THE EFFECT OF MUTUAL FUND INVESTMENT STYLE ON THE ACCRUAL AND BOOK-TO-MARKET ANOMALIES

by

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and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy with a Major in Management.

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I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

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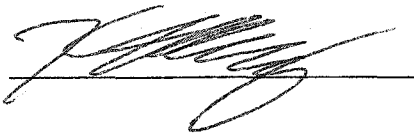
SIGNED: 

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ABSTRACT

This paper shows that institutional investor investment style affects the association between accruals and future returns and book-to-market ratio and future returns. Since both the accrual and book-to-market anomalies generate positive future returns to a trading strategy that is consistent with a value investment style, I predict and find that the accrual effect and the book-to-market effect are lower when the percentage of shares held by value mutual funds is high. These findings are consistent with value mutual funds mitigating mispricing. Additionally, these effects are unrelated to total or growth mutual fund ownership. I also find that changes in value mutual fund holdings are positively associated with the book-to-market ratio, consistent with value funds trading to take advantage of the book-to-market effect, while the results are inconsistent with growth funds trading to take advantage of the anomaly. These results suggest that institutional investor investment style at the fund level has an effect on the accrual and book-to-market ratio anomalies.

1. INTRODUCTION

Prior research finds that future returns are predictable based on current period accruals and book-to-market ratio (Sloan 1996; Rosenberg et al. 1984; Fama and French 1992; Lakonishok et al. 1994). Mispricing and risk are possible explanations for the anomalies. Ali et al. (2000, 2003) and Collins et al. (2003) examine the effect of sophisticated investors on these anomalies using the level of institutional ownership as a proxy for investor sophistication and find mixed evidence. Ali et al. (2003) find that institutional investors act as sophisticated investors to reduce the positive association between book-to-market ratio and future stock returns, but find no evidence that institutional investors reduce the negative association between accruals and future stock returns (Ali et al 2003). In contrast, Collins et al. find that institutional investors that trade frequently reduce the negative association between accruals and future stock returns. While the Bushee (1998) classification used by Collins et al. has several strengths, including the ability to classify all types of institutions and the ability to classify institutions based on their trading frequency, it has some limitations. It treats all funds within an institution as homogeneous and it does not consider how institutions choose which companies to buy. Institutional investment style is important in determining when and how institutions are likely to mitigate mispricing. In this study, I examine the effect of the investment style of institutional investors on the accrual and book-to-market ratio anomalies, to examine whether the accrual and book-to-market anomalies are mitigated by institutional investors with an investment style that makes them more likely to identify accrual and book-to-market mispricing.

Mutual fund investment style heterogeneity is apparent in popular press sources, which generally categorize mutual funds based on the size of stocks in which they invest as well as the investment style they follow. Also, prior research examines mutual fund investment style, and finds that mutual funds are consistent in following their styles (Chan et al. 2002), mutual funds that follow their style consistently earn higher returns (Brown and Harlow 2004), growth funds outperform value funds (Chan et al. 2002), and that mutual fund performance persists after adjusting fund performance for investment style (Ibbotson and Patel 2002; Wermers 2003; Teo and Woo 2001).

Morningstar investment style classifications which are widely used, include value, growth, and balanced. *Morningstar* value funds concentrate their portfolios on stocks that have high book-to-market ratios, high earnings-to-price ratios, and low growth in earnings. Growth funds concentrate their portfolios on stocks that have low book-to-market ratios, low earnings-to-price ratios, and high growth in earnings. Balanced funds follow an investment style that blends both the growth and value strategies. Using *Morningstar* mutual fund investment style classifications, I examine whether the negative association between accruals and future stock returns is related to the percentage of a firm's shares owned by value mutual funds. Additionally, I examine whether the positive association between book-to-market ratio and future stock returns is related to the percentage of a firm's shares owned by value mutual funds. I use the percentage of a firm's shares owned by value mutual funds as a proxy for the probability that the marginal investor is an investor that utilizes an investment style that facilitates identification of the accrual and book-to-market ratio mispricing. By using this proxy, I

attempt to provide insight into one characteristic of sophisticated investors that increases market efficiency. I use this proxy because a value investment style buys and sells stocks in the direction expected to mitigate accrual and book-to-market ratio mispricing. Therefore, consistent with value funds mitigating mispricing, I expect the association between both accruals and future stock returns and book-to-market ratio and future stock returns to be lower for firms with high ownership by value mutual funds relative to firms with low ownership by value mutual funds. Also, I expect the association between accruals and future stock returns and book-to-market ratio and future stock returns to be mitigated to a lesser extent for firms with a high percentage of ownership by growth funds because they trade in the direction opposite of the two anomalies. I focus only mutual funds because investment styles are not available for other types of institutional investors.

Following prior research (Sloan 1996; Collins et al. 2003), I perform hedge portfolio-based tests to investigate mispricing. I form an accruals-based hedge portfolio that takes a long position in firms with smallest accruals, and a short position in firms with the largest accruals. I also form a book-to-market-based hedge portfolio that takes a long position in firms with the highest book-to-market ratios and a short position in firms with the lowest book-to-market ratios. I then form separate hedge portfolios for firms with high and low value mutual fund ownership for both the accruals-based and book-to-market-based hedge portfolios. To control for other factors that influence future stock returns, I perform regression-based tests. The regression-based tests examine the relation between future returns and the decile ranks of accruals and book-to-market ratios for

firms with different levels of value mutual fund ownership, controlling for firm size and earnings-to-price ratio. As robustness tests, I repeat these analyses with the sample partitioned on growth, balanced, and total mutual fund ownership.

Consistent with predictions, hedge portfolio tests show that hedge returns for both the accrual and book-to-market trading strategy are significantly smaller for firms with high value mutual fund ownership relative to firms with low value mutual fund ownership. Results from the regression based tests also show that future returns to an accrual or book-to-market trading strategy are less when value fund ownership is higher. This is not the case for firms with a high level of growth mutual fund ownership. These results are consistent with mispricing as a partial explanation for the accrual and book-to-market effects, and confirm that value funds mitigate these effects, while growth funds do not.

Following Collins et al (2003), I examine trading activity of mutual funds to provide evidence whether the accrual and book-to-market effects are mitigated by informed trading by value mutual funds. The results from trading activity tests are consistent with value funds trading in the direction expected to mitigate the book-to-market effect. Changes in value ownership are positively related to book-to-market ratio, consistent with value funds increasing (decreasing) holdings of firms with high (low) book-to-market ratios. However, I do not find evidence that value funds trade in the direction expected to mitigate the accruals anomaly, which may be due to low power in the statistical tests.

My study contributes to the accrual and book-to-market ratio literature as well as the literature examining institutional investors as sophisticated investors. Prior research shows that future returns are predictable based on current period accruals and book-to-market ratios. Also, most prior research uses total institutional ownership as a proxy for investor sophistication, treating institutional investors as a homogeneous group. Recognizing that institutional investors are not homogeneous, Collins et al. (2003) classify institutional investors based on the institutional investor's portfolio concentration, portfolio turnover and trading sensitivity to current earnings. However, these classifications ignore the manner in which institutional investors choose stocks, i.e. their investment style. Additionally, the classifications are done at the institutional rather than the fund level despite the fact that an institutional investor can have several funds with different investment styles, e.g. Vanguard. I consider the investment style of each fund, and perform the analysis at the fund level. I contribute the literature by providing evidence that mutual fund investment style affects the degree of mispricing related to the accrual and book-to-market ratio anomalies. I predict that the association between accruals and future stock returns and book-to-market ratio and future stock returns is lower when value mutual fund ownership is high, but not when growth or total mutual fund ownership is high because value mutual funds follow an investment style that is consistent with and facilitates identifying accrual and book-to-market ratio mispricing. I provide evidence consistent with this prediction. The evidence suggests that institutional investors that follow a value investment style which facilitates identification of accrual and book-to-market ratio mispricing, mitigate the mispricing, while institutional investors

that following other investment styles which do not facilitate identification of accrual and book-to-market ratio mispricing, do not mitigate the mispricing. Therefore, accrual and book-to-market ratio mispricing are lower when the marginal investor is more likely to follow a value investment style than a growth investment style, suggesting that investment style heterogeneity at the fund level affects the degree of market efficiency with respect accruals and book-to-market ratio.

The remainder of the paper proceeds as follows. Section II develops testable hypotheses. Section III describes the sample and variables. Section IV develops the research design. Section V presents the empirical results and section VI concludes.

2. RELATED RESEARCH AND DEVELOPMENT OF HYPOTHESES

2.1 Institutional Investor Literature

Prior research examines whether institutional investors act as sophisticated investors. Walther (1997) documents that investor expectations of earnings follow analyst forecasts more closely than time series forecasts when institutional ownership is higher. Walther suggests that if reliance on analysts' forecasts indicates sophistication, then institutional ownership proxies for investor sophistication. Hand (1990) tests the extended functional fixation hypothesis (EFFH), which posits that stock price is sometimes set by a marginal investor that is sophisticated, and at other times by a marginal investor that is unsophisticated. Hand uses institutional ownership as a proxy for the probability that the marginal investor is a sophisticated investor. The study tests the EFFH using a sample of firms that used debt-equity swaps, and shows that the stock price reaction to the re-announcement, at the announcement of the quarterly earnings, of the gain due to the swap, is lower when institutional ownership is higher, consistent with institutional investors acting as sophisticated investors. Bartov, Radhakrishnan, and Krinsky (2000) provide evidence that institutional ownership is negatively correlated with post-earnings announcement drift. Jiambalvo, Rajgapol, and Venkatachalam (2002) find that institutional ownership is positively related to the extent to which prices lead earnings. Together these results suggest institutional investors are sophisticated.

2.2 Accrual Anomaly Literature

Sloan (1996) provides evidence that investors fail to understand the differential persistence of accruals and cash flows. Investors overweight the persistence of accruals and underweight the persistence of cash flows. Consequently, future returns are predictable based on current period accruals. Specifically, firms with the lowest current period accruals earn positive future returns, and firms with the highest current period accruals earn negative future returns.

This anomaly has been extended by subsequent research. For example, Chan et al. (2001), Hribar (2001), and Thomas and Zhang (2002) have investigated components of accruals to determine which components seem to cause the accrual anomaly. Other studies have examined the role of financial analysts in the accrual anomaly. Bradshaw et al. (2001) find that future analyst forecast errors are related to current period accruals, suggesting that analysts fail to understand the implications of current period accruals for future earnings. Additionally, Barth and Hutton (2004) find that despite forecast revisions providing information about accrual and earnings persistence beyond the information in current period accruals, investors do not fully incorporate the information into stock price. Beneish and Vargus (2002) examine the relationship between insider trading and the accrual anomaly. They find that accrual mispricing is greater when there is abnormal selling by insiders of firms with positive accruals. Other studies document that the anomaly is due to growth in net operating assets (Fairfield et al. (2003) and Richardson et al. (2004)). Additional studies examine whether the accrual anomaly is distinct from other mispricing anomalies. For example, Collins and Hribar (2000) show

that the accrual anomaly is distinct from post-earnings announcement drift while Desai et al. (2004) find that the accrual anomaly is distinct from the value-glamour anomaly if the value-glamour anomaly is operationalized by book-to-market ratio, earnings-to-price ratio, sales growth, or cash flow-to-price ratio. However, a new variable, operating cash flows scaled by price, seems to capture both the accrual and value-glamour anomaly.

2.3 Institutional Investors and Accrual Anomaly Literature

Finally, research has examined the ability of institutional investors to mitigate accrual anomaly. Evidence consistent with institutional investors mitigating the accrual anomaly is consistent with the anomaly being a result of mispricing rather than risk. However, Ali et al. (2000) group all institutional investors and find that the negative association between accruals and future returns is positively related to institutional ownership, suggesting institutional investors do not mitigate the anomaly. Using Bushee's (1998) classifications, Collins et al. (2003) find that the negative association between accruals and future returns is inversely related to ownership by transient institutional investors. Institutional investors are classified based on portfolio concentration, portfolio turnover, and trading sensitivity to current earnings. Transient investors are characterized as having high turnover and buying (selling) firms with good (bad) earnings news. Quasi-indexers exhibit high diversification and low turnover, while dedicated investors are characterized by high concentration, low turnover, and little sensitivity to current earnings. Collins et al. hypothesize and find that because transient institutional investors are the most active traders, they will trade on accruals signals and mitigate accrual mispricing. They show that the negative association between accruals

and future stock returns is lower when transient institutional investor ownership is higher. Additionally, they find that changes in transient institutional investor ownership are negatively associated with accruals, consistent with informed trading by these investors.

My study differs from Collins et al. and prior research in the way that I partition institutional investors. Collins et al. partition their sample into firms with no institutional ownership and firms with large institutional ownership and a given level of transient ownership. However, classifying institutions using Bushee's institution level classifications discards important information in the heterogeneity within a fund family. For example, the holdings of all Vanguard funds are aggregated to determine the holdings of Vanguard at the institutional level. Vanguard is assigned a trading activity classification based on the aggregate holdings of all its funds. Thus, all Vanguard funds are classified the same. However, Vanguard's multiple funds choose different types of stocks using different methodologies, and should not be treated homogeneously with respect to their investment style. Unlike prior research, my study considers the manner in which funds pick stocks by utilizing *Morningstar* investment style categories at the fund level, and focuses on institutional investors with an investment style that makes them more likely to identify accrual and book-to-market ratio mispricing.

2.4 Book-to-Market Anomaly Literature

In addition to show that future returns are related to current period accruals, prior research shows that future returns are positively related to a firm's book-to-market ratio (Rosenberg et al. 1984; Fama and French 1992; Lakonishok et al. 1994). Thus, a trading strategy that takes a long position in stocks with the highest book-to-market ratio and a

short position in stocks with the lowest book-to-market ratio results in positive future returns. Lakonishok et al. (1994) offers a behavioral explanation for the anomaly, while other Fama and French (1992, 1993, 1996) provide evidence that the higher return is a compensation for risk. However, Daniel and Titman (1997) do not find evidence consistent a risk explanation. Additionally, evidence shows that abnormal returns are concentrated around earnings announcements which is inconsistent with risk as an explanation for the anomaly (La Porta et al. (1997) and Skinner and Sloan (2002)). Overall, mixed evidence exists as to whether this finding is a compensation for risk or mispricing. However, if the predictability of returns is due to mispricing, then sophisticated investors should mitigate the mispricing. Ali et al. (2003) show, among other things, that institutional investors mitigate the book-to-market effect, providing support for the mispricing story. My study refines their measures of institutional trading by focusing on whether institutional investor investment style affects the book-to-market ratio anomaly. I extend Ali et al. by examining whether their results hold only for mutual funds with an investment style consistent with a trading strategy that takes advantage of the book-to-market effect.

2.5 Mutual Fund Investment Style Literature

Prior research finds that past mutual fund performance is useful in predicting future performance (Goetzmann and Ibbotson 1994). Wermers (2003), Ibbotson and Patel (2002), and Teo and Woo (2001) provide evidence that this finding holds even after adjusting mutual fund performance for a mutual fund's style. Chan et al. (2002) find that for the period 1976 to 1997, growth funds outperform value funds, after adjusting mutual

fund performance for investment style. They also document that funds consistently follow their style. This suggests that investment style is a meaningful way to classify mutual funds. Brown and Harlow (2004) provide evidence that funds that follow their style consistently perform better than those funds that do not.

2.6 Hypothesis Development

Prior research focuses on institutional investors as sophisticated investors, and their effect on various anomalies, but ignores investment style. Thus, I focus on the effect of mutual fund investment style on the accrual and book-to-market ratio anomalies, to identify institutional investors that are more likely to identify mispricing related to the anomalies. Consistent with a mispricing story, I expect the association between accruals and future returns and book-to-market ratio and future returns to be lower when the marginal investor is a value-oriented investor.

Prior research documents that mutual funds with a value strategy do not invest in the same types of stocks as mutual funds with a growth strategy, and that mutual funds follow their styles consistently (Chan et al 2002; Brown and Harlow 2004). Value funds focus on identifying out of favor stocks that are expected to realize positive returns in the future. These stocks are often characterized by high book-to-market ratios, high earnings-to-price ratios, and low growth. In contrast growth funds focus on high growth firms. These firms are expected to grow at a rate faster than other firms and are characterized by low book-to-market ratios, low earnings-to-prices ratios, and positive momentum in returns and earnings.

To the extent that market anomalies coincide with a value strategy, I expect only value-oriented institutional investors to mitigate mispricing because they follow an investment style that facilitates the identification of the mispricing while other institutional investors, growth for example, do not. Therefore, I examine the previously ignored effect of institutional investor investment style on the accrual and book-to-market anomalies, and focus on the institutional investors that are most likely to identify and mitigate mispricing with respect the accrual and book-to-market ratio anomalies.

My first set of hypotheses addresses the effect of differences in institutional investor investment style on the accrual and book-to-market ratio anomalies. Prior research shows that a trading strategy that buys low accruals firms and sells high accruals firms is profitable. Prior research also shows that accruals are positively related to growth (Fairfield et al. 2003). Therefore, high accrual firms are generally growth firms while low accrual firms are generally value firms. Thus, the trading strategy is consistent with a value investment style, and value mutual funds are more likely to identify accrual mispricing than other institutional investors. Additionally, firms with high book-to-market ratios are value firms and low book-to-market ratio firms are growth firms (Fama French 1992). Therefore, the book-to-market trading strategy is consistent with a value trading strategy and value mutual funds are more likely to identify book-to-market ratio mispricing that other institutional investors. Because both anomalies are consistent with a value trading strategy, I expect the association between accruals and future returns and book-to-market ratio and future returns to be inversely related to the percentage ownership by value institutional investors. I expect this relationship because as the

percentage ownership by value institutional investors increases, the marginal investor is more likely to be a value investor, which is more likely to trade at an informationally efficient price, reducing the predictability of returns. Additionally, I do not expect growth institutional investors to mitigate the accrual or book-to-market anomalies because their investment styles are inconsistent with the trading strategies of both anomalies. This leads to the following hypotheses:

> H1: Future abnormal returns to an accrual-based trading strategy for firms with a high percentage of value institutional investor ownership are less than future abnormal returns to an accrual-based trading strategy for firms with a low percentage of value institutional investor ownership.
>
> H2: Future abnormal returns to a book-to-market ratio-based trading strategy for firms with a high percentage of value institutional investor ownership are less than future abnormal returns to a book-to-market ratio-based trading strategy for firms with a low percentage of value institutional investor ownership.

Following Collins et al. (2003), my second set of hypotheses focuses on the trading activity of institutional investors. If value institutional investors identify accrual mispricing and trade based on accruals signals, then I expect value funds to increase (decrease) holdings of firms with low (high) accruals. Also, if value institutional investors identify book-to-market ratio mispricing, then I expect value funds to increase (decrease) holdings of firms with high (low) book-to-market ratios. I do not expect the same relationships to hold for growth institutional investors because their investment styles are inconsistent with the trading strategies of both anomalies. This leads to the following hypotheses:

H3: Changes in holdings of value institutional investors are negatively related to accruals.

H4: Changes in holdings of value institutional investors are positively related to book-to-market ratio.

3. SAMPLE AND VARIABLE MEASUREMENT

The empirical tests involving accruals require information not available for all firms on Compustat, resulting in a smaller sample of firms than the sample of firms for book-to-market-based tests. Therefore, I use two samples.

3.1 Accruals Sample

Financial statement data are collected from the Compustat Annual Industrial and Research Files. Returns data are collected from the CRSP daily and monthly stock return files for NYSE, AMEX, and NASDAQ firms. Because investment style classifications are available only for mutual funds, my analysis does not involve all institutional investors. I gather investment style classifications from *Morningstar Principia Advanced Mutual Funds Database, Morningstar Mutual Fund Sourcebook, and Morningstar Mutual Funds.* I obtain mutual fund holdings data from shareholder reports filed with the SEC, provided by Thomson Financial's Mutual Fund Holdings database.

My sample period is from 1993 to 2000. My sample period begins in 1993 because Morningstar investment style classifications became available in 1993. The sample period ends in 2000 due to tests requiring future returns.[1] Following prior research (Collins et al. 2003), I exclude firms in financial services and utility industries (SIC codes 6000-6999 and 4900-4949) and impose minimum size criteria. I exclude firms with sales of less than $25 million, total assets of less than $50 million, or a share

[1] The sample period ends in 2000 because returns for 12 months beginning 4 months after fiscal year-end are necessary for returns test. Therefore, returns for the beginning of 2003 (which are not yet available in CRSP) are needed for most fiscal year 2001 firms.

price of less than $1 or greater than $250. These restrictions result in a final sample of 16,788 firm year observations.

3.2 Book-to-Market Sample

For tests examining the book-to-market effect, I use a broader sample that does not require information available to calculate accruals. I begin with an initial sample of NYSE, AMEX, and NASDAQ firms with financial statement data available on Compustat and returns information available on CRSP, for a sample period of 1993-2000. Unreported results show that on average the book-to-market effect is not present in these sample years.[2] However, the effect is present in four of the eight years.[3] In the other four years, the effect is either not present or is in an opposite direction. Therefore, I limit my sample to firm year observations in the years in which the book-to-market ratio effect is present. Limiting the sample to these years ensures the book-to-market effect is present, and allows me to test if the value funds mitigate the effect. Following prior literature (Fama French 1992), I eliminate firms for which the book-to-market ratio is negative. This results in a final sample of 17,268 firm year observations for the four years in my sample. Ex-ante, I expect results for the book-to-market sample to be stronger than results for the accruals sample because a firm's book-to-market ratio is a classification criterion of the *Morningstar* investment styles while accruals is not.

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[2] This is consistent with Jegadeesh and Titman (2001) who note that the Fama-French book-to-market factor return is not significantly different from zero from 1990-1998.

[3] It is present for 1995, 1996, 1999, and 2000.

3.3 Mutual Fund Holdings and Investment Style Classifications

Mutual funds are required to file shareholder reports with the SEC on a semi-annual basis. Funds are required to file twice a year six months apart, with one of the filing dates coinciding with the fund's fiscal year end. As part of the shareholder reports, funds are required to disclose the holdings in their portfolio. Figure 1 provides a histogram of the frequency of mutual fund filings by month over my sample period. The figure shows that most fund filings coincide with end of calendar quarters; 69.4% of all filings are in March, June, September, and December.

Due to the filing requirements, holdings for a given firm are reported at varying points in time by the funds that hold the firm. For example, Fund A may report holdings for a December year-end firm in June and December, while a Fund B may report holdings for the same firm in September and March. Figure 2 provides a depiction of how fund holdings for a given firm are measured relative to the beginning of the return accumulation period. I calculate the percentage of shares held by mutual funds as the total shares held by mutual funds in the month prior to the return portfolio formation date divided by total shares outstanding. To deal with the varying filing dates, I assume that the number of shares held by a fund in the month prior to the return portfolio formation date is the number of shares reported held in the most recent filing prior to the return portfolio formation date.[4] To calculate changes in holdings, I calculate the difference in the number of shares reported held in the most recent filing prior to the portfolio

[4] While this is likely not the case, more precise holdings data are unavailable.

formation date, and the number of shares reported held in the most recent filing following the portfolio formation date.

Morningstar classifies mutual fund investment styles into three categories: value, growth, and balanced. These annual classifications are determined by the price-to-book, price-to-projected earnings, price-to-sales, price-to-cash flow ratios, dividend yield, long-term projected earnings, historical earnings growth, sales growth, cash flow growth, and book-value growth of stocks in the fund's portfolio at the end of the year based on the most recent filing. I match the *Morningstar* investment style classification to each fund, and calculate the percentage of shares held by value, growth, and balanced funds in addition to total fund ownership. Changes in holdings are then calculated for each fund style classification as well.

3.4 Variables

I calculate accruals using the statement of cash flows approach as suggested by Collins and Hribar (2002). Earnings are calculated as net income before extraordinary items, scaled by average total assets. Cash flows are calculated as the net cash flow from operating activities, scaled by average total assets. *Accruals* are the difference between earnings and cash flows. For the book-to-market sample, the book-to-market ratio, *B/M*, is calculated following Fama and French (1992) as the book value of equity for year t divided by the market value of equity in June of year t+1.

For returns tests, annual buy-and-hold size-adjusted returns are used. Size-adjusted returns are calculated by subtracting the buy-and-hold return of the firm's corresponding size decile from the firm's annual buy-and-hold return. Size deciles are

formed using NYSE and AMEX firms. To form the size deciles, NYSE and AMEX firms are placed into deciles based on beginning of year market value of equity. NASDAQ firms are then placed into deciles based on the decile cutoff points formed using NYSE and AMEX firms. Annual buy-and-hold returns are then calculated for each decile. Buy-and-hold size-adjusted returns are calculated for the twelve months beginning four months after the fiscal year-end for the accruals sample.[5] For the book-to-market sample, following Fama and French, buy and hold returns are calculated for the twelve months beginning in July of year t+1.

[5] This is consistent with prior research that suggests that by the fourth month, information about the accrual and cash flow components of earnings is publicly available (Sloan (1996)).

4. RESEARCH DESIGN

4.1 Hedge Portfolio Tests

I perform hedge portfolio tests as in prior research (Sloan 1996; Collins et al. 2003) to test whether value mutual funds mitigate the accrual and book-to-market anomalies. To perform accruals tests, firms are sorted into deciles in each year based on *Accruals* for year t. I then form three portfolios. The first two portfolios consist of firms in deciles one and ten, respectively. The third portfolio consists of firms in deciles 2-9. I then calculate future annual size-adjusted buy-and-hold returns for each accrual portfolio. Statistical tests are based on the mean and standard error of the annual portfolio returns for the eight sample years. Firms are then assigned to quintiles based on the percentage of value mutual fund ownership, independent of the *Accruals* rankings. Firms in the top quintile of value mutual fund ownership are placed in the high value ownership subsample (*HVal*). Descriptive statistics show that value ownership in quintiles one through four is 1.5% on average, and 12% on average for quintile five. Because I use value fund ownership as a proxy for the probability that the marginal investor follows a value investment style, and value fund ownership is very low in all four of the bottom four quintiles, firms in the bottom four quintiles of value mutual fund ownership are placed in the low value ownership subsample (*LVal*) to partition the sample into firms with the largest value ownership and firms with the smallest value ownership.

Hedge returns are calculated for the full sample and the two subsamples by subtracting the returns for the portfolio of firms in the highest decile of accruals from the

returns for the portfolio of firms in the lowest decile of accruals. Consistent with prior research, I expect the hedge returns to be positive and significant for the full sample. Consistent with H1, hedge returns for the *HVal* subsample are expected to be less than hedge returns for the *LVal* subsample. As robustness tests, I perform the same analyses using partitions based on growth (*HGrowth* and *LGrowth*), balanced (*HBal* and *LBal*) and total (*HTot* and *LTot*) mutual fund ownership. Because mutual fund investment style affects a mutual fund's portfolio choices, and value mutual funds follow and investment style that trades in a direction consistent with identification of the accrual anomaly, I expect the association between accruals and future returns differ when the marginal investor more likely to be a value investor rather than a growth investor. Therefore, I expect the difference in hedge returns between the *HGrowth* and *LGrowth*, *HTot* and *LTot*, and *HBal* and *LBal* subsamples to be less than the difference in hedge returns between the *HVal* and *LVal* subsamples.

For book-to-market ratio tests, firms are sorted into deciles in each year based on *B/M* for year t, and portfolios are formed as described above for accruals. The *HVal* and *LVal* subsamples for book-to-market ratio tests are formed in the same manner as for the accruals tests. Hedge returns are calculated for the full sample and the two subsamples by subtracting the returns for the portfolio of firms with the lowest *B/M* from the returns for the portfolio of firms with the highest *B/M*. Consistent with prior research, I expect the hedge returns to be positive and significant for the full sample. Consistent with H2, hedge returns for the *HVal* subsample are expected to be less than hedge returns for the *LVal* subsample. As robustness tests, I perform the same analyses using partitions based

on growth, balanced, and total mutual fund ownership. As in accruals tests, I expect the difference in hedge returns between the *HGrowth* and *LGrowth*, *HTot* and *LTot*, and *HBal* and *LBal* subsamples to be less than the difference in hedge returns between the *HVal* and *LVal* subsamples.

4.2 Regression-based Tests

In addition to the hedge portfolio tests, I also perform regression-based tests to control for factors shown in prior research to have predictive ability for future returns (Sloan 1996; Collins et al. 2003). I estimate the following equation cross-sectionally for each year for the accruals sample, and report the averages of the coefficients:

$$R_{t+1} = \alpha_0 + \alpha_{0H}HVal_t + \alpha_1 RAcc_t + \alpha_2 RAcc\_HVal_t + \alpha_3 lnMV_t + \alpha_4 lnBM_t + \alpha_5 EP_t + \nu_{t+1} \quad (1)$$

where:

R_{t+1}	=	one-year-ahead size-adjusted returns, measured as annual sized-adjusted buy-and-hold returns from the beginning of the fourth month after the firm's fiscal end;
$HVal_t$	=	1 for firms in the top quintile of percentage value ownership, and zero otherwise;
$RAcc_t$	=	the decile rank of *Accruals* in year *t*, scaled to be between zero and one;
$RAcc\_HVal_t$	=	$RAcc_t$ x $HVal_t$;
$lnMV_t$	=	natural logarithm of the market value of equity at fiscal year end;
$lnBM_t$	=	natural logarithm of the book-to-market ratio at fiscal year end;
EP_t	=	the earnings-to-price ratio at fiscal year end.

In equation (1), $RAcc_t$ is scaled to be between zero and one so that the coefficient α_1 can be interpreted as a hedge return. Prior research suggests that α_1 should be negative, suggesting that future returns are negatively related to current year's total accruals. Consistent with H1, α_2 is expected to be significantly positive, suggesting that value

funds mitigate mispricing. I estimate the following equation cross-sectionally in each year for the book-to-market sample, and report the averages of the coefficients:[6]

$$R_{t+1} = \alpha_0 + \alpha_{0H}HVal_t + \alpha_1 RB/M_t + \alpha_2 RB/M\_HVal_t + \alpha_3 LMVE_t + \alpha_4 EP_t + v_{t+1} \quad (2)$$

where:

R_{t+1}	=	one-year-ahead size-adjusted returns, measured as annual sized-adjusted buy-and-hold returns from the beginning of July of year *t+1*;
$HVal_t$	=	1 for firms in the top quintile of percentage value ownership, and zero otherwise;
RB/M_t	=	the decile rank of B/M in year *t*, scaled to be between zero and one;
RB/M_HVal_t	=	RB/M x $HVal_t$;
$LMVE_t$	=	natural logarithm of the market value of equity at the end of June of year *t+1*;
EP_t	=	the earnings-to-price ratio, measured as earnings per share at the end of the fiscal year *t*, divided by price at the end of June of year *t+1*.

Similar to $RAcc_t$, RB/M_t is scaled to be between zero and one so that α_1 can be interpreted as a hedge return. Prior research suggests that α_1 should be positive, suggesting that high *B/M* firms outperform low *B/M* firms in the future. Consistent with H2, α_2 is expected to be significantly negative, suggesting that value funds mitigate mispricing. As robustness tests, I also estimate equations (1) and (2) replacing the value ownership variable with growth, balanced, and total mutual fund ownership. I expect α_2 to be smaller in magnitude in these specifications than in the specification with value mutual fund ownership, suggesting that mispricing is mitigated to a lesser extent for firms with high growth, balanced or total mutual fund ownership.

[6] In equation (2) accruals is omitted from the model because as discussed in section I, do not limit the book-to-market ratio sample to firms with information available to calculate accruals.

4.3 Changes in Holdings Tests

If accrual and book-to-market ratio anomalies are mitigated because value funds trade on current accrual and book-to-market ratio signals, then I expect changes in value fund holdings to be related to accruals and book-to-market ratios. To test whether changes in fund holdings are related to *Accruals*, I estimate the following equation:

$$ChgVal_t = \alpha_0 + \alpha_1 RAcc_t + \alpha_2 lnMV_t + \alpha_3 ChgTot_t + \alpha_4 ChgE_t + \alpha_5 Ret_t + \nu_t \quad (3)$$

where:

$ChgVal_t$	=	the number of shares held by value funds from the filing following the fourth month after fiscal year end minus the number of shares held by value funds from filing prior to the fourth month after fiscal year end;
$RAcc_t$	=	the decile rank of accruals in year *t*;
$lnMV_t$	=	natural logarithm of the market value of equity at fiscal year end;
$ChgTot_t$	=	the number of shares held by mutual funds from the filing following the fourth month after fiscal year end minus the number of shares held by mutual funds from filing prior to the fourth month after fiscal year end;
$ChgE_t$	=	the change in earnings from year *t-1* to year *t*, measured as the earning per share for year *t* minus earnings per share for year *t-1*;
Ret_t	=	the compounded raw returned measured during the period for which the change in ownership is calculated.

I estimate the above equation cross-sectionally for each of the eight years and report the averages of the coefficients. Consistent with H3, I expect α_1 to be negative, suggesting that value funds sell firms with high *Accruals* and buy firms with low *Accruals.*

To test whether changes in fund holdings are related to *B/M*, I estimate the following equation:

$$ChgVal_t = \alpha_0 + \alpha_1 RB/M_t + \alpha_2 LMVE_t + \alpha_3 ChgTot_t + \alpha_4 ChgE_t + \alpha_5 Ret_t + \nu_t \quad (4)$$

where:

$ChgVal_t$	=	the number of shares held by value funds from the filing following July of year *t+1* minus the number of shares held by value funds from filing prior to July of year *t+1*;
RB/M_t	=	the decile rank of B/M in year *t*, where book value of equity is measured at fiscal year end and market value of equity is measured at the end of June of year;
$LMVE_t$	=	natural logarithm of the market value of equity at the end of June of year *t+1*;
$ChgTot_t$	=	the number of shares held by mutual funds from the filing following July of year *t+1* minus the number of shares held by mutual funds from the filing prior to July of year *t+1*;
$ChgE_t$	=	the change in earnings from year *t-1* to year *t*, measured as the earning per share for year *t* minus earnings per share for year *t-1*;
Ret_t	=	the compounded raw returned measured during the period for which the change in ownership is calculated.

I estimate the above equation cross-sectionally for each of the four years and report the averages of the coefficients. Consistent with H4, I expect α_1 to be positive, suggesting that value funds sell firms with low *B/M* and buy firms with high *B/M* accruals. As robustness tests, I estimate equations (3) and (4) for changes in growth and balanced fund ownership. I do not expect α_1 to be significantly different from zero for either specification, suggesting that growth and balanced funds do not trade in a direction consistent with the either the accrual or book-to-market ratio anomalies.

It is important to note that ideally, the change in fund ownership should be measured closest to the period when *Accruals* and *B/M* become known publicly. Measuring the change in fund ownership this precisely, will capture whether changes in fund holdings are driven by new *Accruals* or *B/M* information. However, because mutual funds are required to file holdings data only twice each year, the data available do not

allow changes in ownership to be measured this precisely. Thus, the power of these tests is low and insignificant results should be interpreted cautiously.

5. EMPIRICAL RESULTS

5.1 Descriptive Statistics

I first examine the association between *Morningstar* investment style classifications and Bushee (1998) institutional investor classifications.[7] Table 1 provides the frequency of value, balanced, and growth classifications among transient, quasi-indexer, and dedicated classifications. The results show that within institutions classified as transient, there is variation in mutual fund investment style. Most importantly, it is not the cast the vast majority of value funds are also classified as transient; therefore, *Morningstar* investment style classifications capture a different construct than that used in Collins et al. (2003). Thus, classifying funds at the institution rather than fund level does not capture the heterogeneity of investment style within fund families. Table 2 provides statistics for the accruals and book-to-market ratio samples. Table 2 reveals that the mean percentage ownership by mutual funds is 11.6%, while the mean for value and growth funds is 3.6% and 3.4% respectively for the accruals sample. The mean percentage ownership by mutual funds is 11.2% for the book-to-market ratio sample, while the mean for value and growth funds is 2.4% and 4.0% respectively.

Table 3 provides the averages of the annual means for each variable in the *HVal* and *LVal* subsamples and the *HGrowth* and *LGrowth* subsample. Table 3 also reports t-tests using the mean and standard errors of the annual means to compare the subsamples. Panel A presents statistics for the accruals sample partitioned based on ownership by

[7] I thank Brian Bushee for making institutional investor classifications for 1993-1999 available to me.

value mutual funds and Panel B presents statistics for the accruals sample partitioned based on ownership by growth mutual funds. Panel C presents statistics for the book-to-market ratio sample partitioned based on ownership by value mutual funds and Panel D presents statistics for the book-to-market ratio sample partitioned based on ownership by growth mutual funds. For the accruals sample, firms in the *HVal* subsample are larger and have a larger book-to-market ratio, *lnMV* of 6.239 and *lnBM* of –0.486 compared to *lnMV* of 6.007 and *lnBM* of –0.780. This result is consistent with value funds investing in firms that have higher book-to-market ratios relative to other types of funds. Additionally, firms in the *HVal* subsample have a higher earnings-to-price ratio of 0.039 compared to 0.006 for the *LVal* subsample. This result is consistent with value funds investing in firms with higher earnings-to-price ratio firms than growth funds. The results show that *Accruals* are not different across the two samples, which is not consistent with value funds investing in firms with smaller accruals. These results are similar when comparing medians instead of means. The results in Panel C, for the book-to-market ratio sample, are also similar.

Panel B shows that for the accruals sample, firms in the *HGrowth* subsample are larger, have higher earnings, and higher cash flows than firms in the *LGrowth* subsample. Firms in the *HGrowth* subsample have a smaller book-to-market ratio than firms in the *LGrowth* subsample, *lnBM* of –1.173 relative to *lnBM* of –0.609. This is consistent with growth mutual funds investing in firms with lower book-to-market ratios relative to other types of funds. Additionally, firms in the *HGrowth* subsample have larger accruals than firms in the *LGrowth* subsample, *Accruals* of –0.037 relative to *Accruals* of –0.048. This

is consistent with growth funds investing in firms with larger accruals, which is inconsistent with the accrual trading strategy. Results in Panel D show that for firms in the book-to-market ratio sample, firms in the *HGrowth* subsample have lower book-to-market ratios than firms in the *LGrowth* subsample. This is consistent with growth funds investing in firms that have lower book-to-market ratios relative to other types of funds.

Examination of the ownership by fund type shows that, by construction, percentage ownership by value funds is greater in the *HVal* subsample; the mean value percentage ownership is 12.0% for the accruals sample and 9.6% for the book-to-market ratio sample. The statistics also show that growth fund ownership is greater in the *LVal* subsample. Unreported statistics show that the percentage value ownership for the *LVal* subsample is zero for the firms in the first quartile and below, 0.8% at the median, and 2.5% at the third quartile for the accruals sample. Conversely, the percentage value ownership for the *HVal* subsample is 8.4% at the first quartile, 10.5% at the median, and 13.9% at the third quartile for the accruals sample. These results are similar for the book-to-market ratio sample. Thus, partitioning the sample into firms in the top quintile of value ownership and firms in the lowest four quintiles seems to be an appropriate means of capturing the firms with large value ownership.

Table 4 presents Spearman correlations of variables for the accruals and book-to-market ratio samples. The statistics are the means of the annual Spearman correlations for each variable. Statistical tests are based on the means and standard errors of the annual correlations. For the accruals sample, the correlations show that accruals and cash flows are negatively correlated. Also, percentage of shares held by mutual funds is

positively correlated with earnings, accruals, cash flows, and book-to-market ratio. Value ownership is significantly correlated with earnings, size, book-to-market ratio, and earnings-to-price ratio. Also, value ownership is uncorrelated with accruals, and growth ownership is positively correlated with accruals. For the book-to-market ratio sample, value ownership is positively correlated with size, book-to-market-ratio, and earnings-to-price ratio.

5.2 Tests of Accrual Mispricing

Table 5 presents the results of hedge portfolio tests for the accruals sample. Panel A provides the results for the hedge portfolio tests for the full sample, and the *HVal* and *LVal* subsamples. The portfolio returns are the means of the eight annual observations. For statistical tests, t-statistics are based on the means and standard errors of the eight annual observations. For the full sample, consistent with prior research, the portfolio with the lowest *Accruals* earns a positive return of 13.1%, while the portfolio with the highest *Accruals* earns a negative return of –8.3%. The hedge return is 21.4%.[8] The return to the lowest *Accruals* portfolio in the *HVal* subsample is 2.1% and is not significantly different from zero, compared to a significantly positive return of 15.0% for the *LVal* subsample. Additionally, a t-test of the annual returns shows that the returns are significantly smaller for the *HVal* subsample at the 0.05 level (one-tailed) than for the *LVal* subsample. The return to the highest A*ccruals* portfolio for the *HVal* subsample is –5.4% and not significantly different from zero, compared to a significantly negative

return of –8.8% for the *LVal* subsample. However, a t-test shows the returns are not significantly different from each other.[9] The hedge return for the *HVal* subsample is 7.5% and not significantly different from zero, while the hedge return for the *LVal* subsample is 23.8% and significant. Consistent with H1, the hedge returns for the *HVal* subsample are significantly less than the hedge returns for the *LVal* subsample at the 0.05 level (one-tailed). These results are consistent with stock price responding more efficiently to accruals when value ownership is high, which is consistent with mispricing as a partial explanation for the accrual anomaly.

As robustness tests, I repeat the analysis for samples partitioned by growth, balanced, and total fund ownership. For this analysis, the high and low ownership subsamples are formed in the same manner as for value ownership. Panel B presents the results for partitions based on percentage of shares owned by growth funds. The *HGrowth* subsample consists of firms in the highest quintile of growth ownership and the *LGrowth* subsample consists of firms in the lowest four quintiles of growth ownership. The results show that there are not significant differences across the two groups for the lowest *Accruals* portfolio or the highest *Accruals* portfolio. Additionally, the hedge returns for the two groups are not significantly different from each other. Thus, growth funds do not appear to mitigate accrual mispricing. Panels C and D present results for

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[8] The return is significantly larger than prior studies. To confirm that this is a feature of the sample period, I replicate Collins et al. (2003) and obtain similar hedge returns to those reported in their study using their sample period.

[9] This is due to a large positive return in the *HVal* sample for one of the years. Eliminating this year causes the return for the *HVal* to be significant. However, the hedge returns are still significantly different across the *HVal* and *LVal* subsamples.

partitions based on balanced and total fund ownership respectively. In both panels, there are no significant differences in returns across the two groups.

I also perform regression-based tests as in prior research (Sloan 1996; Collins et al. 2003) to control for factors that have been shown to affect future returns. Table 6 presents the results of these tests. The coefficients reported are the means of the coefficients from the eight annual cross-sectional regressions, and the t-statistics are based on the means and standard errors of the coefficients. Consistent with prior research, Models 1 and 2 show that accruals are negatively related to future returns. Model 3 examines the effect of value ownership on the associations between current period accruals and future returns. In model 3, *RAcc* captures the accrual based hedge return for firms with low value mutual fund ownership, while *RAcc_HVal* captures the incremental effect for firms with high value mutual fund ownership.[10] The results show that coefficient on *RAcc* is significantly negative (-0.152 one-tailed $p<0.001$) and the coefficient on *RAcc_HVal* is significantly positive (0.101 one-tailed $p<0.05$). Thus, the hedge return of 5.1% (|-0.152+0.101|) for the *HVal* subsample is smaller than the hedge return of 15.2% for the *LVal* subsample. Additionally, consistent with predictions unreported robustness tests provide evidence that the association between accruals and future returns does not differ across levels of growth, total, or balanced mutual fund ownership.

Taken together the results from Tables 5 and 6 provide evidence consistent with mispricing as a partial explanation for the accrual anomaly. The results provide evidence

that value mutual funds mitigate accrual mispricing, while growth funds do not. Additionally, high total mutual fund ownership alone does not mitigate mispricing. Thus mutual fund investment style affects the degree of accrual mispricing.

5.3 Tests of Book-to-Market Mispricing

I perform the same analyses for portfolios based on the book-to-market ratio. Table 7 provides the results of the hedge portfolio tests. Panel A presents the results for the value ownership subsamples. The hedge returns for the full sample are 38.5%. This hedge return is large in comparison to prior research, but the results are based on only four years of data.[11] The return to the lowest portfolio of *B/M* is -3.1% and not significantly different from zero for the *HVal* subsample, compared to a return of -25.1%, which is significantly positive, for the *LVal* subsample. This difference is significant at the 0.01 level using a one-tailed test. For the portfolio with the highest *B/M*, the returns are 12.8% and 14.4% for the *HVal* and *LVal* subsamples, respectively. Both are significantly different from zero, and the difference between the returns for the two subsamples is not significant. The hedge returns are 15.9% and 39.5% for the *HVal* and *LVal* subsamples, respectively. Both are significantly positive, and the hedge return is significantly less for the *HVal* subsample. These results are consistent with H2, and are

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[10] Because *RAcc* is scaled to be between zero and one, it can be interpreted as the hedge return for the firms with low value mutual fund ownership, while *RAcc_HVal+ RAcc* can be interpreted as the hedge return form firms with high value mutual fund ownership.

[11] I calculate hedge returns for the sample period 1981-2000 and find hedge returns similar in magnitude to prior research. Therefore, it seems the unusually large hedge return is due to the specific years in the sample and having a small number of years in the sample.

also consistent with value funds mitigating market mispricing related to book-to-market ratios.

Panels B, C, and D present results for samples partitioned by growth, balanced, and total fund ownership respectively. Panel B reveals that the differences across the *HGrowth* and *LGrowth* groups are not significantly different for the lowest, highest, or hedge portfolio. These results are consistent with growth funds not mitigating book-to-market ratio effect. However, the return for the highest *B/M* portfolio for the *HGrowth* group is not different from zero.[12] Panels C and D show that the hedge returns are not different across groups when partitioning by balanced and total fund ownership.

In addition to the hedge portfolio tests, I also perform regression-based tests to control for other factors related to future returns. The coefficients reported in Table 8 are the means of the coefficients from the four annual cross-sectional regressions, and the t-statistics are based on the means and standard errors of the coefficients. Consistent with prior research, the coefficient on *RB/M* is significantly positive in Models 1 and 2. Model 3 provides evidence that value funds reduce the association between book-to-market ratio and future returns. In model 3, *RB/M* captures the book-to-market ratio based hedge return for firms with low value mutual fund ownership, while *RB/M_HVal* captures the incremental effect for firms with high value mutual fund ownership.[13] The coefficients on *RB/M* and *RB/M_HVal* are positive (0.359) and negative (-0.282). Both

[12] This is due to a large positive return in the *HGrowth* sample for one of the years. With only four annual observations, the large positive value in one year has a large effect on the standard error of the distribution of the means.

are significantly different from zero at the 0.05 level using a one-tailed test. Also, the hedge return for the *HVal* subsample of 7.7% (0.359-0.282) is significantly smaller than the hedge return of 35.9% for the *LVal* subsample. Robustness tests confirm that growth, balanced, and total ownership do not affect the association between book-to-market ratio and future returns.

Taken together, these results support the hypothesis that value funds mitigate mispricing associated with book-to-market ratio. However, these results are based on only four annual observations. Therefore, as a robustness test, I repeat the analyses using pooled cross-sectional data. The unreported results are qualitatively similar.

5.4 Tests of Mutual Fund Trading Activity

Tables 9 and 10 present results of tests examining the changes in fund ownership. Table 9 shows that changes in value ownership are not related to accruals. The coefficient on *RAcc* captures the effect of the decile rank of accruals on the change in value fund holdings and is not significantly different from zero. Robustness tests show that changes in growth and balanced ownership are also not associated to accruals. These results are inconsistent with value funds trading on accruals signals to take advantage of the accruals effect. However, given my inability to measure changes in holdings immediately surrounding the date accruals become publicly available, it is possible that the statistical tests are not of sufficient power.

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[13] Because *RB/M* is scaled to be between zero and one, it can be interpreted as the hedge return for the firms with low value mutual fund ownership, while *RB/M_HVal+ RB/M* can be interpreted as the hedge return from firms with high value mutual fund ownership.

Consistent with H4, table 10 shows that changes in value ownership are positively associated to the decile rank of book-to-market ratio as measured by the significantly positive coefficient on *RB/M*. Robustness tests show that changes in growth ownership are negatively related to the decile rank of book-to-market ratio and changes in balanced ownership are positively related to the decile rank of book-to-market ratio. These results provide evidence that value funds trade in a direction consistent with a trading strategy that takes advantage of the book-to-market ratio effect. Also, growth funds trade in a direction opposite of a strategy that takes advantage of the book-to-market ratio effect.

5.5 Additional Analyses

5.5.1 Further Investigation of Changes in Mutual Fund Holdings

I perform additional analyses to provide more evidence on the trading activity of value mutual fund. Changes in holdings tests provide evidence that changes in value mutual fund holdings are positively related to book-to-market ratio. Results from portfolio tests suggest that the positive relation is driven by low book-to-market stocks. However, this is inconsistent with the notion that mutual funds cannot sell short. Therefore, I investigate whether this result is due to value mutual funds selling stocks of firms with low book-to-market ratios that they already own. To investigate this result, I examine the changes in holdings by value funds for each decile of book-to-market ratio. I first estimate the following equation:

$$ChgVal_t = \alpha_0 + \alpha_1 LMVE_t + \alpha_2 ChgTot_t + \alpha_3 ChgE_t + \alpha_5 Ret_t + v_t \quad (5)$$

which is similar to equation (4), except that the decile rank of the book-to-market ratio is omitted. Therefore, the residuals from this estimation capture the change in value

ownership unrelated to the control variables. This allows me to examine the mean change in value mutual fund ownership by decile of book-to-market ratio without the confounding effects of other factors that are related to the change in value mutual fund ownership. Thus, I examine the mean residual from equation (5) for each decile of book-to-market ratio.

Unreported results show that the mean change in holdings unrelated to the control variables in equation (5) for the lowest decile of book-to-market ratio is significantly negative, while the mean change in holdings for the highest decile of book-to-market ratio is not significantly different from zero. Figure 3 graphically presents these results. Figure 3 shows the mean residual from equation (5) fore each decile of book-to-market ratio. This analysis confirms that, on average, value funds sell stocks in the lowest book-to-market ratio decile, and do not buy stocks in the highest book-to-market ratio decile. Similar tests for the accruals sample are consistent with the results in Table 9 and do not provide evidence of value funds trading in a direction consistent with the accruals anomaly. However, given the inability to measure changes in holdings immediately surrounding the release of current period accruals, these results should be interpreted cautiously.

5.5.2 Beta as an Additional Control Variable

As a robustness test, I include *Beta*, the common stock beta from the capital asset pricing model as an additional control variable. I calculate *Beta* using a maximum 60 months of data prior to the end of the fiscal year, and require that the firm have at least 12 months of prior data to calculate *Beta*. Unreported descriptive statistics show that the

there is not a significant difference between the mean *Beta* for firms with high value mutual fund ownership and firms with low value mutual fund ownership, 1.030 and 1.114 respectively. The results also show that firms with high growth mutual fund ownership are riskier than firms with low growth mutual fund ownership, a *Beta* of 1.038 and 1.334 respectively (two-tailed p-value <0.01). Results of estimating equation (1) including *Beta* are presented in Table 11. Consistent with hypothesis 1, *RAcc_HVal* is significantly positive (0.096, one-tailed p-value <0.10), suggesting that value mutual funds mitigate accrual mispricing. Additionally, unreported robustness tests do not provide evidence that the association between accruals and future returns differs across levels of growth, total, or balanced mutual fund ownership even after controlling for *Beta*.

I also include *Beta* as a control variable in tests examining the book-to-market anomaly. Unreported descriptive statistics indicate that the difference between the mean *Beta* for firms with high value mutual fund ownership is less than the mean *Beta* for firms with low value mutual fund ownership, 0.977 and 1.101 respectively (two-tailed p-value <0.10). Additionally, the mean *Beta* for firms with high growth mutual fund ownership is greater than the mean *Beta* for firms with low growth mutual fund ownership, 1.415 and 0.992 respectively (two-tailed p-value <0.01). Results of estimating equation (2) including *Beta* as a control are presented in Table 12. Consistent with hypothesis 2, *RB/M_HVal* is significantly negative (-0.258, one-tailed p-value <0.05), suggesting that value mutual funds mitigate the book-to-market anomaly. Additionally, unreported robustness tests do not provide evidence that the association between book-to-market

ratio and future returns differs across levels of growth, total, or balanced mutual fund ownership even after controlling for *Beta*.

5.5.3 Summary of Results

Together my results provide evidence consistent with mispricing as an explanation for the accrual and book-to-market ratio anomalies. The results provide evidence that value mutual funds mitigate mispricing. When value ownership is high, stock prices respond more efficiently with respect to accruals and book-to-market ratio. Additionally, value funds trade on book-to-market signals while growth funds do not. Consistent with predictions, the results provide evidence that growth fund do not trade take advantage of accrual mispricing. Thus, the results provide evidence that institutional investor investment style is useful in setting ex ante expectations about which institutional investors should be expected to mitigate accrual and book-to-market ratio mispricing.

6. CONCLUSION AND SUMMARY

My study examines whether institutional investor investment style affects the association between accruals and future returns and book-to-market ratio and future returns. I predict that because both anomalies are consistent with a value trading strategy, the association between accruals and future returns and book-to-market ratio and future returns is inversely related to the probability of the marginal investor following a value investment style. I use the percentage of a firm's shares owned by value mutual funds as a proxy for this probability in order to capture firms with the largest ownership by institutional investors whose investment style is most likely to identify accrual and book-to-market ratio mispricing.

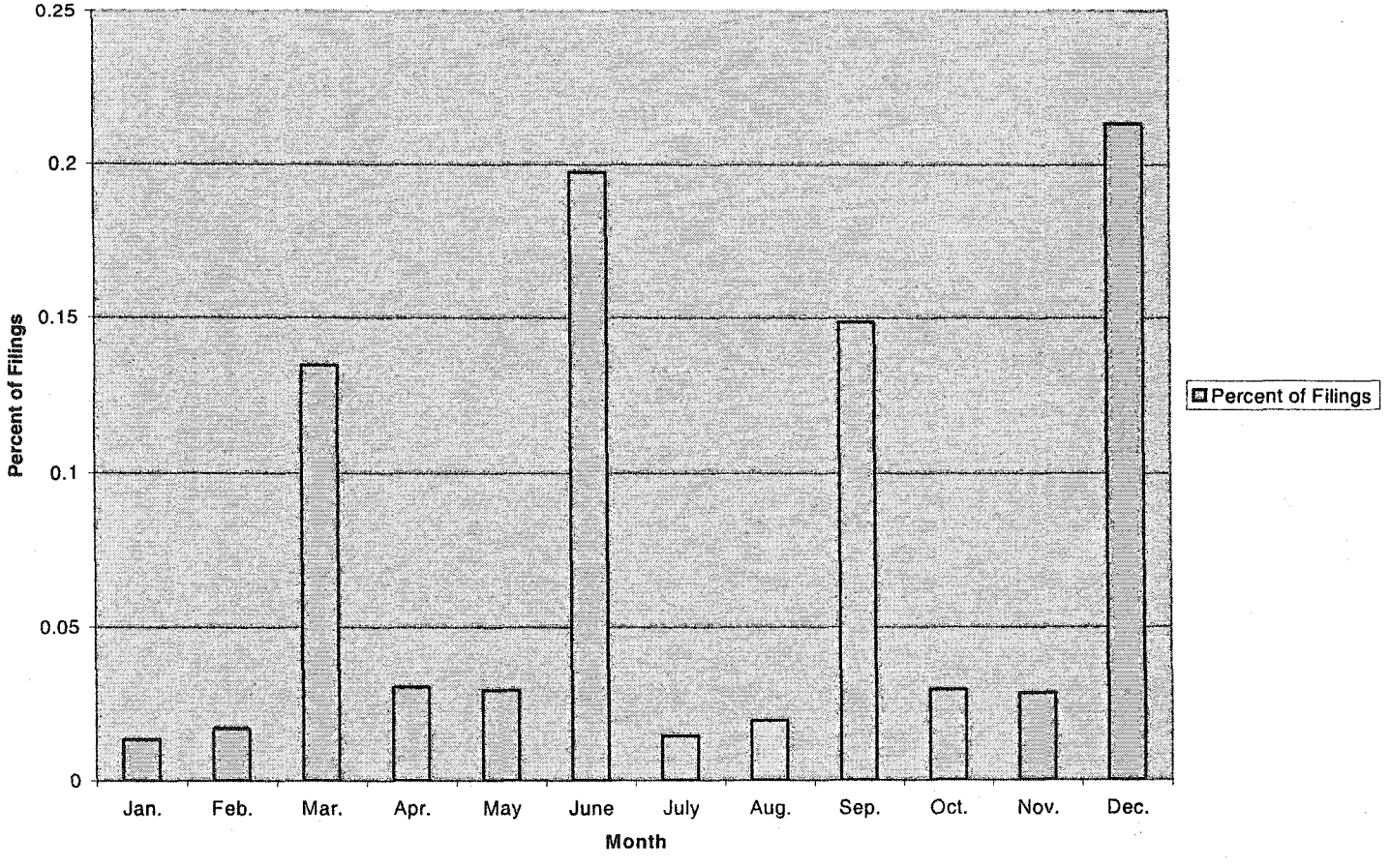
I contribute to the literature by providing evidence that while the association between accruals and future returns and book-to-market ratio and future returns is lower for firms with high value mutual fund ownership, the association is unrelated to the percentage ownership by growth mutual funds or total mutual fund ownership. This provides evidence that institutional investor investment style is important in determining when and how institutions are likely to mitigate mispricing. Specifically, I provide evidence that institutional investors that follow an investment style that makes them more likely to identify accrual and book-to-market ratio mispricing (value mutual funds), mitigate the mispricing, while institutional investors following other investment styles do not. This is consistent with mispricing as a partial explanation for accrual and book-to-market ratio anomalies. I also find that value funds trade to take advantage of the book-to-market ratio anomaly. I do not find that value funds trade to take advantage of the

accruals anomaly; however, this may be due to low statistical power caused by the inability to examine changes in holdings immediately following public knowledge of current period accruals. I am unable to measure changes in holdings immediately surrounding the announcement of accrual information because mutual funds are required to file holdings information with the Securities Exchange Commission only twice per year.

Overall, I introduce a unique way to view institutional investors' role in stock price formation. In light of this evidence, future research should consider the heterogeneity of investment style as a characteristic that affects institutional investors' role in setting stock prices. A limitation of my study is that I test predictions using only mutual funds because investment style classifications are not available for other institutional investors.

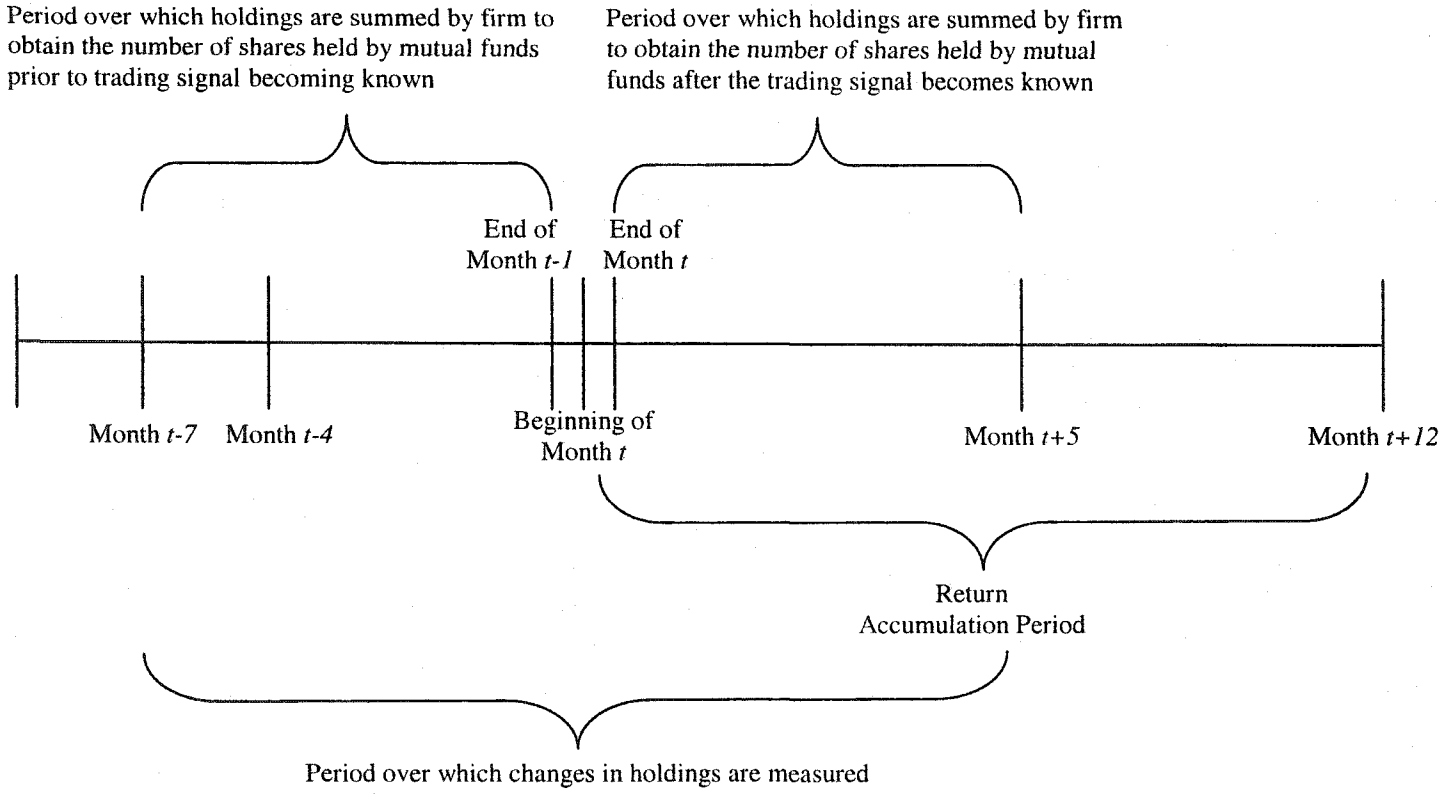
APPENDIX A: FIGURES

Figure 1
Monthly Distribution of Filing Dates of Mutual Funds[a]



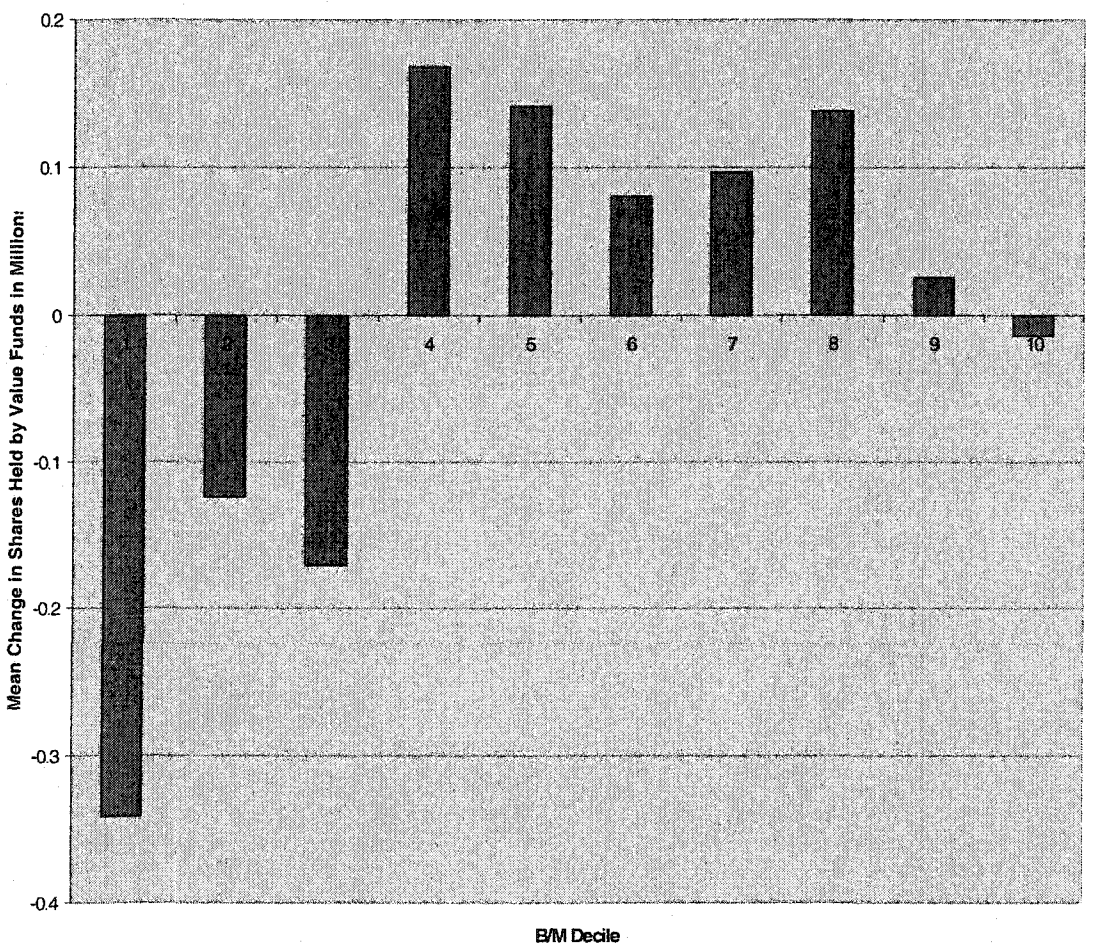
[a] This figure shows the percentage of total SEC shareholder report filings by mutual funds for the period 1993-2000 that fall in each month. Mutual funds are required to file shareholder reports semi-annually each year. The semi-annual filings are based on the fund's fiscal vear end rather than calendar vear end.

Figure 2
Timeline of Mutual Fund Holdings and Return Measurement Dates for the Accruals Sample[a]



[a] This figure shows a timeline depicting a firm's fiscal year end and the period over which future returns are measured for the accruals sample. The accruals sample consists of 16,788 firms-year observations between 1993 and 2000 for which Compustat information is available to calculate accruals. Also shown are periods over which mutual fund holdings are measured to obtain the percentage of shares owned by mutual funds prior to the return accumulation date, and the period over which mutual fund holdings are measured to obtain the change in aggregate holdings by mutual funds for a given firm.

Figure 3
Mean Change in Value Ownership by Book-to-market Ratio Decile[a]



[a] This figure shows change in value mutual fund ownership unrelated to market value of equity, change in total mutual fund ownership, annual change in earnings, and contemporaneous return, for each decile of book-to-market ratio, measured as the mean residual for each decile from the following regression:

$$ChgVal_t = \alpha_0 + \alpha_1 LMVE_t + \alpha_2 ChgTot_t + \alpha_3 ChgE_t + \alpha_4 Ret_t + \nu_t$$

where:

$ChgVal_t$	= the number of shares held by value funds from the filing following July of year t+1 minus the number of shares held by value funds from the filing prior to July of year t+1;
$LMVE_t$	= natural logarithm of the market value of equity at the end of June of year t+1;
$ChgE_t$	= the change in earnings from year t-1 to year t, measured as the earning per share for year t minus Earnings per share for year t-1
Ret_t	= the compounded raw returned measured during the period for which the change in ownership is calculated.
$ChgTot_t$	= the number of shares held by mutual funds from the filing following July of year t+1 minus the number of shares held by mutual funds from the filing prior to July of year t+1;

APPENDIX B: TABLES

Table 1
Comparison of Morningstar Investment Styles and Bushee (1998) Institutional Investors Classifications[a]

Bushee (1998) Classification[b]	Morningstar Investment Style[b]			
	Value	Balanced	Growth	Total
Transient	616	520	877	2013
(Row Percent)	(0.306)	(0.258)	(0.436)	
Quasi-Indexers	1205	1081	1021	3307
(Row Percent)	(0.364)	(0.327)	(0.309)	
Dedicated	327	264	268	859
(Row Percent)	(0.381)	(0.307)	(0.312)	
Total	2148	1865	2166	6179

[a] This table reports the number value, growth, and balanced mutual funds that would be classified as transient, quasi-indexers, or dedicated using the Bushee (1998) classification methodology for the period 1993-1999. The period is from 1993-1999 because Morningstar investment style classifications are available from 1993-present, while classifications using the Bushee (1998) classification methodology were provided by Brian Bushee for the period 1993-1999.

[b] Variable definitions:

Value	=	funds classified as value mutual funds by Morningstar;
Balanced	=	funds classified as balanced mutual funds by Morningstar;
Growth	=	funds classified as growth mutual funds by Morningstar ;
Transient	=	funds classified as transient by Bushee (1998) classification methodology;
Quasi-Indexers	=	funds classified as quasi-indexers by Bushee (1998) classification methodology;
Dedicated	=	funds classified as dedicated by Bushee (1998) classification methodology.

Table 2
Descriptive Statistics for Firm Characteristics for the Accruals and Book-to-market Ratio Samples[a]

Panel A: Accruals Sample

Variable[b]	Mean	Standard Deviation	Min.	First Quartile	Median	Third Quartile	Max.
Earnings	0.043	0.109	-5.408	0.013	0.048	0.0871	0.900
Accruals	-0.046	0.105	-4.233	-0.085	-0.044	-0.004	0.760
CashFlows	0.089	0.096	-1.175	0.039	0.089	0.141	0.670
lnMV	6.063	1.879	1.111	4.675	5.831	7.225	13.139
lnBM	-0.725	0.817	-8.795	-1.183	-0.682	-0.194	2.659
EP	0.126	0.243	-8.096	0.017	0.048	0.074	2.804
TotPct	0.116	0.103	0.000	0.025	0.100	0.180	0.889
ValPct	0.036	0.052	0.000	0.000	0.014	0.053	0.861
BalPct	0.029	0.036	0.000	0.002	0.017	0.042	0.827
GPct	0.034	0.059	0.000	0.000	0.007	0.042	0.676

Panel B: Book-to-Market Ratio Sample

Variable[b]	Mean	Standard Deviation	Min.	First Quartile	Median	Third Quartile	Max.
B/M	0.645	0.846	0.000	0.224	0.437	0.783	25.204
LMVE	5.136	2.335	-5.852	3.790	5.105	6.553	13.170
EP	-0.019	0.371	-30.069	-0.022	0.034	0.069	1.523
TotPct	0.112	0.113	0	0.011	0.083	0.179	0.987
ValPct	0.024	0.043	0	0.000	0.003	0.030	0.555
BalPct	0.024	0.033	0	0.000	0.010	0.034	0.322
GPct	0.040	0.067	0	0.000	0.014	0.054	0.698

[a] The accruals sample consists of 16,788 firms-year observations between 1993 and 2000 for which Compustat information is available to calculate accruals. The book-to-market ratio sample consists of a broader sample of firms that does not require Compustat information be available to calculate accruals. The book-to-market ratio sample consists of 17,268 firm-year observations for the years 1995, 1996, 1999, and 2000. These years are used because the book-to-market ratio effect is not present on average during the period 1993-2000; however, it is present during these four years.

[b] Variable definitions:

Earnings	=	net income before extraordinary items, scaled by average total assets;
CashFlows	=	net cash flow from operating activities, scaled by average total assets;
Accruals	=	Earnings – CashFlows;
lnMV	=	natural logarithm of the market value of equity at fiscal year end;
lnBM	=	natural logarithm of the book-to-market ratio at fiscal year end;
B/M	=	book value of equity for year t divided by the market value of equity in June of year t+1;
LMVE	=	natural logarithm of the market value of equity at the end of June of year t+1;

Table 2 (continued)

TotPct	=	percentage of common shares held by mutual funds;
ValPct	=	percentage of common shares held by mutual funds classified as value funds by Morningstar;
BalPct	=	percentage of common shares held by mutual funds classified as balanced funds by Morningstar;
GPct	=	percentage of common shares held by mutual funds classified as growth funds by Morningstar.

Table 3
Descriptive Statistics for Firm Characteristics for the Accruals and Book-to-market Ratio Samples Partitioned on Percentage Ownership by Value and Growth Mutual Funds[a]

Panel A: Accruals Sample Partitioned on Percentage Ownership by Value Mutual Funds

	Mean			Median		
Variable[c]	HVal[b]	LVal[b]	Difference[d]	HVal[b]	LVal[b]	Difference[d]
Earnings	0.045	0.043	0.002	0.046	0.049	-0.003
Accruals	-0.046	-0.046	0.000	-0.045	-0.044	-0.001
CashFlows	0.091	0.089	0.002	0.090	0.089	0.001
lnMV	6.239	6.007	0.232*	5.992	5.789	0.203
lnBM	-0.486	-0.780	0.294**	-0.478	-0.733	0.311**
EP	0.039	0.006	0.033**	0.064	0.045	0.019**
TotPct	0.206	0.092	0.114**	0.195	0.072	0.123**
ValPct	0.120	0.015	0.105**	0.105	0.005	0.100**
BalPct	0.042	0.026	0.016**	0.033	0.013	0.020**
GPct	0.022	0.036	-0.014*	0.022	0.008	0.014

Panel B: Accruals Sample Partitioned on Percentage Ownership by Growth Mutual Funds

	Mean			Median		
Variable[c]	HGrowth[b]	LGrowth[b]	Difference[d]	HGrowth[b]	LGrowth[b]	Difference[d]
Earnings	0.071	0.036	0.035**	0.073	0.044	0.029**
Accruals	-0.037	-0.048	0.011**	-0.037	-0.045	0.008*
CashFlows	0.108	0.085	0.023**	0.105	0.086	0.019**
lnMV	6.563	5.926	0.637**	6.401	5.588	0.813**
lnBM	-1.173	-0.609	-0.564**	-1.140	-0.566	-0.574**
EP	0.027	0.009	0.018*	0.039	0.052	-0.013**
TotPct	0.220	0.088	0.132**	0.207	0.072	0.135**
ValPct	0.028	0.038	-0.010*	0.013	0.014	-0.001
BalPct	0.044	0.026	0.018**	0.032	0.014	0.018**
GPct	0.122	0.011	0.111**	0.102	0.003	0.099**

Panel C: Book-to-Market Ratio Sample Partitioned on Percentage Ownership by Value Mutual Funds

	Mean			Median		
Variable[c]	HVal[b]	LVal[b]	Difference[d]	HVal[b]	LVal[b]	Difference[d]
B/M	0.824	0.613	0.211*	0.622	0.400	0.222*
LMVE	6.028	4.932	1.096	5.997	4.937	1.060**
EP	0.038	-0.035	0.073*	0.063	0.026	0.037**
TotPct	0.199	0.092	0.107**	0.186	0.053	0.133**
ValPct	0.096	0.007	0.089**	0.083	0.001	0.082**
BalPct	0.044	0.019	0.025**	0.033	0.007	0.026**
GPct	0.029	0.044	-0.015*	0.011	0.008	0.003

Table 3 (continued)

Panel D: Book-to-Market Ratio Sample Partitioned on Percentage Ownership by Growth Mutual Funds

	Mean			Median		
Variable[c]	HGrowth[b]	LGrowth[b]	Difference	HGrowth[b]	LGrowth[b]	Difference
B/M	0.355	0.730	-0.375**	0.243	0.522	-0.279**
LMVE	5.931	4.957	0.974**	6.327	4.755	1.572**
EP	0.008	-0.027	0.035	0.026	0.038	-0.012**
TotPct	0.249	0.079	0.170**	0.236	0.053	0.183**
ValPct	0.017	0.027	-0.010*	0.005	0.004	0.001
BalPct	0.039	0.020	0.019**	0.027	0.007	0.020**
GPct	0.152	0.013	0.139**	0.131	0.003	0.128**

[a] The accruals sample consists of 16,788 firms-year observations between 1993 and 2000 for which Compustat information is available to calculate accruals. The book-to-market ratio sample consists of a broader sample of firms that does not require Compustat information be available to calculate accruals. The book-to-market ratio sample consists of 17,268 firm-year observations for the years 1995, 1996, 1999, and 2000. These years are used because the book-to-market ratio effect is not present on average during the period 1993-2000; however, it is present during these four years.

[b] All firms are ranked annually based on *ValPct* and *GPCT*. The *HVal* subsample consists of 3,356 firm-years from 1993-2000 ranked in the top quintile of *ValPct* for the accruals sample. The *HVal* subsample consists of 3,453 firm-years for the ranked in the top quintile of *ValPct* for the book-to-market ratio sample. The *LVal* subsample consists of 13,432 firm-years from 1993-2000 ranked in the bottom four quintiles of *ValPct* for the accruals sample. The *LVal* subsample consists of 13,815 ranked in the bottom four quintiles of *ValPct* for the book-to-market ratio sample. The *HGrowth* subsample consists of 3,356 firm-years from 1993-2000 ranked in the top quintile of *GPct* for the accruals sample. The *HGrowth* subsample consists of 3,453 firm-years for the ranked in the top quintile of *GPct* for the book-to-market ratio sample. The *LGrowth* subsample consists of 13,432 firm-years from 1993-2000 ranked in the bottom four quintiles of *GPct* for the accruals sample. The *LGrowth* subsample consists of 13,815 ranked in the bottom four quintiles of *GPct* for the book-to-market ratio sample.

[c] Variable definitions:

Earnings	=	net income before extraordinary items, scaled by average total assets;
CashFlows	=	net cash flow from operating activities, scaled by average total assets;
Accruals	=	Earnings – CashFlows;
lnMV	=	natural logarithm of the market value of equity at fiscal year end;
lnBM		natural logarithm of the book-to-market ratio at fiscal year end;
EP	=	the earnings-to-price ratio at fiscal year end for the accruals sample, and the earnings to price ratio at the end of June of year t+1 for the book-to-market sample;
B/M	=	book value of equity for year t divided by the market value of equity in June of year t+1;
LMVE	=	natural logarithm of the market value of equity at the end of June of year t+1;
TotPct	=	percentage of common shares held by mutual funds;

Table 3 (continued)

ValPct	=	percentage of common shares held by mutual funds classified as value funds by Morningstar;
BalPct	=	percentage of common shares held by mutual funds classified as balanced funds by Morningstar;
GPct	=	percentage of common shares held by mutual funds classified as growth funds by Morningstar.

[d] Statistics provided represent the averages of the annual means for each variable in the subsamples, and the t-tests use the mean and standard errors of the annual means.

* Denotes the difference is significant at the 0.05 level using a two-tailed test.

** Denotes the difference is significant at the 0.01 level using a two-tailed test

Table 4
Means of Annual Spearman Correlation Coefficients for Firm Characteristics for the Accruals and Book-to-market Ratio Samples[a]

Panel A: Accruals Sample[b]

Variable[a]	Accruals	CashFlows	lnMV	LnBM	EP	TotPct	ValPct	BalPct	GPct
Earnings	0.290	0.531	0.321	-0.435	0.605	0.193	0.047	0.180	0.254
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.008)	(0.001)	(0.001)
Accruals		-0.555	-0.026	0.0051	0.290	0.025	-0.013	0.008	0.046
		(0.001)	(0.061)	(0.592)	(0.001)	(0.035)	(0.282)	(0.455)	(0.023)
CashFlows			0.288	-0.329	0.246	0.139	0.073	0.150	0.147
			(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
lnMV				-0.603	-0.024	0.281	0.102	0.275	0.334
				(0.001)	(0.307)	(0.001)	(0.001)	(0.001)	(0.001)
lnBM					0.139	-0.150	0.148	-0.133	-0.368
					(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
EP						0.087	0.216	0.104	-0.047
						(0.003)	(0.001)	(0.001)	(0.127)
TotPct							0.702	0.790	0.719
							(0.001)	(0.001)	(0.001)
ValPct								0.555	0.261
								(0.001)	(0.001)
BalPct									0.540
									(0.001)

Table 4 (continued)

Panel B: Book-to-Market Ratio Sample[b]

Variable[c]	LMVE	EP	TotPct	ValPct	BalPct	GPct
B/M	-0.377	0.248	-0.103	0.217	-0.048	-0.338
	(0.003)	(0.025)	(0.099)	(0.003)	(0.414)	(0.003)
LMVE		0.119	0.500	0.350	0.467	0.516
		(0.093)	(0.001)	(0.001)	(0.001)	(0.001)
EP			0.168	0.336	0.221	-0.005
			(0.003)	(0.001)	(0.001)	(0.890)
TotPct				0.638	0.784	0.765
				(0.001)	(0.001)	(0.001)
ValPct					0.603	0.265
					(0.001)	(0.011)
BalPct						0.555
						(0.001)

p-values are given in parentheses.

[a] This table reports the mean of the annual Spearman correlation coefficients. The reported p-values are based on the t-statistics calculated using the means and the standard errors of the annual correlation coefficients.

Table 4 (continued)

[b] The accruals sample consists of 16,788 firms-year observations between 1993 and 2000 for which Compustat information is available to calculate accruals. The book-to-market ratio sample consists of a broader sample of firms that does not require Compustat information be available to calculate accruals. The book-to-market ratio sample consists of 17,268 firm-year observations for the years 1995, 1996, 1999, and 2000. These years are used because the book-to-market ratio effect is not present on average during the period 1993-2000; however, it is present during these four years.

[c] Variable definitions:

Earnings	=	net income before extraordinary items, scaled by average total assets;
CashFlows	=	net cash flow from operating activities, scaled by average total assets;
Accruals	=	Earnings – CashFlows;
lnMV	=	natural logarithm of the market value of equity at fiscal year end;
lnBM	=	natural logarithm of the book-to-market ratio at fiscal year end;
EP	=	the earnings-to-price ratio at fiscal year end for the accruals sample, and the earnings to price ratio at the end of June of year t+1 for the book-to-market sample;
B/M	=	book value of equity for year t divided by the market value of equity in June of year t+1;
LMVE	=	natural logarithm of the market value of equity at the end of June of year t+1;
TotPct	=	percentage of common shares held by mutual funds;
ValPct	=	percentage of common shares held by funds classified as value mutual funds Morningstar;
BalPct	=	percentage of common shares held by funds classified as growth mutual funds Morningstar;
GPct	=	percentage of common shares held by funds classified as balanced mutual funds Morningstar.

Table 5
Time-series Means of Annual Equal Weighted One-year-ahead Size-adjusted Buy-and-hold Return Portfolios Based on Annual Rankings of Accruals and Percentage of Mutual Fund Holdings by Investment Style[a]

Panel A: Partition based on value mutual fund ownership

Accrual Portfolio	Full Sample		Fund Ownership: HVal[b]		Fund Ownership: LVal[b]		Difference (HVal – LVal)	
	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)
Lowest	0.131	(3.21)**	0.021	(0.50)	0.150	(2.93)**	0.129	(1.96)**
2-8	0.011	(0.96)	0.001	(0.02)	0.014	(0.94)	0.013	(0.35)
Highest	-0.083	(-4.24)**	-0.054	(-0.70)	-0.088	(-6.48)***	-0.035	(-0.44)
Hedge Return[c]	0.214	(4.72)**	0.075	(1.00)	0.238	(5.10)***	0.163	(1.87)**

Panel B: Partition based on growth mutual fund ownership

Accrual Portfolio	Full Sample		Fund Ownership: HGrowth[b]		Fund Ownership: LGrowth[b]		Difference (LGrowth–HGrowth)	
	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)
Lowest	0.131	(3.21)**	0.170	(1.61)*	0.120	(3.60)***	-0.050	(-0.45)
2-9	0.011	(0.96)	0.067	(1.78)*	-0.002	(-0.15)	-0.069	(-1.73)*
Highest	-0.083	(-4.24)**	-0.085	(-5.04)**	-0.082	(-2.64)**	0.003	(0.08)
Hedge Return[c]	0.214	(4.72)**	0.255	(2.60)*	0.202	(5.29)***	-0.053	(-0.50)

Panel C: Partition based on balanced mutual fund ownership

Accrual Portfolio	Full Sample		Fund Ownership: HBal[b]		Fund Ownership: LBal[b]		Difference (LBal – HBal)	
	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)
Lowest	0.131	(3.21)**	0.107	(2.18)**	0.135	(3.09)***	0.028	(0.43)
2-9	0.011	(0.96)	0.030	(1.46)	0.006	(0.55)	-0.024	(-1.03)
Highest	-0.083	(-4.24)**	-0.051	(-2.21)**	-0.090	(-3.64)***	-0.039	(-1.16)
Hedge Return[c]	0.214	(4.72)**	0.158	(3.47)** *	0.223	(4.44)***	0.068	(0.99)

Panel D: Partition based on total mutual fund ownership

Accrual Portfolio	Full Sample		Fund Ownership: HTot[b]		Fund Ownership: LTot[b]		Difference (LTot – HTot)	
	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)
Lowest	0.131	(3.21)**	0.140	(2.41)**	0.131	(3.27)***	-0.010	(-0.14)
2-9	0.011	(0.96)	0.018	(1.02)	0.009	(0.81)	-0.007	(-0.40)
Highest	-0.083	(-4.24)**	-0.105	(-4.37)***	-0.078	(-3.00)***	0.027	(0.74)
Hedge Return[c]	0.214	(4.72)**	0.245	(3.72)***	0.209	(4.33)***	-0.036	(-0.44)

Table 5 (continued)

[a] Accrual portfolios are formed annually by assigning firms into deciles based on the magnitude of accruals in year t. Firms in the lowest decile are assigned to one portfolio, firms in deciles 2-9 are assigned to another portfolio, and firms in the highest decile of accruals are assigned to the last portfolio. The size-adjusted returns, measured as annual sized-adjusted buy-and-hold returns from the beginning of the fourth month after the firm's fiscal year end, are then calculated for each portfolio. The sample consists of 16,788 firm-years from 1993-2000. The t-statistics are based on the means and standard errors of the annual portfolio returns.
[b] Firms are assigned into quintiles, independently of accrual portfolio assignments, based on the percentage of the firm's shares owned by value mutual funds. Firms in the highest quintile are assigned to the HVal subsample, and firms in the bottom four quintiles are assigned to the LVal subsample. This procedure is repeated based on the percentage of a firm's shares owned by growth, balanced, and all mutual funds to assign firms to the HGrowth and LGrowth, HBal and LBal, and HTot and LTot subsamples, respectively. The size-adjusted returns, measured as annual sized adjusted buy-and-hold returns from the beginning of the fourth month after the firm's fiscal year end, are then calculated for each accrual portfolio for each subsample. The t-statistics are based on the means and standard errors of the annual portfolio returns.
[c] The hedge return consists of a long position in the lowest accrual portfolio and a short position in the highest accrual portfolio.
* Denotes significance at the 0.10 level using a one-tailed test.
** Denotes significance at the 0.05 level using a one-tailed test.
*** Denotes significance at the 0.01 level using a one-tailed test.

Table 6
Cross-sectional Regression of One-year-ahead Sized-adjusted Buy-and-hold Returns on the Decile Rank of Accruals and Other Predictors of Returns[a]

$$R_{t+1} = \alpha_0 + \alpha_{0H}HVal_t + \alpha_1 RAcc_t + \alpha_2 RAcc\_HVal_t + \alpha_3 lnMV_t + \alpha_4 lnBM_t + \alpha_5 EP_t + \nu_{t+1}$$

Variables[b]	Predicted Sign	(1)	(2)	(3)
		Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
Intercept	?	0.094 (3.53)***	0.092 (2.20)**	0.103 (2.30)***
$HVal_t$	?			-0.062 (-1.17)
$RAcc_t$	-	-0.161 (-3.88)***	-0.134 (-3.54)***	-0.152 (-3.60)***
$RAcc\_HVal_t$	+			0.101 (2.09)**
$lnMV_t$	-		-0.004 (-0.59)	-0.004 (-0.61)
$lnBM_t$	+		-0.016 (-0.54)	-0.016 (-0.60)
EP_t	+		-0.150 (-2.01)**	-0.149 (-2.00)**
Adj. R^2		0.006	0.033	0.036

[a] This table reports the results of 8 annual cross-sectional regressions of future size-adjusted returns on the decile rank of accruals and other predictors of future returns for a sample of 16,788 firms for the period 1993-2000. The reported coefficients and adjusted R^2s are the time-series averages of the 8 annual cross-sectional regressions. The t-statistics are based on the means and standard errors of the annual coefficients.

[b] Variable definitions:

R_{t+1}	=	one-year-ahead size-adjusted returns, measured as annual sized adjusted buy-and hold returns from the beginning of the fourth month after the firm's fiscal year end;
$HVal_t$	=	equal to 1 for firms in the top quintile of ValPct, and zero otherwise;
$RAcc_t$	=	the decile rank of Accruals in year t, scaled to be between zero and one;
$RAcc\_HVal_t$	=	$RAcc_t$ x $HVal_t$;
$lnMV_t$	=	natural logarithm of the market value of equity at fiscal year end;
$lnBM_t$	=	natural logarithm of the book-to-market ratio at fiscal year end;
EP_t	=	the earnings-to-price ratio at fiscal year end;
ValPct	=	percentage of common shares held by funds classified as value mutual funds Morningstar.

* Denotes significance at the 0.10 level using a one-tailed test.
** Denotes significance at the 0.05 level using a one-tailed test.
*** Denotes significance at the 0.01 level using a one-tailed test.

Table 7
Time Series Means of Annual One-year-ahead Size-adjusted Buy-and-hold Return Portfolios Based on Annual Rankings of Book-to-market ratio and Percentage of Mutual Fund Holdings by Investment Style[a]

Panel A: Partition based on value mutual fund ownership

			Fund Ownership					
	Full Sample		HVal[b]		LVal[b]		Difference (LVal – HVal)	
B/M Portfolio	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)
Lowest	-0.244	(3.27)**	-0.031	(-1.19)	-0.251	(-3.31)**	-0.220	(-2.74)**
2-9	-0.017	(-0.85)	0.107	(1.37)	-0.051	(-8.27)***	-0.158	(-2.01)*
Highest	0.141	(4.44)**	0.128	(2.39)**	0.144	(5.17)***	0.016	(0.27)
Hedge Return[c]	0.385	(4.74)***	0.159	(2.91)**	0.395	(3.86)**	0.236	(2.03)*

Panel B: Partition based on growth mutual fund ownership

			Fund Ownership					
	Full Sample		HGrowth[b]		LGrowth[b]		Difference (LGrowth– HGrowth)	
B/M Portfolio	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)
Lowest	-0.244	(-3.27)**	-0.232	(-2.67)**	-0.250	(-3.66)**	-0.018	(-0.16)
2-9	-0.017	(-0.85)	-0.077	(-2.49)**	-0.002	(-0.11)	0.075	(1.95)*
Highest	0.141	(4.44)**	0.052	(0.38)	0.145	(5.07)***	0.089	(0.59)
Hedge Return[c]	0.385	(4.74)***	0.284	(1.38)	0.395	(4.14)**	0.111	(0.49)

Panel C: Partition based on balanced mutual fund ownership

			Fund Ownership					
	Full Sample		HBal[b]		LBal[b]		Difference (LBal – HBal)	
B/M Portfolio	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)
Lowest	-0.244	(3.27)**	-0.122	(-1.61)	-0.263	(-3.47)**	-0.141	(-1.31)
2-9	-0.017	(-0.85)	0.044	(0.76)	-0.034	(-3.25)**	-0.078	(-1.33)
Highest	0.141	(4.44)**	0.191	(3.83)**	0.133	(3.93)**	-0.058	(-0.96)
Hedge Return[c]	0.385	(4.74)***	0.313	(2.85)**	0.396	(3.66)**	0.084	(0.54)

Panel D: Partition based on total mutual fund ownership

			Fund Ownership					
	Full Sample		HTot[b]		LTot[b]		Difference (LTot – HTot)	
B/M Portfolio	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)	Mean	(t-stat)
Lowest	-0.244	(3.27)**	-0.187	(2.28)*	-0.262	(3.52)**	-0.076	(-0.68)
2-9	-0.017	(-0.85)	0.000	(0.00)	-0.021	(-1.74)*	-0.021	(-0.36)
Highest	0.141	(4.44)**	0.132	(1.54)	0.142	(5.86)***	0.010	(0.12)
Hedge Return[c]	0.385	(4.74)***	0.319	(2.12)*	0.405	(4.17)**	0.086	(0.46)

Table 7 (continued)

[a] Book-to-market ratio portfolios are formed annually by assigning firms into deciles based on the magnitude of book-to-market ratio at the end of June of year t+1. Firms in the lowest decile are assigned to one portfolio, firms in deciles 2-9 are assigned to another portfolio, and firms in the highest decile of accruals are assigned to the last portfolio. The size-adjusted returns, measured as annual sized-adjusted buy-and-hold returns beginning in July of year t+1, are then calculated for each portfolio. The sample consists of 17,268 firm-years for the years 1995, 1996, 1999, and 2000. These years are used because the book-to-market ratio effect is not present on average during the period 1993-2000; however, it is present during these four years. The t-statistics are based on the means and standard errors of the annual portfolio returns.

[b] Firms are assigned into quintiles, independently of book-to-market ratio portfolio assignments, based on the percentage of the firm's shares owned by value mutual funds. Firms in the highest quintile are assigned to the HVal subsample, and firms in the bottom four quintiles are assigned to the LVal subsample. This procedure is repeated based on the percentage of a firm's shares owned by growth, balanced, and all mutual funds to assign firms to the HGrowth and LGrowth, HBal and LBal, and HTot and LTot subsamples, respectively. The size-adjusted returns, measured as annual sized adjusted buy-and-hold returns from July of year t to June of year t+1 are then calculated for each accrual portfolio in each subsample. The t-statistics are based on the means and standard errors of the annual portfolio returns.

[c] The hedge return consists of a long position in the in the highest B/M portfolio and a short position in the lowest B/M portfolio.

* Denotes significance at the 0.10 level using a one-tailed test.

** Denotes significance at the 0.05 level using a one-tailed test.

*** Denotes significance at the 0.01 level using a one-tailed test.

Table 8
Cross-sectional Regression of One-year-ahead Sized-adjusted Buy-and-hold Returns on the Decile Rank of Book-to-market Ratio and Other Predictors of Returns[a]

$$R_{t+1} = \alpha_0 + \alpha_{0H}HVal_t + \alpha_1 RB/M_t + \alpha_2 RB/M\_HVal_t + \alpha_3 LMVE_t + \alpha_4 EP_t + \nu_{t+1}$$

Variables[b]	Predicted Sign	(1) Estimate (t-stat)	(2) Estimate (t-stat)	(3) Estimate (t-stat)
Intercept	?	-0.204 (-5.81)***	-0.209 (-6.06)***	-0.191 (-2.35)**
$HVal_t$	?			0.289 (2.59)**
RB/M_t	+	0.360 (3.84)**	0.365 (3.95)**	0.359 (3.46)**
RB/M_HVal_t	-			-0.282 (-2.41)**
$LMVE_t$	-		-0.000 (-0.07)	-0.007 (-0.94)
EP_t	+		0.055 (0.92)	0.043 (0.79)
Adj. R^2		0.040	0.045	0.055

[a] This table reports the results of 4 annual cross-sectional regressions of future size-adjusted returns on the decile rank of book-to-market ratio and other predictors of future returns. The sample consists of 17,268 firm-years for the years 1995, 1996, 1999, and 2000. These years are used because the book-to-market ratio effect is not present on average during the period 1993-2000; however, it is present during these four years. The reported coefficients and adjusted R^2s are the time-series averages of the 4 annual cross-sectional regressions. The t-statistics are based on the means and standard errors of the annual coefficients.

[b] Variable definitions:

R_{t+1}	=	one-year-ahead size-adjusted returns, measured as annual sized-adjusted buy-and hold returns from the beginning of July of year t+1;
$HVal_t$	=	equal to 1 for firms in the top quintile of ValPct, and zero otherwise;
RB/M_t	=	the decile rank of book-to-market ratio in year t, scaled to be between zero and one;
RB/M_HVal_t	=	RB/M_t x $HVal_t$;
$LMVE_t$	=	natural logarithm of the market value of equity at the end of June of year t+1;
EP_t	=	the earnings-to-price ratio, measured as earnings per share at the end of the fiscal year t, divided by price at the end of June of year t+1;
ValPct	=	percentage of common shares held by funds classified as value mutual funds.

* Denotes significance at the 0.10 level using a one-tailed test.
** Denotes significance at the 0.05 level using a one-tailed test.
*** Denotes significance at the 0.01 level using a one-tailed test.

Table 9
Cross-sectional Regression of the Change in Mutual Fund Holdings on the Decile Rank of Accruals[a]

Change Measure = $\alpha_0 + \alpha_1 RAcc_t + \alpha_2 lnMV_t + \alpha_3 ChgTot_t + \alpha_4 ChgE_t + \alpha_5 Ret_t + \nu_t$

	Dependent Variable[a]		
Variables[b]	$ChgVal_t$	$ChgGrowth_t$	$ChgBal_t$
	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
Intercept	-0.672 (-2.04) **	0.705 (1.06)	-0.412 (-0.83)
$RAcc_t$	0.006 (0.83)	-0.007 (-0.77)	0.004 (0.56)
$lnMV_t$	0.137 (2.29) **	-0.132 (-1.13)	0.061 (0.67)
$ChgTot_t$	0.192 (6.43) ***	0.307 (10.02)***	0.341 (16.36)***
$ChgE_t$	0.005 (2.20) **	-0.003 (-1.36)	0.000 (0.06)
Ret_t	-0.388 (-8.63) ***	0.519 (6.22)***	-0.093 (-1.84)*
Adj. R^2	0.368	0.607	0.518

[a] This table reports the results of 8 annual cross-sectional regressions of the change in mutual fund holding on the decile rank of accruals and control variables for a sample of 16,788 firm-years from 1993-2000. The dependent variable for each regression is the change in holdings by value mutual funds, growth mutual funds, or balanced mutual funds. The reported coefficients and adjusted R^2s are the time-series averages of the 8 annual cross-sectional regressions. The t-statistics are based on the means and standard errors of the annual coefficients.

[b] Variable definitions:

$ChgVal_t$ = the number of shares held by value funds from the filing following the fourth month after fiscal year end minus the number of shares held by value funds from filing prior to the fourth month after fiscal year end;

$ChgGrowth_t$ = the number of shares held by growth funds from the filing following the fourth month after fiscal year end minus the number of shares held by growth funds from filing prior to the fourth month after fiscal year end;

$ChgBal_t$ = the number of shares held by balanced funds from the filing following the fourth month after fiscal year end minus the number of shares held by balanced funds from filing prior to the fourth month after fiscal year end;

$ChgTot_t$ = the number of shares held by mutual funds from the filing following the fourth month after fiscal year end minus the number of shares held by mutual funds from filing prior to the fourth month after fiscal year end;

$RAcc_t$ = the decile rank of accruals in year t;

$lnMV_t$ = natural logarithm of the market value of equity at fiscal year end;

Table 9 (continued)

$ChgE_t$	=	the change in earnings from year t-1 to year t, measured as the earning per share for year t-1;
Ret_t	=	the compounded raw returned measured during the period for which the change in ownership is calculated.

* Denotes significance at the 0.10 level using a one-tailed test.
** Denotes significance at the 0.05 level using a one-tailed test.
*** Denotes significance at the 0.01 level using a one-tailed test.

Table 10
Cross-sectional Regression of the Change in Mutual Fund Holdings on the Decile Rank of Book-to-Market Ratio[a]

Change Measure = $\alpha_0 + \alpha_1 RB/M_t + \alpha_2 LMVE_t + \alpha_3 ChgTot_t + \alpha_4 ChgE_t + \alpha_5 Ret_t + \nu_t$

	Dependent Variable[a]		
Variables[b]	$ChgVal_t$	$ChgGrowth_t$	$ChgBal_t$
	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
Intercept	-0.044	0.224	-0.274
	(-0.53)	(2.01)*	(-3.39)**
RB/M_t	0.034	-0.066	0.037
	(7.51) ***	(-4.44)**	(2.26)*
$LMVE_t$	-0.000	-0.000	0.001
	(-0.50)	(-0.83)	(3.85)**
$ChgTot_t$	0.138	0.332	0.284
	(7.98) ***	(10.03)***	(6.68)***
$ChgE_t$	-0.000	0.000	0.000
	(-0.28)	(0.39)	(0.44)
Ret_t	-0.242	0.400	-0.069
	(-4.22) **	(5.47)***	(-4.07)**
Adj. R^2	0.240	0.580	0.736

[a] This table reports the results of 4 annual cross-sectional regressions of the change in mutual fund holding on the decile rank of book-to-market ratio for a sample of 17,268 firm-years for the years 1995, 1996, 1999, and 2000[a]. These years are used because the book-to-market ratio effect is not present on average during the period 1993-2000; however, it is present during these four years. The dependent variable for each regression is the change in holdings by value mutual funds, growth mutual funds, or balanced mutual funds. The reported coefficients and adjusted R^2s are the time-series averages of the 4 annual cross-sectional regressions. The t-statistics are based on the means and standard errors of the annual coefficients.

[b] Variable definitions:

$ChgVal_t$ = the number of shares held by value funds from the filing following July of year t+1 minus the number of shares held by value funds from the filing prior to July of year t+1;

$ChgGrowth_t$ = the number of shares held by growth funds from the filing following July of year t+1 minus the number of shares held by growth funds from the filing prior to July of year t+1;

$ChgBal_t$ = the number of shares held by growth funds from the filing following July of year t+1 minus the number of shares held by balanced funds from the filing prior to July of year t+1;

$ChgTot_t$ = the number of shares held by mutual funds from the filing following July of year t+1 minus the number of shares held by mutual funds from the filing prior to July of year t+1;

RB/M_t = the decile rank of B/M in year t, where book value of equity is measured at fiscal year end and market value of equity is measured at the end of June of year t+1;

Table 10 (continued)

$LMVE_t$	=	natural logarithm of the market value of equity at the end of June of year t+1;
$ChgE_t$	=	the change in earnings from year t-1 to year t, measured as the earning per share for year t minus earnings per share for year t-1;
Ret_t	=	the compounded raw returned measured during the period for which the change in ownership is calculated.

* Denotes significance at the 0.10 level using a one-tailed test.
** Denotes significance at the 0.05 level using a one-tailed test.
*** Denotes significance at the 0.01 level using a one-tailed test.

Table 11

Cross-sectional Regression of One-year-ahead Sized-adjusted Buy-and-hold Returns on the Decile Rank of Accruals and Other Predictors of Returns[a] with Beta as Control Variable

$$R_{t+1} = \alpha_0 + \alpha_{0H}HVal_t + \alpha_1 RAcc_t + \alpha_2 RAcc\_HVal_t + \alpha_3 lnMV_t + \alpha_4 lnBM_t + \alpha_5 EP_t + \alpha_6 Beta_t + \nu_{t+1}$$

Variables[b]	Predicted Sign	(1)
		Estimate (t-stat)
Intercept	?	0.056 (1.53)*
$HVal_t$	?	-0.058 (-1.17)
$RAcc_t$	-	-0.145 (-3.20)***
$RAcc\_HVal_t$	+	0.096 (1.88)*
$lnMV_t$	-	-0.004 (-0.70)
$lnBM_t$	+	-0.014 (-0.59)
EP_t	+	-0.118 (-1.72)*
$Beta_t$	+	0.048 (1.11)
Adj. R^2		0.028

[a] This table reports the results of 8 annual cross-sectional regressions of future size-adjusted returns on the decile rank of accruals and other predictors of future returns for a sample of 15,127 firms for the period 1993-2000. The reported coefficients and adjusted R^2s are the time-series averages of the 8 annual cross-sectional regressions. The t-statistics are based on the means and standard errors of the annual coefficients.

[b] Variable definitions:

R_{t+1}	=	one-year-ahead size-adjusted returns, measured as annual sized adjusted buy-and hold returns from the beginning of the fourth month after the firm's fiscal year end;
$HVal_t$	=	equal to 1 for firms in the top quintile of ValPct, and zero otherwise;
$RAcc_t$	=	the decile rank of Accruals in year t, scaled to be between zero and one;
$RAcc\_HVal_t$	=	$RAcc_t$ x $HVal_t$;
$lnMV_t$	=	natural logarithm of the market value of equity at fiscal year end;
$lnBM_t$	=	natural logarithm of the book-to-market ratio at fiscal year end;
EP_t	=	the earnings-to-price ratio at fiscal year end;

Table 11 (continued)

$Beta_t$	=	the common stock beta from the capital asset pricing model as an additional control variable using a maximum 60 months of data prior to the end of the fiscal year and minimum 12 months;
ValPct	=	percentage of common shares held by funds classified as value mutual funds Morningstar.

* Denotes significance at the 0.10 level using a one-tailed test.
** Denotes significance at the 0.05 level using a one-tailed test.
*** Denotes significance at the 0.01 level using a one-tailed test.

Table 12
Cross-sectional Regression of One-year-ahead Sized-adjusted Buy-and-hold Returns on the Decile Rank of Book-to-market Ratio and Other Predictors of Returns[a] with Beta as a Control Variable

$$R_{t+1} = \alpha_0 + \alpha_{0H}HVal_t + \alpha_1 RB/M_t + \alpha_2 RB/M\_HVal_t + \alpha_3 LMVE_t + \alpha_4 EP_t + \alpha_5 Beta_t + \nu_{t+1}$$

Variables[b]	Predicted Sign	(1) Estimate (t-stat)
Intercept	?	-0.084 (-2.02) *
$HVal_t$	?	0.238 (2.59) **
RB/M_t	+	0.317 (4.55) ***
RB/M_HVal_t	-	-0.258 (-2.59) **
$LMVE_t$	-	-0.004 (-0.40)
EP_t	+	0.020 (0.43)
$Beta_t$	+	-0.06 (-2.28) **
Adj. R^2		0.040

[a] This table reports the results of 4 annual cross-sectional regressions of future size-adjusted returns on the decile rank of book-to-market ratio and other predictors of future returns. The sample consists of 13,593 firm-years for the years 1995, 1996, 1999, and 2000. These years are used because the book-to-market ratio effect is not present on average during the period 1993-2000; however, it is present during these four years. The reported coefficients and adjusted R^2s are the time-series averages of the 4 annual cross-sectional regressions. The t-statistics are based on the means and standard errors of the annual coefficients.

[b] Variable definitions:

R_{t+1}	=	one-year-ahead size-adjusted returns, measured as annual sized-adjusted buy-and hold returns from the beginning of July of year t+1;
$HVal_t$	=	equal to 1 for firms in the top quintile of ValPct, and zero otherwise;
RB/M_t	=	the decile rank of book-to-market ratio in year t, scaled to be between zero and one;
RB/M_HVal_t	=	RB/M_t x $HVal_t$;
$LMVE_t$	=	natural logarithm of the market value of equity at the end of June of year t+1;
EP_t	=	the earnings-to-price ratio, measured as earnings per share at the end of the fiscal year t, divided by price at the end of June of year t+1;
$Beta_t$	=	the common stock beta from the capital asset pricing model as an additional control variable using a maximum 60 months of data prior to the end of the fiscal year and minimum 12 months;
ValPct	=	percentage of common shares held by funds classified as value mutual funds.

* Denotes significance at the 0.10 level using a one-tailed test.
** Denotes significance at the 0.05 level using a one-tailed test.
*** Denotes significance at the 0.01 level using a one-tailed test.

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