GOOD STEWARDS, CHEAP TALKERS, OR FAMILY MEN?
THE IMPACT OF MUTUAL FUND CLOSURES ON FUND MANAGERS, FLOWS, FEES, AND PERFORMANCE

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Review of Financial Studies, forthcoming

April 2006

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Abstract

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 re-opening, suggesting that the fund closure decision does not provide information about superior fund managers.

Keywords: Mutual funds; Fund flows; Fund size; Fund returns; Fund manager performance

"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. …

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 paper, 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 US, which closed to new investment in 1997.[3]

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[1] See Damato, Karen, 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*, 9 September 2005, page 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, Karen, 2005, "Sorry, this small-cap fund is full – More managers close door to potential new investors, citing the stocks' illiquidity", *Wall Street Journal*, 22 August 2005, page C13.)

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

We test three hypotheses on the relation between post-closing 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/or continued inflows from existing investors may be adequate to compensate fund managers for the cost of closing. The *family spillover* hypothesis postulates that closing a popular fund diverts attention to other, ostensibly less popular funds managed by the same fund family. The family spillover 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, Hong, Huang and Kubik (2004) (CHHK), 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 CHHK, 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 alphas 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 alpha of 0.15% in the year after closing, significantly lower than the alpha 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 total net assets) on average from a pre-closure level of 0.86% to a post-closure level of 0.90%.

[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) of the fund, we use median flow to and median TNA of the other funds with the same investment objective.

The difference is statistically significant. More important, 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 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 pre-closure 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 re-opened at least one year after closing. The good steward hypothesis predicts superior performance after re-opening, as managers re-open when the size of their fund has declined to a level that enables them to earn superior returns. We find that funds re-open after sustaining a significant drop in total net assets during closure. Re-opening 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 re-opening. Inconsistent with the good steward hypothesis, investors in these funds do not earn excess returns after the fund reopens. Both the four-factor alpha and cumulative style adjusted abnormal returns are insignificant in the twelve months after re-opening. More importantly, during the year before reopening, these funds actually earn negative risk-adjusted returns. In the year before reopening, the four factor alpha 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. While 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 paper also contributes to the nascent literature on the scalability of active portfolio management. As we note above, we add to CHHK 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 paper is organized as follows. In section I, we describe the hypotheses in more detail, along with a discussion of the academic literature. In section II, we describe the data. Section III presents our results and section IV concludes.

I. Hypotheses

The *good steward* hypothesis tests if 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) and 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) derive a model of rational investors who choose to invest in funds that have performed well. They argue 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 re-opening funds, the good steward hypothesis predicts that funds re-open 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 pre-re-opening 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) document 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 prior to fund closure. This is also consistent with Berk and Green (2004) in the sense 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) finds 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 from fund managers as is the case with the other two hypotheses. In addition, neither the cheap talk nor the family spillover hypotheses makes predictions about post re-opening performance, nor do they have any implications on 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) examine performance of mutual funds before and after closing in a sample of 27 mutual funds between 1978 and 1994, and find no evidence that funds earn superior returns relative to their benchmarks in the three years after closing. Zhao (2004) examines a sample of 139 equity and bond funds that closed to new investment between 1992 and 2001. He finds no evidence that closing a fund protects its performance. Instead, he finds 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 examine a sample of 25 funds that closed between 1982 and 1992. They report that funds in their sample do

[5] Zhao (2004) is probably the closest study to ours in terms of the sample size. Zhao's sample includes 87 U.S. 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 U.S. equity fund closures.

not earn significant excess returns in the 24 months after closure, and under-perform relative to their own pre-closing performance.

II. 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. This data includes information on all funds that were closed to new investors as of the date we obtain the data. We cannot rely exclusively on these datasets since they do not list funds that had previously closed to new investors, but have since re-opened. We supplement this data by calling each fund that was closed to enquire if 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 dataset 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 CRSP Mutual Fund Database. For our sample of closing and reopening funds, in addition, we hand collect data from N-SAR reports to calculate management fees. We discard funds that have no return data on CRSP in the pre-closure period, no data on management fees, and those that re-open in less than a year.[6] We impose the last restriction since we require at least 12 monthly observations to compute Jensen's alpha and four-factor alphas 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 re-openings. 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. Since fund level information such as fund flows and fund total net assets (TNAs) are crucial for our analysis, we recreate the entire data set by

[6] Over 60% of the funds in the sample close and subsequently re-open. 61 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 4 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 re-opened 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

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]

Table 1 reports 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 re-openings 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 which 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's fund objective to classify funds. The Strategic Insight 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 CHHK find a significant negative relation between fund size and performance.

[7] To avoid double counting, one common method frequently used 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. Since 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 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.

Table 1

Mutual fund sample description

Panel A lists the total number of sample funds that closed and/or re-opened to new investment between 1993 and 2004. The number of closing and reopening events is larger than the number of funds in the sample since 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 ICDI objectives of the sample funds, as reported by the CRSP survivor-bias free US mutual fund database. The ICDI fund objective is a 2-character code which identifies the Fund's investment strategy, as identified by Standard & Poor's Fund Services.

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 re-open 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	
ICDI fund objective code	Closing	Reopening	Closing	Reopening
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

III. Results

A. 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, total net assets, fund flows, and expenses.

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

$$\text{Fund flow} = [TNA_t - (1+r_t)\, TNA_{t-1}] / (1+r_t)\, TNA_{t-1}$$

where TNA_t is a fund's total net assets at time t, and r_t is the fund's return over the prior month. The monthly Carhart four-factor alpha (Carhart (1997)) is calculated for funds that have at least nine months of monthly return data before and after closure or reopenings. Fund monthly TNAs and returns are obtained from the survivorship-bias free CRSP Mutual funds database, as are data on fund characteristics such as the investment objective, fund expenses, loads, etc. 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 which 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 prior to closure. The average closing fund receives average inflows of 10.6% over the six months prior to closing, eight times larger than the inflow into the average equity fund in the fund universe. In the month prior to 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 to explain why investors are attracted to these funds. The median closing fund earns twice the return earned by the median

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

fund in the equity universe. Abnormal returns are also larger; the Jensen's and four-factor alphas for the median closing fund are 1.3% and 0.5% respectively over the 12 month pre-closing period, compared to -0.1% and -0.1% respectively for the median fund in the equity universe.[9] The table also shows that closing funds attract substantial inflows without having to advertise or otherwise market their funds aggressively. 12b-1 fees charged by closing funds are marginally lower than those imposed by equity funds that stayed open.

Table 2

Characteristics of closing funds relative to the universe of mutual funds

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. Since 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 alpha and the Carhart four-factor alpha are calculated using monthly returns over 12 months prior to the date of the fund closure (reopening). If the fund does not have 12 months of data before the closing month, all available data is used as long as there is at least 9 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 which 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 CRSP mutual fund database.

	Closing funds		Other funds	
	Mean	Median	Mean	Median
Fund one month lagged total net assets ($ millions)	3,365.59	533.30	847.05	148.56
Fund one month lagged raw returns	3.62%	3.28%	1.64%	1.76%
Fund average raw returns $months_{-6\ to\ -1}$	3.29%	2.67%	1.15%	1.32%
Jensen's alpha	1.65%	1.30%	0.01%	-0.11%
4-factor alpha	0.96%	0.52%	-0.08%	-0.11%
St dev. of fund returns over past twelve 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 $months_{-6\ to\ -1}$	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 12b1 fees	0.23%	0.07%	0.27%	0.25%

[9] Results in the paper are qualitatively similar if Jensen's alpha and Carhart's four factor alpha are estimated over a 24-month period. Since 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 and Carhart four factor alphas 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.

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 a zero 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 total net assets 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 prior to closure, and the four-factor alpha in the 12 months prior to closure are significantly positively related to the likelihood that the fund closes. The level of fund inflows is another significant predictor of the fund closure decision. The coefficients on flows at the one-month horizon and at the six-month horizon 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.

Table 3

Determinants of mutual fund closures

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. P-values are in parentheses.

	(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 ($ millions)	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)
4-factor alpha				0.577		0.489	0.311	0.362
				(0.00)		(0.00)	(0.00)	(0.00)
St dev. of fund returns over past twelve 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

B. The relation between size, flows, and performance

Tables 2 and 3 show 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. CHHK show that larger 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 CHHK, 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 CHHK, 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 comparison of fund size across different investment styles but also helps us to 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 we document in Table 2 that 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 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 post-portfolio formation 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, while Panel B reports four-factor alphas obtained by regressing monthly portfolio excess returns on the four factors in Carhart (1997).

[10] We use ICDI's and Strategic Insight's (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

For the 1993:12-2004:12 period, this table reports post-portfolio formation average monthly returns and Carhart (1997) four factor alphas for the 25 quintile portfolios. Every month, starting in December 1993, equity funds are sorted based on their TNA ratios in that month and their lagged six month cumulative abnormal flows. 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 measure by SI and ICDI 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. 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 to these portfolios. Panel B reports the Carhart four factor alpha estimates obtained by regressing the monthly excess portfolio returns, in excess of the risk-free rate, on the four factors.

Panel A. Average monthly returns

	TNA Ratio						T-statistics					
Flow	Low	Q2	Q3	Q4	High	Hi-Low	Low	Q2	Q3	Q4	High	Hi-Low
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 alphas

	TNA Ratio						T-statistics					
Flow	Low	Q2	Q3	Q4	High	Hi-Low	Low	Q2	Q3	Q4	High	Hi-Low
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	-9.1791	-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-Lo	0.11%	-0.01%	-0.10%	-0.12%	-0.12%	.	3.9981	-0.4397	-2.9664	-2.6633	-2.1184	.

Consistent with CHHK, we find that size affects performance. Funds with high TNA ratios usually earn lower monthly returns and lower 4-factor alphas 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 alpha 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 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 to 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.

C. 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 that 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 twelve-month post-closing period, using both an event study and a time-series approach. In the event study approach, since inflows can be positive if existing investors continue to contribute new funds, we measure cumulative abnormal flows (CAFs) in excess of the median flow to all the

other funds with the same investment objective as the closing fund. Panel A 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.

Table 5

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

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 ICDI and SI 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 CRSP equally weighted index. Jensen's alpha and the 4-factor alpha are calculated by regressing fund excess returns on the market excess returns and on the Carhart 4-factors respectively.

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	140	97.96%	56.53%	28.90%	8.59%	1.01%	-0.68%	-6.36%
investment style flows		(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	140	15.03%	7.76%	3.22%	1.57%	1.33%	0.76%	-0.76%
investment style returns		(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 alpha	1.65	0.05	-1.60	9.00	0.36	-8.34
4 factor alpha	0.96	0.15	-0.81	6.77	1.22	-5.69

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 twelve 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:

$$\text{Flow}_{i,\,[t-6,t-1]} = \alpha + \beta\ \text{Return}_{i,\,[t-12,\,t-7]} + \varepsilon_i$$

$$\text{Flow}_{i,\,[t+1,t+6]} = \alpha + \beta\ \text{Return}_{i,\,[t-6,\,t-1]} + \varepsilon_i$$

$$\text{Flow}_{i,\,[t+7,t+12]} = \alpha + \beta\ \text{Return}_{i,\,[t+1,\,t+6]} + \varepsilon_i$$

where *t* is the month of closure for fund *i*, the dependent variable $\text{Flow}_{i,}$ is the cumulative flow for fund *i* over a 6-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 while the fund is still open and thus provides a benchmark to estimate the impact of closure on these parameters. Estimating the benchmark regression (first model) for 140 funds over the pre-closure period yields a positive and significant alpha of 0.605 (t-statistic 3.10) and a positive and significant beta of 1.68 (t-statistic 2.39). The significantly positive alpha confirms our earlier finding of positive flows to the funds before closure and the positive beta 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 pre-closure returns. If closing a fund impacts the usual fund flow return relation, then this regression should yield a much lower beta estimate than that of the base regression in the first model. We find that this is actually the case. Regressing post-closure flows on pre-closure returns yields an alpha estimate of 0.032 or 3.2% (t-statistic 2.04) implying that during the six month after closure funds still experience inflows, albeit lower than their pre-closure levels of 60.5%. More importantly, this regression yields a beta 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. Since

the dependent and independent variables in the last regression only use post-closure 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 alpha estimate of -0.038 or -3.8% (t-stat: -3.23) and a beta estimate of 0.07 (t-stat: 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 post-closing performance, including raw returns, excess returns relative to the CRSP equally weighted index, style adjusted returns, and three- and four-factor alphas over the pre- and post-closing periods.

The lower half of Table 5 Panel A shows that closing coincides with a period of declining returns. Both raw returns and returns in excess of the CRSP equally weighted 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 to their style benchmarks. The return relative to the style benchmark is a statistically insignificant -0.76%.

Abnormal returns, or alphas, calculated relative to a single-factor and a multi-factor model are reported in Panel B of Table 5. Jensen's alpha is the intercept obtained from a regression of excess fund returns on the excess return to the CRSP value-weighted index. The four-factor alpha 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 pre-closure alphas are positive and statistically significant. Jensen's alpha is 2% per month and the four-factor alpha is 1%. Both alphas 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 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 4 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 to 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 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.

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 a median flow to the other funds with the same objective (raw flows are qualitatively similar and are not reported).

Table 6

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

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 ICDI and SI 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 TNA ratio, the ratio of the TNA of a closing fund 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 while Panel B reports cumulative excess returns to the closing funds.

Panel A: Cumulative excess flows

TNA Ratio Quintile	N	-12 to -1	-6 to -1	-3 to -1	0	1 to 3	1 to 6	1 to 12
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

TNA Ratio Quintile	N	-12 to -1	-6 to -1	-3 to -1	0	1 to 3	1 to 6	1 to 12
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)

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 to 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 3 of the 5

quintiles. However, with the exception of the smallest quintile, Panel B shows that funds do not earn excess returns after closure. The post-closure 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 alpha both decline significantly over the same period, though they still perform better than funds in quintile 5. We thus have at best weak evidence that funds that close at smaller sizes earn excess returns after closing.

D. Flows to other funds in the same family

We next examine the family spillover hypothesis, and test whether stemming inflows into the closed fund helps to 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 the fund family continues up to four months after closure, after which it returns to pre-closure 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 to 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 finds 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 finds 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.

E. 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) document 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 post-closing 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 matches the management fee numbers reported in Morningstar Principia.[12] Results are presented in Table 7.

[12] Note that since 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, legal fees etc. that are unrelated to fees paid to management.

Table 7

Fees charged by closing funds

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 CRSP mutual fund database.

				T-statistics		
	Before	After	Difference	Before	After	Difference
Management fees (%)	0.86	0.90	0.04	30.11	27.36	2.63
Management fees ($000s)	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

The table shows that on average, management fees expressed as a percent of TNA increase significantly from 0.86% in the pre-closing period to 0.90% in the post-closing period. In dollar terms, this corresponds to an increase in gross advisory fees from $12.8 million in the pre-closing period to $19.8 million in the post-closing period. Simultaneously, the funds lower total expense ratios, which decline from 1.23% in the pre-closing period to 1.19% in the post-closing period. Since funds need not incur marketing fees to attract new inflows when they are closed, 12b-1 fees and total load fees are insignificantly different in the two time periods.

Finally, we examine whether investors are compensated for the increased 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 out-perform 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.

F. What happens when funds re-open?

In the final part of the analysis, we examine what happens to performance when funds re-open to investors. The good steward hypothesis predicts that funds re-open when they have shrunk significantly from their pre-closure levels. Re-opening at a lower size may help managers

earn a superior rate of return. The cheap talk and family spillover hypotheses make no predictions about re-openings.

66 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 re-opening. Results are presented in Table 8.

Table 8

Cumulative excess flows and excess returns earned by funds around the re-opening date

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 ICDI and SI 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 CRSP equally weighted index. Jensen's alpha and the 4-factor alpha are calculated by regressing fund excess returns on the market excess returns and on the Carhart 4-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.

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	66	-20.41%	-11.73%	-6.68%	0.28%	-0.33%	-1.16%	-4.43%
fund with same objective		(-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	66	-3.80%	-2.85%	-1.66%	-1.67%	-0.48%	-2.75%	-1.74%
fund with same objective		(-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 re-opening 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 alpha	-0.34	0.06	0.41	-1.97	0.36	1.53
4 factor alpha	-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 ($000s)	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

In the twelve months before re-opening, re-opening funds earn CAFs of –20.41% over the median flow to the other funds with the same objective. Excess inflows occur in the month of re-opening (0.28%), but are not statistically significant. Over the 12 months after re-opening, excess flows become negative (-4.43%) again. The negative inflows during the time the fund is closed leads 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 graphically illustrated 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%**.** Re-opening does not change this pattern. Inflows continue to decline, albeit at a lower rate, for up to 12 months after re-opening. 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 re-opening.

Table 8 also presents statistics on the performance of re-opening funds. The period prior to re-opening is characterized by poor performance. All measures of performance indicate that

reopening funds underperformed relative to their benchmarks during closure, perhaps one reason for re-opening. Contrary to the good steward hypothesis, these funds do not significantly outperform their benchmarks after they reopen. In the twelve month period following re-opening, the excess return over a median fund with same objective is a statistically insignificant –1.74%. Though both the Jensen's alpha and four-factor alphas increase slightly after re-opening, 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 does not change significantly after re-opening. 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 re-opening. The decline is statistically significant. Panel D in Figure 3 shows this decline in family flow around the re-opening date.

Overall, our results show that funds re-open 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 re-opening. Managers are able to maintain their level of compensation in spite of declining flows through higher gross advisory fees.

IV. 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, 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 detracts 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 re-open their funds when inflows decline significantly after closure. At re-opening, the size of the fund decreases to the level of its benchmarks. However, as with closures, there is no evidence that re-opening coincides with a period of improved performance. All measures of performance indicate that the performance of the reopening funds is at best comparable to 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 TIAA-CREF which 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 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 is restricted to mutual funds that close their doors to new investors, leaving this question outside the scope of this paper.

[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 etc. 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. While there is no limit on the level of fees, in California, total expenses must be limited to 2.50% in order for the fund to be able to sell to California residents.

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

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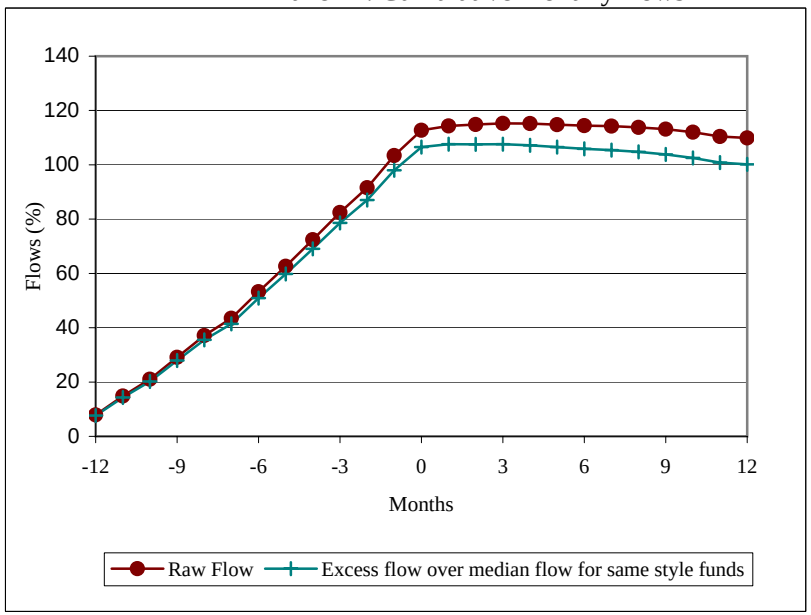
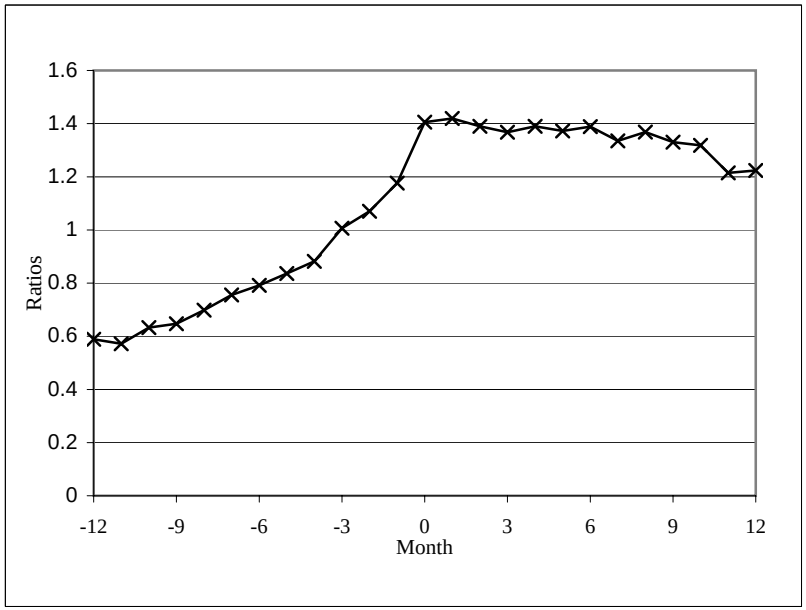
Figure 1. Monthly flows and returns to closing funds around the month of closure.
Panel A plots monthly raw and cumulative abnormal flows to the funds around the month of closure. Panel B plots TNA ratio of closing funds in event time. The TNA ratio is calculated by dividing the TNA of the closing fund,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

Panel A. Cumulative monthly flows



Panel B. TNA ratios



Panel C. Cumulative monthly returns

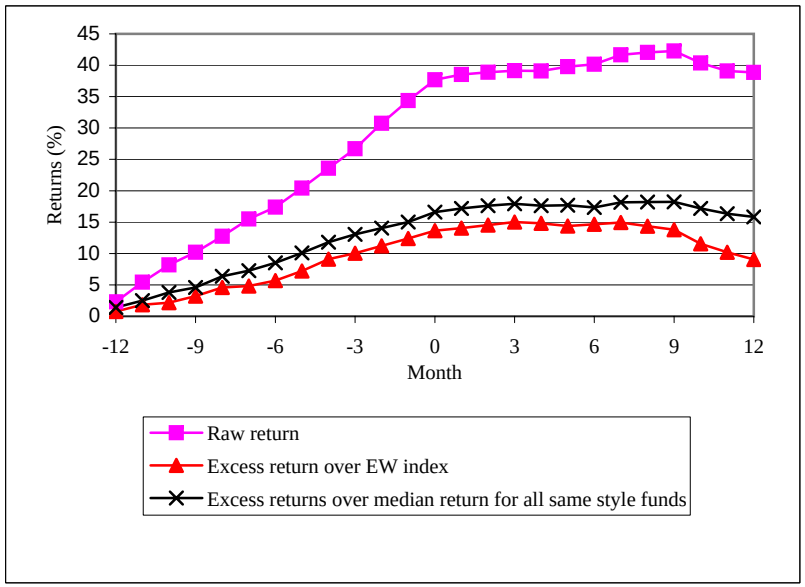


Figure 2. Monthly flows to the other funds in the same family in event time
For each closing fund, monthly median flows to other funds in the same fund family and with the same investment objective are measured. Other funds in the same family are identified as the funds that have the same ICDI identifier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

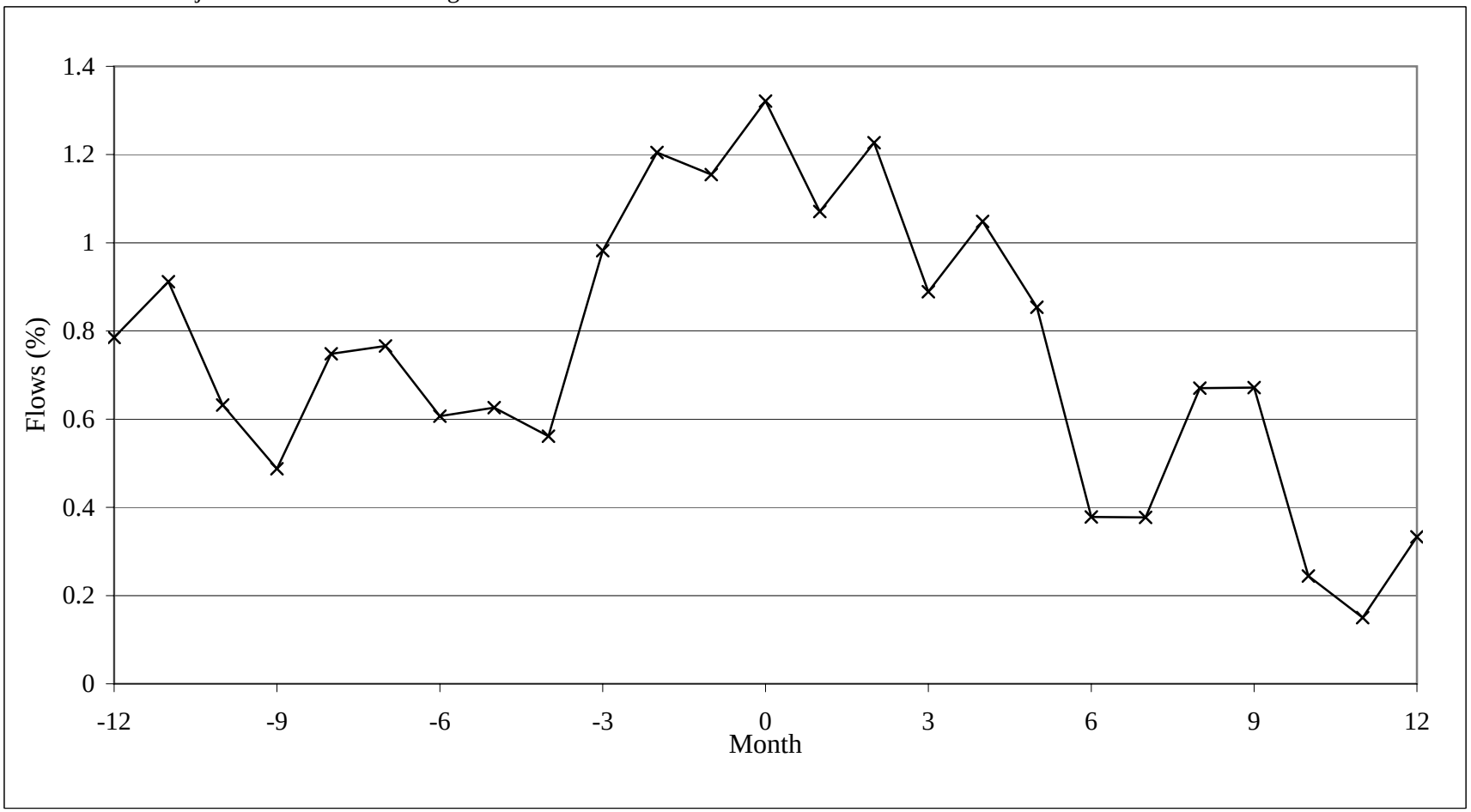
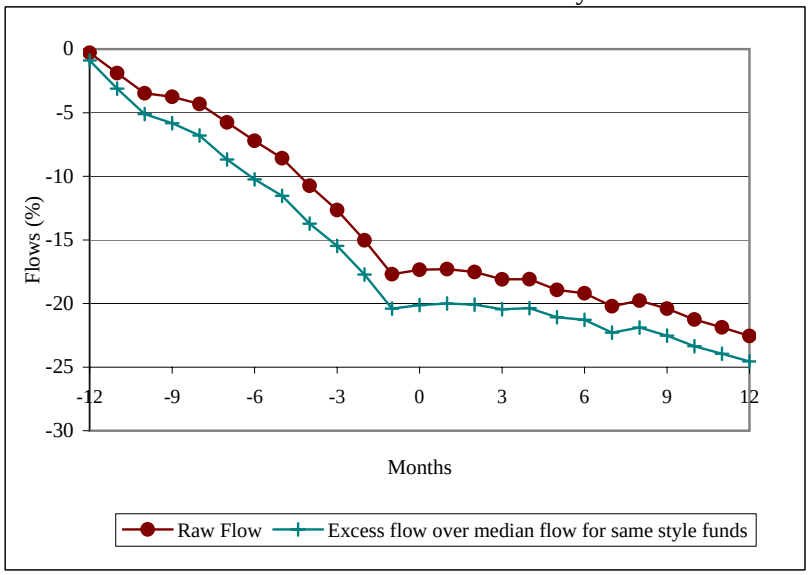


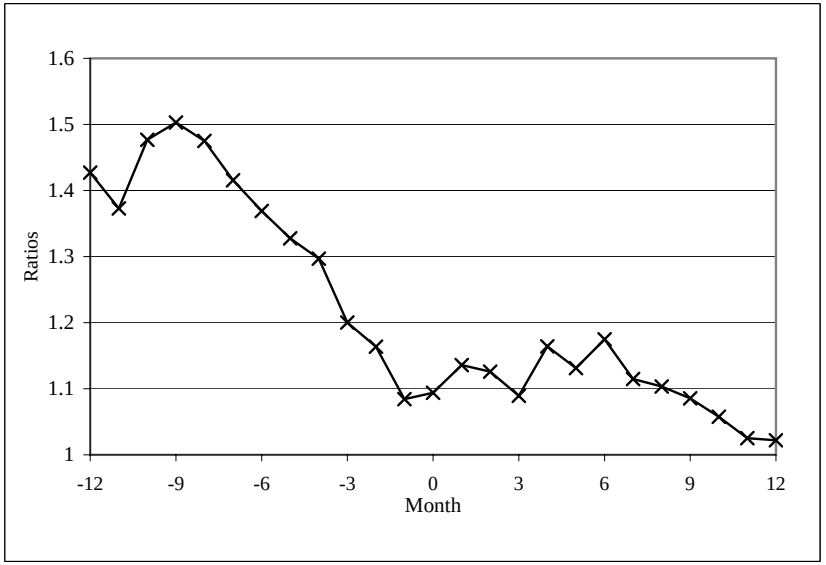
Figure 3. Monthly flows and returns to re-opening funds

Panel A plots monthly raw and cumulative abnormal flows to the funds around the month of reopening. Panel B plots 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. Panel C plots the cumulative monthly fund returns in event time while Panel D plots the monthly flow to other funds in the same family around the re-opening date in event time.

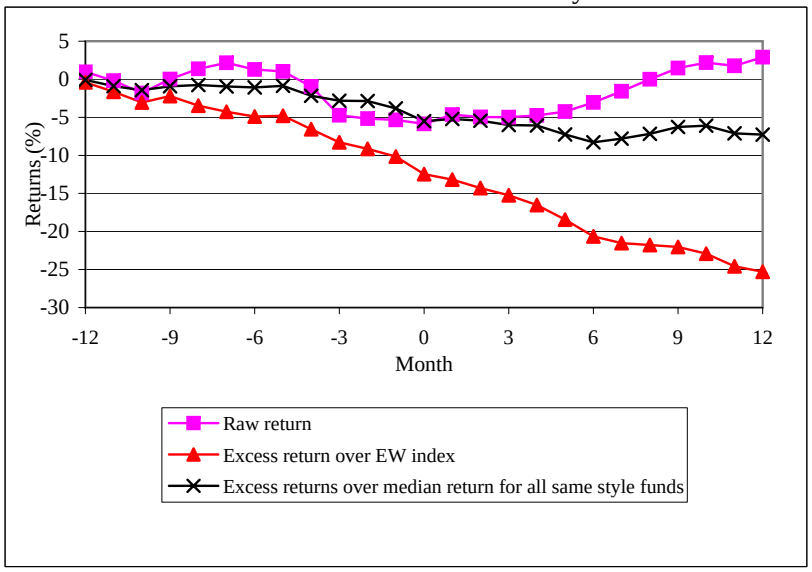
Panel A. Cumulative monthly flows



Panel B. TNA ratios



Panel C. Cumulative monthly returns



Panel D. Monthly flows to other funds in the same family