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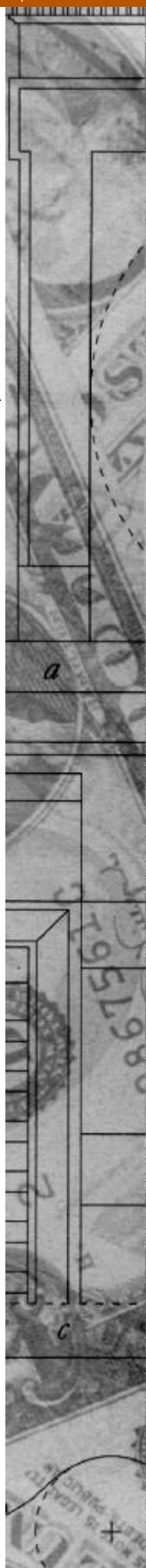

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Evidence from Mutual Fund Share Splits*

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Abstract

We examine the "marketability hypothesis," which states that stock splits enhance the attractiveness of shares to investors by restoring prices to a preferred trading range. We examine splits of mutual fund shares because they provide a clean testing ground for the marketability hypothesis, since the conventional rationales for common stock splits do not apply. We find that splitting funds experience significant increases (relative to non-splitting matched funds) in net assets and shareholders. Stock splits do appear to enhance marketability.

"*You'd better make it four; I don't think I can eat six pieces* Berra, when asked if he wanted his pizza cut into four or six pieces. Hall of Fame Collection[1]

Although practitioners suggest that marketability is the primary reason for executing a split (e.g., Baker and Gallagher, 1980; Baker and Powell, 1993), few papers have rigorously explored this possibility. However, academic research on common stock splits has found some support for the marketability hypothesis. For example, Lamoureux and Poon (1987) and Maloney and Mulherin (1992) report that the number of shareholders increases following common stock splits. Schultz (1999) shows that the number of small orders increases following a stock split, and that the bulk of these orders are buys.[2] Angel, Brooks, and Mathew (1997) show that trading activity by small investors increases following a stock split. Fernando, Krishnamurthy, and Spindt (1999) show that firms going public appear to use the offering price to influence small-investor interest in the issue.

The evidence on common stock splits is also consistent with competing explanations, such as the trading range hypothesis (Lakonishok and Lev, 1987; McNichols and Dravid **,** 1990), the signaling hypothesis (Asquith, Healy, and Palepu, 1989; Desai and Jain , 1997) or a fusion of the two (Ikenberry, Rankine, and Stice, 1996).

According to the trading range hypothesis, round-lot constraints and transaction cost considerations result in a preferred price level, which is restored by the split. According to the signaling hypothesis, managers implement stock splits to communicate favorable private information about the firm's prospects.

However, these competing explanations do not fit very well the case of mutual fund splits.[3] Existing transaction costs and constraint-driven explanations of a trading range do not apply, since mutual funds do not trade in ticks and any transaction costs or trade size restrictions are not related to share prices. Also, in a recent paper, Rozeff (1998) finds that splitting funds do not subsequently outperform non-splitting funds. Rozeff argues that this result is inconsistent with

managerial signaling. Therefore, mutual fund splits provide a relatively clean testing ground for the marketability hypothesis.

The marketability hypothesis states that a splitting fund will attract new money and shareholders. Rozeff (1998) examines 167 splits of mutual funds. He finds no evidence of increased inflow following splits, a finding that appears to contradict the marketability hypothesis. However, Rozeff uses annual data and matches funds based on asset growth in the year the split occurred. This "screen" is coarse and thus might not detect noisy excess inflow that could occur only just following the split.

In this paper, we extend Rozeff's work by examining data on 194 splits of mutual funds executed between 1978 and 1993. We test for excess inflow by using quarterly data and control funds matched on asset growth, performance, and size in the year before the split. We use quarterly data to estimate the timing of any excess inflow more precisely, and we match on prior period characteristics to minimize look-ahead bias in the results.

We find evidence of excess inflow into splitting funds in the quarter of the split and in the two subsequent quarters. The cumulative excess inflow of new money to the splitting funds during the two quarters after the split averages $8.5 million or about 5.6% of net assets.[4] We also find that relative to control funds, there is a significant increase in the number of shareholders in the split year. These findings support the hypothesis that splits improve marketability by restoring share prices to a preferred trading range.

We supplement our empirical work with survey evidence on the views of 52 mutual fund managers. Their responses are also consistent with the marketability hypothesis. These managers generally believe that a lower net asset value (NAV) per share attracts the attention of small investors. Moreover, they do not believe that mutual fund splits convey favorable information about future fund performance.

Conventional justifications of a preferred trading range do not explain why investors respond favorably to mutual fund splits. Although we cannot rule out some as-yet-undiscovered rational explanation for investors' positive response to splits, there may be behavioral (e.g., herding, as in

Bikhchandani, Hirshleifer, and Welch, 1992) or cognitive (e.g., framing, as in Thaler, 1985) factors that lead investors to prefer a trading range. If behavioral or cognitive factors can explain mutual fund splits, they might also be able to explain common stock splits. Indeed, the rationale provided by our findings for why fund managers undertake splits is strikingly similar to the rationale corporate managers cite for undertaking splits of common stock.

The paper is organized as follows. In the next section we discuss briefly the ways in which splits could be related to marketability. Section 2 describes the data in our empirical analysis and confirms Rozeff's (1998) finding that splitting funds do not outperform non-splitting funds. Section 3 presents our tests of the marketability hypothesis. Section 4 reports the results of our survey of mutual fund managers and section 5 concludes.

I. Splits and Marketability

Splits may enhance the marketability of shares by restoring share prices to a preferred trading range. Conventional justifications for a trading range rely on round-lot constraints or transaction costs. However, behavioral or cognitive factors could also explain investor preferences for a trading range.

There is considerable evidence suggesting that individuals base their judgements on some initial "anchoring" value or frame of reference. However, conventional finance theory assumes that individuals should be indifferent to various representations of the same choice problem.[5] Deviations from normative behavior are incorporated in descriptive models of economic behavior, such as the prospect theory of Kahneman and Tversky (1979). Thaler (1985) develops a model that explicitly incorporates framing biases via a "reference price." Thaler provides an extensive discussion of pricing strategies in the presence of such biases.[6]

Public statements by some fund managers indicate their belief that investors exhibit price preference. Michael Price, former portfolio manager of Franklin Funds, observes that "... John Q. Public likes to buy funds that are lower in price than $100 a share. Most funds are at $10 to $30 a share, not $100."[7] Timothy K. Armour, President of Stein Roe Mutual Funds, notes that "By

splitting, we'll bring the price of the fund more in line with that of the average stock fund."[8] Michelle Smith, Managing Director of Mutual Fund Education Alliance, suggests that "NAVs could be a psychological barrier... Investors are going to get fewer shares in a higher-priced fund than they would with a lower one."[9]

In addition to the manner in which choices are presented to investors, Tversky and Kahneman (1986) argue that framing is also controlled by norms, habits, and the expectations of the decision maker.

Bikhchandani, Hirshleifer, and Welch (1992) develop a model to explain widespread observations of conforming behavior. In their model, individuals disregard their own information and follow others with very little information. This leads individuals to converge on one course of action or on rigid norms.

Shefrin and Statman (1993) describe the role of investor behavioral elements in the design and marketing of financial products. They conclude that "... a behavioral framework can offer insights into many other features of security design, such as the design of stocks to have prices within a trading range."

Brennan (1995) observes that individual investors who are the clientele of mutual funds depend on undiversified sources (e.g., a single broker) for their information, and are therefore vulnerable to misinformation. Elton, Gruber, and Rentzler (1989) find that commodity funds and the financial press that covers them provided "... grossly misleading information" about performance. Misinformation coupled with "unsophisticated" investors might lead to puzzling investment behaviors. Gruber (1996) proposes the existence of a disadvantaged clientele (including unsophisticated investors) as a possible explanation for why investors let their money remain in funds that perform poorly.

Thus, behavioral or cognitive factors could also give rise to a preferred trading range. If so, managers would undertake splits in recognition of these factors to enhance the marketability of their funds. If the marketability hypothesis holds, we would expect managers to set post-split prices close to industry averages and for splits to attract new money and investors.

II. Data

In this section, we describe our sample of mutual funds that split and our methods for selecting comparison funds that did not split but were otherwise similar to our sample funds.

A. The Sample

We selected all open-end mutual funds identified in the *CDA Weisenberger Investment Companies Yearbook* as having executing a split during the period 1978 to 1993.[10] We also searched the *CDA Weisenberger Mutual Funds Update* from 1982 to 1993, the mutual funds section of the NASDAQ OTC *Daily Stock Price Record* from 1981 to 1993, and the Moody's *Dividend Record* and the S&P *Dividend Record*, both from 1978 to 1993 for additional splitting funds.

Our final sample consists of 194 mutual funds that executed a split during the 1978 to 1993 period. Approximately 1% of all mutual funds split in a given year during this period.

B. The Control Sample

For each splitting fund, we use two sets of matched control funds to estimate excess inflow of net assets and number of shareholder accounts.

We choose the “net assets” matched fund to match on investment objective, prior return, and fund size, since these could influence the inflow into a mutual fund.[11]

We choose the “growth control” matched fund to match on investment objective and prior growth in net assets, since Patel, Zeckhauser, and Hendricks (1992) present evidence of persistence in inflow into mutual funds. This also allows us to compare our results with those of Rozeff (1998), who uses a similar growth control benchmark.

In all subsequent sections, years (quarters) are in event time, with the split year (quarter) designated as Year 0 (Quarter 0). For each splitting mutual fund, we minimize look-ahead biases by selecting matched funds using only pre-split information. We do not impose a survivorship requirement.

We choose the net assets matched fund as follows. At the end of December of Year -1, we rank all mutual funds with the same investment objective as that of the splitting fund, on the basis of prior three-year return. If the splitting fund has existed for less than three years prior to the split, we separately rank all mutual funds on the basis of two- or one-year returns.

For each splitting fund, we select six funds with returns closest to that of the splitting fund. We then compute the difference in net assets between these six funds and the corresponding splitting fund in Year -1 and rank them on this basis. The fund whose net assets as of the end of December of Year -1 are closest to that of the sample fund is chosen to be the net assets matched fund for the Years 0 through 3.

There are two exceptions to this procedure. First, we select a matched fund only as long as the objective of the splitting fund is unchanged. Second, if in any post-split year the chosen matched fund has missing data (objective, net assets, or number of shareholders), ceases to exist or changes its objective, we use the next best matched fund from among the remaining five possible matches. The matched fund for the split year (Year 0) is used as the match for the pre-split period.

We select the growth control matched fund as follows. We compute the percentage growth in total net assets from Year -2 to Year -1. We begin with the fund listed immediately below the splitting fund in the "Panorama" section of the *Weisenberger Yearbook* and compute the percentage growth in net assets for the same period for all mutual funds whose investment objective is the same as that of the splitting fund. Since the list is in alphabetical order, this process introduces some randomness into the selection process.[12]

We select the first fund whose percentage growth in net assets is within one percent of that of the splitting fund. We return to the top of the list when we reach the end of the list. If we are

unable to match within one percent, we expand the band to five percent and then to ten percent. If we are still unable to generate a match, we choose the fund closest to the splitting fund in percentage growth in net assets.[13]

C. Summary Statistics

We collect monthly raw returns (with all dividends reinvested, after fees and expenses but before sales loads) from the 1995 and 1996 versions of *Morningstar Ondisc*. We collect quarterly and annual data on fund size and returns from various Weisenberger publications, such as the annual *Yearbook*, quarterly *Management Results*, and monthly *Mutual Funds Update*. If a fund ceases to exist due to a merger or liquidation, annual and quarterly data on fund size and returns are still available, but monthly returns are not. We base fund objectives on Weisenberger categories.[14]

Table 1 provides descriptive statistics. The distribution of split dates is even across time. Most of the funds are U.S. equity funds, although there are also some bond funds and "other" funds (such as gold funds, global funds, etc.). Eighty percent of the funds have existed for at least five years before the split. The mean (median) net assets under management at the calendar year-end prior to the split is $227 million ($76 million). The mean (median) number of shareholder accounts is 21,600 (7,539). Notably, 46% of the split factors are larger than two-for-one. Such large split factors are relatively rare for common stock.[15]

The splits are not concentrated in any one month. One hundred fifty-five funds split only once during this period.

[Insert Table 1 about here]

The net assets matched funds and the splitting funds match well on the characteristics we use as the matching criteria. In Year -1, the median net assets of the splitting funds are $78.5 million. The median for the net assets matched fund is $70 million. The median difference is only $1 million and is insignificantly different from zero.

The median prior one-year return for the splitting fund is 22%. The median prior one-year return for the net assets matched fund is 18.4%. The median paired difference is 0.9 % and is not statistically significant. The median paired difference in prior three-year return (sample–match) is 0.1% and is insignificantly different from zero.

For each observation, we also compute the difference in the percent growth in assets in the year prior to the split between the splitting funds and the growth control matched fund. The median percentage growth in assets for the splitting funds is 21.8%. The median for the growth control matched fund is 21.5%. The median paired difference is 0.16% and is not statistically significant.

D. Performance and Risk Characteristics

The marketability hypothesis cannot be tested without first ruling out the possibility that post-split excess inflow is caused by expectations of changes in performance or risk characteristics of splitting funds. Rozeff (1998) uses a matched fund methodology and raw returns to document that splitting funds underperform non-splitting funds following the split. We confirm his results for our sample using a variety of benchmarks.

Elton, Gruber, Das, and Hlavka (1993) use a three-factor (the market risk premium, the pure small stock risk premium and the pure bond risk premium) model to estimate excess returns. We use a similar three-factor model and estimate the excess return over six different periods during the 12, 24, and 36 months both prior to and after the split. For a given period, we regress the excess monthly fund returns (R_i - R_f) on the contemporaneous monthly market risk premium, a pure small stock risk premium and a pure bond risk premium.

We use the return on the CRSP value-weighted index with dividends as our proxy for the market return. The pure small stock return is the intercept plus residual in a regression of the small stock return (from Ibbotson Associates *SBBI Yearbook*) on the market return. The pure bond return is the intercept plus residual in a regression of the bond index return on the market

return and the small stock return. The bond index is a combination of the long-term corporate bond index (20%) and the intermediate-term government bond index (80%).

For each splitting fund, we use the intercept in the three-factor regression as the measure of excess performance. We then calculate the cross-sectional average and median of these intercepts across all the splitting funds and use the results as an aggregate measure of the performance of the splitting funds.

We report the results from the three-factor model, excluding those funds whose objective in Year –1 was "Other" or "Not available." The inferences are not affected when we include these funds also.

The results in Table 2 indicate that mutual funds split after a period of sustained superior performance. The average annualized excess return is about 3.5% in the 36 months prior to the split and 7.1% in the 12 months immediately prior to the split. The average excess performance subsequent to the split is insignificantly different from zero over all periods up to 36 months following the split.

[Insert Table 2 about here]

We obtain substantively similar results using market-adjusted returns, a five-factor model as in Carhart (1997), or matched fund adjusted returns. There is no evidence of superior performance after the split.

In Table 3, we investigate possible changes in the risk characteristics of splitting mutual funds. The results in Panel A indicate that the returns for the sample funds have a positive and significant relation to both the return on the market index and the pure small stock return. The average market beta ranges between 0.80 and 0.90 for all the six holding periods that we examine. The average small stock beta ranges between 0.15 and 0.23. There is no significant relation with the pure bond return. The market beta, the small stock beta, and the bond return beta are similar in the pre- and post-split periods. All the differences in Panel B of Table 3 are insignificant. Hence, the splitting funds seem to be following a similar strategy in both the pre- and post-split periods.[16]

[Insert Table 3 about here]

The evidence shows that mutual funds do not exhibit superior performance after the split. This result holds for all our benchmarks. The risk characteristics of splitting funds also remain unchanged.

III. Changes in Inflow into Splitting Funds around the Split Date

If splits enhance the marketability of shares, we would expect both money inflow and shareholder accounts to increase following splits. Furthermore, under the assumption that smaller investors respond more to these effects, we would expect the inflow of new money to be concentrated in small account sizes. This would also result in a decrease in the average account size after a split.

We estimate the inflow of new money into the fund as follows. We assume that all investors having money in the fund at the beginning of a quarter reinvest all distributions during the quarter back into the fund, and that any inflow of new money occurs at the beginning of the quarter. We assume that the fund is has a pool of money (the existing assets and the new money), which it invests that quarter. Therefore, we estimate the inflow of new money controlling for the natural growth in assets of the fund due to the return during the year. NEWBG (t+1) is the estimate of the inflow of new money in period (t+1) and is calculated as shown below, where NA (t) is the net assets at the end of Period (t), and AR (t+1) is the raw return in Period (t+1).

$$NEWBG\ \ (t+1) = \left[\frac{NA(t+1}{1+AR(t+1)}\right] - NA(t)$$

Patel, Zeckhauser, and Hendricks (1992) show that there is persistence in inflow into mutual funds. We control for the effect of persistence in inflow in two different ways. Our first measure uses the net assets matched fund and a regression model to generate the expected inflow of new money. We pool the splitting and the net assets matched fund and regress the inflow of new money in Period (t-1) on the inflow of new money in Period (t-2). We use the intercept and slope coefficients and the actual inflow of new money in Period (t-1) to calculate the expected inflow of new money in Period (t) for both the splitting and the net assets matched fund. We then compute

the unexpected inflow of new money in Period (t) as the difference between actual inflow and the expected inflow. The excess inflow of new money into the splitting fund in Period (t) is the difference in unexpected inflow between the splitting and the net assets matched fund.

For all post-split Periods (t) subsequent to the split Period 0, we compute the expected inflow in a slightly modified way: We regress the inflow of new money in Period (-1) on the inflow of new money in Period (-2). We use the intercept and slope coefficients from this regression and the expected inflow of new money in Period (t-1) (rather than the actual inflow of new money) to calculate the expected inflow of new money in post-split Period (t).

We compute the unexpected inflow and excess inflow of new money in all periods after the split as explained above. This measure uses only information that exists prior to the split period, since we do not use the actual inflow in the post-split periods in generating these estimates. It also controls for the possible effects of fund size and prior return on inflow, since we chose the net assets matched funds on that basis. We calculate the excess inflow both as a dollar amount and as a percentage of the splitting fund's net assets.

We construct an alternative estimate of the excess inflow of new money into splitting funds. We choose the growth control matched fund to match on prior growth in net assets, so the matching process itself controls for the effect of persistence in inflow. We compute the inflow of new money into both the splitting and the matched fund as explained above by NEWBG(t). The excess inflow is the difference between the inflow of new money to the splitting fund and the inflow of new money to the growth control matched fund, expressed as a percentage of the splitting fund's net assets.

A. Analysis of Annual Excess Inflow around the Split Date

Using the net assets matched fund and the regression-based method, we compute the unexpected inflow of new money for both the splitting and the matched fund.[17] In the split year, there is a large unexpected inflow of new money to splitting funds, which averages 10.1% of net assets (Panel A, Table 4). The excess inflow averages 11.2% of assets and is significant at the 5%

level.[18] However, there is some evidence that the splitting funds also experience excess inflow in Year -1 (an average excess inflow of 6.5%). Hence, our regression-based procedure may not fully control for persistence in inflow.

[Insert Table 4 about here]

To directly control for persistence and also to compare our results with those of Rozeff (1998), we use the growth control matched fund (Panel B, Table 4) to measure excess inflows. When compared to the growth control matched fund, the splitting funds experienced smaller asset growth in the year prior to the split year. The mean (median) excess inflow of new money as a percentage of net assets is -3.2% (-3.2%). Both results are statistically significant.

However, the situation is reversed in the split year. The splitting funds experience greater asset growth as compared to the growth control matched fund. The excess inflow of new money is 19% and the median is 9.3%. Both results are statistically significant at conventional levels.

Overall, our findings suggest that the splitting mutual funds experience an increase in inflow in the split year. This is consistent with the hypothesis that splits enhance the marketability of fund shares.

It is still possible that the new money inflows occurring during in the split year, as documented in Table 4, occur prior to the split. Using annual data does not allow us to estimate the timing of the inflow within the split year. (In his 1998 study, Rozeff faced a similar data constraint.) Therefore, we analyze quarterly net assets data to estimate the inflow that actually occurred subsequent to the split. Since this data allows us to estimate inflow quarter-by-quarter, these tests should be more powerful in detecting whether inflow into splitting mutual funds increases subsequent to a split.

B. Analysis of Quarterly Excess Inflow Around the Split Date

We use the net assets matched fund and the regression approach to estimate excess inflow into the splitting funds. In the split quarter, the average excess inflow into splitting funds is $7.3 million (Panel A, Table 5). The median excess inflow is $2 million. Both figures are significantly

different from zero (*t*=2.73 and Z=2.36). The excess inflow continues to be significant in Quarters 1 and 2, although the magnitudes decline. The average excess inflow in Quarters 1 and 2 is $5 million (*t*=1.81 and 2.30, respectively). The average excess inflow in Quarters 3 and 4 is not significantly different from zero. As a percent of beginning of Quarter 0 net assets, excess inflow is 5.1%, 2.4%, and 3.2% in Quarters 0, 1, and 2 respectively.

In Panel B of Table 5, we report cumulative excess inflow, both including and excluding the split quarter. For example, the cumulative excess inflow in the split quarter and the following two quarters averages $16.5 million and is significant (*t*=2.65). The median is $3.5 million and is also significant (Z=1.91).

In just the two quarters after the split (Quarters 1 and 2), the mean (median) cumulative excess inflow is $8.5 million ($1.5 million) and is statistically at the 5% (10%) level of significance.

[Insert Table 5 about here]

The results for quarterly inflow using the growth control matched fund clearly show that the splitting funds experience a significantly higher level of inflow in the period after the split, though the magnitude decreases over time (Panel C, Table 5). The average excess inflows are $1.4 million, $3.8 million, and $2.4 million, respectively. The corresponding median excess inflow is $1.2 million, $1.1 million, and $1.0 million, respectively. The median inflows are all statistically significant (Z=3.18, 2.28, and 1.88, respectively).

In Panel D, we report the cumulative excess inflow, using growth control matched funds. The average (median) cumulative excess inflow in the split quarter and two subsequent quarters is $8.0 million ($3.6 million). Although average cumulative excess inflow is not statistically significant, the median figures are significant at the 1% level. Moreover, measured as percent of Quarter 0 inflow (Columns 3 and 4 of Panel D), both mean and median cumulative excess inflows are statistically significant. Excess inflow is not reversed for up to four quarters after the split. Even excluding Quarter 0, the average (median) cumulative excess inflow over the two quarters

immediately after the split (Quarters 1 and 2), is $4.7 million ($2.6 million). The median is statistically significant (Z=2.93).

Using both the net assets matched fund and the growth control matched fund, we find that splitting funds experience excess inflows around the split period. This excess inflow occurs not only in the split quarter, but also in at least the first two post-split quarters. The excess inflow is both large and statistically significant consistent with the view that splits enhance the marketability of the mutual fund's shares. Yet the excess inflow is apparently short-lived. Because of this, annual data (as in Rozeff, 1998) is less useful in detecting the excess inflow.

D. Changes in Number of Shareholders, Account Size, and NAV Around the Split Date

If splits enhance the marketability of mutual fund shares, we would expect that more investors would be attracted to the funds. This would show up as an increase in the number of shareholder accounts during the split period. Furthermore, if small investors are more likely to be responsive to marketability issues than are large investors, we would expect that the new shareholders are the smaller investors. If the new accounts are smaller in size, then the average account size should decrease following a split.

In Table 6, we show that the splitting funds experience an increase in the number of shareholder accounts in the split year. We compute the increase in shareholder accounts as a percentage of the number of shareholder accounts at the start of the period. In the year prior to the split, the median increase in the number of shareholder accounts for the splitting funds is 1.2%, compared to a decrease of 4.4% for the net assets matched fund (Panel A). The median excess increase in the number of shareholder accounts (sample minus match) is 4.2% and is not statistically significant (t=1.37).

However, splitting funds attract more investors in the split year. The median excess increase is 9.6% and is significant at the 1% level. In absolute terms, the excess increase in the number of shareholder accounts in the split year averages 6,305, the median is 1,160. Both are statistically

significant at the 1% level. This is much larger than the excess increase in any of the other six years surrounding the split.

[Insert Table 6 about here]

The results using the growth control matched fund provide further evidence confirming that splitting funds attract more investors in the split year. Although the excess increase in the number of shareholder accounts in Year -1 is similar for the splitting and matched funds, this is not so in the split year. The median (average) excess increase in the split year is 10.3% (48.2%), and both are statistically significant.

If splitting funds reduce sales loads or cut minimum investment requirements during the split year, these actions might account for the increase in shareholders around the split. When we investigate this possibility, we find that the proportion of splitting funds lowering entry costs is 7.2%. However, the corresponding proportions for the net assets (growth control) matched fund is 9.7% (5.5%). A two-tailed test of proportions indicates that the differences between sample funds and control funds are not significant.

We find weak evidence that a split attracts additional smaller investors. The total inflow of new money into splitting funds in the split year, NEWBG (0), averages $37.3 million. This is accompanied by the addition of 7,861 new accounts. If all this money comes from new shareholders, the average new account size is $4,745. This is much smaller than the average account size of $10,509 in the year prior to the split (Table 1).

This evidence is only suggestive, since we do not know the actual sales and redemptions for these funds. As further evidence, for each sample and net assets matched fund pair, we compute the difference in average account size in Year (-1) and Year (0). The splitting funds have larger account sizes compared to the matched fund in Year (-1). The median difference is $1,705. About 61% of the differences are positive (Z=2.22). In the split year, the median difference is slightly lower at $1,320. However, 59% of the splitting funds still have an average account size larger than that of the matched fund (Z=1.85).

We compare the NAV for a subsample of the full data set in which we we have NAV data for both the splitting fund and the net assets matched fund (not reported). We observe that in the pre-split period, the average (median) NAV for the splitting funds is $34.66 ($27.50). Both are higher than the mean (median) NAV of $14.91 ($13.66) for the matched fund.

After the split, we observe that the NAV for the splitting fund converges to that of the matched fund. The mean (median) NAV after the split is $11.64 ($10.38). While the pre-split NAV shows wide dispersion, the post-split NAV is clustered around $10. Examination of the distribution of 1994 year-end NAVs for a sample of 2,204 mutual funds with net assets between $25 million and $250 million covered by Morningstar shows that these NAVs also cluster around $10. Within different objective categories, we observe a similar clustering of NAVs around $10. The distribution of pre-split and post-split NAVs indicates that mutual fund split factors are chosen so that the post-split NAV is in line with that in the industry.

There is no evidence that splitting funds exhibit superior performance after the split, nor do the risk characteristics seem to change after the split. This evidence does not support signaling as an explanation for mutual fund splits. But mutual fund do splits seem to enhance the marketability of fund shares. There is an excess inflow both of new money and shareholders in the period of and immediately after the split. There is also some weak evidence that it is smaller investors who respond positively to the split.

IV. Survey of Mutual Fund Managers

We also conducted a survey of mutual fund managers to better understand the motives for mutual fund splits. The survey results are consistent with our findings that mutual fund splits are not signaling devices, but, for whatever reason, investors appear to regard splits as attractive. The survey format is similar to that used by Baker and Gallagher (1980) in which they examined management's attitude toward a common stock split.

We mailed a questionnaire to 238 mutual fund managers. The sample included 169 randomly chosen funds that had not executed a split, and 69 funds that had executed a split.[19] We followed up with non-respondents after four weeks.

We received 52 responses. The response rate for the splitting sample was about 22% (15 out of 69) and about 20% (33 out of 169) for the non-splitting sample.

We asked the fund managers to indicate their response to twelve statements on a five-point scale. The results were obtained by aggregating the two extreme categories at either end of the scale, and are presented in Table 7.

[Insert Table 7 about here]

Fewer than 8% of fund managers agree that splits convey favorable information about future fund performance. Among those who would advocate a split (those who don't), only 13% (0%) agree with the statement that splits convey information about future fund performance. Over 90% agree that the split does not affect the future returns of the fund. The response is similar across the two subsamples that respond “yes”/“no” when asked whether they would advocate a split. This indicates that mutual fund managers do not regard splits as signaling opportunities.

There is modest agreement (about 40%) with the statements that a split keeps the NAV in an optimal range, that a lower NAV attracts more investors, and that it attracts the attention of small investors. More than 50% of the managers who would advocate a split agreed with these statements, compared with less than 20% for the non-advocating group.

Surprisingly, managers don't seem to think that a lower NAV would translate into more inflow into the fund in the future. Only 21% agreed with the statement that a split would increase the number of investors in the fund. Around 45% agreed that a split has no effect on inflow into the fund. Managers who say they would advocate a split are more optimistic than others, and believe that a split will increase fund inflow. Although most managers apparently believe that a split attracts the attention of investors, many of them are unsure whether or not this leads to increased inflow. Generally, managers do not believe that changes in brokers' selling commissions, changes in fund management or fund objectives are associated with mutual fund splits.

V. Conclusion

We empirically examine mutual fund splits to study the phenomenon of stock splits. Conventional liquidity-motivated explanations of a trading range do not apply to mutual funds and cannot explain why mutual funds split. Signaling explanations also are unable to explain mutual fund splits.

We find that mutual funds that do split experience significant post-split increases in net asset inflow and the number of shareholders. Our findings suggest that fund managers use splits to attract new money, and that fund managers regard splits as enhancing the marketability of mutual fund shares.

However, there is still the question of why investors react positively to splits. Investors may prefer a trading range for mutual fund share prices, perhaps owing to behavioral or cognitive factors. Or investors may irrationally confuse mutual fund splits with common stock splits, which they recognize as signaling good news. Nor can we rule out some as-yet-undiscovered rational explanation for investors' positive response to splits. However, if behavioral or cognitive factors are at work in explaining mutual fund splits, they may also be at work in common stock splits.

What is clear is that marketability seems to improve following a split, at least according to the evidence we report here. This evidence provides a rationale for why fund managers undertake splits, and is strikingly similar to the rationale provided by corporate managers for undertaking splits of common stocks.

Journal of Business (July), 409-433.

Elton, E.J., M.J. Gruber, and J. Rentzler, 1989, "New Public Offerings, Information and Investor Rationality: The Case of Publicly Offered Commodity Funds," *Journal of Business* (January), 1-16.

Elton, E.J., M.J. Gruber, S. Das, and M. Hlavka, 1993, "Efficiency with Costly Information: A Reinterpretation of Evidence from Managed Portfolios," *Review of Financial Studies* (Number 1), 1-22.

Fernando, C.S., S. Krishnamurthy, and P.A. Spindt, 1999, "Offer Price and IPO Performance: An Empirical Assessment," Tulane University Working Paper (April).

Grinblatt, M.S., R.W. Masulis, and S. Titman, 1984, "The Valuation Effects of Stock Splits and Stock Dividends," *Journal of Financial Economics* (December), 461-490.

Gruber, M.J., 1996, "Another Puzzle: The Growth in Actively Managed Mutual Funds," *Journal of Finance* (July), 783-810.

Ikenberry, D.L., G. Rankine, and E K. Stice, 1996, "What do Stock Splits Really Signal?" *Journal of Financial and Quantitative Analysis* (September), 357-375.

Kahneman, D. and A. Tversky, 1979, "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica* (March), 263-91.

Lakonishok, J. and B. Lev, 1987, "Stock Splits and Stock Dividends: Why, Who and When," *Journal of Finance* (September), 913-932.

Lakonishok, J., A. Shleifer, and R.W. Vishny, 1992, "The Structure and Performance of the Money Management Industry," Brookings Papers on Economic Activity: Microeconomics, 339-379.

Lamoureux, C G., and P. Poon, 1987, "The Market Reaction to Stock Splits," *Journal of Finance* (December), 1347-1370.

Maloney, M.T. and J.H. Mulherin, 1992, "The Effects of Splitting on the Ex: A Microstructure *Financial Management* (Winter), 44-59.

McNichols, M. and A. Dravid, 1990, "Stock Dividends, Stock Splits and Signaling," *Journal of Finance* (July), 857-879.

Patel, J., R.J. Zeckhauser, and D. Hendricks, 1992, “Investment Flows and Performance: Evidence from Mutual Funds, Cross-border Investments and New Issues,” in R. Sato, R. M. Levich, and R. V. Ramachandran, (Eds.), *Japan and International Financial Markets: Analytical and Empirical Perspectives*, New York: Cambridge University Press.

Porter, D. C. and D. G. Weaver, 1997, "Tick Size and Market Quality", *Financial Management* (Winter), 5-26.

Rozeff, M. S., 1998, “Stock Splits: Evidence from Mutual Funds,” *Journal of Finance* (February), 335-349.

Schultz, P.H., 1999, “Why Do Stocks Split? The Optimal Tick Size and Preferred Price Range *Journal of Finance*, forthcoming.

Shefrin, H. and M. Statman, 1993, “Behavioral Aspects of the Design and Marketing of Financial *Financial Management* (Summer), 123-134.

Sirri, E.R. and P. Tufano, 1998, “Costly Search and Mutual Fund Flows,” *Journal of Finance* (October), 1589-1622).

Thaler, R., 1985, “Mental Accounting and Consumer Choice,” *Marketing Science* (Summer), 199-214.

Tversky, A. and D. Kahneman, 1986, “Rational Choice and the Framing of Decisions,” *Journal of Business* (October), 251-278.

Footnotes

[1] We thank Chris James for suggesting this leader.

[2] Schultz (1999) finds no support for tick-size explanations for stock splits. He concludes that splits broaden the shareholder base by encouraging purchases of the firm's stock especially among small investors. However, Porter and Weaver (1997) conclude that a reduction in the minimum tick size by the Toronto Stock Exchange reduces trade execution costs and may benefit small traders.

[3] Excepting the recent paper by Rozeff (1998), mutual fund splits have not been widely studied in the academic literature. They were noticed early by Barker (1956).

[4] This would increase management fees by roughly 5%.

[5] E.g., see Arrow (1982), Tversky and Kahneman (1986) and Akerlof and Yellen (1987).

[6] Some mutual funds may be mimicking common stock splits (similar to the mimicking argument in Bhabra and Patel (1996)). We do not consider this possibility here.

[7] Investor's Business Daily, January 15, 1997.

[8] Bloomberg News Service, August 23, 1995.

[9] Investor's Business Daily, December 8, 1995.

[10] We include all splits of 20% (six for five) or larger. We exclude money market mutual fund splits and reverse splits. We also excluded three funds that converted from a closed-end fund just prior to the split, and one fund that was listed as an "exchange fund" prior to the split.

[11] A study of "discretionary tax exempt" money management (pension funds) by Lakonishok, Shleifer and Vishny (1992) shows that the amount of net accounts gained by money managers is related to the prior three year return. Sirri and Tufano (1998) also document that net inflows into a mutual fund are a function of the prior performance of the fund, and that this relationship is stronger for smaller and/or newer funds.

[12] If we were to always start from the top of the list, the existence of large fund families such as Alliance, Colonial Funds, Dreyfus, and Fidelity makes it more likely that the matched fund would be from among these funds.

[13]Since Weisenberger stopped reporting net assets in the Panorama section in 1992, this sample ends in 1991.

[14] We aggregate Weisenberger categories. In "Maximum Capital Gain" we include funds pursuing aggressive growth, small cap funds and technology funds. In "Growth" we include funds that pursue long term growth (current income may be an additional focus). In "Equity Income" we include funds whose main objective is current equity income, income from high yielding utility stocks, or flexible income (balanced funds are excluded). "Bonds" include all corporate, government and municipal bond funds, taxable and tax-free. "Other" is mostly global/international funds, or sector funds (mainly gold).

[15] For example, these comprise less than eight percent of the sample in Grinblatt, Masulis and Titman (1984). This may explain why mutual fund splits are undertaken less frequently.

[16] The inferences are similar when we analyze changes in betas from a five-factor model. These results are available from the authors.

[17] All our results for fund inflow using the net assets comparison fund and the regression based approach have been corrected for outliers by omitting the top and bottom two observations, around 3 percent of the sample.

[18] The excess inflow is insignificant in Year 1, a result also documented in Rozeff (1998).

[19] The 69 splitting funds in the survey sample are all the splitting funds in our overall sample for which we could find current address information. The 169 non-splitting funds in the survey are a subset of non-splitting funds for which we could find current address information from a larger random sample.

Table 1

Descriptive Statistics for Splitting Mutual Funds

The table gives descriptive statistics for the total sample of 194 open-end mutual funds that split. The split factor is defined as total number of post-split shares an investor ends up with for each pre-split share. The split year is Year 0. The total dollar net assets, number of shareholder and objective are at the end of Year (-1). The age of the fund is the number of completed years since the fund's inception at the time of the split. The NAVs are from a subsample where the NAV for the splitting and match fund are both available. In panels A through F, the first row gives the number of funds and the second row the percent of funds (out of 194) that fall in each category.

Panel A. Year of the split

	1978-1981	1982-1985	1986-1989	1990-1993
Number	45	32	58	59
Percent	23%	17%	30%	30%

Panel B. Split Factor (SPLFAC)

	1.2≤ *SPLFAC* <1.5	1.5≤ *SPLFAC* <2	*SPLFAC* = 2	*SPLFAC* > 2
Number	8	9	87	90
Percent	4%	5%	45%	46%

Panel C. Net assets of the Fund (NA_1, $millions)

	NA_1 ≤10	10< *NA_1* ≤50	50< *NA_1* ≤250	*NA_1* >250	N.A.
Number	21	49	72	33	19
Percent	11%	25%	37%	17%	10%

Mean (Median) Net Assets (year -1) : $227 million ($76 million)
Mean (Median) Number of shareholder accounts (year -1) : 21,600 (7539)

Panel D. Fund Objective

	Max.Capital Gain	Long Term Growth	Equity Income	Bonds	Others	N.A.
Number	49	64	12	14	32	23
Percent	25%	33%	6%	7%	16%	12%

Note: N.A denotes not available

Table 1
(Continued)

Panel E. Age of the Fund (AGE,years)

	AGE<1	1 *AGE*<5	5 *AGE*<10	*AGE* 10	N.A.
Number	4	35	53	99	3
Percent	2%	18%	27%	51%	2%

Panel F. Loads

	No Load Funds	Load Funds	N.A.
Number	67	101	26
Percent	35%	52%	13%

Panel G. Net Asset Values per Share (NAV)

	Pre-split NAV	Post-split NAV	Match Fund NAV
Mean	$34.66	$11.64	$14.91
Median	$27.50	$10.68	$13.66

Note: N.A. denotes not available

Table 2

One-year, Two-year and Three-year Excess Returns Using the Three Factor Model Around the Split Date

We calculate excess returns as the intercept a_i using the three factor model of Elton et al. (1993). We regress the monthly fund excess return on the market risk premium, the pure small stock risk premium and the pure bond risk premium.

$$r_i - r_f = a_i + b_{i,1}*(r_m - r_f) + b_{i,2}*(r_s - r_f) + b_{i,3}*(r_b - r_f)$$

where
r_i is the monthly fund return with dividends reinvested, and after fees and expenses, but before sales loads,
r_f is the monthly risk free (T bill) rate,
r_m is the market return (CRSP value weighted return with dividends),
r_s is the "pure small stock return" (intercept plus residual from a regression of small stock return on r_m),
r_b is the "pure bond return" (intercept plus residual from a regression of bond index returns on r_m and r_s. The bond index is a combination of 20% long term corporate bond returns and 80% intermediate term government bond returns).

The actual number of months is 11 or 12 for the one-year regressions, between 21 to 24 for the two-year regressions and between 33 and 36 for the three-year regressions. The period is the number of months over which the performance is estimated (the split month is Month 0), i.e. -36 to -1 is the result of regressions using returns from Month -36 to -1 for each fund. The table lists the mean and median a_i across all funds and the associated t-statistic and Z-statistic (we exclude funds whose objective in Year (-1) was "other").

We use the t-statistic to test the mean and the Z-statistic (sign test using the normal approximation to the binomial distribution) to test the median.

Period	Mean(t)	Median	% > 0 (Z)	Median Adj. R^2	n
-36 to -1	0.0029 (5.34)***	0.0015	62.2 (2.47)**	0.846	111
-24 to -1	0.0038 (5.43)***	0.0024	71.2 (4.51)***	0.854	118
-12 to -1	0.0059 (3.73)***	0.0022	64.5 (3.14)***	0.826	124
1 to 12	0.0009 (0.99)	0.0006	57.5 (1.60)	0.812	127
1 to 24	0.0001 (0.18)	-0.0003	49.5 (0.00)	0.837	99
1 to 36	0.0006 (1.19)	0.0001	50.5 (0.00)	0.854	95

***Significant at the 0.01 level (two-tailed).
** Significant at the 0.05 level (two tailed).
* Significant at the 0.10 level (two tailed).

Table 3

Risk Characteristics of Mutual Funds Around the Split Date Using the Three Factor Model

We estimate beta coefficients from the Elton et al. (1993) three factor model for various holding periods. The three factors are the market risk premium, the pure small stock premium and the pure bond risk premium. The coefficients are $Beta_1$, $Beta_2$ and $Beta_3$ respectively. The split month is Month 0. Panel A in the table reports the means of the three betas. For each fund, we calculate the difference (post-split beta minus pre-split beta) for the three-year, two-year and one-year betas. In Panel B, we report the mean of the differences. We exclude funds whose objective in Year (-1) was "other".

Period	Mean $Beta_1$ (Market)	Mean $Beta_2$ (Small Stock)	Mean $Beta_3$ (Bond)	# of Funds
		Panel A: Beta coefficients		
-36 to -1	0.84***	0.15***	0.03	111
-24 to -1	0.89***	0.16***	0.10**	118
-12 to -1	0.86***	0.23***	0.02	124
1 to 12	0.80***	0.16***	-0.01	127
1 to 24	0.89***	0.19***	-0.05	99
1 to 36	0.88***	0.20***	-0.03	95
		Panel B: Comparison of post-split beta and pre-split beta		
(1,36) - (-36,-1)	0.02	0.04	-0.01	95
(1,24) - (-24,-1)	-0.04	0.01	-0.10	99
(1,12) - (-12,-1)	-0.05	-0.06	-0.04	124

*** Significant at the 0.01 level (two-tailed).
** Significant at the 0.05 level (two tailed).
* Significant at the 0.10 level (two tailed).

Table 4

Analysis of Excess Annual Inflows of "New Money" into Splitting Mutual Funds

We estimate the excess inflows of "new money" into the splitting funds in two different ways. We NEWBG(t)" assuming that all inflows occur at the start of the period. In the first measure, we match each splitting fund with a net assets matched fund based on objective, prior return and prior fund size. We use estimates of the intercept and slope coefficients in an OLS regression of NEWBG(t-1) on NEWBG(t-2) and the actual NEWBG(t-1) to estimate the expected inflows in Year t. We calculate the unexpected inflow of new money as the difference between the actual inflow and the expected inflow. The first measure of excess inflow is the difference in this unexpected inflow between the sample and matched fund. We also choose a growth control matched fund based on objective and percentage growth in net assets in the year prior to the split. The second measure of excess inflow is calculated as the difference between the percentage inflows of new money between the splitting fund and the growth control matched fund.

The table lists the mean (median) inflows for the sample fund, the matched fund and the difference (t-statistic (Z-statistic) in parentheses). Panel A reports the results using the net assets matched fund and Panel B the results using the growth control matched fund.

Period	Unexpected inflow for sample fund		Unexpected inflow for matched fund		Excess Inflow (Sample – Match)		# Funds
	Mean	Median	Mean	Median	Mean	Median	
Panel A. Unexpected inflows of new money using the Net Assets matched fund (% of net assets)							
Year (-1)	4.4	-4.0	-2.2	-5.0	6.5 (2.42)**	2.0 (0.80)	125
Year (0)	10.1	3.0	-1.1	-2.0	11.2 (2.60)**	7.0 (1.17)	124

Period	Inflow of new money for sample fund		Inflow of new money for matched fund		Excess Inflow (Sample – Match)		# Funds
	Mean	Median	Mean	Median	Mean	Median	
Panel B. Inflow of new money using Growth Control matched fund (% of net assets)							
Year (-1)	13.7	-3.8	16.9	2.7	-3.2 (-2.25)**	-3.2 (-3.43)***	123
Year (0)	25.1	5.6	6.1	-5.8	19.0 (4.71)***	9.3 (4.51)***	123

*** Significant at the 0.01 level (two-tailed).
** Significant at the 0.05 level (two tailed).
* Significant at the 0.10 level (two tailed).

Table 5

Analysis of Excess Quarterly Inflow of "New Money" into Splitting Mutual Funds

We estimate the excess inflow of new money up to four calendar quarters subsequent to the split (Quarter 0 through Quarter 4) in two different ways. We first compute the inflow of new money in Quarter t NEWBG(t) assuming that all inflows occur at the start of the period. We estimate the intercept and slope coefficients in an OLS regression of NEWBG(-1) on NEWBG(-2) using a pooled sample of splitting and net assets matched funds. We then use these estimates and the actual NEWBG(-1) are then used to estimate the expected inflows in Quarter 0. For Quarters 1 through 4, we use these same coefficients and the expected inflow in the prior period (0 through 3 respectively) to estimate the expected inflow. We calculate the unexpected inflow of new money as the difference between the actual inflow and the expected inflow. The first measure of excess inflow is the difference in unexpected inflow between the splitting and the net assets matched fund. We also choose a growth control matched fund based on objective and percentage growth in net assets in the year prior to the split. The second measure of excess inflow is the difference in percentage inflows of new money between the splitting and matched fund.

The table lists the mean (median) excess inflows (t-statistic (Z-statistic) in parentheses). In Panel A, columns 2 through 5 report the results using the net assets matched fund both as a dollar amount and as a percentage of beginning of quarter 0 net assets. In Panel B, we report the results for cumulative inflows over several quarters using the net assets matched fund. In Panel C, we report the results for percentage growth in assets using the growth control matched fund. In Panel D, we report the results for cumulative inflows using the growth control matched fund.

Table 5
(continued)

Panel A. Excess inflows in quarter 0 through quarter 4 using the net assets matched fund.

Quarter	Excess Inflow ($ mill)		Excess Inflow (%)	
	Mean (t)	Median (Z)	Mean (t)	Median (Z)
0	7.3	2.0	5.1	1.0
	(2.73)***	(2.36)**	(2.51)**	(2.36)**
1	5.0	1.3	2.4	2.0
	(1.81)*	(1.45)	(1.45)	(1.40)
2	5.0	1.0	3.2	1.0
	(2.30)**	(1.64)	(2.22)**	(1.51)
3	3.2	0.9	0.9	1.0
	(1.51)	(1.82)*	(0.58)	(0.93)
4	1.3	0.2	-1.6	0.0
	(0.59)	(0.55)	(-1.19)	(0.0)

Panel B. Cumulative excess inflows into splitting mutual funds using the net assets matched fund.

From Quarter 0 to Quarter:				
1	14.0	2.0	8.7	3.0
	(2.97)***	(1.27)	(2.52)**	(1.97)**
2	16.5	3.5	12.0	4.0
	(2.65)***	(1.92)*	(2.91)***	(2.18)***
3	19.4	5.5	13.7	5.0
	(2.62)***	(1.64)	(2.70)***	(1.18)
4	20.8	3.0	12.5	4.0
	(2.40)**	(1.82)*	(2.17)**	(1.27)
From Quarter 1 to Quarter:				
2	8.5	1.5	5.6	2.0
	(2.04)**	(1.82)*	(2.37)**	(1.66)*
3	11.8	1.5	7.1	1.0
	(2.13)**	(1.45)	(2.02)**	(0.73)
4	13.1	1.9	5.2	2.0
	(1.96)*	(1.09)	(1.12)	(0.82)

Table 5
(continued)

Panel C: Excess inflows in quarter 0 through quarter 4 using the growth control matched fund.

Quarter	Excess Inflow ($ mill)		Excess Inflow (%)	
	Mean (t)	Median (Z)	Mean (t)	Median (Z)
0	1.4	1.2	4.8	2.9
	(0.32)	(3.18) ***	(3.31) ***	(3.58) ***
1	3.83	1.1	5.9	3.1
	(0.86)	(2.28) **	(2.63) ***	(4.18) ***
2	2.4	1.0	2.4	1.5
	(0.78)	(1.88) *	(1.15)	(1.61)
3	3.4	1.2	1.9	1.0
	(1.68) *	(2.48) **	(1.22)	(1.0)
4	-1.4	0.1	-5.9	1.3
	(-0.45)	(0.50)	(-1.08)	(1.41)

Panel D. Cumulative excess inflows into splitting mutual funds using the growth control matched fund.

From Quarter 0 to Quarter:				
1	6.0	2.5	10.9	7.2
	(0.73)	(2.70) ***	(3.44) ***	(3.30) ***
2	8.0	3.6	11.7	7.8
	(0.78)	(2.73) ***	(3.21) ***	(3.13) ***
3	10.9	4.7	13.6	10.8
	(1.00)	(2.93) ***	(3.09) ***	(2.73) ***
4	9.8	5.2	8.1	11.8
	(0.75)	(1.82) ***	(1.02)	(3.08) ***
From Quarter 1 to Quarter:				
2	4.7	2.6	7.6	4.7
	(0.73)	(2.73) ***	(2.54) ***	(2.93) ***
3	7.6	2.9	9.5	6.1
	(1.01)	(2.53) ***	(2.49) ***	(2.73) ***
4	6.7	1.8	4.0	7.7
	(0.68)	(1.44) ***	(0.53)	(2.05) ***

***Significant at the 0.01 level (two-tailed).
**Significant at the 0.01 level (two-tailed).
*Significant at the 0.01 level (two-tailed).

Table 6

Changes in the Number of Shareholder Accounts Around the Split Date

We measure the number of shareholder accounts as of the end of the year (the split year is Year 0). We include funds in this analysis only if the splitting fund's objective in Year (-1) was not missing. Additionally in the post split period, funds are included in a given year only if the objective is the same as in the year prior to the split.

The table shows the mean and median increase in the number of shareholder accounts for the sample fund and both the net assets matched fund (matched on objective, prior three-year raw return and size) and the growth control matched fund. The increase is computed as a percentage of the number of shareholder accounts at the start of the period. For each pair of sample and matched fund, we also calculate the excess increase in new shareholder accounts as the difference (increase in number of accounts for sample - increase in number of accounts for match).

Panel A presents the results for the net assets matched fund and Panel B for the growth control matched fund. The t-statistic (Z-statistic) tests whether the mean (median) excess increase in new shareholder accounts is significantly different from zero. We determine significance levels for the Z-statistic using the normal approximation to the binomial distribution.

Year	Sample fund (%)		Match fund (%)		(Sample - Match) (%)		# of Funds
	Mean	Median	Mean	Median	Mean (t)	Median (Z)	
Panel A. Using the net assets matched fund.							
-1	29.2	1.2	19.1	-4.4	10.1 (1.43)	4.2 (1.37)	120
0	63.1	16.9	20.9	-0.6	42.1 (3.15)***	9.6 (2.84)***	127
Panel B. Using the growth control matched fund.							
-1	30.6	1.2	37.4	-0.6	-6.9 (-0.7)	-1.8 (-1.36)	92
0	64.6	12.1	16.4	-0.8	48.2 (2.66)***	10.3 (4.07)***	92

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

Table 7

Survey Responses

We analyze the responses based on whether or not the fund manager would ever advocate a split of the fund (advocate = "yes" or "no"). The table gives the percentage of the fund managers for whom advocate = "yes" (advocate = "no") who agree, disagree or neither agree nor disagree with the listed statements. The total sample with advocate = "yes" ("no") is 31 (17). We list the percentage of total responses in square brackets.

		Agree	Neither Agree nor Disagree	Disagree
1	A split conveys favorable information about the future performance of the fund	12.9 (0.0) [7.7]	35.5 (17.6) [28.8]	51.6 (82.3) [63.5]
2	Splitting the share of an open end mutual fund keeps the NAV per share in an optimal range	58.1(11.8) [40.4]	32.3(47.1) [40.4]	9.7(41.2) [19.2]
3	A lower NAV per share attracts more investors	51.6(17.6) [40.4]	35.5(47.1) [38.5]	12.9(35.2) [21.2]
4	A split occurs after a period of strong performance	58.1(23.5) [44.3]	25.8(58.8) [36.5]	16.1(17.7) [19.2]
5	A lower NAV per share attracts the attention of small investors	54.8(17.6) [42.3]	29.0(47.1) [34.6]	16.1(35.3) [23.0]
6	A split has no effect on the future returns of the fund	93.5(94.2) [92.3]	3.2(0.0) [3.8]	3.2(5.9) [3.8]
7	A split causes the number of investors in the fund to increase in the future	25.8(11.8) [21.2]	38.7(41.2) [40.4]	35.5(47.0) [38.5]
8	The broker's commission for selling shares in a fund increases after the fund splits	10.0(0.0) [8.5]	23.3(28.6) [25.5]	66.7(71.5) [66.0]
9	A split is usually accompanied by a change in the investment objective of the fund	0.0(0.0) [0.0]	19.4(23.5) [21.2]	80.7(76.5) [78.8]
10	A split is usually accompanied by a change in fund management	0.0(0.0) [0.0]	16.1(23.5) [17.3]	83.9(76.5) [82.7]
11	The broker's commission for selling shares in a fund decreases after the fund splits	3.3(0.0) [2.1]	23.3(14.3) [21.3]	73.3(85.7) [76.6]
12	A split has no effect on the net inflows into the fund	32.3(64.7) [44.3]	38.7(17.6) [30.8]	29.0(17.7) [25.0]