Audit Quality and the Trade-Off between Accretive Stock Repurchases and Accrual-Based Earnings Management

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ABSTRACT: We examine whether audit quality affects the trade-off between accrual-based and real earnings management. We hypothesize that firms motivated to manage earnings per share (EPS) to meet or beat consensus analysts’ forecasts are more likely to engage in accretive stock repurchases (a form of real earnings management) when their ability to manage earnings through accruals is constrained by high audit quality. We find that firms with high audit quality are more likely to use accretive stock repurchases and less likely to use accrual-based earnings management to meet or beat consensus analysts’ forecasts. Our results are robust to various controls for endogeneity concerns.

Keywords: real earnings management; stock repurchases; audit quality; audit industry specialization.

I. INTRODUCTION

We examine whether audit quality affects managers’ choices between accrual-based earnings management and accretive stock repurchases, one form of real earnings management. We focus on accretive stock repurchases where managers’ motivations...
are to meet or beat earnings per share (EPS) targets rather than to execute normal financing activities. While prior research provides evidence that high audit quality is negatively associated with managers’ ability to opportunistically report accruals (Krishnan 2003; Balsam et al. 2003), our paper examines whether managers constrained in their use of accrual-based earnings management are more likely to use open-market stock repurchases as a substitute. Similar to accrual-based earnings management, open-market stock repurchases affect EPS, involve managerial discretion, and lack adequate disclosure prior to their execution. However, unlike accrual-based earnings management, stock repurchases are not subject to auditor scrutiny since they involve decisions about a real financing activity. Given the difference in auditor scrutiny, we argue that in the presence of high audit quality, managers trade off the use of accrual-based earnings management and are more likely to use accretive stock repurchases to meet or beat consensus analysts’ EPS forecasts.

Our study brings together and extends two research streams. First, Hribar et al. (2006) examines open-market stock repurchases and provides evidence that firms use accretive stock repurchases to meet or beat analysts’ forecasts. We extend their paper by examining whether accretive stock repurchases are more frequently used when accrual-based earnings management is likely constrained by the presence of high audit quality. Second, prior research (Cohen and Zarowin 2010; Chi et al. 2011; Zang 2012) examines the trade-off between operational real earnings management activities (i.e., cash flow from operations, production costs, and discretionary expenses) and accrual-based earnings management for firms employing high-quality auditors. Evidence from these studies is mixed. These studies document a trade-off for seasoned equity offering (SEO) firms (Cohen and Zarowin 2010) and for firms sharing strong incentives to manage earnings upward (Chi et al. 2011), while Zang (2012) fails to document a trade-off around earnings benchmarks. We extend these studies by presenting evidence of a trade-off using a financing activity, open-market stock repurchases, as the form of real earnings management focused on meeting or beating analysts’ forecasts. Examining accretive stock repurchases is advantageous because they are not subject to potential misspecifications present in measures of operational real earnings management that rely on fitted models (Cohen et al. 2011). In addition, our use of both industry auditor specialization and propensity score matching addresses concerns raised by Lawrence et al. (2011) that other firm characteristics, such as client size, subsume Big N as an appropriate measure of audit quality.

We examine firms that meet or beat consensus analysts’ forecasts ex post to determine whether firms employing industry-specialist auditors (Hogan and Jeter 1999; Krishnan 2003; Gul et al. 2009) are more likely to use repurchases to meet or beat analysts’ forecasts as compared to other firms who are able to do so absent an accretive stock repurchase. We similarly test whether firms with industry-specialist auditors are less likely to use discretionary current accruals to meet or beat analysts’ forecasts as compared to firms that are able to do so absent the use of discretionary current accruals. We also directly compare firms that likely share a common ex ante expectation of missing consensus analysts’ forecasts, but ex post meet or beat consensus analysts’ forecasts either through accretive stock repurchases or discretionary current accruals. Our findings provide consistent evidence that firms that both engage industry-specialist auditors and meet or beat analysts’ forecasts are more likely to use accretive stock repurchases and less likely to use discretionary current accruals to meet or beat analysts’ forecasts ex post.

Our contribution of documenting a trade-off between real earnings management and accrual-based earnings management to meet or beat consensus analysts’ forecasts not only extends prior accounting research, but also has implications in corporate governance. As boards of directors and investors rely on high audit quality to curtail accrual-based earnings management, they should be aware that managers may substitute accretive stock repurchases to meet or beat EPS forecasts. If a higher frequency of stock repurchases motivated by earnings management incentives potentially obfuscates earnings quality or harms long-term firm value, then alternative governance mechanisms may be necessary to curtail this behavior. We discuss these implications in the conclusion of the paper.
In addition to our main tests, we perform several additional tests to address potential concerns with our results. We provide evidence that our results are robust when we explicitly control for expected repurchases in our models, alleviating concerns that analysts and investors fully anticipate share repurchases. Additionally, we examine whether our results are driven by observable differences in firm characteristics and/or misspecification in regression analysis. Our results remain robust when we use propensity score matching on auditor industry specialization to more directly control for firm characteristics that could spuriously drive our main results. We also provide evidence that earnings management incentives around analysts’ forecasts are an important component of our findings. Finally, our results are robust for the first three quarters of the fiscal year, which indicates that results in the fourth quarter, when auditor oversight is more stringent, do not drive our main results.

The remainder of the paper is as follows. Section II discusses the prior literature and develops our hypotheses. Sections III and IV present the research methodology and the results of the paper, respectively. Section V reports the sensitivity analyses. Section VI discusses the implications of our findings and concludes the paper.

II. PRIOR LITERATURE AND HYPOTHESES

Earnings Benchmarks and Stock Repurchases

Analyst forecasted EPS is commonly used as a performance benchmark in capital markets. Firms that consistently meet or beat analysts’ EPS forecasts enjoy higher credibility (Graham et al. 2005) and valuation premiums (Kasznik and McNichols 2002; Brown and Caylor 2005) that persist even if EPS is knowingly managed (Bartov et al. 2002). When EPS benchmarks are missed, firms suffer severe stock price losses (Skinner and Sloan 2002), managerial compensation declines (Matsunaga and Park 2001), and managers perceive that their reputations are at risk (Graham et al. 2005).

Managers engaging in earnings management select from two broad categories of mechanisms. Accrual-based earnings management occurs when managers choose purposefully to influence earnings through accounting choices and estimates (Healy and Wahlen 1999). Real earnings management involves managerial decisions affecting both cash flows and reported earnings, such as R&D expenditures, capital investment decisions, and stock repurchases. Real earnings management is a departure from normal business activities that focuses more on short-term reporting goals than on promoting firm value (Roychowdhury 2006). Both methods of earnings management are questionable because they are actions managers take to mislead stakeholders about firm performance or influence accounting-based contractual arrangements (Healy and Wahlen 1999).²

Bartov (1993) and DeFond and Jiambalvo (1994) find that managers use accruals when faced with the prospect of just missing analysts’ forecasted EPS. Payne and Robb (2000) show that managers use accruals to manipulate EPS to meet or beat analysts’ forecasts when forecast dispersion is low and Burgstahler and Eames (2006) document that managers meet or beat EPS forecasts through both accrual-based earnings management and expectations management. In addition, Ayers et al. (2006) find that efforts to meet EPS targets through accruals extend to pseudo targets that may, in part, relate to analysts’ forecasts. Barton and Simko (2002) suggest that aggressive accrual-based earnings management is constrained by the cumulative nature of accruals, suggesting that managers may turn to other earnings management tools when those limits are reached. In contrast, Beaver et al. (2007) argues that the asymmetric nature of income taxes and

² Managerial choices between accrual-based and real earnings management is not assumed to be an “either/or” decision. Instead, we expect that in the face of higher audit quality, managers may still misreport accruals, but at a reduced rate. In lieu of this, managers may increase their use of real earnings management techniques.
special items may drive the distribution of earnings near earnings benchmarks rather than earnings management incentives. Consistent with this finding, Dechow et al. (2003) find that small-profit-and-loss firms have similar proportions of both total and positive discretionary accruals and fail to document an association between accrual-based earnings management and meeting or beating analysts’ forecasts. Overall, prior research provides general, but not unqualified support for managers’ use of accrual-based earnings management to meet or beat earnings benchmarks.

A few studies examine real earnings management to meet or beat EPS targets. Roychowdhury (2006) finds a positive association between real earnings management and meeting or beating analysts’ forecasted EPS. With respect to accretive stock repurchases as a real earnings management tool, Hribar et al. (2006) find that accretive stock repurchases occur more frequently when firms are faced with an EPS shortfall and show that negative stock price responses are tempered in the presence of accretive stock repurchases. In addition, Bens et al. (2003) find that firms pressured to demonstrate EPS growth are more likely to use stock repurchases when faced with the dilutive effects of employee stock options. Our paper extends the literature related to real earnings management focused on meeting or beating an EPS benchmark and investigates whether audit quality affects the use of accretive stock repurchases as a real earnings management tool.

Earnings Management and Audit Quality

Audit quality is the joint probability that an auditor will discover and report material misstatements found in financial statements (DeAngelo 1981). Auditor industry specialization as a proxy for audit quality has been widely studied in the literature. Bedard and Biggs (1991) find that as auditors’ industry-specific expertise increases, their ability to locate data errors also increases. Industry-specific auditors more likely identify extraordinary transactions, have more exposure to industry best practices, and have improved ability to identify inherent and control risks (Krishnan 2003). The use of industry-specialist auditors is found to be negatively correlated with violations of accounting standards (O’Keefe et al. 1994) and restatements (Romanus et al. 2008), and positively associated with disclosure quality (Dunn and Mayhew 2004). Together, these studies document a link between high audit quality and the presence of industry-specialist auditors.

Prior research (Krishnan 2003; Balsam et al. 2003) also provides evidence that firms engaging high-quality auditors are associated with constrained accrual-based earnings management. These studies document that clients of industry specialists have lower discretionary accruals than clients of non-industry specialists, consistent with industry specialists constraining opportunistic accrual choices. These studies suggest the presence of high audit quality potentially constrains the attempted use of accruals-based earnings management because of the higher risk that the behavior will be discovered.

In contrast, auditors do not scrutinize real earnings management since their responsibility is to provide reasonable assurance that financial statements are presented in accordance with generally accepted accounting principles. Auditors ensure that the financial statements faithfully represent the real activities of firms, but are not required to evaluate managers’ motivations for decisions related to real activities. Although Roychowdhury (2006) asserts that real earnings management potentially imposes greater long-term costs on firms because it has a negative effect on future cash flows, he also argues that accrual-based earnings management imposes significantly greater short-term costs on managers. This makes real earnings management an

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3 Balsam et al. (2003) and Krishnan (2003) use the absolute value of discretionary total accruals. We model “as-if” earnings by subtracting discretionary current accruals from reported net income. We posit that discretionary current accruals better reflect managerial efforts to manage short-term earnings benchmarks such as quarterly analysts’ forecasts.
attractive choice for managers who are motivated to achieve short-term earnings goals, but are inhibited by high audit quality and therefore limited in their ability to use accrual-based earnings management techniques.

Evidence relating audit quality to a trade-off between the use of accrual-based and real earnings management is mixed. Cohen and Zarowin (2010) provide evidence that firms with Big N auditors are more likely to engage in real earnings management than accrual-based earnings management when involved in a seasoned equity offering. Chi et al. (2011) find that auditor specialization, and to a lesser extent, Big N auditors, are positively associated with real earnings management and negatively associated with accrual-based earnings management in a combined sample of firms that have strong incentives to manage earnings in order to meet or just beat earnings benchmarks or to support seasoned equity offerings. Conversely, using earnings benchmarks, Zang (2012) fails to document a positive association between Big N auditors and real earnings management.

Cohen et al. (2011) examine the estimation models used to construct proxies for real earnings management and raise concerns that the models are likely to be misspecified. They suggest matching on performance as a partial solution, but note that this approach is also subject to specification concerns. Our use of stock repurchases circumvents these issues because they do not involve estimation models and therefore are less subject to misspecification. Additionally, Lawrence et al. (2011) suggest that the effect of Big N auditors may reflect fundamental differences in client characteristics rather than differential audit quality. We address this concern by using industry-specialist auditors as our proxy for high audit quality and also use propensity score matching as an additional test to ensure that our results are not driven by differences between firms with and without industry-specialist auditors.

Accretive Stock Repurchases as a Real Earnings Management Tool

Stock repurchases with the potential to increase reported EPS typically take the form of open-market repurchases, which occur when firms buy shares of their own stock on the open market (Vermaelen 2005). The transaction for open-market repurchases involves an actual stock buyback and corresponding cash expenditure. Open-market repurchases accounted for 94.3 percent of all repurchases and 95.2 percent of the total dollar value of shares repurchased during the 1990s (Grullon and Ikenberry 2000). Open-market repurchase programs must be formally approved by a firm’s board of directors, typically target 5 percent of its total share base, last two to three years, and on average result in the repurchase of 77 percent of the targeted number of shares initially approved (Stephens and Weisbach 1998). Our tests focus on open-market repurchases.

The net effect of stock repurchases on EPS depends jointly on three factors: (1) the timing of the repurchase, (2) the number of shares repurchased, and (3) the forgone future returns from the cash used to repurchase stock. The first two factors increase EPS by decreasing the EPS denominator. Stock repurchases that are larger and occur earlier in a quarter have a greater influence on the denominator of reported EPS because of their stronger effect on the time-weighted average of shares outstanding. The third factor decreases EPS by decreasing the EPS numerator because of forgone returns that the cash used in the repurchase could have generated. Repurchases are

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4 The following discussion assumes that EPS is positive and that the numerator and denominator effects of a repurchase increase reported EPS by at least $0.01. In our sample selection, we eliminate firm-quarters reporting non-positive EPS and round EPS amounts to the nearest $0.01.
accretive only when the timing and amount are sufficient to outweigh the decretive impact of the forgone returns.

Similar to other real earnings management activities, stock repurchases are likely to be costly to firms because the cash used in the repurchase is not available for other income-generating activities. Firms that have more profitable uses of cash are less likely to engage in repurchases as an EPS management tool. As a result, managers must consider the trade-offs between using accretive stock repurchases and other earnings management activities.

Although boards of directors approve open-market repurchase programs, managers are left with considerable discretion with respect to the timing of a stock repurchase (Vermaelen 2005; Cook et al. 2003). In addition, the Securities and Exchange Commission (SEC) requires limited disclosure about repurchases by public firms. Adopted in 1982, SEC Rule 10b-18 originally required firms to disclose amounts spent on stock repurchases. The rule was amended in December 2003 to provide additional disclosures about the average price per share, the number of shares repurchased as part of a repurchase program, and the maximum number of shares that may be repurchased in the future under a repurchase program.

The SEC disclosure requirements are limited to reporting required in quarterly financial reports filed after the quarter end. Therefore, analysts and investors are unlikely to be able to precisely anticipate current-quarter repurchase effects on EPS. The combination of managerial flexibility and limited mandatory disclosures enables firms to use open-market stock repurchases as an effective real earnings management device.

**Hypotheses**

We focus our study on two hypotheses incorporating accretive stock repurchases, accrual-based earnings management, and audit quality. We argue that high audit quality is likely to constrain the use of discretionary accruals to meet or beat analysts’ forecasts and, therefore, firms with high audit quality are more likely to use accretive stock repurchases as a substitute. While H1 focuses on the general association between audit quality and accretive stock repurchases, H2 examines the association between audit quality and the potential trade-off between accretive stock repurchases and accruals-based earnings management. Both are formally stated as null hypotheses as follows:

- **H1:** High audit quality is unrelated to the use of accretive stock repurchases to meet or beat consensus analysts’ forecasts.
- **H2:** High audit quality is unrelated to a trade-off between the use of accretive stock repurchases and accrual-based earnings management to meet or beat consensus analysts’ forecasts.

**III. METHODOLOGY**

**Identification of Firms Suspected of Using Accretive Stock Repurchases for Real Earnings Management**

Firms repurchase common stock for multiple reasons, so it is important that our research design identifies firms that likely use accretive stock repurchases to manage EPS. Therefore, we identify firms that would have missed their quarterly consensus analysts’ forecasts, but actually

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5 Skinner (2008) provides examples of competing motivations, including the signaling of future prospects, the issuing of stock options, and using stock swaps as part of merger and acquisition activities. These competing motivations may result in accretive repurchases, but we distinguish them from efforts to manage EPS.
meet or beat forecasts because they made an accretive stock repurchase. We term these suspect repurchases.

Since firms do not formally disclose the exact timing of stock repurchases in their financial reports, we must estimate the effects of stock repurchases on reported EPS. We follow Hribar et al. (2006) in estimating the weighted average common shares outstanding absent a stock repurchase. We estimate the EPS denominator as the beginning common shares outstanding plus 50 percent times the number of shares issued during the quarter. This procedure assumes that shares are issued evenly over the quarter and allows the repurchase timing parameter to vary across firm-quarters. If a firm does not employ a stock repurchase for a particular period, we set common shares outstanding equal to the number of common shares reported outstanding at the end of that period.

Alternative uses for the cash used to repurchase stock (i.e., growth opportunities and debt refinancing) affect the numerator of EPS and can greatly influence managers’ decisions to use repurchases as an EPS management tool (Hribar et al. 2006). Therefore, we follow Hribar et al. (2006) in estimating opportunity costs associated with stock repurchases by calculating the forgone dollar return on cash used for repurchases ($C_t$). We estimate excess cash as cash balances in excess of 6 percent of assets for retail firms and 2 percent of assets for all other firms (Copeland et al. 2000). If excess cash is greater than or equal to the repurchase dollar amount, then we calculate the forgone return by multiplying the repurchase dollar amount by the three-month Treasury bill rate for the quarter. If excess cash is less than the repurchase dollar amount, we assume the firm borrows cash in order to execute the repurchase. In such cases, we apply a firm’s average interest rate to the incremental funds borrowed. We convert the estimated forgone dollar return into an after-tax amount using Graham and Mills’ (2008) simulated marginal tax rates, which are highly correlated with marginal rates based on actual tax returns.

We calculate both the actual and pre-repurchase forecast error to identify suspect repurchases where firm-quarters meet or beat consensus analysts’ forecasts, but would have missed the forecasts absent accretive stock repurchases. Actual forecast error \(ACTUAL\_FE\) is reported EPS minus the final consensus analysts’ forecasts for each firm-quarter. Consistent with Hribar et al. (2006) and Roychowdhury (2006), we assume that managerial expectations at the beginning of a quarter are represented by the final actual consensus forecasts for the quarter.

To construct the pre-repurchase forecast error, we first compute EPS “as if” firms did not repurchase stock during a quarter. We calculate \(ASIF\_EPS1\) by estimating the denominator and numerator effects of accretive stock repurchases on EPS as follows:

\[
ASN1_{i,t} = \frac{NI_{i,t} + C_{i,t}}{SHARESOUT_{i,t-1} + 0.5 \times SHARESISSUED_{i,t}}.
\]

6 Prior to December 17, 2003, SEC Rule 10b-18 did not require firms to disclose the number of shares issued or the number of shares repurchased as part of a repurchase program. Therefore, it is necessary to estimate the number of shares issued and repurchased for a significant number of observations that occur prior to Rule 10b-18. As necessary, we follow Stephens and Weisbach (1998) to estimate the number of shares repurchased by dividing the dollar amount of common stock repurchased by the average monthly closing stock price for the quarter. We then calculate the number of shares issued as ending shares outstanding minus beginning shares outstanding plus shares repurchased. To address concerns over estimation error, we apply the estimation procedure to firm-quarters where actual repurchases are available and find that the two are highly correlated ($> 0.95$, p-value $< 0.0001$). We use actual repurchases when available, but this additional test reduces concerns over estimation error when actual repurchases are unavailable. Our results remain robust when using the estimation method used by Hribar et al. (2006).

7 We estimate each firm’s borrowing rate following Francis et al. (2005). We calculate a firm’s borrowing rate by taking interest expense divided by average debt for the quarter. If the information is not available to estimate a firm’s borrowing rate, then we use the average industry (two-digit SIC) borrowing rate for that quarter.

8 We thank John Graham for providing data on marginal tax rates.
In this calculation, $ASIF_{EPS1i,t}$ represents the estimated EPS absent accretive stock repurchases. $NI_{i,t}$ is reported earnings before extraordinary items available to common shareholders for the firm-quarter. $C_{i,t}$ is the estimated forgone dollar return on cash used for accretive stock repurchases. $SHARESOUT_{i,t-1}$ is the reported number of diluted common shares outstanding if analysts’ forecast diluted EPS, otherwise primary common shares outstanding, at the beginning of the firm-quarter. Finally, $SHARESISSUED_{i,t}$ is the actual or estimated number of common stock shares issued during a firm-quarter depending on data availability. All variable descriptions are provided in Appendix A.

Next, we remove the EPS effect of stock repurchases from the actual forecast error. We label the EPS effect of stock repurchases as $EPSImpact1$ and calculate it as follows:

$$EPSImpact1_{i,t} = \frac{ReportedEPS_{i,t}}{C0} - ASIF_{EPS1i,t}.$$  

$EPSImpact1$ is positive for accretive stock repurchases and negative for decretive stock repurchases.

The pre-repurchase forecast error is calculated as the actual forecast error less the EPS effect of share repurchases. Specifically:

$$ASIF_FE1_{i,t} = \frac{ACTUAL_FE_{i,t}}{C0} - EPSImpact1_{i,t}.$$  

$ASIF_FE1$ is negative for firm-quarters that would have missed consensus analysts’ forecasts absent the effects of accretive stock repurchases. For firms that do not repurchase common stock, $ASIF_FE1$ equals $ACTUAL_FE$.

Finally, we define suspect repurchases as those that would have missed analysts’ forecasts by five cents or less, but are able to meet or beat forecasts by no more than five cents with a stock repurchase. Specifically, we construct an indicator variable ($SUSPECT_REPURCHASE1_{i,t} = 1$) as our measure for suspect repurchases, where $ASIF_FE1$ is $\geq -0.05$, but $< 0.00$ and $ACTUAL_FE$ is $\geq 0.00$, but $\leq 0.05$ for a firm-quarter. $SUSPECT_REPURCHASE1_{i,t}$ is equal to 0 for all other firm-quarters. Consistent with prior research (Dhaliwal et al. 2004; Cook et al. 2008; Gleason and Mills 2008), we limit the construction of $SUSPECT_REPURCHASE1$ to within five cents of analysts’ forecasts to reduce the influence of motivations for stock repurchases unrelated to efforts to manage EPS within our setting.

Our final identification of suspect repurchases is based on (1) ex ante managerial expectations of falling short of consensus analysts’ forecasts and (2) ex post use of accretive stock repurchases by managers used specifically to meet or beat consensus analysts’ forecasts of EPS. As ex ante expectations of falling short or ex post reported EPS deviates further from analysts’ forecasts, repurchases that increase EPS are likely less motivated by or are a noisier measure of earnings management behavior. Since real earnings management in the form of accretive stock repurchases expend significant amounts of firm resources, it can be a very costly form of earnings management. Therefore, accretive repurchases are most likely to occur as an EPS-management tool as negative values of $ASIF_FE1$ approach 0, making it more likely they are helpful in meeting or beating analysts’ forecasts. Similarly, as $ACTUAL_FE$ becomes increasingly positive, repurchase behavior is less likely to be an effort to manage EPS to meet analysts’ forecasts.

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9 This definition of suspect repurchases captures 85 percent of repurchase firm-quarters with ex ante managerial expectations of falling short of analysts’ forecasts and ex post use of accretive repurchases to meet or beat analysts’ forecasts. Our main results are robust when we expand the definition to 95 percent of possible suspect repurchases. As expected, our results become less robust as we further increase the forecast error limits.
Identification of Firms Suspected of Using Accrual-Based Earnings Management

We similarly identify firm-quarters during which firms appear to be using accrual-based earnings management to meet or beat analysts’ forecasts and term these suspect accruals. We identify suspect accrual firms as those that would have missed analysts’ forecasts absent the use of discretionary current accruals by five cents or less, but were able to meet or beat the forecasts by no more than five cents with their use. Our tests employ discretionary current accruals (see Guenther 1994; Teoh et al. 1998) because earnings management efforts focused on small changes in EPS and one-time quarterly benchmarks are more likely to be focused on current operating accruals.

Following Louis (2004), we measure quarterly discretionary current accruals using a two-step approach. First, we model normal current accruals within each two-digit SIC industry year as a function of both the change in revenue and the change in receivables for each firm-quarter using the following equation:

\[
\text{Current Accruals}_{i,t} = \beta_1 \left( \frac{1}{\text{ATQ}_{i,t-1}} \right) + \beta_2 \left( \frac{\Delta \text{REVQ}_{i,t} - \Delta \text{RECQ}_{i,t}}{\text{ATQ}_{i,t-1}} \right) + \epsilon_{i,t}.
\]

Current accruals are measured as the difference between quarterly income before extraordinary items and quarterly operating cash flows less depreciation and amortization expense. The change in revenue and change in receivables is the difference between the current and prior quarter of each measure, respectively. The residual from the model, \( \epsilon_{i,t} \), represents discretionary current accruals and is equal to actual current accruals less estimated current accruals. The model scales discretionary current accruals by lagged total assets (\( \text{ATQ}_{i,t-1} \)) so we multiply the regression residual by its corresponding lagged total assets to calculate an unscaled measure of discretionary current accruals (\( \text{DACC}_{i,t} \)).

Similar to our approach for constructing suspect repurchases, we calculate “as-if” EPS absent discretionary current accruals (net of income taxes) as follows:

\[
\text{ASIF EPS ACCRUALS}_{i,t} = \frac{\text{NI}_{i,t} - \text{DACC}_{i,t}(1 - T_{i,t})}{\text{Weighted Average SHARESOUT}_{i,t}}.
\]

\( \text{NI}_{i,t} \) is income before extraordinary items available to common shareholders, \( \text{DACC}_{i,t} \) is as defined above, and \( T_{i,t} \) is the firm’s estimated marginal tax rate. The numerator provides an estimate for net income absent the effects of discretionary current accruals. \( \text{Weighted Average SHARESOUT}_{i,t} \) is the shares used by the firm to calculate EPS, and is diluted shares when analysts’ forecast diluted EPS, and primary shares otherwise. Next, we isolate the impact of discretionary current accruals on EPS (\( \text{EPSImpact1 ACCRUALS} \)) as follows:

\[
\text{EPSImpact1 ACCRUALS}_{i,t} = \text{ReportedEPS}_{i,t} - \text{ASIF EPS ACCRUALS}_{i,t}.
\]

\( \text{EPSImpact1 ACCRUALS} \) is positive for income-increasing discretionary current accruals and negative for income-decreasing discretionary current accruals.

We use the actual forecast error (\( \text{ACTUAL FE} \)) and “as-if” forecast error absent discretionary current accruals (\( \text{ASIF FE ACCRUALS} \)) to identify suspect current accruals. Actual forecast error (\( \text{ACTUAL FE} \)) is calculated as before and the “as-if” forecast error absent discretionary accruals is calculated as the actual forecast error less the EPS impact from discretionary current accruals. Specifically:

\[
\text{ASIF FE ACCRUALS}_{i,t} = \text{ACTUAL FE}_{i,t} - \text{EPSImpact1 ACCRUALS}_{i,t}.
\]

\( \text{ASIF FE ACCRUALS} \) is negative for firm-quarters that would have missed consensus analysts’ forecasts absent the effects of discretionary current accruals.
Finally, we define suspect accruals as those that would have missed analysts’ forecasts by five cents or less, but are able to meet or beat forecasts by no more than five cents with discretionary current accruals. We construct an indicator variable $(\text{SUSPECT}_{\text{ACCRUALS}}_{i,t} = 1)$ as our measure for suspect accruals, where $\text{ASIF} \_\text{FE} \_\text{ACCRUALS} \geq -0.05$, but $< 0.00$ and $\text{ACTUAL} \_\text{FE}$ is $\geq $0.00, but $\leq $0.05 for a firm-quarter. $\text{SUSPECT} \_\text{ACCRUALS}$ is equal to 0 for all other firm-quarters.

### Audit Quality

We use an industry-specialist auditor designation as our measure of high audit quality. Consistent with prior research (e.g., Hogan and Jeter 1999; Krishnan 2003; Gul et al. 2009), we define industry specialization as the Big N audit firm with the largest market share (in terms of clients’ total assets\(^{10}\)) within each two-digit SIC industry group on an annual basis.\(^{11}\) High audit quality is equal to 1 $(\text{HAQ}_{i,t} = 1)$ when the audit firm is classified as an industry-specialist auditor, and 0 otherwise.

### Empirical Models

Our empirical model for suspect repurchases uses the following logistic regression:

$$\text{SUSPECT} \_\text{REPURCHASE1}_{i,t} = \alpha + \beta_1 \text{HAQ}_{i,t} + \beta_2 \text{Repurchase}_{i,t-1} + \beta_3 \text{Repurchase}_{i,t-2}$$
$$+ \beta_4 \text{Forecast Dispersion}_{i,t} + \beta_5 \text{Cash}_{i,t-1} + \beta_6 \text{CAPEX}_{i,t-4,t-1}$$
$$+ \beta_7 \text{Dividend Yield}_{i,t-1} + \beta_8 \text{Debt}_{i,t-1} + \beta_9 \text{Size}_{i,t-1}$$
$$+ \beta_{10} \text{Size}^2_{i,t-1} + \beta_{11} \text{Size}^3_{i,t-1} + \beta_{12} \text{ROA}_{i,t} + \beta_{13} \text{MTB}_{i,t}$$
$$+ \epsilon_{i,t}. \quad (1)$$

Suspect repurchases $(\text{SUSPECT} \_\text{REPURCHASE1}_{i,t} = 1)$ are modeled as a function of high audit quality as well as a firm’s prior stock repurchases, cash levels, capital expenditures, dividends, debt levels, size, performance, and growth. We use nonlinear firm size terms consistent with Gul et al. (2009). We also include $\text{Forecast Dispersion}$, calculated as the standard deviation of the individual analyst’ forecasts for each firm-quarter, as a control for the predictability of a firm’s EPS and the definitiveness of the firm’s EPS target in a quarter (Payne and Robb 2000).

$\beta_1 (\text{HAQ}_{i,t} = 1)$ captures the relation between high audit quality and the likelihood that accretive stock repurchases are used to manage EPS. A positive and significant estimate for $\beta_1$ is consistent with a positive association between high audit quality and EPS management through accretive stock repurchases.

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\(^{10}\) Some past studies use audit fees within industry to define “expert,” but fee data are only available after the year 2000. We use the total assets measure since both measures are used in the literature and our sample predates 2000. As a sensitivity test, we do not require the industry expert be a Big N auditor. The results of our tests are qualitatively similar using this alternative measure.

\(^{11}\) Alternatively, Reichelt and Wang (2010) provide evidence that audit quality is systematically associated with joint national and city-specific auditor industry expertise. They use two definitions of industry specialist. The first definition requires an audit firm to have the largest market share of audit fees in an industry (two-digit SIC) by at least 10 percent. The second definition requires an audit firm to have a significant market share in an industry (30 percent of the market for national expertise and 50 percent of the market for city-specific expertise). Our results are qualitatively similar based on the second definition, but are not robust based on the first definition.
Our empirical model for suspect accruals uses the following logistic regression:

\[
\text{SUSPECT\_ACCRUALS}_{i,t} = z + \beta_1 \text{HAQ}_{i,t} + \beta_2 \text{Forecast\_Dispersion}_{i,t} + \beta_3 \text{Cash}_{i,t-1} \\
+ \beta_4 \text{CAPEX}_{i,t-4} + \beta_5 \text{Dividend\_Yield}_{i,t-1} + \beta_6 \text{Debt}_{i,t-1} \\
+ \beta_7 \text{Size}_{i,t-1} + \beta_8 \text{Size}^2_{i,t-1} + \beta_9 \text{Size}^3_{i,t-1} + \beta_{10} \text{ROA}_{i,t} + \beta_{11} \text{MTB}_{i,t} \\
+ e_{i,t}. \tag{2}
\]

Suspect accruals (\text{SUSPECT\_ACCRUALS}_{i,t} = 1) are modeled similar to suspect repurchases, except that we exclude prior stock repurchases as control variables. Once again, \(\beta_1(\text{HAQ}_{i,t} = 1)\) captures the relation between high audit quality and the likelihood that discretionary accruals are used to manage EPS. A negative and significant estimate for \(\beta_1\) is consistent with a negative association between high audit quality and EPS management through discretionary accruals.

Sample Selection

We derive our sample from quarterly financial statement data obtained from the Compustat Xpressfeed North America database for the 22-year period from 1988 to 2009. Our analysis is limited to the post-SFAS 95 period since we require information from cash flow statements to identify stock repurchases and to estimate discretionary accruals. We use lagged data to estimate our models, which limits our sample period to 1989–2009. We eliminate financial institutions, transportation companies, and utilities because regulatory restrictions are likely to constrain their ability to repurchase stock (Bens et al. 2003). In addition, quarterly EPS forecast data must be available in the unadjusted consensus International Brokers’ Estimate System (I/B/E/S) file. We require at least two analysts’ forecasts for each firm-quarter to construct our forecast dispersion measure. We also eliminate firm-quarters reporting non-positive EPS since accretive stock repurchases do not increase EPS for firms reporting zero income or losses. Finally, we remove firm-quarters with repurchases that are more than 20 percent of common shares outstanding. These are unlikely to be open-market repurchases (Hribar et al. 2006) or repurchases associated with EPS management.

We further refine the sample to more directly address H1 and H2. For our first two main tests, we individually compare suspect repurchases and suspect accrual firm-quarters to firm-quarters that are able to meet or beat consensus analysts’ forecasts absent an accretive stock repurchase or discretionary accruals. Therefore, we limit observations to firm-quarters where \(\text{SUSPECT\_REPURCHASE}_{1,i,t} = 1\), \(\text{SUSPECT\_ACCRUALS}_{i,t} = 1\), or \(\text{ACTUAL\_FE} \geq 0.00\) absent stock repurchases or discretionary accruals. This reduces the sample to 23,290 observations, of which 1,894 are suspect repurchase firm-quarters and 3,232 are suspect accrual firm-quarters.

Our third test directly compares suspect repurchase to suspect accrual firm-quarters. This analysis includes only firm-quarters where \(\text{SUSPECT\_REPURCHASE}_{1,i,t} = 1\) or \(\text{SUSPECT\_ACCRUALS}_{i,t} = 1\). The final sample size for this test equals 4,987 total firm-quarters, of which 1,894 are suspect repurchase firm-quarters. The final sample includes 139 firm-quarters designated as both \(\text{SUSPECT\_REPURCHASE}_{1,i,t} = 1\) and \(\text{SUSPECT\_ACCRUALS}_{i,t} = 1\). Our results are qualitatively similar if we eliminate these firm-quarters from the sample.

IV. RESULTS

Descriptive Statistics

Table 1 presents descriptive statistics for the three samples relevant to our tests. Column 1 presents descriptive statistics for suspect repurchase firm-quarters (\(\text{SUSPECT\_REPURCHASE}_{1,i,t} = 1\)), column 2 presents suspect accrual firm-quarters (\(\text{SUSPECT\_ACCRUALS}_{i,t} = 1\)), and column 3...
presents non-suspect control firm-quarters that, \textit{ex post}, meet or beat consensus analysts’ forecasts without accretive stock repurchases or discretionary accruals. We find that 28 percent of suspect repurchase firm-quarters employ industry-specialist auditors (HAQ) versus 22 percent of suspect accrual firm-quarters and 24 percent of non-suspect control firm-quarters. These differences are statistically significant at the 0.01 level based on a t-test of differences in means.

We also find that 58 percent of suspect repurchase firm-quarters consummate a repurchase in the previous quarter (\textit{REPURCHASE}_{i,t-1} = 1) as compared to 25 and 26 percent in the two comparison firm-quarters. Similar differences are present for repurchase behavior two quarters prior (\textit{REPURCHASE}_{i,t-2} = 1). Combined, these findings indicate that suspect repurchase firm-quarters

\[ \text{TABLE 1} \]
\begin{tabular}{lrrrrrr}
 & \multicolumn{2}{c}{\textit{SUSPECT\_REPURCHASE}_{i,t} = 1} & & \multicolumn{2}{c}{\textit{SUSPECT\_ACCRUALS}_{i,t} = 1} & \multicolumn{2}{c}{\textit{ACTUAL\_FE}_{i,t} = [0.00,0.05]} \\
 & \multicolumn{2}{c}{n = 1,894} & & \multicolumn{2}{c}{n = 3,232} & \multicolumn{2}{c}{(Non-Suspect Control Group) n = 18,303} \\
\hline
 & Mean & Median & Mean & Median & Mean & Median \\
HAQ_{i,t} & 0.28 & 0.00 & 0.22*** & 0.00 & 0.24*** & 0.00 \\
\textit{REPURCHASE}_{i,t-1} & 0.58 & 1.00 & 0.25*** & 0.00 & 0.26*** & 0.00 \\
\textit{REPURCHASE}_{i,t-2} & 0.56 & 1.00 & 0.25*** & 0.00 & 0.27*** & 0.00 \\
\text{Forecast Dispersion}_{i,t} & 0.02 & 0.01 & 0.01*** & 0.01 & 0.02 & 0.01 \\
\text{Cash}_{i,t-1} & 0.12 & 0.06 & 0.22*** & 0.16 & 0.17*** & 0.08 \\
\text{CAPEX}_{i,t-1}\_t & 0.01 & 0.01 & 0.22*** & 0.01 & 0.02*** & 0.01 \\
\text{Dividend Yield}_{i,t-1} & 1.63 & 0.12 & 0.57*** & 0.00 & 0.66*** & 0.00 \\
\text{Debt}_{i,t-1} & 0.21 & 0.20 & 0.14*** & 0.08 & 0.19*** & 0.15 \\
\text{Size}_{i,t-1} & 6,709 & 1,716 & 2,006*** & 279 & 2,609*** & 468 \\
\text{ROA}_{i,t} & 0.03 & 0.02 & 0.03*** & 0.02 & 0.02*** & 0.02 \\
\text{MTB}_{i,t} & 4.34 & 3.17 & 4.10*** & 3.04 & 3.63*** & 2.66 \\
\hline
\end{tabular}

*** Denotes the difference between suspect repurchase firm-quarters and either suspect discretionary accruals or the non-suspect control group are significant at less than 1 percent.

Variable Definitions:
\( \text{SUSPECT\_REPURCHASE}_{i,t} = 1 \) where \( \text{ASIF\_FE}_{1,i,t} \) is \( \geq \$0.05 \), but \( < \$0.00 \) and \( \text{ACTUAL\_FE}_{i,t} \) is \( \geq \$0.00 \) but \( \leq \$0.05 \) for a firm-quarter, otherwise 0;
\( \text{SUSPECT\_ACCRUALS}_{i,t} = 1 \) where \( \text{ASIF\_FE\_ACCRUALS}_{i,t} \) is \( \geq \$0.05 \), but \( < \$0.00 \) and \( \text{ACTUAL\_FE}_{i,t} \) is \( \geq \$0.00 \) but \( \leq \$0.05 \) for a firm-quarter, otherwise 0;
\( \text{HAQ}_{i,t} = 1 \) where the auditor is identified as the industry specialist, otherwise 0;
\( \text{REPURCHASE}_{i,t-1} = 1 \) where a firm was a net repurchaser in the previous quarter \( (t-1) \) or two quarters prior \( (t-2) \), otherwise 0;
\( \text{Forecast Dispersion}_{i,t} = \) standard deviation of analysts’ forecasts that comprise the consensus analysts’ forecasts. Firm-quarters with only one analyst forecast are removed from the test samples;
\( \text{Cash}_{i,t-1} = \) cash and cash equivalents (CHEQ) at the beginning of the quarter scaled by total assets (ATQ);
\( \text{CAPEX}_{i,t-2} = \) capital expenditures during the previous year ending at the beginning of the quarter scaled by total assets (ATQ);
\( \text{Dividend Yield}_{i,t-1} = \) dividend payment (DIVY) during the previous year ending at the beginning of the quarter scaled by quarter end price (PRCCQ);
\( \text{Debt}_{i,t-1} = \) total debt (DLTTQ + DLCQ) at the beginning of the quarter scaled by total assets (ATQ);
\( \text{Size}_{i,t-1} = \) total assets (ATQ) at the beginning of the quarter;
\( \text{ROA}_{i,t} = \) earnings before extraordinary items (IBQ) scaled by total assets (ATQ); and
\( \text{MTB}_{i,t} = \) end-of-quarter market value of equity (CSHOQ + PRCCQ) scaled book value of equity (ATQ – LTQ – PSTKQ).

presents non-suspect control firm-quarters that, \textit{ex post}, meet or beat consensus analysts’ forecasts without accretive stock repurchases or discretionary accruals.

We find that 28 percent of suspect repurchase firm-quarters employ industry-specialist auditors (HAQ) versus 22 percent of suspect accrual firm-quarters and 24 percent of non-suspect control firm-quarters. These differences are statistically significant at the 0.01 level based on a t-test of differences in means.

We also find that 58 percent of suspect repurchase firm-quarters consummate a repurchase in the previous quarter (\( \text{REPURCHASE}_{i,t-1} = 1 \)) as compared to 25 and 26 percent in the two comparison firm-quarters. Similar differences are present for repurchase behavior two quarters prior (\( \text{REPURCHASE}_{i,t-2} = 1 \)). Combined, these findings indicate that suspect repurchase firm-quarters
are approximately twice as likely to repurchase stock in previous quarters when compared to other firm-quarters in our sample.

For all other control variables, differences between suspect repurchase and suspect accrual firm-quarters are statistically significant at the 0.01 level. Similarly, all differences for the control variables between suspect repurchase firm-quarters and non-suspect control firm-quarters are statistically significant at the 0.01 level except for forecast dispersion. Most differences for the control variables between suspect discretionary accrual and the non-suspect control firm-quarters are also statistically significant, with the exception of previous quarter repurchases and capital expenditures. Combined, the significance of these differences suggests the need for multivariate testing.

Multivariate Analysis

Table 2 presents the results for the multivariate tests addressing H1. In Model 1, the coefficient on $HAQ (b_1)$ is positive and significant, which supports our hypothesis that managers of firms with higher audit quality are more likely to use accretive stock repurchases to meet or beat analysts’ forecasts. The marginal effect for $HAQ$ indicates that high audit quality firm-quarters are 17 percent more likely to make an accretive repurchase in comparison to firm-quarters that are able to meet or beat analysts’ forecasts without an accretive repurchase ex post. These results are consistent with rejecting H1.

Table 2 also presents results for H2. In Model 2, the coefficient for $HAQ (b_1)$ is negative and significant, providing evidence that firm-quarters with high audit quality are less likely to use discretionary current accruals to meet or beat analysts’ forecasts. The marginal effect for $HAQ$ suggests that firm-quarters with high audit quality are 11 percent less likely to use discretionary current accruals in comparison to firm-quarters that meet or beat analysts’ forecasts without discretionary current accruals ex post.

In Model 3, we directly compare suspect repurchase firm-quarters with suspect accrual firm-quarters by including only observations for which $SUSPECT\_REPURCHASE_{i,t} = 1$ or $SUSPECT\_ACCURALS_{i,t} = 1$. The coefficient for $HAQ (b_1)$ is positive and significant, which, along with results from Models 1 and 2, supports our hypothesis that firms with higher audit quality are more likely to use accretive stock repurchases and less likely to use discretionary current accruals to meet or beat analysts’ forecasts. The marginal effect for $HAQ$ indicates that firm-quarters with high audit quality are 23 percent more likely to use accretive stock repurchases than discretionary current accruals to meet or beat analysts’ forecasts. The evidence presented in Table 2 is consistent with rejecting H2.

In addition to the results for high audit quality, most control variables are statistically significant in all three models. Prior repurchases are very strongly associated with suspect repurchases. As noted in prior research (Hribar et al. 2006), stock repurchases are serially correlated, which may confound our identification of suspect repurchase firm-quarters. We further address this concern through supplementary tests that explicitly control for expected repurchases.

Both suspect repurchase firm-quarters (Model 1) and suspect accrual firm-quarters (Model 2) are negatively associated with forecast dispersion, indicating that as the variance of analysts’ forecasts increases, accretive repurchases and discretionary accruals are less likely to be used to...
Multivariate Results for the Association between High Audit Quality and Suspect Repurchases and Suspect Accruals

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th></th>
<th>Model 2</th>
<th></th>
<th>Model 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Estimate</td>
<td>p-value</td>
<td>Estimate</td>
<td>p-value</td>
<td>Estimate</td>
<td>p-value</td>
</tr>
<tr>
<td>Intercept</td>
<td>-3.52***</td>
<td>&lt; 0.001</td>
<td>-1.72***</td>
<td>&lt; 0.001</td>
<td>-1.70***</td>
<td>&lt; 0.001</td>
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<tr>
<td>HAQ&lt;sub&gt;t,i&lt;/sub&gt;</td>
<td>0.16***</td>
<td>0.004</td>
<td>-0.10**</td>
<td>0.026</td>
<td>0.21***</td>
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<td>REPURCHASE&lt;sub&gt;t,i-1&lt;/sub&gt;</td>
<td>0.84***</td>
<td>&lt; 0.001</td>
<td></td>
<td></td>
<td>0.92***</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>REPURCHASE&lt;sub&gt;t,i-2&lt;/sub&gt;</td>
<td>0.65***</td>
<td>&lt; 0.001</td>
<td></td>
<td></td>
<td>0.73***</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Forecast Dispersion&lt;sub&gt;t,i&lt;/sub&gt;</td>
<td>-3.53**</td>
<td>0.015</td>
<td>-8.59***</td>
<td>&lt; 0.001</td>
<td>1.49</td>
<td>0.481</td>
</tr>
<tr>
<td>Cash&lt;sub&gt;t,i-1&lt;/sub&gt;</td>
<td>-1.92***</td>
<td>&lt; 0.001</td>
<td>0.60***</td>
<td>&lt; 0.001</td>
<td>-2.20***</td>
<td>&lt; 0.001</td>
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<tr>
<td>CAPEX&lt;sub&gt;t-1,t-4&lt;/sub&gt;</td>
<td>-12.12***</td>
<td>&lt; 0.001</td>
<td>2.61**</td>
<td>0.019</td>
<td>-13.71***</td>
<td>&lt; 0.001</td>
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<tr>
<td>Dividend Yield&lt;sub&gt;t,i-1&lt;/sub&gt;</td>
<td>-0.04***</td>
<td>&lt; 0.001</td>
<td>0.04***</td>
<td>0.003</td>
<td>-0.09***</td>
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<tr>
<td>Debt&lt;sub&gt;t,i-1&lt;/sub&gt;</td>
<td>0.37**</td>
<td>0.024</td>
<td>-0.69***</td>
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<td>0.00***</td>
<td>&lt; 0.001</td>
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<tr>
<td>Size&lt;sup&gt;2&lt;/sup&gt;&lt;sub&gt;t,i-1&lt;/sub&gt;</td>
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<td>0.00***</td>
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</tr>
<tr>
<td>Size&lt;sup&gt;3&lt;/sup&gt;&lt;sub&gt;t,i-1&lt;/sub&gt;</td>
<td>0.00***</td>
<td>&lt; 0.001</td>
<td>0.00***</td>
<td>&lt; 0.001</td>
<td>0.00***</td>
<td>&lt; 0.001</td>
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<tr>
<td>ROA&lt;sub&gt;t,i&lt;/sub&gt;</td>
<td>22.79***</td>
<td>&lt; 0.001</td>
<td>1.90</td>
<td>0.141</td>
<td>22.22***</td>
<td>&lt; 0.001</td>
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<tr>
<td>MTB&lt;sub&gt;t,i&lt;/sub&gt;</td>
<td>0.02**</td>
<td>0.014</td>
<td>0.01*</td>
<td>0.054</td>
<td>-0.01</td>
<td>0.214</td>
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<td>Likelihood Ratio</td>
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<td>373.22***</td>
<td>&lt; 0.001</td>
<td>1,390.6***</td>
<td>&lt; 0.001</td>
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<tr>
<td>Total Observations</td>
<td>23,290</td>
<td></td>
<td>23,290</td>
<td></td>
<td>4,987</td>
<td></td>
</tr>
</tbody>
</table>

Observations where:

- **SUSPECT_ REPURCHASE1<sub>t,i</sub> = 1**
- **SUSPECT_ ACCRUALS<sub>t,i</sub> = 1**

Model 1:

SUSPECT_ REPURCHASE1<sub>t,i</sub> = \( x + \beta_1 HAQ_{t,i} + \beta_2 Repurchase_{t,i-1} + \beta_3 Repurchase_{t,i-2} + \beta_4 Forecast Dispersion_{t,i} + \beta_5 Cash_{t,i-1} + \beta_6 CAPEX_{t-1,t-4} + \beta_7 Dividend Yield_{t,i-1} + \beta_8 Debt_{t,i-1} + \beta_9 Size_{t,i-1} + \beta_{10} Size^2_{t,i-1} + \beta_{11} Size^3_{t,i-1} + \beta_{12} ROA_{t,i} + \beta_{13} MTB_{t,i} + e_{t,i}. \)

Model 2:

SUSPECT_ ACCRUALS<sub>t,i</sub> = \( x + \beta_1 HAQ_{t,i} + \beta_2 Forecast Dispersion_{t,i} + \beta_3 Cash_{t,i-1} + \beta_4 CAPEX_{t-1,t-4} + \beta_5 Dividend Yield_{t,i-1} + \beta_6 Debt_{t,i-1} + \beta_7 Size_{t,i-1} + \beta_8 Size^2_{t,i-1} + \beta_9 Size^3_{t,i-1} + \beta_{10} ROA_{t,i} + \beta_{11} MTB_{t,i} + e_{t,i}. \)

Model 3:

Each model sample reflects the following restrictions:

- Model 1: Firm-quarters that meet or beat the consensus analysts’ forecasts ($0.00 \leq \text{ACTUAL}_{FE,t,i} \leq 0.05$). The sample compares firm-quarters suspected of using accretive stock repurchases to meet or beat consensus analysts’ forecasts to those that meet or beat without accretive stock repurchases.
- Model 2: Firm-quarters that meet or beat the consensus analysts’ forecasts ($0.00 \leq \text{ACTUAL}_{FE,t,i} \leq 0.05$). The sample compares firm-quarters suspected of using discretionary accruals to meet or beat consensus analysts’ forecasts to those that meet or beat without discretionary accruals.
- Model 3: Firm-quarters identified as SUSPECT_ REPURCHASE1<sub>t,i</sub> = 1, or SUSPECT_ ACCRUALS<sub>t,i</sub> = 1. The sample compares firm-quarters suspected of using accretive stock repurchases to firm-quarters suspected of using accruals to meet or beat consensus analysts’ forecasts.
meet the consensus analysts’ forecasts. In addition, both suspect repurchase and suspect accrual firm-quarters are positively associated with ROA, although ROA is much higher for suspect repurchase firm-quarters. The signs of cash, capital expenditures, dividend yield, and debt switch between Models 1 and 2, indicating that suspect repurchase firm-quarters exhibit lower levels of each, while suspect accrual firm-quarters exhibit higher levels of each when compared to non-suspect firm-quarters. Together, these findings suggest that firm characteristics are likely to affect firm choices between earnings management types, but also indicate possible underlying firm differences. We address this concern through supplementary tests that apply propensity score matching based on auditor industry specialization to better control for firm differences.

**Supplementary Tests**

**Controlling for Expected Repurchases**

Our main tests estimate pre-repurchase forecast error (i.e., \( ASIF_{FE1} \)) assuming that firms’ open-market repurchases are not anticipated by analysts and investors. If firms previously announce open-market repurchase programs or if analysts anticipate the serial correlation in stock repurchase behavior, then our approach likely understates analysts’ and investors’ repurchase expectations. Our main tests control for this by including prior stock repurchases in the suspect repurchase models. However, to further address this concern, we next directly estimate expected repurchases for use in the suspect repurchase models (see Hribar et al. 2006, 18–19).

We follow Hribar et al. (2006) and estimate expected repurchases by a firm in a given quarter using a two-stage approach that models expected repurchases as the product of the estimated probability that firms will repurchase stock (stage 1) and the expected level of repurchases given that one occurs (stage 2). The first-stage estimation uses both repurchase and non-repurchase firms to estimate a repurchase expectation for every firm-quarter in the sample. The first stage models the repurchase decision as a binary variable, and estimates the following probit model:

\[
REPURCHASE_{ij,t} = \alpha + \beta_1 \text{Repurchase}_{ij,t-1} + \beta_2 \text{Repurchase}_{ij,t-2} + \beta_3 \text{Cash}_{ij,t-1} \\
+ \beta_4 \text{CAPEX}_{ij,t-4,t-1} + \beta_5 \text{Dividend Yield}_{ij,t-1} + \beta_6 \text{Debt}_{ij,t-1} + \beta_7 \text{Size}_{ij,t-1} \\
+ \gamma_i \text{Industry}_{i,k} + \delta_i \text{Year}_{i,j} + \phi_i Qtr_{i,q} + \epsilon_{ij,t},
\]

(3)

where \( REPURCHASE_{ij,t} \) equals 1 if firm \( i \) repurchased shares during quarter \( t \), and 0 otherwise. Independent variables are measured at the beginning of the quarter when expectations are more likely formed about potential stock repurchases. Most control variables are the same as those used in the suspect repurchases model. \( \text{Industry}_{i,k} \), \( \text{Year}_{i,j} \), and \( Qtr_{i,q} \) are included as fixed effects.

Untabulated results for the first-stage regression reveal that the probability of a repurchase is positive and significantly associated with prior repurchases, dividend yield, and size, and negative and significantly associated with cash, capital expenditures, and debt. The pseudo-R\(^2\) from the first-stage analysis is 27.7 percent.

The second-stage model provides an estimate for dollars spent on stock repurchases based on firm characteristics conditioned on the probability that a repurchase occurs. The second-stage regression is similar to the first-stage, except that the actual dollar value of stock repurchases replaces the binary repurchase variables from the first stage and information about the probability of a repurchase is incorporated into the model. Information about the probability of a repurchase for all firms, not just repurchasing firms, is incorporated in the second-stage regression through two variables calculated from the first stage, the standard normal probability density function (\( \phi \)) and the cumulative density function (\( \Phi \)). The variable \( \phi \) is included in the second-stage regression, while \( \Phi \) is multiplied by each of the independent variables from the first stage. Untabulated results for the second-stage regression show that all variables except capital expenditures are significantly
related in the expected direction to the dollar value of stock repurchases. The adjusted $R^2$ in the second stage is 57.1 percent.

The second-stage estimates generate an unconditional expectation of the dollar amount of repurchases for firm-quarters based on information known at the beginning of each quarter. The expected number of shares repurchased is calculated by dividing the estimated dollar amount of shares repurchased by the beginning of the quarter stock price. From this estimate of the expected number of shares repurchased, we create a second “as-if” EPS estimate that incorporates expected stock repurchase activity:

$$ASIF_{EPS2,i,t} = \frac{(NI_{i,t} + C_{i,t})}{\left[SHARESOUT_{i,t-1} + (0.5\times SHARESISSUED_{i,t}) - \left(0.5\times E(REPURCHASE_{i,t})\right)\right]},$$

where $E(REPURCHASE_{i,t})$ is the expectation of shares to be repurchased at the beginning of the quarter. $ASIF_{EPS2}$ is similar to $ASIF_{EPS1}$, except that it removes the EPS effects of expected repurchases. The difference between reported EPS and $ASIF_{EPS1}$ includes the EPS effects of both expected and unexpected repurchases, whereas the difference between reported EPS and $ASIF_{EPS2}$ only reflects the EPS effects of unexpected repurchases.

To obtain the pre-repurchase forecast error based on unexpected repurchases, we isolate the impact of unexpected stock repurchases on EPS ($EPSImpact2$) by comparing $ASIF_{EPS2}$ and reported EPS, where:

$$EPSImpact2_{i,t} = \frac{ReportedEPS_{i,t}}{ASIF_{EPS2_{i,t}}} - \frac{ASIF_{EPS2_{i,t}}}{ASIF_{EPS2_{i,t}}}.$$  

$EPSImpact2$ is positive for accretive stock repurchases and negative for non-accretive stock repurchases.

The pre-repurchase forecast error based on unexpected repurchases is calculated as the actual forecast error less the EPS effect of unexpected repurchases. Specifically:

$$ASIF_{FE2,i,t} = \frac{ACTUAL_{FE_{i,t}}}{-EPSImpact2_{i,t}}.$$  

$ASIF_{FE2}$ is negative for firm-quarters that would have missed consensus analysts’ forecasts absent the effects of accretive stock repurchases. For firms that do not repurchase stock, $ASIF_{FE2}$ equals $ACTUAL_{FE}$.

Finally, we define suspect repurchases as those that would have missed analysts’ forecasts by five cents or less, but are able to meet or beat forecasts by no more than five cents with unexpected stock repurchases. We construct an indicator variable ($SUSPECT_{REPURCHASE2_{i,t}} = 1$) as an alternative measure for suspect repurchases based on unexpected repurchases, where $ASIF_{FE2}$ is $\geq -0.05$ and $< 0.00$ and $ACTUAL_{FE}$ is $\geq 0.00$ and $\leq 0.05$ for a firm-quarter. $SUSPECT_{REPURCHASE2}$ is equal to 0 for all other firm-quarters.

Table 3 replicates our main tests for H1 and H2, but substitutes $SUSPECT_{REPURCHASE2}$ for $SUSPECT_{REPURCHASE1}$ to control for expected repurchases. The results from these supplementary tests are consistent with our main tests. In Model 4, the coefficient on $HAQ (\beta_1)$ is positive and significant, which provides support that managers of firms with higher audit quality are more likely to use accretive stock repurchases to meet or beat analysts’ forecasts. In Model 5, the coefficient for $HAQ (\beta_1)$ is negative and significant, providing evidence that firm-quarters with high audit quality are less likely to use discretionary current accruals to meet or beat analysts’ forecasts. Finally, in Model 6, the coefficient for $HAQ (\beta_1)$ is positive and significant, which supports our hypothesis that firms with higher audit quality are more likely to use accretive stock repurchases and less likely to use discretionary current accruals to meet or beat analysts’ forecasts.
Our main tests use control variables to reduce the effects of firm characteristics on the association between suspect repurchases, suspect accruals, and high audit quality. However, the results from our main tests may still be influenced by fundamental differences in firm characteristics. Prior research (Lawrence et al. 2011; Armstrong et al. 2010) finds that the regression framework is subject to misspecification of the functional relationship between control variables and the dependent variable for different treatment levels and recommends using propensity score matching to address this concern. In our study, size is of particular concern since industry-specialist auditors are identified based on market share. Therefore, we employ propensity score matching to match firms with industry-specialist auditors to firms without industry-specialist auditors based on relevant observable firm characteristics.

First, following Gul et al. (2009), we estimate propensity scores using a logistic regression in which the dependent variable is either an industry-specialist auditor (1) or not an industry-specialist auditor (0). We model the choice of an industry-specialist auditor based on size, debt, return on assets, market-to-book, asset turnover, litigation risk, lagged absolute value of discretionary

\[ \text{SUSPECT\_REPURCHASE2}_{i,t} = \begin{cases} 1 & \text{if } ASIF\_FE2_{i,t} \geq -0.05, \text{ but } < 0.00, \text{ and ACTUAL\_FE}_{i,t} \geq 0.00, \text{ but } \leq 0.05 \text{ for a firm-quarter, otherwise 0.} \\
0 & \text{otherwise} \end{cases} \]
accruals, age, industry, and year. Next we match, without replacement, an industry-specialist firm to the non-industry-specialist firm with the closest propensity score within a maximum distance of 0.03. This results in 5,153 matched pairs.

Table 4 reports tests of differences in means of observable firm characteristics between the HAQ and matched non-HAQ firms for suspect repurchases and suspect accruals. The two-tailed t-tests of differences in means indicate that none of the observable firm characteristics are significantly different between the sample and control firms, suggesting that the firms are matched appropriately. As described next, we find that firms with industry-specialist auditors are more likely to use accretive repurchases to meet or beat analysts’ forecasts than firms without industry-specialist auditors. The difference between HAQ and matched non-HAQ firms for SUSPECT_REPURCHASE1 (SUSPECT_REPURCHASE2) indicates that firms with industry-specialist auditors execute 14.5 percent (35.7 percent) more suspect repurchases than firms without industry-specialist auditors. The p-values for the difference in means between HAQ and matched non-HAQ firms for SUSPECT_REPURCHASE1 and SUSPECT_REPURCHASE2 are 0.095 and 0.012, respectively.

Consistent with a trade-off between accretive repurchases and accrual-based earnings management, we find that firms with industry-specialist auditors use 13.5 percent less suspect accruals to meet or beat analyst forecasts. This result is supported by the significant difference in means for SUSPECT_ACCRUALS, with industry-specialist auditors using 13.5 percent less suspect accruals than non-industry-specialist auditors. The p-value for this difference is 0.007.

### TABLE 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>HAQ Mean</th>
<th>Non-HAQ Mean</th>
<th>Difference in Means</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUSPECT_REPURCHASE1</td>
<td>0.063</td>
<td>0.055</td>
<td>0.008*</td>
<td>0.095</td>
</tr>
<tr>
<td>SUSPECT_REPURCHASE2</td>
<td>0.038</td>
<td>0.028</td>
<td>0.010**</td>
<td>0.012</td>
</tr>
<tr>
<td>SUSPECT_ACCRUALS</td>
<td>0.115</td>
<td>0.133</td>
<td>−0.018***</td>
<td>0.007</td>
</tr>
<tr>
<td>Size_{\text{t−1}}</td>
<td>3,659.8</td>
<td>3,695.5</td>
<td>−35.7</td>
<td>0.863</td>
</tr>
<tr>
<td>Size_{\text{t−1}}^2</td>
<td>7,000.0a</td>
<td>7,100.0a</td>
<td>−100.0a</td>
<td>0.909</td>
</tr>
<tr>
<td>Size_{\text{t−1}}^3</td>
<td>2,300.0a</td>
<td>2,300.0a</td>
<td>0.000</td>
<td>0.927</td>
</tr>
<tr>
<td>Debt_{\text{t−1}}</td>
<td>0.190</td>
<td>0.191</td>
<td>−0.001</td>
<td>0.887</td>
</tr>
<tr>
<td>ROA_{\text{t}}</td>
<td>0.022</td>
<td>0.022</td>
<td>0.000</td>
<td>0.374</td>
</tr>
<tr>
<td>MTB_{\text{t}}</td>
<td>3.934</td>
<td>3.977</td>
<td>−0.043</td>
<td>0.541</td>
</tr>
<tr>
<td>Asset Turnover_{\text{t}}</td>
<td>0.297</td>
<td>0.296</td>
<td>0.001</td>
<td>0.670</td>
</tr>
<tr>
<td>Litigation_{\text{t}}</td>
<td>0.036</td>
<td>0.035</td>
<td>0.001</td>
<td>0.791</td>
</tr>
<tr>
<td>Abs. DACC_{\text{t−1}}</td>
<td>0.016</td>
<td>0.016</td>
<td>0.000</td>
<td>0.967</td>
</tr>
<tr>
<td>Age_{\text{t−1}}</td>
<td>2.684</td>
<td>2.700</td>
<td>−0.016</td>
<td>0.319</td>
</tr>
</tbody>
</table>

***,*** Indicate significance at the 0.10, 0.05, and 0.01 levels, respectively, using two-tailed t-tests. The table presents means and differences in means for firms with HAQ and propensity score matched firms without HAQ. Using the full sample from the main tests in Table 2, we match HAQ firms, without replacement, to non-HAQ firms with the closest propensity score and within a maximum distance of 0.03.

a Size^2 is scaled by one million and Size^3 is scaled by one billion. All other variables are defined in Table 1.

Variable Definitions:

* Asset Turnover = quarterly sales divided by total assets;
* Litigation = 1 for firms with the following SIC codes: (2833–2836), (3570–3577), (3600–3674), (5200–5961), or (7370–7370), otherwise 0;
* Abs. DACC = previous quarter’s absolute value of discretionary accruals; and
* Age = log of the number of years a firm has been on Compustat beginning with 1950.
beat analysts’ forecasts than the same matched non-industry-specialist auditor firms. The p-value of
the difference in means for SUSPECT_ACCRUALS is 0.007. The evidence from propensity score
matching supports our main results and helps alleviate concerns that differences in observable firm
characteristics are driving our results.

V. SENSITIVITY TESTS

One concern is that our main tests could be capturing a spurious relation between high audit
quality and accretive stock repurchases and discretionary accruals. We address this issue in two
ways. First, we test whether there is a relation between accretive stock repurchases and
discretionary current accruals absent incentives to meet or beat analysts’ forecasts. We identify both
accretive stock repurchase firm-quarters and EPS increasing discretionary current accruals not
classified as suspect in our main tests. In other words, we test whether our hypothesized trade-off
persists for non-suspect repurchase and non-suspect accrual firm-quarters. Untabulated results show
that high audit quality is not significantly related to non-suspect repurchase or accrual firm-quarters,
providing evidence that our main tests are not capturing a general relation.

Second, we adopt an approach similar to Ayers et al. (2006) by examining whether a trade-off
between suspect repurchases and suspect accruals exists where the change in EPS is the difference
between meeting or beating pseudo earnings targets set at five cents above or below analysts’
forecasts. If the results from our main tests are unrelated to analysts’ forecasts, we would expect the
results around pseudo targets to be similar to the results occurring around analysts’ forecasts.
Unlike the results from our main tests, untabulated results for high audit quality are insignificant
using pseudo targets, providing further evidence that efforts to meet or beat analysts’ forecasts are
an important aspect of our study.

A second concern stems from the fact that auditor scrutiny is likely more rigorous during the
fourth quarter (Brown and Pinello 2007) and, therefore, fourth quarter observations could be
driving our main results. However, audit quality is likely to affect the first three quarters for at least
two reasons. First, technological advancements in auditing reduce the seasonality of auditing by
facilitating timely interim reviews and reducing year-end workloads (Shu 2000). Second, managers’
accrual choices during the first three quarters are likely affected by expectations of higher audit
scrutiny at year-end. We ensure that our main results are not driven by observations from the fourth
quarter by re-estimating our main tests using only the first three fiscal quarters during which auditor
oversight may be less stringent. Results are qualitatively similar for the first three quarters, which
provides evidence that high audit quality is associated with our suggested trade-off even in quarters
with less stringent auditor scrutiny.

VI. IMPLICATIONS AND CONCLUSION

We examine whether audit quality affects managers’ choices between accrual-based earnings
management and accretive stock repurchases. We provide consistent evidence that firms that
engage high-quality auditors are more likely to use accretive stock repurchases and less likely to
manage accruals to meet or beat consensus analysts’ forecasts. Combined, our findings suggest that
managers faced with high audit quality trade off the use of accretive stock repurchases with
accrual-based earnings management to meet or beat analysts’ forecasts.

Our findings have at least three implications for corporate governance. First, our findings
provide evidence that the decision to hire high audit quality to combat accrual-based earnings
management is associated with an unintended consequence: the increased use by managers of at
least one real earnings management mechanism—accretive stock repurchases. Firms choose high
audit quality to signal earnings quality and corporate governance effectiveness. This signal becomes
obfuscated when the use of real earnings management is elevated.
Second, if managers circumvent high audit quality through the use of this real earnings management technique, then other governance mechanisms, especially those limiting management’s ability to use real earnings management to influence firm performance measures, might be considered concurrently with the decision to engage a high-quality auditor. Corporate boards and audit committees may wish to consider compensation-related issues and other contractual features for managers that constrain firm value-decreasing behaviors of management.

Finally, the use of accretive repurchases to meet or beat EPS benchmarks potentially deviates from “business as usual,” which may have negative consequences to the short- and long-term performance of the firm. Often, accretive stock repurchases involve a substantial number of shares and firms face significant opportunity costs from the loss of resources used in accretive stock repurchases. This is especially problematic when repurchases alter normal business practices. Although not formally tested in this paper, accretive repurchases used as a real earnings management tool could potentially have unfavorable implications for a firm’s current and future operating performance and could impose unnecessary costs on the firm and its shareholders. 13

REFERENCES

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13 Cohen and Zarowin (2010) find that firms that engage in real earnings management prior to a seasoned equity offering suffer significant performance declines after the offering period. Conversely, Gunny (2010) provides evidence that real earnings management to meet earnings benchmarks signals positive future performance.


**APPENDIX A

VARIABLE DESCRIPTIONS**

Abs. $DACC_{i,t-1}$ = absolute value of a firm’s previous quarter discretionary accruals;

$ACTUAL\_FE_{i,t}$ = firm’s reported EPS minus its final consensus analysts’ forecast;

$Age_{i,t}$ = log of the number of years a firm has been on Compustat, beginning in 1950;

$ASIF\_EPS1_{i,t}$ = firm’s estimated EPS absent accretive stock repurchases calculated as:

$$\frac{NI_{i,t} + C_{i,t}}{SHARESOUT_{i,t-1} + 0.5*SHARESISSED_{i,t}};$$

$ASIF\_EPS2_{i,t}$ = firm’s estimated EPS absent accretive stock repurchases that incorporates expected repurchases, calculated as:

$$\frac{(NI_{i,t} + C_{i,t})}{\left[SHARESOUT_{i,t-1} + (0.5*SHARESISSED_{i,t}) - \left(0.5*E(REPURCHASE_{i,t})\right)\right]};$$

$ASIF\_EPS\_ACCURALS_{i,t}$ = firm’s estimated EPS absent current discretionary accruals, net of income taxes, calculated as:

$$\frac{NI_{i,t} - DACC_{i,t}(1 - T_{i,t})}{\text{Weighted Average SHARESOUT}_{i,t}};$$

$ASIF\_FE1_{i,t}$ = firm’s estimated pre-repurchase forecast error, calculated as: $ACTUAL\_FE_{i,t} - EPSImpact1_{i,t};$

$ASIF\_FE2_{i,t}$ = firm’s estimated pre-repurchase forecast error that incorporates expected repurchases, calculated as: $ACTUAL\_FE_{i,t} - EPSImpact2_{i,t};$
ASIF_FE_ACCRUALS_{i,t} = \text{firm’s estimated pre-discretionary current accrual forecast error, calculated as:} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ meeting the expectations of the auditors and the public.

Ni, t = \text{firm’s reported earnings before extraordinary items available to common shareholders for the firm-quarter (IBCOMQ)};

ReportedEPS_{i,t} = \text{firm’s earnings per share as reported for the quarter};

REPURCHASE_{i,t,(t-1),(t-2)} = 1 \text{ where a firm was a net repurchase in the previous quarter (t-1) or two quarters prior (t-2), otherwise 0};

ROA_{i,t} = \text{earnings before extraordinary items (IBQ), scaled by total assets (ATQ)};

SHARESISSUED_{i,t} = \text{actual or estimated number of common stock shares issued during a firm-quarter, depending on data availability;}

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SHARESOUT\(_{i,t-1}\) = reported number of diluted common shares outstanding if analysts’ forecast diluted EPS, otherwise primary common shares outstanding, at the beginning of the firm-quarter;

\(\text{Size}_{i,t-1}\) = firm’s total assets (ATQ) at the beginning of the quarter;

\(\text{SUSPECT\_REPURCHASE1}_{i,t}\) = indicator variable indicating whether the firm meets or beats analysts’ consensus forecasts using share repurchases, equal to 1 if \(\text{ASIF\_FE1} \geq -0.05\) but \(< 0.00\) and \(\text{ACTUAL\_FE} \geq 0.00\), but \(\leq 0.05\), otherwise 0;

\(\text{SUSPECT\_REPURCHASE2}_{i,t}\) = indicator variable indicating whether the firm meets or beats analysts’ consensus forecasts using unexpected share repurchases, equal to 1 if \(\text{ASIF\_FE2} \geq -0.05\) and \(< 0.00\) and \(\text{ACTUAL\_FE} \geq 0.00\) and \(\leq 0.05\), otherwise 0;

\(\text{SUSPECT\_ACCRUALS}_{i,t}\) = indicator variable indicating whether the firm meets or beats analysts’ consensus forecasts using discretionary accruals, equal to 1 if \(\text{ASIF\_FE\_ACCRUALS} \geq -0.05\), but \(< 0.00\) and \(\text{ACTUAL\_FE} \geq 0.00\), but \(\leq 0.05\), otherwise 0; and

\(\text{Weighted\ Average\ SHARESOUT}_{i,t}\) = weighted average diluted common shares outstanding if analysts’ forecast diluted EPS (CSHFDQ), otherwise primary common shares outstanding (CSHPRQ).