# WORKING CAPITAL ACCRUALS AND EARNINGS MANAGEMENT[1]

Joseph Kerstein[*], Atul Rai[**]


## Abstract

We reexamine market reactions to large and small working capital accruals and predict that the market is more likely to discount unexpected earnings when *positive or negative* large working capital accruals (LWCAs) lead to small increases in earnings. We find that the earnings response coefficient (ERC) is lower when small earnings increases are accompanied by LWCAs of either sign, but not in other cases. Results are robust to alternate definitions of working capital accruals and the inclusion of ERC control variables. The study contributes to extant literature by identifying specific situations where the market views LWCAs as earnings management.


**Key words:** Earnings management; large discretionary working capital accruals; earnings response coefficient; earnings quality.
**JEL Classification:** M4; L14; C89.

## 1. Introduction

The accrual method of accounting has been widely criticized as allowing managers too many opportunities to use discretionary accounting choices to manage earnings. The practice of altering earnings to mislead stakeholders or achieve contractual outcomes is 'earnings management' (Schipper, 1989). Earnings management has enabled firms to be profitable, achieve positive earnings surprises and smooth earnings growth (Carslaw, 1988; Burtstahler and Dichev, 1997; Degeorge et al., 1999; Barth et al., 1999; Matsumoto, 2002). Prior research suggests that the market relies on working capital accruals to mitigate timing and matching problems inherent in cash flows (Dechow, 1994). This implies either that working capital accruals are not generally managed, or that the market does not recognize (or ignores) earnings management.

If the market is unable to detect earnings management, questions can be raised about the effectiveness of auditors/accounting regulations in identifying earnings management, and/or the market's efficiency in recognizing managerial motivations behind accounting choices. The literature provides mixed evidence about the market's ability to see through earnings management. Sloan (1996) finds evidence that the market misjudges the time series properties of accruals. He suggests that the market overestimates the persistence of low quality (high accrual) earnings and underestimates the persistence of high quality (low accrual) earnings. Dechow and Skinner (2000) (DS) suggest that the market is inefficient in detecting earnings management to reach simple earnings targets. DS argue that extreme reactions to small deviations from simple benchmarks such as analysts' earnings predictions indicate that the market uses overly "simple heuristics" to measure economic performance forecasts. On the other hand, focusing on non-linear relations between returns and large absolute discretionary working capital accruals, Ali (1994) finds that the market distinguishes between the persistence of unexpected accruals that are large compared to those that are small in absolute value[2]. He suggests that the market expects *either large positive or large negative* discretionary working capital accruals to be more transitory than smaller amounts. Ali,

---

[*] Baruch College, City University of New York, USA.
[**] Wichita State University, USA.

[1] We gratefully acknowledge comments from Masako Darrough, John Elliott, Aloke Ghosh, Suresh Govindaraj, Anthony Kozberg, Steve Lilien, Rick Morton, Bill Ruland, Steve Ryan, Bharat Sarath, and seminar participants in University of Alabama, University of Florida, and Florida State University. Any errors that remain are our own.

[2] Defond and Park (2001) also examine the market's reaction to unexpected working capital accruals but in contrast to Ali (1994) do not concentrate on annual earnings changes and the market's reaction to large versus small working capital accruals and earnings surprises.

however, does not consider the overall relation between large discretionary working capital accruals (LWCAs), earnings management and earnings response coefficients (ERCs).

We examine the market's reaction to positive and negative earnings changes influenced by LWCAs and predict circumstances where LWCAs lead to varying market expectations of earnings quality, which has neither been suggested nor tested in earlier work. We argue that annual earnings changes associated with either positive or negative LWCAs are more likely to be viewed by the market as being managed and, therefore, being of lower quality when they are associated with small earnings changes. On the other hand, we anticipate that the existence of LWCAs does not, in and of itself, necessarily connote earnings management to the market. For example, large positive earnings surprises having positive LWCAs are inconsistent with the 'bonus hypothesis' (Healy, 1985). Managers are normally expected to reserve accruals for use in future earnings management rather than greatly overshoot bonus earnings targets. The existence of positive LWCAs along with small earnings declines is also inconsistent with likely managerial incentives, which, according to the literature, encourage managers to increase accruals a bit more to achieve positive earnings growth. Possible alternative explanations for LWCAs include value-increasing actions (i.e., positive signals), attempts to mitigate timing problems, or errors in the measure ( Kothari, Leone and Wasley, 2004)[1]. We expect conflicting differences in the reasons why LWCAs exist to lead to diverse investor opinions, resulting in a less predictable market reaction.

In general, we expect the market to characterize discretionary working capital accruals as follows:

1. Positive or negative LWCAs associated with small earnings increases are likely to be perceived as earnings management;
2. Small positive or negative discretionary working capital accruals are more likely to represent *non-discretionary* accruals or measurement error and less likely to be viewed as earnings management;
3. Positive or negative LWCAs lead to more disagreements about managerial motivations among market participants except when they result in small earnings increases.

We focus on annual earnings changes (similar to Ali, 1994) because there is widespread interest by investors, analysts and compensation committees in annual earnings trends, which is likely to affect managerial incentives to manage earnings. In addition, there is more detailed information available in annual filings from which the market can assess earnings management. In designing our tests, we focus on working capital accruals rather than total accruals because working capital accruals have been found to be especially important in helping the market resolve problems inherent in cash flows from operations (Dechow, 1994). In addition, we avoid potential noise in our measure given the mixed evidence surrounding the use of large negative non-working capital accruals to take 'big baths' (White, Sondhi and Fried, 2003, p. 60). We concentrate on earnings before extraordinary and special items as our primary measure of earnings. We exclude loss firms from our analysis since earnings management has been found to be less important when earnings are negative (Degeorge et al., 1999)[2]. Similar to Ali (1994), we allow for separate valuation of small and large absolute earnings changes[3]. In addition, we control for factors that have been found in previous work to affect the ERC including growth, persistence, and risk (Collins and Kothari, 1989), so that ERC differences attributable to LWCAs are more likely to be related to lower earnings quality than be surrogates for those other factors. Also, consistent with extant research, we expect large positive or negative unexpected working capital accruals to involve a greater degree of discretionary accounting choices than small negative or positive unexpected working capital accruals.

---

[1] Since non-discretionary accruals are unobserved variables, an exact measure of discretionary accruals is typically not likely to occur.

[2] In our sensitivity analysis, however, the results are qualitatively similar when losses are included.

[3] Ali (1994) finds that the ERCs are lower under these circumstances, consistent with Brooks and Buckmaster (1976) and Freeman, Ohlson, and Penman (1982) who find that when the absolute change in earnings is small, a random-walk model is a good approximation for annual earnings time-series properties, while a mean-reverting model is a better one for large absolute changes in earnings.

Our sample is divided into four mutually exclusive groups: (a) positive small earnings changes, (b) negative small earnings changes, (c) positive large earnings changes, and (d) negative large earnings changes. We separately analyze the effects of positive or negative LWCAs on the ERCs within each group (the cases identified by the market as being of lower quality earnings are expected to be found in category ‘a’). We divide our earnings surprises and discretionary working capital accruals into large (small) categories based on whether the magnitudes exceed (are less than or equal to) the annual median of the firm’s industry[1]. Our working capital accruals expectation model relies on the historic relationship between sales and working capital (Defond and Park, 2001). Our main finding suggests that the market discount earnings surprises with LWCAs in the small earnings increase group but not in the other groups.

The remainder of this paper is organized as follows. Section 2 describes hypotheses development. Section 3 describes the research design. Section 4 identifies sample selection and data. Section 5 discusses results, and section 6 concludes the paper.

## 2. Hypotheses Development

As noted previously, the magnitude of absolute unexpected working capital accruals is anticipated to be positively associated with the degree of managerial discretion. This suggests that LWCAs are more likely than smaller unexpected working capital accruals to signify earnings management and the existence of lower earnings quality to the market. The fact that LWCAs exist does imply, however, that the market identifies managerial intentions behind accounting choices. We predict that the market is more likely to anticipate managerial motivations when they are consistent with established managerial incentives. For example, managers may use *negative* LWCAs to avoid large earnings shocks, ending up with small earnings increases and the impression of smoother earnings growth. Although the market normally prefers (i.e., puts a premium on) smoother earnings, the use of extraordinary means such as LWCAs to mask earnings variance is likely to suggest lower earnings quality once the market sees through the manager’s attempts. In addition, managers may use *positive* LWCAs to transform earnings declines into positive (but not excessive) earnings growth, a desirable outcome for achieving bonuses. Whether firms mask much higher variance or the existence of earnings declines, the market is anticipated to discount the value of earnings that it perceives as being of lower quality. This leads to the first hypothesis stated in both the null and the alternate forms:

> $H_{1,0}$: *Negative or positive LWCAs have no impact on the ERCs of firms reporting positive small earnings surprises.*
>
> $H_{1,A}$: *Negative or positive LWCAs reduce the ERCs of firms with positive small earnings surprises.*

When earnings surprises are negative but small in magnitude, the managerial motivations surrounding positive or negative LWCAs are not clearly evident to the market. For example, when firms use large positive LWCAs to report small earning declines, by not using a little extra working capital accruals they appear to waste an opportunity to report earnings increases which are highly desirable earnings targets. If it was not possible to increase working capital accruals further, then accruals could be saved for flexibility in reporting earnings in future periods. Similarly, the existence of negative LWCAs in the presence of earnings below last year’s levels is unlikely to be the result of earnings management and, therefore, the market is more likely to view LWCAs as being credible. In the absence of clear motivations behind managerial choices, there is more diversity of views among investors about the firm’s prospects compared to cases involving more transparent earnings management, the implication being that market reactions are likely to be mixed. This suggests the second hypothesis, both in the null and the alternate forms:

> $H_{2,0}$: *Positive or negative LWCAs have no impact on ERCs of firms reporting small earnings declines.*

[1] We use the median of the industry rather than the sample median as the demarcation point given our decision to truncate ‘loss’ firms.

*$H_{2,A}$: Positive or negative LWCAs reduce ERCs of firms reporting small earnings declines.*

The existence of positive or negative LWCAs in large positive or negative earnings surprises also obfuscates managerial intentions because an earnings management strategy is expected to be a multi-period one that retains future flexibility. This suggests that the managerial motivation behind positive LWCAs that occur along with large positive earnings surprises is not clearly evident to the market. The existence of negative LWCAs and large positive earnings surprises also raises questions about managerial motivations, i.e., why didn't managers achieve smoother earnings growth and, in the absence of being able to do so, save negative discretionary accruals for a different time. The existence of positive LWCAs and negative earnings shocks is also inconsistent with the 'big bath'. Finally, the existence of negative LWCAs and negative earnings shocks is consistent with a 'big bath', but working capital accruals have not been identified as the usual vehicle for achieving 'big baths'. The literature normally points to the disposal of bad long-term investments as a way for firms to 'clear the deck'. This leads to the third hypothesis, both in the null and the alternate forms:

*$H_{3,0}$: Positive or negative LWCAs have no impact on ERCs of firms reporting large earnings increases or declines.*

*$H_{3,A}$: Positive on negative LWCAs reduce ERCs of firms reporting large earnings increases or declines.*

## 3. Research Design

We assume a random walk model for annual earnings and use annual earnings changes as a proxy for unexpected earnings or earnings surprises. We examine ERCs for the following four mutually exclusive groups that correspond to our four regression tables: (a) positive earnings surprises of small magnitude, (b) negative earnings surprises of small magnitude, (c) positive earnings surprises of large magnitude, and (d) negative earnings surprises of large magnitude. To test our hypotheses, we use dummy variables within each group representing the existence of either positive or negative LWCAs. In addition, we control for variables that prior research has identified to be determinants of cross-sectional differences in ERCs. Thus, ERC differences attributable to LWCAs are more likely to be related to lower earnings quality than be viewed as surrogates for those other factors. Consistent with prior work (e.g., Ali, 1994), we use a long-window association study.

***Annual return (RET)***

We use raw returns computed as the compounded monthly returns from nine months prior to the fiscal year-end to three months after the fiscal year-end as the dependent variable.

***Unexpected working capital accruals ($\Delta WC_t$) and absolute unexpected working capital accruals ($|\Delta WC_t|$):***

Working capital from operations for period t is defined as current assets (net of cash and short-term investments) minus current liabilities (net of short-term debts)[1]:

$WC_t = (Data\ 4_t - Data\ 1_t) - (Data\ 5_t - Data\ 104_t)$[2].

There have been different measures of unexpected working capital accruals in the literature. Ali (1994) and Dechow (1994) use a random-walk expectation model to capture annual surprises in working capital accruals. They both examine cases involving different rankings of absolute values of working capital surprises. Defond and Park (2001) (DP) base their working capital accrual expectations model on how much working capital is normally needed to support current

[1] Unless otherwise specified, all data are obtained from Year 2001 Annual Compustat dataset at Wharton Research Data System. Data numbers refer to COMPUSTAT data item numbers. Firm subscript j is omitted for sake of brevity.

[2] If short term debt (Data $104_t$) was missing then it was replaced by zero.

sales. Our approach is similar to DP (although we test the other model in our sensitivity analysis) where we define expected working capital as:

$E(WC_t) = WC_{t\text{-}1}$ x $Sales_t$ / $Sales_{t\text{-}1} = WC_{t\text{-}1}$ x ($Data$ $12_t$/$Data$ $12_{t\text{-}1}$)

We define unexpected working capital ($\Delta WC_t$) as the difference between the actual working capital $WC_t$, and the expected working capital, $E(WC_t)$, scaled by the beginning period market value.

$\Delta WC_t = [WC_t - WC_{t\text{-}1}$ x ($Data$ $12_t$/$Data$ $12_{t\text{-}1}$)]/ ($Data199_{t\text{-}1}$ x $Data$ $25_{t\text{-}1}$).

Our measure of 'large' working capital accruals (LWCA) is consistent with the ones used in earlier studies. We first rank all observations of $|\Delta WC_t|$ in one of fifteen industrial sectors. Industrial sectors are defined according to the definition used in Barth, Beaver and Landsman (1998). Variable $LWCA_t$ for a firm j equals 1 if $|\Delta WC_t|$ is above the median for the industry of firm j in year t (zero, otherwise).

After creating the variable LWCA to classify whether unexpected working capital accruals are large or small, we then define dummy variables $RWP_t$ and $RWN_t$ based on whether unexpected working capital accruals are positive or negative as follows:

$RWP_t = 1$ if $LWCA_t = 1$ and $\Delta WC_t$ is positive, $RWP_t$ equals 0 otherwise.

$RWN_t = 1$ if $LWCA_t = 1$ and $\Delta WC_t$ is negative. $RWN_t$ equals 0 otherwise.

***Earnings changes ($\Delta NI_t$) and absolute changes in earnings ($|\Delta NI_t|$)***

We use earnings before extraordinary items and special items. By excluding extraordinary items and special items, we reduce the likelihood that our results are driven by the market's response to one-time events. We use changes in annual earnings (scaled by beginning of the period market value) as a proxy for unexpected earnings under the assumption that annual earnings follow a random walk process.

$\Delta NI_t$, = unexpected earnings = Change in Earnings before extraordinary items and special items, divided by market value at the beginning of the period.

= [(Data $18_t$ – Data $17_t$) – (Data $18_{t-1}$ – Data $17_{t-1}$)] /(Data$199_{t-1}$ x Data $25_{t-1}$).

We define dummy variable $RE_t$ to identify firm-years with large magnitude of unexpected earnings. Analogous to LWCA, $RE_t$ is defined by ranking firms according to $|\Delta NI_t|$ within each industry group.

***Control Variables ($X_{j,t}$ j = 1 to 11)***

Prior research has identified control variables that are related to the cross-sectional differences in ERCs. We include a total of eleven control variables in our market returns regressions. They include size, book-to-market, and debt to equity as risk proxies (Fama and French, 1992); separate proxies for growth, persistence, and change in book value (Barth et al., 1999); and interactions between all of these variables (except the change in book value) and earnings surprises. Control variables are described in Appendix A.

We estimate equation (1) below separately for each of our four regression tables (i.e., one each for small positive earnings changes, small negative earnings changes, large positive earnings changes, and large negative earnings changes). To test hypothesis 1, we examine regression coefficients in an estimation using only those observations that have small and positive earnings surprises, i.e., the dummy variable for large absolute unexpected earnings ($RE_t$) = 0 and $\Delta NI_t > 0$. To test hypothesis 2, we use observations with small and negative earnings surprises, i.e., $RE_t = 0$ and $\Delta NI_t < 0$. To test hypothesis 3, we use observations with large and positive earnings surprises, i.e., $RE_t = 1$ and $\Delta NI_t > 0$. We also test it separately for observations with large and negative earnings surprises, i.e., $RE_t = 1$ and $\Delta NI_t < 0$.:

$$RET_t = a_{0,t} + a_{1,t}\Delta NI_t + a_{2,t}RWP_t \times \Delta NI_t + a_{3,t}RWN_t \times \Delta NI_t + a_{4,t}RWP_t + a_{5,t}RWN_t + \sum_{j=1}^{11} a_{j+5,t} \times X_{j,t} \quad (1)$$

The marginal price response to unexpected earnings is $a_{1,t}$ for firms with small accruals. It is ($a_{1,t}+a_{2,t}$) for firms with positive LWCAs. It is ($a_{1,t}+ a_{3,t}$) for firms with negative LWCAs. A negative value of $a_{2,t}$ ($a_{3,t}$) indicates that the marginal price response to earnings is lower for firms with positive (negative) LWCAs. Tests of the three hypotheses of the study are conducted by examining whether coefficient $a_{2,t}$, < 0 and $a_{3,t} < 0$.

We estimate each of these equations separately for each year t and use Fama and Macbeth (1973) tests on our coefficients. To control for extreme observations affecting cross-sectional results, we use the DFFITS criteria (Belsley et al., 1980, pp. 28-29), which enables us to identify and then delete observations that have a large influence on parameter estimates.

In addition to estimating the equations for each year separately, we also estimate each equation using pooled regressions after adding year dummy variables to allow for year-wise variation in the intercept. Similar to individual year regressions, we use the DFFITS procedure to ensure that our results are not unduly influenced by extreme observations. To control for heteroscedasticity in the pooled sample, we examine consistent estimates of the covariance matrix using the White (1980) procedure. Finally, we conduct sensitivity analysis to check the robustness of our results.

## 4. Sample Selection

We use financial statement data for the period of 1982-2001 from Year 2001 COMPUSTAT annual dataset that includes industrial, full coverage, and research files. We obtain stock return data from Year 2001 CRSP dataset. Calculations of earnings variance and earnings growth require four prior years of data. Thus the first year of estimation is 1986. This sample consists of 41,936 firm-year observations for a sixteen-year period from 1986 to 2001. In the full sample, 21,114 firm-year observations are ranked as small $|\Delta NI_t|$ firm-years and 20,822 firm-years as large $|\Delta NI_t|$ firm-years[1]. Of all small $|\Delta NI_t|$ firm-years, 18,942 (89.7%) firm-years reported profit. Of all large $|\Delta NI_t|$ firm-years, 12,952 (62.2%) firm-years reported profit. After calculating annual industry ranks based on the full sample, we select only those firms that reported profits before extra-ordinary items and special items[2]. The final sample for regressions and tests of hypotheses consists of firm-years with positive net income, consisting of 31,894 firm-year observations (18,942 small $|\Delta NI_t|$ and 12,952 large $|\Delta NI_t|$ firm-years).

## 5. Results

Table 1 reports the frequency of small accruals, positive LWCAs and negative LWCAs for small and large $|\Delta NI_t|$ firms in the sample. For firms reporting small increase in earnings (RE = 0 and $\Delta NI > 0$), 8439 firm-years (67%) used small accruals, 1944 firm-years (15.5%) used positive LWCAs and the remaining 2195 firm-years (17.5%) used negative LWCAs. Approximately equal frequency of positive and negative LWCAs suggests that earnings smoothing (masking the variance) and earnings management to report small increase in earnings (masking the level) are equally likely. For firms reporting a small decrease in earnings (RE = 0 and $\Delta NI < 0$), 3951 firm-years (62.1%) had small discretionary accruals, 1199 firms (18.8%) had positive LWCAs and the remaining 1214 firm-years (19.1%) had negative LWCAs. For firms reporting large increase in earnings (RE = 1 and $\Delta NI > 0$), 3412 firm-years (36.5%) had small accruals, 2698 firm-years (28.9%) had positive LWCAs, and the remaining 3239 firm-years (34.6%) had negative LWCAs. For firms reporting large decrease in earnings (RE = 1 and $\Delta NI < 0$) 1598 firm-years (44.4%) had small accruals, 1052 firm-years (29.2%) had positive LWCAs and the remaining 953 firm-years (26.4%) had negative LWCAs. The fact that nearly three quarters of the firms did not use negative LWCAs in this last group tends to suggest that other means were being used to obtain big baths.

---

[1] The main reason that small and large $|\Delta NI_t|$ groups do not have equal number of observations is because the ranking takes place each year for each industry. To the extent that industry-year groups have odd-numbered firms, inequality in the two groups may result.

[2] As explained earlier, the ranking of firms prior to deleting loss firms is done to ensure that the abnormal performance is measured relative to the entire industry rather than relative to only profitable firms.

Table 1

Classification of Earnings Changes and Unexpected Working Capital Accruals

| Magnitude of absolute changes in earnings ($\|\Delta NI_t\|$) of profit firms | Increase/Decrease in earnings | Unexpected Accrual Classification | Firm-Years |
|---|---|---|---|
| Small magnitude of $\|\Delta NI_t\|$ (18,942 firm-years) | Increase in earnings (12,578 firm-years) | Normal (LWCA = 0) | 8,439 |
| | | Large and Positive (RWP = 1) | 1,944 |
| | | Large and Negative (RWN = 1) | 2,195 |
| | Decrease in earnings (6,364 firm-years): | Normal (LWCA = 0) | 3,951 |
| | | Large and Positive (RWP = 1) | 1,199 |
| | | Large and Negative (RWN = 1) | 1,214 |
| Large magnitude of $\|\Delta NI_t\|$ (12,952 firm-years) | Increase in earnings (9,349 firm-years) | Normal (LWCA = 0) | 3,412 |
| | | Large and Positive (RWP = 1) | 2,698 |
| | | Large and Negative (RWN = 1) | 3,239 |
| | Decrease in earnings (3,603 firm-years) | Normal (LWCA = 0) | 1,598 |
| | | Large and Positive (RWP = 1) | 1,052 |
| | | Large and Negative (RWN = 1) | 953 |
| Total Firm-Years | | | 31,894 |

Notes:

1. $\Delta NI_t$ = (Change in firm j's earnings before extraordinary items and special items for fiscal year t)/ (market value of the firm)$_{t-1}$. Subscript j is omitted everywhere for sake of brevity.

2. Each year firms are ranked according to their $|\Delta NI_t|$ within their respective industry. Industries are classified according to Barth et al. (1998). $|\Delta NI_t|$ above (below) the industry median are classified as large (small) change in earnings.

3. $WC_t$ = Working capital accrual for firm j for fiscal-year t = Current assets net of cash - current liabilities net of short term debt.

$E(WC_t)$ = Expected working accrual for firm j for fiscal-year t = $WC_{t-1}$ x ($Sales_t$ / $Sales_{t-1}$)

$\Delta WC_t$ = Unexpected working capital accrual = [$WC_t$ - $E(WC_t)$] / (market value of the firm)$_{t-1}$

4. Each year, firms are ranked according to their $|\Delta WC_t|$ within their respective industry. Industries are classified according to Barth et al. (1998). Dummy variable LWCA equals 1 when $|\Delta WC_t|$ is above the industry median, and zero otherwise.

5. $RWP_t$ ($RWN_t$) = 1 when LWCA = 1 and $\Delta WC_t$ is positive (negative). $RWP_t$ ($RWN_t$) = 0 otherwise.

6. After the ranking, only those firms that reported profit were included in the sample. The sample consists of 31,894 firm-year observations.

To test the first hypothesis of this study, we estimate equation (1) using only those observations that have annual profits, small increases in earnings, i.e., small $|\Delta NI_t|$ and a positive change in earnings. This results in 12,578 firm-year observations[1]. Table 2 reports the regression estimates of equation (1) for this group. The mean of yearly coefficients on $\Delta NI_t$ with small accruals ($a_{1t}$) is 15.61 (t =7.19). The coefficient on $RWP_t*\Delta NI_t$, $a_{2,t}$, is –3.02 (t = –2.36). A negative and significant coefficient on $RWP_t*\Delta NI_t$ shows that the marginal response to unexpected earnings is significantly lower for firms with positive LWCAs ($RWP_t$ =1 ) than for firms with small accruals. The mean of yearly ERCs for the positive LWCA firms ($a_{1,t}$+$a_{2,t}$) is 12.59 and is significant (t = 6.37, not reported). This indicates a 19% decline in the ERC of firms with positive LWCAs in comparison to firms with small accruals. The coefficient on $RWN_t*\Delta NI_t$, $a_{2,t}$, is –3.59 (t = –3.43), suggesting that the marginal response to unexpected earnings is smaller for firms with negative LWCAs ($RWN_t$ = 1 ) than for firms with small accruals. The mean of yearly ERCs for the negative LWCA firms ($a_{1,t}$+$a_{3,t}$) is 12.02 and is significant (t = 4.61, not reported). This indicates a 23% decline in the ERC of firms with small negative accruals in comparison to firms with small discretionary accruals. Thus, LWCAs of either positive or negative signs are associated with reduced ERCs when earnings changes are small increases.

[1] Actual number of observations used in each regression is different due to elimination of influential observations through the procedure of Belsley et al. described in section 3 of this paper.

Table 2

Impact of AWCAs on information content of small increase in earnings

| | $RET_t = a_{0,t} + a_{1,t}\Delta NI_t + a_{2,t}RWP_t \times \Delta NI_t + a_{3,t}RWN_t \times \Delta NI_t + a_{4,t}RWP_t + a_{5,t}RWN_t + \sum_{j=1}^{11} a_{j+5,t} \times X_{j,t}$ | | | | | | | | | | | | | | | | Year-wise Regression | | Pooled Regression | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Coeff. Mean | t-statistic | Coeff. | White t-statistic |
| Intercept | -0.07 | -0.11 | -0.15 | -0.13 | -0.05 | 0.13 | -0.26 | 0.01 | -0.21 | -0.17 | -0.16 | -0.17 | -0.40 | -0.02 | -0.15 | 0.11 | -0.11 | -3.37 | -0.21 | -6.02 |
| $\Delta NI_t$ | 14.0 | 5.42 | 12.96 | 10.52 | 20.50 | 11.43 | 13.43 | 15.24 | 24.52 | 27.71 | 7.47 | 21.35 | 8.98 | 35.51 | 2.36 | 18.39 | 15.61 | 7.19 | 12.47 | 9.50 |
| $RWP_t \times \Delta NI_t$ | -5.02 | 3.51 | -1.82 | -1.29 | -1.14 | -8.52 | -0.69 | -1.56 | -7.77 | -10.56 | -0.27 | -14.41 | 3.94 | 1.07 | 1.06 | 4.86 | -3.02 | -2.36 | -3.35 | -3.88 |
| $RWN_t \times \Delta NI_t$ | -6.47 | -1.28 | -2.21 | -8.36 | -0.73 | -2.68 | -6.24 | -6.40 | -5.49 | -10.25 | -1.37 | -3.61 | -4.59 | 3.42 | -6.94 | 5.72 | -3.59 | -3.43 | -3.24 | -4.15 |
| Other variables | | | | | | | | | | | | | | | | | | | | |
| $RWP_t$ | -0.05 | -0.03 | -0.02 | -0.04 | -0.03 | 0.04 | -0.03 | -0.01 | 0.08 | 0.10 | -0.01 | 0.12 | -0.05 | -0.15 | -0.01 | -0.18 | -0.02 | -0.85 | 0.01 | 0.42 |
| $RWN_t$ | 0.07 | -0.01 | -0.01 | 0.09 | 0.03 | 0.05 | 0.05 | 0.07 | 0.06 | 0.17 | 0.01 | 0.06 | 0.00 | -0.06 | 0.09 | 0.09 | 0.05 | 3.41 | 0.03 | 2.35 |
| $x_{1,t}$ | 0.10 | 0.15 | 0.18 | 0.07 | -0.08 | 0.05 | 0.26 | 0.12 | -0.02 | 0.10 | 0.14 | 0.18 | 0.01 | -0.04 | 0.21 | 0.68 | 0.13 | 3.04 | 0.10 | 6.90 |
| $x_{2,t}$ | -0.01 | -0.03 | 0.00 | -0.01 | 0.00 | -0.02 | 0.02 | -0.01 | 0.00 | 0.00 | -0.01 | 0.01 | -0.01 | -0.03 | 0.01 | 0.03 | 0.00 | -0.96 | 0.00 | -0.99 |
| $x_{3,t}$ | 0.03 | 0.01 | 0.02 | 0.03 | 0.03 | 0.00 | 0.03 | -0.01 | 0.03 | 0.04 | 0.03 | 0.05 | 0.05 | 0.02 | 0.02 | -0.04 | 0.02 | 3.69 | 0.03 | 10.35 |
| $x_{4,t}$ | -0.58 | -0.50 | -0.61 | -0.07 | -0.08 | -0.32 | -0.52 | -0.17 | -0.28 | -0.20 | -0.35 | -0.38 | -0.29 | 0.23 | -0.42 | -0.42 | -0.31 | -5.66 | -0.30 | -8.62 |
| $x_{5,t}$ | 0.01 | -0.02 | 0.01 | 0.00 | -0.01 | 0.01 | -0.02 | 0.00 | 0.00 | 0.00 | -0.01 | 0.00 | 0.00 | 0.00 | -0.06 | -0.30 | -0.03 | -1.36 | 0.00 | -3.92 |
| $x_{6,t}$ | 0.45 | -0.12 | 0.02 | 0.17 | 0.39 | 0.27 | 0.43 | -0.03 | 0.18 | 0.43 | 0.12 | 0.30 | 0.34 | 1.82 | 0.71 | -0.09 | 0.34 | 2.97 | 0.34 | 10.24 |
| $x_{7,t}$ | -7.65 | -9.42 | -4.83 | -6.98 | -10.97 | -0.44 | -6.45 | -5.53 | -0.12 | -9.78 | -3.07 | -12.19 | -10.58 | -16.17 | 0.98 | -32.06 | -8.45 | -4.31 | -4.08 | -4.90 |
| $x_{8,t}$ | -1.34 | 0.24 | 0.26 | 0.85 | -2.23 | 0.79 | -0.80 | -0.75 | -1.01 | -1.15 | 0.83 | -0.45 | 0.50 | -2.69 | -0.01 | 2.25 | -0.29 | -0.93 | 0.04 | 0.67 |
| $x_{9,t}$ | 0.20 | 0.40 | -0.99 | -0.37 | -1.03 | -0.60 | -0.35 | -0.22 | -1.94 | -1.79 | -0.19 | 1.33 | -0.10 | -2.22 | -0.08 | -0.52 | -0.70 | -3.56 | -0.67 | -4.45 |
| $x_{10,t}$ | 6.85 | 19.34 | 30.31 | 9.85 | -2.51 | 26.53 | 27.15 | 9.62 | 3.71 | 8.05 | 9.48 | 31.95 | 5.86 | -24.18 | 9.22 | 41.39 | 13.29 | 3.36 | 11.00 | 5.00 |
| $x_{11,t}$ | -0.13 | 1.32 | -0.82 | -0.21 | 0.64 | -1.48 | -0.18 | 0.11 | -0.21 | -0.06 | 0.58 | -0.03 | -0.63 | 1.11 | 1.62 | 8.98 | 0.66 | 1.13 | 0.04 | 1.12 |
| Observations | 584 | 691 | 722 | 664 | 684 | 640 | 763 | 816 | 913 | 885 | 907 | 938 | 863 | 873 | 832 | 119 | 743.38 | | 12164 | |
| Adj-Rsq | 0.16 | 0.06 | 0.13 | 0.09 | 0.09 | 0.09 | 0.14 | 0.13 | 0.11 | 0.10 | 0.09 | 0.07 | 0.13 | 0.13 | 0.10 | 0.22 | 0.11 | | 0.14 | |

1. See Notes 1 through 6 of Table 1 for definitions of $\Delta NI_t$, $RWP_t$ and $RWN_t$.
2. Sample in this table consists of firms that have (i) profit, i.e $NI_t > 0$, (ii) increase in earnings, i.e. $\Delta NI_t > 0$, and (iii) the increase is small, i.e. $|\Delta NI_t| \leq$ industry median. 12,578 firm-years spanning a sixteen-year period from 1986 to 2001 met these criteria.
3. $RET_t$ = Annual return of firm j for fiscal year t, calculated by compounding monthly returns from nine months before the end of fiscal year t, to three months after the end of fiscal year t.
4. Control variables for each firm j, for fiscal year t ($X_{i,t}$, i = 1 to 11) are defined in Appendix A..
5. Year-wise regression mean is the mean of annual regression coefficients over 16 annual regressions. Year-wise regression t-statistic is calculated as the mean of the year-wise coefficient divided by its standard error, similar to Fama and MacBeth (1973). Each regression uses Belsley et al. (1980) diagnostic DFFITS to identify and delete influential observations, hence the actual number of observations used is less than the number of observations mentioned in Note 2.
6. Pooled regression coefficient estimates are based on consistent estimates of the covariance matrix using White (1980) procedure. The regression uses Belsley et al. (1980) diagnostic DFFITS to identify and delete influential observations, hence the actual number of observations used is less than the number of observations mentioned in Note 2.

Table 3

## Impact of AWCAs on information content of small decrease in earnings

| | $RET_t = a_{0,t} + a_{1,t}\Delta NI_t + a_{2,t}RWP_t \times \Delta NI_t + a_{3,t}RWN_t \times \Delta NI_t + a_{4,t}RWP_t + a_{5,t}RWN_t + \sum_{j=1}^{11} a_{j+5,t} \times X_{j,t}$ | | | | | | | | | | | | | | | | Year-wise Regression | | Pooled Regression | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Coeff. Mean | t-statistic | Coeff. | White t-statistic |
| Intercept | -0.26 | -0.34 | -0.29 | -0.38 | -0.20 | 0.10 | -0.40 | -0.30 | -0.18 | -0.06 | -0.01 | 0.05 | -0.40 | 0.03 | -0.43 | -0.26 | -0.21 | -4.71 | -0.21 | -5.58 |
| $\Delta NI_t$ | 5.47 | 1.66 | -8.29 | -7.76 | 10.66 | 1.65 | 3.51 | 4.67 | 13.87 | 10.68 | 24.74 | 11.27 | 11.37 | -3.12 | -10.93 | -0.53 | 4.31 | 1.84 | 4.02 | 2.82 |
| $RWP_t \times \Delta NI_t$ | 5.81 | -3.21 | -1.16 | 2.03 | -0.88 | 0.62 | 5.24 | -2.34 | 1.58 | 0.74 | 8.94 | -7.04 | -1.65 | -6.33 | 5.91 | 11.25 | 1.22 | 0.95 | 0.82 | 0.96 |
| $RWN_t \times \Delta NI_t$ | 6.07 | -3.38 | -7.49 | -2.18 | -2.25 | -0.39 | 6.29 | -5.32 | -0.49 | 4.04 | 9.36 | 10.24 | 0.28 | 6.32 | -3.25 | 0.33 | 1.15 | 0.87 | 1.19 | 1.25 |
| Other variables | | | | | | | | | | | | | | | | | | | | |
| $RWP_t$ | 0.07 | -0.06 | -0.04 | -0.05 | 0.00 | 0.01 | 0.07 | 0.01 | 0.00 | -0.01 | 0.12 | -0.10 | -0.07 | -0.16 | 0.08 | 0.11 | 0.00 | -0.07 | -0.01 | -0.58 |
| $RWN_t$ | 0.04 | -0.03 | -0.08 | -0.07 | -0.01 | 0.06 | 0.09 | -0.08 | 0.02 | 0.07 | 0.16 | 0.13 | 0.01 | -0.01 | -0.05 | 0.07 | 0.02 | 1.12 | 0.03 | 2.01 |
| $x_{1,t}$ | 0.14 | 0.23 | 0.22 | 0.32 | 0.16 | 0.13 | 0.35 | 0.21 | 0.08 | 0.11 | -0.02 | 0.15 | 0.03 | 0.08 | 0.44 | 0.50 | 0.19 | 5.38 | 0.17 | 8.72 |
| $x_{2,t}$ | -0.01 | 0.02 | 0.05 | 0.01 | -0.02 | 0.00 | 0.06 | 0.02 | 0.01 | 0.02 | 0.01 | -0.01 | 0.00 | -0.05 | 0.01 | 0.03 | 0.01 | 1.42 | 0.00 | 0.94 |
| $x_{3,t}$ | 0.05 | 0.02 | 0.02 | 0.05 | 0.02 | -0.01 | 0.03 | 0.02 | 0.02 | 0.01 | 0.00 | 0.01 | 0.04 | 0.01 | 0.03 | -0.02 | 0.02 | 4.23 | 0.02 | 8.08 |
| $x_{4,t}$ | -0.16 | -0.28 | 0.24 | -0.3 | -0.03 | -0.24 | 0.05 | -0.08 | -0.42 | -0.31 | -0.60 | -0.15 | -0.27 | -0.50 | -0.44 | -0.51 | -0.25 | -4.43 | -0.30 | -6.86 |
| $x_{5,t}$ | 0.01 | 0.03 | 0.00 | -0.03 | 0.00 | -0.02 | -0.01 | 0.01 | 0.00 | 0.00 | -0.01 | -0.01 | 0.00 | 0.00 | -0.04 | 0.01 | 0.00 | -1.00 | 0.00 | 0.10 |
| $x_{6,t}$ | 0.31 | -0.04 | -0.07 | 0.30 | 0.34 | 0.57 | 0.53 | 0.59 | 0.11 | 0.43 | 0.19 | 0.10 | 0.29 | 0.83 | 0.13 | 1.87 | 0.40 | 3.35 | 0.35 | 8.72 |
| $x_{7,t}$ | -7.23 | 4.89 | 5.97 | 0.88 | -1.89 | -0.90 | 1.32 | -4.25 | -3.69 | -5.01 | -22.23 | -5.39 | -12.85 | 7.66 | 14.80 | 8.33 | -0.72 | -0.31 | -1.21 | -1.21 |
| $x_{8,t}$ | -1.13 | 1.36 | 2.20 | 0.29 | -0.11 | 0.35 | 1.91 | 0.93 | 1.16 | -0.48 | 1.98 | -3.13 | 0.42 | -2.40 | 0.30 | 8.62 | 0.77 | 1.19 | -0.03 | -0.20 |
| $x_{9,t}$ | -0.31 | -0.67 | 0.20 | 1.59 | -0.57 | 0.21 | -0.28 | -0.56 | -1.62 | -0.83 | -2.49 | -0.21 | -0.50 | 0.46 | 0.61 | -3.19 | -0.51 | -1.76 | -0.20 | -1.16 |
| $x_{10,t}$ | 24.12 | -0.40 | 26.81 | -13.30 | 0.76 | 2.28 | 3.64 | 3.99 | -16.73 | -3.37 | -22.41 | 15.49 | 1.67 | -15.59 | 9.33 | -7.94 | 0.52 | 0.15 | -1.91 | -0.73 |
| $x_{11,t}$ | -0.06 | 2.27 | 0.01 | -1.28 | -0.37 | -0.42 | -1.16 | 1.51 | -0.15 | 0.17 | -0.83 | -0.52 | -0.14 | -0.60 | -0.99 | 1.42 | -0.07 | -0.28 | -0.04 | -0.60 |
| Observations | 371 | 281 | 292 | 355 | 381 | 501 | 408 | 384 | 319 | 380 | 415 | 394 | 542 | 4.81 | 471 | 96 | 374.94 | | 6147 | |
| Adj-Rsq | 0.27 | 0.11 | 0.07 | 0.16 | 0.10 | 0.09 | 0.21 | 0.21 | 0.17 | 0.10 | 0.15 | 0.09 | 0.13 | 0.04 | 0.14 | 0.19 | 0.14 | | 0.17 | |

1. See Notes 1 through 6 of Table 1 for definitions of $\Delta NI_t$, $RWP_t$ and $RWN_t$.
2. Sample in this table consists of firms that have (i) profit, i.e $NI_t > 0$, (ii) decrease in earnings, i.e. $\Delta NI_t < 0$, and (iii) the decrease is small, i.e. $|\Delta NI_t| \leq$ industry median. 6,364 firm-years spanning a sixteen-year period from 1986 to 2001 met these criteria.
3. $RET_t$ = Annual return of firm j for fiscal year t, calculated by compounding monthly returns from nine months before the end of fiscal year t, to three months after the end of fiscal year t.
4. Control variables for each firm j, for fiscal year t ($X_{i,,t}$, i = 1 to 11) are defined in Appendix A.
5. Year-wise regression mean is the mean of annual regression coefficients over 16 annual regressions. Year-wise regression t-statistic is calculated as the mean of the year-wise coefficient divided by its standard error, similar to Fama and MacBeth (1973). Each regression uses Belsley et al. (1980) diagnostic DFFITS to identify and delete influential observations, hence the actual number of observations used is less than the number of observations mentioned in Note 2.
6. Pooled regression coefficient estimates are based on consistent estimates of the covariance matrix using White (1980) procedure. The regression uses Belsley et al. (1980) diagnostic DFFITS to identify and delete influential observations, hence the actual number of observations used is less than the number of observations mentioned in Note 2.

Pooled regression results reported in the last two columns of Table 2 provide evidence similar to the separate year regression results. We use White's method for consistent estimate of variance-covariance matrix for calculating t-statistics in all of the pooled regressions. The ERC for firms with small increase in earnings and small discretionary accruals is 12.47 (White's t = 9.50). Coefficient $a_{2,t}$ is –3.35 (White's t = –3.88) which suggests a 27% decline in ERCs for positive LWCAs. Coefficient $a_{3,t}$ is –3.24 (White's t = –4.15) which indicates a 26% decline in ERCs for negative LWCAs. Negative and significant values of coefficients $a_{2,t}$ and $a_{3,t}$ imply a rejection of the null of the first hypothesis, $H_{1,0}$ in favor of its alternative, $H_{1,A.}$ Overall, the results of Table 2 suggest that firms that report small increases in earnings but have large discretionary accruals that are *either positive or negative* are viewed negatively by the market. The size of discretionary working capital accruals significantly moderates market responses.

To test the second hypothesis, we select profit firms that reported a small decrease in earnings (RE = 0, ΔNI <0). There were 6,364 firm-year observations that met this criterion. Results of year-wise regressions, reported in Table 3, show that the mean value of annual ERCs for profitable firms that reported small decrease in earnings using small accruals (coefficient $a_{1t}$) is 4.31, compared to 15.61 with small earnings increases, and it is marginally significant (t = 1.84). The coefficient $a_{2,t}$ is 1.22 (t = 0.95) indicating that there is no decline in ERCs of firms with positive LWCAs. The coefficient $a_{3,t}$ is 1.15, and is not significant, (t=0.87) indicating that there is no decline in ERCs of firms with negative LWCAs. Results of pooled regressions show that the coefficient on ΔNI is 4.02 and is significant (White's t = 2.82), but the coefficients on $RWP_t*\Delta NI_t$ or $RWN_t*\Delta NI_t$ are not significant. These results indicate that the use of large accruals, either income increasing or income decreasing, does not cause a further decline in the ERC of profit firms that reported a small decrease in earnings. Thus, the overall results in Table 3 for both year-wise regressions and the pooled regression results fail to reject the null of the second hypothesis $H_{2,0}$ in favor of its alternative, $H_{2,A}$.

To test the third hypothesis of this study, we select profit firms that had large increases (Table 4) or decreases (Table 5) in earnings. Results of Table 4 are based on 9,349 firm-year observations. Table 4 shows that the mean coefficient on $\Delta NI(a_{1t})$ from annual regressions is 0.97 and is significantly different from zero (t = 2.51). In the pooled regression, the coefficient on ΔNI is 1.04 and also significant (White's t = 6.18). The coefficient $a_{2,t,}$ is –0.27 (t = –1.03) suggesting that there is no significant decline in ERCs for firms with positive LWCA. The coefficient $a_{3,t}$ is -0.17 (t = –0.71) suggesting that there is no significant decline in ERCs for firms with negative LWCAs. Pooled regression results also show that coefficients on $RWP_t*\Delta NI_t$ and $RWN_t*\Delta NI_t$ respectively are negligible and insignificant.

Results of Table 5 are based on 3,603 firm-year observations that reported profit and had a large decrease in earnings. Table 5 shows that the mean of coefficient on $\Delta NI(a_{1t})$ is 0.82 and is not significantly different from zero (t = 0.98). In the pooled regression, the coefficient on ΔNI is 0.82 and also not significantly different from zero (White's t = 1.51). These results show that when firms report large decreases in earnings, the information content of earnings (as measured by the statistical significance of the corresponding ERCs) is negligible. Netting the two coefficients above for the separate year regressions, the ERC for firms with large positive accruals is 0.15 and statistically insignificant ( t = 0.18 not reported); the ERC for firms with large negative accruals the ERC is 0.14 and not significant either (t = 0.14). Interestingly, the difference between firms with small accruals and positive LWCA is statistically significant given the significance of coefficient on $RWP_t$ for year-wise regressions as well as for pooled regression (t = –2.04 and White's t = –2.05 respectively), while the difference between firms with small accruals and negative LWCAs is statistically insignificant both in year-wise as well as in pooled regressions. Overall, the results of Table 4 and Table 5 fail to reject the null of hypothesis 3, $H_{3,0}$ in favor of its alternative, $H_{3,A.}$ The low overall ERCs in Tables 4 and 5 are consistent with Freeman and Tse (1992) and Ali (1994) who find that earnings shocks are valued less by the market.

Table 4

Impact of AWCAs on information content of large increase in earnings

| | $RET_t = a_{0,t} + a_{1,t}\Delta NI_t + a_{2,t}RWP_t \times \Delta NI_t + a_{3,t}RWN_t \times \Delta NI_t + a_{4,t}RWP_t + a_{5,t}RWN_t + \sum_{j=1}^{11} a_{j+5,t} \times X_{j,t}$ | | | | | | | | | | | | | | | Year-wise Regression | | Pooled Regression | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Coeff. Mean | t-statistic | Coeff. | White t-statistic |
| Intercept | 0.03 | 0.10 | 0.34 | 0.37 | 0.26 | 0.66 | 0.36 | 0.32 | 0.20 | 0.92 | 0.19 | 0.81 | 0.07 | 1.16 | 0.12 | 0.15 | 0.38 | 4.53 | 0.43 | 6.32 |
| $\Delta NI_t$ | 3.50 | -0.31 | -0.17 | 1.59 | 0.66 | 1.48 | 1.01 | 1.72 | 3.16 | 0.05 | 2.76 | -2.43 | 0.32 | 1.78 | -0.92 | 1.29 | 0.97 | 2.51 | 1.04 | 6.18 |
| $RWP_t \times \Delta NI_t$ | -1.15 | -0.22 | 0.62 | 1.32 | 0.20 | 0.03 | 0.27 | -0.75 | -2.39 | -0.49 | 0.02 | 1.47 | -0.08 | -1.02 | -0.11 | -1.97 | -0.27 | -1.03 | -0.04 | -0.30 |
| $RWN_t \times \Delta NI_t$ | 0.08 | 0.18 | 0.72 | 1.89 | -0.74 | -0.93 | 0.15 | -0.61 | -1.89 | 0.10 | -0.63 | 1.53 | -0.60 | -0.74 | -0.45 | -0.78 | -0.17 | -0.71 | -0.05 | -0.33 |
| Other variables | | | | | | | | | | | | | | | | | | | | |
| $RWP_t$ | 0.03 | -0.01 | -0.05 | -0.23 | -0.17 | -0.12 | -0.09 | -0.01 | 0.00 | 0.06 | -0.12 | -0.11 | -0.06 | -0.19 | 0.13 | 0.42 | -0.03 | -0.84 | -0.05 | -2.31 |
| $RWN_t$ | 0.01 | -0.01 | -0.03 | -0.16 | 0.06 | 0.18 | -0.05 | 0.13 | 0.00 | 0.01 | 0.03 | -0.05 | 0.06 | 0.00 | 0.07 | 0.25 | 0.03 | 1.27 | 0.01 | 0.79 |
| $x_{1,t}$ | 0.00 | 0.05 | 0.06 | -0.10 | -0.08 | 0.00 | -0.03 | 0.05 | -0.07 | -0.13 | 0.07 | -0.05 | -0.07 | -0.08 | 0.05 | 0.06 | -0.02 | -1.02 | 0.00 | -0.30 |
| $x_{2,t}$ | -0.03 | -0.03 | -0.02 | 0.01 | -0.05 | -0.05 | 0.02 | -0.03 | 0.01 | -0.02 | 0.00 | 0.00 | -0.05 | -0.06 | 0.01 | -0.01 | -0.02 | -3.05 | 0.00 | -2.27 |
| $x_{3,t}$ | 0.04 | -0.02 | -0.02 | 0.01 | -0.01 | -0.05 | 0.00 | -0.02 | -0.01 | -0.07 | 0.00 | -0.04 | 0.02 | -0.10 | 0.00 | -0.02 | -0.02 | -2.21 | -0.02 | -4.82 |
| $x_{4,t}$ | 0.32 | 0.24 | 0.03 | 0.09 | 0.65 | 0.27 | -0.11 | -0.27 | -0.18 | -0.23 | -0.31 | -0.15 | -0.29 | -0.82 | 0.05 | 0.01 | -0.04 | -0.53 | -0.08 | -2.39 |
| $x_{5,t}$ | 0.01 | 0.00 | 0.00 | -0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -0.01 | 0.00 | -0.02 | -0.01 | 0.00 | -1.28 | 0.00 | 0.93 |
| $x_{6,t}$ | 0.25 | 0.13 | 0.15 | 0.49 | 0.39 | 0.72 | 0.39 | 0.39 | 0.45 | 0.65 | 0.38 | 0.35 | 0.18 | 0.94 | 0.08 | 1.06 | 0.44 | 6.24 | 0.17 | 4.01 |
| $x_{7,t}$ | -0.37 | -0.17 | -0.21 | -0.43 | 0.14 | -0.38 | 0.29 | -0.06 | 0.11 | 0.43 | -0.53 | 0.29 | 0.43 | -0.08 | 0.49 | 0.00 | 0.00 | -0.06 | -0.07 | -1.61 |
| $x_{8,t}$ | -0.13 | 0.26 | 0.07 | -0.37 | 0.07 | 0.14 | -0.14 | 0.18 | -0.10 | 0.04 | -0.01 | 0.02 | 0.17 | 0.21 | -0.03 | -0.40 | 0.00 | -0.03 | 0.00 | 0.47 |
| $x_{9,t}$ | -0.33 | 0.10 | 0.14 | -0.21 | 0.17 | 0.09 | -0.07 | 0.02 | -0.01 | -0.04 | -0.26 | 0.30 | -0.19 | -0.14 | 0.11 | -0.04 | -0.02 | -0.56 | -0.09 | -3.52 |
| $x_{10,t}$ | 2.48 | 0.01 | 1.56 | 2.10 | -1.64 | 0.07 | 0.84 | 3.47 | 2.26 | 0.74 | 4.23 | 0.87 | 0.28 | 4.08 | -0.55 | 1.99 | 1.42 | 3.43 | 1.18 | 5.99 |
| $x_{11,t}$ | -0.06 | 0.02 | 0.01 | -0.01 | -0.06 | -0.01 | -0.07 | -0.02 | -0.01 | 0.01 | 0.01 | 0.03 | -0.01 | -0.01 | 0.05 | 0.07 | 0.00 | -0.39 | -0.01 | -2.13 |
| Observations | 384 | 516 | 568 | 456 | 385 | 463 | 641 | 685 | 746 | 726 | 712 | 713 | 615 | 590 | 581 | 70 | 553.19 | | 9095 | |
| Adj-Rsq | 0.16 | 0.04 | 0.06 | 0.16 | 0.10 | 0.15 | 0.18 | 0.12 | 0.10 | 0.08 | 0.10 | 0.03 | 0.03 | 0.12 | 0.01 | 0.32 | 0.11 | | 0.12 | |

1. See Notes 1 through 6 of Table 1 for definitions of $\Delta NI_t$, $RWP_t$ and $RWN_t$.
2. Sample in this table consists of firms that have (i) profit, i.e $NI_t > 0$, (ii) increase in earnings, i.e. $\Delta NI_t > 0$, and (iii) the increase is large, i.e. $|\Delta NI_t|$ > industry median. 9,349 firm-years spanning a sixteen-year period from 1986 to 2001 met these criteria.
3. $RET_t$ = Annual return of firm j for fiscal year t, calculated by compounding monthly returns from nine months before the end of fiscal year t, to three months after the end of fiscal year t.
4. Control variables for each firm j, for fiscal year t ($X_{i,,t}$, i = 1 to 11) are defined in Appendix A.
5. Year-wise regression mean is the mean of annual regression coefficients over 16 annual regressions. Year-wise regression t-statistic is calculated as the mean of the year-wise coefficient divided by its standard error, similar to Fama and MacBeth (1973). Each regression uses Belsley et al. (1980) diagnostic DFFITS to identify and delete influential observations, hence the actual number of observations used is less than the number of observations mentioned in Note 2.
6. Pooled regression coefficient estimates are based on consistent estimates of the covariance matrix using White (1980) procedure. The regression uses Belsley et al. (1980) diagnostic DFFITS to identify and delete influential observations, hence the actual number of observations used is less than the number of observations mentioned in Note 2.

Table 5

## Impact of AWCAs on information content of large decrease in earnings

| | $RET_t = a_{0,t} + a_{1,t}\Delta NI_t + a_{2,t}RWP_t \times \Delta NI_t + a_{3,t}RWN_t \times \Delta NI_t + a_{4,t}RWP_t + a_{5,t}RWN_t + \sum_{j=1}^{11} a_{j+5,t} \times X_{j,t}$ | | | | | | | | | | | | | | | | Year-wise Regression | | Pooled Regression | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | Coeff. Mean | t-statistic | Coeff. | White t-statistic |
| Intercept | -0.15 | -0.14 | -0.12 | 0.09 | -0.48 | 0.02 | -0.29 | -0.54 | -0.60 | -0.39 | -0.19 | 0.05 | -0.47 | -0.08 | -0.19 | -0.51 | -0.25 | -4.48 | -0.16 | -3.14 |
| $\Delta NI_t$ | 2.42 | 1.91 | 4.93 | 7.25 | -0.83 | 0.19 | 2.04 | -3.28 | -2.40 | -4.59 | 2.92 | 0.69 | -1.25 | 0.27 | 5.70 | -2.77 | 0.82 | 0.98 | 0.82 | 1.51 |
| $RWP_t \times \Delta NI_t$ | 0.63 | 0.53 | -1.46 | -1.71 | -1.01 | -1.78 | -2.30 | 1.63 | -2.13 | -1.44 | -0.84 | -1.03 | -1.59 | -0.10 | -0.32 | 2.14 | -0.67 | -2.04 | -0.55 | -2.05 |
| $RWN_t \times \Delta NI_t$ | 1.18 | 0.09 | -3.18 | -1.05 | -1.78 | 0.79 | -1.71 | 6.17 | -0.70 | -4.52 | 0.65 | -0.22 | -0.11 | -1.24 | -0.81 | -4.49 | -0.68 | -1.09 | -0.18 | -0.55 |
| Other variables | | | | | | | | | | | | | | | | | | | | |
| $RWP_t$ | -0.01 | -0.06 | -0.18 | -0.11 | -0.03 | -0.13 | -0.16 | 0.07 | -0.11 | -0.12 | -0.04 | -0.15 | -0.15 | 0.01 | -0.04 | 0.15 | -0.07 | -2.91 | -0.05 | -2.68 |
| $RWN_t$ | 0.10 | -0.09 | -0.21 | -0.05 | -0.05 | 0.12 | -0.04 | 0.26 | 0.03 | -0.31 | 0.11 | 0.00 | 0.01 | -0.11 | -0.03 | -0.22 | -0.03 | -0.87 | 0.00 | 0.10 |
| $x_{1,t}$ | 0.18 | -0.03 | 0.17 | -0.06 | 0.33 | 0.12 | 0.28 | 0.28 | 0.26 | 0.18 | 0.11 | 0.07 | 0.18 | 0.18 | 0.14 | 0.54 | 0.18 | 5.14 | 0.13 | 7.29 |
| $x_{2,t}$ | -0.03 | -0.04 | 0.07 | -0.02 | 0.04 | 0.02 | -0.02 | -0.01 | 0.00 | 0.10 | -0.03 | 0.02 | 0.01 | 0.00 | -0.02 | 0.04 | 0.01 | 0.99 | 0.00 | -0.22 |
| $x_{3,t}$ | 0.01 | 0.02 | 0.01 | 0.02 | 0.04 | -0.01 | 0.03 | 0.05 | 0.06 | 0.04 | 0.03 | 0.02 | 0.03 | -0.02 | 0.02 | 0.02 | 0.02 | 4.18 | 0.03 | 5.24 |
| $x_{4,t}$ | -0.12 | 0.11 | 0.53 | -0.51 | -0.31 | -0.52 | -0.53 | -0.71 | -0.45 | 0.14 | -0.50 | -0.53 | -0.47 | 0.20 | -0.31 | -0.38 | -0.27 | -3.18 | -0.34 | -6.94 |
| $x_{5,t}$ | -0.02 | 0.14 | -0.02 | 0.01 | -0.01 | 0.00 | -0.01 | 0.01 | 0.00 | 0.01 | 0.00 | -0.01 | -0.03 | -0.03 | -0.01 | -0.01 | 0.00 | 0.14 | 0.00 | -2.79 |
| $x_{6,t}$ | 0.27 | 0.55 | 0.50 | 0.40 | 0.15 | 0.42 | 0.46 | 0.11 | 0.51 | 0.23 | 0.30 | 0.36 | 0.40 | 0.46 | 0.75 | 0.13 | 0.37 | 8.76 | 0.29 | 7.19 |
| $x_{7,t}$ | -0.01 | -1.59 | -1.50 | -2.62 | 2.37 | 0.47 | 2.09 | 1.95 | 1.56 | 1.62 | -0.62 | -0.19 | 1.06 | 0.73 | -0.41 | 4.26 | 0.57 | 1.31 | -0.17 | -1.15 |
| $x_{8,t}$ | -0.52 | -0.42 | 0.64 | -0.18 | 0.75 | 0.19 | -1.34 | 0.03 | 0.20 | 1.52 | -0.27 | 0.01 | 0.20 | 0.51 | -0.29 | 0.62 | 0.10 | 0.64 | -0.01 | -0.39 |
| $x_{9,t}$ | -0.39 | -0.05 | -0.39 | -0.37 | 0.05 | -0.08 | 0.04 | 0.05 | 0.38 | 0.24 | -0.18 | 0.03 | 0.28 | -0.46 | -0.79 | -0.12 | -0.11 | -1.44 | -0.01 | -0.20 |
| $x_{10,t}$ | 5.31 | 9.52 | 4.92 | -0.65 | -0.48 | -1.70 | -6.61 | -4.44 | -3.67 | 9.08 | -1.75 | -0.14 | -3.36 | 6.27 | -0.76 | 0.99 | 0.78 | 0.65 | -0.83 | -1.55 |
| $x_{11,t}$ | -0.44 | 1.48 | -0.34 | -0.17 | -0.14 | -0.11 | -0.25 | -0.01 | 0.15 | 0.29 | 0.01 | -0.19 | -0.78 | -0.17 | -0.31 | -0.14 | -0.07 | -0.58 | -0.07 | -3.05 |
| Observations | 217 | 151 | 127 | 202 | 266 | 239 | 193 | 181 | 191 | 208 | 261 | 243 | 260 | 275 | 293 | 60 | 210.44 | | 3466 | |
| Adj-Rsq | 0.21 | 0.22 | 0.27 | 0.20 | 0.15 | 0.04 | 0.14 | 0.15 | 0.18 | 0.11 | 0.18 | 0.11 | 0.06 | 0.01 | 0.10 | 0.18 | 0.14 | | 0.17 | |

1. See Notes 1 through 6 of Table 1 for definitions of $\Delta NI_t$, $RWP_t$ and $RWN_t$.
2. Sample in this table consists of firms that have (i) profit, i.e $NI_t > 0$, (ii) decrease in earnings, i.e. $\Delta NI_t < 0$, and (iii) the decrease is large, i.e. $|\Delta NI_t|$ is above the industry median. 3,603 firm-years spanning a sixteen-year period from 1986 to 2001 met these criteria.
3. $RET_t$ = Annual return of firm j for fiscal year t, calculated by compounding monthly returns from nine months before the end of fiscal year t, to three months after the end of fiscal year t.
4. Control variables for each firm j, for fiscal year t ($X_{i,t}$, i = 1 to 11) are defined in Appendix A.
5. Year-wise regression mean is the mean of annual regression coefficients over 16 annual regressions. Year-wise regression t-statistic is calculated as the mean of the year-wise coefficient divided by its standard error, similar to Fama and MacBeth (1973). Each regression uses Belsley et al (1980) diagnostic DFFITS to identify and delete influential observations, hence the actual number of observations used is less than the number of observations mentioned in Note 2.
6. Pooled regression coefficient estimates are based on consistent estimates of the covariance matrix using White (1980) procedure. The regression uses Belsley et al (1980) diagnostic DFFITS to identify and delete influential observations, hence the actual number of observations used is less than the number of observations mentioned in Note 2.

***Sensitivity analysis***

(1) We repeat our analysis using a random walk model for working capital accruals, instead of one based on the expected relation between accruals and sales. We find that the conclusions are unchanged.

(2) We include earnings levels (scaled by market value) as a substitute variable for change in book value (Control variable $X_{6,t}$, see Appendix for details). Using earnings levels in lieu of change in book value makes no difference in our results.

(3) We restored loss firms to our sample but the results are qualitatively similar.

## 6. Conclusions

We examine market reactions to unexpected earnings influenced by large unexpected working capital accruals (LWCAs). Focusing on nonlinear relations between returns and LWCA, prior work has found that market reactions are generally weaker for LWCA than for small discretionary working capital accruals. We extend the extant literature by examining the market's reaction to positive and negative earnings changes influenced by LWCAs and predict circumstances where LWCAs lead to varying market expectations of earnings quality. Prior work generally assumes that LWCAs have a uniform impact on market expectations. We examine eight situations that combine positive or negative LWCAs with earnings changes that are either positive or negative and are of either small or large absolute magnitudes. We argue that the market is more likely to suspect earnings management and, therefore, view earnings as being of lower quality when firms report small increases in earnings with the help of positive or negative LWCAs. According to the literature, managers are strongly motivated to produce small earnings increases instead of earnings declines (i.e., by using positive LWCAs), or produce small earnings increases instead of positive earnings shocks (i.e., by using negative LWCAs). The remaining six situations are not consistent with traditional managerial incentives suggested by the literature and, therefore, do not necessarily imply earnings management. For example, when there are large increases in earnings using positive LWCAs, managerial accounting choices are inconsistent with the motivation predicted by the bonus hypothesis and with expectations that managers retain future flexibility to manage earnings. Similarly, when managers report small decreases in earnings using positive or negative LWCAs, their actions are inconsistent with the expected desire to report increases in earnings. These apparent inconsistencies may be a result of error in the LWCA measure or unobservable motivations by management.

Consistent with our predictions, we find that the market discounts unexpected earnings when there are small increases in earnings using negative LWCA (i.e., masking earnings variance or smoothing) or positive LWCA (i.e., masking lower earnings levels). We find little or no evidence that positive or negative LWCAs lead to lower ERCs in the remaining six situations. The failure of positive or negative LWCAs to reduce ERCs in these other cases may be due to an absence of earnings management, error in the measure, diversity in opinions among investors about LWCAs being a manifestation of earnings management, or failure of the market to detect earnings management.

## References

1. Ali, A., 1994, The incremental information content of earnings, working capital from operations, and cash flows, Journal of Accounting Research 34, 61-74.
2. Barth, M.E., W.H. Beaver, and W.R. Landsman, 1998, Relative valuation roles of equity book value and net income as a function of financial health, Journal of Accounting and Economics 25, 1-34.
3. Barth, M.E., J. A.Elliott, and M.W. Finn, 1999, Market rewards associated with patterns of increasing earnings, Journal of Accounting Research 37, 387-413.
4. Belsley, D.A., E. Kuh, and R.E. Welsch, 1980, Regression diagnostics (John Wiley, New York).

5. Brooks, L.D., Buckmaster, D.A., 1976, Further evidence of the time series properties of accounting income, The Journal of Finance, 31, 1359-1373.
6. Burgstahler, D., and I. Dichev, 1997, Earnings management to avoid earnings decreases and losses, Journal of Accounting and Economics 24, 99-126.
7. Carslaw, A., 1988, Anomalies in income numbers, Evidence of goal oriented numbers, The Accounting Review 63, 321-327.
8. Collins, D.W., and S.P. Kothari, 1989, A theoretical and empirical analysis of the determinants of cross-sectional and inter-temporal differences in earnings response coefficients, Journal of Accounting and Economics 11, 143-181.
9. Dechow, P., 1994, Accounting earnings and cash flows as measures of firm performance: the role of accounting accruals, Journal of Accounting and Economics 18, 3-42.
10. Dechow, P., and D. Skinner. 2000, Earnings management, Reconciling the views of accounting academics, practitioners, and, regulators, Accounting Horizon 14, 235-250.
11. DeFond, M.L., and C.W. Park, 2001, The reversal of abnormal accruals and market valuation of earnings surprises, The Accounting Review 76, 375-404.
12. Degeorge F., J. Patel and R. Zeckhauser, 1999, Earnings management to exceed thresholds, Journal of Business 72, 1-33.
13. Fama, E.R., and K.R. French 1992, The cross-section of expected returns, Journal of Finance 47, 427-465.
14. Fama, E.R., and J.D. MacBeth,. 1973, Risk return and equilibrium, Empirical tests. Journal of Political Economy 71, 607-636.
15. Freeman, R. N., Ohlson, J. A., Penman, S.H., Book rate-of-return and prediction of earnings changes: An empirical investigation, Journal of Accounting Research, 20, 639-653.
16. Freeman, R.N., and S.Y. Tse, 1992, The multi-period information content of accounting earnings: Confirmations and contradictions of previous earnings reports. Journal of Accounting Research 27, 49-79.
17. Healy, P., 1985, The effect of bonus schemes on accounting decisions, Journal of Accounting and Economics 7, 85-107.
18. Kothari, S.P., A.J. Leone, and C.E. Wasley, 2004, Performance matched discretionary accruals, Journal of Accounting and Economics 39, 163-197.
19. Matsumoto, D.A. 2002, Manager's incentives to avoid negative earnings surprises, The Accounting Review 77, 483-514.
20. Mendenhall, R.R., 2002, How naïve is the market's use of firm-specific earnings information? Journal of Accounting Research 40, 841-863.
21. Sloan, R.G. 1996, Do stock prices fully reflect information in cash flow and accruals about future earnings? The Accounting Review 71, 289-315.
22. Schipper, K., 1989, Commentary, Earnings management. Accounting Horizons 3, 91-102.
23. White G.I., A.C. Sondhi, and D. Fried, 2003, The analysis and use of financial statements (John Wiley, New York).
24. White, H., 1980, A heteroscedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity, Econometrica 48, 817-838.

## APPENDIX A. DESCRIPTION OF CONTROL VARIABLES

***Variables for proxies of risk***

Based on prior literature (Fama and French 1992) we use three proxies to control for risk characteristics of a firm. These are book-to-market ($X_{1t}$), debt-to-equity ($X_{2t}$ ), and size at the beginning of the period ($X_{3t}$).

$X_{1t}$ = Book value of firm (t)/Market Value (t-1)
= $(\text{Data } 217)_t/(\text{Data } 199_{t-1} \text{ x Data } 25_{t-1})$
$X_{2t}$ = Debt/Book Value of firm
=$(\text{Data } 2_t - \text{Data } 217_t)/(\text{Data } 217_t)$
$X_{3t}$ = Size at the beginning of the period
= $\log(\text{Data}199_{t-1} \text{ x Data } 25_{t-1})$

***Control for growth and variability in earnings***

Prior research (Barth, Elliot and Finn, 1999) has shown that growth and variability of earnings are determinants of returns-earnings relationship. Barth et al (1999) argue that earnings variability is a measure of operating risk. Accordingly, we define the following two control variables $X_{4,t}$ and $X_{5,t}$ respectively:
$X_{4t}$ = Growth in Book value over previous three years

$$= \left(\sqrt[3]{BV_{t-1} / BV_{t-4}}\right) - 1 = \left(\sqrt[3]{Data217_{t-1} / Data217_{t-4}}\right) - 1$$

$X_{5t}$ = Standard deviation of earnings change over previous three years

$$= \left(\sqrt{\frac{1}{2} \cdot \sum_{k=1}^{3} \frac{\left(NI_{t-k} - NI_{t-k-1}\right)^2}{|NI_{t-k-1}|}}\right), \text{ where,}$$

$\Delta NI_t$, = Change in Earnings before extraordinary items and special items, divided by market value at the beginning of the period.
= $(\text{Data } 18_t - \text{Data } 17_t) - (\text{Data } 18_{t-1} - \text{Data } 17_{t-1})] / (\text{Data}199_{t-1} \text{ x Data } 25_{t-1})$.

***Control for change in book value***[1]

Barth et al. (1999) suggest that change in book value has significant impact on ERCs. Correspondingly, we use change in book value scaled by the market value as an additional control variable.
$X_{6,t}$ = Change in book value divided by market value at the beginning of the period
=$(\text{Data } 217_t - \text{Data } 217_{t-1})/(\text{Data}199_{t-1} \text{ x Data}25_{t-1})$

***Interaction of control variables with change in earnings***

We are also interested in each control variable's marginal response to change in earnings. Hence we interact each control variable (except change in book value, control variable $X_{6,t}$) with change in earnings. Since change in book value is a proxy for earnings, we do not interact it with change in earnings. The interaction terms create the following additional five control variables, $X_{7,t}$ through $X_{11,t}$.

$X_{7,t}$ = $X_{1,t}$ x $\Delta NI_t$
$X_{8,t}$ = $X_{2,t}$ x $\Delta NI_t$
$X_{9,t}$ = $X_{3,t}$ x $\Delta NI_t$
$X_{10,t}$ = $X_{4,t}$ x $\Delta NI_t$
$X_{11,t}$ = $X_{5,t}$ x $\Delta NI_t$

---
[1] Later in sensitivity analysis, we replace change in book value with earnings levels. Results are similar.