and examine the impact of the closure decision on fund performance, fund flows, and fees. Closing funds prohibit fund purchases by new investors and operate only with existing assets and, in some cases, with new money from existing investors. An example is the Fidelity Magellan Fund, the largest mutual fund in the United States, which closed to new investment in 1997.[3]

We test three hypotheses on the relation between postclosing performance and inflows. The *good steward* hypothesis postulates that managers close their funds to restrict inflows and maintain fund performance. These funds should be able to maintain their superior performance after they close. The *cheap talk* hypothesis argues that closing does not impose a cost on the fund either if existing investors continue to contribute new funds or if fund closing is accompanied by an increase in fees. The combination of a higher fee and continued inflows from existing investors may be adequate to compensate fund managers for the cost of closing.

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[1] See Damato, K., 2005, "To Close or Not to Close a fund? Turning Away Potential Investors Can Help Performance, But Letting Everyone In Could Bolster Profits," *Wall Street Journal*, September 9, 2005: p. C1.

[2] For example, Bill McVail, portfolio manager of the Turner Small-Cap Growth Fund, recently closed it to new investors and was quoted in the *Wall Street Journal* as saying "We want to make sure we can perform for our clients. If we left it open, it would have compromised our ability to provide value." (See Talley, K., 2005, "Sorry, This Small-Cap Fund Is Full – More Managers Close Door to Potential New Investors, Citing the Stocks' Illiquidity," *Wall Street Journal*, August 22, 2005: p. C13.)

[3] See Gasparino, C., and S. E. Frank, 1997, "Magellan: Closing the Door – Magellan's Lead May Be Followed," *Wall Street Journal*, August 28, 1997, p. C17.

The *family spillover* hypothesis postulates that closing a popular fund diverts attention to other, ostensibly less popular funds managed by the same fund family. This hypothesis implicitly assumes that the impetus to close comes from trustees or senior executives at the fund, rather than from the individual portfolio manager, as is the case with the other two hypotheses.

We first document that, across the universe of mutual funds, consistent with Chen et al. (2004), fund returns decline with fund size. However, fund returns do not simply decline linearly with fund size alone. Fund returns are also inversely related to fund inflows. For funds experiencing low inflows, future performance is not related to the size of the fund. The negative relation between fund size and returns, documented by Chen et al., occurs when the funds experience large inflows from investors.

The closing funds in our sample close following a period of superior performance and large inflows. In the year before closing, they earn statistically significant style-adjusted excess returns of 15% and significant monthly four-factor αs of 1%. Over the same period, they experience style-adjusted excess fund inflows of 98%. At the time of closing, funds in our sample are roughly 40% larger than the median fund in their corresponding investment styles.[4]

Closing the fund is effective in stemming the inflows. In the year after closing, the cumulative raw and style-adjusted excess flows drop to –3 and –6%, respectively. In other words, closing the fund imposes real constraints on fund inflows.

However, we find little evidence to support the good steward hypothesis. The average closed fund earns a monthly four-factor α of 0.15% in the year after closing, significantly lower than the α before closing.

Consistent with the cheap talk hypothesis, fund closing does not adversely affect managerial compensation. Closing fund managers raise their gross advisory fee (as a percent of TNAs) on average from a preclosure level of 0.86% to a postclosure level of 0.90%. The difference is statistically significant. More importantly, it is also hugely economically significant. A naive investor might look at the increase in fees of 0.04% and think of it as a small number. It is not. To put this number into perspective, consider a mutual fund that closes when it has $1 billion under management. By increasing fees from 0.86 to 0.90%, the manager earns an additional $400,000. In contrast, if the manager does not increase the fees he charges, to earn the same additional amount, the manager must increase the *excess* return he generates by 4%. In our

[4] Style-adjusted returns are calculated every month by taking the difference of the fund's return and the average return of all the other funds that have the same investment objective as the closing/reopening fund. In measuring style-adjusted flows and relative size [relative total net assets (TNAs)] of the fund, we use median flow to and median TNA of the other funds with the same investment objective.

sample, the average increase in percent advisory fees translates roughly to an increase of $7 million in managerial compensation, in dollar terms.

There is little evidence to support the family spillover hypothesis. Median inflows into the fund family increase by 1.3% in the month of closing. The increase is only temporary however, as inflows drop to preclosure levels two months after closing. Moreover, any additional inflow to the fund family around the time of closure is almost completely offset by outflows from the family when these funds reopen at a later date.

Sixty-six funds in the sample reopened at least one year after closing. The good steward hypothesis predicts superior performance after reopening, as managers reopen when the size of their fund has declined to a level that enables them to earn superior returns. We find that funds reopen after sustaining a significant drop in TNAs during closure. Reopening funds shrink from being 1.5 times as large as the median fund in the same investment style in the month of closure to being only 1.1 times as large in the month of reopening. Inconsistent with the good steward hypothesis, investors in these funds do not earn excess returns after the fund reopens. Both the four-factor α and cumulative style-adjusted abnormal returns are insignificant in the 12 months after reopening. More importantly, during the year before reopening, these funds actually earn negative risk-adjusted returns. In the year before reopening, the four-factor α for the reopening funds is –0.1%, and the annual abnormal return over the style benchmark is a significant –3.8%. These numbers are even lower than the funds' performance in the year after closure. The worsening performance over the closure period and the evidence of poor performance before reopening do not support the good steward hypothesis, as the fund management cannot be acting on improved fund performance before reopening.

Overall, our results are most consistent with the cheap talk hypothesis. Mutual funds that close do not earn excess returns after they close or they reopen. Although managers of these funds do face real restrictions on the inflows, they reduce the costs to them by increasing fees. The family the fund belongs to does not benefit materially except in the short term around the fund closure decision, and even this marginal gain disappears for the most part when the fund reopens.

Our article also contributes to the nascent literature on the scalability of active portfolio management. As we note above, we add to Chen et al. (2004) by documenting that while fund returns decline with lagged fund size, this relationship is significant only for funds that earn large inflows. For funds with low inflows, the size is not significantly related to returns.

The rest of this article is organized as follows. In Section 1, we describe the hypotheses in more detail, along with a discussion of the academic literature. In Section 2, we describe the data. Section 3 presents our results, and Section 4 concludes.

1. Hypotheses

The *good steward* hypothesis tests whether managers who close mutual funds indeed earn excess returns. Academic studies have shown that, although mutual fund investors seem to chase performance [Chevalier and Ellison (1997), Sirri and Tufano (1998)], there is little evidence that the relative performance of mutual fund managers persists over time. These findings raise important questions on investor rationality—investors seem to devote attention to evaluating the past performance of mutual fund managers and direct investments into funds on that basis, even though past and future performance appear to be unrelated. Berk and Green (2004) derived a model of rational investors who choose to invest in funds that have performed well. They argued that funds that perform well, and subsequently receive large inflows, do not outperform passive benchmarks because of decreasing returns to scale in active portfolio management. The good steward hypothesis follows this line of reasoning to predict that superior managers serve their shareholders by limiting fund inflows. For reopening funds, the good steward hypothesis predicts that funds reopen when the size of the fund has declined to the level the funds generate abnormal returns. Consequently, the good steward hypothesis argues that after reopening, managers can sustain performance at their prereopening levels.

One alternative to the good steward hypothesis is the *cheap talk* hypothesis. Like the good steward hypothesis, this hypothesis argues that managers close when the fund becomes larger than optimal. However, very few mutual funds actually close completely—almost all remain open to existing investors. If the flows from existing investors are sufficient, there may not be any real cost to closing. In addition, mutual fund managers can also raise their fees. The cheap talk hypothesis posits that instead of taking their pay increase from the inflow of new capital, mutual fund managers can just as easily take their pay increase by raising their fees. Warner and Wu (2005) documented that high asset growth increases the likelihood of a mutual fund advisory contract change. These rate changes occur in both directions and are substantial, with typical percentage fee shifts exceeding one-fourth. Managers at closing funds have an opportunity to increase their fees following the increase in net asset values in the period before fund closure. This is also consistent with Berk and Green (2004) in that here managers choose to extract rents by raising their fees after closing, rather than by choosing not to close and allowing inflows.

Our third hypothesis, the *family spillover* hypothesis postulates that closing a popular fund diverts attention to other, ostensibly less popular funds managed by the same fund family. Zhao (2004) found evidence that fund families signal their superior performance by closing a star fund,

thereby attracting attention to other relatively obscure funds in the same family. The family spillover hypothesis differs from the other two hypotheses in that the decision to close is made by trustees or senior executives at the fund, rather than by fund managers, as is the case with the other two hypotheses. In addition, neither the cheap talk nor the family spillover hypothesis makes predictions about post-reopening performance. They also do not have any implications for why managers might choose to reopen.

These hypotheses are not mutually exclusive. For example, it is plausible that closed funds that attract enough investment from current investors and who consequently do not face any costs from closing may also be able to gather added benefits from marketing other funds in the same family.

To our knowledge, there are only three studies that have investigated why mutual funds close and none that have examined mutual fund performance after the funds subsequently reopen. Manakyan and Liano (1997) examined the performance of mutual funds before and after closing in a sample of 27 mutual funds between 1978 and 1994 and found no evidence that funds earn superior returns relative to their benchmarks in the three years after closing. Zhao (2004) examined a sample of 139 equity and bond funds that closed to new investment between 1992 and 2001. He found no evidence that closing a fund protects its performance. Instead, he found weak evidence that fund closures are accompanied by higher short-run inflows to other funds in the same family.[5] These results are consistent with Smaby and Fizel (1995) who examined a sample of 25 funds that closed between 1982 and 1992. They reported that funds in their sample do not earn significant excess returns in the 24 months after closure and underperform relative to their own preclosing performance.

2. Data

We rely on multiple sources to construct our sample of closing and reopening funds. The primary data source is the Factiva news archive, which we search using variations of keywords such as "mutual fund closures," "fund closed to new investors," and "fund reopening." We supplement this source by obtaining data from Lipper Analytical Services in December 2001 and from Morningstar Principia in December 2001 and March 2005. These data include information on all funds that were closed to new investors as of the date we obtain the data. We cannot rely exclusively on these data sets because they do not list funds that had

[5] Zhao's (2004) study is probably the closest study to ours in terms of the sample size. Zhao's sample includes 87 US domestic funds, 44 bond funds, and 17 international funds. In contrast, our sample includes 140 closures by US domestic firms (we exclude international funds and bonds funds) making our study the most comprehensive study of US equity fund closures.

previously closed to new investors but have since reopened. We supplement these data by calling each fund that was closed to enquire whether any other funds in their fund family had closed to new investors in the past and, if so, the dates of closing and reopening. This process also helps us verify the dates of closing as reported by Morningstar and Lipper.

Our initial data set consists of a sample of 166 funds that closed to new investors between 1993 and 2004. Our main source of data on fund size, returns, loads, and expenses is the Center for Research in Security Prices (CRSP) Mutual Fund Database. For our sample of closing and reopening funds, in addition, we hand-collect data from N-SAR reports (periodic reports filed by registered investment companies under Section 13(a) or 15(d) of the Exchange Act) to calculate management fees. We discard funds that have no return data on CRSP in the preclosure period, no data on management fees, and those that reopen in less than a year.[6] We impose the last restriction because we require at least 12 monthly observations to compute Jensen's α and four-factor αs for the funds. Nine of the funds that remained were international funds, which were eliminated from the sample. The 125 remaining funds represent 206 events, of which 140 events are fund closings and 66 events represent fund reopenings. One of the main problems with the CRSP data for the purpose of this study is that it is reported on a share class basis. Because fund level information, such as fund flows and fund TNAs, is crucial for our analysis, we recreate the entire data set by merging different share classes of the same fund to obtain fund level statistics. Fund level TNA is obtained by aggregating TNAs of all share classes. Fund-level monthly returns, expense ratios, loads, and 12b-1 fees are obtained by averaging corresponding statistics across the different share classes. This process also helps us avoid double counting by using fund level information rather than share class information.[7]

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[6] Over 60% of the funds in the sample close and subsequently reopen. Sixty-one funds in the sample closed once and did not reopen before the end of our sample period. Of the remaining funds, 67 reopened after the first closure. 29 funds closed more than once during the sample period, with three funds closing and reopening four times over the sample period. For the closing funds that reopened, the average (median) length of time the funds stay closed is 20 (17) months, and 34 (16) fund closures lasted less than 12 (6) months. The maximum (minimum) length is 71 (1) months between closing and reopening. We eliminate all events where the fund reopened less than 12 months after it closed. For our final set of 66 reopening events, the average (median) length of time the funds stay closed is 27 (24) months.

[7] To avoid double counting, a commonly used technique in the literature is to use only the primary share classes for the funds with multiple share classes. This technique has several problems for our purpose. First, if the remaining share classes are as large as the primary share class, as is generally the case, this results in a loss of information and would potentially yield incorrect inferences on return-size and return-flow relations. Second, in some cases, institutional share classes are the largest share class in the fund. If the size of a share class is used in determining the primary share class of the fund, this would result in choosing the institutional share class of the fund as the primary share class. Because these share classes have very different load, 12b-1 fee, and expense ratio characteristics than an average share class of the fund, using them to represent the fund would yield distorted estimates of load and expense ratios. Third, the size of a given share class changes over time. Using the size of the share class to identify the primary share class, a third approach, will result in different share classes representing the same fund over time. This creates problems of discrete jumps for the variables used. Finally, if we use the same share class all

Table 1 reports the characteristics of the sample. Panel A summarizes the sample selection process. Panel B reports data on the distribution of fund closings by year. Over 65% of our sample of funds closed in the period 1998–2003. The largest proportion of fund closures (17%) occurred during 2000. Interestingly, we find that the largest proportion of fund reopenings is concentrated in these years as well. In our sample, 86% of the funds reopened between 1998 and 2003. Panel C reports the distribution of sample funds by fund objective, as classified by Investment Company Data Inc. (ICDI). The ICDI fund objective is a two-character code that uses Standard & Poor's Fund Services to identify the fund's investment strategy.

According to the ICDI classification, 69% of the closing funds in our sample are classified in the aggressive growth category, and a further 17% are classified as long-term growth. Not surprisingly, these same categories of funds form the largest proportions of our reopening sample (70 and 13%, respectively). In tables not reported, we also use Strategic Insight (SI) fund objective to classify funds. The SI classification shows that 62.5% of the closing funds are classified as small company growth funds. The next two largest categories are growth (13%) and aggressive growth funds (6%). Interestingly, our sample is drawn predominantly from the aggressive growth and small company categories, the same groups where Chen et al. (2004) found a significant negative relation between fund size and performance.

3. Results

3.1 Characteristics of closing funds

Table 2 compares the mean and median characteristics of closing funds with those of the universe of all other equity funds, matched on the date of the closure. We report data on lagged returns, excess returns, standard deviation of returns, TNAs, fund flows, and expenses.

The fund flow over the period $t-1$ to t is defined as[8]

$$\text{Fund flow} = \frac{TNA_t - (1+r_t)TNA_{t-1}}{(1+r_t)TNA_{t-1}}$$

where TNA_t is a fund's TNA at time t, and r_t is the fund's return over the prior month. The monthly Carhart four-factor α [Carhart (1997)] is

the time for the same fund, problems arise as the relative size, fees, and performance of this share class significantly change over time as compared to the remaining share classes. Using fund level data alleviates most of these problems.

[8] We thank the referee for suggesting this approach. This expression differs from what is traditionally used [see, e.g., Sirri and Tufano (1998)] because it has $(1 + r_t)\text{TNA}_{t-1}$ in the denominator rather than TNA_{t-1}. Berk and Xu (2004) discussed potential problems using the traditional measure. Our results are not qualitatively different when we use the traditional measure.

Table 1
Mutual fund sample description

Panel A: Sample funds

	Funds in sample			Closing and opening events		
	Total	Closing	Reopening	Total	Closing	Reopening
Initial sample	166	166	99	323	203	120
After eliminating						
Funds with no return data	165	165	98	319	201	118
Funds with no fee data	155	155	90	290	185	105
Funds that reopen within a year	134	134	64	218	149	69
International funds	125	125	61	206	140	66

Panel B: Fund closures and reopenings by year

	Fund closures	Fund reopenings
1993	2	0
1994	4	0
1995	7	3
1996	12	2
1997	14	2
1998	15	13
1999	12	5
2000	24	8
2001	11	13
2002	22	15
2003	11	3
2004	6	2
Total	140	66

Panel C: Fund closures and reopenings by investment objective

	Number of funds		Number of events	
	Closing	Reopening	Closing	Reopening
ICDI fund objective code				
Aggressive growth	88	43	100	47
Global equity	2	2	2	2
Growth and income	5	2	5	2
Long-term growth	22	8	23	9
Precious metals	1	0	1	0
Sector funds	7	6	7	6
Total return	2	0	2	0
Total	127	61	140	66

Panel A lists the total number of sample funds that closed and/or reopened to new investment between 1993 and 2004. The number of closing and reopening events is larger than the number of funds in the sample because funds may close and reopen multiple times. Panel B reports data on the distribution of the closure and reopening events by year. Panel C reports data on the Investment Company Data Inc. (ICDI) objectives of the sample funds, as reported by the Center for Research in Security Prices (CRSP) survivorship-bias free US Mutual Fund Database. The ICDI fund objective is a 2-character code that identifies the fund's investment strategy, as identified by Standard & Poor's Fund Services.

calculated for funds that have at least nine months of monthly return data before and after closure or reopenings. Fund-level monthly TNAs and returns are obtained from the survivorship-bias free CRSP Mutual Fund

Table 2
Characteristics of closing funds relative to the universe of mutual funds

	Closing funds		Other funds	
	Mean	Median	Mean	Median
Fund one-month-lagged total net assets ($ million)	3365.59	533.30	847.05	148.56
Fund one-month-lagged raw returns (%)	3.62	3.28	1.64	1.76
Fund average raw returns months$_{-6 \text{ to } -1}$ (%)	3.29	2.67	1.15	1.32
Jensen's α (%)	1.65	1.30	0.01	−0.11
Four-factor α (%)	0.96	0.52	−0.08	−0.11
Standard deviation of fund returns over past 12 months (%)	5.97	5.52	4.90	4.40
Mean one-month-lagged fund flow (%)	11.84	6.22	0.98	0.03
Mean fund flow months$_{-6 \text{ to } -1}$ (%)	10.61	6.01	1.34	0.10
Total one-month-lagged load (%)	1.57	0.75	1.90	1.94
One-month-lagged expenses (%)	1.20	1.18	1.13	1.07
One-month-lagged 12b-1 fees (%)	0.23	0.07	0.27	0.25

This table compares mean and median characteristics for closing funds with those for the universe of all other equity funds, matched on the date of the closure. Because funds are aligned on the event month (closure or reopening), the lagged values represent the fund characteristics just before the event month. Fund lagged returns are geometric returns computed by compounding one month returns over an N-month period. Fund flow is defined as $[TNA_t - (1 + r_t)TNA_{t-1}]/[(1 + r_t)TNA_{t-1}]$. The Jensen's α and the Carhart four-factor α are calculated using monthly returns over 12 months before the date of the fund closure (reopening). If the fund does not have 12 months of data before the closing month, all available data are used as long as there is at least nine months of data. The total load is the total of all maximum front, deferred, and redemption fees as a percentage total of loads applied to a fund. The expense ratio (over the calendar year) is the percentage of the total investment that shareholders pay for the mutual fund's operating expenses. The 12b-1 fee is a charge that is deducted from the underlying mutual fund's total assets to cover the cost of distribution and marketing. The value reported is the actual annual percentage of total assets attributed to this expense as of fiscal year end as reported in the prospectus. These variables are obtained, respectively, from the TOT_LOAD, EXPENSES, and _12_B1 variables in the Center for Research in Security Prices (CRSP) Mutual Fund Database.

Database, as are data on fund characteristics such as the investment objective, fund expenses, and loads. The total load is the total of all maximum front, deferred, and redemption fees applied to a fund. The expense ratio (over the calendar year) is the percentage of the total investment that shareholders pay for the mutual fund's operating expenses. The 12b-1 fee is a charge that is deducted from the underlying mutual fund's total assets to cover the cost of distribution and marketing. The value reported is the actual annual percentage of total assets attributed to this expense as of fiscal year end, as reported by CRSP.

Both the good steward and the cheap talk hypotheses assume that funds close when they become large and unwieldy. Our results in Table 2 are consistent with this assumption. To place the size issue in perspective, the median closed fund is over three times larger than the median equity fund in the fund universe. Two factors contribute to the large fund size. First, closing funds experience massive inflows in the months before closure. The average closing fund receives average inflows of 10.6% over the six months before closing, eight times larger than the inflow into the average equity fund in the fund universe. In the month before closure alone, these funds receive inflows of 11.8%. Second, these funds earn high raw and excess

returns in the period before closure. This superior performance in fact helps explain why investors are attracted to these funds. The median closing fund earns twice the return earned by the median fund in the equity universe. Abnormal returns are also larger; the Jensen's α and four-factor αs for the median closing fund are 1.3 and 0.5%, respectively, over the 12-month preclosing period, compared with -0.1 and -0.1%, respectively, for the median fund in the equity universe.[9] The table also summarizes that closing funds attract substantial inflows without having to advertise or otherwise market their funds aggressively. The 12b-1 fees charged by closing funds are marginally lower than those imposed by equity funds that stayed open.

We next estimate a cross-sectional logistic regression to examine the determinants of the decision to close. Using data from the month of closure, we assign a dummy of 1 to the closing fund and 0 to all other funds in the equity sector that remained open. This is our dependent variable. We then stack the data across the fund closure events to create our sample. The results are reported in Table 3.

Consistent with Table 2, larger funds are more likely to close. The coefficient on one-month-lagged TNA is positive and statistically significant in every specification. Fund performance is also a positive predictor of fund closure; higher absolute returns in the six months before closure and the four-factor α in the 12 months before closure are significantly positively related to the likelihood that the fund will close. The level of fund inflows is another significant predictor of the fund closure decision. The coefficients on flows at the one- and six-month horizons are significantly positively related to fund closures.

In addition, the regressions show that fund expenses play a role in a fund's decision to close. The coefficient on fund expenses is positive, which is to be expected. Fund expenses are incurred in trading the securities in the fund, and their magnitude depends on the liquidity of the securities in the fund and on portfolio turnover. Consistent with the univariate results in Table 2, 12b-1 fees are not related to the fund closure decision.

3.2 The relation between size, flows, and performance

Tables 2 and 3 summarize that fund size is an important determinant of the fund closure decision. In this section, we examine why a large fund size presents a problem to fund managers. Chen et al. showed that larger

[9] Results in the article are qualitatively similar if Jensen's α and Carhart's four-factor αs are estimated over a 24-month period. Because our sample period is relatively short and many of the closing funds eventually reopen as early as a year after closure (note that we discard closure and reopening events in cases where funds reopen in less than a year after closure), we focus on the 12-month window before and after closure/reopening to calculate the performance and flow measures. For consistency and ease of comparison, we report Jensen's α and Carhart's four-factor αs estimated over the same period. Expanding the estimation window would mean discarding further events, as the post-closure period would include the reopening event for funds that reopened early.

Table 3
Determinants of mutual fund closures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	−9.579	−10.082	−10.252	−9.884	−10.841	−10.642	−10.829	−10.746
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Fund one-month-lagged total net assets ($ million)	1.017	1.001	1.184	1.061	1.276	1.278	1.288	1.319
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Fund lagged returns months$_{-6 \text{ to } -1}$ (%)		0.283			0.194		0.112	0.126
		(0.00)			(0.00)		(0.00)	(0.00)
Fund one-month-lagged return (%)						0.032		0.021
						(0.01)		(0.12)
Four-factor α (%)				0.577		0.489	0.311	0.362
				(0.00)		(0.00)	(0.00)	(0.00)
Standard deviation of fund returns over past 12 months (%)								−0.063
								(0.07)
Fund lagged flow months$_{-6 \text{ to } -1}$ (%)			0.063		0.050		0.046	0.044
			(0.00)		(0.00)		(0.00)	(0.00)
Fund one-month-lagged flow (%)						0.015		0.004
						(0.00)		(0.03)
Total one-month-lagged load (%)					−0.112	−0.130	−0.107	−0.117
					(0.09)	(0.04)	(0.10)	(0.06)
One-month-lagged expense ratio (%)					0.324	0.354	0.337	0.372
					(0.00)	(0.00)	(0.00)	(0.00)
One-month-lagged 12b-1 fees (%)					−0.516	−0.377	−0.454	−0.366
					(0.28)	(0.41)	(0.33)	(0.43)
N	140,682	140,682	140,682	140,682	140,682	140,682	140,682	140,682

This table reports results for a cross-sectional logistic regression to investigate the characteristics of closing funds. The regression is estimated as follows: We assign the closing fund a dummy of 1 and others 0 and regress this on control variables that proxy for fund performance, advertising, and other expenses. Explanatory variables are as defined in Table 2. The *p*-values are in parentheses.

funds underperform relative to their benchmarks, particularly among funds that invest in small, growth stocks that are illiquid. The negative impact of increased fund size on the fund's future return is also one of the key points in the model of Berk and Green (2004). As in Chen et al. (2004), we examine the relation between fund size and performance but make two important additions to understand the nature of this relation in our data set. First, instead of using the raw level of TNA as a measure of fund size as in Chen et al., we use the relative fund size, as measured by the ratio of TNA of a fund to the TNA of a median fund within the same investment objective.[10] Using the TNA ratio not only facilitates the comparison of fund size across different investment styles but also helps us control for changes in investment opportunities for the same fund over time. Second, in addition to fund size, we also include fund inflows in our analysis, as the degree of impact of fund size on fund returns might be affected by the inflows experienced by the fund. It is reasonable to expect that abnormal inflows to a fund constrained by its large size will be more damaging than to funds that are not yet constrained by their large sizes. This is important in our analysis because, as we document in Table 2, funds close after experiencing abnormal inflows.

Every month, using all the equity funds in CRSP, we calculate each fund's TNA ratio (fund TNA/median TNA of the funds with the same investment style) and lagged six-month cumulative abnormal flow (CAF) in excess of the median flow of its investment style. We then sort the funds by their TNA ratios and lagged abnormal flows into 5×5 independent quintiles. Returns of these 25-quintile portfolios are tracked in the following year. We reform portfolios every month recursively till the end of the sample period.[11] The resulting portfolio returns are used to calculate performance statistics that are reported in Table 4. Panel A of Table 4 reports the equally weighted raw returns to the funds in each quintile, whereas Panel B reports four-factor αs obtained by regressing monthly portfolio excess returns on the four factors in Carhart (1997).

Consistent with Chen et al. (2004), we find that size affects performance. Funds with high TNA ratios usually earn lower monthly returns and lower four-factor αs than smaller funds. However, we find that the negative impact of size is also exacerbated by high inflows. High inflows into a large fund lead to worse performance subsequently. In TNA ratio quintile 5 (the largest funds), the four-factor α declines from –0.16% for the quintile with the lowest inflows to –0.28% for the quintile with the highest inflows. For the funds with the lowest TNA ratio, inflows have a

[10] We use ICDI and SI fund objective codes provided in the CRSP Mutual Fund Database to identify funds within the same investment objective.

[11] Annual rebalancing yields similar results.

Table 4
Fund flow/TNA ratio quintile portfolio returns for the general fund sample

	TNA ratio						*t*-statistics					
Flow	Low	Q2	Q3	Q4	High	Hi-Low	Low	Q2	Q3	Q4	High	Hi-Low
Panel A: Average monthly returns												
Low	0.83%	0.91%	0.88%	0.91%	0.82%	0.00%	7.6198	0.3449	7.7094	0.3425	7.3360	−0.1520
Q2	0.83%	0.85%	0.87%	0.84%	0.80%	−0.03%	7.6202	8.0264	7.9199	7.5156	7.2470	−1.0245
Q3	0.81%	0.84%	0.80%	0.77%	0.78%	−0.04%	7.3760	7.7138	7.0348	6.6053	6.7450	−1.6970
Q4	0.93%	0.84%	0.81%	0.73%	0.77%	−0.16%	0.3532	7.3676	6.9326	5.9803	6.2247	−5.2298
High	0.95%	0.94%	0.81%	0.77%	0.74%	−0.21%	0.3583	0.3541	6.2207	5.7014	5.1279	−5.0272
Hi-Low	0.12%	0.02%	−0.06%	−0.14%	−0.08%	.	3.5202	0.6172	−1.4154	−2.4779	−1.0582	.
Panel B: Four-factor αs												
Low	−0.17%	−0.09%	−0.13%	−0.14%	−0.16%	0.01%	−5.9914	−3.4355	−4.8840	−4.2053	−4.9533	0.4703
Q2	−0.12%	−0.13%	−0.13%	−0.15%	−0.14%	−0.02%	−5.1427	−7.1049	−6.2478	−6.8667	−6.2714	−0.9726
Q3	−0.12%	−0.14%	−0.19%	−0.20%	−0.15%	−0.03%	−5.2896	−7.9057	−10.7332	−9.5437	−9.4864	−1.6032
Q4	−0.06%	−0.17%	−0.19%	−0.25%	−0.16%	−0.10%	−2.6559	−8.6626	v9.1791	−10.0894	−6.8603	−3.6150
High	−0.06%	−0.10%	−0.24%	−0.26%	−0.28%	−0.22%	−3.1978	−4.5535	–8.5938	−8.2022	−7.5845	−6.4278
Hi-Low	0.11%	−0.01%	−0.10%	−0.12%	−0.12%	.	3.9981	−0.4397	−2.9664	−2.6633	−2.1184	.

For the December 1993–December 2004 period, this table reports average monthly returns and Carhart (1997) four-factor αs for the 25-quintile portfolios. Every month, starting in December 1993, equity funds are sorted based on their total net asset (TNA) ratios in that month and their lagged six-month cumulative abnormal flows (CAFs). The TNA ratio of a fund is calculated by dividing the TNA of the fund to the median TNA of all the equity funds with the same investment objective as measured by SI and Investment Company Data Inc. investment objective codes. Monthly abnormal flows are measured by subtracting the mean flow of all the funds with the same investment objective from the flow of a given fund. These flows are then cumulated over the past six months to obtain six-month cumulative abnormal flows. A total of 25 independent quintile portfolios are formed from the intersection of the lagged flow and TNA ratio quintile sorts. Monthly returns of these portfolios are measured in the following year. The portfolios are rebalanced every month till the last portfolio formation month of 2003:12. Panel A reports the average monthly returns and their *t*-statistics. Panel B reports the Carhart four-factor α estimates obtained by regressing monthly excess portfolio returns, in excess of the risk-free rate, on the four factors.

positive impact on future performance, possibly due to economies of scale. Size has a much weaker influence on performance when inflows are low. For instance, in the lowest quintile of flows, the performance of large funds is comparable with that of small funds (–0.16% for the highest TNA quintile and –0.17% for the lowest TNA quintile).

Table 4 provides a compelling motivation for funds to close. By themselves, large fund sizes or large inflows do not have a significant negative impact on performance. It is the combination of large fund size and a high inflow that has a significant negative impact on performance. It is no surprise therefore that fund managers intervene to limit the negative impact of inflows into an already large fund by closing the fund.

3.3 Flows and performance in the closure period

Is closure effective in reducing fund size? The good steward hypothesis predicts that closing enables fund managers to outperform their peers by lowering fund size to a level that enables them to earn a better than competitive rate of return. If closing funds earn positive returns, size can either decline or remain at the same level only if net inflows are negative. Therefore, the good steward hypothesis predicts that closures impose real restrictions on fund inflows and that mutual fund managers will continue to maintain their superior performance after closing. The cheap talk hypothesis makes the opposite prediction. It predicts that either fund inflows from existing investors continue even after closing so that fund size is not expected to decline or the decline in flows is compensated by an increase in management fees.

We therefore examine both inflows and performance for the closing funds in the 12-month postclosing period, using both an event-study and a time-series approach. In the event-study approach, because inflows can be positive if existing investors continue to contribute new funds, we measure CAFs in excess of the median flow to all the other funds with the same investment objective as the closing fund. Panel A in Table 5 reports both cumulative raw and abnormal flows, and raw and excess returns over the year before to the year after the fund closure date. We also compute time-series averages of excess returns using factor models. Panel B reports time-series averages of monthly raw and excess returns, fund flows, and fees to the funds in the year before to the year after the fund closure date.

Over the year before closing, the funds in our sample experience cumulative raw flows of 103.43%. The flows drop dramatically in the year after closure, with the closing funds experiencing significantly negative flows of –2.82% over this period. Abnormal flows in excess of median flow to the remaining funds with the same investment objective are a significant –6.36% in the 12 months following closing. In other words, fund closing imposes real restrictions on fund inflows.

In a further attempt to test whether closing lowers the flow to the funds, we conduct regression tests in the spirit of Chevalier and Ellison (1997). Specifically, we estimate the following regression specifications for our sample of fund closures:

$$Flow_{i,\,[t-6,\,t-1]} = \alpha + \beta\ Return_{i,\,[t-12,\,t-7]} + \epsilon_i$$

$$Flow_{i,\,[t+1,\,t+6]} = \alpha + \beta\ Return_{i,\,[t-6,\,t-1]} + \epsilon_i$$

$$Flow_{i,\,[t+7,\,t+12]} = \alpha + \beta\ Return_{i,\,[t+1,\,t+6]} + \epsilon_i$$

where t is the month of closure for fund i, the dependent variable $Flow_i$ is the cumulative flow for fund i over a six-month period, and the independent variable $Return_i$ is the lagged six-month buy-and-hold return for fund i. The first model tests the fund flow-performance relation when the fund is still open and thus provides a benchmark to estimate the impact of closure on subsequent flow-performance sensitivity. Estimating the benchmark regression (first model) for 140 funds over the preclosure period yields a positive and significant α of 0.605 (t-statistic 3.10) and a positive and significant β of 1.68 (t-statistic 2.39). The significantly positive α confirms our earlier finding of positive flows to the funds before closure, and the positive β estimate shows a positive association between lagged fund returns and future flows, as documented in prior literature. The second model regresses the flows immediately after closure on cumulative preclosure returns. If closing a fund impacts the usual fund flow return relation, this regression should yield a much lower β estimate than that of the base regression in the first model. We find that this is actually the case. Regressing postclosure flows on preclosure returns yields an α estimate of 0.032 or 3.2% (t-statistic 2.04), implying that during the six months after closure funds still experience inflows, albeit lower than their preclosure levels of 60.5%. More importantly, this regression yields a β estimate of –0.05 (t-statistic –1.138), implying that the positive association between fund flows and past returns no longer exists when the fund is closed. We find similar results when we regress cumulative fund flows over six months to one year after closure to fund returns over one to six months after closure in the final model. Because the dependent and independent variables in the last regression only use postclosure flow and return information, this regression avoids any potential biases that might arise due to events around the month of closure. The last regression yields an α estimate of –0.038 or –3.8% (t-statistic –3.23) and a β estimate of 0.07 (t-statistic 1.20). The regression specifications clearly show that funds closed to new investors no longer experience a positive flow-performance relation after the fund closes. This evidence, coupled with much lower, and in some periods negative, flows after closure, shows that closing a fund has a negative and significant impact on flows to the fund.

The good steward hypothesis implies that the lower inflows should enable managers at closing funds to outperform their peers. Table 5 also reports several measures of postclosing performance, including raw returns, excess returns relative to the CRSP equally weighted index, style-adjusted returns, and three- and four-factor αs over the pre- and post-closing periods.

The lower half of Panel A of Table 5 shows that closing coincides with a period of declining returns. Both raw returns and returns in excess of the CRSP equally weighted (EW) index decline significantly after closing. Cumulative raw returns decline from 34.36% in the year before to an insignificant 1.18% in the year after closing. Similarly, excess returns relative to the EW index drop dramatically from a statistically significant 12.39% in the –12 to –1 period to a statistically significant negative value of –4.59% in the +1 to +12 period. Finally, over the year after the closure date, closing funds go from outperforming the other funds in the same investment style to earning returns that end up being comparable with their style benchmarks. The return relative to the style benchmark is a statistically insignificant –0.76%.

Abnormal returns, or αs, calculated relative to a single-factor and a multi-factor model are reported in Panel B of Table 5. Jensen's α is the intercept obtained from a regression of excess fund returns on the excess return to the CRSP value-weighted index. The four-factor α is the intercept obtained from a regression of excess fund returns on the three Fama–French factors and a momentum factor as in Carhart (1997). Both preclosure αs are positive and statistically significant. Jensen's α is 2% per month, and the four-factor α is 1%. Both αs drop to an economically and statistically insignificant value of 0.1% after closure. According to the factor model returns, the closing funds do not outperform in the year after closure.

To better illustrate these results, in Figure 1 we plot cumulative inflows, returns, and TNA ratios in the year before and after the date of closing. Panel A plots raw flows and flows in excess of the median flow to the other funds with the same investment objective. Both cumulative raw and excess flows increase steadily until the closing month. Closure sharply stems the inflow, and after about four months, the fund inflows begin to decline. The net impact of declining inflows on size can be ambiguous if fund returns are high enough to offset negative flows. In Panel B of Figure 1, we therefore plot the ratio of TNA of a fund in a given month to that of a median fund within the same investment objective. In the year before closing, the ratio of the TNA of the closing fund to that of the median fund with the same style increases from 0.59 to 1.41 at the time of closing. Thus, funds that close are on average 40% larger than the median fund in the same investment objective at the time of closure. The TNA ratio declines dramatically after closing. By the end of the year after the closure date, the TNA ratio has dropped to 1.22 from its month 0 level of

Table 5
Cumulative excess flows and excess returns earned by funds around the closing date

Panel A: Event-study returns and flows for closing funds

	N	−12 to −1	−6 to −1	−3 to −1	0	1 to 3	1 to 6	1 to 12
Fund flow	140	103.43%	59.96%	31.01%	9.28%	2.56%	1.72%	−2.82%
		(20.03)	(14.40)	(10.03)	(7.41)	(3.87)	(1.86)	(−2.28)
Excess flow over median investment style flows	140	97.96%	56.53%	28.90%	8.59%	1.01%	−0.68%	−6.36%
		(19.17)	(13.67)	(9.34)	(6.93)	(1.59)	(−0.74)	(−5.22)
Raw returns	140	34.36%	18.86%	10.77%	3.31%	1.47%	2.47%	1.18%
		(16.37)	(11.89)	(9.55)	(4.51)	(1.04)	(1.37)	(0.47)
Excess returns over EW index	140	12.39%	7.59%	3.29%	1.24%	1.38%	1.02%	−4.59%
		(7.44)	(6.35)	(3.87)	(2.35)	(1.46)	(0.84)	(−2.61)
Excess returns over mean investment style returns	140	15.03%	7.76%	3.22%	1.57%	1.33%	0.76%	−0.76%
		(11.65)	(8.13)	(4.64)	(3.44)	(1.56)	(0.74)	(−0.54)

Panel B: Time-series averages (%) in the year before to the year after the closing date

				t-statistics		
	Before	After	Difference	Before	After	Difference
Flows	9.87	−0.26	−10.12	8.09	−1.53	−8.25
Raw returns	3.04	0.13	−2.91	11.26	0.70	−8.34
Excess returns (style)	1.35	−0.05	−1.40	6.99	−0.41	−6.25
Excess returns (EW index)	1.15	−0.35	−1.51	5.03	−2.50	−5.67
Jensen's α	1.65	0.05	−1.60	9.00	0.36	−8.34
Four-factor α	0.96	0.15	−0.81	6.77	1.22	−5.69

This table reports average raw and cumulative excess returns and cumulative excess flows to the closing funds in the year before to the year after the closing date. Excess returns and flows are calculated with respect to a style benchmark. Every month for each closed fund we find all other funds with the same Investment Company Data Inc. and Strategic Insight fund objective codes. The mean return (median flow) to these funds is used as the style benchmark return (flow). Cumulative abnormal returns (CARs) and cumulative abnormal flows (CAFs) are computed with respect to this style benchmark. Panel A reports cumulative excess returns and flows to closing funds in an event-study framework. Panel B reports cross-sectional means of time-series monthly averages of flows, returns, and fees in the year before to the year after closing. Excess returns (style) are monthly averages of fund returns in excess of the average return of all the funds with the same style as the closing fund. Excess returns (EW index) are averages of fund returns in excess of the Center for Research in Security Prices (CRSP) equally weighted index. Jensen's α and the four-factor α are calculated by regressing fund excess returns on the market excess returns and on the Carhart four factors, respectively.

1.41. Panel C plots monthly returns for the funds from the year before to the year after closure. Consistent with the results in Table 5, and inconsistent with the good steward hypothesis, the closing funds do not earn excess returns after closing.

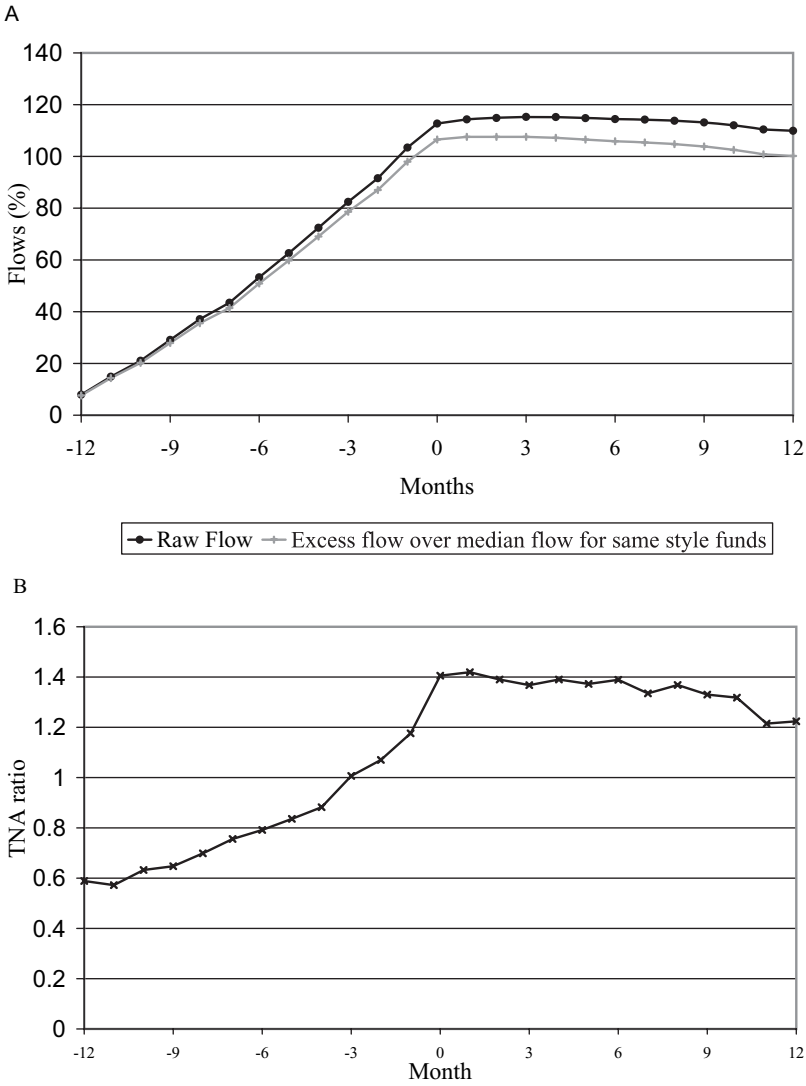

Figure 1
Monthly flows and returns to closing funds around the month of closure
Panel A plots monthly raw and cumulative abnormal flows (CAFs) to the funds around the month of closure. Panel B plots total net asset (TNA) ratio of closing funds in event time. The TNA ratio is calculated by dividing the TNA of the closing fund, every month, by the median TNA of all the funds with the same investment style as the closing fund.

C

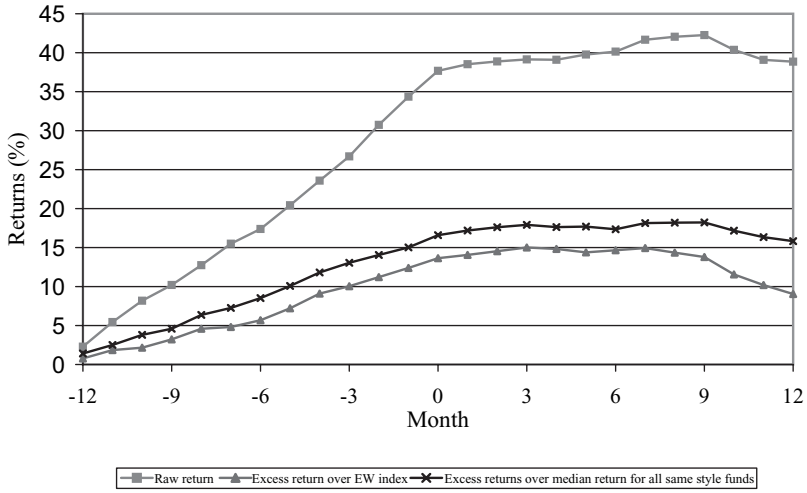

Figure 1
Monthly flows and returns to closing funds around the month of closure (Continued)
Panel C plots the cumulative monthly fund returns in event time.

Perhaps one reason we find no support for the good steward hypothesis is because our results are driven by closing funds that are already very large at the time of closure. Perhaps funds that close when they are still relatively small will be where we find excess performance. We therefore sort the funds in our sample into quintiles on the basis of their TNA ratio at the time of closure. Abnormal inflows and returns are calculated for the year before to the year after the closing date. Table 6 presents the results. Panel A reports excess flows over the median flow to the other funds with the same objective (raw flows are qualitatively similar and are not reported).

Panel A shows that closure stems inflows across all five categories of mutual fund sizes. Inflows into the smallest quintile are 130% over months –12 to –1 compared with the inflows of 62% for the largest quintile of funds. There is no relation between the size of the fund at the time of closure and the decrease in flows after closure. Abnormal inflows drop significantly in three of the five quintiles. However, with the exception of the smallest quintile, Panel B shows that funds do not earn excess returns after closure. The postclosure performance for the funds in the smallest quintile is significantly larger than those for the funds in the largest quintile. However, the excess returns documented for the smallest quintile in this panel are sensitive to the methodology used to measure excess returns. The funds in the smallest quintile do not earn significant positive excess returns relative to the EW index, and their four-factor and Jensen's αs both decline significantly over the same period, although they

Table 6
Cumulative excess flows and excess returns earned by funds sorted on TNA ratio

TNA ratio quintile	*N*	−12 to −1	−6 to −1	−3 to −1	0	1 to 3	1 to 6	1 to 12
				Panel A: Cumulative excess flows				
1 (smallest)	28	129.88%	85.08%	49.08%	11.18%	0.44%	−0.57%	−9.18%
		(6.54)	(5.09)	(3.65)	(3.64)	(0.23)	(−0.19)	(−2.70)
2	28	75.39%	51.74%	26.01%	7.70%	3.52%	2.56%	−1.36%
		(9.40)	(7.45)	(5.37)	(3.34)	(2.11)	(1.11)	(−0.41)
3	28	124.71%	59.33%	29.00%	13.96%	−0.33%	−4.26%	−11.90%
		(12.51)	(8.68)	(7.47)	(3.15)	(−0.27)	(−2.41)	(−5.52)
4	28	101.27%	50.70%	23.42%	6.79%	1.57%	0.49%	−3.25%
		(12.52)	(11.09)	(8.27)	(5.45)	(1.17)	(0.29)	(−1.44)
5 (largest)	28	61.86%	36.76%	17.29%	3.13%	−0.15%	−1.66%	−6.22%
		(8.10)	(5.41)	(4.82)	(4.02)	(−0.23)	(−1.89)	(−2.84)
				Panel B: Cumulative excess returns				
1 (smallest)	28	21.02%	11.18%	4.82%	3.66%	8.87%	8.66%	9.10%
		(6.27)	(4.56)	(3.37)	(2.39)	(3.05)	(2.61)	(2.19)
2	28	12.38%	5.21%	2.59%	1.22%	−0.43%	−0.94%	−2.25%
		(4.78)	(3.01)	(2.55)	(1.38)	(−0.36)	(−0.54)	(−0.84)
3	28	17.50%	10.14%	5.51%	2.28%	0.90%	−0.93%	−3.76%
		(5.61)	(4.99)	(3.35)	(3.01)	(0.42)	(−0.36)	(−1.00)
4	28	11.74%	3.62%	0.79%	1.79%	−3.08%	−2.79%	−1.67%
		(4.81)	(2.09)	(0.63)	(1.98)	(−2.51)	(−1.74)	(−0.75)
5 (largest)	28	13.17%	8.83%	2.41%	−1.08%	0.31%	−0.29%	−5.45%
		(4.44)	(3.40)	(1.14)	(−1.67)	(0.26)	(−0.20)	(−2.52)

This table reports average cumulative excess flows and returns to the closing funds in the year before to the year after the closing date. Excess returns and flows are calculated with respect to a style benchmark. Every month, for each closed fund, we find all other funds with the same Investment Company Data Inc. and Strategic Insight fund objective codes. The mean return (median flow) to these funds is used as the style benchmark return (flow). Cumulative abnormal returns (CARs) and cumulative abnormal flows (CAFs) are computed with respect to this style benchmark. The funds are sorted on the basis of their total net asset (TNA) ratio, the ratio of the TNA of a closing fund in a given month to the median TNA of all the other funds in the same investment objective as the closing fund. Panel A reports cumulative excess flows, whereas Panel B reports cumulative excess returns to the closing funds.

still perform better than funds in the fifth quintile. We thus have at best weak evidence that funds that close at smaller sizes earn excess returns after closing.

3.4 Flows to other funds in the same family

We next examine the family spillover hypothesis and test whether stemming inflows into the closed fund help attract flows to other less stellar funds in the same fund family. For each closing fund in our sample, we measure monthly median flow to other funds in the same fund family and with the same investment objective around the month of closure. We identify other funds in the same family as the equity funds that have the same ICDI identifier for the management company name and same ICDI fund objective code as the closing fund. Figure 2 plots median fund inflows into the other funds with the same investment objective in the same fund family around the month of closure. The plot shows very weak, if any, support for the hypothesis. Starting three months before closure up to the end of closure month, the fund's family experiences a considerable increase in flows, possibly due to the announcement of the closing of the fund a couple of months before the actual closure date. Over this period, the closing fund also experiences abnormal flows, suggesting that the early increase is not simply a shift in investment from the closing fund to the family but a general increase in fund flow for both the closing fund and the fund family. The increase in flows to

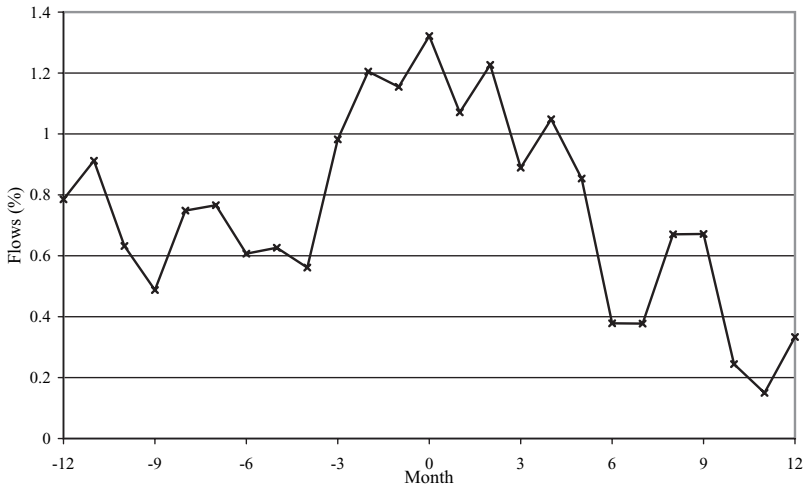

Figure 2
Monthly flows to the other funds in the same family in event time
For each closing fund, monthly median flows to other funds in the same fund family and with the same investment objective are measured. Other funds in the same family are identified as the funds that have the same Investment Company Data Inc. (ICDI) identifier for the management company name and the same ICDI fund objective code as the closing fund.

the fund family continues up to four months after closure, after which it returns to preclosure levels. On average, monthly flows to other funds in the same family are 0.67% in the year after closing, significantly lower than 1.13% in the year before closing. Overall, Table 5 and Figures 1 and 2 show that while closing helps stem inflows, it does not succeed in diverting investor attention to other funds in the same fund family. Moreover, as we discuss later, reopening has the opposite impact on family flows. After the mutual fund reopens, the fund family it belongs to seems to lose part of its additional inflows that it earned at the time of closure.

These results are consistent with Zhao (2004) who found that inflows to the family are significantly larger in the quarter immediately after closing. However, in the longer term, over the year after closing, Zhao also found no improvement in the family inflows, suggesting that the effectiveness of fund closures on promoting inflows to the rest of the family diminishes over time.

3.5 Do managers raise their fees on closing?

Our evidence so far is inconsistent with the cheap talk hypothesis in that funds face real restrictions on fund inflows after closing. However, managers can also recover their compensation by raising the fees they charge. Hence, the cheap talk hypothesis predicts that fund managers will raise their fees after closing. Warner and Wu (2005) documented that fund managers typically increase their fees after periods of high asset growth and superior performance, both of which are characteristic of the period before funds close. We compare fees and expenses charged by the funds in the pre- and postclosing periods.

We collect management fee data from N-SAR reports. N-SAR reports include data on gross advisory fees (item 72F), the number of months this data item covers (item 72A), and monthly average of net assets (item 75B). To calculate management fees, we first divide gross advisory fees by the number of months over which it is measured to find average monthly fees. We then divide this number by the average monthly net assets reported in the N-SAR report. This monthly figure is then annualized to obtain percentage management fees. Our calculations of management fees match the management fee numbers reported in Morningstar Principia.[12] Results are presented in Table 7.

The table summarizes that, on average, management fees expressed as a percent of TNA increase significantly from 0.86% in the preclosing period to 0.90% in the postclosing period. In dollar terms, this corresponds to an increase in gross advisory fees from $12.8 million in the preclosing period

[12] Note that because CRSP reports monthly expense ratios and 12b-1 fees, one easy alternative to hand-collecting management fee data would seem to be to use the expense ratio net of 12b-1 fees as a proxy for management fees. However, this would not be a proper measure of management fees as reported expense ratios include 17 other items such as postage, printing expenses, and legal fees that are unrelated to fees paid to management.

Table 7
Fees charged by closing funds

				t-statistics		
	Before	After	Difference	Before	After	Difference
Management fees (%)	0.86	0.90	0.04	30.11	27.36	2.63
Management fees ($ thousands)	12,840.78	19,760.40	6,919.62	4.06	4.92	5.23
Expense ratio, net of 12b-1 fees (%)	1.23	1.19	−0.04	36.67	35.54	−2.95
12b-1 fees (%)	0.22	0.23	0.01	9.64	9.90	0.97
Total load (%)	1.56	1.59	0.03	9.88	10.26	0.63

This table reports average management fees and expense ratios for closing funds. Management fees are computed using gross advisory fee and average net asset data from N-SAR reports. Using the item numbers in N-SAR reports, management fees are computed as (Item 72F/Item 72A)/Item 75B. Expense ratios and 12b-1 fees are obtained from the Center for Research in Security Prices (CRSP) Mutual Fund Database.

to $19.8 million in the postclosing period. Simultaneously, the funds lower total expense ratios, which decline from 1.23% in the preclosing period to 1.19% in the postclosing period. Because funds need not incur marketing fees to attract new inflows when they are closed, 12b-1 fees and total loads are insignificantly different in the two time periods.

Finally, we examine whether investors are compensated for the increased management fees by increased performance. We sort the funds in the sample on the basis of the difference between the management fees over the year after closure and the management fees over the year before closure. We find no evidence that funds that raise their fees more outperform relative to their benchmarks or according to a factor model. Across all quintiles, there is no evidence that an increase in fees is matched by an increase in performance. On balance therefore, our evidence is most consistent with the cheap talk hypothesis.

3.6 What happens when funds reopen?

In the final part of the analysis, we examine what happens to performance when funds reopen to investors. The good steward hypothesis predicts that funds reopen when they have shrunk significantly from their preclosure levels. Reopening at a lower size may help managers earn a superior rate of return. The cheap talk and family spillover hypotheses make no predictions about reopenings.

Sixty-six funds in our sample reopened to all investors at least one year after they first closed. For these funds, we test the good steward hypothesis by comparing excess flows, returns, and fees in the year before to the year after reopening. Results are presented in Table 8.

In the 12 months before reopening, reopening funds earn CAFs of –20.41% over the median flow to the other funds with the same objective. Excess

Table 8
Cumulative excess flows and excess returns earned by funds around the reopening date

Panel A: Event-study returns and flows for reopening funds

	N	−12 to −1	−6 to −1	−3 to −1	0	1 to 3	1 to 6	1 to 12
Fund flow	66	−17.68%	−11.93%	−6.95%	0.35%	−0.75%	−1.84%	−5.21%
		(−11.41)	(−10.83)	(−7.47)	(0.45)	(−0.94)	(−1.57)	(−2.86)
Excess flow over median fund with same objective	66	−20.41%	−11.73%	−6.68%	0.28%	−0.33%	−1.16%	−4.43%
		(−13.53)	(−11.24)	(−7.63)	(0.38)	(−0.45)	(−1.06)	(−2.53)
Raw returns	66	−5.35%	−7.51%	−4.40%	−0.53%	0.90%	2.82%	8.78%
		(−1.43)	(−2.81)	(−2.23)	(−0.42)	(0.58)	(1.25)	(2.73)
Excess returns over EW index	66	−10.15%	−5.87%	−3.60%	−2.31%	−2.78%	−8.17%	−12.82%
		(−3.90)	(−3.38)	(−2.66)	(−2.88)	(−2.56)	(−5.33)	(−5.58)
Excess returns over median fund with same objective	66	−3.80%	−2.85%	−1.66%	−1.67%	−0.48%	−2.75%	−1.74%
		(−1.92)	(−2.12)	(−1.70)	(−2.30)	(−0.59)	(−2.29)	(−1.02)

Panel B: Time-series averages (%) in the year before to the year after the reopening date

				t-statistics		
	Before	After	Difference	Before	After	Difference
Flows	−1.48	−0.39	1.10	−7.24	−1.42	3.92
Raw returns	−0.45	0.71	1.16	−1.58	2.55	2.66
Excess returns (style)	−0.32	−0.17	0.15	−1.71	−1.02	0.56
Excess returns (EW index)	−0.85	−1.08	−0.23	−3.84	−4.81	−0.78
Jensen's α	−0.34	0.06	0.41	−1.97	0.36	1.53
Four-factor α	−0.10	0.07	0.17	−0.70	0.56	0.90
Management fees (%)	0.82	0.84	0.02	18.20	19.57	1.35
Management fees ($ thousands)	21,059.90	17,633.11	−3,426.78	3.96	3.54	−1.57
Expense ratio, net of 12b-1 fees	1.15	1.14	−0.01	20.79	20.84	−0.62
12b-1 fees	0.25	0.25	−0.00	6.85	6.82	−0.25
Total load	1.82	1.88	0.06	7.13	7.78	1.23

This table reports average raw and cumulative excess returns and cumulative excess flows to the reopening funds in the year before to the year after the reopening date. Excess returns and flows are calculated with respect to the mean return and median flow of the funds with the same style (as measured by the Investment Company Data Inc. and Strategic Insight fund objective codes) as the reopening fund. Cumulative abnormal returns (CARs) and cumulative abnormal flows (CAFs) are computed with respect to these benchmarks. Panel A reports cumulative excess returns and flows to closing funds in an event-study framework. Panel B reports time-series monthly averages of flows, returns, and fees in the year before to the year after reopening. Excess returns (style) are monthly averages of fund returns in excess of the average return of all the funds with the same style as the reopening fund. Excess returns (EW index) are averages of fund returns in excess of the Center for Research in Security Prices (CRSP) equally weighted index. Jensen's α and the four-factor α are calculated by regressing fund excess returns on the market excess returns and on the Carhart four factors, respectively. Management fees are computed using gross advisory fee and average net asset data from N-SAR reports. Using the item numbers in N-SAR reports, management fees are computed as (Item 72F/Item 72A)/Item 75B. Expense ratios and 12b-1 fees are obtained from CRSP Mutual Fund Database.

inflows occur in the month of reopening (0.28%) but are not statistically significant. Over the 12 months after reopening, excess flows become negative (–4.43%) again. The negative inflows during the time the fund is closed lead to a drop in TNA. Median TNA drops from $587.81 million from a year before reopening to $486.16 at the month of reopening. To put this in another way, reopening funds were 40% larger than the median fund with the same investment objective a year before reopening. At the end of the reopening month, they are only 9% larger than the median fund with the same investment objective.

These results are also shown in Figure 3, Panel A, which shows a steady decline in unadjusted flows and in flows in excess of the median flow into other funds in the same style category. Over the year before the reopening date, inflows decline by 20%. Reopening does not change this pattern. Inflows continue to decline, albeit at a lower rate, for up to 12 months after reopening. Panel B of Figure 3 illustrates the same decline in terms of the TNA ratio of the reopening funds, measured by scaling the TNA of each reopening fund every month by the median TNA of the other funds within the same investment objective. At the time of closing, these same funds are 1.53 times the size of their peers. Funds shrink to just about the same size as their peers in the month of reopening.

Table 8 also presents statistics on the performance of reopening funds. The period before reopening is characterized by poor performance. All measures of performance indicate that reopening funds underperformed relative to their benchmarks during closure, one reason, perhaps for reopening. Contrary to the good steward hypothesis, these funds do not significantly outperform their benchmarks after they reopen. In the 12-month period following reopening, the excess return over a median fund with same objective is a statistically insignificant –1.74%. Although both the Jensen's α and four-factor αs increase slightly after reopening, the increase is insignificant at any conventional level of significance. This is also illustrated in Figure 3, Panel C.

Other statistics in Table 8 show that gross advisory fees expressed in dollars and as a percent of TNA do not change significantly after reopening. Other fees and expenses are also insignificantly different in the two periods. Not reported in the table are the flows into other funds in the fund family. We find that flows into the fund family decline sharply from 0.51 to –0.04% after reopening. The decline is statistically significant. Panel D in Figure 3 shows this decline in family flow around the reopening date.

Overall, our results show that funds reopen after experiencing steep declines in inflows. The decline in inflows enables fund size to decline to the level of its benchmarks. There is no evidence that fund managers are able to outperform their peers on reopening. Managers are able to maintain their level of compensation despite declining flows through higher gross advisory fees.

4. Conclusions

We examine a sample of mutual funds that closed to new investors. We find that mutual fund managers close their funds when they experience large inflows and earn superior returns in the period before closing. However,

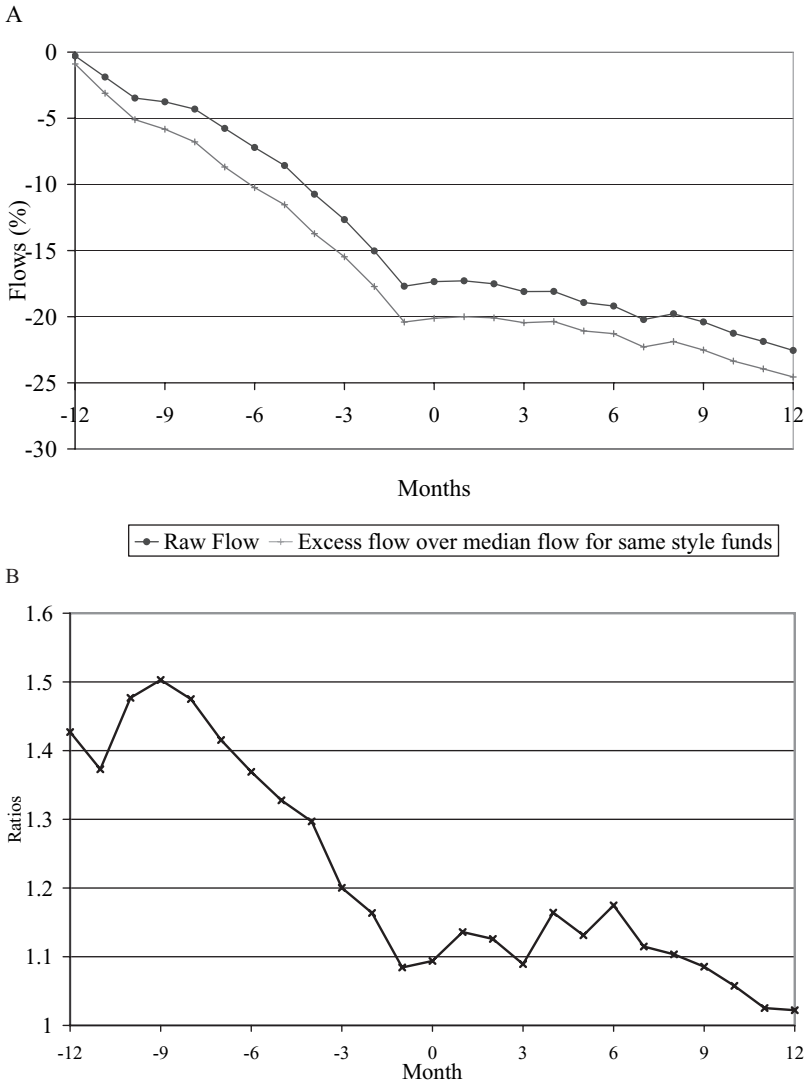

Figure 3
Monthly flows and returns to reopening funds
Panel A plots monthly raw and cumulative abnormal flows (CAFs) to the funds around the month of reopening. Panel B plots total net asset (TNA) ratio of reopening funds in event time. The TNA ratio is calculated by dividing the TNA of the reopening fund, every month, by the median TNA of all the funds with the same investment style as the reopening fund.

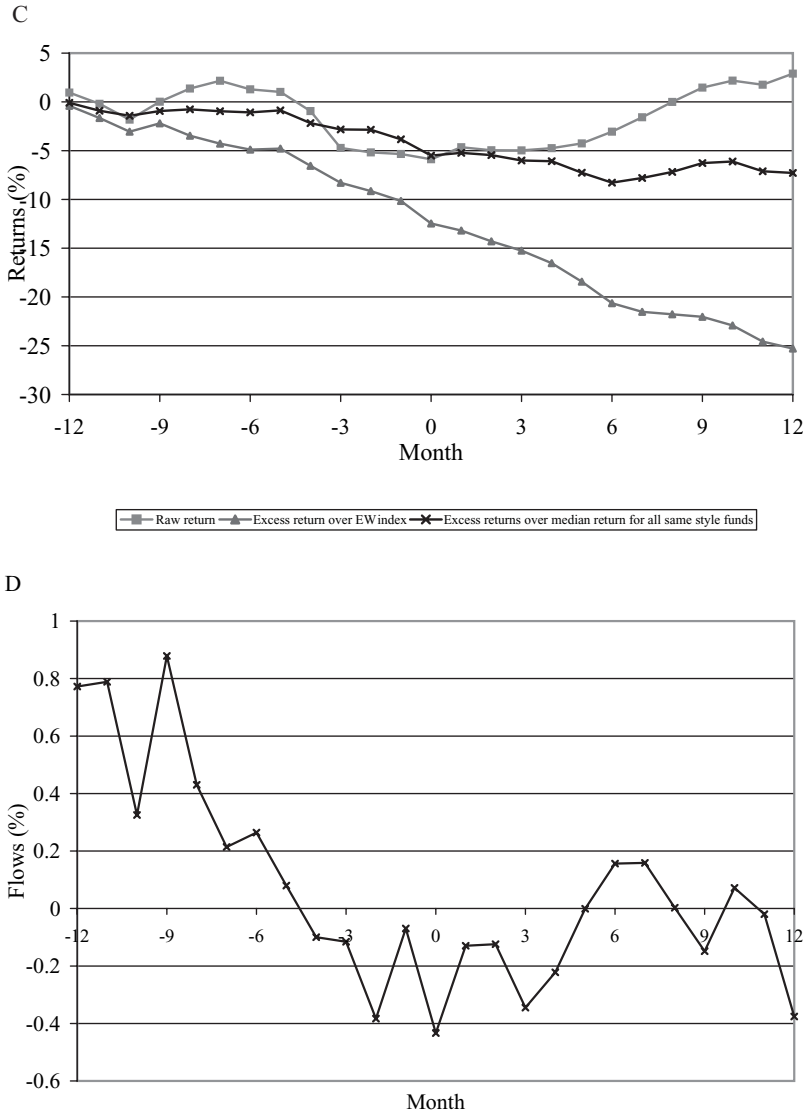

Figure 3
Monthly flows and returns to reopening funds (Continued)
Panel C plots the cumulative monthly fund returns in event time. Panel D plots the monthly flow to other funds in the same family around the reopening date in event time.

while closing their funds does impose real restrictions on their fund inflows, it does not seem to protect their performance. Managers do not maintain their superior performance after closure. Even though performance does not significantly improve, fund managers are not worse off by closing their

funds. Fund managers appear to capitalize on the rapid growth in net assets and their superior performance before closure to raise their gross advisory fees. Finally, there is no spillover effect on other funds in the same family except in the immediate short term around the fund closure date.

Our results are strikingly consistent with Berk and Green (2004). The premise behind the model in Berk and Green (2004) is that the manager captures all the rents, so when he closes the fund, he should not give up rents. Consistent with Berk and Green, going forward, the fund does not outperform. But prior to closing, the manager did outperform. According to the Berk and Green model, he should have extracted the rents by allowing an inflow of funds. At first blush, therefore, it looks like the act of closing is a rejection of the model. We show, however, that in this case the manager extracts the rents by raising his fee, rather than by growing the size of the fund.

We also add to the existing body of literature on the link between fund size and performance by showing that it is large inflows into already large funds that detract from performance rather than size per se. Closure is effective in stemming inflows, but there is no evidence that it is effective in improving the performance of the average fund. The importance of inflows is also highlighted by managers' decisions to reopen their funds when inflows decline significantly after closure. At reopening, the size of the fund decreases to the level of its benchmarks. However, as with closures, there is no evidence that reopening coincides with a period of improved performance. All measures of performance indicate that the performance of the reopening funds is at best comparable with that of their benchmarks.

One puzzle remains. An alternative method for managers to control inflows is to raise their fees sufficiently to curtail new investment. Why do managers close their funds in addition to raising fees? Perhaps to effectively curtail the new inflows, managers will have to raise their fees to prohibitively high levels for which shareholder approval might be difficult to obtain.[13] One recent example of a fund attempting to raise its fees is the Teachers Insurance and Annuity Association-College Retirement Equities Fund (TIAA-CREF) that failed to win shareholder approval to raise its fees in August 2005. After the failure, the financial press speculated that TIAA-CREF might close its funds to new investors.[14] Determining

[13] There are only two ways that managers can raise the fees they charge. The first requires shareholder approval by majority vote. Managers typically seek this approval through proxy votes, involving filing documents, and others. The second is only applicable if a fund has temporarily reduced or waived some part of its fee. Managers can then restore the fee to a higher level but not above the full contractual rate previously established. This does not require any shareholder approval. Although there is no limit on the level of fees, in California, total expenses must be limited to 2.50% for the fund to be able to sell to California residents.

[14] See Hennessey, R., 2005, "TIAA-CREF May Shutter Funds After Lost Vote on Fee Hikes," *Dow Jones News Service*, August 31, 2005.

the relation between fee increases and restrictions in fund flows requires N-SAR data on mutual fund advisory fees for the universe of mutual funds. Unfortunately, our hand-collected data on mutual fund fees are restricted to mutual funds that close their doors to new investors, leaving this question outside the scope of this article.

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