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The Reversal of Abnormal Accruals and the Market Valuation of Earnings Surprises

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ABSTRACT: If the market anticipates the reversing nature of *abnormal* working capital accruals, then the *reported* magnitude of earnings surprises that contain abnormal accruals will differ from the *underlying* magnitude that is priced by the market. We expect the market's perception of this difference to affect the ERCs associated with earnings surprises that contain abnormal accruals. We test our predictions using an abnormal accruals measure that captures the difference between reported working capital and a proxy for the market's expectations of the level of working capital required to support current sales levels. Consistent with our hypotheses, we find higher ERCs when abnormal accruals suppress the magnitude of earnings surprises, and lower ERCs when abnormal accruals exaggerate the magnitude of earnings surprises. We also find results consistent with analysts predictably considering the reversing implications of abnormal accruals in revising future earnings forecasts. These findings are consistent with market participants anticipating the reversing implications of abnormal accruals. However, analysis of subsequent stock returns provides evidence that market participants do not fully impound the pricing implications of abnormal accruals at the earnings announcement date.

Keywords: *accruals; abnormal accruals; earnings surprise; earnings response coefficient.*

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Data Availability: *The data used in this study are publicly available from the sources listed in the study.*

I. INTRODUCTION

The role of accounting earnings in pricing securities is a fundamentally important issue in accounting research (Ball and Brown 1968; Watts and Zimmerman 1986; Beaver 1998). Prior studies find that accounting accruals play an important role in helping market participants value securities (Bowen et al. 1987; Dechow 1994; Subramanyam 1996). However, research also suggests that market participants may not fully understand the information conveyed by accruals (Sloan 1996; Xie 2001). This study further investigates the role of accruals in pricing securities by testing whether the market's pricing of earnings surprises anticipates the reversing implications of abnormal accruals.

We argue that the reversing nature of *abnormal* working capital accruals suggests that they have little or no net effect on lifetime earnings, and therefore should be priced differentially by the market. For example, understating the allowance for bad debts results in abnormal accruals that increase current earnings. When the firm eventually recognizes the bad debt expenses, the abnormal accruals reverse, thereby decreasing future earnings. Thus, the income-increasing effect of the abnormal accruals is later offset by the income-decreasing effect of the reversal. Abnormal accruals that have little or no net effect on lifetime earnings should have little or no stock price impact in reasonably efficient capital markets.[1] Thus, we expect the *reported* magnitude of earnings surprises that contain abnormal accruals to differ from the *underlying* magnitude that the market prices. We test inferences about the market's pricing of abnormal accruals using an abnormal accruals measure that captures the difference between reported working capital and a proxy for the market's expectations of the level of working capital required to support current sales levels.

We expect the market's perception of the magnitude of earnings surprises to depend upon both the effect of the abnormal accruals on income and the sign of the earnings surprise. Income-*increasing* abnormal accruals exaggerate the magnitude of *good* news earnings surprises and, therefore, we expect the market to infer that the underlying surprise is actually smaller than reported.[2] If the market perceives that the underlying good news surprise is smaller than the reported surprise, we expect a lower earnings response coefficient (ERC) associated with the reported surprise. On the other hand, income-*decreasing* abnormal accruals suppress the magnitude of *good* news earnings surprises, so we expect the market to infer that the underlying surprise is larger than reported. In this case, we expect a higher ERC associated with the reported surprise. Therefore, our first hypothesis is that good news firms with income-increasing abnormal working capital accruals have lower ERCs than good news firms with income-decreasing abnormal working capital accruals.

Abnormal accruals have the opposite implications for reported bad news surprises. Income-increasing abnormal accruals suppress the magnitude of bad news earnings surprises and thus should lead the market to infer that the underlying surprise is actually larger than reported. Conversely, income-decreasing abnormal accruals exaggerate the magnitude of bad news surprises, suggesting that the underlying surprise is smaller than reported.

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[1] Because earnings shift across periods, differences in factors such as marginal tax rates and bonus thresholds mean that the reversal may not precisely offset the initial abnormal accrual. However, we expect the majority of the abnormal accruals to reverse against future earnings.

[2] We refer to firms reporting positive (negative) earnings surprises relative to analysts' forecasts as "good (bad) news firms."

Thus, our second hypothesis is that bad news firms with income-increasing abnormal working capital accruals have higher ERCs than bad news firms with income-decreasing abnormal working capital accruals.

Our sample consists of 14,839 firm-quarter earnings announcements from the First Call Historical Database (hereafter First Call) from 1992 through 1995. Conceptually, our abnormal accruals measure captures the difference between *realized* working capital and a proxy for the market's *expectations* of the level of working capital required to support current sales levels. Intuitively, this difference represents working capital accruals that are unlikely to be sustained in the future and, therefore, are likely to reverse against future earnings.[3] Consistent with our predictions, for good news firms the ERC is significantly higher for firms reporting income-decreasing abnormal accruals (6.1) than for firms reporting income-increasing abnormal accruals (4.6). By contrast, for bad news firms the ERC is significantly higher for firms reporting income-increasing abnormal accruals (1.1) than for firms reporting income-decreasing abnormal accruals (0.6). These results are robust after controlling for number of analysts, firm size, the market-to-book ratio, growth in book value of equity, earnings volatility, and earnings persistence.

We also examine whether analysts' revisions of their forecasts of next quarter's earnings, after this quarter's earnings announcement, anticipate the reversing implications of abnormal accruals. We find that analysts make smaller upward forecast revisions in response to *good* news surprises that contain income-increasing abnormal accruals, and larger downward forecast revisions in response to *bad* news surprises that contain income-increasing abnormal accruals. This is consistent with analysts anticipating the reversing implications of abnormal accruals, and corroborates the findings in our primary hypotheses tests.

While these results are consistent with the market anticipating the reversing implications of abnormal accruals, they do not address whether the market appropriately prices the earnings surprises in anticipation of the reversing behavior of the abnormal accruals. Therefore, we also examine cumulative abnormal returns associated with the accruals partitions during the 80 trading days following the earnings announcement. We find significant post-announcement abnormal returns associated with the accruals partitions and estimate that the market only anticipates 19–23 percent of the pricing implications of the abnormal accruals.

Our evidence that the market anticipates the reversing implications of abnormal accruals, but only to a limited degree, is consistent with prior evidence that the market does not fully adjust for other implications of accrual-based earnings.[4] To the extent that abnormal accruals reflect intentional misstatements rather than unusual nondiscretionary events, our findings are consistent with market participants at least partially adjusting for suspected earnings management. Our results are also consistent with inferences drawn in contemporaneous, independently developed research reported in Xie (2001). Xie concludes that the

[3] We use the term "abnormal" to characterize our accruals estimates while similar estimates from the Jones model are interchangeably referred to as "discretionary" (for example in Jones 1991) or "abnormal" (for example in DeFond and Jiambalvo 1994). Healy (1996) observes that "abnormal" is more accurate because "discretionary" connotes purposeful intervention by management and the Jones model estimates can also include inadvertent misstatements. Therefore, we believe that "abnormal" appropriately characterizes our accruals measure.

[4] For example, evidence suggests that the market does not fully adjust for earnings surprises (Foster et al. 1984; Freeman and Tse 1989; Bernard and Thomas 1990), transitory items (Hand 1990), or the reduced persistence of extreme total accruals (Sloan 1996; Bradshaw et al. 1999).

market misprices abnormal accruals by overestimating the persistence of abnormal accruals. However, research design differences hinder direct comparisons of the two studies.[5]

We also use an abnormal working capital accruals model that differs from the Jones-type models as popularly specified in prior research (Jones 1991; Dechow et al. 1995; Han and Wang 1998). The Jones-type models base their estimates of expected accruals on the coefficient from a regression of accruals on the change in sales, and include an intercept term equivalent to the average level of accruals (after controlling for the change in sales). In contrast, our model estimates expected accruals based upon the firm-specific, seasonally adjusted ratio of working capital to sales.[6]

The next section discusses our hypotheses development, Section III explains the research design and Section IV presents the results. Section V reports several robustness checks and we summarize our findings in Section VI.

II. HYPOTHESES DEVELOPMENT

Working capital accruals represent the change in noncash working capital accounts such as inventories, receivables and accrued expenses. Dechow (1994, Table 2) and Dechow et al. (1998, 141) theoretically and empirically demonstrate that, if sales follow a random walk and normal working capital is a fixed proportion of sales, normal working capital *accruals* follow a mean zero, white noise time-series process. For example, suppose a demand shock permanently increases sales by $100 each period. Assume *normal* working capital equals 20 percent of sales, and for simplicity consists only of accounts receivable. In this simple example, the $100 increase in sales results in a *permanent* $20 increase in accounts receivable. This means that earnings include a $20 income-increasing accrual in the period of the demand shock. During the next period, *ceteris paribus*, the $20 increase in receivables reverses when the account is collected by crediting accounts receivable and debiting cash, but it is replaced with another $20 in receivables. Thus, earnings effectively include a one-time $20 income-increasing accrual in the period of the demand shock.

However, unlike *normal* working capital accruals, *abnormal* working capital accruals eventually reverse (without replacement) against future earnings, so they have a smaller *net* impact on lifetime earnings.[7] For example, understating the allowance for bad debts results in abnormal accruals that increase current period earnings. When the allowance for bad debts is ultimately restored to its correct balance, crediting the allowance account and debiting bad debt expense reverses the abnormal accruals. The net result is that the income-*increasing* effect of the abnormal accrual is ultimately offset by the income-*decreasing* effect of the reversal. In this example, abnormal accruals result from discretionary manipulation, and have *no* net impact on lifetime earnings.

Efficient capital markets should differentially price abnormal accruals that have little or no impact on lifetime earnings. Therefore, we expect the *reported* magnitude of earnings surprises containing abnormal accruals to differ from the *underlying* magnitude that the

[5] For example, Xie (2001) uses a long-window setting to examine abnormal accruals as measured by the model in Jones (1991), while our study uses a short-window setting to examine an accruals measure that differs from the Jones model (as discussed in Section V).

[6] This is consistent with Dechow et al. (1998) who model working capital as a fixed proportion of contemporaneous sales.

[7] Abnormal accruals may arise from operational reasons (Bernstein and Wild 1999) or earnings management (Watts and Zimmerman 1986; Healy and Wahlen 1999). Examining a sample of 1,821 companies over 36 quarters from 1988 through 1996 from the Compustat database, we find that abnormal accruals have negative first-order serial-correlation (both mean and median). This is consistent with abnormal working capital accruals reversing against future earnings.

market prices. For example, a reported good news earnings surprise that contains income-decreasing abnormal accruals effectively understates the magnitude of the true underlying good news. The market's perception of the underlying magnitude of the earnings surprise affects the slope coefficient of the returns/earnings regression, or ERC (Kormendi and Lipe 1987; Collins and Kothari 1989; Easton and Zmjewski 1989). Theoretically, if the earnings surprise is largely permanent, the ERC equals $1 + (1/r)$ where r is the cost of capital. However, if the *underlying* surprise is perceived to exceed the *reported* surprise, the estimated ERC will be higher. For example, if a *reported* good news surprise is \$2 and it contains an income-decreasing abnormal accrual of \$1 that will reverse with no net impact on earnings, the *underlying* surprise is actually \$3. If the return associated with the underlying good news is \$12, then the ERC should be 4 (\$12/\$3). However, since the reported good news is only \$2, the estimated ERC is 6 (\$12/\$2).

While income-*decreasing* abnormal accruals *understate* the magnitude of reported good news surprises, income-*increasing* abnormal accruals *overstate* the magnitude of good news surprises. If market participants understand the reversing implications of abnormal accruals, then we expect, *ceteris paribus*, higher ERCs associated with good news surprises that contain income-decreasing abnormal accruals, and lower ERCs associated with good news surprises that contain income-increasing abnormal accruals. Thus, our first hypothesis, in alternative form, is:

Hypothesis 1: Good news firms with income-increasing abnormal working capital accruals have lower ERCs than good news firms with income-decreasing abnormal working capital accruals.

Abnormal accruals have the opposite implications for bad news earnings surprises. Income-*decreasing* abnormal accruals *overstate* the magnitude of reported bad news surprises, and income-*increasing* abnormal accruals *understate* the magnitude of bad news surprises. Thus, our second hypothesis, in alternative form, is:

Hypothesis 2: Bad news firms with income-increasing abnormal working capital accruals have higher ERCs than bad news firms with income-decreasing abnormal working capital accruals.

III. RESEARCH DESIGN

Hypotheses Tests

We test our hypotheses by examining the ERCs from a regression of two-day cumulative stock returns on earnings forecast errors after partitioning on the signs of (1) the forecast error and (2) the abnormal working capital accruals. We use market-adjusted returns measured as the difference between the raw stock return and the return on the CRSP value-weighted market portfolio. Our ERCs are estimated from the following model:

$$\begin{aligned} CAR = \alpha &+ \beta_1(GOODNEWS \times FE/P_{-2}) + \beta_2(GOODNEWSINCR \times FE/P_{-2}) \\ &+ \beta_3(BADNEWS \times FE/P_{-2}) + \beta_4(BADNEWSINCR \times FE/P_{-2}) + \varepsilon \qquad (1) \end{aligned}$$

where:

CAR = market-adjusted stock returns accumulated over the two trading days $[-1,0]$ where 0 is the *Wall Street Journal* earnings announcement date;
FE/P_{-2} = forecast error for the current period earnings announcement, computed as actual earnings for the current quarter minus the most recent analysts' forecast, scaled by the closing share price at trading day -2;
GOODNEWS = good news dummy that equals 1 if actual earnings exceed forecast;
GOODNEWSINCR = good news income-increasing dummy that equals 1 if GOODNEWS equals 1 and abnormal working capital accruals increase income;
BADNEWS = bad news dummy that equals 1 if actual earnings fall short of forecast;
BADNEWSINCR = bad news income-increasing dummy that equals 1 if BADNEWS equals 1 and abnormal working capital accruals increase income; and
ε = error term.

We support our first hypothesis if the coefficient on the good news income-increasing partition (β_2) is negative, and we support our second hypothesis if the coefficient on the bad news income-increasing partition (β_4) is positive.

Abnormal Working Capital Accruals

At a conceptual level, our proxy for abnormal accruals measures the difference between realized working capital, and a proxy for the market's expectations of the level of working capital needed to support current sales levels. The intuition behind our measure is that this difference is the portion of working capital accruals that are unlikely to be sustained and, therefore, are expected to reverse against future earnings. The Appendix develops our empirical measure, which is the difference between the current quarter's realized working capital, and the *expected* level of working capital, where the historical relation of working capital to sales captures expected working capital.[8] Specifically, our empirical abnormal accruals proxy is:[9]

$$AWCA_t = WC_t - [(WC_{t-4}/S_{t-4}) \times S_t] \tag{2}$$

where:

t = year-quarter; thus $t - 1$ refers to the prior quarter and $t - 4$ refers to the same quarter in the prior year;
$AWCA_t$ = abnormal working capital accruals in the current quarter;
WC_t = noncash working capital in the current quarter computed as (current assets − cash and short-term investments) − (current liabilities − short-term debt);

[8] Using the historical relation of working capital to sales to capture expected working capital is consistent with Dechow et al. (1998) who model working capital as a fixed proportion of contemporaneous sales.

[9] As discussed in Section V, our model differs from the Jones-type abnormal accruals models. For example, we estimate abnormal accruals using a firm-specific seasonally adjusted ratio of working capital to sales, while the Jones-type models typically do not allow for seasonality in the relation between accruals and sales changes.

WC_{t-4} = working capital in the same quarter last year;
S_t = sales in the current quarter; and
S_{t-4} = sales in the same quarter last year.

Ideally, our model of abnormal accruals would incorporate analysts' forecasts of accruals, consistent with our model of unexpected earnings. However, analysts' forecasts of accruals (or cash flows) are not widely available and, therefore, our mechanical model-based abnormal accruals estimates are probably less precise than our unexpected earnings estimates. While this is a limitation, we only rely on the model for the sign of the abnormal accrual predictions (i.e., simply distinguishing between income-increasing and income-decreasing abnormal accruals).

In addition, investors must have balance sheet information to compute abnormal accruals. Of the 12,576 earnings announcements in our sample with press releases available on the Lexis-Nexis Academic Universe database, 4,889 (39 percent) voluntarily disclose balance sheet information. However, investors may also have access to balance sheet information through conference calls. Frankel et al. (1999) report that 85 percent of conference calls relate to quarterly earnings announcements. Ultimately, however, we cannot be sure that balance sheet information is available at the earnings announcement date for firms that do not voluntarily disclose this information in their earnings announcements.

Data

Our sample period spans 1992 through 1995 and all observations have stock price information in the CRSP database, earnings forecasts in First Call, Compustat data to compute abnormal working capital accruals, and the adjustment factor for stock dividends and splits in First Call or the quarterly Compustat database.[10] To precisely capture the announcement date, sample firms must have *Wall Street Journal* announcement dates (in the *Wall Street Journal Abstracts* in *Proquest*) exactly one trading day after the wire service/press release announcement dates (in First Call). Finally, we delete observations in the top and bottom 1 percent of returns and forecast errors to mitigate the effects of potential outliers. This selection procedure yields a sample of 14,839 firm-quarter observations.

We measure earnings expectations using the most recent mean analyst forecast from First Call. First Call updates on a real-time basis by revising their reported mean and median forecasts whenever analysts revise their forecasts, reducing the error in our earnings surprise measure. The mean (median) time between our sample firm forecast dates and their *Wall Street Journal* earnings announcement dates is 15 (9) trading days with an upper quartile of 20 trading days and a lower quartile of 5 trading days. We measure the earnings surprise as the difference between First Call reported earnings per share and First Call mean earnings forecast per share. First Call defines forecasts and earnings realizations as earnings from continuing operations, so they exclude transitory items such as special and extraordinary items. Thus, transitory items do not confound our earnings surprise measure.

Table 1 presents descriptive statistics. Panel A indicates that our sample observations have zero median forecast errors, and slightly positive abnormal returns and abnormal working capital accruals. Panel B presents mean values of our variables of interest partitioned by the sign of the earnings surprise and the sign of abnormal accruals. The last row

[10] We use First Call split factors to adjust all variables to an equivalent per-share basis at the time of the earnings announcement. However, some split factors in earlier periods are missing. The director of quantitative research at First Call confirmed that the split factors in First Call are essentially identical to those in the quarterly Compustat database. Thus, when a firm's split factors are missing in First Call, we use Compustat split factors.

TABLE 1
Descriptive Statistics

Panel A: Distribution of Cumulative Abnormal Returns, Earnings Forecast Errors, and Abnormal Accruals (n = 14,839)

Variable	*Mean*	σ	*Lower Quartile*	*Median*	*Upper Quartile*
Cumulative abnormal returns (CAR)[a]	0.001	0.054	−0.028	0.001	0.023
Earnings forecast error per share, scaled by share price (FE/P_{-2})[b]	−0.001	0.007	−0.001	0.000	0.001
Abnormal working capital accruals per share, scaled by price ($AWCA/P_{-2}$)[c]	0.001	0.116	−0.021	0.002	0.028

Panel B: Mean Values of Variables of Interest by Sign of Earnings Surprise and Sign of Abnormal Accruals

			Good News Earnings Surprises[d]		*Bad News Earnings Surprises*[e]	
	Total Sample	*Zero Forecast Error*	*Income-Decreasing Working Capital Accruals*	*Income-Increasing Working Capital Accruals*	*Income-Decreasing Working Capital Accruals*	*Income-Increasing Working Capital Accruals*
CAR	0.001	−0.001	0.019	0.012	−0.009	−0.016
FE/P_{-2}	−0.001	0.000	0.002	0.002	−0.006	−0.006
$AWCA/P_{-2}$	0.001	0.003	−0.048	0.041	−0.066	0.065
N	14,839	3,303	3,098	2,762	2,470	3,206

[a] CAR = Market-adjusted stock returns accumulated over the trading days [−1,0], where 0 is the *Wall Street Journal* earnings announcement date. Earnings announcement dates are obtained from the *Wall Street Journal Abstracts* and are required to be exactly one trading day after the wire service/press release announcement date (from First Call).

[b] FE/P_{-2} = Actual earnings for the current quarter minus the most recent mean analysts' forecast of current quarter earnings reported by First Call, scaled by closing share price at trading day −2.

[c] $AWCA_t = WC_t - [(WC_{t-4}/S_{t-4}) \times S_t]$

where:

t = year-quarter; thus $t - 1$ refers to the prior quarter and $t - 4$ refers to the same quarter in the prior year;

$AWCA_t$ = abnormal working capital accruals in the current quarter;

WC_t = working capital in the current quarter where working capital is computed as (current assets − cash and short-term investments) − (current liabilities − short-term debt);

WC_{t-4} = working capital in the same quarter last year;

S_t = sales in the current quarter; and

S_{t-4} = sales in the same quarter last year.

[d] Good news earnings surprises are defined as actual earnings exceeding forecasted earnings for the quarter.

[e] Bad news earnings surprises are defined as actual earnings falling short of forecasted earnings for the quarter.

indicates that our observations are reasonably well distributed over the four partitions. Consistent with prior research, the good news surprise partitions have positive CARs and the bad news surprise partitions have negative CARs. The mean forecast errors scaled by price (FE/P_{-2}) are identical across income-increasing and income-decreasing firms within each surprise partition. In addition, the mean abnormal working capital accruals scaled by price ($AWCA/P_{-2}$) are quite symmetric across the income-increasing and income-decreasing firms within each surprise partition.

IV. RESULTS

Hypotheses Tests

Table 2 presents our hypotheses tests. The first row of Panel A reports that the unconditioned ERC is 1.38, somewhat larger than the ERCs in prior research with similar return periods. Using First Call real-time forecasts and restricting our sample to firms with earnings announcements within one day of the *Wall Street Journal* announcement likely yields more precise forecast errors and probably explains our larger ERCs.[11]

The results in the second row of Panel A support our predictions. The coefficient on the good news income-increasing partition is negative and the coefficient on the bad news income-increasing partition is positive, both at the 1 percent level (one-tailed).[12] Panel B presents the regression coefficients in a 2 × 2 table based on the signs of the forecast errors and the abnormal accruals. As documented in Basu (1997, 23), ERCs are asymmetric with respect to the sign of the surprise. Good news earnings surprises are associated with higher ERCs (Basu [1997] attributes this to greater persistence for income-increasing surprises). We find that the ERCs are also asymmetric with respect to the sign of the abnormal accruals within each surprise partition. This is consistent with the income-increasing abnormal accruals exaggerating the magnitude of the good news and suppressing the magnitude of the bad news, and the income-decreasing abnormal accruals suppressing the magnitude of the good news and exaggerating the magnitude of the bad news.

We also note that abnormal accruals suppressing earnings surprises are consistent with "income-smoothing." However, our results suggest the market does not consistently reward or punish income smoothing. While higher ERCs in the cell with *good* news surprises and income-*decreasing* abnormal accruals are consistent with the market rewarding smoothing, higher ERCs in the cell with *bad* news surprises and income-*increasing* abnormal accruals are consistent with the market punishing smoothing.

Hypotheses Tests with Controls

Because prior research finds that ERCs are associated with size, risk, growth and earnings persistence (Easton and Zmjewski 1989; Collins and Kothari 1989), we rerun our analysis after including controls for the number of analysts, firm size, the market-to-book ratio, growth in book value of equity, earnings volatility, and earnings persistence.[13] Descriptive statistics for the control variables appear in Table 3, Panel A. We perform the

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[11] The standard deviation of our forecast errors reported in Table 1 is smaller than generally reported in previous studies. For example, Philbrick and Ricks (1991, Panel A, Table 1) report that I/B/E/S-based forecast errors (scaled by price) have the smallest standard deviation (0.051), which is much larger than our standard deviation of 0.007.

[12] Throughout the paper we report one-tailed significance levels when our predictions are signed and two-tailed significance levels otherwise. Clustering in event time or industry is unlikely to affect our inferences, because less than 1 percent of our sample is clustered on the same event date, and the most frequent industry represents less than 9 percent of our observations.

[13] Earnings persistence is measured as $(1 - \theta)$ with the assumption that annual earnings per share (adjusted for stock dividends and splits) follows an IMA(1,1) process: i.e., $EPS_y = EPS_{y-1} + \varepsilon_y - \theta\varepsilon_{y-1}$. While interest rates are also expected to impact ERCs, we assume that interest rates do not fluctuate significantly over the period of our analysis.

TABLE 2

Regression of Two-Day Market-Adjusted Returns on Earnings Forecast Errors Partitioned by Good/Bad Earnings News and Income-Increasing/Decreasing Abnormal Working Capital Accruals

(n = 14,839)

Panel A: Regression Analysis[a]

$$CAR = \alpha + \beta_1(GOODNEWS \times FE/P_{-2}) + \beta_2(GOODNEWSINCR \times FE/P_{-2}) + \beta_3(BADNEWS \times FE/P_{-2}) + \beta_4(BADNEWSINCR \times FE/P_{-2}) + \varepsilon$$

			Good News Earnings Surprises		Bad News Earnings Surprises		
	Intercept	FE/P_{-2}	*Good News Dummy* × FE/P_{-2}	*Income-Increasing Dummy* × FE/P_{-2}	*Bad News Dummy* × FE/P_{-2}	*Income-Increasing Dummy* × FE/P_{-2}	*Adj.* R^2
Predictions		+	+	−	+	+	
Coefficient	0.00	1.38					0.027
t-statistic	(5.98)***	(20.39)***					
Coefficient	−0.00		6.05	−1.47	0.57	0.53	0.046
t-statistic	(−3.51)***		(19.16)***	(−3.22)***	(5.48)***	(3.83)***	
n for dummy = 1			[5,860]	[2,762]	[5,676]	[3,206]	

(*Continued on next page*)

TABLE 2 (Continued)

Panel B: Earnings Response Coefficients from Panel A Partitioned by Sign of Earnings Surprise and Sign of Abnormal Accruals

		Earnings Surprise				Differences (GOOD NEWS Minus BAD NEWS Cells)
		GOOD NEWS		*BAD NEWS*		
Abnormal Working Capital Accruals	Income-Increasing	*(i)*	4.58***	*(ii)*	1.10***	3.48***
	Income-Decreasing	*(iii)*	6.05***	*(iv)*	0.57***	5.48***
	Hypotheses Tests: (Income-Increasing minus Income-Decreasing cells)					
	Prediction		–		+	
			−1.47***		0.53***	

*, **, *** $p < 0.10$, $p < 0.05$, $p < 0.01$, respectively, one-tailed.

[a] The variables in the regression are defined as follows:

CAR = market-adjusted stock returns accumulated over the two trading days [−1,0] where 0 is the *Wall Street Journal* earnings announcement date. Earnings announcement dates are obtained from the *Wall Street Journal Abstracts* and are required to be exactly one trading day after the wire service/press release announcement date (from First Call);

FE/P_{-2} = actual earnings for the current quarter minus the most recent mean analysts' forecast of current quarter earnings reported by First Call, scaled by closing share price at trading day −2;

GOODNEWS = good news dummy that equals 1 if actual earnings exceed forecast;

GOODNEWSINCR = good news income-increasing dummy that equals 1 if GOODNEWS equals 1 and abnormal working capital accruals increase income;

BADNEWS = bad news dummy that equals 1 if actual earnings fall short of forecast;

BADNEWSINCR = bad news income-increasing dummy that equals 1 if BADNEWS equals 1 and abnormal working capital accruals increase income; and

ε = error term.

TABLE 3
Regression of Two-Day Market-Adjusted Returns on Earnings Forecast Errors Partitioned by Good/Bad Earnings News and Income-Increasing/Decreasing Abnormal Working Capital Accruals, with Control Variables[a]

Panel A: Univariate Statistics for Control Variables

		GOOD NEWS Earnings Surprises			BAD NEWS Earnings Surprises		
		Income-decreasing Working Capital Accruals	Income-increasing Working Capital Accruals	Difference	Income-decreasing Working Capital Accruals	Income-increasing Working Capital Accruals	Difference
Number of analysts	Mean	6.5	6.2	0.3**	5.9	5.8	0.1
	Median	5	4	1**	4	4	0
	n	3,098	2,762		2,470	3,206	
Size ($millions)	Mean	2,105	1,966	139	1,538	1,395	143
	Median	439	390	49***	282	236	46***
	n	3,096	2,755		2,465	3,193	
Market-to-book equity ratio	Mean	3.43	3.48	−0.05	2.79	3.19	0.40
	Median	2.47	2.54	−0.07*	1.96	2.03	0.07
	n	3,023	2,693		2,395	3,126	
Growth in book value of equity	Mean	0.04	−0.07	0.11	−0.02	0.13	−0.15
	Median	0.10	0.11	−0.01***	0.09	0.11	−0.02***
	n	2,299	1,805		1,847	2,191	
Earnings volatility	Mean	7.25	15.20	−7.95	18.79	3.75	15.04**
	Median	0.0057	0.0060	−0.0003**	0.0063	0.0059	0.0004
	n	2,321	1,860		1,867	2,243	
Earnings persistence	Mean	0.92	0.88	0.04**	0.79	0.77	0.02
	Median	0.92	0.87	0.05**	0.72	0.69	0.03
	n	1,815	1,439		1,454	1,721	

(Continued on next page)

TABLE 3 (Continued)

Panel B: Regression Analysis (n = 7,849)

$$CAR = \alpha + \beta_1(GOODNEWS \times FE/P_{-2}) + \beta_2(GOODNEWSINCR \times FE/P_{-2}) + \beta_3(BADNEWS \times FE/P_{-2})$$
$$+ \beta_4(BADNEWSINCR \times FE/P_{-2}) + \beta_5(Number\ of\ analysts\ dummy \times FE/P_{-2}) + \beta_6(Size\ dummy \times FE/P_{-2})$$
$$+ \beta_7(Market\text{-}to\text{-}book\ dummy \times FE/P_{-2}) + \beta_8(Growth\ dummy \times FE/P_{-2}) + \beta_9(Earnings\ volatility\ dummy \times FE/P_{-2})$$
$$+ \beta_{10}(Earnings\ persistence\ dummy \times FE/P_{-2}) + \varepsilon$$

		GOOD NEWS Earnings Surprises		BAD NEWS Earnings Surprises								
	Intercept	*Good News Dummy* × FE/P_{-2}	*Income-Increasing Dummy* × FE/P_{-2}	*Bad News Dummy* × FE/P_{-2}	*Income-Increasing Dummy* × FE/P_{-2}	*Number of Analysts Dummy* × FE/P_{-2}	*Firm Size Dummy* × FE/P_{-2}	*Market-to-Book Equity Ratio Dummy* × FE/P_{-2}	*Growth in Book Value of Equity Dummy* × FE/P_{-2}	*Earnings Volatility Dummy* × FE/P_{-2}	*Earnings Persistence Dummy* × FE/P_{-2}	*Adj.* R^2
Prediction		+	−	+	+	?	?	+	+	−	+	
Coefficient	−0.00	6.07	−1.62	0.52	0.64	0.16	0.11	0.70	0.60	−0.61	0.22	0.059
t-statistic	(−2.81)***	(13.24)***	(−2.74)***	(2.10)***	(3.22)***	(0.71)	(0.45)	(2.77)***	(2.98)***	(−2.95)***	(1.12)	
n for Dummy = 1		[3,139]	[1,389]	[3,052]	[1,661]							

(Continued on next page)

TABLE 3 (Continued)

*, **, *** $p < 0.10$, $p < 0.05$, $p < 0.01$, one-tailed for predicted signs in Panel B, all others are two-tailed, respectively, where p-values corresponding to differences in means refer to t-tests, and p-values corresponding to differences in medians refer to Wilcoxon two-sample tests.

[a] The variables are defined as follows:

CAR = market-adjusted stock returns accumulated over the trading days [−1,0], where 0 is the *Wall Street Journal* earnings announcement date. Earnings announcement dates are obtained from the *Wall Street Journal Abstracts* and are required to be exactly one trading day after the wire service/press release announcement date (from First Call);

FE/P_{-2} = actual earnings for the current quarter minus the most recent mean analysts' forecast of current quarter earnings reported by First Call, scaled by closing share price at trading day −2;

GOODNEWS = good news dummy that equals 1 if actual earnings exceed forecast;

GOODNEWSINCR = good news income-increasing dummy that equals 1 if GOODNEWS equals 1 and abnormal working capital accruals increase income;

BADNEWS = bad news dummy that equals 1 if actual earnings fall short of forecast;

BADNEWSINCR = bad news income-increasing dummy that equals 1 if BADNEWS equals 1 and abnormal working capital accruals increase income;

Number of analysts dummy = 1 if the number of analysts' forecasts from the First Call database is above the sample median and 0 otherwise;

Size dummy = 1 if the market value of the firm at the end of the quarter is above the sample median and 0 otherwise;

Market-to-book equity ratio dummy = 1 if the market value of common equity divided by the book value of common equity at the end of the quarter is above the sample median and 0 otherwise;

Growth in book value of equity dummy = 1 if the average growth in the book value of equity over the prior three years is above the sample median and 0 otherwise;

Earnings volatility dummy = 1 if the variance of ROE over the past five years (where ROE is defined as earnings before extraordinary items divided by beginning of year equity) is above the sample median and 0 otherwise;

Earnings persistence dummy = 1 if $(1 - \theta)$ is above the sample median and 0 otherwise, with the assumption that annual earnings per share (adjusted for stock dividends and splits) follows an IMA(1,1) process: i.e., $EPS_y = EPS_{y-1} + \varepsilon_y - \theta\, \varepsilon_{y-1}$. We use earnings per share data from 1987 to 1996 to estimate persistence; and

ε = error term.

regression analysis with 7,849 firm-quarter observations that have complete data for all control variables, but we present descriptive statistics using all available observations. Although differences between income-increasing and income-decreasing firms within each surprise partition are modest, some are statistically significant. In particular, the median firm size is larger and the median growth in book value is smaller, among the income-decreasing observations.

The results in Panel B of Table 3 indicate that our hypotheses are supported after controlling for the variables in Panel A. The coefficient for the good news income-increasing partition remains negative and the coefficient for the bad news income-increasing partition remains positive, both at the 1 percent level (one-tailed).[14]

Forecast Revision Tests

If our hypotheses are true, then we also expect securities analysts to consider the reversing implications of abnormal accruals when revising future forecasts in response to current period earnings surprises. Good news forecast errors that contain income-increasing abnormal accruals should result in smaller upward forecast revisions than good news forecast errors that contain income-decreasing abnormal accruals. Similarly, bad news forecast errors that contain income-increasing abnormal accruals should result in larger downward forecast revisions than bad news forecast errors that contain income-decreasing abnormal accruals. We test this conjecture by estimating the parameters in the following model.

$$\begin{aligned} FR_{t+1}/P_{-2} = {} & \alpha + \beta_1(GOODNEWS \times FE/P_{-2}) + \beta_2(GOODNEWSINCR \times FE/P_{-2}) \\ & + \beta_3(BADNEWS \times FE/P_{-2}) + \beta_4(BADNEWSINCR \times FE/P_{-2}) + \varepsilon \end{aligned} \quad (3)$$

where:

FR_{t+1}/P_{-2} = the first analyst forecast revision of next quarter's earnings after the current period's earnings announcement, computed as the revised forecast minus the original forecast, scaled by the closing share price at trading day −2.

The other variables are as defined previously.

We restrict this analysis to forecast revisions within 40 days following the *Wall Street Journal* earnings announcement, resulting in a mean (median) of 8.7 (4) trading days between the earnings announcement and the revision, with an upper quartile of 12 days and a lower quartile of one day. Consistent with our hypotheses, Table 4 reports that the coefficient on the good news income-increasing partition (β_2) is significantly negative, and the coefficient on the bad news income-increasing partition (β_4) is significantly positive, both at the 1 percent level (one-tailed). Therefore, this test provides additional evidence that market participants (in this case analysts) consider the reversing nature of abnormal accruals when interpreting earnings surprises.

[14] We also (sequentially) test these alternative specifications: (1) market-to-book ratio (which is measured at the end of the period in the Table 3 analysis) is replaced by market-to-book measured at the beginning of the period; (2) growth in book value of equity is replaced by growth in market capitalization measured as the average growth over the prior three years; (3) earnings volatility is replaced by return volatility measured as the variance in monthly returns over the prior 36 months; (4) IMA earnings persistence is replaced by earnings persistence calculated as the coefficient on an AR(1) process, following Ohlson (1995). The results continue to support our hypotheses as reported in Table 3.

TABLE 4
Regression of Analysts' Forecast Revisions on Earnings Forecast Errors Partitioned by Good/Bad Earnings News and Income-Increasing/Decreasing Abnormal Working Capital Accruals
(n = 8,561)[a]

$$FR_{t+1}/P_{-2} = \alpha + \beta_1(GOODNEWS \times FE/P_{-2}) + \beta_2(GOODNEWSINCR \times FE/P_{-2}) + \beta_3(BADNEWS \times FE/P_{-2}) + \beta_4(BADNEWSINCR \times FE/P_{-2}) + \varepsilon$$

		GOOD NEWS Earnings Surprises		*BAD NEWS Earnings Surprises*		
	Intercept	*Good News Dummy* × FE/P_{-2}	*Income-Increasing Dummy* × FE/P_{-2}	*Bad News Dummy* × FE/P_{-2}	*Income-Increasing Dummy* × FE/P_{-2}	*Adj.* R^2
Predictions		+	−	+	+	
Coefficient	−0.00	0.30	−0.11	0.24	0.10	0.165
t-statistic	(−16.42)***	(12.00)***	(−3.03)***	(19.94)***	(6.39)***	
n for dummy = 1		[3,627]	[1,708]	[3,267]	[1,902]	

*, **, *** $p < 0.10$, $p < 0.05$, $p < 0.01$, respectively, one-tailed.
[a] The variables in the regression are defined as follows:

FR_{t+1}/P_{-2} = the first analyst forecast revision of next quarter's earnings made after the current period's earnings announcement, computed as the revised forecast minus the original forecast, closing share price at trading day −2;
FE/P_{-2} = actual earnings for the current quarter minus the most recent mean analysts' forecast of current quarter earnings reported by First Call, scaled by closing share price at trading day −2;
GOODNEWS = good news dummy that equals 1 if actual earnings exceed forecast;
GOODNEWSINCR = good news income-increasing dummy that equals 1 if GOODNEWS equals 1 and abnormal working capital accruals increase income;
BADNEWS = bad news dummy that equals 1 if actual earnings fall short of forecast;
BADNEWSINCR = bad news income-increasing dummy that equals 1 if BADNEWS equals 1 and abnormal working capital accruals increase income; and
ε = error term.

Post-Announcement Abnormal Returns

While the above analysis suggests that the market anticipates the reversing implications of abnormal accruals, it does not address whether the market fully impounds the implications over our two-day event window. We investigate this issue by examining the cumulative abnormal returns during the 80 trading days following the earnings announcement.[15]

Panel A of Table 5 reports post-announcement CARs, in ten-day increments, over the 80 days following the quarterly earnings announcements. At the end of the 80-day period, differences in cumulative abnormal returns across the accruals partitions are 2.4 percent for the good news surprises and 3.0 percent for the bad news surprises. Figure 1 displays the

[15] Because we restrict this analysis to observations with complete returns data, we drop 22 and 15 (21 and 30) good (bad) news income-increasing and income-decreasing observations, respectively. Since this is less than 1 percent of each partition, survivorship bias is unlikely to affect our results.

TABLE 5

Cumulative Abnormal Returns (CARs), by Good/Bad Earnings News and Income-Increasing/Decreasing Partitions for +1 to +80 days Following the Earnings Announcement Date, for the Full Sample (Panel A) and for the Sample Matched on Earnings Announcement Dates (Panel B)[a]

Panel A: Full Sample

	GOOD NEWS Earnings Surprises			*BAD NEWS Earnings Surprises*		
Event Window	*(1) Income-Decreasing Accruals* *n = 3,076*	*(2) Income-Increasing Accruals* *n = 2,747*	*Difference (1) − (2)*	*(3) Income-Decreasing Accruals* *n = 2,449*	*(4) Income-Increasing Accruals* *n = 3,176*	*Difference (3) − (4)*
[+1,+10]	0.005	0.003	0.002	0.001	−0.001	0.002
[+1,+20]	0.010	0.007	0.003	0.003	0.002	0.001
[+1,+30]	0.010	0.007	0.003	−0.002	−0.004	0.002
[+1,+40]	0.012	0.005	0.007*	−0.006	−0.012	0.006
[+1,+50]	0.014	0.004	0.010**	−0.005	−0.020	0.015***
[+1,+60]	0.020	0.004	0.016***	−0.003	−0.027	0.024***
[+1,+70]	0.027	0.003	0.024***	−0.002	−0.030	0.028***
[+1,+80]	0.029	0.005	0.024***	0.002	−0.028	0.030***

(Continued on next page)

TABLE 5 (Continued)

Panel B: Sample Matched on Earnings Announcement Dates[b]

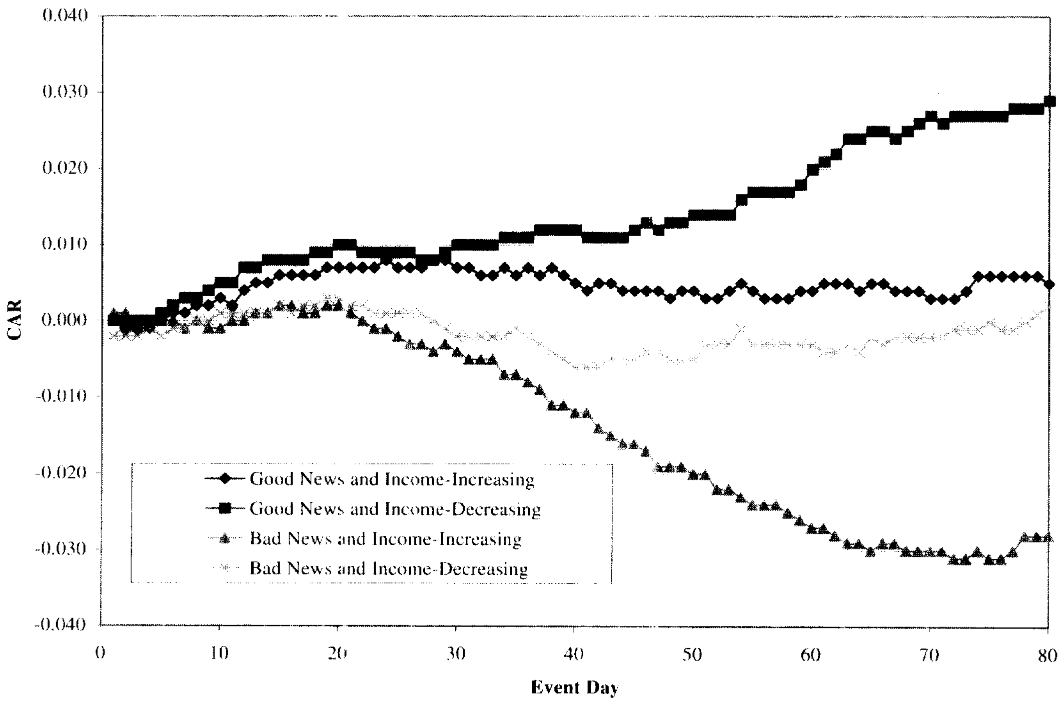
	GOOD NEWS Earnings Surprises			*BAD NEWS Earnings Surprises*		
	(1) Income-Decreasing Accruals	*(2) Income-Increasing Accruals*		*(3) Income-Decreasing Accruals*	*(4) Income-Increasing Accruals*	
Event Window	*n = 580*	*n = 580*	*(1) − (2)*	*n = 559*	*n = 559*	*(3) − (4)*
[+1,+10]	0.007	0.004	0.003	−0.003	0.000	−0.003
[+1,+20]	0.013	0.011	0.002	0.000	0.002	−0.002
[+1,+30]	0.008	0.010	−0.002	−0.005	−0.005	0.000
[+1,+40]	0.012	0.007	0.005	−0.009	−0.012	0.003
[+1,+50]	0.016	0.008	0.008	−0.007	−0.013	0.006
[+1,+60]	0.022	0.007	0.015	−0.005	−0.019	0.014
[+1,+70]	0.032	0.003	0.029**	0.003	−0.016	0.019*
[+1,+80]	0.036	0.010	0.026**	0.006	−0.019	0.025**

*, **, *** $p < 0.10$, $p < 0.05$, $p < 0.01$, respectively, two-tailed.

[a] Cumulative abnormal returns are market-adjusted and begin cumulating on the day after the *Wall Street Journal* announcement date. Earnings surprises and working capital accruals are defined in Table 1.

[b] Observations are pair-wise matched such that an income-increasing and an income-decreasing observation occur on the same earnings announcement date. When more than one match occurs on a given announcement date, we retain the observation with the smallest absolute difference in abnormal accruals.

FIGURE 1
Cumulative Abnormal Returns (CARs) by Signs of the Earnings Surprise and the Abnormal Accruals for Event Window [+1, +80]



CARs from Table 5 and shows that the good news income-decreasing observations increase in value, while the bad news income-increasing firms decline in value. This is consistent with the market under-anticipating both the positive implications of income-decreasing abnormal accruals and the negative implications of income-increasing abnormal accruals.

The analysis in Table 5 suggests that the market underestimates the magnitude of the pricing implications of the abnormal accruals. To quantify the market's underestimation, we calculate the relative proportion of the pricing implications that the market assimilates at the earnings announcement date. Table 5 reports that *net* abnormal returns of 2.4 percent and 3.0 percent accrue to the good and bad news partitions, respectively, during the 80 days after the earnings announcement. Panel B of Table 1 suggests that the market assimilates a 0.7 percent *net* abnormal return during the two-day [−1,0] announcement period for both the good news partition (0.019 minus 0.012) and the bad news partition (−0.009 minus −0.016). This suggests that market participants anticipate approximately 23 percent [0.7 percent/(0.7 percent + 2.4 percent)] and 19 percent [0.7 percent/(0.7 percent + 3.0 percent)] of the pricing implications of the abnormal accruals in the good and bad news partitions, respectively. In supplementary analysis we also examine abnormal returns over the subsequent 250 trading days (approximately one year) and find that *net* abnormal returns of 5.3 percent accrue to each of the good and bad news partitions. This suggests that the market anticipates approximately 12 percent of the one-year returns [0.7 percent/(0.7 percent + 5.3 percent)].

The analysis in Panel A of Table 5 does not represent a zero net investment portfolio because earnings announcement dates for the income-increasing observations do not necessarily correspond with the announcement dates for the income-decreasing observations. Therefore, we replicate this analysis after pair-wise matching the income-increasing and income-decreasing observations on announcement dates (following Bernard and Thomas 1989). The results appear in Panel B of Table 5.[16] While matching reduces the number of observations to less than 600 in each partition, the results at the end of the 80-day period are quite similar to those reported in Panel A. Thus, restricting the post-announcement analysis to a zero net investment portfolio does not alter our conclusions.

Another limitation of the analysis in Panel A of Table 5 is that it does not control for risk factors that may affect post-announcement returns. We address this issue in two ways. First, we run Fama and MacBeth (1973) regressions over the 40-, 60-, and 80-day periods following the quarterly earnings announcements. This regression includes dummy variables capturing the returns for each of our partitions and continuous control variables for Fama and French (1992) risk factors. The control variables are firm size (log of market value), book-to-market (log form), beta (estimated over the 250 days ending two days before the earnings announcement), and the earnings-to-price ratio (prior year's annual earnings per share divided by end of the prior year stock price). We run individual regressions for each of the 16 quarters during the four-year period of our analysis and present the means of the 16 estimated coefficients along with t-statistics computed from their time-series standard error (as suggested in Bernard 1987). Panel A of Table 6 presents the regression statistics after controlling for the risk factors and Panel B presents test statistics for the income-decreasing minus the income-increasing returns for each earnings surprise partition. While Panel A indicates that the returns for the individual partitions differ somewhat from those estimated in Panel A of Table 5, the differences reported in Panel B of Table 6 are generally consistent with those found in Table 5, particularly over the entire 80-day period. Thus, risk differences do not appear to explain our inference that the market does not fully assimilate the pricing implications of abnormal accruals.

Bernard et al. (1997) suggest that abnormal returns clustered around subsequent earnings announcements are more likely due to informational mispricing than omitted risk factors. Consequently, we also examine returns at the next quarter's earnings announcement. As in prior literature we examine returns during the three-day window $[-2,0]$ ending with the Compustat earnings announcement date (Bernard and Thomas 1990; Sloan 1996; Collins and Hribar 2000). The results in Table 6, Panel C, indicate that while the three-day window represents only 3.8 percent of the 80-day accumulation period, it contains 21 percent (0.5/2.4) and 13 percent (0.4/3.0) of the net abnormal returns contained in the good and bad news partitions, respectively, as reported in Panel A of Table 5.[17]

Taken together, the analyses in Tables 5 and 6 suggest that the market, on average, does not fully impound the pricing implications of abnormal working capital accruals associated with earnings surprises. The purpose of our investigation is to assess whether market participants fully understand the pricing implications of abnormal accruals, not to identify an implementable strategy for capturing abnormal trading profits. In addition to risk factors, other barriers to earning excess trading profits include: (1) transactions costs

[16] When more than one match occurs on a given announcement date, we retain the observation with the smallest absolute difference in abnormal accruals.

[17] Abnormal returns around earnings announcements may coincide with risk shifts, because *investment risk* is systematically related to *earnings changes* (Ball and Kothari 1991; Ball et al. 1993). However, it is unclear how *investment risk* is systematically related to *abnormal accruals* (after controlling for unexpected earnings).

TABLE 6

Cumulative Abnormal Returns with Controls for Risk Factors (Panels A and B), and Returns during the Three-Day Window around Subsequent Earnings Announcements (Panel C)

Panel A: Cross-Sectional Regressions with Controls for Risk Factors (n = 14,731)[a]

$$CAR = \alpha + \beta_1(GOODNEWSINCR) + \beta_2(GOODNEWSDECR) + \beta_3(BADNEWSINCR) + \beta_4(BADNEWSDECR) + \beta_5(Firm\ Size) + \beta_6(Book\text{-}to\text{-}Market) + \beta_7(Stock\ Beta) + \beta_8(Earnings\text{-}to\text{-}Price\ Ratio) + \varepsilon$$

	Cumulative Abnormal Returns (CARs)		
	[+1,+40]	*[+1,+60]*	*[+1,+80]*
Intercept	0.026	0.044	0.055
(t-stat)	(2.83)**	(3.57)***	(4.33)***
Good News Surprises			
Income-increasing dummy	0.007	0.005	−0.002
(t-statistic)	(1.20)	(0.74)	(−0.23)
Income-decreasing dummy	0.013	0.018	0.019
(t-statistic)	(4.43)***	(3.56)***	(3.29)***
Bad News Surprises			
Income-increasing dummy	−0.016	−0.034	−0.043
(t-statistic)	(−5.13)***	(−8.01)***	(−7.64)***
Income-decreasing dummy	−0.010	−0.012	−0.016
(t-statistic)	(−2.92)**	(−2.17)**	(−2.21)**
Risk Factor Controls			
Firm size	−0.003	−0.005	−0.005
(t-statistic)	(−2.04)*	(−2.73)**	(−2.85)**
Book-to-market equity ratio	0.005	0.007	0.009
(t-statistic)	(1.35)	(1.34)	(1.41)
Stock beta	−0.004	−0.004	0.000
(t-statistic)	(−0.87)	(−0.71)	(0.01)
Earnings-to-price ratio	−0.007	−0.021	−0.008
(t-statistic)	(−0.35)	(−0.68)	(−0.20)

Panel B: Differences in Returns between the Abnormal Accruals Partitions Estimated in Panel A

	[+1,+40]	*[+1,+60]*	*[+1,+80]*
Differences in Good News Partitions			
Income-decreasing – Income-increasing	0.006	0.013	0.021
	(0.99)	(1.45)	(2.28)**
Differences in Bad News Partitions			
Income-decreasing – Income-increasing	0.006	0.022	0.027
	(1.40)	(3.23)***	(3.05)***

(*Continued on next page*)

TABLE 6 (Continued)

Panel C: Abnormal Returns during Three-Day Window around Subsequent Earnings Announcements

	GOOD NEWS Earnings Surprises			*BAD NEWS Earnings Surprises*		
	(1) Income-Decreasing Accruals	*(2) Income-Increasing Accruals*		*(3) Income-Decreasing Accruals*	*(4) Income-Increasing Accruals*	
Event Window	*n = 2,905*	*n = 2,566*	*(1) − (2)*	*n = 2,240*	*n = 2,859*	*(3) − (4)*
Cumulative abnormal return over three-day window around subsequent earnings announcements	0.008	0.003	0.005***	0.002	−0.002	0.004**

*, **, *** $p < 0.10$, $p < 0.05$, $p < 0.01$, respectively, two-tailed.

[a] We run individual regressions for each of the 16 quarters during 1992–1995, and Panel A presents the means of the 16 estimated coefficients along with t-statistics from their time-series standard error. The variables in the regression are defined as follows:

CAR = market-adjusted stock returns accumulated over the trading days [−1,0], where 0 is the *Wall Street Journal* earnings announcement date. Earnings announcement dates are obtained from the *Wall Street Journal Abstracts* and are required to be exactly one trading day after the wire service/press release announcement date (from First Call);
GOODNEWSINCR = good news income-increasing dummy that equals 1 if GOODNEWS equals 1 and abnormal working capital accruals increase income;
GOODNEWSDECR = good news income-decreasing dummy that equals 1 if GOODNEWS equals 1 and abnormal working capital accruals decrease income;
BADNEWSINCR = bad news income-increasing dummy that equals 1 if BADNEWS equals 1 and abnormal working capital accruals increase income;
BADNEWSDECR = bad news income-decreasing dummy that equals 1 if BADNEWS equals 1 and abnormal working capital accruals decrease income;
Firm size = the natural log of the market value of the firm at the end of the quarter;
Book-to-market equity ratio = the natural log of the ratio of the book value of common equity divided by the market value of common equity at the end of the quarter;
Stock beta = estimated from a regression of daily raw returns on the CRSP value-weighted daily return index using the 250-day return period ending the two trading days before the *Wall Street Journal* date;
Earnings-to-price ratio = annual earnings per share of the prior year divided by the stock price at the end of the prior year; and
ε = error term.

of identifying and trading the firms in our partitions, (2) pricing pressure from enacting a trading rule, and (3) availability of balance sheet data to compute abnormal accruals. If balance sheet information is unavailable until the current quarter's 10-Q or 10-K is ultimately released, then the "post-announcement" returns are simply perfect foresight returns to the delayed release of the balance sheet information. However, if the full response occurs at the 10-Q or 10-K filing, then we would not find returns clustered around the subsequent quarter's earnings announcements as reported in Panel C of Table 6. Moreover, replicating our analyses in Tables 5 and 6 using just the 4,889 observations that voluntarily disclose balance sheet information with their earnings announcements yields inferences identical to those drawn based on the full sample.

V. ROBUSTNESS CHECKS

The study's hypotheses are still supported after the following robustness checks:

1) Tests allowing for a nonlinear earnings-return relation—Freeman and Tse (1992) find that the earnings-return relation is nonlinear and may be better specified using an arc-tangent regression model, so we rerun the regression in Table 2 using an arc-tangent specification.
2) Eliminating loss firms—Because loss firms' ERCs are on average lower than ERCs of firms with positive earnings (Hayn 1995) we rerun the regression in Table 2 after deleting loss firm observations.
3) Including intercepts for good and bad news—We rerun the analysis in Table 2 after including good and bad news dummy variables.
4) Including partitions based on sales growth—Because our measure of abnormal accruals is a function of sales in the current and prior year, we rerun the regression in Table 2 after adding variables that partition the forecast errors based on sales growth. We include a dummy for good news firms with low sales growth (below the median) times the forecast error, and a dummy for bad news firms with low sales growth (below the median) times the forecast error.
5) Eliminating observations with management forecasts—An alternative explanation for our findings is a market response to management earnings forecasts issued at the time of the earnings announcements. Thus, we rerun the regression in Table 2 after dropping observations that issue (or are suspected of issuing) management forecasts at the earnings announcement date, identified from the *Wall Street Journal Abstracts* in *Proquest* and First Call. Because First Call does not collect comprehensive data on management forecasts prior to 1995, we drop all observations for firms that issue at least one forecast during the period of our analysis, resulting in a loss of 5,360 observations.
6) Eliminating observations with large acquisitions or divestitures—Collins and Hribar (1999) report that acquisitions and divestitures may distort the interpretation of reported accounting accruals. Therefore, we rerun the analysis in Table 2 after dropping firms with acquisitions that exceed 5 percent of total sales and firms reporting discontinued operations (nonzero Compustat item #66) during the event year or the year preceding the event year. While the results continue to support our hypotheses, the significance of the coefficient on the bad news income-increasing partition is slightly weaker at $p < 0.02$ (one-tailed).
7) Alternative measure for working capital to sales ratio—We use prior year's same-quarter ratio of working capital to sales to capture the current quarter's expected ratio of working capital to sales. However, because the prior year's same quarter ratio of working capital to sales may include the initiation and/or reversal of abnormal accruals from prior periods, we rerun the regression in Table 2 using this ratio's average over both the prior two years, and prior three years. While the results of both regressions continue to support our hypotheses, the coefficients on the good news income-increasing partitions are significantly negative at $p \leq 0.04$ (one-tailed) or less.

In addition to the above robustness checks we also perform the following analyses.

Results by Quarter

We replicate the regression in Table 2 by fiscal quarter. The coefficient on the good news income-increasing dummy is significantly negative at the 10 percent level (one-tailed) or less in the first three quarters. The bad news income-increasing dummy is significantly positive at the 5 percent level (one-tailed) or less in the first three quarters. Our results therefore hold in all but the fourth quarter.

Alternative Accruals Models

Our abnormal working capital accruals model differs from the Jones-type models in several ways. However, it is an empirical question whether the two measures are empirically distinct. Therefore, we test whether Jones model discretionary accruals lead to similar inferences. We rerun our hypotheses tests in Table 2 after replacing our abnormal accruals measure with discretionary accruals calculated from the following working capital version of the quarterly Jones model (similar to Han and Wang 1998):

$$(WC_t - WC_{t-1}) = \alpha + \beta_1(S_t - S_{t-1}) + \beta_2 D1 + \beta_3 D2 + \beta_4 D3 + \Sigma DYear + \varepsilon \quad (4)$$

where:

WC_t = noncash working capital in the current quarter;
WC_{t-1} = noncash working capital in the previous quarter;
S_t = sales in the current quarter;
S_{t-1} = sales in the previous quarter;
D1 = dummy if observation relates to first quarter;
D2 = dummy if observation relates to second quarter;
D3 = dummy if observation relates to third quarter;
ΣDYear = dummies for years 1987 through 1995; and
ε = error term.

Abnormal working capital accruals are defined as the error term from equation (4). Consistent with Han and Wang (1998), we estimate the above model using pooled cross-sectional data, by industry.[18] We use two-digit industry SICs and firm quarter observations for the ten-year period from 1986–1995, requiring each quarter to have at least three observations over this period. We also eliminate influential observations using the procedure in Belsley et al. (1980), and delete the extreme 1 percent of the discretionary accruals estimates. This procedure results in 12,723 firm-quarter observations. The Pearson correlation coefficient between our measure of abnormal accruals and the Jones model accruals estimates is only 0.25. Given that our abnormal accruals measure is empirically quite distinct from the Jones model, it is not necessarily surprising that neither of our hypotheses is supported using the Jones model estimates.

We believe our abnormal accruals measure is more appropriate for our research question. While the Jones model estimates normal accruals based on a coefficient from a pooled cross-sectional regression (β_1) and includes the intercept term from this regression, our measure of normal accruals varies by quarter and year for each firm, and is thus specifically tailored to each observation in our sample.[19] Seasonal variations across industries suggest that quarter-specific measures are likely to better capture normal accruals. For example, a

[18] We estimate the model separately for each industry in our sample, while Han and Wang (1998) examine only the oil and gas industry, and thus estimate one set of parameters for their study.

[19] While equation (4) includes quarter and year intercept terms, this simply removes the *average* variation across all quarters and years in the observations used to estimate the model, which is not equivalent to allowing β_1 to vary by quarter and year for each firm.

retailer's working-capital-to-sales ratio is likely to be different around the holiday season than in mid-summer. In addition, firm-specific measures are likely to be superior to industry-wide estimates. For example, within a given industry, a firm's size, age, and accounting choices may affect the normal level of working capital required to sustain current sales levels, but Jones model measures of normal accruals only reflect the average effects of these factors. Unfortunately, we are unable to identify the precise source of the different inferences obtained from the two models, and we leave this issue to future research.

Our *abnormal* working capital accruals also differ from *total* working capital accruals. The Pearson correlation coefficient between our measure of abnormal accruals and total working capital accruals is only 0.30, indicating that the two measures are empirically quite distinct. Rerunning the Table 2 analysis after substituting total working capital accruals for our abnormal accruals measure reveals that our first hypothesis is not supported, but our second hypothesis is supported. These results are consistent with our measure of *abnormal* working capital accruals leading to more powerful tests than simply using *total* (normal plus abnormal) working capital accruals.

Analysis of Working Capital Accrual Components

To assess whether specific working capital components (such as current assets or current liabilities) drive our results, we rerun the regression in Table 2 partitioned on each of the following: current assets, current liabilities, inventories, and accounts receivable. Abnormal accruals for each component are computed as in equation (2), where working capital is replaced by the components. We find that our results are not concentrated in any single working capital component. The negative coefficient on the good news income-increasing partition appears largely attributable to either total current assets or total current liabilities, while the positive coefficient on the bad news income-increasing partition appears largely attributable to inventories and accounts receivable.

Fundamental Analysis Signals on Accounts Receivable and Inventory

Lev and Thiagarajan (1993) and Abarbanell and Bushee (1997, 1998) (hereafter LT and AB) find significant associations between fundamental signals and long window stock returns. Among the nine fundamental signals investigated in LT and AB, two capture aspects of working capital—the change in accounts receivable minus the change in sales, and the change in inventory minus the change in sales. Thus, we attempt to discern whether our partitions (based on our estimate of abnormal working capital accruals) have incremental explanatory power over partitions using the LT and AB measures. We rerun our analysis in Table 2 after adding forecast error partitions that use these two fundamental signals to capture income-increasing abnormal accruals. The results indicate that the coefficients on the partitions that capture our hypotheses tests are essentially unchanged. Thus, our abnormal working capital accruals measure appears distinct from the receivables and inventory measures in LT and AB.

Selective Balance Sheet Disclosure

Management may opportunistically guide market participants by selectively disclosing balance sheet information only when it contains income-*decreasing* abnormal accruals, because these accruals suppress underlying good news and exaggerate underlying bad news. However, the evidence does not support this conjecture since we find that 38.9 percent of the observations with income-*decreasing* abnormal accruals, and 39.6 percent of the observations with income-*increasing* abnormal accruals disclose balance sheet information.

Balance Sheet Data Availability

Our tests assume market participants have balance sheet information to compute working capital accruals. Therefore, we perform three additional analyses. First, we rerun the hypotheses tests in Table 2 using only the 4,889 observations with balance sheet disclosures included in their earnings announcements. We find that the coefficient on the good news income-increasing partition is insignificantly negative ($p = 0.19$, one-tailed), and the coefficient on the bad news income-increasing partition is positive at $p = 0.05$ (one-tailed). Low statistical power from dropping two-thirds of the sample is likely responsible for the weaker results.

Second, we rerun the forecast revision tests in Table 4 using only the 4,889 observations with voluntary balance sheet disclosures. The coefficient on the good news income-increasing partition is negative at $p = 0.09$ (one-tailed), and the coefficient on the bad news income-increasing partition is positive at $p < 0.01$ (one-tailed). Once again, the expected signs but weakened significance on the first hypothesis are likely due to loss of power.

Finally, we also rerun the hypotheses tests in Table 2, using the entire sample, after expanding the event window to include the 20 trading days (approximately one month) following the earnings announcement. Expanding the event window over this period assures that market participants are likely to have balance sheet information from the 10-Q or 10-K to compute working capital accruals. Our hypotheses continue to hold at $p < 0.01$ (one-tailed) in this analysis. Thus, our hypotheses are supported when we perform our tests over a period when balance sheet information is likely to be available for the entire sample.

Truncation of Abnormal Accruals Measure

Partitioning our data based on the sign of the abnormal accruals means that observations close to zero receive the same weight as observations that are far away from zero. However, we expect the observations farther from zero to have relatively greater pricing implications. Moreover, our noisy abnormal accruals measure is more likely to misclassify near-zero income-increasing observations as income-decreasing observations and vice versa. Thus, we rerun the Table 2 analysis after sequentially deleting quartiles of observations in each partition that are closest to zero. Despite the smaller number of observations, the (absolute) t-statistics become larger after dropping observations around zero. Thus, our inferences continue to hold in subsamples where our abnormal accruals measure is least noisy.

VI. SUMMARY

We hypothesize that the reversing implications of abnormal working capital accruals affect the market's perception of the underlying magnitude of earnings surprises. We test our hypotheses by examining ERCs for two-day event windows ending on the quarterly earnings announcement date. The evidence supports our hypotheses. Specifically, we find that the ERCs associated with good news earnings surprises that include income-*increasing* abnormal accruals are *lower* than ERCs associated with good news earnings surprises that include income-*decreasing* abnormal accruals. By contrast, the ERCs associated with bad news earnings surprises that include income-*increasing* abnormal accruals are *higher* when compared to ERCs associated with good news earnings surprises that include income-*decreasing* abnormal accruals.

Also consistent with our hypotheses, we find that analysts appear to consider the implications of abnormal accruals when revising future forecasts in response to current period earnings surprises. That is, analysts' forecast revisions following good news earnings surprises that include income-*increasing* abnormal accruals are *less* positive than forecast revisions following good news earnings surprises that include income-*decreasing* abnormal accruals. By comparison, analysts' forecast revisions following bad news earnings surprises that include income-*increasing* abnormal accruals are *more* negative than forecast revisions following good news earnings surprises that include income-*decreasing* abnormal accruals.

However, we also find that during the 80 trading days following the earnings announcement: (1) good news firms with income-decreasing abnormal accruals experience significantly higher cumulative abnormal returns than good news firms with income-increasing abnormal accruals, and (2) bad news firms with income-increasing abnormal accruals experience significantly lower cumulative abnormal returns than bad news firms with income-decreasing abnormal accruals. This suggests that the market does not fully assimilate the implications of abnormal accruals at the earnings announcement date.

Our findings are consistent with market participants using abnormal working capital accruals to interpret the underlying magnitude of earnings surprises, but not fully adjusting for their pricing implications. This is consistent with prior evidence that stock prices do not fully impound the implications of reported earnings (Foster et al. 1984; Freeman and Tse 1989; Bernard and Thomas 1990; Sloan 1996).

In addition, we estimate abnormal accruals using a model that, conceptually, attempts to capture the amount of working capital accruals that are unlikely to be sustained and, therefore, are expected to reverse against future earnings. Our empirical model of normal working capital accruals differs from the Jones-type models often used in prior research (Jones 1991) in some important respects. For example, while our model allows normal accruals to vary by quarter and year for each firm, and thus to be unique for each observation in our sample, the Jones-type models base their estimates on regression coefficients that do not allow for seasonality. Seasonal variations across industries suggest that quarter-specific measures likely result in superior accrual estimates in quarterly studies. Hence, not surprisingly, our findings are not replicated using a quarterly Jones-type model to estimate normal accruals. However, while we believe our model is more likely to capture abnormal accruals, we are unable to identify the precise source of the different inferences obtained from the two models, and we leave this issue to future research.

APPENDIX

Development of Abnormal Working Capital Accruals Measure

Our abnormal accruals measure attempts to capture the difference between reported working capital and the market's *expectations* of the normal working capital required to support current sales levels. This difference between realized working capital and the market's expectations of required working capital is the portion of working capital accruals that is expected to reverse against future earnings. This appendix formally develops our measure.

We define working capital accruals (WCA) as the change in non-cash working capital ($WC_t - WC_{t-1}$). Since we are interested in *quarterly* working capital, our time subscripts "t" refer to year-quarters. Thus, $t - 1$ refers to the quarter immediately preceding year-quarter t, and $t - 4$ refers to the same quarter in the prior year. We assume that the expectation of WCA is formed at time $t - \varepsilon$, just before market participants see working capital (WC_t), but after they observe $S_{t-\varepsilon}$, which we assume is equal to contemporaneous sales S_t. This essentially assumes that market participants first observe reported sales and then use that information to evaluate reported working capital. Thus, if I_{t-1} is the information available at time t − 1 we have:

$$\text{Unexpected WCA}_t = (WC_t - WC_{t-1}) - E_{t-\varepsilon}[(WC_t - WC_{t-1}) \mid I_{t-1}, S_{t-\varepsilon}] \quad \text{(A1)}$$

$$\text{Unexpected WCA}_t = WC_t - E_{t-\varepsilon}[WC_t \mid I_{t-1}, S_{t-\varepsilon}] \quad \text{(A2)}$$

In simplifying equation (A1) to equation (A2), beginning working capital (WC_{t-1}) drops out because WC_{t-1} is known at time $t - \varepsilon$, thus $E_{t-\varepsilon}[WC_{t-1}] = WC_{t-1}$. A reasonable expectation for working capital (WC_t) just after market participants have observed sales but before they have observed WC_t is the normal level of working capital required to support contemporaneous sales. Consistent with Dechow et al. (1998, 138, equation 9), we assume that sales follow a seasonal random walk and that *normal* working capital at time $t - \varepsilon$ is a fixed proportion of contemporaneous sales ($a_qS_{t-\varepsilon}$). Thus:

$$E_{t-\varepsilon}[WC_t \mid I_{t-1}, S_{t-\varepsilon}] = a_qS_{t-\varepsilon} \quad \text{(A3)}$$

We allow a_q to vary across quarters due to seasonality and empirically estimate seasonal a_q as the prior year's same-quarter ratio of working capital to sales (WC_{t-4}/S_{t-4}), which leads to:

$$E_{t-\varepsilon}[WC_t \mid I_{t-1}, S_{t-\varepsilon}] = (WC_{t-4}/S_{t-4})\, S_{t-\varepsilon}. \quad \text{(A4)}$$

After substituting equation (A4) into equation (A2), we derive the abnormal working capital accruals (AWCA) proxy we use in our tests:[20]

$$AWCA_t = WC_t - (WC_{t-4}/S_{t-4})\, S_{t-\varepsilon}. \quad \text{(A5)}$$

In summary, our abnormal accruals proxy in equation (A5) essentially captures the difference between realized working capital and the market's *expectation* of the normal level of working capital required to support current sales levels.

[20] The terms unexpected and abnormal are often used interchangeably in the accounting literature. While the underlying construct for our measure is unexpected accruals, to be consistent with prior accruals research we label our measure abnormal accruals.

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