Changes in analysts' accrual-related forecast optimism after the disappearance of the accrual anomaly

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Abstract: We investigate changes in analysts' accrual-related forecast optimism after the disappearance of the accrual anomaly. We find that such optimism persists in the no-anomaly period, particularly when analysts' incentives are aligned with greater optimism (i.e., for firms with high external financing). By contrast, the accrual-related forecast optimism declines when analysts' incentives for optimism are low and in circumstances where analysts would have been more aware of accruals information after the anomaly became publicized (i.e., when analysts issued a cash flow forecast). These findings suggest that analysts' incentives can offset forecast improvements that their heightened accrual awareness would otherwise allow. They also highlight the importance of considering both analysts' incentives and knowledge when interpreting their forecasts.

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I. Introduction

In this study, we investigate changes in analysts' accrual-related forecast optimism following the disappearance of the accrual anomaly. Prior studies attribute the disappearance of the anomaly around 2001 to increased market participant awareness of the lower persistence of accruals relative to cash flows for future earnings, hereafter accrual awareness (Richardson, Tuna, and Wysocki 2010; Green, Hand, and Soliman 2011). Bradshaw, Richardson, and Sloan (2001) find that analysts also made accrual-related errors in their forecasts before the anomaly disappeared, which they attribute to analysts' low accrual awareness or to their incentives. We conjecture that financial analysts, as sophisticated information providers, also became increasingly aware of accruals information after the anomaly was publicized. Thus, analysts' accrual-related optimism should decline in the no-anomaly period if it is due to low accrual awareness. However, if the optimism during the anomaly period was driven by analysts' incentives to inflate earnings forecasts, then it may persist even with increased accrual awareness. Since investors rely extensively on analyst forecasts, it is important to examine changes in analysts' forecasting behavior around the disappearance of the accrual anomaly.

The accrual anomaly, originally documented by Sloan (1996), suggests that investors price stocks as if they are unaware that accruals are less persistent than cash flows. Although analysts specialize in interpreting financial information and should thus be more knowledgeable about the persistence of earnings components than investors, Bradshaw et al. (2001) find that they also incorporate accruals information incorrectly in

their forecasts. They conclude that analysts' accrual-related forecast optimism is due to low accrual awareness or to their incentives and call for research on these explanations.

The disappearance of the accrual anomaly enables us to examine analysts' forecast properties before and after a change in accrual awareness among market participants. Richardson et al. (2010) conclude that the anomaly was driven by investors' low accrual awareness and declined once investors learned about the low persistence of accruals relative to cash flows and incorporated this information in their expectations. Consistent with this argument, Green et al. (2011) find that the disappearance of the accrual anomaly coincides with an increase in the number of hedge funds investing in the accrual strategy. These findings strongly suggest that the academic discovery of the anomaly increased sophisticated investors' awareness of accruals information.[1]

We expect analysts' accrual-related optimism to decline in the no-anomaly period if it is due to low accrual awareness in the anomaly period. Prior studies document a significant increase in the incidence of analyst cash flow forecasts that coincides with the disappearance of the anomaly and conclude that cash flow forecasts help investors reduce accrual-related mispricing in the no-anomaly period (Mohanram 2014; Radhakrishnan and Wu 2014). Therefore, we use the provision of cash flow forecasts as a proxy for increased accrual awareness, and expect the decline in analysts' accrual-related optimism to be more pronounced for firms with cash flow forecasts.

An opposing view is that analysts introduce accrual-related optimism in their forecasts to inflate earnings forecasts for self-interested reasons. We use external

[1] For example, Ron Kahn, Global Head of Systematic Equity Research at BGI stated that buying and selling securities based on their accruals characteristics was a good investment strategy "until the market figured it out." (*Financial Times*, January 25, 2009, p. 4).

financing as a proxy for analyst incentives because Bradshaw, Richardson, and Sloan (2006) find that both affiliated and unaffiliated analysts issue optimistic forecasts for firms raising external financing and conclude that this optimism is primarily attributable to some combination of indirect investment banking pressure and incentives to generate brokerage business. In addition, prior studies find that accruals are positively associated with external financing, possibly because managers engage in income-increasing accruals management to inflate expectations when they raise external financing (e.g., Rangan 1998, Teoh, Welch, and Wong 1998, Cohen and Lys 2006, and Richardson and Sloan 2003). These findings raise the possibility that the accrual-related analyst forecast optimism observed in prior studies is partly due to external financing incentives. If so, analysts' accrual-related optimism may persist in the no anomaly period for firms raising external financing despite an increase in analysts' accrual awareness.

We conduct our study using data from 1989 to 2019, and separately analyze 1989 to 2000 (the "anomaly period," when the accrual strategy was consistently profitable), and 2001 to 2019 (the "no-anomaly period," when the accrual strategy became unprofitable) to determine whether there is change in analysts' accrual-related forecast optimism. We use the last consensus forecast before the end of the fourth month of the fiscal year to reflect the information available in analyst forecasts for the accrual-related trading strategy and measure analysts' forecast optimism as the consensus forecast minus actual earnings, scaled by stock price as of the forecast date. We first document a significant decline in analysts' overall forecast optimism that coincides with the beginning of the no-anomaly period, consistent with prior evidence that analyst forecasts are less optimistically biased following the passage of Regulation FD and the Global

Settlement (e.g., Hovakimian and Saenyasiri 2010; Keskek and Tse 2018). Next, we find a positive relation between forecast optimism and accruals in both the anomaly and no-anomaly periods even after we control for several variables that may contribute to forecast optimism. More importantly, we find that the positive overall relation between forecast optimism and accruals is restricted to positive accruals firms. In contrast, we find no relation between forecast optimism and negative accruals in either period. Thus, our results suggest that analysts' apparent misunderstanding of accruals information is confined to positive accruals, where such misunderstanding leads them to issue overly optimistic forecasts when accruals are high. This asymmetric pattern and its persistence in the no-anomaly period suggests that analysts' accrual-related optimism is influenced by their incentives and hence is not solely due to their low accrual awareness.[2]

Next, we examine the cross-sectional effects of analysts' incentives and accrual awareness on their accrual-related forecast optimism. We use external financing as our proxy for analysts' incentives and the provision of cash flow forecasts as our proxy for the level of analysts' accrual awareness. We estimate separate effects for negative and positive accruals and focus our attention on positive accruals because we find no significant association for negative accruals. In the anomaly period, we find a positive association between analyst forecast optimism and accruals that is insensitive to levels of external financing. Our findings suggest that analysts' accrual-related optimism in the anomaly period cannot be attributed to external financing related incentives alone, implying that analysts' low accrual awareness in this period may have contributed to their

[2] Another possibility is that managers are especially diligent in explaining transactions that lead to negative accruals, particularly non-recurring expenses such as asset write-downs and impairments. We are grateful to a reviewer for this suggestion.

accrual-related optimism. In the no-anomaly period, we find a positive relation between forecast optimism and accruals for firms with high levels of external financing, suggesting that analysts continue to introduce accrual-related optimism in their forecasts when their incentives are high. However, we find no significant relation between forecast optimism and accruals for firms with low levels of external financing, suggesting that analysts improved their use of accruals information when their incentives are low, consistent with their heightened accrual awareness in the no-anomaly period. We also find that analysts' accrual-related optimism is significantly lower for firms with cash flow forecasts, providing further evidence that analysts' accrual awareness reduces accrual-related optimism.

This study contributes to the literature by documenting analyst forecast behavior following the disappearance of the accrual anomaly. As sophisticated market participants, analysts might reasonably be expected to incorporate accrual-related information in their forecasts once the accrual anomaly was publicized. Instead, we find a nuanced response that reflects both analysts' external financing incentives and increased accrual awareness. Specifically, we find that analysts respond correctly to accruals information when external financing incentives are low but introduce accrual-related optimism in their forecasts when external financing incentives are high. Our findings indicate that analysts' incentives can impede forecast enhancements that their awareness would otherwise enable. Engelberg, McLean, and Pontiff (2020) investigate 125 anomalies and show that analysts only partially incorporate publicized anomaly-related information in their price forecasts. Our study contributes to the literature by identifying analysts' external financing incentives as a possible underlying reason for the persistence of anomaly-

related bias in analyst forecasts. Our study also responds to Cohen and Lys's (2006) call for research to shed light on the relation between the external financing-related and accrual-related optimism in analyst forecasts.

Our findings also contribute to the literature by documenting that analyst forecasts can significantly diverge from investors' earnings expectations reflected in security prices. Specifically, we find that analysts' accrual-related optimism persists for high external financing firms even after security prices began correctly incorporating accruals information after the accrual anomaly was publicized. Analyst forecasts are the primary source of information for many investors (Mikhail, Walther, and Willis 2007), and their widespread use as a proxy for market expectations presumes that they mirror investors' earnings expectations. However, the disappearance of the accrual anomaly suggests that the earnings forecasts implicit in security prices diverge significantly from analyst forecasts, which continue to be predictably related to accruals. Our findings also support prior studies seeking alternative proxies for market expectations of earnings that are free of the predictable biases in analyst forecasts (Hou, Van Dijk, and Zhang 2012; Li and Mohanram 2014; Keskek, Myers, and Myers 2020).

The rest of the paper is organized as follows: We discuss related literature and develop hypotheses in Section II. We describe sample selection procedures and report descriptive statistics in Section III. Research methods and results are in Section IV, and we conclude with Section V.

II. Related literature and hypothesis development

a. The disappearance of the accrual anomaly

Sloan (1996) finds that the accruals component of earnings is less persistent than the cash flow component and that investors price securities as if they are unaware of this difference, naively fixating on bottom line earnings. As a result, a strategy that takes a long position in the lowest-accrual firms and a short position in the highest-accrual firms generates economically large and statistically significant excess returns. Prior research shows that the accrual anomaly is robust to using alternative estimation methods and reflects market mispricing rather than risk because capital market imperfections only partially explain the negative relation between accruals and future returns (Richardson et al. 2010).[3]

Recent studies find that the accrual anomaly disappeared in 2001 and has been undetectable since then (Richardson et al. 2010; Green et al. 2011). Richardson et al. (2010) conjecture that the adaptive market efficiency theory by Grossman and Stiglitz (1980) can explain the attenuation of the accrual anomaly. This explanation posits that the anomaly was driven by investors' low accrual awareness and declined once investors correctly incorporated accruals and cash flow persistence in their expectations. Consistent with this argument, Green et al. (2011) find that the disappearance of the accrual anomaly coincides with an increase in the number of hedge funds investing in the accrual strategy and argue that academic accountants played a significant role in ending the anomaly by assisting hedge funds in devising strategies to exploit it.[4] Other studies provide evidence consistent with the mispricing explanation by linking declines in returns to academic

[3] Kraft, Leone, and Wasley (2006) find an inverted U-shaped relation between abnormal returns and total accruals. They conclude that investors' naive fixation on earnings does not fully explain accruals mispricing.

[4] Green et al. (2011) note that key senior accounting academics such as Charles Lee and Richard Sloan significantly increased their ties to Barclays Global Investors. For example, Charles Lee worked full time at BGI between July 2004 and July 2008 as director of Accounting Research, head of U.S. Equity Research, cohead of North America Active Equity, and global head of Equity Research.

research that draws investors' attention to return predictors (Jegadeesh, Kim, Krische, and Lee 2004; Engelbert and Pontiff 2016; Bowles, Reed, Ringgenberg, and Thornock 2023). Overall, prior research tends to favor the mispricing explanation over the risk-based explanation for the accrual anomaly and attributes its disappearance to an increase in market participants' awareness that the accrual component of earnings is less persistent than the cash flow component.

b. Analysts' accrual-related optimism around the disappearance the anomaly

Bradshaw et al. (2001) find that analysts incorporate accruals information incompletely into their forecasts even though they specialize in interpreting financial information. They conclude that analysts' accrual-related forecast optimism is due to either low accrual awareness or to their incentives, calling for further research on these explanations. Subsequent studies conclude that although analysts incorporate accruals information incompletely in their forecasts, they have a better understanding of accruals information than investors. For example, Elgers, Lo, and Pfeiffer (2003) find that analyst forecasts are less subject to accrual-related optimism than security prices, and Barth and Hutton (2004) find that analysts' forecast revisions reveal information about the lower persistence of accruals that investors do not fully incorporate in security prices.

We build on prior research attributing the disappearance of the accrual anomaly to heightened awareness of accruals information among sophisticated investors. Analysts may also have become aware of the accrual anomaly and corrected their accrual-related optimism concurrently with other sophisticated investors. Supporting this conjecture, Engelberg, McLean and Pontiff (2020) investigate 125 anomalies and conclude that

analysts have incorporated more of the information in their price targets after anomaly variables have been publicized but have done so incompletely. In addition, Mohanram (2014) and Radhakrishnan and Wu (2014) find that the disappearance of the anomaly coincides with a significant increase in the incidence of analyst cash flow forecasts and conclude that cash flow forecasts help investors understand the components of earnings and thereby mitigate the mispricing of accruals. They do not, however, directly examine whether analysts reduced accrual-related error in their forecasts in the no-anomaly period. If analysts' accrual-related forecast optimism in the anomaly period was primarily due to their low accrual awareness, then we should find an improvement in their use of accruals information in the no-anomaly period. By contrast, analysts' accrual-related optimism in the anomaly period may have been driven by their incentives rather than a lack of accrual awareness (Bradshaw et al. 2001). We conjecture that analysts' incentives remain unchanged in the no-anomaly period. Consequently, analysts' accrual-related optimism would persist in the no-anomaly period if it was primarily caused by their incentives. The low accrual awareness and incentives explanations lead to conflicting predictions about analysts' accrual related optimism in the no-anomaly period. Accordingly, we state the following non-directional hypothesis:

H1: Accrual-related optimism in analysts' earnings forecasts remains unchanged in the no-anomaly period.

c. External financing, cash flow forecasts, and analysts' accrual-related optimism

In this section, we examine the cross-sectional effects of analysts' incentives and awareness on their accrual-related optimism. We use external financing as a proxy for analyst incentives because prior research finds that analysts tend to issue optimistic

forecasts for firms that raise external financing (Rajan and Servaes 1997), a likely consequence of their incentives to drive business to their brokerage houses (Bradshaw, Richardson, and Sloan 2003, 2006).[5] Furthermore, prior studies find that accruals are positively associated with external financing, possibly because managers engage in income-increasing accruals management to inflate expectations when they raise external financing (e.g., Rangan 1998, Teoh, Welch, and Wong 1998, Cohen and Lys 2006, and Richardson and Sloan 2003). These findings collectively raise the possibility that accrual-related optimism is partly due to analysts' external financing-related optimism.

We conjecture that analysts' accrual awareness increases while their external financing incentives remain unchanged in the no-anomaly period. Consequently, we expect accrual-related optimism to persist in the no-anomaly period among firms that obtain high levels of external financing. Our first cross-sectional test investigates whether accrual-related optimism in the no-anomaly period is stronger for firms that raise high levels of external financing than for other firms.

Next, we use analysts' provision of cash flow forecasts as a proxy for their awareness of the relative persistence of cash flows and accruals. We expect that analysts providing supplemental cash flow forecasts have a better understanding of accruals based on prior research concluding that analysts' cash flow forecasts contributed to the disappearance of the accrual anomaly (Mohanram 2014; Radhakrishnan and Wu 2014). Thus, we expect accrual-related optimism to be lower for firms with cash flow forecasts. Our second cross-sectional test, therefore, examines whether accrual-related optimism in

[5] See Bradshaw et al. (2003) for a detailed discussion of allegations and anecdotal evidence that both affiliated and unaffiliated analysts issue overly optimistic forecasts for firms raising external financing.

the no-anomaly period is lower for firms with cash flow forecasts than for those without them.

III. Sample selection and descriptive statistics

We obtain financial statement data from the Compustat annual database for fiscal years between 1988 and 2018, stock returns data from the CRSP monthly stock returns files through 2019, and analyst forecast data from the I/B/E/S Summary file.[6] We begin the sample period in 1988 because cash flow data based on Statement of Financial Accounting Standards No. 95 (SFAS 95) became available in that year. In addition, I/B/E/S increased its coverage beyond large firms in the late 1980s, so we reduce the likelihood of misclassifying followed firms as having no analyst coverage by beginning the sample period at that time (Bradshaw et al. 2001). As in prior studies, we exclude financial firms (SIC code between 6000 and 6999).

We follow Bradshaw et al. (2001) in using SFAS 95 data to measure working capital accruals (*WCAcc*) and cash flows from recurring operations (WCCF), and follow Bradshaw et al. (2006) to measure net cash flow from external financing (*ΔXFIN*). We obtain with-dividend returns from the CRSP monthly returns file. We measure compounded buy-and-hold returns over twelve months beginning four months after the end of the fiscal year, and compute size-adjusted returns by deducting a firm's size-matched portfolio buy-and-hold return from its raw buy-and-hold return. We restrict the sample to observations with fiscal-year-end stock prices greater than one dollar to ensure that our results are not induced by low-priced stocks (Kraft et al. 2006).[7] Finally, we

[6] Correspondingly, we form portfolios annually from 1989 to 2016 and our returns data ends in 2017.
[7] Kraft et al. (2006) identify several sample selection biases that affect excess returns to the accrual related strategy, and we follow their procedures to mitigate these problems, including restricting our sample to

obtain analyst forecasts of one-year-ahead annual EPS from the I/B/E/S Summary file, retaining the most recent mean consensus forecast before the portfolio formation date for each firm-year.[8]

We report descriptive statistics in Table 1, with distribution data in Panel A. We measure analysts' consensus forecast optimism as the difference between analysts' mean consensus EPS forecast and actual EPS reported by I/B/E/S, scaled by price as of the forecast date. Mean and median forecast optimism estimates are 0.018 and 0.002, respectively, consistent with prior findings that analysts' forecasts are optimistically biased early in the year. Mean and median working capital accruals (*WCAcc*) are 0.016 and 0.009, respectively, indicating that working capital accruals are on average income-increasing, consistent with Bradshaw et al. (2001). We find that mean external financing (*EXFIN*) is positive, 0.044, and the median is close to zero, consistent with Bradshaw et al. (2006). We define all variables in Appendix A.

The correlation table in Panel B of Table 1 shows that working capital accruals are most highly correlated with working capital cash flows (-0.228), with smaller correlations for other variables. Working capital cash flows are highly correlated with external financing (-0.517) and losses (-0.569). We also find a significant negative correlation of -0.10 between external financing and the issuance of cash flow forecasts, suggesting that analysts are less likely to issue cash flow forecasts for firms with strong financing-related incentives for analyst optimism.

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stocks listed on US exchanges in the returns measurement period to avoid the bias induced by selecting stocks based on the current listing exchange instead of the exchange on which the stock traded in the returns measurement period.

[8] We use the I/B/E/S summary file for consistency with Bradshaw et al. (2001, 2006), and also because Call, Hewitt, Watkins, and Yohn (2021) document considerable inconsistency in the availability of analyst forecasts in the I/B/E/S detail file. In additional untabulated analyses, we repeat all analyses using analysts' two-year ahead forecasts and obtain qualitatively similar results.

IV. Research Methods, Specification of Empirical Tests, and Results

a. The accrual anomaly over time

We first document the excess return to the accrual-related strategy of buying firms in the lowest accruals decile and selling firms in the highest decile. We rank observations annually and assign them to decile portfolios based on *WCAcc*. We plot excess returns to the accrual strategy over time in Figure 1 and find consistent positive excess returns until 2001, confirming that the accrual anomaly ended at this time. Thus, we label the period through 2000 the anomaly period and label the post-2000 period the no-anomaly period.

We plot excess returns across accrual deciles in the anomaly and no-anomaly periods in Figure 2. Consistent with the yearly results in Figure 1, we observe a negative relation between returns and the level of accruals in the anomaly period but find that accruals are unrelated to returns in the no-anomaly period. The differences between excess returns in the lowest and highest accruals deciles are 18.4 percent and -0.1 percent in the anomaly and no-anomaly periods, respectively.

b. Analysts' accrual-related forecast optimism in the anomaly and no-anomaly periods

In this section, we compare analysts' accrual-related forecast optimism in the anomaly and no-anomaly periods. We report analysts' mean and median one-year ahead forecast optimism (defined as analyst forecasts minus realized earnings) and the proportion of forecasts that are optimistic (% Optimistic) by accruals deciles in the anomaly and no-anomaly periods in Table 2 and plot the mean forecast optimism in Figure 3. We find that analysts' overall forecast optimism is lower in the no-anomaly period across each accrual decile, consistent with prior evidence that analyst forecasts are less optimistically biased following the passage of Regulation FD and the Global

Settlement (e.g., Hovakimian and Saenyasiri 2010; Keskek and Tse 2018). In the anomaly period, the difference in mean optimism between Deciles 1 and 10 is 0.009, and is statistically significant, indicating overall positive accrual-related optimism in analysts' forecasts. The difference in mean optimism is 0.017 in the no-anomaly period and is statistically significant, suggesting that analysts continue to misinterpret the relative persistence of accruals in the no-anomaly period.

Figure 3 shows that in the anomaly period, forecast optimism declines with accruals in the left portion of accruals but increases with accruals in the right portion, resulting in a U-shaped relation between accruals and forecast optimism. This nonlinear relation suggests a more nuanced relation between forecast optimism and accruals than would result solely from analysts misunderstanding the predictive relation between accruals and cash flows.[9] Additional analysis shows that the overall positive association between accruals and forecast optimism in both periods is restricted to positive (i.e., income increasing) accruals, which constitute 65% of accruals in the anomaly period and 59% in the no-anomaly period. The results from the median and % Optimistic measures of forecast optimism are generally consistent with the mean optimism measure, except the median and % Optimistic have limited association with lower levels of accruals in both the anomaly and no-anomaly periods, such that the U-shaped relation is less apparent.

Overall, our univariate results indicate that analysts' apparent misunderstanding of accruals information mainly affects firms with positive accruals, where such misunderstanding leads them to issue optimistic forecasts. This asymmetric response to

[9] Relatedly, Kraft, Leone, and Wasley (2006) observe a nonlinear (inverse U-shaped) relation between accruals and returns and question whether accrual-related returns are solely due to functional fixation.

accruals information suggests that analysts' forecast optimism is at least in part driven by their incentives and persists in the no-anomaly period.

We next examine the relation between analysts' forecast optimism and accruals formally by estimating the following model in the anomaly and no-anomaly periods (firm subscripts are suppressed):

$$\begin{aligned} OPTIMSM_{t+1} = {} & \alpha_0 + \alpha_1 WCAcc_t + \alpha_2 WCCF_t + \alpha_3 REXFIN_t \\ & + \alpha_4 DCFF_t + \alpha_5 POPTIMSM_t + \alpha_6 Loss_t + \alpha_7 LogAT_t \\ & + \alpha_8 LogNANL_t + \alpha_9 BM_t + \alpha_{10} LogAGE_t + \varepsilon_{t+1}, \end{aligned} \quad (1)$$

where $OPTIMSM_{t+1}$ is analysts' mean forecast optimism for year t+1 earnings. Our primary focus is on the coefficient of working capital accruals (*WCAcc*). We include several control variables in the model to ensure that we can attribute our results to the relation between accruals and forecast optimism and not to the effects of other variables. The control variables are working capital cash flows (*WCCF*) because accruals and cash flows are the primary components of earnings and accruals are highly correlated with cash flows (Sloan 1996; Drake and Myers 2011); decile-ranked net external financing (*REXFIN*), scaled to range between zero and one, to control for financing-related forecast bias; an indicator variable for firm-years with a cash flow forecast (*DCFF*) to control for analysts' awareness of the relation between accruals and future earnings; analysts' prior forecast optimism (*POPTIMSM*) to control for analysts' persistent company-specific forecast bias; a loss indicator (*Loss*) to control for the possibility that analyst optimism is higher for loss firms; logarithms of firm size and the number of analysts providing a forecast (*LogAT* and *LogNANL*) to control for the firm's information environment; the book to market ratio (*BM*), which is inversely related to growth; and the logarithm of

firm's age (*LogAGE*), a measure of the firm's life cycle stage. We also include industry and year fixed effects.

We first restrict the model to *WCAcc* as the only explanatory variable and then estimate the full model. We report the results in Table 3.[10] The results for the anomaly period in column 1 show a statistically significant coefficient on accruals of 0.070, indicating a positive relation between accruals and analyst forecast optimism in the anomaly period. Model explanatory power increases from 0.005 to 0.172 with the addition of the control variables and fixed effects in column 2. More importantly, the accruals coefficient is 0.063, and is statistically significant, so we still observe accrual-related optimism when we include the control variables in the model. Notably, the coefficient for external financing (*REXFIN*) is positive and significant, indicating that forecast optimism increases with financing. Other control variables have significantly positive coefficients (*LOSS*, and *BM*, indicating optimism related to loss and the book to market ratio and *POPTIMSM*, indicating persistence in forecast optimism). Coefficients for several of the control variables are negative and statistically significant (*WCCF*, *LogNANL*, and *LogAGE*, indicating declining optimism with cash flows, the number of analysts, and firm age, respectively).

The results for the model restricted to accruals in the no-anomaly period in column 3 show a significant *WCAcc* coefficient of 0.072 in column 3. This is virtually identical to the corresponding coefficient in the anomaly period. The accruals coefficient remains significant when we include the control variables in column 4, at 0.078. We also find that the difference in the *WCAcc* coefficient for the anomaly and no-anomaly periods

[10] We obtain consistent results when we measure accruals as scaled decile ranks and omit those results for brevity.

is statistically insignificant (untabulated), suggesting that analysts' accrual-related optimism persists in the no-anomaly period. The results for most control variables are similar in the anomaly and no-anomaly periods. Notable exceptions are *WCCF*, with a coefficient that goes from significantly negative to significantly positive, *DCFF*, with a coefficient that goes from insignificant to significantly positive, *LogAT*, with a coefficient that goes from insignificant to significantly negative, and *LogAGE*, with a coefficient that goes from significantly negative to insignificant.[11] In summary, the *WCAcc* coefficient estimates suggest that analyst forecasts continue to reflect accrual-related optimism in the no-anomaly period.

Although our results suggest that accrual-related forecast optimism continues in the no-anomaly period, Figure 3 and Table 2 suggest that the relation between optimism and accruals is restricted to positive accruals. To investigate this pattern more formally, we estimate the forecast optimism model with separate explanatory variables for positive and negative working capital accruals, $NegWCAcc_t$ and $PozWCAcc_t$, respectively:

$$\begin{aligned} OPTIMSM_{t+1} = {} & \alpha_0 + \alpha_{11} NegWCAcc_t + \alpha_{12} PozWCAcc_t + \alpha_2 WCCF_t \\ & + \alpha_3 REXFIN_t + \alpha_4 DCFF_t + \alpha_5 POPTIMSM_t + \alpha_6 Loss_t \\ & + \alpha_7 LogAT_t + \alpha_8 LogNANL_t + \alpha_9 BM_t + \alpha_{10} LogAGE_t \\ & + \varepsilon_{t+1}. \end{aligned} \tag{2}$$

We report the results in Table 4, starting with the base model for the anomaly period in column 1. For negative accruals, we observe a significantly negative coefficient

[11] The change in the relation between analysts' forecast optimism and *WCCF* in the no-anomaly period may be partly attributable to the large negative correlation between *WCAcc* and *WCCF*, suggesting that analysts' awareness of differential persistence of accruals and cash flows may also influence their incorporation of *WCCF* into their forecasts. The change in the *WCCF* coefficient in the no-anomaly period may also be influenced by the substantial increase in analysts' provision of cash flow forecasts (*DCFF*) during this period because we also find that analysts' forecast optimism is positively related to *DCFF* in the no-anomaly period. There are few observations with cash flow forecasts in the anomaly period, so those results should be interpreted with caution. Future studies might examine the properties of cash flow forecasts and analysts' use of those forecasts in deriving their earnings forecasts.

of -0.195, implying that forecast optimism decreases with accruals in that region. For positive accruals, the coefficient in the anomaly period is 0.169, implying that optimism increases with accruals, consistent with the overall pattern of accrual-related optimism we observe for the full sample. In column 2, we introduce the control variables and find that the coefficient on negative accruals becomes statistically insignificant, suggesting that the negative relation between optimism and negative accruals that we observe in the anomaly period may be attributable to characteristics reflected in the control variables. The coefficient on positive accruals is still positive and significant, but its magnitude is significantly smaller when we introduce the control variables (0.169 without controls and 0.104 with controls). The coefficients and significance levels of the control variables are essentially unchanged from the estimation with total working capital accruals in Table 3. Overall, the results in columns 1 and 2 suggest that, in the anomaly period, the control variables only partially explain the accrual-related optimism in positive accruals.

The results for the basic model in the no-anomaly period (column 3) indicate that the coefficient for negative accruals is only marginally significant and is considerably smaller than the coefficient in the anomaly period (-0.195 versus -0.027 in the anomaly and no-anomaly periods, respectively). In contrast, the coefficient for positive accruals is positive and significant with a magnitude only somewhat smaller than in the anomaly period (0.169 in the anomaly period versus 0.134 in the no-anomaly period). In untabulated analysis, we find that the difference in the coefficients is statistically significant at the five percent level. When we introduce the control variables in column 4, the coefficient for negative accruals becomes statistically insignificant. In contrast, the coefficient for positive accruals is positive and significant with a coefficient of 0.107,

similar to the anomaly period coefficient of 0.104. The difference is statistically insignificant (untabulated). The coefficients and significance levels of the control variables in column 4 of Table 4 are again unchanged from the estimation with total working capital accruals in column 4 of Table 3. The full-model results indicate that there is significant accrual-related optimism for positive accruals in both the anomaly and no-anomaly periods. The persistence of accrual-related optimism in the no-anomaly period implies that we cannot reject H1, which posits that accrual-related optimism is unchanged in the no-anomaly period.

c. External financing, cash flow forecasts, and accrual-related forecast optimism

In this section, we further investigate the link between external financing incentives and analysts' accrual-related optimism. Figure 4 plots external financing levels across accrual deciles and shows a general increase across accrual deciles in both the anomaly and no-anomaly periods, though decile 1 has a relatively high level in the no-anomaly period. This pattern suggests that accrual-related optimism in both periods may be in part explained by analysts' response to external financing incentives and raises the possibility that we continue to observe accrual optimism in the no-anomaly period because financing incentives strongly affect analyst forecast optimism.

We also investigate whether accrual-related optimism is reduced when analysts issue cash flow forecasts, which may indicate greater analyst awareness of the relation between both cash flows and accruals with future earnings. Consistent with prior findings, Figure 5 shows a sharp increase in the provision of cash flow forecasts beginning in 2003, roughly coinciding with the disappearance of the anomaly.

In the preceding tables, we introduce external financing and cash flow forecasts as standalone explanatory variables and find that they leave the primary results on the accruals variables largely unchanged. We examine their role further by investigating whether they moderate the association between forecast optimism and accruals. We estimate the following model:

$$\begin{aligned} OPTIMSM_{t+1} = {} & \alpha_0 + \alpha_{11} NegWCAcc_t + \alpha_{111} NegWCAcc_t \times REXFIN_t \\ & + \alpha_{112} NegWCAcc_t \times DCFF_t + \alpha_{12} PozWCAcc_t \\ & + \alpha_{121} PozWCAcc_t \times REXFIN_t \\ & + \alpha_{122} PozWCAcc_t \times DCFF_t + \alpha_2 WCCF_t + \alpha_3 REXFIN_t \\ & + \alpha_4 DCFF_t + \alpha_5 POPTIMSM_t + \alpha_6 Loss_t + \alpha_7 LogAT_t \\ & + \alpha_8 LogNANL_t + \alpha_9 BM_t + \alpha_{10} LogAGE_t + \varepsilon_{t+1}, \end{aligned} \quad (3)$$

where all variables are as defined previously. We report the results in Table 5. Similar to the results in Table 4 with control variables, we find no significant association between analysts' forecast optimism and negative accruals (*NegWCAcc*) in either the anomaly or no-anomaly period. In addition, the interactions of both *REXFIN* and *DCCF* with *NegWCAcc* are statistically insignificant. Thus, we find that analysts completely incorporate accruals information in their forecasts when accruals are negative regardless of the level of external financing incentives or the availability of cash flow forecasts. In the anomaly period, the coefficient on positive accruals remains positive and significant in all estimations. More importantly the interaction term for positive accruals and external financing, $PozWCAcc \times REXFIN$, is statistically insignificant.[12] Thus, accrual-related optimism in the anomaly period is restricted to positive accruals (where external financing incentives are strongest) but does not vary across levels of external financing,

[12] The sum of the coefficients on *PozWCAcc* and the interaction term, $PozWCAcc \times REXFIN$, which represents analysts' accrual-related optimism for firms in the highest financing decile, is 0.108 and is statistically significant at the one percent level (untabulated).

suggesting that accrual-related optimism could be driven by both analysts' incentives and low accrual awareness in this period. We also find that the coefficient on the interaction term for positive accruals and cash flow forecasts, $PozWCAcc \times DCFF$, is statistically insignificant, suggesting that analysts' provision of cash flow forecasts has no effect on their accrual-related optimism in the no-anomaly period. We note, however, that the size of our sample should be taken into consideration when interpreting these results, as few observations have cash flow forecasts in the anomaly period.

In the no-anomaly period, the coefficient on positive accruals, *PozWCAcc*, is insignificant when we include the interaction term for positive accruals and external financing, $PozWCAcc \times REXFIN$, in the model. Thus, analysts' accrual-related optimism declines and becomes insignificant in the no-anomaly period when external financing is low. This finding suggests that, even among firms with positive accruals, analysts incorporate accrual information more completely at low levels of external financing, presumably because of their heightened accrual awareness in the no-anomaly period. More importantly, the interaction term for positive accruals and external financing, $PozWCAcc \times REXFIN$, is positive and statistically significant, suggesting that analysts continue to introduce accrual-related optimism in their forecasts when their incentives are high. The sum of the coefficients on *PozWCAcc* and the interaction term, $PozWCAcc \times REXFIN$, which represents analysts' accrual-related optimism for firms in the highest financing decile, is 0.148 and is statistically significant at the one percent level (untabulated). Overall, we find that analysts' accrual-related optimism persists in the no-anomaly period, particularly for firms with high external financing incentives.

Turning to the role of cash flow forecasts, when we interact positive accruals, *PozWCAcc*, with cash flow forecasts but not external financing in Column 5, we find a significant positive coefficient of 0.125 on *PozWCAcc*, suggesting that, ignoring the effect of external financing, accrual-related optimism remains significant in the no-anomaly period. More importantly, we find a negative coefficient on the interaction of positive accruals with cash flow forecasts, $PozWCAcc \times DCFF$, suggesting reduced accrual-related forecast optimism for firms with cash flow forecasts. In untabulated analysis, we also find that the sum of the *PozWCAcc* coefficient and its interaction with cash flow forecasts, $PozWCAcc \times DCFF$, is significantly positive, 0.073, with a t-statistic of 4.67, suggesting that analysts' accrual awareness, as proxied by cash flow forecasts, results in improved but incomplete incorporation of accruals information in earnings forecasts in the no-anomaly period.

In Column 6, we report the results for the full model where we interact positive accruals, *PozWCAcc*, with both external financing, *REXFIN*, and cash flow forecasts, *DCFF*. The coefficient on *PozWCAcc* is 0.049 and is statistically significant at the ten percent level. In untabulated analysis, we find that the change in *PozWCAcc* coefficient from 0.091 in the anomaly period (Column 3) to 0.049 in the no-anomaly period is statistically significant at the five percent level. Thus, accrual-related optimism appears to decline in the no-anomaly period when external financing incentives are low even in the absence of cash flow forecasts. This suggests an overall increase in analysts' accrual awareness that enables them to better incorporate accruals information in their forecasts in the no-anomaly period when their incentives for optimism are low.

The coefficient on the interaction term for positive accruals and external financing, $PozWCAcc \times REXFIN$, remains positive and statistically significant after we control for the interaction term for *DCFF*. Thus, analysts' accrual-related optimism persists in the no-anomaly period when external financing incentives are high. Finally, the coefficient on the interaction of *PozWCAcc* with cash flow forecasts, $PozWCAcc \times DCFF$, is significantly negative, and the sum of the coefficients on *PozWCAcc* and the interaction term, $PozWCAcc \times DCFF$, is statistically insignificant. Thus, we find no accrual-related optimism in the no-anomaly period for firms with low external financing incentives when analysts provide cash flow forecasts, suggesting increased accrual awareness.

Our overall conclusion is that analysts' accrual-related optimism is concentrated among firms with positive accruals, and that analysts' incentives (as measured by external financing) tend to increase this optimism while their accrual awareness (as measured by cash flow forecasts) tends to reduce it. On balance, however, the effect of external financing incentives outweighs the effects of cash flow forecasts. As a consequence, we continue to observe significant accrual-related optimism for positive accruals in the no-anomaly period even when analysts issue cash flow forecasts. We find, however, that analysts completely incorporate accruals information into their forecasts when their external financing incentives are low and accrual awareness (as measured by cash flow forecasts) are high.

V. Conclusion

The quality of financial analysts' forecasts can be compromised by their incentives and lack of knowledge, so it is important to understand the effects of

incentives and knowledge on analysts' forecasting decisions. In this study, we use the disappearance of the accrual anomaly to investigate whether financial analysts' accrual-related forecast optimism in the anomaly period are due to their lack of awareness about the persistence of accruals or to their incentives. Prior research concludes that the accrual anomaly disappeared when sophisticated investors started trading on the relative persistence of cash flows and accruals. Building on prior research documenting an increase in incidence of analysts' cash flow forecasts that coincides with the disappearance of the accrual anomaly (Mohanram 2014; Radhakrishnan and Wu 2014), we conjecture that financial analysts also became aware of the persistence of accruals in this period. If so, their forecasts should be less subject to accrual-related bias in the no-anomaly period. But if they bias their forecasts in the anomaly period because of their incentives then we would expect continued accrual-related forecast optimism after the accrual anomaly disappeared.

We first confirm prior research showing that analysts' forecast optimism in the anomaly period increases with accruals. We also find evidence that the overall positive relation between accruals and forecast optimism is attributable to positive accruals. In the no-anomaly period, we find continued accrual-related optimism for positive accruals but find no relation between optimism and accruals for negative accruals. These findings suggest that accrual-related bias in the anomaly period is at least partially driven by incentives and cannot solely be attributed to a lack of accrual awareness.

For further evidence on the relative roles of incentives and awareness, we examine the effects of external financing and the availability of cash flow forecasts on analysts' accrual-related optimism in the anomaly and no-anomaly periods. Prior studies

find that analysts' forecast optimism increases with external financing, and that external financing increases with accruals. We confirm that overall optimism increases with external financing. More importantly, we find that analysts' accrual-related optimism declines in the no-anomaly period when analysts' financing-related incentives are low but persists and becomes even stronger when incentives are high. We also find that analysts' cash flow forecasts, our proxy for increased accrual awareness, help reduce accrual-related optimism in the no-anomaly period. Overall, these findings support the view that both low accrual awareness and incentives contributed to analysts' accrual-related forecast optimism in the anomaly period that persists in the no-anomaly period for firms with high external financing incentives. Prior research finds that analysts incorporate anomaly-related information incompletely in their price forecasts even after the anomalies became widely known (e.g., Engelberg et al. 2020). Our study extends this literature by showing that analysts' incentives may allow anomaly-related forecast bias to persist even after the discovery of the anomaly. While we focus on the accrual anomaly and examine the relative roles of accrual awareness and external financing incentives on accrual-related optimism, future studies may explore how analysts' knowledge and incentives contribute to their forecast behavior in other anomaly settings.

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APPENDIX A
Variable Definitions

Dependent variable

OPTIMSM	=	One-year-ahead forecast optimism, computed as the consensus forecast of annual earnings per share for the coming year from the I/B/E/S summary file minus the corresponding realized earnings per share, scaled by stock price as of the forecast date. We use the most recent monthly forecast available before the return accumulation period beginning four months after the firm's fiscal year-end.

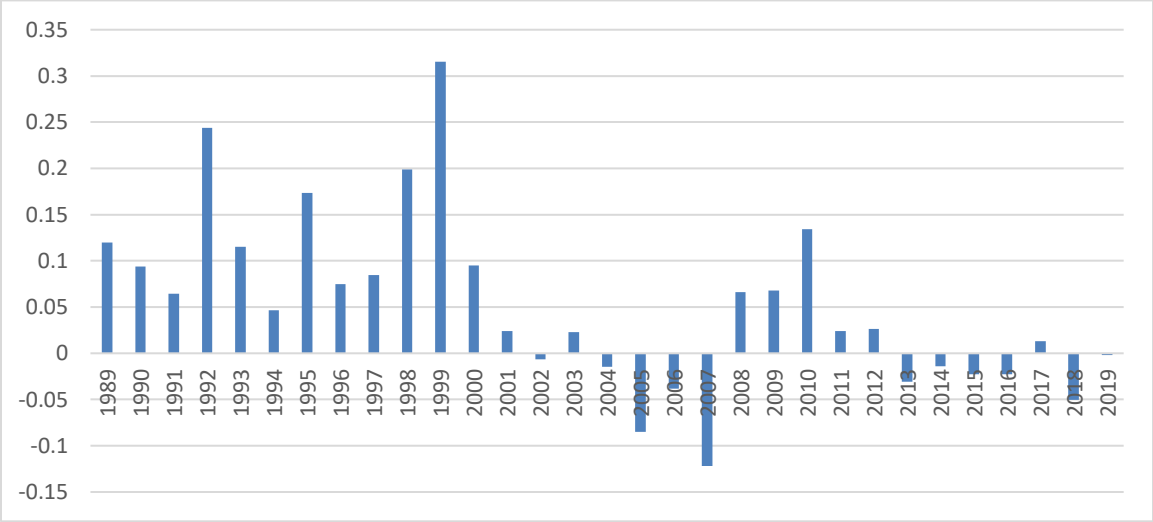
Primary explanatory variables

WCAcc	=	Working capital accruals for year t, measured as – (Increase in accounts receivable (Compustat annual data item RECCH) + Increase in inventory (INVCH) + Decrease in accounts payable (APALCH) + Decrease in income tax payable (TXACH) + Net change in other accrued liabilities (AOLOCH))/ average total assets (AT). We replace missing values of APALCH, TXACH, and AOLOCH with zero.
NegWCAcc	=	*WCAcc* for negative values of *WCAcc* and zero otherwise.
PozWCAcc	=	*WCAcc* for positive values of *WCAcc* and zero otherwise.
EXFIN	=	Net external financing, calculated as the sum of *ΔDEBT* and *ΔEQUITY* where *ΔDEBT* is net debt financing measured as the cash proceeds from the issuance of long-term debt (DLTIS) less cash payments for long-term debt reductions (DLTR) less the net changes in current debt (DLCCH) and *ΔEQUITY* is net equity financing measured as the proceeds from the sale of common and preferred stock (SSTK) less cash payments for the purchase of common and preferred stock (PRSTKC) less cash payments for dividends (DV), scaled by average total assets.
DCFF	=	An indicator variable taking value of one if there is a cash flow forecast in the most recent I/B/E/S summary file before the accumulation period beginning four months after the firm's fiscal year-end.

Control variables

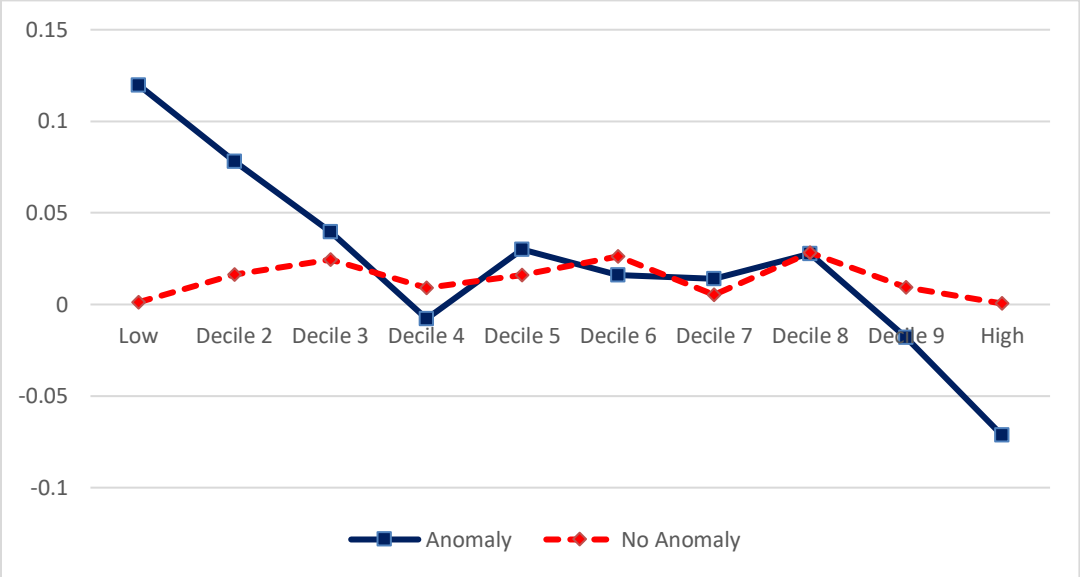
WCCF	=	Working capital cash flow for year t, measured as earnings before interest, taxes, depreciation and amortization (OIBDP) - WCAcc, scaled by average total assets.
POPTIMSM	=	Analysts' prior year forecast optimism, computed as the monthly consensus forecast of annual earnings per share before the fiscal year-end from the I/B/E/S summary file minus annual earnings per share for the prior year, scaled by stock price as of the forecast date.
LOSS	=	An indicator variable taking value of one if income (IB) is negative, and zero otherwise.
AT	=	Total assets.
NANL	=	Number of analysts issuing forecast in the most recent consensus forecast before the return accumulation period beginning begins four months after the firm's fiscal year-end.
AGE	=	Firm age, calculated as the number of years to date that the firm appears in the Compustat Annual Database.
MV	=	Market value of equity at the end of the prior fiscal year end.
BM	=	Book to Market ratio at the end of the prior fiscal year end.
SARET	=	The 12-month buy-and-hold size-adjusted returns cumulated from the fourth month after the end of year *t*,
		We exclude the bottom and top 1% of *OPTMSM* and *POPT*. All other variables are winsorized at the 1st and 99th percentiles.

Figure 1
Excess returns to the accrual-related trading strategy over time



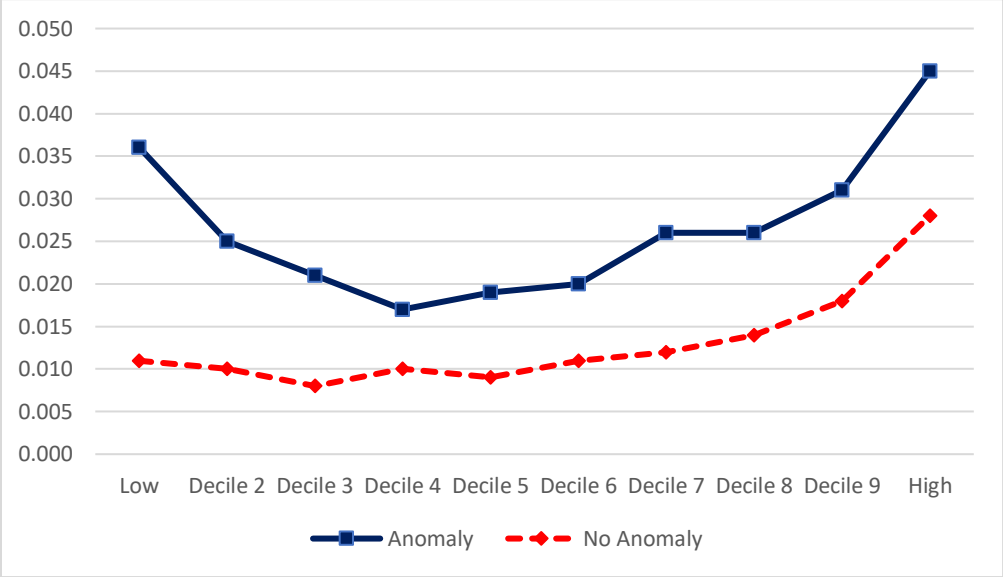
Notes:
This figure reports one year size-adjusted excess returns, *SARET*, to the accrual strategy over time. Firm-year observations are ranked annually and assigned in equal numbers to decile portfolios based on working capital accruals (*WCAcc*). The accrual strategy buys shares of the firms in the lowest decile and sells shares of the firms in the highest decile of accruals.

Figure 2
Excess returns across accrual deciles in the anomaly and no-anomaly periods



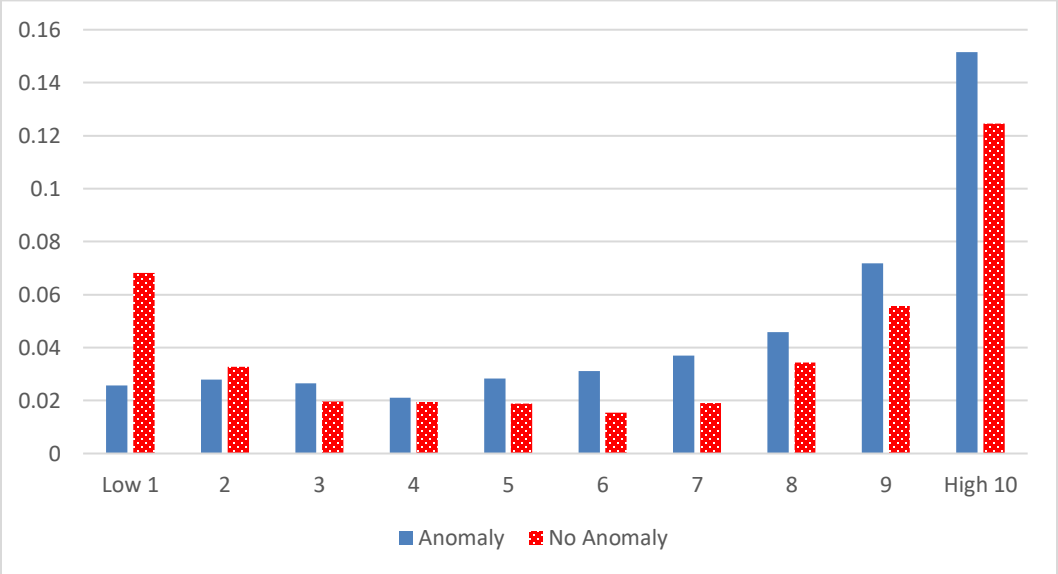
Notes:
This figure plots size-adjusted cumulative abnormal returns across accrual deciles in the anomaly (1989-2000) and no-anomaly (2001-2019) periods.
Firm-year observations are ranked annually and assigned in equal numbers to decile portfolios based on working capital accruals (*WCAcc*).

Figure 3
Analysts' forecast optimism and accruals in the anomaly and no-anomaly periods



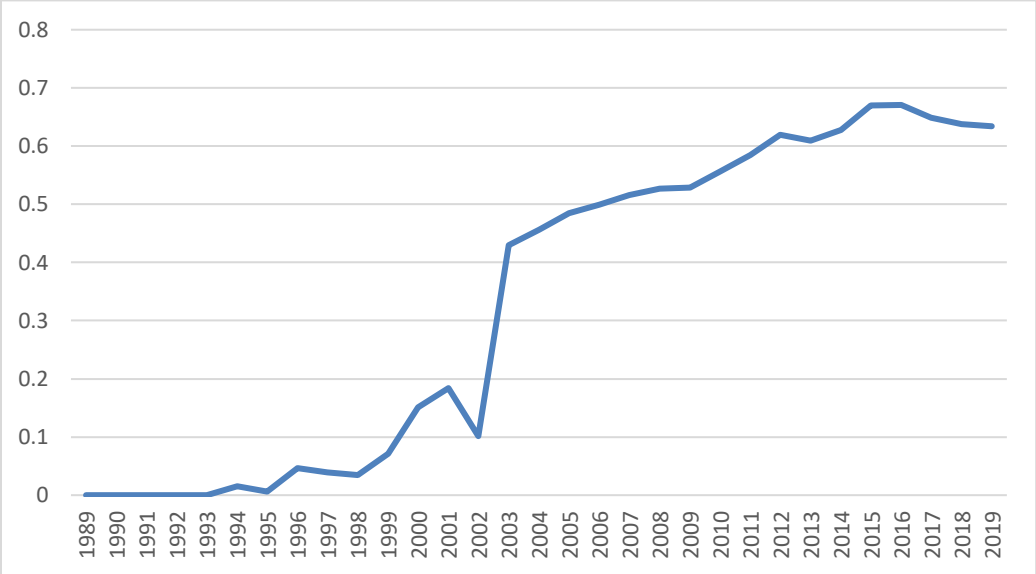
Notes:
This figure plots analysts' forecast optimism across working capital accrual (*WCAcc*) deciles in the anomaly (1989-2000) and no-anomaly (2001-2019) periods. We define optimism as analyst forecasts minus realized earnings.

Figure 4
The level of net external financing across deciles of working capital accruals



Notes:
This figure plots the mean external financing (*EXFIN*) across working capital accrual (*WCAcc*) deciles in the anomaly (1989-2000) and the no-anomaly (2001-2019) periods. We rank observations and sort them into decile portfolios based on *WCAcc*.

Figure 5
Proportion of firms with supplemental cash flow forecasts (CFF) by year



Notes:
This figure plots the proportion of firms with supplemental cash flow forecasts (CFF) by year. *DCFF* is an indicator variable taking value of one if there is a cash flow forecast for the firm-year in the most recent I/B/E/S summary file before accumulation period, beginning four months after the firm's fiscal year-end, and zero otherwise. This figure plots the mean *DCFF* by year.

TABLE 1
Panel A: Descriptive Statistics for Variables in Models (N=51,750)

Variable	Mean	Std Dev	25%	Median	75%
OPTIMSM	0.018	0.063	-0.005	0.002	0.022
WCAcc	0.016	0.063	-0.013	0.009	0.039
WCCF	0.089	0.177	0.049	0.116	0.178
EXFIN	0.044	0.204	-0.048	-0.003	0.052
DCFF	0.338	0.473	0.000	0.000	1.000
POPTIMSM	0.004	0.025	-0.002	0.000	0.003
LOSS	0.250	0.433	0.000	0.000	0.000
AT	3044.980	7889.370	132.540	461.662	1898.720
NANL	8.138	7.167	3.000	6.000	11.000
AGE	20.284	15.878	8.000	15.000	29.000
SARET	0.017	0.592	-0.286	-0.050	0.196
MV	3548.390	10129.310	155.782	543.851	2042.040
BM	0.515	0.392	0.252	0.432	0.682

Notes:
The sample period extends from 1988 to 2018.

Panel B: Pearson Correlations

	WCAcc	WCCF	EXFIN	DCFF	POPTIMSM	LOSS	AT	NANL	AGE	BM	SARET
OPTIMSM	**0.087**	**-0.121**	**0.066**	**-0.125**	**0.257**	**0.141**	**-0.088**	**-0.169**	**-0.111**	**0.175**	**-0.183**
WCAcc		**-0.228**	**0.133**	**-0.107**	**-0.038**	**-0.143**	**-0.062**	**-0.080**	**-0.086**	**-0.043**	**-0.037**
WCCF			**-0.517**	**0.098**	**-0.106**	**-0.569**	**0.102**	**0.224**	**0.185**	**-0.058**	**0.014**
EXFIN				**-0.100**	**0.041**	**0.287**	**-0.114**	**-0.136**	**-0.240**	**-0.099**	**-0.050**
DCFF					**-0.071**	**-0.057**	**0.343**	**0.428**	**0.197**	**-0.097**	-0.002
POPTIMISM						**-0.216**	**0.047**	**0.106**	**0.054**	**-0.143**	**-0.014**
LOSS							**-0.123**	**-0.176**	**-0.210**	**0.089**	**0.022**
AT								**0.525**	**0.429**	**-0.041**	-0.007
NANL									**0.308**	**-0.198**	**-0.013**
AGE										0.003	-0.005
BM											**0.034**

Correlation coefficients are in bold if they are significantly different from zero at the 1% level or better.

TABLE 2
Univariate relation between analysts' forecast optimism and accruals

Accruals Decile	Anomaly Period (N=20,005)			No-anomaly Period (N=31,745)		
	Mean	Median	% Optimistic	Mean	Median	% Optimistic
1 Low	0.036	0.005	57.45	0.011	0.000	47.39
2	0.025	0.003	57.66	0.010	0.000	47.75
3	0.021	0.004	60.88	0.008	0.000	48.57
4	0.017	0.002	58.28	0.010	0.000	49.33
5	0.019	0.004	61.02	0.009	0.000	51.44
6	0.020	0.004	61.03	0.011	0.000	51.47
7	0.026	0.005	64.58	0.012	0.002	55.21
8	0.026	0.006	66.67	0.014	0.003	56.81
9	0.031	0.008	68.29	0.018	0.004	60.43
10 High	0.045	0.015	72.00	0.028	0.009	62.75
High – Low	0.009***	0.010***	14.55***	0.017***	0.009***	15.36***
	(-3.63)	(-9.52)	(10.88)	(-8.49)	(-11.04)	(11.02)

Notes:
Panel A reports mean and the median measures of forecast optimism and the proportion of optimistic forecasts (% Optimistic) across working capital accruals (*WCAcc*) deciles in the anomaly (1989-2000) and the no-anomaly (2001-2019) periods. We rank observations based on WCAcc using the full sample and sort them into decile portfolios. t-statistics (z-statistics for the median) are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels based on two-tailed *t*-tests.

TABLE 3
Analyst forecast optimism and accruals

	Anomaly Period		No-anomaly Period	
	(1)	(2)	(3)	(4)
WCAcc	0.070***	0.063***	0.072***	0.078***
	(7.60)	(6.16)	(9.25)	(9.52)
WCCF		-0.034***		0.013***
		(-5.80)		(3.66)
REXFIN		0.006***		0.007***
		(3.48)		(6.03)
DCFF		-0.003		0.002**
		(-1.11)		(2.52)
POPTIMSM		0.533***		0.397***
		(15.08)		(11.47)
LOSS		0.013***		0.010***
		(5.65)		(8.22)
LogAT		0.001		-0.001***
		(0.31)		(-3.44)
LogNANL		-0.008***		-0.007***
		(-8.21)		(-9.01)
BM		0.023***		0.014***
		(10.60)		(8.42)
LogAGE		-0.003***		-0.001
		(-3.11)		(-1.06)
Intercept	0.026***		0.012***	
	(36.05)		(27.15)	
Industry Effects	No	Yes	No	Yes
Year Effects	No	Yes	No	Yes
Adj. R^2	0.005	0.172	0.005	0.098
N	20,005	20,005	31,745	31,745

Notes:
This table reports estimation results for the relation between analysts' forecast optimism and accruals in the anomaly period (1989-2000) and the no-anomaly period (2001-2019). We estimate the models using OLS regression and cluster standard errors by firm. T-statistics are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels based on two-tailed *t*-tests. See Appendix A for variable definitions.

TABLE 4
Analyst forecast optimism and negative versus positive accruals

	Anomaly Period		No-anomaly Period	
	(1)	(2)	(3)	(4)
NegWCAcc	-0.195***	0.031	-0.027*	0.033
	(-7.52)	(1.25)	(-1.93)	(1.54)
PozWCAcc	0.169***	0.104***	0.134***	0.107***
	(14.60)	(8.26)	(10.74)	(8.74)
WCCF		-0.033***		0.013***
		(-5.79)		(3.70)
REXFIN		0.006***		0.007***
		(3.31)		(5.86)
DCFF		-0.003		0.002**
		(-1.01)		(2.54)
POPTIMSM		0.527***		0.396***
		(14.97)		(11.42)
LOSS		0.012***		0.010***
		(5.44)		(8.05)
LogAT		0.001		-0.001***
		(1.01)		(-2.79)
LogNANL		-0.008***		-0.007***
		(-8.37)		(-9.09)
BM		0.024***		0.014***
		(10.84)		(8.60)
LogAGE		-0.002***		-0.001
		(-2.79)		(-0.96)
Intercept	0.019***		0.009***	
	(23.45)		(17.34)	
Industry Effects	No	Yes	No	Yes
Year Effects	No	Yes	No	Yes
Adj. R^2	0.019	0.174	0.009	0.099
N	20,005	20,005	31,745	31,745

Notes:
This table reports estimation results for the relation between analysts' forecast optimism and both negative and positive accruals in the anomaly period (1989-2000) and the no-anomaly period (2001-2019). We estimate the models using OLS regression and cluster standard errors by firm. t-statistics are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels based on two-tailed *t*-tests. See Appendix A for variable definitions.

TABLE 5
The effects of external financing incentives and supplemental cash flow forecasts on analysts' accrual-related optimism

	Anomaly Period			No-anomaly Period		
	(1)	(2)	(3)	(4)	(5)	(6)
NegWCAcc	-0.033	-0.030	-0.032	0.036	0.020	0.020
	(-0.85)	(-1.21)	(-0.83)	(1.55)	(0.97)	(0.72)
*NegWCAcc*REXFIN*	0.008		0.008	0.002		0.008
	-0.12)		(0.12)	(0.06)		(0.20)
*NegWCAcc*DCFF*		-0.050	-0.050		0.034	0.034
		(-0.46)	(-0.46)		(1.36)	(1.34)
PozWCAcc	0.091***	0.104***	0.091***	0.029	0.125***	0.049*
	(3.08)	(8.20)	(3.07)	(1.22)	(7.65)	(1.78)
*PozWCAcc*REXFIN*	0.017		0.017	0.119***		0.110***
	(0.45)		(0.45)	(3.46)		(3.16)
*PozWCAcc*DCFF*		0.024	0.024		-0.052**	-0.040*
		(0.35)	(0.36)		(-2.34)	(-1.79)
REXFIN	0.005**	0.006***	0.005**	0.004***	0.007***	0.005***
	(2.43)	(3.31)	(2.42)	(2.96)	(5.88)	(3.18)
DCFF	-0.003	-0.004	-0.004	0.002**	0.004***	0.004***
	(-1.01)	(-1.20)	(-1.20)	(2.55)	(3.60)	(3.34)
Other Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.174	0.174	0.174	0.099	0.099	0.099
N	20,005	20,005	20,005	31,745	31,745	31,745

Notes:

This table reports estimation results for the effects of external financing and supplemental cash flow forecasts on the relation between analysts' forecast optimism and both negative and positive accruals in the anomaly period (1989-2000) and the no-anomaly period (2001-2019). We estimate the models using OLS regression and cluster standard errors by firm. t-statistics are presented in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels based on two-tailed *t*-tests. See Appendix A for variable definitions.