Agency Theory of Overvalued Equity as an Explanation for the Accrual Anomaly

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Abstract

We show that the agency theory of overvalued equity (see Jensen, 2005, and others) rather than investors' fixation on accruals explains the accrual anomaly, i.e., abnormal returns to an accrual trading strategy (see Sloan, 1996). Under the agency theory of overvalued equity, managers of overvalued firms are likely to manage their firms' accruals upwards to prolong the overvaluation. Overvaluation, however, cannot be sustained indefinitely and we expect price reversals for high accrual firms. In contrast, undervalued firms do not face incentives to report low accruals. Therefore, we predict and find an asymmetric relation between accruals and both prior and subsequent returns. In addition, consistent with the predictions of the agency theory of overvalued equity, we find high, but not low, accrual firms' investment-financing decisions and insider trading activity are distorted. Overall, return behavior, investment-financing decisions, and insider trading activity are all consistent with the agency theory of overvalued equity and inconsistent with investor fixation on accruals.

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1 Introduction

In this study we draw upon the agency theory of overvalued equity to explain the Sloan (1996) accrual anomaly, i.e., the predictable negative relation between accounting accruals and subsequent stock returns. A large body of research articulates the agency theory of overvalued equity and its implications for corporate investment, financing, and financial reporting decisions.[1] One of the predictions of the theory is that overvalued firms' managers will boost their firms' reported performance to meet investor expectations. We therefore expect overvalued firms to engage in earnings management, and as a result such firms will gravitate toward the high accrual deciles of the population of firms. However, since overvaluation and superior reported performance cannot last indefinitely, not surprisingly, accrual reversal and negative abnormal returns follow the overvaluation.

In contrast, undervalued firms are not expected to actively under-report accruals, i.e., manage earnings downwards. Therefore, we predict an asymmetry in the relation between accruals and past, current, and future returns for the high and low accrual deciles of stocks. Consistent with the asymmetry prediction, many demonstrate that the accrual anomaly is due mostly to the mispricing of the income-increasing accruals and essentially unobservable or weak for income decreasing accruals.[2]

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[1] See Jensen, Murphy, and Wruck (2004), Jensen (2004), Shleifer and Vishny (2003), Baker, Stein, and Wurgler (2000), Polk and Sapienza (2004), Moeller, Schlingemann, and Stulz (2005), Ritter (1991), Loughran and Ritter (1995), Graham and Harvey (2001), Dong, Hirshleifer, Richardson, and Teoh (2006), and others.

[2] See Beaver, McNichols, and Price (2005), Beneish and Vargus (2002), D'Avolio, Gildor, and Shleifer (2001), Houge and Loughran (2001), and Lesmond and Wang (2005).

We also predict asymmetric incidence of insider trading activity and asymmetric distortions in firms' investment and financing decisions, i.e., expect these among firms in the high, but not the low, accrual deciles. The predictions that firms' investment-financing decisions will be distorted or there would be unusual amount of insider trading activity among the high-accrual decile firms are distinct from the investor fixation explanation for the accrual anomaly. The different predictions based on the agency costs of overvalued equity versus investor fixation enable us to discriminate between the competing explanations for the anomaly.

We find evidence consistent with all of our predictions based on the agency costs of overvalued equity. Collectively, the evidence casts doubt on the prevailing hypothesis that market naïvely fixates on reported financial performance in generating the accrual anomaly. The fact that predictable stock price reversals follow equity overvaluation and earnings management among firms in the high accrual deciles is consistent with many explanations, including limited arbitrage (see DeLong et al., 1990, and Shleifer and Vishny, 1997) and trading frictions preventing a speedy adjustment of overvalued firms' stock prices, survival biases, risk misestimation, etc.

Background. The accrual anomaly has received tremendous attention in the literature, with Xie (2001), Thomas and Zhang (2002), Hirshleifer et al. (2004), and Richardson et al. (2006) replicating and extending the anomaly. The most common explanation for the anomaly is that investors naively fixate on reported earnings without fully recognizing the transitory, i.e., less persistent, nature of accruals (see Sloan, 1996, and Hirshleifer and Teoh, 2003). We label this explanation as the fixation hypothesis.

Many studies reexamine the accrual anomaly and document evidence that undermines the naïve investor fixation hypothesis by focusing, for example, on the asymmetry in the accrual-

return relation. While the evidence that the accrual anomaly is observed in the high-accrual firms, but not in the low-accrual firms is damaging to the fixation hypothesis, it does not explain the anomaly, especially the asymmetric relation between returns and accruals. In contrast, we propose that agency costs of overvalued equity would manifest themselves in an asymmetric relation between returns and accruals. We also predict distortions in firms' investment-financing decisions and insider trading activity, which are not predicted under the fixation hypothesis. [3]

Overvalued firms' managers not only resist market "correction," but they proactively attempt to prolong the overvaluation. Thus, instead of disseminating information that would disappoint capital markets, shareholders, and even the board, managers are likely to take actions designed to meet the market's optimistic performance expectations and sustain the overvaluation.[4] Among the actions, earnings management is expected to feature prominently. In addition, in the overvalued subset of firms, managers are expected to make excessive debt and equity issues, capital expenditures, acquisitions paid for using equity, and engage in insider trading.[5]

Summary of results. Consistent with the predictions of the agency costs of overvalued equity, we find (i) an asymmetric relation between accruals and (past, current, and future) returns, (ii) asymmetric insider trading behavior, and (iii) asymmetric distortion in the

[3] There is another stream of research that focuses on survivor biases, risk misestimation, and distributional properties of the data as explanations for the abnormal performance of the accrual strategy (see Zach, 2004, Kraft, Leone, and Wasley, 2005, Khan, 2005, Kothari, Sabino, and Zach, 2004, etc.). This research examines whether the anomaly is a statistical artifact, not evidence of market inefficiency. Related research also examines whether trading frictions account for the apparent slow price adjustment to accrual information (e.g., Ali, Hwang, and Trombley, 2000, and Lesmond and Wang, 2005). For other explanations, e.g., difference in the persistence of accruals and cash flows, see Dechow, Richardson, and Sloan (2004), Francis and Smith (2004), Ahmed, Nainar and Zhou (2001), Bradshaw, Richardson and Sloan (2001), Zach (2004) and Chambers (2005). Our study does not pursue any of the above lines of inquiry.

[4] See Kothari, Shu, and Wysocki (2005) for evidence that managers delay the dissemination of bad news.

[5] See Jensen, Murphy, and Wruck (2004), Jensen (2004), Moeller, Schligemann, and Stultz (2005), Baker and Wurgler (2002), Baker, Stein, and Wurgler (2003), and Polk and Sapienza (2004).

investment-financing decisions. Specifically, we document significant return reversals for the high accrual-decile firms, but weak/insignificant for the low accrual-decile firms. To further discriminate between the fixation and agency-cost hypotheses, we examine stock-price performance of the accrual-decile firms for three years prior to the year in which we classify firms into accrual deciles. The high accrual-decile firms' abnormal returns (measured as annualized Fama-French three-factor model alphas) for the prior three years are significantly positive at about 18% per year compared to only -3.6% for the low accrual-decile firms. The evidence is consistent with over-valuation prompting managers to engage in earnings management as evidenced among the high accrual-decile firms. The asymmetric return-accrual relation in the prior years is not consistent with fixation.

In addition, we observe unusually high levels of insider-trading activity, debt and equity issues, capital expenditures, and M&A activity among the high accrual-decile firms prior to and during the year of high accruals compared to the low accrual-decile firms. These phenomena are predicted under the agency hypothesis, but not the fixation hypothesis.

Section 2 summarizes the relevant literature and presents testable hypotheses. Section 3 describes sample selection and variable construction. Section 4 presents our empirical tests and results. We summarize and conclude in Section 5.

2 Literature Review and Hypotheses Development

In this section we examine the accrual anomaly in the context of the agency theory of overvalued equity. We show that considerable evidence surrounding the accrual anomaly accords with the implications of the theory of overvalued equity rather than investor fixation on accruals. We then present a set of testable hypotheses and empirical predictions that would

discriminate between the agency theory of overvalued equity and fixation as the driving force behind the accrual anomaly.

2.1 Literature Review

The accrual anomaly is that an economically large magnitude of abnormal return is earned from a zero-investment strategy that holds a short position in the highest accrual-decile firms and a long position in the lowest accrual-decile firms. Sloan (1996) and others attribute the abnormal performance to investors' fixation on accruals. Under the fixation hypothesis, investors overestimate the persistence of the accrual component of earnings, which in turn leads to systematic mispricing and subsequent price reversals.

In this study we advance an alternative explanation for the accrual anomaly, namely, agency cost of overvalued equity (see references in the Introduction). An overvalued firm's management has strong incentives to generate misleading signals (e.g., via managed earnings) about the firm's economic health to the investment community and the board of directors. The management's incentive is that it reaps benefits from the firm's continued growth and overvaluation in the form of higher compensation and high valuation of their personal equity in the firm. The management's response is due in part to the market gearing up its performance expectation in line with the overvalued stock price. The unwinding of the overvaluation as well as the earnings management, however, is inevitable. Thus, the agency theory of overvalued equity predicts a direct link between income increasing accruals and subsequent underperformance. In addition, since managements of undervalued firms do not face similar incentives, the agency theory of overvalued equity does not predict a negative relation between those firms' accruals and subsequent returns. That is, the agency theory predicts an asymmetric relation between accruals and future returns.

Considerable prior research examining various aspects of the accrual anomaly is consistent with the implications of the agency costs of overvalued equity. We classify the relevant literature into four streams. First, accrual strategy's return predictability is related almost entirely to the abnormal or the discretionary component of accruals (see, e.g., Xie, 2001, Thomas and Zhang, 2001, and DeFond and Park, 2001). The agency theory of overvalued equity directly ties overvaluation to the discretionary accruals. In contrast, the fixation hypothesis presumes investor misconception about both discretionary and non-discretionary accrual components.

Second, previous research reports that the accrual component of earnings is mispriced only for specific subsets of firms: firms whose insiders were abnormal sellers of their equity (see Beneish and Vargus, 2002), glamour stocks (see Desai, Rajgopal, and Venkatachalam, 2005), and firms engaged in mergers, acquisitions, or divestures (Zach, 2003). These all three subsets of firms are likely to be overvalued. For example, insiders of overvalued firms sell equity (e.g., Jenter, 2005), glamour stocks are hypothesized to be overvalued (e.g., Lakonishok, Shleifer, and Vishny, 1994), and, as pointed out earlier, overvalued firms excessively engage in M&A activities. The evidence in Zach (2003), though not directly implying overvaluation, is consistent with overvalued firms' managers (i) using equity as cheap currency to make acquisitions to satisfy growth expectations, (ii) raising external capital to over-invest in risky green-field projects.

Third, recent research fails to uncover differences between sophisticated and individual investors in how they process accrual information (e.g., Bradshaw, Richardson, and Sloan, 2001, Barth and Hutton, 2004, and Ahmed, Nainar, and Zhou, 2001). This is inconsistent with the naïve fixation hypothesis in which sophisticated investors are more discerning. However, the

lack of difference between naïve and sophisticated investors is consistent with the agency theory of overvaluation. It is the analysts and other sophisticated investors who fuel the market's expectations about firm performance, and hence are likely to constitute a driving force behind the agency problems of overvalued equity. It's important to note that sophisticated investors generate an asymmetry because their presence only exerts pressure on overvalued firms' managers. An overvalued company with more extensive analyst coverage faces more pressure to deliver the expected superior performance and hence has a greater incentive to manage earnings. Ali et al. (2000) find the negative association between accruals and future returns is more pronounced for firms with extensive analysts' coverage and greater institutional ownership.

Finally, accrual mispricing is observed primarily among the firms reporting income increasing accruals.[6] While inconsistent with the naïve-investor fixation, this asymmetry in the accrual-return relation is suggestive of agency theory of overvalued equity. The latter predicts only the over-valued high accrual-decile firms to engage in accrual manipulation and to exhibit subsequent reversals.

2.2 Empirical Predictions

To empirically distinguish between investor fixation, i.e., the fixation hypothesis, and the agency theory of overvalued equity, i.e., the agency hypothesis, as explanations for the accrual anomaly we test three sets of predictions with respect to: (i) the return-accrual relation, (ii) insider trading, and (iii) corporate investment and financing decisions.

Return predictions. We make predictions about return behavior in the year of, years prior to, and years following the accrual measurement year, year zero. Under the fixation

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[6] See Beneish and Vargus (2002), Zach (2004), Beaver, McNichols and Price (2005), D'Avolio, Gildor and Shleifer (2001), Houge and Lougran (2000), and Lesmond and Wang (2005).

hypothesis, returns in year zero are increasing in accruals, and in years one and beyond, the return-accrual relation is negative. This is the accrual anomaly that investors fixate on accruals and subsequently return reversals are predicted because investors in year zero had failed to recognize accruals' lower persistence. The fixation hypothesis is silent with respect to the pattern of stock returns in the years leading up to year zero.

In contrast, the agency hypothesis implies an asymmetry in the relation between year zero accruals and stock returns of all periods. Specifically, we expect a price run up in the years leading up to and in year zero among the higher accrual-decile firms because these are over-valued firms that attempt to prop up reported earnings through accruals. For the high accrual-decile firms, this produces a positive relation between leading period returns and year zero accruals. In addition, a contemporaneous positive return-accrual association is expected in year zero. The high accrual-decile firms' earnings management behavior is managers' response to overvaluation that began to occur in the years prior to year zero. Therefore, in the years leading up to year zero, we expect positive abnormal returns for the high accrual-decile firms, but not the low accrual-decile firms. The return reversals in years one and beyond are also expected primarily for the high-decile firms because these were overvalued firms that engaged in accrual management to prolong the overvaluation. Overall, asymmetry in the accrual-return relation is predicted under the agency hypothesis, but not under the fixation hypothesis.

Since the agency hypothesis is premised on the assumption that overvaluation motivates earnings management, we expect the subset of relatively more overvalued firms to bear out the return predictions of the agency hypothesis more compellingly than other firms. Using prior one year's abnormal price run-up as a (crude) proxy for overvaluation, we test whether the reversals in stock prices are more pronounced in future years, i.e., years 1 and beyond, for the highly

overvalued stocks. In contrast, the fixation hypothesis implies that prior abnormal return has no implication for the magnitude of the return reversal in future years.

Insider trading. The agency hypothesis predicts asymmetry in the insider trading activity across the accrual deciles. Insiders among the high accrual-decile firms are predicted to be net sellers because those firms are overvalued. The agency hypothesis does not expect insiders of the low accrual-decile firms to exhibit abnormal buying of firm equity in the years surrounding year zero of the accrual anomaly. In contrast, under the fixation hypothesis, we expect insiders to be net sellers of firm equity among the high accrual-decile firms and net buyers of firm equity among the low accrual-decile firms. Thus, insider trading activity is predicted to be symmetric in its occurrence and magnitude across the accrual deciles under the fixation hypothesis.

Investment-financing decisions. The agency hypothesis makes several predictions about corporations' investment-financing decisions, which are quite distinct from the behavior predicted under the fixation hypothesis. Specifically, the agency hypothesis predicts that in year zero and prior years the high accrual-decile firms will (i) excessively tap the debt and equity markets using their overvalued equity; (ii) excessively use overvalued equity as currency to pay for mergers and acquisitions; and (iii) overinvest in property, plant, and equipment (i.e., capital expenditures) and R&D. Once again, these investment-financing decisions are expected to be asymmetric, i.e., observed among the high accrual-decile firms, but not the low accrual-decile firms. The fixation hypothesis does not predict (especially discretionary) accruals to impact the firm's investment-financing decisions. It also does not predict an asymmetry in the relation between accruals and investment activity.

3 Data and Sample Selection

3.1 Sample Selection

We analyze all firms with available data on Compustat and CRSP files excluding closed-end funds, investment trusts and foreign companies. Our initial sample contains 42 years of financial data beginning in 1963 and ending in 2004. Due to the difficulties involved in interpreting accruals for financial firms, consistent with the literature in this area, we drop companies with SIC codes from 6000 to 6999. These procedures yield 157,456 firm-year observations with non-missing total accruals data and 156,000 firm-year observations with discretionary accruals data, where discretionary accruals are estimated using the within-industry cross-sectional modified-Jones model.[7]

For the purpose of our analysis, each year we divide the sample of firms into decile portfolios based on the magnitude of either total accruals or discretionary accruals. We do not restrict our analysis only to discretionary accruals as a measure of managed earnings because they are known to contain estimation error that might induce a bias and/or reduce the power of our tests. Hence, along the discretionary accrual portfolios, we also use total accrual portfolios. The results are qualitatively similar using the two different measures. The assignment of firm-years to the accrual deciles remains constant throughout the analysis to insure compatibility of results across different sets of tests even though some tests (e.g., insider trading behavior) impose additional filters on our primary sample.

[7] We do not require that firms in our sample to survive through the period of our analysis. We include all valid firm-year observations irrespective of their fiscal-year-end, though some tests in our analysis require December year-end firms (e.g., buy-and-hold abnormal returns). In each sub-section we specify the additional sample restrictions we impose.

3.2 Earnings Management Variables

We use the balance-sheet method to compute total accruals (see, e.g., Francis et al., 2005). The total accruals ($TA_{j,t}$) for a firm j in year t are computed as follows:[8]

$$TA_{j,t} = (\Delta CA_{j,t} - \Delta Cash_{j,t}) - (\Delta CL_{j,t} - \Delta STDebt_{j,t} - \Delta TP_{j,t}) - Dep_{j,t} \quad \textbf{(1)}$$

where $\Delta CA_{j,t}$ is change in current assets (Compustat item #4),

$\Delta Cash_{j,t}$ is change in cash/cash equivalents (Compustat item #1),

$\Delta CL_{j,t}$ is change in current liabilities (Compustat item #5),

$\Delta STD_{j,t}$ is change in debt included in current liabilities (Compustat item #34),

$\Delta TP_{j,t}$ is change in income taxes payable (Compustat item #71), and

$Dep_{j,t}$ is depreciation and amortization expense (Compustat item #14).

For compatibility across sample firms, the dollar amount of total accruals is deflated by the beginning of the year total assets (Compustat item #6).

Further, we use cross-sectional modified Jones model to separate discretionary and non-discretionary accrual components (Jones, 1991, and Dechow et al., 1995). We estimate the following cross-sectional regression for each of 48 Fama-French industry groups in each year *t*:

$$\frac{TA_{j,t}}{Assets_{j,t-1}} = \alpha_1 \frac{1}{Assets_{j,t-1}} + \alpha_2 \frac{(\Delta \mathrm{Re}v_{j,t} - \Delta AR_{j,t})}{Assets_{j,t-1}} + \alpha_3 \frac{PPE_{j,t}}{Assets_{j,t-1}} + \varepsilon_{j,t} \quad \textbf{(2)}$$

where $\Delta Rev_{j,t}$ is change in sales revenues (Compustat item #12),

$\Delta AR_{j,t}$ is change in accounts receivable (Compustat item #2), and

$PPE_{j,t}$ is gross property, plant and equipment (Compustat item #7).

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[8] Collins and Hribar (2002) show that total accruals measured from the balance-sheet data contain a measurement error while those measured directly from the statement of cash-flows are more accurate. To account for the error, we also implement our empirical tests using the total accruals estimated via statement of cash flows for the sample of financial statements after 1987. We find our results to be robust to the total accruals definition.

We denote the predicted values of the modified-Jones model as non-discretionary accruals ($NDA_{j,t}$) and the residuals as discretionary accruals ($DA_{j,t}$).[9]

3.3 Descriptive Statistics

Table 1 reports descriptive statistics for several variables of interest. Panel A presents the analysis by total accrual-decile portfolio and Panel B by discretionary accrual-decile portfolio. All variables are measured contemporaneously with accruals. We find the characteristics of firms in our sample to be similar to those reported in earlier studies. First, we find that firms with extreme accruals, those occupying lowest and highest accrual deciles, are smaller than the firms in the middle accrual deciles. Both market capitalization and total assets exhibit an inverted U-shaped pattern with respect to the accrual deciles. Moreover, the median size of the lowest accrual-decile firms is smaller than that of the highest accrual-decile firms, but the mean size of the lowest accrual-decile firms is larger than the mean size of the highest accrual-decile firms. Second, firms with extreme income increasing accruals have higher market-to-book ratios than firms with income-decreasing accruals. Third, firm performance, measured by median income before extraordinary items as a percentage of total assets, hereafter earnings, is increasing monotonically with accruals. Median earnings increase from -7% for the lowest total-accrual-decile portfolio to 7.5% for the highest total-accrual-decile portfolio. Finally, leverage of extreme accrual-decile firms is lower than that of firms in the middle of the accrual distribution.

[Table 1]

[9] The modified-Jones model likely yields biased estimates of discretionary accruals for firms experiencing extreme growth rates. We nonetheless use the model to maintain comparability with past research.

4 Empirical Tests and Results

In this section we present the results of our empirical tests that are designed to distinguish between the agency and fixation hypotheses as the driving force behind the accrual anomaly. We analyze the dynamics of the abnormal stock performance, insider trading behavior, and firms' investment-financing decisions. We then describe results of the Mishkin market efficiency tests separately for firms with income-increasing and income-decreasing accruals. Finally, we perform regression tests of the relation between accruals and returns.

4.1 Abnormal Stock Returns

We begin by analyzing abnormal stock return performance in the year of, years prior to, and years following the accrual measurement year using two methodologies. First, we compare the size and book-to-market adjusted annual buy-and-hold returns computed by following the procedure outlined in Barber, Lyon, and Tsai (1999). Second, we estimate annualized alphas from Fama-French three factor model based on the calendar-time monthly accrual portfolio returns. In each case we use CRSP monthly stock returns adjusted to include delisting returns using the method detailed in Beaver, McNichols, and Price (2005).

4.1.1 Buy-and-Hold Abnormal Returns

This sub-section summarizes results using size and book-to-market adjusted abnormal buy-and-hold returns. The benchmark portfolio returns are constructed as follows. Each year we compute end of April capitalization quintile cutoffs for the sample of NYSE firms. Based on these cutoff points we assign all of the sample firms to size quintile portfolios. Since the lowest size quintile contains roughly half of firm-year observations, we further divide this quintile into five additional portfolios. Each of the resulting nine size portfolios is then divided into quintile portfolios based on book-to-market ratio, where book value is taken as of previous fiscal year

end and market value is as of the end of the following April. This procedure yields 45 benchmark portfolios. Annual abnormal return for each firm-year is computed as one-year buy-and-hold return (12-month return starting in April) less average annual return of the corresponding size and book-to-market portfolio.[10] For consistency between benchmark returns and individual firm returns we limit our sample to December fiscal-year-end firms.

Table 2 presents time-series means and Fama-MacBeth t-statistics for annual abnormal buy-and-hold returns. Average abnormal returns for each accrual-decile portfolio are calculated for nine annual periods from event-year -4 to year +4, where event-year 0 is the accrual measurement year. Panel A presents the results for total accrual portfolios while Panel B presents the results for discretionary accrual portfolios. We illustrate the results graphically in Figure 1a and 1c, where we graph annual buy-and-hold abnormal returns for the 1st, 5th, and 10th accrual-decile portfolios.

[Table 2]

Firms with the highest income increasing accruals (both discretionary and total) experience significant abnormal price run-up prior to the accrual measurement year, i.e., year 0, and underperform subsequently. In case of total accruals, the highest accrual-decile portfolio experiences 29.43% abnormal return in year -1, which is followed by -7.63% abnormal return (reversal) in year +1. Similarly, the highest discretionary accrual decile portfolio earns 18.3% abnormal return in year -1, which is followed by -8.3% of underperformance in year +1. Superior performance prior to firms recording high accruals, i.e., high earnings growth, is consistent with the market anticipating strong earnings performance, i.e., returns leading earnings (see Beaver, Lambert, and Morse, 1980, Collins, Kothari, and Rayburn, 1987, and many

[10] We measure returns from end of April to ensure that the market has reacted to the release of the prior year financial statements.

others). However, the evidence is also consistent with the agency hypothesis that a portion of the price run-up is overvaluation and that the overvalued firms engage in accrual management, and experience market correction in years +1 and beyond. This latter evidence of return reversal suggests that the prior price run up was not due entirely to rational anticipation of future earnings, i.e., prices leading earnings, but due in part to overvaluation.

The performance behavior of the lowest accrual portfolio in the years subsequent to and prior to year 0 lends further support to the agency hypothesis and helps us in discriminating between the fixation and agency hypotheses. Specifically, consistent with prior research, the lowest accrual-decile portfolio's performance in years +1 and beyond is not significantly positive. In fact, the point estimates of average abnormal return for the lowest accrual-decile portfolio are insignificantly negative. Turning to the performance in years prior to 0, the lowest accrual decile portfolio experiences considerably smaller magnitude of negative abnormal performance compared to the highest accrual-decile portfolio. Panel A of Table 1 shows that, in year -1, the lowest accrual-decile portfolio's abnormal return is -11.8% compared to 29.4% for the highest-decile accrual portfolio. Corresponding numbers when portfolios are formed on the basis of discretionary accruals in Panel B are -5.3% and 18.33%, which again reveals the large disparity in performance in prior years.

As a test of asymmetry in the performance of the highest and lowest accrual-decile portfolios in prior years, we compare their performance against that of accrual-decile portfolio 5. Portfolio 1's, i.e., the lowest accrual-decile portfolio's performance is statistically indistinguishable from that of portfolio 5 in years -1 and -2, whereas portfolio 10 statistically outperforms portfolio 5 in years -1 and -2. The considerable asymmetry in abnormal returns across the highest and lowest accrual decile portfolios coupled with the absence of significantly

positive subsequent abnormal return for the portfolio of income decreasing accruals is inconsistent with the fixation hypothesis but supports the agency hypothesis.

4.1.2 Annualized Alphas from Fama-French Three-Factor Model

In addition to average buy-and-hold abnormal returns, below we repeat the analysis using annualized alphas as a measure of the accrual-decile portfolios' abnormal return performance. We estimate the Fama-French three factor model using calendar-time monthly portfolio returns. Intercepts from these regressions for each of the 10 accrual portfolios are estimates of abnormal performance. We estimate the regression over five different event-time horizons: event years -3 to -1; year -1, year zero, year +1, years +1 to +3. As before, the return measurement period is four months after the fiscal year end for each firm included in the analysis. To estimate abnormal performance, i.e., alphas, we regress monthly equal-weighted accrual portfolio returns on the three Fama-French factors, namely market, size, and book-to-market. Similar to Table 2, Panel A of Table 3 reports results for the total accrual portfolios and Panel B for the discretionary accrual portfolios. Figures 1b and 1d present the results graphically.

The tenor of the results based on alphas as a measure of abnormal performance is similar to that based on buy-and-hold abnormal returns. The highest accrual-decile portfolio earns significantly positive abnormal returns prior to year zero and significantly negative abnormal returns beyond year zero. Prior to year 0, the annualized value of estimated alpha for the highest total-accrual-decile portfolio is 25.58% for year -1 and 17.82% when averaged over years -3 to -1. In contrast, the estimated alphas for the lowest accrual decile firms are negative prior to year 0, but they are remarkably smaller in magnitude when compared to alphas of the highest accrual decile firms. Specifically, in Panel A, the abnormal alpha is -3.92% for the lowest decile versus

17.82% for the highest decile using total accruals portfolios, and, in Panel B, it is -0.06% versus 12.88% using discretionary accruals portfolios.

[Table 3]

The asymmetry in the performance of the highest and lowest accrual-decile portfolios is also observed in year +1 and beyond. In Panel A, the estimated annualized alphas for the highest total accrual portfolio are -8.12% for year +1, and -5.36% when averaged over years +1 to +3. In contrast, the lowest accrual-decile portfolio's year +1 or year +1 to +3 alphas are statistically and economically insignificant. Furthermore, while the highest accrual decile portfolio alphas are significantly different from those of the 5th accrual decile portfolio, the lowest-decile portfolio's alphas are not. The above conclusions are also applicable to the results using discretionary accruals as reported in Panel B of Table 3.

4.1.3 Accrual Anomaly Conditioning on Prior Performance

In this sub-section, we examine whether the extent of future return reversal for the accrual-decile portfolios varies with the prior performance of the portfolios. The fixation hypothesis does not predict such variation; it predicts variation as a function of accruals, not prior returns. In contrast, under the agency cost hypothesis, prior performance as a proxy for misvaluation predicts subsequent reversals, especially for the high-accrual portfolios. To perform the tests, we subdivide accrual-decile portfolios each year into quartiles based on the annual abnormal buy-and-hold return (calculated by adjusting for size and book-to-market) in year -1. We report return performance in year +1 for the quartile portfolios within each of the accrual-decile portfolios 1, 5, and 10.[11] We present time-series means and Fama-MacBeth t-

[11] In this subsection we only include December fiscal year-end firms. This is similar to the previous analysis using buy-and-hold returns in section 4.1.1.

statistics for the abnormal returns. Panels A and B of Table 4 present results for total and discretionary accrual-decile portfolios.

Table 4 shows that return reversals in Panels A and B both are predominantly observed for the extreme prior return quartiles Q4 and Q3 and that too prominently only for the two quartiles within the highest accrual-decile portfolio. Specifically, in Panel A, the highest return quartile Q4 within accrual-decile portfolio 10 earns an average annual abnormal return of -10.57% compared to -3.99% for Q4 within the lowest accrual-decile portfolio. The Q4 portfolio within the lowest accrual-decile portfolio earns negative, not positive, abnormal returns in year +1. This is inconsistent with low accrual firms earning positive abnormal returns according to the accrual anomaly. Average abnormal returns of the Q3 portfolios within accrual deciles 1 and 10 are consistent with return reversals, but the magnitudes are markedly smaller. Specifically, Q3 portfolios within accrual deciles 1 and 10 earn average annual abnormal returns of -3.84 and 2.13%. The abnormal return magnitudes for Q1 and Q2 portfolios are small in absolute magnitude, particularly for those within the lowest accrual-decile portfolio. These results reveal the asymmetry in return performance of the high and low accrual portfolios, which is consistent with the agency, but not the fixation, hypothesis. The concentration of reversals in the extreme high prior return portfolio is also consistent with the agency, not fixation, explanation for the accrual anomaly.

[Table 4]

As further evidence of the asymmetry, we compare abnormal returns of quartile portfolios within deciles 1 and 10 with those of the quartile portfolios within the 5^{th} decile. The fifth decile portfolio is used as the benchmark to assess whether performance of the portfolios within decile 1 and 10 is asymmetric as predicted under the agency hypothesis. The results in

Panels A and B both reveal that only the performance of the Q4 portfolio within decile 10 is significantly different from that of Q4 within decile 5. Once again, the asymmetry and concentration of abnormal performance in Q4 are consistent with the agency hypothesis, and inconsistent with the fixation hypothesis.

4.2 Insider Trading Behavior

The second set of the empirical predictions under the agency hypothesis calls for an analysis of insiders' trading for the companies in different accrual deciles. In the interest of brevity, below we only report results using total accruals. However, the evidence based on discretionary accruals is qualitatively similar.

The data for the insider-trading analysis comes from Thomson Financial Insider Filing Form 4 that provides all common and ordinary shares transactions of insiders (purchases and sales only). Our definition of insiders includes CEO, COO, CFO, president, and chairman of the board. For firms in each accrual-decile, we analyze insiders' equity transactions over 9 years from year -4 to year 4, where year 0, as before, is the year of accrual measurement. For each year we include transactions occurring between the beginning and the end of the fiscal year. Consistent with the earlier literature (see, e.g., Lakonishok and Lee, 2001), we exclude small transactions defined as those with the number of shares traded less than 100. Due to the unavailability of the Thomson Financial Insider Filing Data prior to 1986, the analysis in this subsection covers activities from 1986 to 2004.[12]

Table 5 presents evidence on three measures of insider trading. Panel A presents the *average net purchase ratio* calculated according to Lakonishok and Lee (2001) as the number of

[12] The limited number of years for which the data is available also prevents us from presenting Fama-MacBeth standard errors in our analysis. Instead we present means and t-statistics based on pooled sample.

shares purchased minus the number of shares sold, divided by the total number of shares traded by the insiders. The second measure is the net purchase dollar volume (see Lakonishok and Lee, 2001) calculated as the dollar volume of purchases minus the dollar volume of the sale transactions, divided by the total dollar volume of all transactions by the insiders (Panel B). Finally, we use the *average net shares traded* (see Beneish and Vargus, 2002), which is calculated as the number of shares purchased by insiders minus number of shares sold by insiders, divided by the total number of shares outstanding (Panel C). All three measures are size adjusted by subtracting the average insider trading characteristic of all the companies with the same fiscal year and belonging to the same size decile portfolio. Figure 2 presents the results graphically comparing insider trading across 1st, 5th, and 10th accrual-decile portfolios.

[Table 5]

Management of companies in the highest accrual decile engage in insider trading behavior consistent with firm overvaluation prior to and during the year of accrual measurement, i.e., year 0. Specifically, the insiders are abnormal sellers of their equity in the company in years -1 and 0, and continue to do so in year +1. As seen from Figure 2 and Table 5, the selling activity of insiders of decile 10 firms is the highest of all the portfolios using all three measures of insider selling. In year 0, the highest accrual decile firms' insiders sell around 19% more shares (in terms of number of shares and dollar volume) than they buy. This is equivalent to selling, on average, 3.7% of company shares outstanding (see Panel C), which likely represents a substantial fraction of the insiders' stake in the company. To assess statistical significance, we compare decile 10 insider selling with that of decile 5. In year 0, all three measures indicate insiders of decile 10 firms sell more equity than insiders of decile 5. In years -1 and -2, the net purchase ratio and the net dollar volume of transactions ratio in Panels A and B for decile 10 are

significantly greater than those measures for decile 5. The third measure has a negative point estimate, as predicted, but they are not statistically significant in years -1 and -2.

The insiders of the lowest accrual decile firms do not exhibit a consistent buying or selling behavior around year 0. They are net buyers of company stock in year 0, but the magnitude is neither economically nor statistically different from the buying behavior of the insiders of decile 5 firms. In fact, the buying of firm equity by the insiders of the firms in decile 1 is generally lower than that of decile 5 insiders. If low accruals were to indicate undervaluation, the insiders of firms with extreme low accruals, i.e., decile 1, should be more aggressive in acquiring equity than the insiders of the firms with the average magnitude of accruals, i.e., decile 5, which should not be mispriced, on average.

The insider trading evidence described above is most consistent with the agency costs of overvalued equity hypothesis, and inconsistent with the fixation hypothesis. The asymmetry in the insider behavior across the high and low accrual-decile portfolios is as predicted under the agency hypothesis. Decile 1 insiders' net selling prior to year 0 also suggests the management of these firms were aware of overvaluation and attempt to take advantage of it by unloading their ownership stake in the firm. The fixation hypothesis does not make such a prediction.

4.3 Investment-Financing Decisions

Management might attempt to prolong the overvaluation by making certain investment-financing decisions that are not necessarily value-maximizing for the shareholders. Overvalued companies are likely to (i) raise excessive amount of equity cheaply, (ii) use overvalued equity as currency in merger and acquisition transactions; and (iii) overinvest in capital assets, i.e., PP&E, and in R&D.

Table 6 reports the investment and financing decisions of the firms in various accrual deciles. In Panel A we report firms' average external equity issues as a percentage of total assets (Compustat data item #108/item #6). Panel B summarizes the contribution of new equity through mergers and acquisitions, as a percentage of total assets (Compustat data item #129/item #6). Finally, Panel C examines the firms' intensity of investment in capital assets and R&D, which we measure as the growth in the sum of capital assets and R&D expenditures (Compustat data item #128 + item #46). All three investment-financing variables are size adjusted by subtracting the average investment-financing amount for the portfolio of companies in the same year and size decile portfolio of the sample firms. The sample contains all CRSP-Compustat firm-years from 1963 to 2004 for which sufficient data exists to construct considered firm characteristics. Figure 3 presents our results where we graphically compare firms' investment and financing decisions across 1st, 5th, and 10th accrual-decile portfolios.

Panels A-C of Table 6 demonstrate that firms in decile 10 exhibit very high levels of investment-financing activity in year 0 and in prior years compared to decile 5. In Panel A, mean amount of equity issued as a percentage of total assets is 30.62% for decile 10 compared to -2.75% for decile 5 in year 0, and the difference is highly significant. While the decile 10's equity issues are of considerably smaller magnitudes in year -4 through -1, they are nonetheless significantly greater than thos of the firms in decile 5. The lowest accrual decile firm, contrary to the fixation hypothesis, also raises equity in year 0, but the magnitude is considerably smaller at 7.21% of its total assets.[13] Decile 1's equity issues are not statistically different from that of

[13] The surprising positive equity issues for the 1st decile could be due in part to the low value of assets of the firms reporting losses, i.e., low accruals.

decile 5. Overall, the evidence on firms' equity issues reinforces the asymmetric pattern as predicted under the agency costs hypothesis.

[Table 6]

Besides equity issues, the M&A activity as well as the growth in capital expenditures and R&D expenditures for decile 10, but not decile 1, are high in year 0. These differences increase and peak in year zero when the highest accrual-decile firms have 10 times larger levels of M&A activity, and 6 times higher growth in capital and R&D expenditures compared to the lowest accrual decile firms. This supports the overvaluation hypothesis, but the asymmetry in the investment-financing decisions is inconsistent with the fixation hypothesis.

4.4 Mishkin Test

In addition to documenting the predictability of returns using accruals, the literature shows that investors overestimate the persistence of the (discretionary) accrual component of earnings. Such evidence is consistent with the fixation hypothesis. Following the literature, in this sub-section we use the Mishkin (1983) test to determine whether the relation between accruals and stock returns is asymmetric, i.e., non-linear. Evidence of asymmetry would be inconsistent with the fixation hypothesis. We apply the Mishkin (1983) framework of testing the rational expectations hypothesis and estimate the following system of simultaneous equations:

$$\text{Earnings}_{t+1} = \gamma_0 + \gamma_1 \text{ Cash Flows}_t + \gamma_2 \text{ Total Accruals}_t + \xi_{t+1} \quad \textbf{(3)}$$

$$\text{Abnormal Returns}_{t+1} = \beta_0 + \beta_1(\text{Earnings}_{t+1} - \gamma_0^* - \gamma_1^* \text{ Cash Flows}_t - \gamma_2^* \text{ Total Accruals}_t) + \zeta_{t+1} \quad \textbf{(4)}$$

Equation (3) is the forecasting equation for predicting one-year-ahead earnings and γ coefficients reflect the persistence of the earnings components. Equation (4) is the valuation equation and γ^* coefficients reflect the market persistence beliefs in valuing stocks. Sloan (1996) and others document that market underestimates the persistence of cash flows ($\gamma_1 > \gamma_1^*$) and

overestimates the persistence of accruals ($\gamma_2 < \gamma_2^*$), which contributes to the predictability of returns using accruals. Under the fixation hypothesis, investors are expected to overestimate the persistence of the accrual in a similar fashion for income-increasing and income-decreasing accrual firms. That is, fixation should be symmetric. Hence, we predict $\gamma_2 - \gamma_2^*$ of a similar magnitude across sub-samples under the fixation hypothesis. In contrast, the agency cost of overvalued equity hypothesis predicts that $\gamma_2 - \gamma_2^*$ would be negative for high accrual firms and zero for the low accrual firms.

Table 7 presents results of the Mishkin test for the full sample and two sub-samples of firm-years in the top and bottom five deciles of the accrual distribution. Panel A reports results of the market pricing for the cash flow and accrual components of earnings. Panel B further decomposes the accruals into discretionary and non-discretionary components. In panel B, we split the full sample into sub-samples at the median of the discretionary-accrual distribution. We report coefficients estimated using the pooled sample regressions as well as the Fama-MacBeth coefficient estimates of the non-linear system (3)-(4) and test whether $\gamma_1 = \gamma_1^*$ and $\gamma_2 = \gamma_2^*$.

[Table 7]

We find that investors' mis-processing of the persistence of accruals differs dramatically between income-increasing and income-decreasing accruals. Surprisingly, investors *underestimate,* not overestimate, the persistence of accruals for the low accrual decile portfolios 1 through 5. For these firms, ($\gamma_2 - \gamma_2^*$) is positive 0.29 when estimated for the pooled-sample and 0.24 using the Fama-MacBeth estimates, both significant at the 1% level. Similarly, when we decompose accruals into discretionary and non-discretionary components, the bias is due mostly to investors *underestimating* the persistence of discretionary accruals. In contrast, investors *overestimate* the persistence of accruals for the high accrual decile portfolios 6 through

10. Based on the pooled-sample estimates, $(\gamma_2 - \gamma_2^*)$ is -0.18 for total accruals in Panel A and -0.17 for discretionary accruals in Panel B, both significant at the 1% level. The Fama-MacBeth estimates suggest that investors' pricing of total and discretionary accruals is indistinguishable from rational pricing in an efficient market.

Overall, results using the Mishkin test reinforce the asymmetry in investors' pricing of income-increasing and income-decreasing accruals. Since we are able to replicate the accrual anomaly for the full sample, the evidence of asymmetry is unlikely to be due to some unusual attributes of our sample. The observed asymmetry is inconsistent with investor fixation on accruals. The results are consistent with the agency hypothesis in that investors over-estimate the persistence of high accrual firms. Surprisingly, however, we also find that investors underestimate the persistence when accruals are low. This result is not predicted under the agency hypothesis.

4.5 Relation between Stock Returns and Accruals

To further discriminate between the fixation and agency hypotheses, in this section we test for the causality implications of the two hypotheses. The fixation hypothesis implies that investors' over-estimation of accrual persistence leads to stock-price over-reaction, especially in the extreme accrual portfolios. This means extreme accruals should forecast future return reversals, whereas past returns should not anticipate future accruals. The agency theory, on the other hand, contends that it is over-valuation in the first place that leads to overstated accruals. Below we discriminate between the hypotheses by first performing an instrumental variable analysis, which shows that overvaluation causes earnings management. Second, we perform quantile regressions (described below), which demonstrate a striking asymmetry in the relation between accruals and past and current returns.

4.5.1 Instrumental Variable Analysis

We regress accruals on past and present abnormal returns, with the latter as a crude proxy for overvaluation. However, we recognize that returns contain information about (future) earnings and hence accruals (see Beaver, Lambert, and Morse, 1980, and Collins, Kothari, and Rayburn, 1987), so past returns' predictive ability can be due to returns leading earnings, not overvaluation. We propose instruments that are likely to be correlated with overvaluation, but not with the information about future unmanaged accruals or earnings. This set of instruments, when used in the two-stage least squares framework, allows us to identify the causal relation between overvaluation and future accruals as implied by the agency hypothesis.

One set of instruments is managerial actions, except earnings management, which firms are likely to take to prolong the overvaluation. Our instruments include: (i) equity issuance as a percentage of total assets, (ii) acquisitions as a percentage of total assets, (iii) growth in PPE and PPE as a fraction of total assets, (iv) growth in R&D and R&D as a fraction of total assets, (v) growth in capital expenditures and capital expenditures as a fraction of total assets, (vi) dummy for a positive income contribution from acquisitions, and (vii) dummy for a positive change in good-will. Under the agency hypothesis, an increase in each of these variables is indicative of overvaluation, but is unlikely to be correlated with future accruals.

Table 8 reports the results of 2SLS regressions of accruals on one year lagged returns (Panel A) and contemporaneous returns (Panel B) where the returns are instrumented using firm characteristics above. In our analysis we require non-missing data on the instrumental variables and buy-and-hold abnormal returns (described in Section 3.1.1).[14] The instruments are measured

[14] Since we use the buy-and-hold abnormal return we limit our consideration to December fiscal-year-end firms.

contemporaneously with the independent variable (abnormal return). The table presents time-series average coefficients and associated Fama-MacBeth test statistics.

[Table 8]

Panel A shows year -1 abnormal returns' effect on year zero total and discretionary accruals. The coefficients on lagged returns are 0.076 (p-value 0.02) for total accruals and 0.039 (p-value 0.04) for discretionary accruals. The coefficient magnitudes imply one percentage point increase in lagged buy-and-hold abnormal returns leads to a 7.6 basis-point increase in total accruals as a percentage of total assets and a 4.1 basis-point increase in discretionary accruals. Since the highest accrual-decile firms exhibit 29.5% abnormal buy-and-hold return in year -1 it translates in 2.24% increase in total accruals. Panel B reports contemporaneous 2SLS regression of year zero accruals on year zero returns. The coefficient magnitudes double to 0.157 and 0.124 in the total and discretionary accrual cases, with both being significant at the 1% level. The evidence supports our conjecture that the agency theory of overvalued equity contributes to the accrual anomaly.

Finally, Panel C of Table 8 shows that overvaluation proxies predict managements' investment-financing decisions. We show that lagged buy-and-hold abnormal returns lead to increased levels of equity and debt issuance, participation in acquisitions, and investments in capital and R&D. This evidence supports the predictions of the agency hypothesis as well as it validates our choice of instrumental variables.

4.5.2 Relation between Accruals and Returns: Quantile Regression Results

We evaluate the symmetry in the accrual-return relation by examining the effect of returns on the tails of accrual distribution. This is done using the Quantile regression framework. Similar to an OLS regression, which models the relation between regressors and conditional

mean of the distribution of the dependent variable, a quantile regression estimates the relation between regressors and the conditional quantiles of the distribution of interest (see Koenker and Hallock, 2001, for details and economic applications). Specifically, a Quantile regression estimates the linear conditional quantile function $Q(q \mid x) \equiv \min\{y \mid F(y \mid x) \geq q\} = x'\beta^q$, where the estimated $\hat{\beta}^q = \arg\min_{\beta} \sum_{i=1}^{n} \rho_q(y_i - x_i'\beta)$, where $\rho_q(z) = z(q - 1_{\{z<0\}})$.

For each quantile $q \in \{0.05, 0.1, 0.2, 0.3, 0.5, 0.6, 0.7, 0.8, 0.9, 0.95\}$ of the dependent variable, we estimate the following models:[15]

$$\text{Accruals}_t = \alpha^q + \beta^q \text{Abnormal Returns}_{t-1} + \zeta_t^q \quad (5)$$

$$\text{Accruals}_t = \alpha^q + \beta^q \text{Abnormal Returns}_t + \zeta_t^q \quad (6)$$

Table 9 presents time-series average coefficient estimates and Fama-MacBeth t-statistics for the quartile regressions. Panel A and Panel B report the slope coefficients for the cases of total and discretionary accruals. Figure 4 presents our results graphically showing not only Fama-MacBeth slope coefficient estimates but also pooled sample estimates plotted against different quantiles *q*.[16]

[Table 9 and Figure 4]

Estimation of model (5) reveals that high abnormal returns of year -1 positively impact year 0 accruals, but this phenomenon is observed primarily for the upper tail of the accrual

[15] Although we estimate the quantile regression model for each quantile of the dependent variable, quantile regressions are not equivalent to the OLS regressions estimated over subsets of observations partitioned on the dependent variable into quantiles. It's well-known that the latter lead to biased and inconsistent slope coefficient estimates because the regression errors are likely to be non-zero for different partitions of the data on the dependent variable. In contrast, quantile regressions employ all of the data when fitting the quantiles and therefore produce unbiased and consistent effects of the independent variables on conditional quantiles.

[16] In this section of our analysis we use December fiscal-year-end firms for which the data on total (discretionary) accrual and returns in years -1, and 0.

distribution. In case of total accruals, the slope coefficient $\beta^{0.95}$ is 0.09, which is 4.5 times as large as the $\beta^{0.05}$ coefficient of 0.02. A similar order of magnitude difference is observed when the regressions use discretionary accruals. Figures 4a and 4b reveal striking patterns in quantile coefficients where the relation appears to grow geometrically as we approach the tail of the income increasing accruals. The evidence suggests that variation in prior returns drives higher accrual quantiles to a much greater extent. This is consistent with abnormal price run-ups driving accruals of those firms that are likely to be manipulate them.

Estimation of model (6) shows that contemporaneous return-accrual relation is weak over the range of accrual distribution except for its highest quantiles. The evidence is in line with that of the predictive model (5) and confirms pronounced asymmetry in the accruals-return relation. Overall the results of this section confirm the pronounced asymmetry in the relation between abnormal returns and accruals.

5 Summary and conclusions

Agency theory of overvalued equity predicts that the overvalued firms are likely to engage in income increasing earnings management in order to meet the unrealistic performance expectations incorporated in the stock prices. This prediction suggests an alternative explanation for accrual anomaly as we expect that a sub-sample of firms with upward managed accruals will be more heavily populated with overvalued firms and the subsequent negative stock performance of such companies is a mere overvaluation reversal. We formulate a number of testable predictions that allow us to distinguish between the agency theory of overvalued equity and the traditional naïve investor fixation hypothesis as the driving force behind the accrual anomaly.

Consistent with the agency theory of overvalued equity, we find an asymmetry in the relation between accruals and returns, accruals and insider-trading patterns, and accruals and corporate investment-financing decisions. Such asymmetry is not predicted under the naïve investor fixation on accruals. We find that companies in the highest income increasing accrual decile experience an economically large abnormal price run-up prior to the accrual management year, which is followed by stock underperformance in the subsequent years. Finally we find evidence consistent with the prediction of the agency theory of overvalued equity using the instrumental variable framework which allows us to isolate a casual relationship from overvaluation to accrual management.

Overall, the evidence in our study casts doubt on the prevailing hypothesis that market naively fixates on accruals or earnings. In contrast to earlier studies that merely present evidence inconsistent with fixation, we provide an alternative economic mechanism rooted in the agency theory of overvalued equity.

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Figure 1a. Annual Buy-and-Hold Abnormal Returns For Total Accrual Portfolios

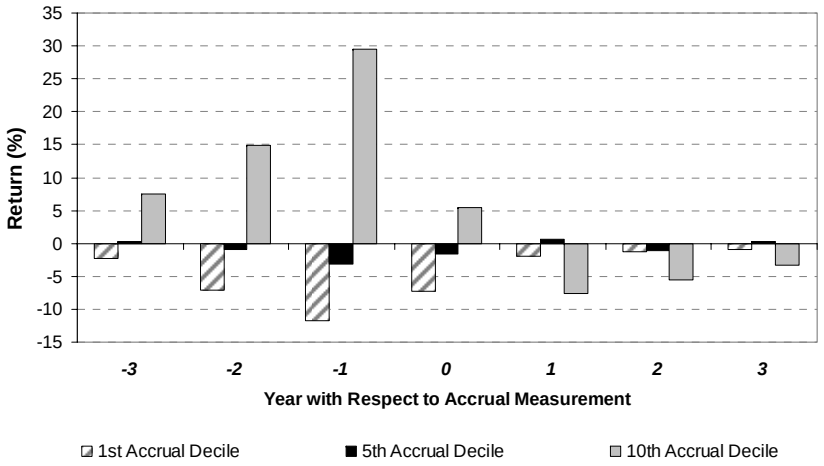

Figure 1c. Annual Buy-and-Hold Abnormal Returns For Discretionary Accrual Portfolios

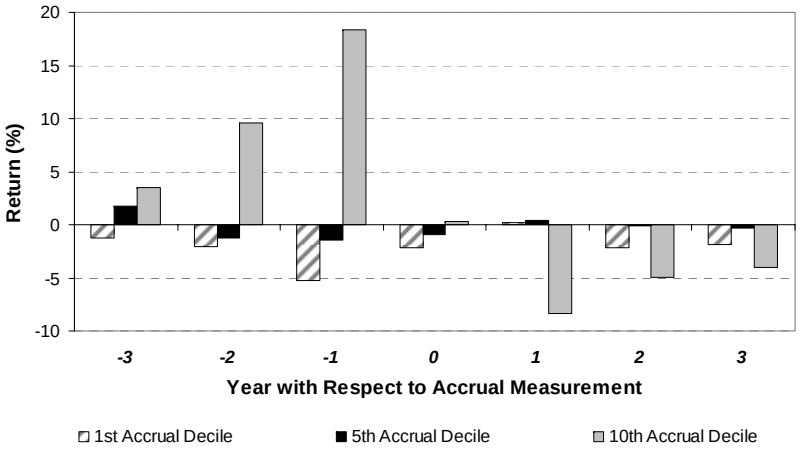

Figure 1b. Annualized Alphas From Fama-French Three Factor Model For Total Accrual Portfolios

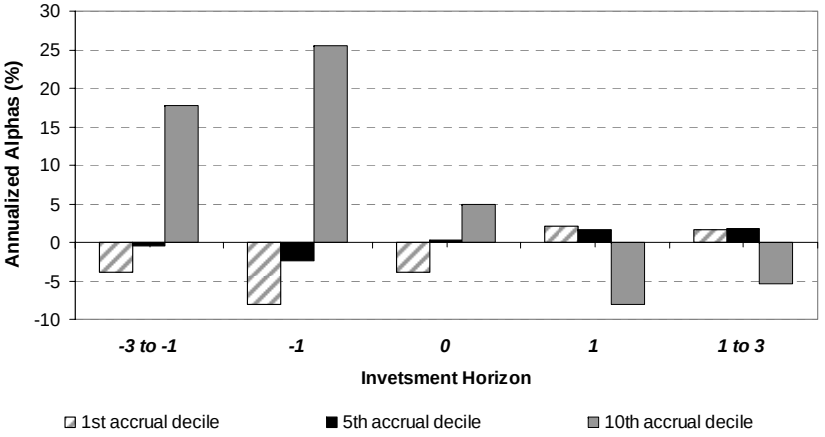

Figure 1d. Annualized Alphas From Fama-French Three Factor Model For Discretionary Accrual Portfolios

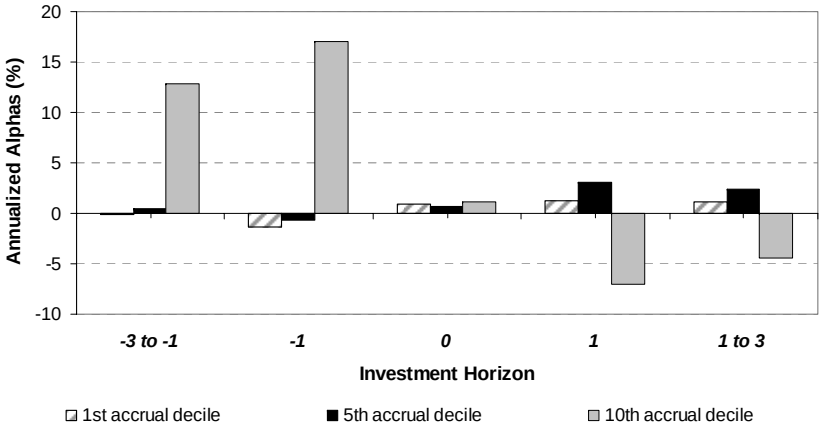

Figure 1 presents the abnormal stock performance of accrual (total and discretionary) portfolios constructed in year *t*. Only 1st, 5th, and 10th decile accrual portfolios are depicted. Figures 1a and 1b present the results for total accruals portfolios whereas Figures 1c and 1d present the results for the discretionary accrual portfolios. The buy-and-hold annual abnormal returns presented in Figures 1a and 1c are size and book-to-market adjusted and described in detail in Table 2. The annualized alphas from Fama-French three factor model for various return horizons presented in Figures 1b and 1d are described in detail in Table 3.

Figure 2a. Size Adjusted Net Purchase Ratio

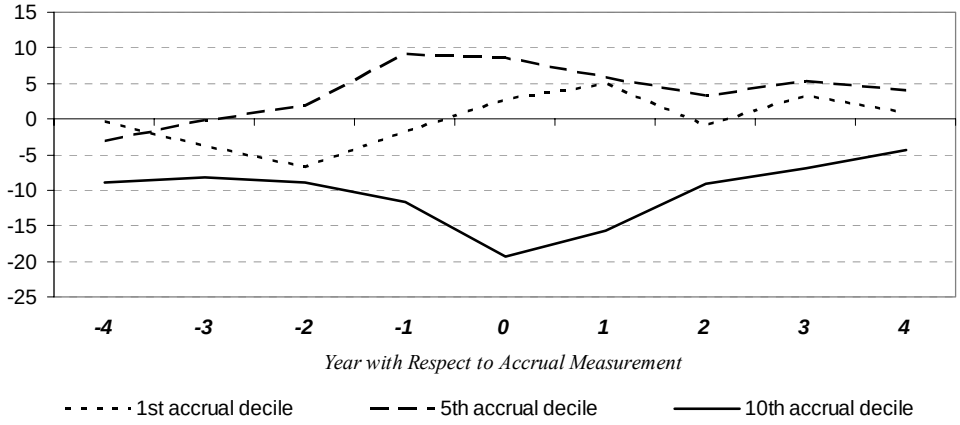

Figure 2b. Size Adjusted Volume Net Purchase Ratio

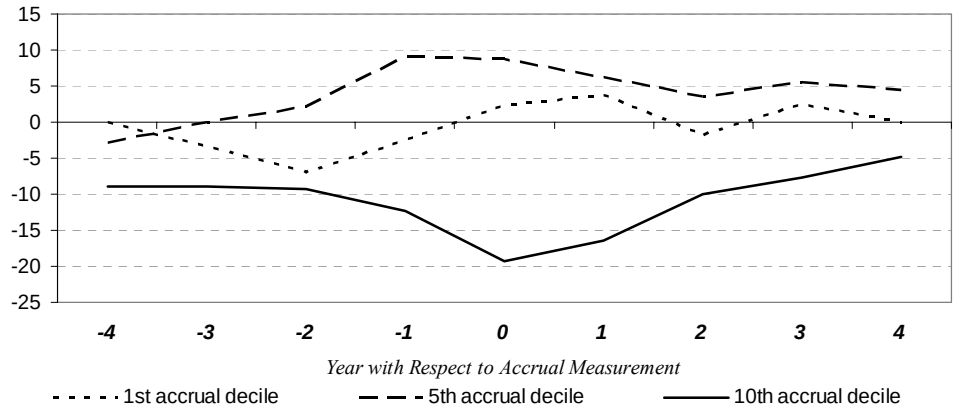

Figure 2c. Size Adjusted Net Shares Traded

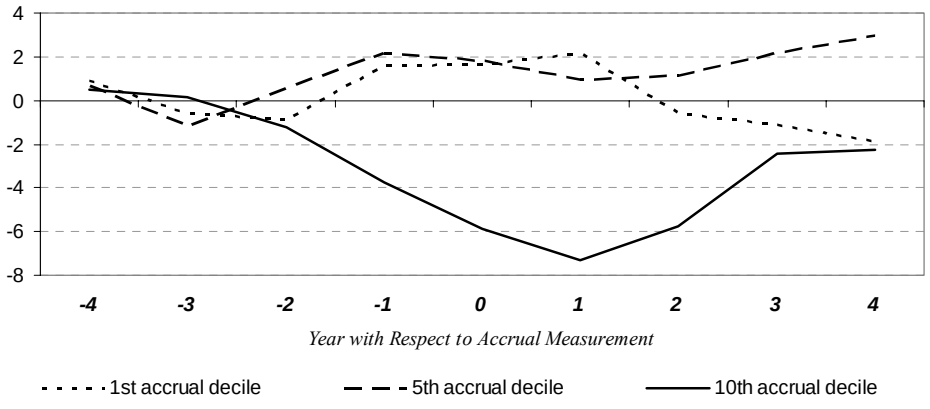

Figure 2 presents the evidence of insider trading for companies in different total accruals deciles. Only 1st, 5th, and 10th decile accrual portfolios are considered. The total accruals are computed in year *t* using the balance sheet data. Figure 2a presents the average net purchase ratio. Figure 2b presents the average net purchase volume. Figure 2c presents the average net shares traded. All three measures are size adjusted and described in detail in Table 5. Our definition of insiders includes: CEO, CO, President, Chairman of the board, and CFO. The insider trading data is the common/ordinary shares transactions (purchases and sales only) recorded in Form 4 of Thomson Financial Insider Filing Data.

Figure 3a. Equity Issues as a Percentage of Total Assets (%)

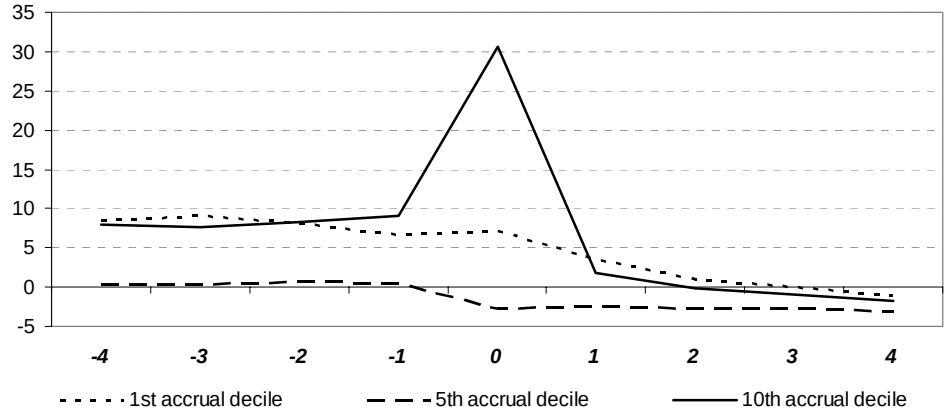

Figure 3b. Contribution from Acquisition as a Percentage of Total Assets (%)

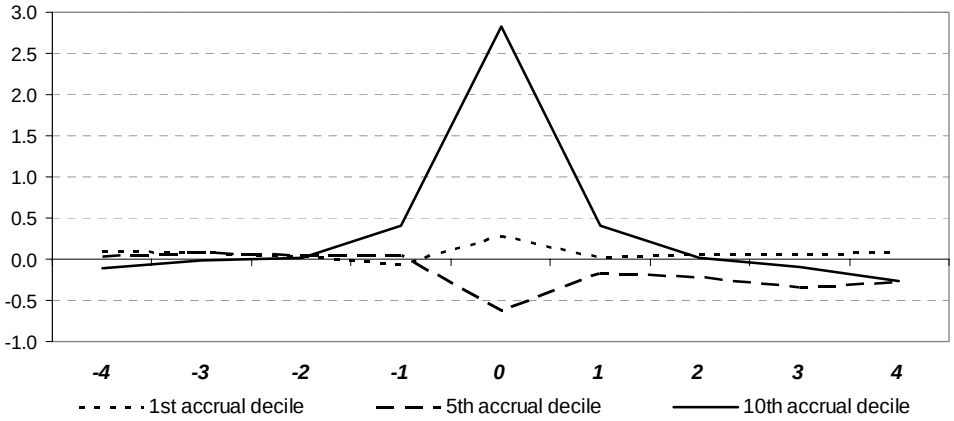

Figure 3c. Growth in Capital Expenditures and R&D (%)

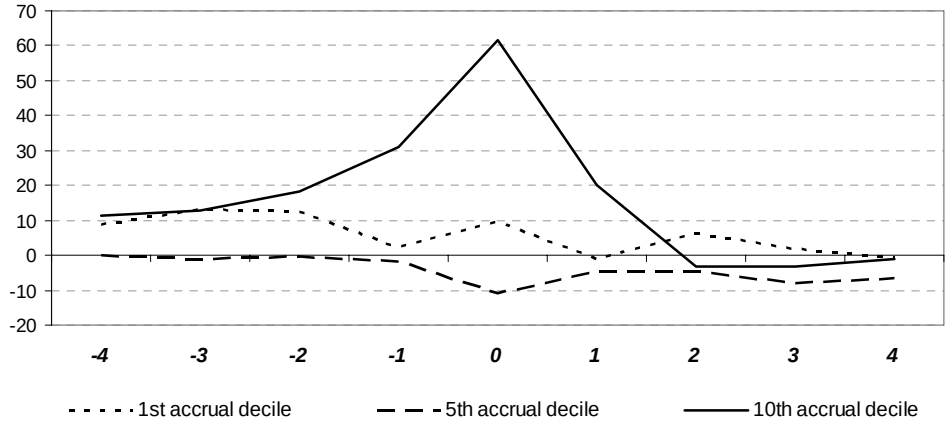

Figure 3 presents the time-series means of the operating decisions characteristics for companies in 1st, 5th, and 10th total accrual decile. The total accruals portfolios are formed in the accrual measurement year *zero* using balance sheet data. Figure 3a presents the firm's equity issues as a percentage of total assets (Compustat data item 108/item 6). Figure 3b presents the contributions from acquisitions as a percentage of total assets (Compustat data item 129/item 6). Figure 3c presents growth in capital expenditures and R&D (Compustat data item 128 + item 46). All three measures are size adjusted. The sample contains firm-years from 1963 to 2004.

Figure 4a. Quantile Regressions of Total Accruals on Past Returns

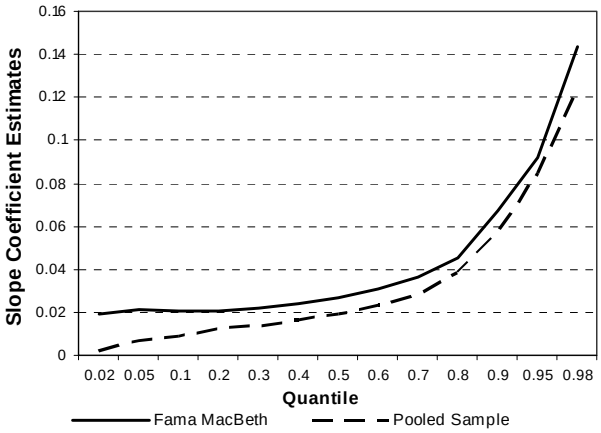

Figure 4b. Quantile Regressions of Discretionary Accruals on Past Returns

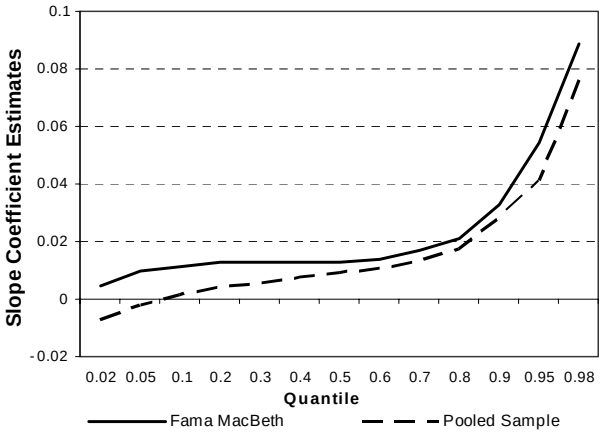

Figure 4c. Quantile Regressions of Total Accruals on Contemporaneous Returns

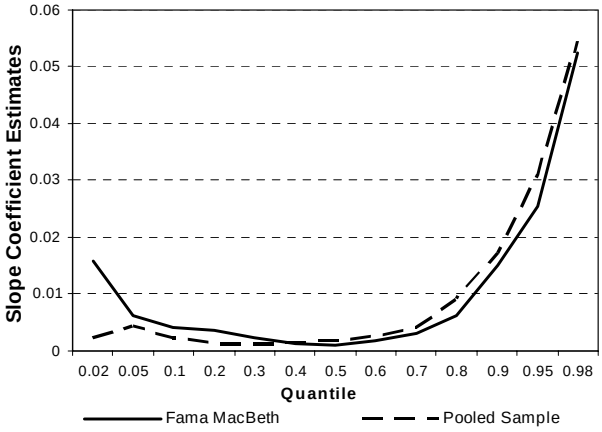

Figure 4d. Quantile Regressions of Discretionary Accruals on Contemporaneous Returns

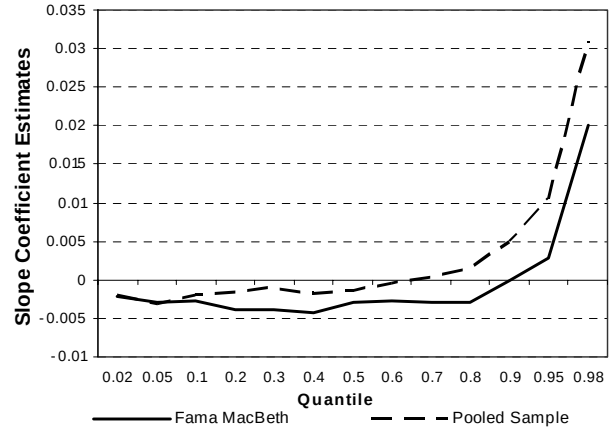

Figure 4 present the slope coefficients for the quantile regressions of accruals in year 0 on annual abnormal buy-and-hold returns in year -1 (Figures 4a and 4b), and slope coefficients for the quantile regressions of accruals in year 0 on annual abnormal buy-and-hold returns in year 0 (Figures 4c and 4d). The slope coefficients are estimated for the following set of percentiles: 2%, 5%, 10% though 90%, 95%, and 98%. The buy-and-hold annual abnormal returns are size and book-to-market adjusted and described in detail in Table 2. Figures 4a, and 4c present the result for total accruals while Figures 4b and 4d present the results for discretionary accruals.

Table 1

Summary of the Sample Firms Financial Characteristics

The table presents the summary statistics for various firms' characteristics in our sample. Panel A presents the mean (median) characteristics for total accrual-decile portfolios. The total accruals are computed using the balance-sheet method. Panel B presents the mean (median) characteristics for discretionary accrual-decile portfolios. Along total and discretionary accruals we analyze: (i) market capitalization (Compustat data item #24*item #25), (ii) total assets (Compustat data item #6), (iii) leverage (Compustat data item #142/item #6), (iv) market-to-book ratio (Compustat data item #24*item #25/item #60), and (v) income before extraordinary items (Compustat data item #18/ item 6). The sample contains all firm-years from 1963 to 2004. To be included in the sample firm-years should contain sufficient information in Compustat for the calculations of the presented characteristics and be present in CRSP Monthly Returns file.

Panel A: Total Accrual Decile Portfolios

	1	2	3	4	5	6	7	8	9	10
Total Accruals (as % of Total Assets)	-26.37 (-22.40)	-12.55 (-12.59)	-8.69 (-8.91)	-6.28 (-6.49)	-4.36 (-4.53)	-2.57 (-2.75)	-0.53 (-0.66)	2.27 (2.23)	7.21 (7.18)	31.27 (21.01)
Market Capitalization ($ mil.)	493.42 (18.60)	1053.18 (41.24)	1526.34 (68.59)	1672.11 (100.66)	1728.15 (121.08)	1558.34 (109.69)	1287.55 (88.68)	925.52 (65.35)	508.45 (48.26)	315.60 (38.91)
Total Assets ($ mil.)	339.68 (24.41)	1031.49 (62.16)	1501.26 (100.16)	1754.26 (146.54)	1876.27 (167.84)	1708.06 (148.88)	1198.94 (108.55)	873.80 (75.87)	427.17 (50.90)	200.00 (31.84)
Leverage	17.85 (6.11)	19.50 (12.03)	20.65 (15.64)	21.25 (17.49)	21.58 (18.08)	20.71 (16.69)	20.18 (14.58)	16.81 (11.53)	16.50 (8.70)	14.25 (5.11)
Market-to-Book Ratio	3.41 (1.42)	2.66 (1.40)	2.04 (1.39)	3.10 (1.43)	2.42 (1.43)	2.18 (1.44)	2.43 (1.52)	2.76 (1.61)	3.14 (1.75)	3.97 (2.29)
Income Before Extraordinary Items(as % of Total Assets)	-21.83 (-7.00)	-5.33 (2.08)	-1.45 (3.50)	0.58 (4.06)	1.30 (4.35)	1.81 (4.53)	2.06 (4.87)	2.40 (5.52)	1.87 (6.21)	-3.71 (7.53)

Panel B: Discretionary Accrual Decile Portfolios

	1	2	3	4	5	6	7	8	9	10
Discretionary Accruals (as % of Total Assets)	-25.66 (-21.60)	-10.74 (-10.50)	-6.34 (-6.28)	-3.65 (-3.60)	-1.63 (-1.59)	0.11 (0.14)	1.87 (1.86)	4.12 (4.03)	7.98 (7.67)	26.39 (18.34)
Market Capitalization ($ mil.)	452.95 (19.00)	774.56 (34.75)	1022.48 (56.57)	1364.80 (84.59)	1559.26 (108.90)	1737.18 (126.88)	1554.80 (118.29)	1422.63 (80.99)	849.97 (51.29)	363.38 (35.88)
Total Assets ($ mil.)	288.32 (20.99)	548.20 (45.05)	863.89 (75.87)	1259.01 (108.36)	1606.73 (142.57)	1909.29 (169.93)	1805.52 (155.50)	1450.73 (106.77)	893.89 (62.53)	293.60 (33.98)
Leverage	15.15 (3.94)	16.70 (8.69)	18.55 (12.58)	19.95 (15.25)	20.61 (15.98)	21.42 (16.93)	21.47 (17.93)	20.40 (16.54)	19.32 (12.83)	15.99 (7.21)
Market-to-Book Ratio	4.43 (1.64)	2.61 (1.54)	2.53 (1.50)	2.21 (1.50)	2.49 (1.48)	2.40 (1.45)	1.98 (1.47)	2.85 (1.49)	2.92 (1.57)	3.62 (1.96)
Income Before Extraordinary Items(as % of Total Assets)	-19.74 (-2.94)	-5.26 (2.60)	-1.71 (3.77)	0.30 (4.39)	1.45 (4.51)	2.13 (4.58)	2.75 (4.77)	2.44 (4.85)	1.79 (5.30)	-4.89 (5.75)

Table 2

Buy-and-Hold Abnormal Returns

This table presents the time-series means and Fama-MacBeth t-statistics for annual abnormal returns on 10 accrual portfolios. The accrual portfolios are constructed in year zero. The abnormal returns are computed as follows. Each year we use end of April market capitalization to allocate all companies in our sample into size quintiles based on cutoffs computed for NYSE sub-sample. We further allocate lowest size decile firms into another 5 quintiles. Subsequently each of the resulting nine size portfolios is allocated into five quintiles based on book-to-market ratio, which results in 45 benchmark portfolios in total. The book value is measured as of December of the previous (fiscal) year. The annual abnormal return for each stock is computed as one-year buy-and-hold return (12 month return starting in April) less average annual return of the corresponding size – book-to-market portfolio. Panel A presents the results for total accruals portfolios. The total accruals are computed using the balance sheet data. Panel B presents the results for discretionary accruals portfolios. The discretionary accruals are estimated via within industry, cross-sectional modified Jones model. ***, **, and * indicate significance of the t-statistics for the tests of difference in means at 1, 5, and 10 percent levels, respectively. The sample contains all December year-end non-financial firms that are present in both CRSP and Compustat and covers the period from 1963 to 2004.

Accrual Decile	*Year With Respect to Accrual Measurement*								
	-4	***-3***	***-2***	***-1***	***0***	***1***	***2***	***3***	***4***
Panel A: Case of Total Accruals									
Lowest	0.49	-2.35	-7.02	-11.82	-7.22	-1.92	-1.29	-0.83	0.57
2	-0.29	-1.02	-5.24	-8.74	-3.23	1.17	-1.11	-0.50	-1.93
3	1.87	-0.92	-3.42	-5.91	-1.20	-0.43	0.33	-0.72	-0.03
4	0.49	-0.94	-2.60	-4.87	-0.95	0.14	0.28	-0.98	-1.57
5	-0.69	0.28	-0.92	-3.09	-1.61	0.57	-1.15	0.25	-0.81
6	1.02	1.29	0.54	-2.03	-1.71	-0.19	-0.53	-0.97	-0.96
7	1.33	1.12	1.06	-0.28	-1.60	-1.22	-1.24	-1.57	-2.40
8	3.33	3.19	5.05	2.86	-2.40	-1.69	-0.20	-0.71	-1.12
9	4.46	3.38	9.74	10.23	0.28	-4.07	-2.40	-2.09	-0.98
Highest	0.41	7.48	14.83	29.43	5.45	-7.63	-5.53	-3.34	-0.84
10th - 1st	-0.08	9.82***	21.84***	41.25***	12.66***	-5.70***	-4.23**	-2.50	-1.41
1st - 5th	1.17	-2.63	-6.09	-8.72	-5.61	-2.48	-0.14	-1.07	1.37
10th - 5th	1.09	7.19***	15.74***	32.52***	7.05***	-8.19***	-4.37***	-3.58**	-0.03
Panel B: Case of Discretionary Accruals									
Lowest	-0.38	-1.20	-2.10	-5.29	-2.19	0.21	-2.18	-1.91	-2.06
2	-0.47	-0.23	-4.36	-6.53	-0.96	0.11	-0.96	-0.30	-0.54
3	2.49	1.11	-2.22	-4.28	-1.32	0.16	0.24	0.25	-1.56
4	2.72	0.42	-1.14	-3.53	-0.02	0.07	-0.13	-1.57	-1.01
5	1.25	1.76	-1.27	-1.39	-0.95	0.41	-0.09	-0.33	0.07
6	1.52	-0.76	-0.29	-1.34	-2.66	-0.20	1.50	-0.38	-1.29
7	-0.04	1.02	0.63	-1.32	-1.77	-1.48	-0.75	-0.30	-1.64
8	0.67	1.62	2.39	-0.49	-2.28	-1.79	-2.96	-0.87	-0.17
9	2.77	1.16	5.63	2.78	-2.46	-2.39	-2.85	-1.77	-2.86
Highest	-1.22	3.46	9.57	18.33	0.33	-8.36	-4.91	-3.97	0.13
10th - 1st	-0.84	4.65**	11.67***	23.63***	2.51	-8.57***	-2.73	-2.07	2.20
1st - 5th	-1.63	-2.96	-0.83	-3.90	-1.24	-0.20	-2.09	-1.57	-2.14
10th - 5th	-2.46*	1.69	10.84***	19.73***	1.27	-8.76***	-4.82***	-3.64**	0.06

Table 3
Annualized Alphas from Fama-French Three Factor Model

This table presents annualized Jensen's alphas for 10 accrual portfolios and for different holding horizons. The accrual portfolios are constructed in Year *t.* The alphas are estimated from calendar time regressions based on Fama-French's three-factor model using monthly returns:

$$R_{pt} - R_{ft} = \alpha + \beta(R_{mt} - R_{ft}) + s \cdot SMB_t + h \cdot HML_t + \varepsilon_t$$

where R_{pt} is the return on the accrual portfolio in month *t*; R_{mt} is the return on the CRSP value-weighted index in month *t*; R_{ft} is the 3-month T-bill yield in month *t*; SMB_t is the return on small firms minus the return on large firms in month *t*; and HML_t is the return on high book-to-market stocks minus the return on low book-to-market stocks in month *t*. The factor definitions are described in Fama and French (1993). The accrual portfolios are constructed in the following way. For companies in each accrual decile in year *t*, we include monthly returns earned over five different horizons (around year *zero*): *Years -3 to -1, Year -1, Year zero, Year 1, Years 1 to 3*. Monthly returns are included starting from 4 months after the beginning and 4 months after the end of each horizon. Panel A presents results for total accruals portfolios. Total accruals are computed using balance sheet data. Panel B presents results for discretionary accruals portfolios. Discretionary accruals are estimated using the within industry, cross-sectional modified Jones model. The sample contains all non-financial firms that are present in both CRSP and Compustat in year zero and covers the period from 1963 to 2004. T-statistics are presented in parentheses. ***, **, and * indicate significance of the t-statistics for the tests of difference in means at 1, 5, and 10 percent significance levels.

Panel A: Case of Total Accruals

Accrual Decile	***Years -3 to -1***		***Year -1***		***Year 0***		***Year 1***		***Years 1 to 3***	
	Alpha	T-Stat	Alpha	T-Stat	Alpha	T-Stat	Alpha	T-Stat	Alpha	T-Stat
Lowest	-3.92	(1.97)**	-8.03	(3.70)***	-3.94	(1.74)*	2.11	(0.98)	1.64	(0.87)
2	-2.79	(2.29)**	-6.12	(4.41)***	0.12	(0.08)	3.80	(2.76)***	3.45	(2.82)***
3	-1.65	(1.66)*	-4.09	(3.60)***	1.66	(1.37)	4.57	(4.24)***	3.98	(4.14)***
4	-1.14	(1.37)	-2.73	(2.88)***	0.46	(0.47)	2.77	(3.05)***	2.23	(2.85)***
5	-0.39	(0.51)	-2.35	(2.74)***	0.36	(0.39)	1.57	(1.83)*	1.78	(2.37)**
6	0.82	(1.09)	-0.27	(0.32)	1.03	(1.13)	2.25	(2.23)**	1.99	(2.52)**
7	3.00	(3.50)***	2.17	(2.32)**	-0.15	(0.17)	1.83	(2.02)**	1.65	(1.99)**
8	5.08	(6.04)***	4.96	(5.23)***	0.91	(0.99)	0.22	(0.24)	1.19	(1.34)
9	8.59	(8.21)***	10.74	(9.90)***	1.50	(1.44)	-2.13	(1.80)*	-0.87	(0.77)
Highest	17.82	(12.29)***	25.58	(17.06)***	4.88	(3.62)***	-8.12	(5.18)***	-5.36	(3.51)***
10th - 1st	21.73	(8.82)***	33.61	(12.75)***	8.82	(3.35)***	-10.24	(3.84)***	-7.00	(2.89)***
1st - 5th	-3.52	(1.65)*	-5.69	(2.44)**	-4.30	(1.76)*	0.54	(0.23)	-0.14	(0.07)
10th - 5th	18.21	(11.11)***	27.93	(16.17)***	4.51	(2.74)***	-9.69	(5.42)***	-7.14	(4.20)***

Panel B: Case of Discretionary Accruals

Accrual Decile	***Years -3 to -1***		***Year -1***		***Year 0***		***Year 1***		***Years 1 to 3***	
	Alpha	T-Stat	Alpha	T-Stat	Alpha	T-Stat	Alpha	T-Stat	Alpha	T-Stat
Lowest	-0.06	(0.04)	-1.40	(0.73)	0.94	(0.45)	1.30	(0.65)	1.12	(0.63)
2	-1.04	(0.80)	-3.10	(2.13)**	2.49	(1.63)	4.35	(2.90)***	3.74	(2.90)***
3	-0.34	(0.33)	-1.82	(1.56)	1.34	(1.17)	3.53	(3.19)***	2.82	(2.73)***
4	0.33	(0.39)	-1.42	(1.55)	0.69	(0.64)	2.08	(2.09)**	2.09	(2.25)**
5	0.48	(0.62)	-0.71	(0.80)	0.64	(0.66)	3.07	(3.54)***	2.43	(3.11)***
6	0.88	(1.29)	0.14	(0.17)	-0.13	(0.16)	0.70	(0.86)	1.57	(2.09)**
7	1.49	(2.25)**	0.54	(0.73)	-0.24	(0.30)	0.87	(1.06)	1.26	(1.76)*
8	2.46	(3.09)***	1.52	(1.74)*	0.40	(0.45)	0.02	(0.02)	0.55	(0.66)
9	5.21	(5.14)***	5.88	(5.66)***	0.16	(0.16)	-0.35	(0.27)	0.13	(0.13)
Highest	12.88	(9.02)***	17.04	(11.46)***	1.10	(0.84)	-7.10	(4.58)***	-4.48	(3.02)***
10th - 1st	12.94	(5.71)***	18.44	(7.60)***	0.16	(0.06)	-8.40	(3.33)***	-5.60	(2.42)**
1st - 5th	-0.54	(0.28)	-0.69	(0.32)	0.30	(0.13)	-1.77	(0.82)	-1.31	(0.68)
10th - 5th	12.40	(7.62)***	17.76	(10.24)***	0.46	(0.28)	-10.17	(5.73)***	-6.91	(4.13)***

Table 4
Magnitude of the Accrual Anomaly and Prior Overvaluation

This table presents time-series means and Fama-MacBeth t-statistics for the average annual abnormal stock return in year +1 for accrual portfolios constructed in year 0. The abnormal returns are size and book-to-market adjusted as described in Table 2. Within each decile accrual portfolio, we assign sample companies to quartile portfolios based on their abnormal return in year -1, i.e., they year prior to the accrual measurement year. We report abnormal returns for each quartile portfolio within selected accrual-decile portfolios. The sample contains all December year end non-financial firms that are present in both CRSP and Compustat and covers the period from 1963 to 2004.

Panel A presents the results for total accruals portfolios. Total accruals are computed using balance sheet data. Panel B presents results for discretionary accrual portfolios. Discretionary accruals are estimated using the within industry, cross-sectional modified Jones model.

The t-statistics are reported in parentheses. ***, **, and * indicate significance of the t-statistics for the tests of difference in means at 1, 5, and 10 percent significance levels.

Panel A: Abnormal Returns in Year +1 for Total Accruals Portfolios (%)

	For quartile portfolios formed on the basis of abnormal return in year -1			
Accrual Decile	**Q1**	**Q2**	**Q3**	**Q4**
1	0.48	-0.25	2.13	-3.99
	(0.20)	(0.10)	(0.74)	(1.49)
5	2.34	-1.21	0.54	0.34
	(1.30)	(1.11)	(0.49)	(0.18)
10	-1.54	-1.14	-3.84	-10.57
	(0.43)	(0.33)	(1.41)	(6.34)
10th-1st	-2.02	-0.89	-5.97	-6.58**
	(0.47)	(0.21)	(1.51)	(2.08)
1st-5th	-1.86	0.96	1.59	-4.33
	(0.61)	(0.36)	(0.52)	(1.32)
10th-5th	-3.88	0.07	-4.38	-10.91***
	(0.97)	(0.02)	(1.49)	(4.34)

Panel B: Abnormal Returns in Year +1 for Discretionary Accruals Portfolios (%)

	For quartile portfolios formed on the basis of abnormal return in year -1			
Accrual Decile	**Q1**	**Q2**	**Q1**	**Q4**
1	2.70	2.11	2.10	-4.92
	(0.80)	(0.56)	(0.69)	(1.57)
5	-0.27	1.64	2.09	-2.27
	(-0.13)	(1.32)	(1.53)	(1.38)
10	-2.94	-6.19	-3.98	-11.68
	(0.86)	(2.97)	(1.47)	(7.19)
10th-1st	-5.64	-8.30*	-6.07	-6.76*
	(1.18)	(1.92)	(1.49)	(1.91)
1st-5th	2.97	0.47	0.00	-2.65
	(0.75)	(0.12)	(0.00)	(0.75)
10th-5th	-2.67	-7.83***	-6.07**	-9.41***
	(0.66)	(3.25)	(2.00)	(4.07)

Table 5
Insider Trading By Total Accrual Deciles

This table presents insider trading activity for companies in different *total* accruals deciles. Total accruals are computed in year *t* using balance sheet data. Panel A presents mean net purchase ratio as number of shares purchased minus number of shares sold divided by total number of shares traded by the insiders. Panel B presents mean net purchase volume ratio as volume of purchase transactions minus volume of sale transactions divided by total volume of shares traded by the insiders. Panel C presents mean net shares traded as number of shares purchased by the insiders minus number of shares sold by the insiders divided by total number of shares outstanding. All three measures are size adjusted by subtracting the average insider trading characteristic of companies in the same year and size decile portfolio. The definition of insiders includes: CEO, COO, President, Chairman of the board, and CFO. The insider trading data is the common shares transactions (purchases and sales only) recorded in Form 4 from Thomson Financial Insider Filing Data. We exclude small transactions with number of shares traded less than 100. The sample period is 1986-2004. ***, **, and * indicate significance of the t-statistics for the tests of difference in means at 1, 5, and 10 percent significance levels.

Accrual Decile	***Year With Respect to Accrual Measurement***								
	-4	***-3***	***-2***	***-1***	***0***	***1***	***2***	***3***	***4***
Panel A: Size Adjusted Net Purchase Ratio (%)									
Lowest	-0.389	-3.726	-6.806	-1.718	2.848	4.968	-0.804	3.356	0.903
2	-10.367	-7.520	-6.012	-1.701	2.333	-1.250	-1.213	-2.192	-0.845
3	-4.383	-2.395	-4.215	-1.531	1.974	-1.035	-3.087	-2.334	-3.025
4	-6.039	-0.974	-1.009	2.443	7.633	6.437	3.700	0.929	5.599
5	-3.024	-0.117	1.828	9.075	8.649	5.801	3.318	5.349	3.975
6	1.797	2.471	4.782	3.980	6.698	6.477	4.545	5.050	2.439
7	-2.425	-2.590	1.091	0.762	2.275	-1.173	-2.206	-1.475	-1.103
8	-8.741	-6.696	-8.483	-5.031	-2.152	-5.882	-3.261	0.144	-4.918
9	-8.488	-12.765	-16.412	-17.465	-11.031	-9.406	-8.370	-7.690	-4.842
Highest	-8.899	-8.168	-8.919	-11.686	-19.374	-15.670	-9.029	-6.944	-4.270
10th - 1st	-8.509	-4.442	-2.113	-9.969	-22.223***	-20.638***	-8.225***	-10.300**	-5.173**
1st - 5th	2.635	-3.609	-8.634	-10.793**	-5.801***	-0.833**	-4.122	-1.993	-3.072
10th - 5th	-5.874	-8.051	-10.747*	-20.761***	-28.024***	-21.471***	-12.347***	-12.294***	-8.245***
Panel B: Size Adjusted Volume Net Purchase Ratio (%)									
Lowest	0.024	-3.352	-6.980	-2.536	2.393	3.738	-1.742	2.534	-0.084
2	-10.318	-7.452	-6.298	-2.429	2.186	-1.279	-1.819	-2.399	-0.177
3	-5.017	-2.841	-5.187	-1.834	1.738	-1.533	-3.372	-2.262	-3.047
4	-6.603	-1.208	-0.763	2.260	7.819	5.924	3.554	0.828	5.245
5	-2.904	0.012	2.159	9.189	8.669	6.270	3.591	5.484	4.464
6	2.070	2.432	5.019	4.074	6.793	6.723	4.927	4.843	2.622
7	-2.099	-2.621	0.871	0.534	2.451	-0.983	-2.260	-1.652	-1.119
8	-8.835	-6.400	-8.415	-4.755	-2.010	-6.428	-3.552	-0.387	-5.648
9	-8.765	-13.058	-16.340	-17.389	-11.049	-9.946	-9.140	-8.183	-4.439
Highest	-8.920	-8.913	-9.364	-12.409	-19.221	-16.365	-9.986	-7.758	-4.862
10th - 1st	-8.943	-5.562	-2.383	-9.873	-21.614***	-20.103***	-8.243***	-10.291**	-4.777**
1st - 5th	2.928	-3.364	-9.140	-11.725**	-6.276***	-2.532**	-5.334	-2.950	-4.548
10th - 5th	-6.015	-8.926	-11.523*	-21.598***	-27.890***	-22.635***	-13.577***	-13.241***	-9.326***

Panel C: Size Adjusted Net Shares Traded (%)									
Lowest	0.881	-0.585	-0.897	1.599	1.661	2.173	-0.591	-1.124	-1.861
2	-1.842	0.144	-1.184	-1.552	0.021	-0.376	0.831	-0.048	-1.403
3	-1.544	-1.047	-0.495	-0.375	-1.568	-1.543	-0.018	-0.430	-0.256
4	-0.522	0.666	2.911	1.096	1.510	2.956	2.928	2.519	2.695
5	0.693	-1.157	0.583	2.143	1.820	0.952	1.126	2.152	2.974
6	0.239	2.442	2.265	2.505	2.238	1.648	3.231	3.473	2.761
7	0.277	0.036	0.845	1.506	2.136	1.234	0.431	1.157	0.861
8	1.044	0.442	-0.520	-0.468	0.328	0.141	0.580	1.697	0.682
9	1.394	-0.564	-5.172	-5.363	-2.294	-1.734	0.662	1.638	2.073
Highest	0.512	0.140	-1.203	-3.736	-5.848	-7.318	-5.789	-2.451	-2.235
10th - 1st	-0.369	0.725	-0.306	-5.335	-7.508***	-9.491***	-5.198**	-1.327*	-0.374
1st - 5th	0.188	0.572	-1.480	-0.544	-0.160	1.222	-1.716	-3.276	-4.835**
10th - 5th	-0.181	1.297	-1.786	-5.879	-7.668***	-8.270***	-6.915***	-4.603***	-5.209***

Table 6
Financing and Investing Decisions of Firms in Total Accrual Deciles

This table presents time-series means and Fama-McBeth t-statistics for the operating decision of companies in different total accruals deciles. The deciles are formed in the accrual measurement year zero using balance sheet data. Panel A presents portfolio means of equity issues as a percentage of total assets (Compustat data item 108/item 6). Panel B presents mean contributions from acquisitions as a percentage of total assets (Compustat data item 129/item 6). Panel C presents mean growth in capital and R&D expenditures (Compustat data item 128 + item 46). All three measures are size adjusted by subtracting the average operating decision characteristic of companies in the same year and size decile portfolio. The sample contains all firm-years from 1963 to 2004. To be included in the sample, each firm-year observation should contain sufficient Compustat data to calculate the presented characteristics and also have data on the CRSP Monthly Returns file. ***, **, and * indicate significance of the t-statistics for the tests of difference in means at 1, 5, and 10 percent significance levels.

Accrual Decile	***Year With Respect to Accrual Measurement***								
	-4	***-3***	***-2***	***-1***	***0***	***1***	***2***	***3***	***4***
Panel A: Equity Issues as Percentage of Total Assets (%)									
Lowest	8.42	9.03	8.06	6.64	7.21	3.66	0.97	-0.03	-1.18
2	3.26	3.16	2.15	1.66	-1.43	-1.80	-2.38	-2.83	-3.25
3	1.46	1.31	0.75	-0.35	-2.93	-2.31	-2.80	-3.15	-3.71
4	0.09	1.28	0.67	-0.10	-2.92	-2.97	-3.07	-3.29	-3.78
5	0.37	0.41	0.62	0.49	-2.75	-2.47	-2.75	-2.76	-3.13
6	0.47	0.61	0.88	1.22	-2.92	-2.89	-2.60	-3.07	-3.40
7	1.32	1.12	2.01	1.81	-2.65	-2.69	-2.68	-3.23	-3.61
8	1.86	2.09	2.65	3.17	-2.12	-2.37	-3.22	-3.66	-3.75
9	2.67	3.04	3.22	4.73	2.76	-1.71	-2.68	-3.69	-4.00
Highest	7.98	7.60	8.32	9.14	30.62	1.77	-0.06	-0.95	-1.73
10th - 1st	-0.435	-1.427	0.258	2.500	23.415***	-1.888**	-1.034	-0.915	-0.550
1st - 5th	8.046***	8.623***	7.449***	6.155***	9.959***	6.130***	3.722***	2.731***	1.945***
10th - 5th	7.611***	7.196***	7.707***	8.655***	33.375***	4.241***	2.689***	1.816***	1.394**
Panel B: Contribution from Acquisition as Percentage of Total Assets (%)									
Lowest	0.09	0.08	0.03	-0.06	0.28	0.01	0.06	0.07	0.08
2	0.01	0.11	0.07	-0.07	-0.30	-0.11	-0.15	-0.19	-0.18
3	0.06	0.01	0.02	-0.10	-0.55	-0.18	-0.24	-0.15	-0.17
4	0.17	0.22	0.12	0.06	-0.68	-0.19	-0.24	-0.25	-0.42
5	0.03	0.07	0.05	0.04	-0.62	-0.18	-0.22	-0.34	-0.28
6	0.02	0.07	0.00	-0.01	-0.62	-0.27	-0.32	-0.39	-0.42
7	0.02	0.02	0.13	0.14	-0.36	-0.15	-0.19	-0.32	-0.35
8	0.00	0.00	0.15	0.21	0.04	-0.10	-0.21	-0.22	-0.28
9	-0.03	-0.09	0.17	0.29	0.83	0.24	0.03	-0.13	-0.22
Highest	-0.11	-0.02	0.01	0.41	2.82	0.41	0.02	-0.10	-0.26
10th - 1st	-0.196*	-0.103	-0.016	0.471***	2.541***	0.402***	-0.039	-0.169*	-0.340***
1st - 5th	0.056	0.007	-0.022	-0.103	0.905***	0.186**	0.283***	0.406***	0.360***
10th - 5th	-0.140	-0.097	-0.038	0.368***	3.446***	0.589***	0.244***	0.237**	0.020
Panel C: Growth in Capital Expenditures and R&D (%)									
Lowest	8.67	13.04	12.34	2.38	9.55	-1.22	6.21	1.89	-0.70
2	6.93	7.81	3.84	-3.85	-7.20	-6.83	-3.62	-3.50	-4.76
3	5.53	2.60	0.98	-3.39	-11.18	-5.45	-5.68	-5.77	-5.86
4	3.01	2.10	1.19	-2.96	-10.63	-5.81	-6.10	-7.06	-10.36
5	-0.02	-1.10	-0.35	-1.62	-10.74	-4.73	-4.86	-7.80	-6.46
6	-1.98	0.86	-1.15	-0.12	-9.15	-6.14	-6.56	-5.96	-8.24
7	3.42	0.65	3.07	3.50	-5.87	-4.34	-7.04	-7.22	-7.73
8	3.82	3.54	5.36	8.32	2.38	-2.37	-7.13	-6.43	-7.40
9	4.61	6.16	7.55	13.85	13.93	0.66	-5.33	-6.82	-5.41
Highest	11.21	12.62	18.38	30.84	61.48	20.03	-3.29	-3.37	-1.10
10th - 1st	2.539	-0.427	6.040	28.469***	51.929***	21.247***	-9.501***	-5.257*	-0.402
1st - 5th	8.689***	14.143***	12.684***	3.998	20.290***	3.516	11.067***	9.691***	5.760**
10th - 5th	11.228***	13.717***	18.724***	32.467	72.220***	24.762	1.567***	4.434***	5.357**

Table 7
Mishkin Test of the Market Pricing of Cash Flows and Accruals

This table presents results of the Mishkin test. Panel A reports the market pricing of the cash flow and total accrual components of earnings. Panel B reports the market pricing of the cashflow, discretionary accrual, and non-discretionary accrual components of earnings. We present two sets of estimates: (i) the coefficients estimated via the iterated non-linear least squares using full sample of firm-years ("Pooled Estimates"); and (ii) Fama-MacBeth coefficients and t-statistics generated from annual estimates of the iterated non-linear least squares. In addition, we implement the Mishkin test for two subsets of the sample. Based on accruals in year t (total accruals in Panel A and discretionary accruals in Panel B) we separate the sample into bottom five accrual decile firm-years (1st through 5th deciles) and top five accrual decile firm-years (6th through 10th deciles). The sample contains all non-financial firms from 1963 to 2004 with data on both CRSP and Compustat in year *t* and *t+1* for which abnormal buy-and-hold returns can be calculated. The t-statistics for the difference in the coefficients are reported in round parentheses and the chi-square statistics for the difference in the estimated coefficients are reported in square parentheses. ***, **, and * indicate significance of the test statistics for the difference in estimates at 1, 5, and 10 percent significance levels.

Panel A: Total Accruals

$$\text{Earnings}_{t+1} = \gamma_0 + \gamma_1 \text{ Cash Flows}_t + \gamma_2 \text{ Total Accruals}_t + \xi_{t+1}$$

$$\text{Abnormal Returns}_{t+1} = \beta_0 + \beta_1(\text{Earnings}_{t+1} - \gamma_0^* - \gamma_1^* \text{ Cash Flows}_t - \gamma_2^* \text{ Total Accruals}_t) + \zeta_{t+1}$$

	Pooled Estimates			Fama-MacBeth Estimates		
	Full Sample	1st to 5th Accrual Decile Firm-Years	6th to 10th Accrual Decile Firm-Years	Full Sample	1st to 5th Accrual Decile Firm-Years	6th to 10th Accrual Decile Firm-Years
γ_1	0.746	0.763	0.732	0.761	0.764	0.770
γ_1*	0.613	0.620	0.663	0.677	0.595	0.722
$\gamma_1 - \gamma_1$*	0.133	0.143	0.069	0.084	0.169	0.047
	[38.17]***	[18.35]***	[5.61]**	(1.85)*	(3.71)***	(0.69)
γ_2	0.703	0.701	0.713	0.706	0.695	0.709
γ_2*	0.796	0.411	0.899	0.833	0.454	0.698
$\gamma_2 - \gamma_2$*	-0.092	0.291	-0.186	-0.127	0.240	0.011
	[6.34]**	[11.12]***	[13.14]***	(1.03)	(3.33)***	(0.18)

Panel B: Discretionary and Non-discretionary Accruals

$$\text{Earnings}_{t+1} = \gamma_0 + \gamma_1 \text{ Cash Flows}_t + \gamma_2 \text{ Discretionary Accruals}_t + \gamma_3 \text{ Non - discretionary Accruals}_t + \xi_{t+1}$$

$$\text{Abnormal Returns}_{t+1} = \beta_0 + \beta_1(\text{Earnings}_{t+1} - \gamma_0^* - \gamma_1^* \text{ Cash Flows}_t - \gamma_2^* \text{ Discretionary Accruals}_t - \gamma_3^* \text{ Non - discretionary Accruals}_t) + \zeta_{t+1}$$

	Pooled Estimates			Fama-MacBeth Estimates		
	Full Sample	1st to 5th Accrual Decile Firm-Years	6th to 10th Accrual Decile Firm-Years	Full Sample	1st to 5th Accrual Decile Firm-Years	6th to 10th Accrual Decile Firm-Years
γ_1	0.746	0.762	0.726	0.760	0.758	0.770
γ_1*	0.612	0.617	0.647	0.636	0.596	0.686
$\gamma_1 - \gamma_1$*	0.134	0.145	0.079	0.124	0.163	0.084
	[38.99]***	[16.33]***	[8.97]***	(3.08)***	(3.42)***	(1.79)*
γ_2	0.709	0.705	0.683	0.710	0.703	0.699
γ_2*	0.837	0.500	0.860	0.692	0.481	0.697
$\gamma_2 - \gamma_2$*	-0.128	0.204	-0.177	0.018	0.222	0.002
	[9.91]***	[4.44]**	[9.80]***	(0.41)	(2.08)**	(0.04)
γ_3	0.685	0.648	0.710	0.688	0.675	0.704
γ_3*	0.668	0.449	0.756	0.617	0.547	0.671
$\gamma_3 - \gamma_3$*	0.017	0.199	-0.047	0.071	0.129	0.033
	[0.07]	[2.81]*	[0.43]	(0.75)	(0.92)	(0.37)

Table 8
Relations between Returns, Accruals, and Operating Decisions

This table presents evidence of a causal relation between prior/present returns (as proxies for overvaluation) and current accruals and operating decision characteristics. Panel A reports time series means of slope coefficients from cross-sectional regressions of accruals at time *t* on annual buy-and-hold abnormal returns at time *(t-1)* where the returns are instrumented using instrumental variables measured at time *(t-1)*. Panel B reports time series means of slope coefficients from cross-sectional regressions of accruals at time *t* on annual buy-and-hold abnormal returns at time *t* where the returns are instrumented using instrumental variables measured at time *t*. Annual buy-and-hold abnormal returns are size and book-to-market adjusted as described in Table 2. In both panels the instrumental variables are (i) equity issuance as percentage of total assets, (ii) acquisitions as percentage of total assets, (iii) growth in PPE and PPE as a fraction of total assets, (iv) growth in R&D and R&D as a fraction of total assets, (v) growth in CapEx and CapEx as a fraction of total assets, (vi) dummy for positive income contributions from acquisitions, and (vii) dummy for positive change in good-will. Panel C reports the time series means of the slope coefficient of the cross-sectional regression of operating decisions at time *t* on annual buy-and-hold abnormal returns at time *(t-1)*. We consider six operating decisions characteristics: (i) equity issues as a percentage of total assets (Compustat data item 108/item 6), (ii) debt issues as a percentage of total Assets (Compustat data item 111/item 6), (iii) contributions from acquisitions as a percentage of total assets (Compustat data item 129/item 6), (iv) growth in capital expenditures (Compustat data item 128), (v) growth in R&D expenditures (Compustat data item 46), and (vi) growth in property plant and equipment (Compustat data item 7). The sample contains all non-financial firms from 1963 to 2004 with data available on both CRSP and Compustat in year *t* and *(t-1)*. T-statistics are based on Fama-MacBeth standard errors.

Panel A: $\text{Accruals}_t = \alpha + \beta \cdot \text{Abnormal Return}_{t-1} + \varepsilon_t$

$\text{Abnormal Return}_{t-1} = c + D \cdot \text{Instrumental Variables}_{t-1} + \xi_{t-1}$

	Coefficient (β)	*T-stat*	*P-value*	*Number of observations*
Total Accruals	0.0764	2.556	0.015	38
Discretionary Accruals	0.0390	2.111	0.041	38

Panel B: $\text{Accruals}_t = \alpha + \beta \cdot \text{Abnormal Return}_t + \varepsilon_t$

$\text{Abnormal Return}_t = c + D \cdot \text{Instrumental Variables}_t + \xi_t$

	Coefficient (β)	*T-stat*	*P-value*	*Number of observations*
Total Accruals	0.1568	4.101	0.001	38
Discretionary Accruals	0.1240	4.014	0.001	38

Panel C: $\text{Operating Decision}_t = \alpha + \beta \cdot \text{Abnormal Return}_{t-1} + \varepsilon_t$

	Coefficient (β)	*T-stat*	*P-value*	*Number of observations*
Equity Issues (% of Total Assets)	0.0565	6.468	0.001	32
Debt Issues (% of Total Assets)	0.0268	6.444	0.001	32
Acquisitions (% of Total Assets)	0.0086	7.691	0.001	32
Growth in Capital Expenditures	0.5610	11.157	0.001	38
Growth in R&D	0.0725	10.906	0.001	38
Growth in PPE	0.1356	11.157	0.001	38

Table 9
Quantile Regression Analysis of the Relation between Returns and Accruals

The table reports the time series means and Fama-MacBeth t-statistics for the slope coefficients from cross-sectional regressions: (i) of accruals in year 0 on annual abnormal buy-and-hold return in year -1, and (ii) of annuals abnormal buy-and-hold return in year +1 on accruals in year 0. The coefficients for each quantile ***q*** regression are estimated as follows:

$$\begin{cases} \hat{\beta}^{q} = \arg\min_{\beta} \sum_{i=1}^{n} \rho_q(y_i - x_i'\beta) \\ \rho_q(z) = z(q - 1_{\{z<0\}}) \end{cases}$$

Panel A presents the results for total accruals, whereas Panel B presents the results for discretionary accruals. Annual buy-and-hold abnormal returns are size and book-to-market adjusted as discussed in Table 2. The total accruals are computed using the balance sheet data. The discretionary accruals are estimated via within industry, cross-sectional modified Jones model. The sample contains all non-financial firms that are present in both CRSP and Compustat in years -1, 0, and 1 and covers period from 1963 to 2004.

Quantile of Distribution	$Accruals_{it} = \alpha + \beta\ Ret_{it-1} + \varepsilon_{it}$		$Accruals_{it} = \alpha + \beta\ Ret_{it} + \varepsilon_{it}$	
q	**Slope Coefficient**	**T-Stat**	**Slope Coefficient**	**T-Stat**
Panel A: Total Accruals				
5%	0.021	(4.88)	0.006	(1.37)
10%	0.020	(5.39)	0.004	(1.28)
20%	0.021	(6.83)	0.004	(1.40)
30%	0.022	(7.89)	0.002	(0.88)
40%	0.024	(8.78)	0.001	(0.49)
50%	0.027	(9.59)	0.001	(0.47)
60%	0.031	(11.44)	0.002	(0.75)
70%	0.036	(11.50)	0.003	(1.20)
80%	0.045	(12.43)	0.006	(1.97)
90%	0.067	(13.45)	0.015	(3.29)
95%	0.092	(13.93)	0.026	(3.79)
95%-5%	0.071	(13.23)	0.019	(2.59)
95%-50%	0.066	(12.17)	0.024	(4.18)
5%-50%	-0.005	(1.69)	0.005	(1.37)
Panel B: Discretionary Accruals				
5%	0.010	(2.69)	-0.003	(0.58)
10%	0.011	(3.89)	-0.003	(0.91)
20%	0.013	(5.32)	-0.004	(1.83)
30%	0.013	(6.22)	-0.004	(2.23)
40%	0.013	(7.00)	-0.004	(2.59)
50%	0.013	(8.33)	-0.003	(1.87)
60%	0.014	(9.72)	-0.003	(1.64)
70%	0.017	(11.76)	-0.003	(1.69)
80%	0.021	(12.68)	-0.003	(1.29)
90%	0.033	(12.93)	0.001	(0.01)
95%	0.054	(9.68)	0.003	(0.52)
95%-5%	0.045	(8.78)	0.006	(0.87)
95%-50%	0.042	(8.08)	0.006	(1.18)
5%-50%	-0.003	(1.17)	0.001	(0.01)