Earnings management and the post-earnings announcement drift

Henock Louis and Amy X. Sun

Smeal College of Business, Pennsylvania State University, University Park, PA 16802

Abstract

There is reliable evidence that managers smooth their reported earnings. If some firms manage earnings downwards (upwards) when they experience large positive (negative) earnings shocks and if investors have cognitive limits or are inattentive, then it is plausible that the post-earnings announcement drift could be related to earnings management. Consistent with this conjecture, we find that firms with large negative (positive) changes in operating cash flows manage their accruals substantially upwards (downwards). Most importantly, we find no evidence of a positive post-earnings announcement drift for those firms with large positive earnings changes that are least likely to have managed earnings downward or a negative post-earnings announcement drift for those firms with large negative earnings changes that are least likely to have managed earnings upward. That is, for these firms, there is no evidence of an underreaction to earnings changes. The underreaction is concentrated largely among those firms that are most likely to have smoothed their reported earnings, although this effect has weakened in recent years as investors started paying more attention to the anomalies and hedge funds were focusing on exploiting them. Finally, consistent with the earnings management hypothesis, we also find that the post-earnings announcement drift is generally associated with discretionary (or abnormal) accruals and not with nondiscretionary accruals. These findings reconcile PEAD with the (abnormal) accrual anomaly.

JEL Classification: *G12, G14, M41, M43*

Keywords: *Market anomalies, post-earnings-announcement drift, (abnormal) accrual anomaly, earnings management, earnings smoothing*

*We thank Walid Al-Issa, Sung Chung, Paul Fischer, Dan Givoly, Zhaoyang Gu, Chris Jones, Bin Ke, Adam Koch, Joan Lee, Andrew Leone, Russell Lundholm, James McKeown, Jeffrey Ng, Scott Richardson, Lakshmanan Shivakumar, Oktay Urcan, Hal White, and workshop participants at Carnegie Mellon University, London Business School, the third Penn State Summer Research Conference, the 2007 AAA annual conference, the Securities and Exchange Commission, and the 2007 Norfolk Southern Excellence in Accounting Conference at the College of William and Mary for helpful comments on an earlier draft. We are particularly grateful to Steven Huddart for an extensive discussion of the research idea and to an anonymous referee for some very constructive comments.

One of the most robust market anomalies is the delayed market reaction to earnings news, referred to in the literature as the post-earnings announcement drift (PEAD).[1] More specifically, it has been documented that firms reporting large positive earnings changes experience positive abnormal returns over the six months after the earnings announcement, whereas those that report large negative earnings changes experience negative abnormal returns. PEAD has been subjected to intense scrutiny and, although many previously documented anomalies have apparently disappeared (Schwert, 2003), PEAD seems to persist to the dismay of market efficiency proponents. PEAD is so robust that Fama (1998) concludes that it is "above suspicion."

Many explanations have been suggested for the delayed market reaction: 1) investors' (presumably) false assumptions about earnings properties (Bernard and Thomas, 1990; Barberis, Shleifer, and Vishny, 1998), 2) fluctuations in overconfidence (Daniel, Hirshleifer, and Subrahmanyam, 1998), 3) underreaction to information due to cognitive limits (Hong and Stein, 1999), 4) disposition effect (Frazzini, 2006; ,Grinblatt and Han, 2005), 5) information uncertainty (Zhang, 2006), and 6) inattention (DellaVigna and Pollet, 2009; ,Hirshleifer, Lim, and Teoh, 2009). However, none of these studies has considered the potential role of earnings management.

Investors presumably have cognitive limits and limited attention (Hong and Stein, 1999; Hirshleifer and Teoh, 2003; Peng and Xiong, 2006; Barber and Odean, 2008; DellaVigna and Pollet, 2009; Hirshleifer et al., 2009; Loh, 2010; Louis and Sun, 2010). DellaVigna and Pollet (2009) and Hirshleifer et al. (2009) suggest that PEAD is associated with investor inattention. They make no assumption about the quality of the earnings reports. They simply maintain that

[1] There is a long list of studies that document PEAD. They include: Ball and Brown (1968), Jones and Litzenberger (1970), Brown and Kennelly (1972), Rendleman, Jones, and Latané (1982), Bernard and Thomas (1989, 1990), Constantinou, Forbes, and Skerratt (2003), Battalio and Mendenhall (2005), Chordia and Shivakumar (2006), Zhang (2006), DellaVigna and Pollet (2009), Hirshleifer et al. (2009), among others.

due to limited attention, investors' responses to the reports are delayed. However, Hirshleifer, Hou, Teoh, and Zhang (2004) suggest that because investors have limited attention, they tend to incorrectly value abnormal accruals. Consistent with this view, extant studies suggest that many well documented anomalous stock price behaviors are associated with (discretionary) abnormal accruals. They conclude, for instance, that discretionary accruals drive the accrual anomaly (Xie, 2001; Chan, Chan, Jegadeesh, and Lakonishok, 2006) and are associated with anomalous long-term returns after seasoned public offerings (Teoh, Welch, and Wong, 1998a; Teoh and Wong, 2002; DuCharme, Malatesta, and Sefcik, 2004), initial public offerings (Teoh, Welch, and Wong, 1998b; Teoh, Wong, and Rao, 1998; Teoh and Wong, 2002), stock-for-stock mergers (Louis, 2004; Gong, Louis, and Sun, 2008a), open market repurchases (Gong, Louis, and Sun, 2008b).[2] Therefore, we posit that the post-earnings announcement drift could also be due, at least partly, to managerial discretionary reporting behavior. More specifically, we speculate that earnings smoothing could be one reason why investors are mistaken about earnings properties.

As Collins and Hribar (2000) conjecture, "firms faced with large negative unexpected earnings shocks may attempt to smooth earnings and/or make their situation look better by using large income increasing accruals … [whereas] firms with large positive unexpected earnings shocks may attempt to mitigate these shocks by creating large income decreasing accruals".[3] If some firms manage earnings downward (upward) when they experience large positive (negative) earnings shocks and if investors have cognitive limits or are inattentive, then future returns are

[2] Prior studies find that accruals are negatively associated with future stock returns. Chan et al. (2006) suggest that some components of accruals help signal future business prospects and investors may underreact to the signal. However, consistent with the earnings management hypothesis, they also find that the non-discretionary component of accruals does not predict future returns and that only the discretionary components of accruals predict returns, consistent with Xie (2001).

[3] Managers generally have incentives to maximize their stock prices (even artificially). Hence, it is not always immediately clear why managers would want to temporarily deflate their earnings. However, while smoothing earnings downward reduces stock prices temporarily, it can also increase firm value in the long run by reducing the cost of capital (Tucker and Zarowin, 2006). Accordingly, earnings smoothing is quite common among U.S. corporations. Earnings smoothing became so common that the Securities and Exchange Commission (SEC) has investigated many companies, including Microsoft, for the practice (Markoff, 1999).

likely to be positively correlated with current earnings changes. Because earnings management is implemented in a direction opposite that of the earnings changes (e.g., firms manage earnings downward (upward) when they experience large positive (negative) earnings shocks), investors may more easily misinterpret managers' actions. Therefore, notwithstanding the other plausible explanations for PEAD, earnings management could be a determining factor.

Consistent with the earnings management hypothesis, we find strong evidence to suggest that firms with large negative changes in operating cash flows manage their accruals substantially upward, while those with large positive changes in operating cash flows manage their accruals significantly downward.[4] We also find no evidence of a positive drift for those firms with large positive earnings changes that are least likely to have managed earnings downward or a negative drift for those firms with large negative earnings changes that are unlikely to have managed earnings upward.[5] Furthermore, we find that most of the upward drift after positive earnings surprises is concentrated among those firms that are most likely to have managed earnings downward. Similarly, we find that most of the downward drift after negative earnings surprises is concentrated among those firms that are inclined to have managed earnings upward. We also find that this effect tends to become weaker in recent years as investors have been paying more attention to the anomalies and hedge funds have been focusing on exploiting them. Finally, consistent with the earnings management hypothesis, we also find that the drifts are generally associated with discretionary (or abnormal) accruals and not with nondiscretionary accruals.

[4] Ideally, we would like to analyze the abnormal accruals of firms with large earnings changes in general. However, because abnormal accruals are a component of earnings, it is almost impossible to totally isolate them from extreme earnings performance. Therefore, to assess whether firms with large negative (positive) changes in operating performance inflate (deflate) their reported earnings, we analyze the abnormal accruals of firms with large negative (positive) changes in operating cash flows instead of firms with large negative (positive) changes in earnings.
[5] We explain how we classify firms into those that are most or least likely to have managed earnings in the next section.

Taken together, the results support the earnings management hypothesis. In particular, they suggest that PEAD is consistent with a situation where: 1) firms with large positive earnings and large positive earnings changes manage earnings downward to create reserves and 2) firms with large negative earnings changes manage earnings upward, particularly to avoid reporting losses. As Kothari (2001) notes, given that accruals are a major component of earnings, the overreaction to accruals and underreaction to earnings changes are quite intriguing. Our analysis provides an explanation for the apparent inconsistency.

The balance of the paper is organized as follows. Section I describes the potential correlation between earnings management and the post-earnings announcement drift. Section II discusses the variable measurement process, some implementation issues, and our sample selection. Section III reports abnormal accruals, earnings changes, and other descriptive statistics for the firms. Section IV analyzes the association between operating cash flows and abnormal accruals. Section V examines the association between abnormal accruals and the post-earnings announcement drift. Section VI explores the drift associated with firms that are deemed least likely to have managed earnings. Section VII investigates the drift associated with firms that are deemed most likely to have managed earnings. Section VII provides our conclusions.

I. Analyzing the Effect of Earnings Management on the Drift

A. Abnormal Accruals as a Proxy for Earnings Management

Collins and Hribar (2000) allude to a potential link between the post-earnings announcement drift and accruals. They posit that "the empirical fact that the market systematically underestimates the persistence of earnings surprises might result simply from not impounding the mean reverting tendencies of the accruals embedded within the earnings surprise." However, they conclude that the PEAD effect is distinct from the potential earnings management effect. In particular, they observe that accruals and changes in earnings are positively correlated and that a strategy consisting of taking long positions in firms with the most positive changes in earnings and short positions in firms with the most negative changes in earnings is profitable, even after removing firms with the most negative and the most positive accruals. However, because total accruals are a very noisy proxy for earnings management, these results do not rule out earnings management as an explanation for PEAD. In addition, the drift is observed in the extreme earnings changes portfolios, and has substantial cross-sectional variations within these portfolios. Hence, it is still plausible that the firms with the most positive (negative) earnings changes that experience the drift are those that also deflate (inflate) earnings the most.

Generally, firms that have good (poor) performance tend to have positive (negative) accruals. Therefore, some of the firms with large positive earnings changes and large negative accruals could be firms that simply have poor operating performance (although the changes in earnings are positive), as opposed to firms that deflate earnings. Similarly, some of the firms with large negative earnings changes and large positive accruals could be firms that have good operating performance as opposed to firms that inflate earnings. To mitigate potential errors in sorting firms into income decreasing and income increasing earnings management categories, we use discretionary (abnormal) accruals instead of total accruals. The use of abnormal accruals as a proxy for earnings management is consistent with Teoh et al. (1998a, 1998b), Teoh et al. (1998), Xie (2001), Teoh and Wong (2002), DuCharme et al. (2004), Fischer and Louis (2008), and Louis, Robinson, and Sbaraglia (2008), among others.

Although abnormal accruals estimates are less noisy than total accruals as a measure of earnings management, they still include substantial noise. The estimated abnormal accruals could be positive although the unobserved abnormal accruals are negative (and vice versa). However, our analysis focuses on firms with the largest estimated abnormal accruals. Therefore, it is less likely that the signs of the abnormal accrual estimates would switch because of estimation errors, reducing the risk that we would misclassify income increasing and income decreasing abnormal accruals.

B. Cases Most Likely Associated with Earnings Management

Kothari, Leone, and Wasley (2005) suggest that, generally, estimated discretionary accruals are also correlated with performance. Some highly (poorly) performing firms are likely to have positive (negative) abnormal accruals. The need to control for the effect of performance when testing for earnings management is largely recognized in the literature (Teoh et al., 1998a, 1998b). However, extant procedures offer only partial controls for the problem. Abnormal accruals are affected by current period earnings performance while, at the same time, they are a component of the reported earnings. Therefore, it is practically impossible to totally separate current period abnormal accruals from current period earnings performance. Extant procedures that generally control for lagged earnings performance can mitigate the problem in most settings; however, they are less effective in our setting. We are analyzing earnings management in the context of extreme earnings changes, as opposed to stock issuances as in Teoh et al. (1998a, 1998b) or stock-for-stock mergers as in Louis (2004). Contrary to these alternative settings, extreme earnings changes are mechanically related to the current period abnormal accruals.

To mitigate the confounding effects of performance and other potential estimation errors, and better capture the effect of earnings management, we instead condition the analysis on the likelihood that a firm indeed manages earnings. More specifically, we classify: 1) firms with large positive earnings changes into those that are most likely and those that are least likely to have managed earnings downward and 2) firms with large negative earnings changes into those that are most likely and those that are least likely to have managed earnings upward. This classification then serves as the basis for our predictions. We provide details regarding the classification below. It is important to note that our attempt here is not to dismiss the extensive literature on identifying earnings management using abnormal accruals. Instead, we rely on the abnormal accrual measure and, because of the mechanical correlation between extreme earnings changes and abnormal accruals, we try to differentiate between cases where abnormal accruals are most likely to be associated with earnings management and cases where they are least likely to be associated with earnings management.

1 The Likelihood of Downward Earnings Management

Fudenberg and Tirole (1995) model managers' incentives to smooth earnings. They suggest that in good times (i.e., when performance is high), managers "are less concerned by their short-term prospects, and information decay gives them an incentive to save for future bad times." Goel and Thakor (2003) also argue that "[w]hen reported earnings are high, reporting even higher earnings tends to elicit a relatively small positive market reaction. The company may therefore want to "hide" some of its current earnings for reporting it in a future period when earnings are lower and the marginal impact of a higher report is greater." Accordingly, we consider a firm most likely to manage earnings downward when earnings are high and least likely to do so when earnings are negative. Loss firms can have large (estimated) negative abnormal accruals; however, these negative abnormal accruals are more likely to be associated with the poor earnings performance rather than downward earnings smoothing. Firms are presumably unlikely to smooth earnings into negative territory. Large reported losses can result from "big baths;" however, big baths are not consistent with the large positive earnings increases that characterize firms in the long position of the PEAD strategy. Firms that take big baths typically report large negative earnings changes as opposed to large positive earnings changes.

We do not suggest that firms with large positive earnings changes cannot manage earnings upward. Obviously, some of the highly performing firms could have managed earnings upward. We instead argue that under the earnings management hypothesis, firms with both high positive earnings changes and high positive abnormal accruals are unlikely to be the driver of PEAD. Our point is that when employing the earnings management hypothesis, there should not be a positive drift for firms with high positive earnings changes and positive abnormal accruals. Upward earnings management should lead to negative (as opposed to positive) future abnormal returns. In addition, for firms with high positive earnings changes, abnormal accruals can be positive even if these firms manage earnings downward as long as the performance component of abnormal accruals is larger than the actual downward earnings management. We also note that investors are presumably more inclined to see through earnings management when it is in the same direction as the earnings surprise. Therefore, mispricing and subsequent corrections are less likely for firms with high positive earnings changes and positive abnormal accruals.

2 The Likelihood of Upward Earnings Management

Previous studies also suggest that managers have strong incentives to manage earnings upward to meet certain benchmarks, most notably analyst forecasts, seasonally lagged quarterly earnings, and the zero earnings benchmark (Burgstahler and Dichev, 1997; DeGeorge, Patel, and Zeckhauser, 1999; Graham, Harvey, and Rajgopal, 2005). As such, positive abnormal accruals are more likely to be related to earnings inflation than to some other factors when they allow managers to meet certain earnings benchmarks. Consequently, we consider a firm least likely to manage earnings upward when earnings are already high and more inclined to do so when the previous quarter earnings are above zero[6] and the firm would have missed the zero earnings benchmark if it did not report positive abnormal accruals. A firm with an extreme earnings decline, by definition, has already missed the seasonally lagged quarterly earnings benchmark. For such a firm, the relevant target is the zero earnings benchmark. The other benchmarks are essentially non-binding. Accordingly, Jiang (2008) finds that beating the zero earnings benchmark is most beneficial to a firm in terms of lowering the cost of debt.

An important advantage of using the zero earnings benchmark is that firms operating at the breakeven point do not generally produce large abnormal accruals through their normal operations. The abnormal accrual measurement process can underestimate “normal” accruals and over-estimate abnormal accruals for firms with large sales increases (Kothari et al., 2005). However, firms operating near the earnings breakeven point typically do not have large sales increases. Therefore, their abnormal accruals are less likely to be correlated with their operating performance. In this regard, conditioning on the likelihood of earnings management using the zero earnings benchmark is a reasonable substitute for performance matching.

Poorly performing firms commonly have incentives to hide the extent of their losses. However, prior studies suggest that the incentives are stronger when the earnings management activities allow the firms to meet or beat the zero earnings benchmark.[7] Firms with large positive

---

[6] We impose this condition because, generally, the incentive and pressure to meet a benchmark weakens after a firm has recently missed the benchmark. Yong (2007) finds that firms seldom reinitiate a second earnings string after a break in their earnings string. He also finds that firms reduce their earnings management activities once the string is broken, suggesting that a firm is more likely to manage earnings to meet a benchmark when it met the benchmark in the previous period than when it missed the benchmark.

[7] Prior studies find that the number of observations that fall immediately to the left (right) of the zero earnings benchmark is abnormally low (high). This phenomenon is often interpreted as an indication that firms inflate

earnings can have large (estimated) positive abnormal accruals. Yet, given the mechanical relationship between extreme earnings performance and abnormal accruals, the positive abnormal accruals can be related to the high earnings performance as opposed to earnings inflation. Loss firms are presumably more likely to take big baths than to inflate earnings. However, those firms that we deem most likely to have managed earnings upward have positive (and not negative) abnormal accruals. They are not firms that have taken big baths.

3. Summary

Based on the aforementioned considerations, we posit that if the drift is associated with earnings management, 1) the abnormal returns associated with large positive earnings changes will be less positive when earnings are negative and 2) the abnormal returns associated with large negative earnings changes will be less negative when earnings are high. Conversely, we expect future abnormal returns to be 1) positive for firms with large positive earnings changes that also have large negative abnormal accruals and large positive earnings and 2) negative for firms with large negative earnings changes that also have large positive abnormal accruals and that would have missed the zero earnings benchmark if they did not report positive abnormal accruals. These hypotheses form the bases of our analysis.

II. Variable Measurement, Implementation Issues, and Sample Selection

In this section, we describe our abnormal accrual estimation process, our abnormal return measures, various implementation and research design choices, and the sample selection process.

---

earnings by small amounts to meet or beat the zero earnings benchmark. The assumption is that the observations that fall immediately to the right of the zero earnings benchmark come from firms with small "unmanaged" losses that would have fallen immediately to the left of the zero earnings benchmark in the absence of earnings management. A broader interpretation of the extant evidence on the distribution of earnings, however, is that firms are less likely to report small losses. Once they get very close to the zero earnings benchmark (whether it is through earnings management or not), they are likely to (further) manage earnings to avoid reporting losses.

A. Estimating Abnormal Accruals

Following the extant literature, we proxy for discretionary accruals by the level of abnormal accruals using the residual from a modified version of the Jones (1991) accruals model. For each calendar quarter and two-digit SIC code industry, we estimate the following model using all firms that have the necessary data on Compustat:

$$TA_i = \sum_{j=1}^{4}\lambda_{j-1}Q_{j,i} + \lambda_4\Delta SALE_i + \lambda_5 PPE_i + \lambda_6 L1TA_i + \lambda_7 ASSET_i + \lambda_8 L4NI_i + \varepsilon_i, \quad (1)$$

where TA is total accruals, Q_j is a binary variable taking the value of one for fiscal quarter j and zero otherwise, $\Delta SALE$ is the quarterly change in sales, PPE is property, plant, and equipment at the beginning of the quarter, $L1TA$ is the lag of total accruals, $ASSET$ is total assets at the beginning of the quarter, $L4NI$ is net income for the same quarter of last year, and ε is the regression residual. We measure total accruals as the difference between net income and cash flows from operations. All of the variables, including the indicator variables, are scaled by total assets at the beginning of the quarter. After we deflate the model, $ASSET$ is transformed into a column of ones allowing us to estimate the model with the standard intercept. To mitigate the effects of outliers and errors in the data, we delete the top and bottom one percentiles of all the variables in the model. We also require at least 20 observations for each estimation. The model has an average adjusted R^2 of 28.81%.

The abnormal accruals model is a modification of the models used in Louis and White (2007) and Gong et al. (2008a, 2008b). We include lagged net income (*L4NI*) in the model to mitigate the effect of performance on abnormal accruals. Kothari et al. (2005) suggest that one means of controlling for the effect of performance on abnormal accruals is to include lagged earnings in the accrual model. They find that misspecification problems are attenuated when lagged ROA is included in the model. Our results hold if we use Kothari et al.'s (2005) matching procedure. However, trading strategies based on abnormal accruals estimated by this procedure are not implementable. In particular, we cannot ensure that the potential matches would have already reported their earnings by the time of the portfolio formation, which would have been necessary to implement the trading strategies.

B. Estimating Abnormal Returns

Following Collins and Hribar (2000), we measure abnormal returns over the period from 18 trading days after the earnings announcement for Quarter 0 (the current quarter) to 17 trading days after the earnings announcement for Quarter +2 (the second quarter after Quarter 0). There is no consensus in the literature regarding how to estimate long-term abnormal returns (see Barber and Lyon, 1997; Kothari and Warner, 1997; Fama, 1998; Ikenberry, Shockley, and Womack, 1999; Lyon, Barber, and Tsai, 1999; Brav, Geczy, and Gompers, 2000; and Mitchell and Stafford, 2000 for issues related to estimating long-term abnormal returns). However, in the case of the post-earnings announcement drift, the return horizon is relatively short – generally six months. Issues related to long-term abnormal return measurements are more serious for return horizons of one year or more (Ikenberry et al., 1999). Accordingly, many studies on post-earnings announcement drifts use size-adjusted buy-and-hold returns.

To ensure that our results are robust to the concerns expressed by Fama (1998) and Brav et al. (2000), among others, about inferences based on long-term buy-and-hold returns, we also use Fama and French's (1993) three-factor model. The three-factor model controls for the market factor, the size factor, and the book-to-market factor. Carhart (1997) extends the three-factor model by including a momentum factor. We do not use the four-factor model since Chordia and Shivakumar (2006) suggest that the momentum effect is related to the earnings change effect.

C. Implementing the Trading Strategies

The execution of the study involves some important implementation issues. This section discusses these issues and the design choices that we make.

First, to ensure that the hedge portfolio strategies are implementable, the entire distribution of earnings, earnings changes, and abnormal accruals must be known prior to the portfolio formation date. However, because firms do not announce earnings or file proxy reports at the same time, the variables in the abnormal accrual model are not available at the same time for all the firms. To address this issue, we estimate the accrual model four quarters prior to the quarter of the portfolio formation and then apply the estimated parameters of the model to the data for the individual firms in the quarter of the portfolio formation.

Additionally, the study involves sorting the sample firms into quintiles of earnings changes, abnormal accruals, and earnings. We determine the cut-off points for abnormal accruals, earnings changes, and earnings in Quarter -4. Since we compute abnormal accruals for the quarter of the portfolio formation (Quarter 0) using parameters estimated in the previous year (Quarter -4), we also compute abnormal accruals for Quarter -4 using parameter estimates in Quarter -8. Note, however, that our results are robust to the timing of the abnormal accrual estimation. We obtain similar results whether we estimate the model in Quarter 0, Quarter -4, or Quarter -8.

Furthermore, firms in the short position typically have relatively high earnings in the previous year (they have large earnings declines and still report positive earnings). Considering their previous performance, many of these firms are likely to have incentives to keep their reported earnings at a certain distance above the zero earnings benchmark. However, it could be argued that firms are more likely to have inflated earnings when they marginally beat their benchmarks than when they beat the benchmarks by large amounts. To address this issue, we also require that the firms in the short position have earnings below 1% of assets (as opposed to below the top earnings quintile). The tighter restriction also recognizes that the magnitude of the estimated abnormal accruals does not correspond to the actual amount of earnings management. Firms sometimes manage earnings by large amounts, depending on the managers' motivation. Hennes, Leone, and Miller (2008) report a net amount of earnings overstatement of about 12% of the total assets for firms that restate earnings due to irregularities.[8] However, due to the potential noise in abnormal accrual estimates, we use large positive (negative) abnormal accruals only as indications of upward (downward) earnings management. Therefore, by requiring that reported earnings be close to zero, we increase the probability that the firms with large estimated abnormal accruals would have reported losses if they did not inflate their earnings.

Moreover, since abnormal accruals are deflated by total assets, we also use total assets to deflate earnings changes.[9] We compute earnings changes as the seasonal change in the ratio of net income to beginning total assets. We obtain qualitatively similar results to those reported in our paper if we use change in net income divided by beginning total assets. We use the change in the ratio of net income to beginning total assets as it better adjusts the performance measure for changes in the size of the firm's operation. Consider, for instance, the case where a firm issues stock during the quarter. Net income for the current quarter and net income for the same quarter of the previous year are not directly comparable due to the change in the size of the firm's operations. However, deflating net income by the corresponding beginning total assets adjusts for the difference in the size of the firm's operations. This issue does not exist when using

[8] The 12% is the net average of overstatement. The sample includes both overstatement and understatement. Therefore, the average amount of overstatement (excluding the cases of understatement) is more than 12%. Some of the irregularities cover multiple periods; however, they are unlikely to be evenly distributed over the quarters and, for many firms, the irregularities take place in a single period.

[9] Note, however, that the hedge portfolio returns are qualitatively similar if we define earnings changes as the seasonal change in earnings per share deflated by price at the beginning of the current quarter.

change in earnings per share deflated by price as both earnings per share and price are adjusted for size. Firms with negative assets are deleted.

Finally, to determine the level of earnings, we deflate net income by beginning total assets. We deflate by assets instead of market value to differentiate the earnings management effect from the value strategy effect. Earnings-to-price can be high not because earnings are high, but because the deflator (price) is low. Under the earnings management explanation, the drift should be associated with earnings, whether earnings are deflated by market value or total assets. However, the earnings management effect is confounded with the value strategy effect when market value is used as the deflator.

D. Sample Selection

Our sample period extends from the second quarter of 1990 to the fourth quarter of 2006. Cash flow (Compustat Data Item #108 - Compustat Data Item #78), used to estimate accruals, is available starting in 1987. However, because we sort the sample on three different dimensions and the cash flow variable on Compustat is sparsely populated in 1987, there are not enough data points in 1987 to conduct our analyses. Since we use lagged accruals in our accrual regression model, the first period for which we can estimate abnormal accruals is the second quarter of 1988. Due to the restrictions imposed by the implementation of the trading strategy, the data necessary to conduct the analysis are only available from the second quarter of 1990 forward. The sample period ends in the fourth quarter of 2006. We measure abnormal returns over the months after the earnings announcement. Completing the sample in 2006 ensures that our results are not affected by the recent financial crisis that started in 2008.

We require that a firm release its earnings report within 45 (90) days of the end of the three interim (the fourth) fiscal quarters, which is the Securities and Exchange Commission

(SEC) filing deadline for most of our sample period. Since late announcers tend to face some special circumstances (e.g., SEC investigation), the post-earnings announcement returns of late announcers are less likely to be associated with managers' manipulation of the current fiscal quarter earnings report.

III. Abnormal Accruals, Earnings Changes, and Other Descriptive Statistics

Table I analyzes the abnormal accruals and earnings changes of the sample firms. The average abnormal accrual for firms with the most negative earnings changes that are deemed most likely to have managed earnings upward is 0.066 (Panel A). We will later demonstrate that these firms experience the most negative drift. Similarly, the average abnormal accrual for firms with the most positive earnings changes that are considered most likely to have managed earnings downward is -0.069 (Panel B). These firms experience the most positive drift. In comparison, the average abnormal accrual for firms with the most negative earnings changes that are deemed least likely to have managed earnings upward is 0.046 (Panel A), while the average abnormal accrual for firms with the most positive earnings changes that are least likely to have managed earnings downward is -0.074 (Panel B). The average abnormal accruals for the other firms with the most negative earnings changes and the most positive abnormal accruals is 0.073. The average abnormal accruals for the other firms with the most positive earnings changes and the most negative abnormal accruals is -0.063. Therefore, there is no evidence that the extreme abnormal accruals are concentrated among the firms in our hedge portfolios as opposed to among those firms that we believe least likely to have managed earnings. This observation is important as our sample partition could yield larger hedge portfolio returns simply because it concentrates on the long position firms with the largest negative abnormal accruals and on the short position firms with the largest positive abnormal accruals. However, the statistics in Table I demonstrate that this is not the case.

Insert Table I about here.

The same argument is valid for change in earnings. The statistics in Table I provide no evidence that the extreme changes in earnings are concentrated among the firms in our hedge portfolios as opposed to those firms that we deem least likely to have managed earnings. The average earnings change for firms with the most negative earnings changes that are deemed most likely to have managed earnings upward is only -0.031 (Panel A). The average earnings change for firms with the most positive earnings changes that are considered most likely to have managed earnings downward is only 0.044 (Panel B). In comparison, the average earnings change for firms with the most negative earnings changes that are deemed least likely to have managed earnings upward is -0.033 (Panel A). The average earnings changes for firms with the most positive earnings changes that are considered least likely to have managed earnings downward is 0.086 (Panel B). The average earnings change for the other firms with the most negative earnings changes and the most positive abnormal accruals is -0.054. The average earnings change for the other firms with the most positive earnings changes and the most negative abnormal accruals is 0.036. To facilitate the comparison, we also report the distributions of earnings changes and abnormal accruals by quintiles of earnings changes (Panel C) and quintiles of abnormal accruals (Panel D).

Table II presents the average risk characteristics for firms in the top and bottom quintiles of earnings changes. The statistics in Panel A of Table II report that firms in the top and bottom quintiles of earnings changes differ on many potential risk factors such as *SIZE*, *BM* (book-to-market value), *MM* (momentum), *ARBRISK* (arbitrage risk), *PRICE*, *VOLUME*, and *IO* (institutional ownership). The statistics in Panel B of Table II indicate that these variables are also significantly different across firms in the top quintiles of earnings changes that are deemed most likely to have managed earnings downward and those in the bottom quintiles of earnings changes that are considered most likely to have managed earnings upward. We control for the effect of these variables in our regression models.

Insert Table II about here.

IV. Association Between Operating Cash Flow and Abnormal Accruals

In Table I, we find that the abnormal accruals in the short position are positive, while those in the long position are negative. One reason for this observation is that the short position has only *SUE1/ABAC5* firms and the long position has only *SUE5/ABAC1* firms. By construction, the *ABAC5* firms are companies with positive abnormal accruals and the *ABAC1* firms are companies with negative abnormal accruals. Therefore, the statistics in Table I are not informative regarding the smoothing activities of the sample firms.

As explained earlier, we would prefer to analyze the abnormal accruals of firms with large earnings changes in general. However, since abnormal accruals are a component of earnings, it is practically impossible to totally separate current period abnormal accruals from extreme current period earnings performance. Extreme earnings changes and estimated abnormal accruals have a mechanical positive correlation. Therefore, to assess whether firms with large negative (positive) changes in operating performance inflate (deflate) their reported earnings, we analyze the abnormal accruals of firms with large negative (positive) changes in operating cash flows.

Insert Table III about here.

The results, reported in Table III, are consistent with the earnings smoothing hypothesis. We find that, on average, firms with large negative changes in operating cash flows manage their accruals upward, whereas those with large positive changes in operating cash flows manage their accruals downward. More specifically, firms in the bottom quintile of changes in operating cash flows (*SUCF1*) report an average earnings change of -1.8% and an average abnormal accrual of 2.8% of assets. In contrast, firms in the top quintile of changes in operating cash flows (*SUCF5*) report an average earnings change of 2.3% and an average abnormal accrual of -2.1% of assets. These abnormal accruals are both statistically significant and economically substantial.

V. Association Between Abnormal Accruals and the Post-Earnings Announcement Drift

We first analyze the association between abnormal accruals and the post-earnings announcement drift after controlling for other factors that might affect future returns. We model the post-announcement drift as follows:

$$\begin{aligned} ABRET_{it} = {} & \alpha_1 SUEQ1_{it} + \alpha_2 SUEQ5_{it} + \alpha_3 SUEQ1_{it} {*} ABACQ_{it} + \alpha_4 SUEQ5_{it} {*} ABACQ_{it} \\ & + \alpha_5 SIZED_{it} + \alpha_6 BM_{it} + \alpha_7 MM_{it} + \alpha_8 ARBRISK_{it} + \alpha_9 PRICED_{it} \\ & + \alpha_{10} VOLUMED_{it} + \alpha_{11} IO_{it} + \varepsilon_{it} \end{aligned} \tag{2}$$

ABRET is the size-adjusted return measured over the period from 18 trading days after the earnings announcement for Quarter 0 (the current quarter) to 17 trading days after the earnings announcement for Quarter +2 (the second quarter after Quarter 0). *SUEQ1* is a binary variable taking the value one if the standardized earnings change is in the bottom quintile and zero if it is in the top quintile. *SUEQ5* is a binary variable taking the value one if the standardized earnings change is in the top quintile and zero if it is in the bottom quintile. *ABACQ* is quintile of abnormal accruals (the residual from the accrual model). *SIZED* is the decile of the market value of common equity at the beginning of the current quarter and *BM* is the ratio of the book value of equity to the market value of equity at the beginning of the current quarter. *MM*, momentum, is the stock return from twelve to two months prior to the earnings announcement month. *ARBRISK* is arbitrage risk, defined as the residual variance from a standard market model regression of a firm's return on the returns of the CRSP S&P 500 equal-weighted market index over a 48-month period ending one month prior to the earnings announcement month. *PRICED* is the decile of stock price at the beginning of the current quarter. *VOLUMED* is the decile of dollar trading volume over the 12-month period ending at the end of the month immediately preceding the earnings announcement quarter and *IO* is the percentage of institutional ownership at the end of the calendar quarter prior to the end of the earnings announcement quarter.

All five quintiles of abnormal accruals are included in the analysis. We do not have a main effect for *ABACQ* as the sample includes only those firms in either the top or the bottom quintile of earnings changes. We allow for two separate coefficients on *ABACQ*: 1) one for those firms in the bottom quintile of earnings changes (the *SUE1* firms) and 2) one for those firms in the top quintiles of earnings changes (the *SUE5* firms). We scale *ABACQ* to range from -0.5 to 0.5, such that the coefficients on *SUEQ1* and *SUEQ5* (α_1 and α_2) represent the average negative and positive drifts for firms in the median quintile of abnormal accruals, respectively. We include the control variables in the models because, as reported in Panel A of Table II, firms in the top and bottom quintiles of earnings changes differ on many of the potential risk factors. Due to inflation, the most recent observations of size, stock price, and trading volume generally have the largest values and the earliest observations generally contain the lowest values. To remove the effects of the time trends in these variables each quarter, consistent with Bartov, Radhakrishnan, and Krinsky (2000), we rank them into deciles. We also rescale them to range from -0.5 to 0.5, consistent with Mendenhall (2004).

The results are reported in Table IV. Consistent with the notion that PEAD is related to firms with large negative earnings changes that manage earnings upward, we find that the negative return associated with large negative earnings changes increases in abnormal accruals. That is, the more a firm manages earnings upward, the higher the return from the short position of a trading strategy based on earnings changes. Similarly, consistent with the notion that PEAD is related to firms with large positive earnings changes that manage earnings downward, we find that the positive return associated with large positive earnings changes decreases in abnormal accruals. That is, the more a firm manages earnings downward, the higher the return from the long position of a trading strategy based on earnings changes.

Insert Table IV about here.

There are some other important observations to be noted from the results in Table IV. We find no evidence that the coefficient on *SUEQ1* (α_1) is significantly negative. In addition, the coefficient on *SUEQ1* for those firms in the bottom quintile of abnormal accruals (α_1 - 0.5*α_3) is actually positive, although it is not statistically significant. These results indicate that the negative return associated with *SUEQ1* is observed mainly for those firms that also report large positive abnormal accruals. Moreover, the coefficient on *SUEQ5* (α_2) is significantly positive. Specifically, there is a positive drift even for the *SUEQ5* firms that have abnormal accruals in the middle quintile. One potential explanation is that firms that have large earnings increases tend to also have large increases in accruals (a component of earnings). Some of these firms can still report positive abnormal accruals even after smoothing earnings downward. In the next section, we control for this eventuality by conditioning the analysis on the likelihood that a firm manages earnings.

The coefficient on the interaction between *SUEQ5* and *ABACQ* is -0.05 implying that the average abnormal return is 0.015 (0.04 - 0.05*0.5) for firms that fall in both the top quintile of earnings changes and the top quintile of abnormal accruals. At first glance, this finding might seem inconsistent with the earnings management hypothesis. Note, however, that the results in Table IV are simply a replication of the basic results in Collins and Hribar (2000). Our argument is that for firms with extreme earnings, abnormal accruals often reflect the effect of performance. That is, firms that have high *SUE*s tend to naturally have high accruals. Therefore, further refinements are necessary in order to make inferences regarding earnings management in such a setting. It is also important to note that the average abnormal return of 0.015 is neither economically nor statistically significant. It is practically zero. As we demonstrate in Tables V and VI, there is no evidence of a drift for: 1) firms with large positive earnings changes that are deemed least likely to have managed earnings downward or 2) firms with large negative earnings changes that are considered least likely to have managed earnings upward.

VI. The Drift for Those Firms that are Deemed Least Likely to Have Managed Earnings

We analyze the drift associated with those firms that are deemed least likely to have managed earnings. Essentially, we implement a strategy consisting of taking long positions in firms with large positive earnings changes that are least likely to have managed earnings downward and short positions in firms with large negative earnings changes that are least likely to have managed earnings upward. If the drift is associated with earnings smoothing, then we expect it to disappear or, at least, to weaken for those firms that are deemed least likely to have smoothed their earnings.

The long position includes firms with earnings changes in the top quintile and earnings below zero, while the short position includes firms with earnings changes in the bottom quintile and earnings in the top quintile. We impose no restriction on the abnormal accruals estimates. It would be easier to demonstrate that there is no evidence of a drift if we take: 1) long positions in firms with large positive earnings changes, large positive abnormal accruals, and negative earnings and 2) short positions in firms with large negative earnings changes, large negative abnormal accruals, and large positive earnings. However, there is a potential confounding effect when analyzing the returns of firms with large positive earnings changes that also have positive abnormal accruals or the returns of firms with large negative earnings changes that also have negative abnormal accruals. The positive drift associated with undervaluation of positive earnings changes could be offset by the negative drift associated with overvaluation of positive abnormal accruals. Similarly, the negative drift associated with undervaluation of negative earnings changes could be offset by the positive drift associated with overvaluation of negative abnormal accruals. Therefore, we could fail to observe a drift, although the market could have undervalued the earnings changes. We mitigate this problem by not requiring that firms with large positive earnings changes also have large positive abnormal accruals or that firms with large negative earnings changes also have large negative abnormal accruals.

The results of our analysis are reported in Table V. Consistent with the earnings management hypothesis, the buy-and-hold hedge portfolio return is essentially zero (and, if anything, it is negative) for those firms with large positive earnings changes that are least likely to have managed earnings downward and those with large negative earnings changes that are least likely to have managed earnings upward. A long position in firms with the most positive earnings changes yields an average buy-and-hold abnormal return of -1.2%. A short position in firms with the most negative earnings changes yields an average abnormal return of -1.0%, for a hedge portfolio return of -2.2% over the two quarters after the earnings announcement. We obtain similar results when we use Fama and French's (1993) three-factor model. The average monthly abnormal returns are 0.4% for the long position and -0.1% for the short potion. These are not statistically significant at conventional levels.

Insert Table V about here.

It is plausible that we do not fully control for the offsetting effects of positive earnings changes and positive abnormal accruals, or the offsetting effects of negative earnings changes and negative abnormal accruals. To control for the effect of abnormal accruals and other factors that could affect the abnormal returns, we regress abnormal returns on an indicator variable for large earnings changes, abnormal accruals, and other control variables. More specifically, we estimate the following regression model using those firms with earnings changes in either the top or the bottom quintile that are deemed least likely to have managed earnings:

$$\begin{aligned} ABRET_{it} = {} & \alpha_0 + \alpha_1 SUEQ5_{it} + \alpha_2 ABACQ_{it} + \alpha_3 SIZED_{it} + \alpha_4 BM_{it} + \alpha_5 MM_{it} \\ & + \alpha_6 ARBRISK_{it} + \alpha_7 PRICED_{it} + \alpha_8 VOLUMED_{it} + \alpha_9 IO_{it} + \varepsilon_{it}, \end{aligned} \tag{3}$$

where *SUE5* is a binary variable taking a value one if an earnings change is in the top quintile and zero if it is in the bottom quintile. *ABACQ* is the quintile of abnormal accruals. We assign to the abnormal accrual quintiles values ranging from -0.5 to 0.5. Again, there is no restriction on the abnormal accruals estimates. The other variables are as defined previously.

The results are reported in Table VI. Under Column (1), we control only for *ABACQ*. Consistent with the results in Table V, the coefficient on *SUE5* is not significantly positive. In fact, the sign of the coefficient on *SUE5* is negative. The average abnormal return for firms with the most positive earnings changes, $\alpha_0 + \alpha_1$, is virtually zero. Hence, there is no evidence that, on average, the firms with large positive earnings changes that we deem least likely to have managed earnings downward experience positive abnormal returns after the earnings announcement or the firms with large negative earnings changes that are considered least likely to have managed earnings upward experience negative abnormal returns after the earnings announcement. The coefficient on *ABACQ* is not statistically negative either. This is not consistent with the predictions of the abnormal accrual anomaly. However, this result is not surprising given that we limit the sample to firms that are deemed least likely to have managed earnings. Xie (2001) suggests that the abnormal accrual anomaly is related to earnings management.[10]

Insert Table VI about here.

Under Column (2), we control for various factors that could affect returns. We still find no evidence that the average abnormal return for firms with the most negative earnings changes, α_0, is negative. In fact, α_0 is highly positive (0.047). There is also no evidence that the average abnormal return for firms with the most positive earnings changes, $\alpha_0 + \alpha_1$, is positive. The average return for these firms is essentially zero for a hedge portfolio return of approximately -0.016. Therefore, there is no evidence that the disappearance of the drift (documented in Table V) for those firms with the most negative earnings changes that are least likely to have managed earnings upward and those with the most positive earnings changes that are least likely to have managed earnings downward is due to a failure to control for correlated omitted variables. If anything, the large positive intercept (α_0) suggests that, typically, those firms with large negative earnings changes that are considered least likely to have managed earnings upward might have actually managed earnings downward. Hence, the best strategy, if any, would be to take a long position (instead of a short position) in those firms with large negative earnings changes that are least likely to have managed earnings upward.

One potential explanation for the disappearance of the drifts is that the extreme earnings changes and abnormal accruals might be concentrated among those cases that are more likely to be associated with earnings management as opposed to those least likely to be associated with earnings management. However, the results in Table V indicate that, among the firms that are least likely to have managed earnings, the average earnings changes are -0.032 for those with the

[10] The coefficient on abnormal accruals is nonetheless negative, albeit insignificantly so. Some firms with large positive earnings changes, negative earnings, and positive abnormal accruals could have managed earnings upward depending on the managers' incentives. Similarly, some firms with large negative earnings changes, large positive earnings, and negative abnormal accruals could have managed earnings downward.

most negative earnings changes and 0.085 for those with the most positive earnings changes. These are not substantially different from the average earnings changes for the other subgroups (see Table I). As discussed earlier, the results in Table I provide no evidence that the extreme abnormal accruals or extreme earnings changes are concentrated among the firms in our hedge portfolios as opposed to those that are considered least likely to have managed earnings.

VII. The Drift for Those Firms that are Deemed Most Likely to Have Managed Earnings

Thus far, we demonstrate that there is no evidence of PEAD for those firms that are deemed least likely to have managed earnings. We now analyze the drift for those firms that are most likely to have managed earnings. Firms with large positive earnings changes are most likely to manage earnings downward (and negative estimated abnormal accruals most likely related to earnings smoothing) when earnings are high. Firms with large negative earnings changes are most likely to have managed earnings upward (and positive estimated abnormal accruals most likely related to earnings smoothing) when the previous quarter earnings are above zero and the firms would have missed the zero earnings benchmark in the current quarter if they did not report positive abnormal accruals.

A. Unconditional Hedge Portfolio Returns

Consistent with our expectations, the results reported in Panel A of Table VII demonstrate a substantial increase in the portfolio returns. The long (short) positions yield average abnormal returns of 9.1% (10.4%), for a total hedge portfolio return of about 19.5%. In contrast, untabulated results indicate that a trading strategy based on earnings changes alone yields a hedge portfolio return of only 5.0%, while a trading strategy based on earnings changes and abnormal accruals alone yields a hedge portfolio return of only 12.6%. We obtain a similar pattern when we use Fama and French's (1993) three-factor model.

Insert Table VII about here.

The numbers of observations in our portfolios are relatively small. Assuming that an investor holds these positions for the entire return horizon (two quarters), he will typically hold approximately 80 stocks in the long position and 30 stocks in the short position at a given time. However, provided that there are a sufficient number of liquid stocks available in these portfolios, the small number of observations may not impede implementing our strategy. In a given quarter, the number of firms in our long and short positions are closer to the number of firms that some arbitrageurs apparently hold in their portfolios. For example, Mendenhall (2004) mentions the case of the manager of a $1 billion portfolio who concentrates his holdings among 40 stocks. Mendenhall (2004) also reports that "one partner of a hedge fund advisory service confided that the firm has several clients who hold fewer than 25 long (and short) positions."

Untabulated results also report a striking difference in the abnormal returns between firms that slightly miss the zero earnings benchmark and those that meet or slightly beat the benchmark. The average abnormal return for firms with large negative earnings changes and positive abnormal accruals is only -5.4% for firms with ROAs between -0.5% and 0.0% (i.e., firms that slightly miss the zero earnings benchmark). The average abnormal return is dramatically more negative (-11.3%) for firms with ROAs between 0.0% and 0.5% (i.e., firms that meet or slightly beat the zero earnings benchmark) and -9.5% for those with ROAs between 0.5% and 1.0%. Limiting the short position to firms with positive ROAs below 0.5% (instead of positive ROAs below the top quintile) increases the abnormal return from the short position by 4.6% (from 10.4% to 15.0%) for a total hedge portfolio return of 24.1%. Therefore, the average abnormal return from the hedge portfolio is larger when we limit the short position to firms with positive ROAs below 0.5%. However, the number of observations becomes relatively small, which may further impede the implementation of the strategy.

There is some profit from going short in firms with large negative earnings changes and large positive abnormal accruals that report losses. Untabulated results indicate that such a strategy yields an average abnormal return of 4.4% over the two quarters consistent with the notion that some firms could have incentives to inflate earnings even if they cannot reach the zero earnings benchmark. However, the drift is much larger (10.4%) for firms that report positive earnings, but would have reported losses if they did not also report positive abnormal accruals. This is consistent with the conjecture that positive abnormal accruals are most likely to be associated with earnings management when they allow a poorly performing firm to meet the zero earnings benchmark.

The long position of our trading strategy includes firms with large negative abnormal accruals and large positive earnings, and the short position includes firms with large positive abnormal accruals that would have reported losses if they did not report positive abnormal accruals. Therefore, it is unlikely that the large abnormal accruals in the long and short positions are driven by performance.[11] Nonetheless, to further assess the extent to which the abnormal accrual effect is related to managerial discretionary financial reporting behavior, we repeat the analysis using estimated nondiscretionary (normal) as opposed to estimated discretionary (abnormal) accruals.

Consistent with the earnings management hypothesis, we find that the improvement in abnormal returns is largely due to the discretionary (or abnormal) component of accruals. The results reported in Panel B of Table VII indicate that our trading strategy yields an average

[11] Furthermore, since our analyses are based on the top and bottom quintile ranking of abnormal accruals (instead of the actual abnormal accrual estimates), it is less likely that our inferences are driven by potential noise in our abnormal accrual measure.

abnormal return of 12.6% over the two quarters after the earnings announcement when we use nondiscretionary (normal) accruals instead of abnormal accruals as a partitioning variable.[12] This return is actually lower than the return (13.7%) that we obtain when we do not partition on accruals at all, and substantially lower than the 19.5% return that we obtain when we partition on abnormal accruals. The main difference between the return from the hedge portfolio based on abnormal accruals and the return from the hedge portfolio based on nondiscretionary (normal) accruals comes from the short position. The average abnormal return is 0.6% higher when sorting on discretionary accruals than when sorting on nondiscretionary accruals (9.1% vs. 8.5%) for the long position and 6.3% higher (10.4% vs. 4.1%) for the short position. These results suggest that abnormal accruals are a less noisy measure of earnings management for firms in the short position than for those in the long position. We also note that the strategy involving nondiscretionary accruals is profitable. One reason is that the portfolios are formed on the basis of the likelihood that a firm manages earnings, and those firms with large negative (positive) earnings changes that are deemed to have inflated (deflated) earnings the most can also have large positive (negative) estimated nondiscretionary accruals.[13]

Insert Figure I about here.

Figure I presents a synoptic view of the drifts associated with various trading strategies. The results indicate that a strategy based on earnings changes yields a short (long) position return of 2.1% (2.9%) over the 120 trading days starting 18 trading days after the earnings announcement date. Using abnormal accruals as an additional partitioning variable increases the

---

[12] Nondiscretionary (normal) accrual is the difference between total accrual and discretionary (abnormal) accrual (i.e., the predicted value from the abnormal accrual model).

[13] Note that we do not have a perfect proxy for discretionary/non-discretionary accruals and that abnormal accruals can be affected by factors other than earnings management. In addition, firms can use real earnings management that does not involve accruals. Therefore, considering that we classify firms on their incentives to smooth earnings, it is not surprising to observe abnormal returns whether we further classify the firms on the estimated abnormal accruals or not. However, it is worth noting the substantial difference in the abnormal returns when we sort on the estimated discretionary (abnormal) as opposed to the non-discretionary accruals.

abnormal returns to the short (long) position to 5.8% (6.8%). If we further condition on the likelihood of earnings management, the abnormal returns increase to 9.7% and 9.1% for the short and long positions, respectively, for an average hedge portfolio return of about 18.8%. These results indicate that our findings are robust to measuring abnormal returns over a fixed horizon.[14] A casual inspection of Figure I also indicates that our results are not sensitive to alternative starting dates. The drift is quite smooth over the return horizon. Therefore, an investor does not have to open the positions 18 trading days after the earnings announcement. He can actually exploit our strategy by opening the positions almost anytime during the return horizon.

B. Conditional Hedge Portfolio Returns

As reported in Panel B of Table II, the hedge portfolio firms are different from the population. Firms in the long and short positions are also varying in many important factors, although the disparities are not extreme. We control for the potential effects of these differences by estimating the following regression models for: 1) firms with large positive earnings changes and large negative abnormal accruals (Model 4A) and 2) firms with large negative earnings changes and large positive abnormal accruals (Model 4B):

$$\begin{aligned} ABRET_{it} = {} & \alpha_1 MOST\_DOWN_{it} + \alpha_2 LEAST\_DOWN_{it} + \alpha_3 OTHER\_DOWN_{it} + \alpha_4 SIZED_{it} \\ & + \alpha_5 BM_{it} + \alpha_6 MM_{it} + \alpha_7 ARBRISK_{it} + \alpha_8 PRICED_{it} + \alpha_9 VOLUMED_{it} \\ & + \alpha_{10} IO_{it} + \varepsilon_{it}, \end{aligned} \tag{4A}$$

$$\begin{aligned} ABRET_{it} = {} & \alpha_1 MOST\_UP_{it} + \alpha_2 LEAST\_UP_{it} + \alpha_3 OTHER\_UP_{it} + \alpha_4 SIZED_{it} + \alpha_5 BM_{it} \\ & + \alpha_6 MM_{it} + \alpha_7 ARBRISK_{it} + \alpha_8 PRICED_{it} + \alpha_9 VOLUMED_{it} + \alpha_{10} IO_{it} + \varepsilon_{it}, \end{aligned} \tag{4B}$$

[14] The returns in the graph are cumulated over the 120 days starting 18 trading days after the earnings announcement (Quarter 0) whereas those in the tables are measured over the period from 18 trading days after the earnings announcement for Quarter 0 (the current quarter) to 17 trading days after the earnings announcement for Quarter +2 (the second quarter after Quarter 0).

where *ABRET* is the size-adjusted return over the period from 18 trading days after the earnings announcement for Quarter 0 (the current quarter) to 17 trading days after the earnings announcement for Quarter +2 (the second quarter after Quarter 0) (the expected return is the compound return of the respective firm's CRSP NYSE/AMEX/NASDAQ size-decile portfolio assignment at the beginning of the year. *MOST_DOWN* is a binary variable taking a value of one if (standardized) earnings are high (in the top quintile), and zero otherwise. *LEAST_DOWN* is a binary variable taking a value of one if earnings are negative, and zero otherwise. *OTHER_DOWN* is a binary variable taking a value of one if both *MOST_DOWN* and *LEAST_DOWN* are zero, and zero otherwise. *MOST_UP* is a binary variable taking a value of one if the previous quarter earnings are above zero and the firm would have missed the zero-earnings benchmark in the current quarter if it did not report positive abnormal accruals, and zero otherwise. *LEAST_UP* is a binary variable taking a value of one if (standardized) earnings are high (in the top quintile), and zero otherwise. *OTHER_UP* is a binary variable taking a value of one if both *MOST_UP* and *LEAST_UP* are zero, and zero otherwise. The other variables are as previously defined.

The results are reported in Table VIII. Consistent with our expectations, the coefficient on *MOST_DOWN* for the long position in Panel A is the highest (0.091). That is, after accounting for the control variables in the regression, the long position of the hedge portfolio earns an abnormal return of 9.1% when it is limited to those firms that are deemed most likely to have managed earnings downward. The coefficient on *MOST_UP* for the short position in Panel B is −0.083. Specifically, after accounting for the control variables, the short position of the hedge portfolio earns an abnormal return of 8.3% when it is limited to those firms that are deemed most likely to have managed earnings upward, for a total hedge portfolio return of 17.4%. The results are generally the same whether we use a pooled regression or the Fama and MacBeth (1973) procedure. They are also quite close to those reported in Table VII. Therefore, it does not appear that the hedge portfolio returns are due to the documented differences in the sample firms' characteristics.[15]

Insert Table VIII about here.

C. Other Sensitivity Analyses

1. Controlling for the Lag Between 10-Q Filing and 10-K Filing

The lag between the earnings announcement date and the 10-K filing date is generally different from the lag between the earnings announcement date and the 10-Q filing date. Easton and Zmijewski (1993) indicate that the average lag between the end of the fiscal quarter and the filing date is 94.2 (46.8) days for the fourth quarter (the three interim quarters) for NASDAQ firms and 97.2 (44.7) days for NYSE/AMEX firms. Accordingly, to assess the extent to which the difference in the lag between the end of the fiscal quarter and the filing date could affect our results, for the fourth quarter, we measure the abnormal returns from 98 calendar days (or 14 weeks) after the fiscal quarter end to 97 days after the second fiscal quarter end subsequent to the earnings announcement. For the interim quarters, we measure the abnormal returns from 49 calendar days (or 7 weeks) after the fiscal quarter end to 48 days after the second fiscal quarter end subsequent to the earnings announcement. We obtain an average hedge portfolio return of 19.5%. Consequently, it does not appear that controlling for the lag between the earnings announcement date and the 10-Q filing date affects our results.

[15] The coefficient on momentum is negative and marginally significant for the short position, which might seem surprising given that momentum is generally positively associated with future returns. However, Chordia and Shivakumar (2006) suggest that the momentum effect could be associated with the change in earnings effect. Therefore, there is not a strong reason why momentum should be positively correlated with future returns within the change in earnings quintiles.

2. The Potential Effect of Special Items

Prior studies suggest that the market under reacts less to special items than to other earnings components (Burgstahler, Jiambalvo, and Shevlin, 2002). It is also possible that the loss firms with the most positive earnings changes and the most negative abnormal accruals have large asset write-downs and report earnings with large negative and transitory components, which could explain the disappearance of the drift for these firms. To assess the potential effect of special items, we replicate the findings in Table VI after adjusting all the earnings variables for special items (Compustat Quarterly Data Item 32). We set the tax rate to the income tax expense (Compustat Quarterly Data Item 6) divided by the pre-tax earnings (Compustat Quarterly Data Item 23) if both the income tax expense and the pre-tax earnings are positive and to zero if either the income tax expense or the pre-tax earnings is non-positive. We obtain an average hedge portfolio return of 19.9%. As a result, special items are not the drivers of our hedge portfolio returns.

3. The Potential Effect of Recently Heightened Attention to the Anomalies

If earnings management affects the delayed market reaction to earnings announcements and if this effect is due to investor inattention, we would expect the effect to at least decrease as investors pay more attention to the anomalies. Consistent with this view, Schwert (2003) finds that many well-documented anomalies tend to disappear as they become known and investors start paying attention to them. Using accruals up to 2002, Lev and Nissim (2006) find no evidence that the returns from the accrual anomaly have declined over time. However, since the early 2000s, there has been an explosion in the number of hedge funds and the size of the assets under their management (Stultz, 2007). Many of these funds specialized in exploiting anomalies documented in the academic literature and have been actively recruiting analysts with Ph.D. degrees and prominent accounting professors. As such, there has been much more attention brought to the anomalies after 2002 and the attention effect is more likely to be felt since then. Green, Hand, and Soliman (2010) provide an extensive discussion of the effect of hedge funds on the potential disappearance of the accrual anomaly.

To assess the extent to which the recent increase in attention to the anomalies affects our results, we analyze the time series of the abnormal returns from our trading strategies. As reported in Table IX, our trading strategy is profitable in every single year from 1990-2006. However, consistent with the inattention explanation, we find that the returns from the strategy are much smaller in recent years (2003, 2004, 2005, and 2006). Over these four years, the average six-month abnormal return is 7.7% compared to 20.5% over the earlier years. It is important to note that our results are not affected by the recent financial crisis. The years in our sample refer to the fiscal years for which the earnings reports are prepared, and we measure abnormal returns over a six-month period after the earnings announcements. Therefore, the return periods in our sample do not extend to 2008, the year when the financial crisis started.

Insert Table IX about here.

VIII. Conclusion

We posit that the delayed market response to earnings news could be related to earnings management. Prior studies suggest that investors have cognitive limits and limited attention. In particular, they find that the delayed market response to earnings news is partly related to investor inattention. However, there is also evidence that many well known market anomalies are related to earnings management. Hirshleifer et al. (2004) also suggest that because investors have limited attention, they tend to misvalue firms with large abnormal accruals. Furthermore, there is reliable evidence that managers smooth their reported earnings. If firms manage earnings downward (upward) when they experience large positive (negative) earnings shocks and if investors have cognitive limits or are inattentive, then the post-earnings announcement drift could also be related to earnings management.

Our results support our conjecture. Consistent with the earnings management hypothesis, we find strong evidence suggesting that firms with large negative (positive) changes in operating cash flows manage their accruals substantially upward (downward). Moreover, we find no evidence of a positive drift for those firms with large positive earnings changes that are least likely to have managed earnings downward or a negative drift for those firms with large negative earnings changes that are least likely to have managed earnings upward. That is, for these firms, there is no evidence of an underreaction to earnings changes. In contrast, we find that most of the upward drift after positive earnings changes is concentrated among those firms that are most likely to have managed earnings downward. Similarly, we find that most of the downward drift after negative earnings changes is concentrated among those firms that are most likely to have managed earnings upward. We also find that this effect tends to become weaker in recent years as investors started paying more attention to the anomalies and hedge funds were focusing on exploiting them. Finally, consistent with the earnings management hypothesis, we also find that the drifts are generally associated with discretionary (or abnormal) accruals and not with nondiscretionary accruals.

In sum, our study suggests that earnings management is likely one determinant of the delayed market response to earnings news. It demonstrates that the anomaly is consistent with a situation where firms with large positive earnings and large positive earnings changes manage earnings downward, while those with large negative earnings changes manage earnings upward, particularly to stay above the zero-earnings benchmark.

Reference

Ball, R. and P. Brown, 1968, “An Empirical Evaluation of Accounting Numbers,” *Journal of Accounting Research* 6, 159-178.

Barber, B. and J. Lyon, 1997, “Detecting Long-Run Abnormal Stock Returns: The Empirical Power and Specification of Test Statistics,” *Journal of Financial Economics* 43, 341-372.

Barber, B. and T. Odean, 2008, “All that Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors,” *Review of Financial Studies* 21, 785-818.

Barberis, N., A. Shleifer, and R. Vishny, 1998, “A Model of Investor Sentiment,” *Journal of Financial Economics* 49, 307-343.

Bartov, E., S. Radhakrishnan, and I. Krinsky, 2000, “Investor Sophistication and Patterns in Stock Returns After Earnings Announcements,” *The Accounting Review* 75, 43-63.

Battalio, R. and R. Mendenhall, 2005, “Earnings Expectations, Investor Trade Size, and Anomalous Returns Around Earnings Announcements,” *Journal of Financial Economics* 77, 289-319.

Bernard, V. and J. Thomas, 1989, “Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium?” *Journal of Accounting Research* 27, 1-36.

Bernard, V. and J. Thomas, 1990, “Evidence That Stock Prices Do Not Fully Reflect the Implications of Current Earnings for Future Earnings,” *Journal of Accounting and Economics* 13, 305-340.

Brav, A., C. Geczy, and P. Gompers, 2000, “Is the Abnormal Return Following Equity Issuances Anomalous?” *Journal of Financial Economics* 56, 209-240.

Brown, P. and J. Kennelly, 1972, “The Information Content of Quarterly Earnings: An Extension and Some Further Evidence,” *Journal of Business* 45, 403-415.

Burgstahler, D. and I. Dichev, 1997, “Earnings Management to Avoid Earnings Decreases and Losses,” *Journal of Accounting and Economics* 24, 99-126.

Burgstahler, D., J. Jiambalvo, and T. Shevlin, 2002, “Do Stock Prices Fully Reflect the Implications of Special Items for Future Earnings?” *Journal of Accounting Research* 40, 585-612.

Carhart, M., 1997, “On Persistence in Mutual Fund Performance,” *Journal of Finance* 52, 57-82.

Chan, K., L. Chan, N. Jegadeesh, and J. Lakonishok, 2006, “Earnings Quality and Stock Returns,” *Journal of Business* 79, 1,041-1,082.

Chordia, T. and L. Shivakumar, 2006, "Earnings and Price Momentum," *Journal of Financial Economics* 80, 627-656.

Collins, D. and P. Hribar, 2000, "Earnings-Based and Accrual-Based Market Anomalies: One Effect or Two?" *Journal of Accounting & Economics* 29, 101-123.

Constantinou, C., W. Forbes, and L. Skerratt, 2003, "Analyst Underreaction in the United Kingdom," *Financial Management* 32, 93-106.

Daniel, K., D. Hirshleifer, and A. Subrahmanyam, 1998, "Investor Psychology and Security Market Under- and Overreactions," *Journal of Finance* 53, 1,839-1,885.

DeGeorge, F., J. Patel, and R. Zeckhauser, 1999, "Earnings Management to Exceed Thresholds," *Journal of Business* 72, 1-33.

DellaVigna, S. and J. Pollet, 2009, "Investor Inattention and Friday Earnings Announcements," *Journal of Finance* 64, 709-749.

DuCharme, L., P. Malatesta, and S. Sefcik, 2004, "Earnings Management, Stock Issues, and Shareholder Lawsuits," *Journal of Financial Economics* 71, 27-49.

Easton, P. and M. Zmijewski, 1993, "SEC Form 10K/10Q Reports and Annual Reports to Shareholders: Reporting Lags and Squared Market Model Prediction Errors," *Journal of Accounting Research* 31, 113-129.

Fama, E., 1998, "Market Efficiency, Long-Term Returns, and Behavioral Finance," *Journal of Financial Economics* 49, 283-306.

Fama, E. and K. French, 1993, "Common Risk Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics* 33, 3-56.

Fama, E. and J. MacBeth, 1973, "Risk, Return, and Equilibrium: Empirical Tests," *Journal of Political Economy* 81, 607-636.

Fischer, P. and H. Louis, 2008, "Financial Reporting and Conflicting Managerial Incentives: The Case of Management Buyouts," *Management Science* 54, 1,700-1,714.

Frazzini, A., 2006, "The Disposition Effect and Under-Reaction to News," *Journal of Finance* 61, 2,017-2,046.

Fudenberg, D. and J. Tirole, 1995, "A Theory of Income and Dividend Smoothing Based on Incumbency Rents," *Journal of Political Economy* 103, 75-93.

Goel, A. and A. Thakor, 2003, "Why Do Firms Smooth Earnings?" *Journal of Business* 76, 151-192.

Gong, G., H. Louis, and A. Sun, 2008a, "Earnings Management, Lawsuits, and Stock-for-Stock Acquirers' Market Performance," *Journal of Accounting and Economics* 46, 62-77.

Gong, G., H. Louis, and A. Sun, 2008b, "Earnings Management and Firm Performance Following Open-Market Repurchases," *Journal of Finance* 63, 947-986.

Graham, J., C. Harvey, and S. Rajgopal, 2005, "The Economic Implications of Corporate Financial Reporting," *Journal of Accounting and Economics* 40, 3-73.

Green, J., J. Hand, and M. Soliman, 2010, "Going, Going, Gone? The Death of the U.S. Accruals Anomaly," University of North Carolina - Chapel Hill Working Paper.

Grinblatt, M. and B. Han, 2005, "Prospect Theory, Mental Accounting, and Momentum," *Journal of Financial Economics* 78, 311-333.

Hennes, K., A. Leone, and B. Miller, 2008, "The Importance of Distinguishing Errors from Irregularities in Restatement Research: The Case of Restatements and CEO/CFO Turnover," *The Accounting Review* 83, 1,487-1,519.

Hirshleifer, D., K. Hou, S. Teoh, and Y. Zhang, 2004, "Do Investors Overvalue Firms with Bloated Balance Sheets?" *Journal of Accounting & Economics* 38, 297-331.

Hirshleifer, D., S. Lim, and S. Teoh, 2009, "Driven to Distraction: Extraneous Events and Underreaction to Earnings News," *Journal of Finance* 64, 2,289-2,325.

Hirshleifer, D. and S. Teoh, 2003, "Limited Attention, Information Disclosure, and Financial Reporting," *Journal of Accounting and Economics* 36, 337-386.

Hong, H. and J. Stein, 1999, "A Unified Theory of Underreaction, Momentum Trading, and Overreaction in Asset Markets," *Journal of Finance* 54, 2,143-2,184.

Ikenberry, D., R. Shockley, and K. Womack, 1999, "Why Active Fund Managers Often Underperform the S&P 500: The Impact of Size and Skewness," *Journal of Private Portfolio Management* 1, 13-26.

Jiang, J., 2008, "Beating Earnings Benchmarks and the Cost of Debt," *The Accounting Review* 83, 377-416.

Jones, J., 1991, "Earnings Management During Import Relief Investigations," *Journal of Accounting Research* 29, 193-228.

Jones, C. and R. Litzenberger, 1970, "Quarterly Earnings Reports and Intermediate Stock Price Trends," *Journal of Finance* 25, 143-148.

Kothari, S., 2001, “Capital Markets Research in Accounting,” *Journal of Accounting and Economics* 31, 105-231.

Kothari, S., A. Leone, and C. Wasley, 2005, “Performance Matched Discretionary Accruals,” *Journal of Accounting and Economics* 39, 163-197.

Kothari, S. and J. Warner, 1997, “Measuring Long-Horizon Security Price Performance,” *Journal of Financial Economics* 43, 301-339.

Lev, B. and D. Nissim, 2006, “The Persistence of the Accruals Anomaly,” *Contemporary Accounting Research* 23, 193-226.

Loh, R., 2010, “Investor Inattention and the Underreaction to Stock Recommendations,” *Financial Management* 39, 1,223-1,252.

Louis, H., 2004, “Earnings Management and the Market Performance of Acquiring Firms,” *Journal of Financial Economics* 74, 121-148.

Louis, H., D. Robinson, and A. Sbaraglia, 2008, “An Integrated Analysis of the Association Between Accrual Disclosure and the Abnormal Accrual Anomaly,” *Review of Accounting Studies* 13, 23-34**.**

Louis, H. and A. Sun, 2010, "Investor Inattention and the Market Reaction to Merger Announcements," *Management Science* 56, 1,781-1,793.

Louis, H. and H. White, 2007, “Do Managers Intentionally Use Repurchase Tender Offers to Signal Private Information? Evidence from Firm Financial Reporting Behavior,” *Journal of Financial Economics* 85, 205-233.

Lyon, J., B. Barber, and C. Tsai, 1999, “Improved Methods for Tests of Long-Run Abnormal Stock Returns," *Journal of Finance* 54, 165-201.

Markoff, J., 1999, “Microsoft’s Accounting Under Scrutiny,” The New York Times (July 1). **http://www.nytimes.com/1999/07/01/business/microsoft-s-accounting-under-scrutiny.html** (accessed October 7, 2009).

Mendenhall, R., 2004, “Arbitrage Risk and Post-Earnings-Announcement Drift,” *Journal of Business* 77, 875-894.

Mitchell, M. and E. Stafford, 2000, “Managerial Decisions and Long-Term Stock Price Performance,” *Journal of Business* 73, 287-329.

Peng, L. and W. Xiong, 2006, “Investor Attention, Overconfidence and Category Learning,” *Journal of Financial Economics* 80, 563-602.

Rendleman, R., C. Jones, and H. Latané, 1982, "Empirical Anomalies Based on Unexpected Earnings and the Importance of the Risk Adjustments," *Journal of Financial Economics* 10, 269-287.

Schwert, W., 2003, "Anomalies and Market Efficiency," in *Handbook of the Economics of Finance*, 21, Amsterdam, London, and New York, Elsevier, North Holland.

Stultz, 2007, "Hedge Funds: Past, Present, and Future," *Journal of Economic Perspectives* 21, 175-194.

Teoh, S., I. Welch, and T. Wong, 1998a, "Earnings Management and the Underperformance of Seasoned Equity Offerings," *Journal of Financial Economics* 50, 63-100.

Teoh, S., I. Welch, and T. Wong, 1998b, "Earnings Management and the Long-Run Market Performance of Initial Public Offerings," *Journal of Finance* 53, 1,935-1,974.

Teoh, S. and T. Wong, 2002, "Why New Issues and High-Accrual Firms Underperform: The Role of Analysts' Credulity," *The Review of Financial Studies* 15, 869-900.

Teoh, S., T. Wong, and G. Rao, 1998, "Are Accruals During Initial Public Offerings Opportunistic?" *Review of Accounting Studies* 3, 175-208.

Tucker, J. and P. Zarowin, 2006, "Does Income Smoothing Improve Earnings Informativeness?" *The Accounting Review* 81, 251-270.

Xie, H., 2001, "The Mispricing of Abnormal Accruals," *The Accounting Review* 76, 357-373.

Yong, K., 2007, "Why Do Firms Not Resume Their Earnings Strings After an Earnings Break?" Duke University Working Paper.

Zhang, F., 2006, "Information Uncertainty and Stock Returns," *Journal of Finance* 61, 105-136.

Table I. Average Abnormal Accruals and Earnings Changes for Our Hedge Portfolios

Standardized earnings changes (*SUE*) are defined as the seasonal change in the ratio of net income to total assets. *ABAC*, abnormal accruals, are computed as the residual from a modified accrual model. *SUE1*, *SUE2*, *SUE3*, *SUE4*, and *SUE5* are the first, second, third, fourth, and fifth quintiles of (standardized) earnings changes. Similarly, *ABAC1*, *ABAC2*, *ABAC3*, *ABAC4*, and *ABAC5* are the first, second, third, fourth, and fifth quintiles of abnormal accruals. For the short position, a firm with large negative earnings changes is deemed most likely to have managed earnings upward (and (estimated) positive abnormal accruals most likely to be related to earnings smoothing) when the previous quarter earnings are above zero and the firms would have missed the zero earnings benchmark in the current quarter if they did not report the income increasing abnormal accruals. It is deemed least likely to manage earnings upward when (standardized) earnings are high (in the top quintile). For the long position, a firm with large positive earnings changes is deemed most likely to have managed earnings downward (and (estimated) negative abnormal accruals more likely to be related to earnings smoothing) when reported ROA is high (top quintile). It is considered least likely to manage earnings downward when reported earnings are negative. We winsorize the quarterly earnings changes and abnormal accruals at the top and bottom one percentiles. We report *t*-statistics in parentheses and the number of observations in brackets.

Panel A. Short Position - SUE1 / ABAC5

	Most Likely Cases of Upward Earnings Management	**Least Likely Cases of Upward Earnings Management**	**Others**
Earnings Change	-0.031^{+++} (-42.92) [n=1,010]	-0.033^{+++} (-14.47) [n=121]	-0.054^{+++} (-74.63) [n=4,446]
Abnormal Accruals	0.066^{+++} (68.83) [n=1,010]	0.046^{+++} (38.62) [n=121]	0.073^{+++} (133.51) [n=4,446]

Panel B. Long Position - SUE5 / ABAC1

	Most Likely Cases of Downward Earnings Management	**Least Likely Cases of Downward Earnings Management**	**Others**
Earnings Change	0.044^{+++} (48.30) [n=2,666]	0.086^{+++} (40.26) [n=1,866]	0.036^{+++} (39.59) [n=1,565]
Abnormal Accruals	-0.067^{+++} (-89.42) [n=2,666]	-0.074^{+++} (-66.99) [n=1,866]	-0.063^{+++} (-71.34) [n=1,565]

Panel C. SUE Quintiles

	SUE1	***SUE2***	***SUE3***	***SUE4***	***SUE5***
Earnings Change	-0.058^{+++} (-212.4) [n=41,889]	-0.007^{+++} (-336.06) [n=44,877]	-0.000*** (-39.37) [n=27,792]	0.005^{+++} (357.19) [n=45,619]	0.058^{+++} (181.23) [n=45,292]
Abnormal Accruals	-0.018*** (-53.83) [n=41,889]	0.004*** (23.3) [n=44,877]	0.006*** (26.4) [n=27,792]	0.006*** (29.8) [n=45,619]	0.016*** (59.03) [n=45,292]

Panel D. ABAC Quintiles

	ABAC1	*ABAC2*	*ABAC3*	*ABAC4*	*ABAC5*
Earnings Change	-0.022*** (-55.23) [n=36,328]	-0.002*** (-9.27) [n=426,44]	0.001*** (6.06) [n=43,503]	0.005*** (22.83) [n=43,100]	0.019*** (51.89) [n=39,894]
Abnormal Accruals	-0.072^{+++} (-280.98) [n=36,328]	-0.016^{+++} (-397.38) [n=42,644]	0.003*** (98.48) [n=43,503]	0.022^{+++} (544.44) [n=43,100]	0.071^{+++} (390.81) [n=39,894]

*** ($^{+++}$) indicates significance at the 1% level in a two- (one-) tailed test.

Table II. Average Risk Characteristics for the Full Sample of Firms in the Top and Bottom Quintiles of Earnings Changes

SUE1 and *SUE5* are the first and the fifth quintiles of (standardized) earnings changes defined as the seasonal change in the ratio of net income to total assets. *SIZE* is the market value of common equity at the beginning of the current quarter (in millions of dollars). *BM* is the ratio of book value of equity to market value of equity at the beginning of the current quarter. *MM*, momentum, is the stock return from twelve to two months prior to the earnings announcement month. *ARBRISK* is the arbitrage risk defined as the residual variance from a standard market model regression of a firm's return on the returns of the CRSP S&P 500 equal-weighted market index over a 48-month period ending one month prior to the earnings announcement month. *PRICE* is the stock price (Compustat quarterly Data Item #14) at the beginning of the current quarter. *VOLUME* is the monthly trading volume over the 12-month period ending at the end of the month immediately proceeding the earnings announcement quarter (in millions of dollars). *IO* is the percentage of institutional ownership at the end of the calendar quarter immediately preceding the end of the earnings announcement quarter. The short position consists of firms with the most negative earnings changes and the most positive abnormal accruals that are most likely to manage earnings upward. The long position consists of firms with the most positive earnings changes and the most negative abnormal accruals that are most likely to manage earnings downward. The population includes all NYSE/AMEX/NASDAQ firms in our sample period that have enough data to compute the variables in the regression analysis in Table IV.

Panel A. Full Sample of Firms in the Top and Bottom Quintiles of Earnings Changes

Variables	Population	*SUE5* Firms (N = 37,525)	*SUE1* Firms (N =34,306)	*T*-value for Testing the Mean of the *SUE5* Firms Against the Population Mean	*T*-value for Testing the Mean of *SUE1* Firms Against the Population Mean	*T*-value for Testing for Mean Difference Between *SUE5* and *SUE1* Firms
SIZE	1,756.000	1,201.900	1,097.000	-21.40***	-25.03***	2.84***
BM	0.594	0.516	0.577	-24.47***	-5.02***	-13.04***
MM	1.181	1.422	0.977	44.21***	-48.38***	64.56***
ARBRISK	0.033	0.049	0.047	58.07***	49.97***	5.56***
PRICE	18.205	14.319	13.212	-44.69***	-64.06***	9.49***
VOLUME	25.800	21.900	26.100	-9.29***	0.64	-6.23***
IO	39.161	32.446	33.215	-48.04***	-41.80***	-3.85***

Table II. Average Risk Characteristics for the Full Sample of Firms in the Top and Bottom Quintiles of Earnings Changes (Continued)

Panel B, Firms in the Top (Bottom) Quintiles of Earnings Changes that are Deemed Most Likely to Have Managed Earnings Downward (Upward)						
Variables	**Population**	**Long Position (N = 2,561)**	**Short Position (N = 941)**	***T*-value for Testing the Mean for the Firms in the Long Position Against the Population Mean**	***T*-value for Testing the Mean for the Firms in the Short Position Against the Population Mean**	***T*-value for Testing for Mean Difference Between Firms in the Long and Short Positions**
SIZE	1,756.000	1,342.200	493.980	-4.18***	-24.12***	-7.58***
BM	0.594	0.393	0.484	-25.12***	-10.62***	6.99***
MM	1.181	1.733	1.010	26.96***	-9.63***	-26.69***
ARBRISK	0.033	0.038	0.035	5.98***	1.57	-2.2**
PRICE	18.205	19.370	14.605	3.12***	-9.19***	-8.81***
VOLUME	25.800	25.100	13.300	-0.40	-7.13***	-4.92***
IO	39.161	36.340	31.400	-4.94***	-9.37***	-4.92***

***/** indicates significance at the 1%/5% level using a two-tail t test.

Table III. Average (Standardized) Earnings Changes and Abnormal Accruals by Quintile of (Standardized) Changes in Operating Cash Flows

Change in earnings and change in operating cash flows are seasonal differences standardized by beginning total assets. *SUCF1*, *SUCF2*, *SUCF3*, *SUCF4*, and *SUCF5* are the first, second, third, fourth, and fifth quintiles of changes in operating cash flows. We winsorize the quarterly earnings changes and abnormal accruals at the top and bottom one percentiles. We report *t*-statistics in parentheses and the number of observations in brackets.

	SUCF1	***SUCF2***	***SUCF3***	***SUCF4***	***SUCF5***
Earnings Change	-0.018*** (-54.06) [n=34,430]	-0.003*** (-17.98) [n=39,441]	0.000 (0.86) [n=34,402]	0.003*** (16.75) [n=39,588]	0.023*** (58.15) [n=35,080]
Abnormal Accruals	0.028*** (88.67) [n=34,430]	0.010*** (50.61) [n=39,441]	0.003*** (13.98) [n=34,402]	-0.004*** (-19.77) [n=39,588]	-0.021*** (-64.23) [n=35,080]

*** indicates significance at the 1% level in a two-tailed test.

Table IV. The Association Between Abnormal Accruals and the Post-Earnings-Announcement Drift (N = 71,831)

$ABRET_{it} = \alpha_1 SUEQ1_{it} + \alpha_2 SUEQ5_{it} + \alpha_3 SUEQ1_{it}*ABACQ_{it} + \alpha_4 SUEQ5_{it}*ABACQ_{it} + \alpha_5 SIZED_{it} + \alpha_6 BM_{it} + \alpha_7 MM_{it} + \alpha_8 ARBRISK_{it} + \alpha_9 PRICED_{it} + \alpha_{10} VOLUMED_{it} + \alpha_{11} IO_{it} + \varepsilon_{it}$. The sample includes firms that are in either the top or bottom quintile of earnings changes. *ABRET* is the size-adjusted return measured over the period from 18 trading days after the earnings announcement for Quarter 0 (the current quarter) to 17 trading days after the earnings announcement for Quarter +2 (the second quarter after Quarter 0). *SUEQ1* is a binary variable taking a value of one if the standardized earnings change is in the bottom quintile and zero if it is in the top quintile. *SUEQ5* is a binary variable taking a value of one if the standardized earnings change is in the top quintile and zero if it is in the bottom quintile. *ABACQ* is the quintile of abnormal accruals (the residual from the accrual model). We impose no restriction on abnormal accruals. *SIZED* is the decile of the market value of common equity at the beginning of the current quarter. *BM* is the ratio of the book value of equity to the market value of equity at the beginning of the current quarter. *MM*, momentum, is the stock return from twelve to two months prior to the earnings announcement month. *ARBRISK* is arbitrage risk defined as the residual variance from a standard market model regression of a firm's return on the returns of the CRSP S&P 500 equal-weighted market index over a 48-month period ending one month prior to the earnings announcement month. *PRICED* is the decile of the stock price at the beginning of the current quarter. *VOLUMED* is the decile of the dollar trading volume over the 12-month period ending at the end of the month immediately preceding the earnings announcement quarter. *IO* is the percentage of institutional ownership at the end of the calendar quarter immediately preceding the end of the earnings announcement quarter. Each quarter, we rank size, stock price, and trading volume into deciles. Then, we assign values ranging from –0.5 to 0.5 to the rank deciles. *T*-statistics are reported in parentheses. They are adjusted using one-way clustering at the quarter (time) level. We use one-way clustering because many firms are in the sample only once.

	Column (1)	**Column (2)**
SUEQ1	-0.021 (-1.27)	-0.021 (-0.99)
SUEQ5	0.040^{+++} (2.88)	0.044^{++} (2.21)
*SUEQ1*ABACQ*	-0.062^{+++} (-5.84)	-0.059^{+++} (-5.55)
*SUEQ5*ABACQ*	-0.050^{+++} (-3.81)	-0.049^{+++} (-3.61)
SIZED	–	0.026 (0.83)
BM	–	0.024^{+} (1.34)
MM	–	-0.007 (-0.92)
ARBRISK	–	-0.540^{+++} (-2.40)
PRICED	–	-0.124^{+++} (-2.58)
VOLUMED	–	-0.060^{+} (-1.43)
IO	–	0.001^{++} (1.79)
Adj. R^2	0.003	0.009

$^{+++}/^{++}$ indicates significance at the 1%/5% level using a one-tail t test.

Table V. Trading Strategies Based on Earnings Changes Using those Firms That Are Deemed Least Likely to Have Managed Earnings: Univariate Analysis

We take long positions in those firms with large positive earnings changes (*SUE5*) that are considered least likely to have managed earnings downward and short positions in those firms with large negative earnings changes (*SUE1*) that are deemed least likely to have managed earnings upward. Firms in the long position are judged least likely to have managed earnings downward when earnings are negative, while firms in the short position are deemed least likely to have managed earnings upward when earnings are in the top quintile. We impose no restriction on abnormal accruals. That is, abnormal accruals can take any value for either the short or the long position. We report *t*-statistics in parentheses.

	Long Position ***SUE5* Firms That Are Least Likely to Have Managed Earnings Downward**	**Short Position** ***SUE1* Firms That Are Least Likely to Have Managed Earnings Upward**
Average Buy-and-Hold Abnormal Return	-0.012 (-1.82)	0.010 (1.36)
Alpha from Fama and French's (1993) Three-Factor Model	0.004 (1.17)	0.001 (0.60)
Average Earnings Change	0.085^{+++} (105.18)	-0.032^{+++} (-71.64)
N	12,436	3,074

*** indicates significance at the 1% level in a one-tailed test.

Table VI. Trading Strategies Based on Earnings Changes Using those Firms That Are Deemed Least Likely to Have Managed Earnings: Multivariate Analysis (N = 14,331)

$ABRET_{it} = \alpha_0 + \alpha_1 SUEQ5_{it} + \alpha_2 ABACQ_{it} + \alpha_3 SIZED_{it} + \alpha_4 BM_{it} + \alpha_5 MM_i + \alpha_6 ARBRISK_{it} + \alpha_7 PRICED_{it} + \alpha_8 VOLUMED_{it} + \alpha_9 IO_{it} + \varepsilon_{it}$. The sample includes firms that are in either the top or the bottom quintile of earnings changes. *ABRET* is the size-adjusted return measured over the period from 18 trading days after the earnings announcement for Quarter 0 (the current quarter) to 17 trading days after the earnings announcement for Quarter +2 (the second quarter after Quarter 0). *SUEQ5* is a binary variable taking a value of one if the standardized earnings change is in the top quintile and zero if it is in the bottom quintile. *ABACQ* is the quintile of abnormal accruals (the residual from the accrual model). We impose no restriction on abnormal accruals. *SIZED* is the decile of the market value of common equity at the beginning of the current quarter. *BM* is the ratio of the book value of equity to the market value of equity at the beginning of the current quarter. *MM*, momentum, is the stock return from twelve to two months prior to the earnings announcement month. *ARBRISK* is arbitrage risk defined as the residual variance from a standard market model regression of a firm's return on the returns of the CRSP S&P 500 equal-weighted market index over a 48-month period ending one month prior to the earnings announcement month. *PRICED* is the decile of the stock price at the beginning of the current quarter. *VOLUMED* is the decile of the dollar trading volume over the 12-month period ending at the end of the month immediately preceding the earnings announcement quarter. *IO* is the percentage of institutional ownership at the end of the calendar quarter immediately preceding the end of the earnings announcement quarter. Each quarter, we rank size, stock price, and trading volume into deciles. Then, we assign values ranging from –0.5 to 0.5 to the rank deciles. The numbers of observations in Table V do not sum up to the number of observations in Table VI as some of the control variables in Table VI have missing observations. *T*-statistics are reported in parentheses. They are adjusted using one-way clustering at the quarter (time) level. We use one-way clustering because many firms are in the sample only once.

	Column (1)	**Column (2)**
Intercept	0.007 (0.73)	0.047 (2.13)
SUEQ5	-0.007 (-0.17)	-0.063 (-1.79)
ABACQ	-0.032 (-1.19)	-0.031 (-1.12)
SIZED	–	0.091^{++} (1.76)
BM	–	0.039^{++} (1.92)
MM	–	-0.012 (-1.03)
ARBRISK	–	-0.385^{++} (-2.26)
PRICED	–	-0.198^{+++} (-3.02)
VOLUMED	–	-0.136^{+++} (-2.66)
IO	–	0.001 (1.23)
Adj. R^2	0.000	0.011

$^{+++}/^{++}$ indicates significance at the 1%/5% level using a one-tail *t* test.

Table VII. The Effect of Earnings Management on the Post-Earnings Announcement Drift

In Panel A, the short position includes firms with large negative earnings changes (bottom quintile) and large positive abnormal accruals (top quintile) that are most likely to manage earnings upward (*ABAC1/SUE5/MOST_UP*). The long position incorporates firms with large positive earnings changes (top quintile) and large negative abnormal accruals (bottom quintile) that are most likely to manage earnings downward (*ABAC5/SUE1/MOST_DOWN*). In Panel B, abnormal accruals are replaced by normal accruals. Normal accrual is the difference between total accrual and abnormal accrual. *NAC1* and *NAC5* are the first and the fifth quintiles of normal accruals, respectively. Firms with large negative earnings changes are deemed most likely to have managed earnings upward (and (estimated) positive abnormal accruals most likely to be related to earnings smoothing) when the previous quarter earnings are above zero and the firms would have missed the zero-earnings benchmark in the current quarter if they did not report the income increasing abnormal accruals. Firms with large positive earnings changes are considered most likely to have managed earnings downward (and (estimated) negative abnormal accruals more likely to be related to earnings smoothing) when reported ROA is high (top quintile). We report *t*-statistics in parentheses and the number of observations in brackets. Note that the abnormal returns from Fama and French's (1993) three-factor model are monthly abnormal returns (and not buy-and-hold abnormal returns).

Panel A. Trading Strategy Based on Abnormal Accruals, Earnings Changes, and the Likelihood of Earnings Management

	Long Position ***ABAC1/SUE5/MOST_DOWN***	**Short Position** ***ABAC5/SUE1/MOST_UP***	**Hedge-Portfolio Return**
Average Buy-and-Hold Abnormal Returns	0.091^{+++} (8.23) [n=2,666]	-0.104^{+++} (-8.34) [n=1,010]	0.195^{+++} (9.99)
Fama and French's (1993) Three-Factor Model	0.016^{+++} (6.83)	-0.011^{+++} (-3.55)	0.027^{+++} (7.90)

Panel B. Trading Strategy Based on Normal Accruals, Earnings Changes, and the Likelihood of Earnings Management

	Long Position ***NAC1/SUE5/MOST_DOWN***	**Short Position** ***NAC5/SUE1/MOST_UP***	**Hedge-Portfolio Return**
Average Buy-and-Hold Abnormal Returns	0.085^{+++} (6.89) [n=2,308]	-0.041^{+++} (-2.68) (n=827)	0.126^{+++} (5.58)
Fama and French's (1993) Three-Factor Model	0.010^{+++} (3.56)	-0.007^{++} (-1.98)	0.016^{+++} (4.02)

$^{+++}/^{++}$ indicates significance at the 1%/5% level using a one-tail test.

Table VIII. Association Between Future Returns and the Likelihood of Earnings Management Conditional on Abnormal Accruals and Earnings Changes

ABRET is the size-adjusted return over the period from 18 trading days after the earnings announcement for Quarter 0 (the current quarter) to 17 trading days after the earnings announcement for Quarter+2 (the second quarter after Quarter 0). The expected return is the compound return of the respective firm's CRSP NYSE/AMEX/NASDAQ size-decile portfolio assignment at the beginning of the year. *MOST_DOWN* is a binary variable taking a value of one if (standardized) earnings are high (in the top quintile), and zero otherwise. *LEAST_DOWN* is a binary variable taking a value of one if earnings are negative, and zero otherwise. *OTHER_DOWN* is a binary variable taking a value of one if both *MOST_DOWN* and *LEAST_DOWN* are zero, and zero otherwise. *MOST_UP* is a binary variable taking a value of one if the previous quarter earnings are above zero and the firm would have missed the zero earnings benchmark in the current quarter if it did not report positive abnormal accruals, and zero otherwise. *LEAST_UP* is a binary variable taking a value of one if (standardized) earnings are high (in the top quintile), and zero otherwise. *OTHER_UP* is a binary variable taking a value of one if both *MOST_UP* and *LEAST_UP* are zero, and zero otherwise. *SIZED* is the decile of the market value of common equity at the beginning of the current quarter. *BM* is the ratio of book value of equity to the market value of equity at the beginning of the current quarter. *MM*, momentum, is the stock return from twelve to two months prior to the earnings announcement month. *ARBRISK* is arbitrage risk defined as the residual variance from a standard market model regression of a firm's return on the returns of the CRSP S&P 500 equal-weighted market index over a 48-month period ending one month prior to the earnings announcement month. *PRICED* is the decile of the stock price at the beginning of the current quarter. *VOLUMED* is the decile of the dollar trading volume over the 12-month period ending at the end of the month immediately preceding the earnings announcement quarter. *IO* is the percentage of institutional ownership at the end of the calendar quarter immediately preceding the end of the earnings announcement quarter. Each quarter, we rank size, stock price, and trading volume into deciles. Then, we assign values ranging from –0.5 to 0.5 to the rank deciles. The *t*-values are adjusted using one-way clustering at the quarter (time) level. We use one-way clustering as many firms are in the sample only once.

Panel A. Long Position - SUE5 / ABAC1 (N = 5,787)

$$ABRET_{it} = \alpha_1 MOST\_DOWN_{it} + \alpha_2 LEAST\_DOWN_{it} + \alpha_3 OTHER\_DOWN_{it} + \alpha_4 SIZED_{it} + \alpha_5 BM_{it} + \alpha_6 MM_{it} + \alpha_7 ARBRISK_{it} + \alpha_8 PRICED_{it} + \alpha_9 VOLUMED_{it} + \alpha_{10} IO_{it} + \varepsilon_{it}$$

	Coefficient	***t*-value**
MOST_DOWN	0.091^{+++}	2.93
LEAST_DOWN	0.015	0.31
OTHER_DOWN	0.051^{++}	1.81
SIZED	-0.046	-0.75
BM	0.002	0.09
MM	0.000	0.03
ARBRISK	-0.502^{+}	-1.66
PRICED	-0.199^{+++}	-3.64
VOLUMED	0.001	0.02
IO	0.001^{+}	1.54
Adjusted R^2	0.023	

Table VIII. Association Between Future Returns and the Likelihood of Earnings Management Conditional on Abnormal Accruals and Earnings Changes (Continued)

Panel B. Short Position - SUE1 / ABAC5 (N = 5,278)

$$ABRET_{it} = \alpha_1 MOST\_UP_{it} + \alpha_2 LEAST\_UP_{it} + \alpha_3 OTHER\_UP_{it} + \alpha_4 SIZED_{it} + \alpha_5 BM_{it} + \alpha_6 MM_{it} + \alpha_7 ARBRISK_{it} + \alpha_8 PRICED_{it} + \alpha_9 VOLUMED_{it} + \alpha_{10} IO_{it} + \varepsilon_i$$

	Coefficient	*t*-value
MOST_UP	-0.083^{++}	-2.31
LEAST_UP	-0.017	-0.31
OTHER_UP	-0.023	-0.50
SIZED	0.140^{++}	1.78
BM	0.004	0.12
MM	-0.011	-0.63
ARBRISD	-0.477^{+}	-1.62
PRICED	-0.143^{+}	-1.62
VOLUMED	-0.122^{++}	-1.89
IO	0.001^{+}	1.43
Adjusted R^2	0.011	

$^{+++}$/$^{++}$ indicates significance at the 1%/5% level using a one-tail test.

Table IX. Year by Year Average Abnormal Return from the Trading Strategy Based on Abnormal Accruals, Earnings Changes, and the Likelihood of Earnings Management

The abnormal returns are the average size-adjusted buy-and-hold returns for the four quarters of the year. The sample starts in the second calendar quarter of 1990 and ends in the fourth calendar quarter of 2006. The abnormal returns are computed daily over the 120 trading days starting 18 trading days after the earnings announcement. The short position includes firms with large negative earnings changes (bottom quintile) and large positive abnormal accruals (top quintile) that are most likely to manage earnings upward, while the long position includes firms with large positive earnings changes (top quintile) and large negative abnormal accruals (bottom quintile) that are most likely to manage earnings downward.

Year	Average Hedge-Portfolio Return
1990	0.168
1991	0.217
1992	0.182
1993	0.101
1994	0.154
1995	0.259
1996	0.064
1997	0.187
1998	0.301
1999	0.505
2000	0.195
2001	0.128
2002	0.234
2003	0.069
2004	0.052
2005	0.110
2006	0.076

Figure I. The Drift from Various Alternative Trading Strategies Based on Abnormal Accruals, Earnings Changes, and the Likelihood of Earnings Management

The abnormal returns are the average size-adjusted returns. *SUE1* and *SUE5* are the first and the fifth quintiles of (standardized) earnings changes defined as the seasonal change in the ratio of net income to total assets. *ABAC1* and *ABAC5* are the first and the fifth quintiles of abnormal accruals computed as the residual from a modified accrual model. The observations are pooled across all the quarters from the second calendar quarter of 1990 to the fourth calendar quarter of 2006. The abnormal returns are computed daily over the 120 trading days starting 18 trading days after the earnings announcement. *MOSTUP* designates *SUE1/ABAC5* firms that are most likely to have managed earnings upward. *MOSTDOWN* designates *SUE5/ABAC1* firms that are most likely to have managed earnings downward.