

The Relationship Between Non-GAAP Earnings and Aggressive Estimates in Reported GAAP Numbers

RYAN D. GUGGENMOS ,* KRISTINA RENNEKAMP,*
KATHY RUPAR,[†] AND SEAN WANG[‡]

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ABSTRACT

This study uses a controlled experiment to examine the trade-off between managers' use of non-GAAP and GAAP earnings to satisfy market expectations and how this relationship can be moderated by both formal and informal regulatory attention to non-GAAP earnings. Our key takeaway is that allowing financial reporting discretion in an alternative disclosure channel, that is, non-GAAP earnings, can reduce firms' opportunistic GAAP reporting. However, statements by regulators about increased attention to non-GAAP earnings constrain this channel, and this can result in more aggressive GAAP earnings management and reduced GAAP earnings quality. We triangulate these findings with a survey and archival analyses and find results that are

*Cornell University; [†]Georgia Institute of Technology; [‡]Southern Methodist University

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consistent with this primary message. Our study provides evidence relevant to standard setters and regulators that non-GAAP measures may serve an important role even if they can be used opportunistically.

JEL codes: G32, G41, H32, K22, M40, M41

Keywords: non-GAAP measures; earnings management; aggressive reporting; reconciliation

1. Introduction

Non-GAAP reporting is nearly ubiquitous. The Center for Audit Quality (CAQ) found that 94% of S&P 500 companies disclosed at least one non-GAAP financial measure in their Q1 2020 earnings release (CAQ [2020]). Archival research has found that non-GAAP earnings are value-relevant (Brown and Sivakumar [2003]) and attract investor attention (Bhattacharya et al. [2003], Lougee and Marquardt [2004]). However, non-GAAP earnings are less regulated than GAAP earnings, and firms may take advantage of the flexibility allowed in these metrics (for a review, see Black et al. [2018]). As a consequence, regulators and standard setters have recently focused attention on the discretion available to managers reporting non-GAAP earnings (PCAOB [2016]) and have addressed this topic when speaking to auditors, issuers, and investors (White [2015, 2016]). Our study investigates how managers' disclosure of non-GAAP earnings, as well as formal or informal regulatory attention to non-GAAP earnings disclosures, affect managers' aggressiveness in GAAP reporting.

Managers want to convey their views on firm performance and have strong incentives to satisfy market expectations. Prior papers examine how managers use accrual and/or real earnings management to satisfy market expectations (Ewert and Wagenhofer [2005], Wang and D'Souza [2006], Cohen and Zarowin [2010], Zang [2012]). In addition to these strategies, managers can report both GAAP and non-GAAP metrics to satisfy market participants. This is in line with prior archival research in accounting that recognizes these metrics as potential substitutes (Black et al. [2017]). Given the lighter regulation and greater discretion available in non-GAAP, compared to GAAP, earnings, managers may prefer to use non-GAAP earnings disclosures to calibrate investors' expectations instead of pursuing accrual or real earnings management strategies. As a result, we predict that managers are less likely to manage GAAP earnings to meet market benchmarks when non-GAAP earnings are also disclosed. However, regulators have increased their attention to non-GAAP earnings disclosures. This could make the use of non-GAAP earnings to calibrate expectations less attractive and make more traditional GAAP earnings management methods relatively more attractive. Thus, we also predict that regulatory attention to non-GAAP earnings, whether as formal attention from reconciliation requirements or informal attention from regulators' statements about

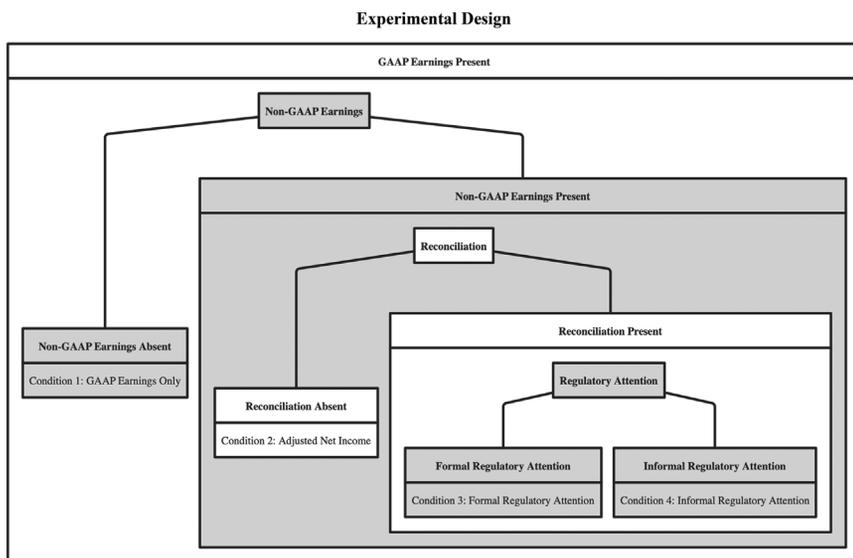


FIG. 1.—Experimental design. This figure presents a diagram of our between-participants experimental design. The experiment manipulates the presentation of a non-GAAP earnings measure, reconciliation of the non-GAAP earnings to reported GAAP earnings, and the presence of a prompt to remind participants of increased regulatory attention on non-GAAP measures.

areas of concern, will increase managers' opportunistic use of discretion in GAAP earnings.

We first present hand-collected archival data around the implementation of Reg G to provide preliminary support for our hypotheses. Consistent with expectations, our analyses indicate a positive association between increased regulatory attention to non-GAAP earnings disclosures and increased GAAP aggressiveness in the post-Reg G period. Next, we use a between-participants experiment with experienced financial reporting professionals to directly test our predictions. In this experiment, the participants' primary task is to decide the amount of Property, Plant, and Equipment (PP&E) impairment to record. We test our predictions by making comparisons across a set of experimental conditions designed to mimic the increasing attention to non-GAAP reporting. Figure 1 shows our research design and outlines the comparisons used to test our hypotheses.

We predict that managers disclosing both GAAP and non-GAAP earnings are more willing to record an impairment that misses a GAAP-based analyst consensus forecast than managers disclosing only GAAP earnings. To test this prediction, we compare the proportion of managers in each condition that book an impairment amount that allows them to meet a GAAP-based analyst consensus. Although our results are directionally consistent with our prediction, the difference across conditions is not significant. We make two additional comparisons in the supplemental analyses.

First, we compare the mean GAAP net income reported in each condition to the analyst consensus forecast. Second, we compare the mean GAAP net income reported across adjacent experimental conditions. These analyses provide some support consistent with our theory. In the condition where only GAAP earnings are disclosed, we find that GAAP net income is not significantly different from the analyst consensus, consistent with managers meeting analyst expectations. However, in the condition where GAAP and non-GAAP earnings are disclosed, GAAP net income is significantly lower than the GAAP-based analyst consensus and significantly lower than GAAP net income in the condition where only GAAP earnings are disclosed.

Next, we investigate the effects of formal and informal regulatory attention to non-GAAP reporting on the aggressiveness of GAAP earnings. To the extent that regulatory attention increases scrutiny of non-GAAP reporting, this could reduce managers' ability to use non-GAAP earnings to meet market expectations and, in turn, increase aggressiveness in GAAP earnings. With respect to formal regulatory attention, Reg G requires managers to present a reconciliation from non-GAAP earnings to GAAP earnings. We predict that this reconciliation draws attention to the relationship between non-GAAP and GAAP earnings and reintroduces pressure to meet market expectations by managing GAAP earnings. Counter to our prediction, we find that presenting a non-GAAP to GAAP reconciliation *increases* managers' willingness to book an impairment that misses the GAAP earnings analyst consensus forecast compared to when non-GAAP and GAAP earnings are unreconciled. Although unexpected, this is consistent with managers believing that a reconciliation increases the reliability of non-GAAP earnings (Elliott [2006]), making them an even more attractive option for meeting market expectations and further reducing GAAP aggressiveness.

Finally, we examine how increased informal regulatory attention affects managers' willingness to book an impairment that misses a GAAP benchmark. We find that managers who are aware of increased regulatory attention to non-GAAP earnings are less likely to record an impairment that causes the firm to miss the GAAP earnings analyst consensus, as compared to managers unaware of increased regulatory attention. This suggests that informal regulatory attention to non-GAAP disclosures reduces their appeal for meeting market expectations and may increase GAAP earnings management.

Following the recommendation of Asay et al. [2021], we conduct a survey of 30 experienced accounting managers to test our assumption that presenting non-GAAP earnings changes the pressures that managers feel to meet GAAP benchmarks.¹ Our survey results support this assumption and provide further evidence that the addition of non-GAAP reporting disclosure changes the pressures felt by managers with respect to achieving GAAP benchmarks.

¹ Approval to use human participants in the experiment and survey was granted by the Institutional Review Boards of the authors' respective institutions.

Together, our results suggest two main takeaways. First, we find evidence that non-GAAP earnings disclosures may reduce GAAP earnings management. This suggests that despite non-GAAP disclosures being susceptible to manager opportunism, they may allow for a previously unexplored benefit: higher quality GAAP earnings. Second, our results also suggest that regulatory attention may have an unintended spillover effect on overall earnings quality. Although intended to reduce opportunism in non-GAAP disclosures, we provide evidence that increased informal regulatory attention to non-GAAP earnings may lead to increased aggressiveness in GAAP earnings. This makes the net effect of regulatory focus on overall earnings quality difficult to assess. This is important, as it is unclear whether regulators and investors have considered how spillover effects resulting from increased regulatory attention to non-GAAP reporting could affect managers' GAAP reporting decisions and, thus, the overall quality of financial reporting.

2. *Background and Hypotheses*

2.1 DISCLOSURE OF NON-GAAP EARNINGS

Capital markets reward firms that meet or beat analyst forecasts and punish those that fall short (Bartov, Givoly, and Hayn [2002], Skinner and Sloan [2002]). As a result, managers have strong incentives to meet market expectations. Although meeting GAAP earnings forecasts via strong performance is one way to satisfy market expectations, it is not always feasible. Accordingly, managers often turn to other strategies to deal with these pressures. Among these is to construct and disclose alternative earnings metrics, known as non-GAAP earnings measures. The CAQ reports that 94% of S&P 500 index firms reported at least one non-GAAP earnings metric in the first quarter of 2020 (CAQ [2020]).² Managers construct these measures by beginning with GAAP earnings and then include or exclude specific earnings components to arrive at the non-GAAP financial measure.

Non-GAAP disclosures are increasingly popular because they allow managers to communicate information not captured by GAAP net income. Managers argue that non-GAAP earnings are more representative of a firm's performance than GAAP earnings, and research supports this claim (Shumsky [2016a], Sidibe [2016]). Lougee and Marquardt [2004] show that firms with less informative GAAP earnings are more likely to issue non-GAAP earnings disclosures. Brown and Sivakumar [2003] show that non-GAAP earnings are more informative than GAAP earnings. In addition, prior research finds that investors pay more attention to non-GAAP earnings when both GAAP and non-GAAP earnings measures are presented in the same press release (Bhattacharya et al. [2003], Lougee and Marquardt

² Firms use a variety of terms to describe non-GAAP earnings measures, including "operating," "adjusted," "core," or "organic" earnings (Garavaglia [2021]).

[2004]). If managers believe that investors see non-GAAP earnings as incrementally useful to GAAP earnings, this could lead to increased non-GAAP reporting.

However, some non-GAAP measures may be less informative than their GAAP counterparts, and there is evidence that investors should be skeptical of these measures. When firms report both GAAP and non-GAAP earnings, non-GAAP earnings are on average 44% higher than GAAP earnings (Shumsky [2016b]). This has concerned regulators, legislators, and the financial press (Elstein [2001], Liesman and Weil [2001a, b], SEC [2001], Leone [2010], Rapoport [2013]). Consistent with these concerns, Doyle, Lundholm, and Soliman [2003] and Black and Christensen [2009] show that some items excluded from GAAP net income to arrive at non-GAAP earnings have implications for future cash flows and therefore may not be appropriate to exclude. Similarly, Black and Christensen [2009] and Doyle, Jennings, and Soliman [2013] suggest that some managers opportunistically define non-GAAP earnings components to meet or beat analyst forecasts. In fact, investors find non-GAAP disclosures to be less informative when companies meet analysts' forecasts with non-GAAP, but not GAAP, earnings (Bhattacharya et al. [2003]). This is consistent with warnings that non-GAAP disclosures "be viewed with appropriate and healthy skepticism" (SEC [2001]). On balance, research supports that non-GAAP earnings can be informative but also recognize the potential for opportunism.

2.2 THE RELATIONSHIP BETWEEN GAAP AND NON-GAAP EARNINGS

To understand how changes in GAAP and non-GAAP regulation could impact one another, it is important to consider the relationship between these metrics. Black et al. [2017] provide evidence that when managers are unable to meet market expectations with strong operating performance, they see non-GAAP reporting and earnings management strategies as substitutes. More specifically, because non-GAAP earnings disclosures give managers an additional outlet to communicate their views on firm performance and meet market expectations, providing non-GAAP earnings disclosures reduces pressure to meet market expectations using costly GAAP earnings management strategies. CFOs recognize the high cost of earnings management (Graham, Harvey, and Rajgopal [2005]) and therefore are likely to embrace alternatives that could reduce these costs. Our theory is consistent with evidence suggesting that firms disclosing non-GAAP earnings (or emphasizing non-GAAP earnings relative to GAAP earnings) are successful at shifting investor focus away from GAAP earnings (Bhattacharya et al. [2003], Lougee and Marquardt [2004], Bowen, Davis, and Matsumoto [2005]).

Prior research suggests that this success is not limited to more informative non-GAAP earnings disclosures or less sophisticated financial statement users. Doyle et al. [2013] show that managers who disclose non-GAAP metrics that are higher than GAAP earnings are more likely to meet or beat analysts' expectations, indicating analysts do not fully adjust for

opportunistic non-GAAP earnings disclosures. Additionally, Gomez, Heflin, and Wang [2020] show that the informativeness of non-GAAP disclosures does not increase once companies address SEC comment letter concerns, implying that even the SEC finds it difficult to detect opportunistic non-GAAP disclosures.³

The substitutability of GAAP earnings management and non-GAAP disclosure, combined with the difficulty of detecting opportunism in these disclosures, make it likely that disclosing non-GAAP earnings will be attractive to managers facing pressure to meet market expectations. If so, GAAP earnings management is also likely to be viewed as less attractive. This leads to our first hypothesis:

H1: Managers reporting both GAAP and non-GAAP earnings will be less likely to engage in GAAP earnings management to meet market expectations than managers reporting only GAAP earnings.

2.3 THE EFFECTS OF REGULATORY ATTENTION

As non-GAAP earnings metrics become more common, regulators increasingly use both formal regulations and less formal public communications to focus attention on these disclosures. The Sarbanes–Oxley Act of 2002 (SOX) was one of the most substantial formal regulatory reforms of the past 20 years. Although this legislation primarily focuses on GAAP reporting, Section 401(b) of SOX addresses the use of “non-GAAP financial measures”. Its directive led to SEC Regulation G, which included a requirement that all non-GAAP disclosures be reconciled to their most directly comparable GAAP-based metric (SEC [2003]).

Although the SEC intended to improve disclosure quality, requiring firms to reconcile non-GAAP measures to GAAP numbers also draws investors’ attention to the GAAP metric. Furthermore, the reconciliation highlights adjustments made to construct non-GAAP metrics and causes investors to question whether these adjustments are opportunistic. Whether investors hold these views or not, managers who expect investors to interpret reconciled non-GAAP disclosures in this way should view non-GAAP earnings disclosure as a less attractive option for meeting market expectations. Therefore, our second hypothesis follows.

H2: Providing a reconciliation between GAAP and non-GAAP earnings will increase managers’ willingness to engage in GAAP earnings management to meet market expectations with respect to GAAP earnings.

³We recognize that the strength of this effect may change with shareholder sophistication, as more sophisticated users of these disclosures may more frequently identify opportunistic non-GAAP disclosures and focus on other metrics (Frederickson and Miller [2004], Elliott [2006], Allee et al. [2007], Bhattacharya et al. [2007]). However, if managers believe that some portion of the shareholder base focuses on non-GAAP earnings, then non-GAAP disclosure will likely still be an attractive disclosure channel, reducing the incentive to manage GAAP earnings.

In addition to formal regulation, such as Reg G, the SEC influences financial reporting practices via informal attention, such as speeches about areas of focus. Libby, Rennekamp, and Seybert [2015] discuss the impact of these informal interventions, noting that regulators' stated areas of attention may have effects on managers' behavior that are similar to, or even stronger than, formal regulations. SEC staff have frequently used this approach to increase awareness of opportunistic non-GAAP reporting practices, specifically noting that they are increasing their scrutiny of these measures and that investors should do the same. Even though public statements from regulators about non-GAAP reporting are less formal, we expect it to impact the appeal of managing GAAP earnings to meet market expectations.

First, informal regulatory attention may introduce new costs to managers who rely on non-GAAP disclosure to meet performance expectations. Specifically, SEC communication about potential opportunism in non-GAAP measures indicates to managers that regulators view these disclosures as opportunistic, which is likely to increase concerns about disclosure oversight and enforcement. Second, informal regulatory attention may reduce some of the benefits of non-GAAP disclosure. Concerns expressed by regulators over opportunism in non-GAAP earnings may cause investors to question the credibility of these measures, leading them to rely on GAAP earnings to a relatively greater extent. Furthermore, Curtis, Li, and Patrick [2021] find that concerns about opportunism in non-GAAP disclosure decrease company board reliance on these numbers in performance evaluations. Given that 84% of their sample of S&P 1500 firms use non-GAAP earnings for bonus compensation and that this practice increases overall bonus compensation, drawing attention to opportunism in non-GAAP measures may have pervasive economic effects. If informal regulatory attention to non-GAAP earnings disclosures causes managers to anticipate that non-GAAP disclosures will be subject to increased costs and reduced benefits, we expect that this will inhibit the ability of non-GAAP measures to reduce pressure on managers to engage in earnings management to meet GAAP-based benchmarks. This leads us to our final hypothesis:

H3: Public communication of increased regulatory attention to non-GAAP earnings disclosures will increase managers' reliance on GAAP earnings management to meet market expectations.

2.4 INITIAL ARCHIVAL EVIDENCE

Both H2 and H3 predict that increased regulatory attention to non-GAAP earnings will increase GAAP reporting aggressiveness. We provide initial support for this using hand-collected archival data around the implementation of Reg G. Our analysis complements prior work. Kolev, Marquardt, and McVay [2008] examine the effects of increased regulatory attention on the persistence (i.e., quality) of non-GAAP disclosure exclusions. Hribar et al. [2022] find an association between less GAAP reporting

discretion and greater use of voluntary disclosure channels. However, we are unaware of any studies that examine the association between increased attention to non-GAAP disclosures and more aggressive GAAP earnings.

Although managers' preferences may differ with respect to the channels by which they achieve market expectations (e.g., non-GAAP earnings disclosure, real earnings management, accrual earnings management, etc.), prior literature finds that managers view these strategies as substitutes (Black et al. [2017]). Therefore, we expect that as increased regulatory attention to non-GAAP earnings disclosures reduces the flexibility (and therefore the appeal) of non-GAAP reporting as a tool to satisfy capital market expectations, managers will resort to more aggressive GAAP earnings management to meet these expectations.

For our analyses, we begin by collecting information from firms' press releases during the period from 2000 to 2006.⁴ We then identify a set of items that firms commonly exclude from GAAP income when creating and reporting non-GAAP earnings. Prior literature has shown managers' use of discretion with these items to be associated with managed GAAP earnings (primarily through expense reduction).⁵ Rather than examining each exclusion individually, our dependent variable aggregates this set of common non-GAAP exclusions and sums them into a single measure (*COMMON_EXCL*).

GAAP and non-GAAP earnings are not only linked conceptually as substitutes, but also mechanically through the construction of the non-GAAP measure. When managers face increased regulatory attention to non-GAAP earnings, they receive both direct and indirect benefits from managing GAAP expenses that are commonly excluded from non-GAAP earnings. First, managers achieve direct GAAP expense reduction, which boosts GAAP net income. Second, they simultaneously reduce the magnitude of

⁴We thank Ted Christensen for granting access to these data. These data, drawn from searches of the PR Newswire and Business Wire on Lexis Nexis from 1998 to 2007, were used in Bhattacharya et al. [2003, 2007] and consist of the company name, ticker symbol, and firm pro forma EPS quarterly announcement date. Because ticker symbols change over time (e.g., because of name changes, acquisitions, delistings, etc.), we use the WRDS Code Lookup tool to verify that the ticker symbol, company name, and current ticker "TIC" identifier in WRDS match. If the WRDS Code Lookup tool fails to match, we use Google web search to identify ticker symbol updates. We then verify that the updated ticker matches the WRDS Code Lookup tool and update accordingly.

⁵GAAP exclusions associated with earnings management include: discontinued items (Barua, Lin, and Sbaraglia [2010]), depreciation expense (Keating and Zimmerman [1999]), goodwill impairments (Beatty and Weber [2006]), gains and losses on asset sales (Bartov [1993]), tax expense (Dhaliwal, Gleason, and Mills [2004]), special items (McVay [2006]), restructuring charges (Moehrl [2002]), stock-based compensation (Choudhary, Rajgopal, and Venkatachalam [2009], Choudhary [2011]), asset write-downs (Zucca and Campbell [1992]), and R&D expenses (Baber, Fairfield, and Haggard [1991], Wang and D'Souza [2006]). We further note that these common non-GAAP exclusions not only consist of expensed line items that reduce GAAP income, but also are subject to managerial discretion with regard to the magnitude of the expense and/or the timing of when the expense is taken.

common non-GAAP exclusions (as well as differences between GAAP and non-GAAP earnings), potentially reducing scrutiny from regulators and investors. With this in mind, we predict that a shock that increases regulatory attention to non-GAAP earnings disclosures will result in a decrease in the magnitude of common exclusions from the pre- to post-period.

We exploit the March 28, 2003 passing of SEC Reg G to proxy for a shock to the level of regulatory attention to non-GAAP disclosures. This allows us to test the association between the increased attention to non-GAAP disclosures and the magnitude of a set of items commonly used to manage GAAP earnings. We define the pre-Reg G period as January 1, 2000 to December 31, 2002, and the post-Reg G period as July 1, 2003 to June 30, 2006, which allows for a six-month gap around our pre- and postevent periods. Our analysis requires that the same firm reports non-GAAP earnings at least once in our pre- and post-periods, and we calculate *COMMON_EXCL* in each quarter that non-GAAP earnings were announced. Following prior literature (Bradshaw and Sloan [2002], Bhattacharya et al. [2003], Barth et al. [2012], Bratten, Larocque, and Yohn [2021]), we merge our *COMMON_EXCL* data with Compustat to calculate the potential earnings exclusions. We then combine the merged data set with data from CRSP and IBES, which we use to estimate control variables for multivariate regressions. We exclude firms with a stock price at the announcement of less than five dollars to mitigate the influence of penny stocks on our analyses. Our sample consists of 2,995 firm-quarter observations, with 1,346 (1,649) observations in the pre- (post-)Reg G period. A reconciliation of our sample is provided as table 1, and variable definitions are provided in table 2.

Consistent with our prediction, mean common non-GAAP exclusions decrease following increased regulatory attention to non-GAAP earnings disclosures. As shown in panel A of table 3, the mean common non-GAAP exclusions scaled by assets (*COMMON_EXCL_ASSETS*) and revenues (*COMMON_EXCL_REVENUES*) were -0.025 and -0.234 , respectively, in the pre-period. In the post-period, the mean common non-GAAP exclusions scaled by assets and revenues become 0.021 and -0.124 , respectively.⁶ This decrease is significant (both p 's < 0.01 , one-tailed, table 3, panel A) and is consistent with our theory that increased attention to non-GAAP earnings disclosures leads to higher GAAP earnings via increased GAAP earnings aggressiveness for the set of items commonly added back as non-GAAP exclusions.

Next, we estimate multivariate regressions. We use our dependent variable, common non-GAAP exclusions (*COMMON_EXCL*), and an indicator for Reg G (*REG_G*) that takes a value of 1 in the post-Reg G period and a value of 0 in the pre-Reg G period. Our regression covariates include variables commonly shown by prior research (e.g., Kolev et al. [2008], Frankel, McVay, and Soliman [2011]) to be correlated with the level of non-GAAP

⁶ A negative coefficient indicates an expense item.

TABLE 1
Archival Analysis: Sample Selection

	Number of Observations
Full sample of pro forma hand-collected data from 1998 to 2007	20,168
Less:	
Observations outside of the pre- (1/1/2000 to 12/31/2002) and post- (7/1/2003 to 6/30/2006) Reg G Period	(6,578)
Firms without verifiable matches on CRSP, Compustat, and I/B/E/S	(6,127)
Firm years with stock prices less than \$5	(1,397)
Firm that do not have at least one observation in the pre- and post-Reg G periods	(2,989)
Firms with negative book equity, or missing Compustat values for assets or sales	(82)
Archival analysis sample	2,995

This table presents the sample selection criteria for our archival analysis investigating whether firms increase their level of GAAP aggressiveness by reducing the magnitude of common non-GAAP exclusions. These data were generously provided by Ted Christensen and were hand-collected from searches of the PR Newswire and Business Wire on Lexis Nexis from 1998 to 2007. Because Ticker Symbols change over time (often due to events such as name changes, stock exchange listing changes, acquisitions, liquidations, stock exchange delistings), we used the WRDS Code Lookup tool to query each ticker symbol in our database and verify that it matches the correct company name and current ticker "TIC" identifier in WRDS at the time of the press release. If the WRDS Code Lookup tool failed to match, we queried the company's name in Google's web search to manually search for changes in the ticker in the press releases. We then verify that the updated ticker matches the company name and date range in the WRDS Code Lookup tool and update the database accordingly.

exclusions: *LEV*, the firm's leverage calculated as total debt divided by total assets; *SALES*, the firm's sales scaled by total assets; *LOSS*, an indicator variable that takes a value of 1 if GAAP earnings are negative; *LOGSIZE*, the natural log of the firm's market cap in the month of the firm's announcement date; *LOGMB*, the log of one plus the ratio of the firm's market value of equity to book value of equity; and *LOGNUMEST*, the log of one plus the number of analysts covering the firm in a given year. Regressions include firm-fixed effects to control for other potential confounding effects, and standard errors are clustered by the month and year of the firm's earnings announcement. The main empirical specification is shown below in equation (1). The results are summarized in panel B of table 3.

$$\begin{aligned}
 COMMON_EXCL = & \beta_0 + \beta_1 REG_G + \beta_2 SALES + \beta_3 LEV \\
 & + \beta_4 LOSS + \beta_5 LOGSIZE + \beta_6 LOGMB \\
 & + \beta_7 LOGNUMEST + FixedEffects.
 \end{aligned} \tag{1}$$

We find that nearly half of the variation in our regression can be explained by a combination of the firm fixed effects and control variables ($R^2 = 0.49$ and 0.46 , when common non-GAAP exclusions are scaled by assets and revenues, respectively). We also note that the *LOSS* indicator is negative and significant in both specifications ($LOSS_{assets} = -0.030$ and $LOSS_{revenues} = -0.282$, both p 's < 0.01 , table 3, panel B) due to its mechanical relation

TABLE 2
Archival Analysis: Dependent Variable Calculation and Variable Definitions

Dependent Variable Calculation	
$COMMON_EXCL = DOQ - DPQ + \frac{GDWLIAQ}{(1-0.35)} + GLPQ + NRTXTQ + OSPIQ + RCPQ + XIQ - \frac{STKCPAQ}{(1-0.35)} + WDPQ - XRDQ$	
Variable	Definition
<i>COMMON_EXCL</i>	The sum of all common exclusions (i.e., <i>DOQ</i> through <i>XRDQ</i>).
<i>COMMON_EXCL_ASSETS</i>	The sum of all common exclusions (i.e., <i>DOQ</i> through <i>XRDQ</i>) scaled by assets.
<i>COMMON_EXCL_REVENUES</i>	The sum of all common exclusions (i.e., <i>DOQ</i> through <i>XRDQ</i>) scaled by revenues.
<i>DOQ</i>	Discontinued items.
<i>DPQ</i>	Depreciation and amortization expense. We multiply <i>DPQ</i> by -1 to maintain the same convention as the other items, where expenses netted against income are negative.
<i>GDWLIAQ</i>	After-tax goodwill impairment, adjusted by dividing goodwill impairment by (1-0.35).
<i>GLPQ</i>	Gains and losses.
<i>NRTXTQ</i>	Nonrecurring taxes.
<i>OSPIQ</i>	Other special items. Calculated as special items, less the sum of gains and losses, goodwill impairments, restructuring costs and asset write-downs.
<i>RCPQ</i>	Restructuring costs.
<i>XIQ</i>	Extraordinary items.
<i>STKCPAQ</i>	After-tax stock compensation expenses, adjusted by dividing stock compensation expenses by (1-0.35).
<i>WDPQ</i>	Asset write-downs.
<i>XRDQ</i>	Research and development expenses. We multiply <i>XRDQ</i> by -1 to maintain the same convention as the other items, where expenses netted against income are negative.

This table presents the calculation of our dependent variables for our archival analysis. Data are obtained from the Compustat database. Our archival analysis investigates whether firms increase their level of GAAP aggressiveness by reducing the magnitude of common non-GAAP exclusions.

with common exclusions. Most importantly, our primary variable of interest, *REG_G*, is positive and significant in both regressions ($REG_G_{assets} = 0.0044$ and $REG_G_{revenues} = 0.0971$, $p < 0.01$, table 3, panel B). Consistent with our univariate results, multivariate regressions are consistent with a positive association between increased regulatory attention to non-GAAP earnings disclosures and increased GAAP aggressiveness in the post-Reg G period.

It is worth noting that although we can archivally document the predicted association between regulatory attention to non-GAAP disclosures

TABLE 3
Archival Analysis: Regression Results

Panel A: Univariate results			
	Prediction	(1) <i>COMMON_EXCL_ASSETS</i>	(2) <i>COMMON_EXCL_REVS</i>
PRE		-0.025	-0.234
POST		-0.021	-0.124
POST - PRE	(+)	0.004***	0.110***
Panel B: Multivariate results			
Variable	Prediction	(1) <i>COMMON_EXCL_ASSETS</i>	(2) <i>COMMON_EXCL_REVS</i>
<i>REG_G</i>	(+)	0.00436*** (2.91)	0.09710*** (4.65)
<i>SALES</i>		-0.11109*** (-3.20)	0.44767 (1.28)
<i>LEV</i>		0.01593* (1.92)	0.10908 (1.07)
<i>LOSS</i>	(-)	-0.03012*** (-10.99)	-0.28247*** (-10.14)
<i>LOGSIZE</i>		-0.00187 (-0.54)	-0.07267* (-1.77)
<i>LOGMB</i>		-0.00117 (-0.27)	0.11898** (2.19)
<i>LogNUMEST</i>		0.00127 (-1.58)	-0.01138 (-1.31)
<i>Fixed effects</i>		Firm	Firm
<i>R</i> ²		0.4893	0.4631

This table provides the results of our archival analysis. For this analysis, we aggregate a set of common non-GAAP exclusions for a group of firms that report non-GAAP earnings both before and after the passing of Reg G, a positive shock to the degree of regulatory attention on non-GAAP disclosures. We then examine whether the shock to firms with non-GAAP disclosures results in increased GAAP earnings aggressiveness in the post-period. We define the pre-Reg G period as January 1, 2000 to December 31, 2002, and the post-Reg G period as July 1, 2003 to June 30, 2006, allowing a six-month gap around our pre-post event periods. We require that the same firm reports non-GAAP earnings at least once in the pre- and post-Reg G periods and aggregate the GAAP exclusions in each quarter where non-GAAP earnings were announced and exclude firms with a stock price at the time of announcement of less than five dollars. We merge the hand-collected data sets with Compustat, which we use to calculate the potential earnings exclusions, and CRSP and IBES, which we use to estimate our control variables. Panels A and B present the results of univariate and multivariate regressions, respectively. ***, **, and * indicate significance at p-values (two-tailed) of less than 0.01, 0.05, and 0.10, respectively.

and GAAP earnings management, our ability to make strong causal inferences in this setting is limited for several reasons. First, prior literature documents the difficulty of using empirical models to measure a firm's use of accounting discretion (Guay, Kothari, and Watts [1996], Healy [1996], Fields, Lys, and Vincent [2001]). Consistent with this research, it is difficult to determine whether the decrease in total exclusions we observe is directly related to management's accounting discretion to reduce the amounts of each exclusion, or whether the decrease in total exclusions is economically justified, that is, unbiased by management's accounting discretion. Our analysis is also subject to self-selection and endogeneity concerns. Second, beyond these general concerns, our analysis is unable to directly link GAAP

aggressiveness to managers' decreased reliance on non-GAAP earnings to meet market expectations. Third, our analysis is unable to disentangle the effects of the formal Reg G reconciliation requirement versus the effects of informal regulatory communication about non-GAAP reporting behavior or to distinguish the effects of Reg G from other changes implemented in the same period via the Sarbanes–Oxley Act or other legislative reforms. We, therefore, use a controlled experiment to provide strong causal evidence and to disentangle the effects of the formal vs. informal regulatory attention to non-GAAP earnings on GAAP reporting aggressiveness that are confounded in the post-period.

3. *Experimental Design*

We use a between-participants experiment with four cells to formally test our hypotheses. Our design allows us to examine incremental changes to the reporting environment while simultaneously holding other changes that are likely to occur in practice constant. Therefore, our tests can tease apart the individual effects of changes in non-GAAP reporting disclosures on GAAP earnings aggressiveness, as they are naturally layered in our setting.

3.1 PARTICIPANTS

We recruit 120 managers with financial reporting experience from Qualtrics panels. To be included in the study, participants must correctly answer two accounting knowledge check questions and report public company financial reporting experience. We provide a reconciliation of our participant screening procedures in table 4.⁷

Our participants average 39.3 years of age and 16.5 years of full-time work experience; slightly more than half (55%) are male. When asked about their work, 59%, 30%, and 8% reported working primarily in accounting, finance, and management, respectively. In addition, 44% of our participants report involvement in asset impairment or write-down decisions. Combined with the results of our participant screening procedures, this suggests that our participants are appropriate for our study (Libby et al. [2002]).

⁷When sourcing participants from Qualtrics panels, we do not have visibility into how Qualtrics identifies eligible participants or determines compensation. To assess data quality, we compare the proportion of participants that fail our knowledge check question to the proportion that would be expected to fail due to chance. As reported in table 4, panel B, knowledge check failures are significantly less than those expected by chance (binomial test: 70.6% vs. 93.75%, $z = 24.35$, $p < 0.01$, one-tailed). This implies that participants are not guessing the correct answers to our questions, and guards against including participants due to chance. By testing participants' accounting knowledge, only including those with appropriate knowledge, and ensuring that knowledge check failure rates are significantly less than chance, we gain additional comfort that our participants are appropriate for our study.

TABLE 4
Experiment: Participant Eligibility

Panel A: Experienced participant eligibility	Participant Pool	Retained	Excluded	Exclusion Rate
Beginning participants identified by Qualtrics panels	859			N/A
Finish screening questions	859	858	1	<1%
Self-report requisite accounting knowledge	858	648	210	24.5%
Accounting knowledge check	648	190	458	70.6%
Income comprehension check	190	127	63	33.2%
SEC attention comprehension check	127	125	2	9.4%
Study completion speed check (<154 seconds)	125	120	5	4.0%
Final participant count (assigned to conditions)	120			86.0%

Panel B: Binomial test of proportions for participants passing accounting knowledge check questions versus chance

Accounting knowledge check	Total Participants	Check Failures	Failure Rate	Null hypothesis proportion	z-Statistic	p-Value
	648	458	70.6%	93.75%	24.35	<0.01

This table provides information about screening conducted to ensure participants are appropriate for the experimental task. Participants were managers provided by Qualtrics panels, a third-party provider of online participants. Managers self-report as to the level of accounting knowledge they possess. Their choices are None, Very Little (I understand the absolute basics, like the difference between assets and liabilities), Some (I understand how basic transactions affect the financial statements), Quite a bit (I could write the journal entries for most transactions), and A lot (I could prepare all journal entries and financial statements for my business). They also provide a yes or no response to the question "Do you have either personal or professional experience reading through company financial statements?" Participants responding with "Some", "Quite a bit", or "A lot" on the accounting knowledge self-report question and "Yes" on the financial statement experience question are considered for inclusion in the study. These participants are asked two knowledge check questions. One question requires calculating the carrying value of machinery, and the other question requires the selection of the correct journal entry for the disposition of equipment at a loss. Participants answering both questions correctly are allowed to begin the study. During the study, all participants respond to a pair of comprehension check questions to ensure that they understand whether investors focus on GAAP earnings or non-GAAP earnings in their condition and that they understand the effect of a write-down on net income. In addition, participants in the *Informal Regulatory Attention* condition answer two comprehension check questions ensuring that they understand that the SEC is scrutinizing non-GAAP financial measures and that Regulation G requires a reconciliation of non-GAAP earnings to GAAP earnings. In addition to descriptive information in panel A, we provide the results of a binomial test of proportions conducted to assess the suitability of manager participants provided by Qualtrics panels in panel B.

3.2 TASK PROCEDURE

We begin by asking participants to assume that they are an executive at Radko Inc., a hypothetical manufacturing company (“Radko”). Participants receive summary financial information and are told that the company has made process improvements that led to equipment obsolescence. Accordingly, participants learn that the company must record PP&E impairment and that a range of write-downs (between \$5 MM and \$10 MM) are defensible. Once the impairment is booked, the magnitude of the chosen impairment will reduce GAAP earnings. All participants also receive recent company performance information that suggests that Radko has performed well relative to the industry average.

3.3 EXPERIMENTAL CONDITIONS AND MANIPULATIONS

As noted above, we test our hypotheses using a between-participants experiment with four cells. As shown in figure 1, we refer to our four conditions as *GAAP Earnings Only*, *Non-GAAP Earnings*, *Formal Regulatory Attention*, and *Informal Regulatory Attention*. GAAP earnings are disclosed to investors in all four conditions, and each condition adds a feature of the non-GAAP disclosure setting that we predict will have an effect on managers’ willingness to use GAAP earnings management to satisfy market expectations.

In the first condition (*GAAP Earnings Only*), Radko only reports GAAP earnings. In the second condition (*Non-GAAP Earnings*), the company also discloses “adjusted net income,” a non-GAAP earnings measure constructed by excluding the asset impairment expense.⁸ In the third condition (*Formal Regulatory Attention*), Radko presents a non-GAAP to GAAP earnings reconciliation in accordance with SEC Regulation G (SEC 2003). Finally, in our fourth condition (*Informal Regulatory Attention*), we test for the effect of increased informal regulatory attention on managers’ GAAP earnings aggressiveness by providing participants with a news article discussing increased SEC attention to non-GAAP earnings disclosures.

In all conditions where non-GAAP earnings are disclosed, we hold non-GAAP earnings constant by excluding the impact of the impairment from the non-GAAP earnings measure. This ensures that our participants’ decisions only impact reported GAAP earnings and that non-GAAP earnings remain constant. To ensure that participants understand their decisions’ impact on the firm’s financial reporting, we provide them with a table showing the effect of both a \$5 MM and \$10 MM write-down on GAAP earnings. We manipulate the table provided based on condition. As shown in figure 2, panel A, the *GAAP Earnings Only* condition presents participants with a basic income statement. The *Non-GAAP Earnings* condition adds bottom-line

⁸ We refer to GAAP earnings (non-GAAP earnings) as “net income” (“adjusted net income”) in the experimental materials to mirror common terminology used in real firm disclosures (Garavaglia [2021]). However, we use the term GAAP earnings (non-GAAP earnings) herein to be consistent with prior academic literature.

Manipulations Presented to Participants

Panel A: *GAAP Earnings Only* Condition – Effect of Impairment on GAAP Earnings

\$5 million Writedown			
FISCAL YEAR (in millions)	2017		2016
Revenues	\$ 983	\$	947
Expenses	(726)		(699)
Impairment Loss	(5)		-
Net Income ¹	\$ 252	\$	248

¹In accordance with U.S. Generally Accepted Accounting Principles (GAAP)

\$10 million Writedown			
FISCAL YEAR (in millions)	2017		2016
Revenues	\$ 983	\$	947
Expenses	(726)		(699)
Impairment Loss	(10)		-
Net Income ¹	\$ 247	\$	248

¹In accordance with U.S. Generally Accepted Accounting Principles (GAAP)

Panel B: *Non-GAAP Earnings* Condition – Effect of Impairment on GAAP Earnings

\$5 million Writedown			
FISCAL YEAR (in millions)	2017		2016
Revenues	\$ 983	\$	947
Expenses	(726)		(699)
Impairment Loss	(5)		-
Net Income ¹	\$ 252	\$	248
Adjusted Net Income	\$ 257	\$	248

¹In accordance with U.S. Generally Accepted Accounting Principles (GAAP)

\$10 million Writedown			
FISCAL YEAR (in millions)	2017		2016
Revenues	\$ 983	\$	947
Expenses	(726)	\$	(699)
Impairment Loss	(10)	\$	-
Net Income ¹	\$ 247	\$	248
Adjusted Net Income	\$ 257	\$	248

¹In accordance with U.S. Generally Accepted Accounting Principles (GAAP)

FIG. 2. — Manipulations presented to participants.

This figure presents information viewed by participants in the *GAAP Earnings Only* (panel A), *Non-GAAP Earnings* (panel B), *Formal Regulatory Attention* (panel C), and *Informal Regulatory Attention* (panel D) conditions. Each set of displays informed participants in the relevant condition about how impairment information would be presented to investors given a minimum and maximum impairment amount. We refer to our GAAP earnings (non-GAAP earnings) measures as “net income” (“adjusted net income”) in the experimental materials to mirror the terminology used in actual corporate disclosures.

non-GAAP earnings (figure 2, panel B). The *Formal Regulatory Attention* condition presents a table with columns showing (1) GAAP earnings, (2) non-GAAP earnings, and (3) a non-GAAP to GAAP earnings reconciliation (see panel C of figure 2). Finally, the *Informal Regulatory Attention* condition adds a *Wall Street Journal* article communicating the SEC’s increased regulatory attention on non-GAAP earnings disclosures. These tables, as well

Panel C:

*Formal Regulatory Attention Condition – Non-GAAP to GAAP Reconciliation***\$5 million Writedown**

FISCAL YEAR (in millions)	2017			2016		
	(As Reported) ¹	Income Adjustments	2017 (Adjusted)	(As Reported) ¹	Income Adjustments	2016 (Adjusted)
Revenues	\$ 983	\$ -	\$ 983	\$ 947	\$ -	\$ 947
Expenses	(726)	-	(726)	(699)	-	(699)
Impairment Loss	(5)	5	-	-	-	-
Net Income	\$ 252	\$ 5	\$ 257	\$ 248	\$ -	\$ 248

¹In accordance with U.S. Generally Accepted Accounting Principles (GAAP)

\$10 million Writedown

FISCAL YEAR (in millions)	2017			2016		
	(As Reported) ¹	Income Adjustments	2017 (Adjusted)	(As Reported) ¹	Income Adjustments	2016 (Adjusted)
Revenues	\$ 983	\$ -	\$ 983	\$ 947	\$ -	\$ 947
Expenses	(726)	-	(726)	(699)	-	(699)
Impairment Loss	(10)	10	-	-	-	-
Net Income	\$ 247	\$ 10	\$ 257	\$ 248	\$ -	\$ 248

¹In accordance with U.S. Generally Accepted Accounting Principles (GAAP)

Panel D:

*Informal Regulatory Attention Condition - SEC communication**SEC Cracks Down on Novel Earnings Measures That Boost Profits (WSJ 4/28/2016):*

The Securities and Exchange Commission is stepping up its scrutiny of companies' homegrown earnings measures, signaling its plans to target firms that... employ customized metrics that stray too far from accounting rules. 'The point is, now the company has created a measure that no longer reflects its business model. We're going to take exception to that practice,' said Mark Kronforst, chief accountant of the SEC's corporate finance division, referring to companies' customized measures that don't comply with generally accepted accounting principles, or GAAP.

One of the ways that the SEC has tried to ensure that investors and others are not misled by the use of adjusted financial measures was to pass Regulation G. Regulation G requires that any adjusted numbers presented by companies be reconciled with their most directly comparable financial numbers prepared in accordance with GAAP. The SEC anticipates that this reconciliation will help users better evaluate the adjusted numbers presented."

FIG. 2.— *Continued*

as the article provided in the *Regulatory Attention* condition, are provided in figure 2, panels A to D.

We remind participants in all conditions that the analyst consensus forecast for Radko is \$250 MM and that a \$5 MM (\$10 MM) impairment will result in the company reporting GAAP net income of \$252 MM (\$247 MM). After viewing this information, participants decide the amount of an impairment loss to record, ranging from the \$5 MM minimum to the \$10 MM maximum. Participants then answer debriefing and demographic questions.

3.4 DESIGN CHOICES

This section discusses three key design choices in our setting. Specifically, we discuss our (1) *Informal Regulatory Attention* manipulation, (2) decision to create a setting where non-GAAP earnings meet analyst expectations, yet GAAP earnings do not, and (3) decision to include a statement in our materials informing participants of management's expectations about investors' focus on different measures.

3.4.1. Informal Regulatory Attention Manipulation. To cleanly manipulate regulatory attention on non-GAAP earnings disclosures, it is important to not introduce any additional factors that could affect managers' willingness to manage GAAP earnings. If we were to operationalize our construct using a more general regulatory action, such as the passing of Reg G, then the test of our construct would be confounded by additional components of the regulatory action that do not specifically increase regulatory attention on non-GAAP measures.⁹ This would reduce our ability to disentangle the contemporaneous changes of interest and threaten our ability to generalize the test of our theory (Asay et al. [2021]). We, therefore, manipulate *Informal Regulatory Attention* with a quotation from the chief accountant of the SEC's corporate finance division (as reported in a WSJ article) that does not mention other contemporaneous events. Additionally, we do not discuss regulatory attention to GAAP earnings disclosures for two reasons. First, regulatory actions surrounding GAAP earnings are not the focus of our study. Excluding this information strengthens our manipulations (Libby et al. [2002]). Second, we expect that our experienced participants are already aware of the high degree of attention to GAAP earnings in the post-SOX environment (Cohen, Dey, and Lys [2008], Evans et al. [2015]).

3.4.2. Non-GAAP Earnings Beat, and GAAP Miss, of Analyst Consensus Forecast. We choose a setting where the firm's non-GAAP earnings measure is likely to meet (or beat) and GAAP earnings miss, the analyst consensus forecast. We make this choice because it is an interesting setting to test our theory and is quite common. Bhattacharya et al. [2003] find that 80.1% of the non-GAAP disclosures in their sample meet or beat analysts' mean forecasts, while only 38.7% of GAAP operating earnings do the same. As shown in table 5, our own review of recent non-GAAP firm disclosures by firms in the Dow Jones Industrial Index (as of Q4 2019) suggests that this situation may be even more common, as 78.3% of these companies meet or beat analysts' mean forecasts with non-GAAP earnings, while only 26.1% do so via GAAP earnings.

More importantly, our setting provides managers with ambiguity about how investors will interpret these mixed signals. Bhattacharya et al. [2003]

⁹ Note that this is one of the primary limitations of our archival analysis presented in subsection 2.3.

TABLE 5
Non-GAAP Reporting by Firms in the Dow Jones Industrial Index: Q4 2019

	Number of Firms	Percentage of Firms
Non-GAAP Measure Reporting:		
Firms that report at least one non-GAAP measure	29/30	97%
Firms that provide an explanation of the non-GAAP measure	27/29	93%
Firms that provide an explicit indication that the non-GAAP measure is useful	27/29	93%
Non-GAAP EPS Reporting:		
Firms that report non-GAAP EPS	23/30	77%
Of these firms:		
Firms that report non-GAAP EPS that meets or beats consensus, but misses the GAAP consensus	13/23	57%
Firms that report both GAAP and non-GAAP EPS that meets or beats consensus	5/23	22%
Firms that report both GAAP and non-GAAP EPS that misses consensus	4/23	17%
Firms that report non-GAAP EPS that misses consensus, but GAAP EPS that meets or beats consensus	1/23	4%
Total	23/23	100%

This table presents an informal analysis of non-GAAP reporting by firms listed in the Dow Jones Industrial Index as of Quarter 4 of 2019. These data were hand-collected from company Web sites and EDGAR. The WRDS database was used to obtain analyst consensus forecasts.

demonstrate that investors find non-GAAP disclosures to be less informative when companies meet analysts' forecasts with non-GAAP, but not GAAP, earnings. This is consistent with investors heeding SEC warnings (SEC [2001]). However, this does not tell us whether *managers* will expect non-GAAP disclosures to shift investor focus away from GAAP earnings in these situations. If managers doubt the ability of non-GAAP earnings disclosures to shift investor focus, it is unlikely that these disclosures will reduce pressure to aggressively manage GAAP earnings.

3.4.3. Statement Regarding Financial Statement User Focus. In conditions with a non-GAAP earnings disclosure, we instructed participants to "Note that Radko Inc. encourages financial statement users to focus on *Adjusted Net Income*, stating that this measure best captures underlying firm operations." We choose to include this statement to reflect the requirement of Reg S-K Item 10(e)(1)(i)(C) that registrants include, "a statement disclosing the reasons why the registrant's management believes that presentation of the non-GAAP financial measure provides useful information to investors regarding the registrant's financial condition and results of operations." By including this statement, Radko Inc. satisfies the Reg S-K reporting requirement but does not provide any specific information to participants about non-GAAP disclosure informativeness, which could confound our results. However, we recognize the possibility that firms may not include this information in their disclosures. To address this, we collect Dow Jones Industrial Index firms' Q4 2019 non-GAAP disclosures and search for an explicit indication provided by management that the non-GAAP earnings measure is useful. As shown in table 5, we find that 93% of firms reporting non-GAAP earnings during Q4 2019 highlight the importance of the measure to investors.

Additionally, we present thirty experienced professionals with the non-GAAP to GAAP reconciliation that participants received in our experiment (shown as figure 2, panel C) and ask whether investors will weight GAAP earnings or adjusted net income (i.e., non-GAAP earnings) more heavily to evaluate the firm.¹⁰ We omit information related to management's expectations of financial statement user focus. Nineteen of 30 (63.3%) respondents indicate that investors will weight adjusted net income more heavily than GAAP earnings, while only eight (26.6%) indicate that investors will weight GAAP earnings more heavily. A sign test confirms that this difference is significant in the predicted direction ($s = 20$, $p = 0.05$, untabulated). This indicates that whether we included this statement, it is likely that managers would expect investors to place greater weight on non-GAAP earnings than on GAAP earnings.

¹⁰ This question was asked as part of our survey of experienced financial professionals. The survey and its methodology are discussed further in subsection 4.2.

4. Results

4.1 EXPERIMENTAL RESULTS

Our hypotheses predict how incremental changes to the non-GAAP reporting environment will affect managers' willingness to manage market expectations using GAAP earnings management. To test our hypotheses, we compare the proportion of participants booking an impairment that meets or beats the analysts' consensus forecast between adjacent cells in our experimental design. We construct a binary variable coded "1" if the manager booked an impairment that meets or beats the analysts' consensus forecast of \$250 MM, or "0" otherwise, which serves as our dependent variable. Because adjacent cells in our design only differ by the additional feature being tested (e.g., the addition of a reconciliation, given that non-GAAP earnings are presented), comparisons between adjacent cells provide the cleanest test of our theory for our primary analyses. In addition to our primary tests, we provide supplemental analyses as further support for our results. These supplemental analyses make between-cell comparisons of the mean GAAP net income across adjacent experimental conditions and within-cell comparisons of the mean GAAP net income to the analyst consensus forecast of \$250 MM. Panel A of table 6 provides descriptive statistics by condition.

H1 predicts that managers will be less likely to engage in GAAP earnings management when they report both GAAP and non-GAAP earnings compared to when they only report GAAP earnings. Although directionally consistent with our hypothesis, our primary test does not support H1. This analysis uses a two-sample test for equality of proportions to compare the proportion of managers that book an impairment that meets or beats the analyst consensus in the *Non-GAAP Earnings* condition to that in the *GAAP Earnings Only* condition. The proportion is directionally lower in the *Non-GAAP Earnings* condition versus the *GAAP Earnings Only* condition (48.4% vs. 65.6%), although the difference is not significant ($\chi_1^2 = 1.910$, $p = 0.166$, two-tailed).

Acknowledging that this nonparametric test of H1 is potentially underpowered, we conduct supplemental analyses to help us better understand managers' choices. First, we compare the GAAP net income reported by managers in the *Non-GAAP Earnings* and *GAAP Earnings Only* conditions. As expected, GAAP net income reported by managers in the *GAAP Earnings Only* condition is higher than that reported in the *Non-GAAP Earnings* condition (mean = \$250.44 MM vs. \$249.39 MM). This difference is significant ($t_{118} = 6.54$, $p = 0.01$, one-tailed, table 7, panel A). We also compare the GAAP net income reported by managers in the *GAAP Earnings Only* condition and the *Non-GAAP Earnings* condition to the \$250 MM analyst consensus forecast using 1-sample t -tests.¹¹ In the *GAAP Earnings Only* condi-

¹¹ More specifically, we test whether the mean is less than the \$250 MM consensus forecast, as this coincides with a manager failing to "meet or beat" market expectations. A test of

TABLE 6
Experimental Results: Descriptive Statistics and Hypothesis Testing

Reported GAAP Earnings and Proportions of Impairments by Experimental Condition that “Meet or Beat” the Analyst Consensus Forecast

Panel A: Descriptive statistics

	GAAP Earnings Only	Non-GAAP Earnings	Formal Regulatory Attention	Informal Regulatory Attention	Overall
Cell	1	2	3	4	
Reported GAAP Earnings					
Mean	\$250.44	\$249.39	\$248.88	\$249.92	\$249.69
(SD)	(1.24)	(1.97)	(1.72)	(1.38)	(1.68)
[n]	[32]	[31]	[27]	[30]	[120]
Proportion (percentage) of participants who booked an impairment that “Meets or Beats” analyst consensus forecast	21/32 (65.6%)	15/31 (48.4%)	6/27 (22.2%)	19/30 (63.3%)	61/120 (50.8%)

Panel B: Primary hypothesis tests: proportions of impairments that “meet or beat” the analyst consensus forecast

Hypothesis with Directional Prediction	Directional Prediction Supported?	df	χ^2 -Statistic	p-Value
H1: <i>Non-GAAP Earnings < GAAP Earnings Only (Cell 1 vs. Cell 2)</i>	No	1	1.910	0.166
H2: <i>Formal Regulatory Attention > Non-GAAP Earnings (Cell 2 vs. Cell 3)</i>	No	1	4.278	0.039
H3: <i>Informal Regulatory Attention > Formal Regulatory Attention (Cell 3 vs. Cell 4)</i>	Yes	1	9.754	0.001

This table presents descriptive statistics and the results of our primary hypothesis tests. Panel A provides the mean reported GAAP net income, as well as the proportion of participants who booked an impairment that “meets or beats” the analyst consensus forecast. Panel B presents the results of our primary hypothesis tests, conducted using two-sample tests for equality of proportions with comparisons between adjacent experimental conditions. The experiment manipulates the presentation of a non-GAAP earnings measure, reconciliation of the non-GAAP earnings to reported GAAP earnings, and the presence of a prompt to remind participants of increased regulatory attention to non-GAAP earnings disclosures. After being subjected to the manipulations, a total of 120 participants provided an impairment amount for Property, Plant, and Equipment (PP&E). This impairment amount was subtracted from \$257 MM, the company’s preimpairment GAAP earnings, to arrive at the reported GAAP earnings number.

TABLE 7
Experimental Results: Supplemental Tests

	Directional Prediction Supported?	SS/MS	t-Statistic	df	p-Value
Supplemental test of H1: <i>Non-GAAP Earnings < GAAP Earnings Only</i> (Cell 2 vs. Cell 1)	Yes	17.70	6.537	118	0.012 ^f
Supplemental test of H2: <i>Formal Regulatory Attention > Non-GAAP Earnings</i> (Cell 3 vs. Cell 2)	No	2.77	0.979	118	0.225
Supplemental test of H3: <i>Informal Regulatory Attention > Formal Regulatory Attention</i> (Cell 4 vs. Cell 3)	Yes	14.79	5.41	118	0.011 ^f
Panel B: Comparisons of reported GAAP earnings to the Analyst Consensus Forecast of \$250 MM					
Planned comparison	H _a	t-Statistic	df	p-Value	
<i>GAAP Earnings Only</i> condition (Supplemental Test of H1)	$\mu < \$250 \text{ MM}$	+2.01	31	0.97 ^f	
<i>Non-GAAP Earnings</i> condition (Supplemental Test of H1)	$\mu < \$250 \text{ MM}$	-1.73	30	0.05 ^f	
<i>Formal Regulatory Attention</i> condition (Supplemental Test of H2)	$\mu < \$250 \text{ MM}$	-3.39	26	< 0.01	
<i>Informal Regulatory Attention</i> condition (Supplemental Test of H3)	$\mu < \$250 \text{ MM}$	-0.30	29	0.38 ^f	

This table presents the results of statistical tests designed to supplement our primary result. Panel A provides comparisons of the mean reported GAAP net income across experimental conditions in our between-participants experiment. Panel B provides the results of a 1-sample *t*-test, testing whether the mean of GAAP net income in each condition is less than the \$250 MM consensus forecast. The experiment manipulates the presentation of a non-GAAP earnings measure, reconciliation of the non-GAAP earnings to reported GAAP earnings, and the presence of a prompt to remind participants of increased regulatory attention to non-GAAP earnings disclosures. After being subjected to the manipulations, a total of 120 participants provided an impairment amount for Property, Plant, and Equipment (PP&E). This impairment amount was subtracted from \$257 MM, the company's preimpairment GAAP earnings, to arrive at the reported GAAP earnings number. The measure in these analyses is reported GAAP earnings. All *p*-values reported are one-tailed equivalents, given our directional predictions, with the exception of the *p*-value reported for our tests of H2, as our directional hypothesis was not supported. One-tailed *p*-values are denoted with a superscript dagger (^f).

tion, participants reported a mean GAAP net income of \$250.44 MM, which is not significantly less than the analyst consensus forecast of \$250 MM ($t_{31} = 2.01$, $p = 0.97$, one-tailed). However, in the *Non-GAAP Earnings* condition, participants reported a GAAP net income of \$249.39 MM, which, as shown in table 7, panel B, is significantly less than the \$250 MM analyst consensus forecast ($t_{30} = -1.73$, $p = 0.05$, one-tailed). The results of our supplemental analyses are consistent with our expectations and with prior research showing that GAAP and non-GAAP measures are seen by managers as substitute disclosure channels (Black et al. [2017]). Taken together, our primary and secondary tests provide evidence that is consistent with our theory, but we also recognize that our primary test of H1, while directionally consistent with our expectations, does not reach significance.

Our second and third hypotheses concern the impact of the two forms of non-GAAP regulatory attention on GAAP earnings management. We begin with the Reg G reconciliation requirement. As discussed in section 2, Reg G requires issuers to reconcile non-GAAP measures to their most closely comparable GAAP-based measure. We expect that this requirement will lead managers to report more aggressive GAAP earnings.

Our primary test of H2 compares the proportion of managers who book an impairment that meets or beats the analyst consensus forecast in the *Non-GAAP Earnings* condition to that in the *Formal Regulatory Attention* condition. Contrary to our prediction, we find that a smaller proportion of managers in the *Formal Regulatory Attention* condition choose to book an impairment that meets or beats the analyst consensus forecast compared to managers in the *Non-GAAP Earnings* condition (22.2% vs. 48.4%). As shown in table 6, panel B, this difference is significant ($\chi^2_1 = 4.278$, $p = 0.039$, two-tailed).

Similar to our tests of H1, we conduct additional analyses to test H2. As shown in table 7, panel A, mean GAAP net income reported by managers in the *Formal Regulatory Attention* condition (\$248.88 MM) does not differ significantly ($t_{118} = 0.979$, $p = 0.225$, two-tailed) from that reported in the *Non-GAAP Earnings* condition (\$249.39 MM).¹² Consistent with our unexpected primary H2 result, we find that participants' mean reported GAAP net income (\$248.88 MM) is significantly less than the analyst consensus forecast of \$250 MM ($t_{26} = -3.39$, $p < 0.01$, one-tailed).

Our primary and supplemental tests of H2 suggest that the Reg G reconciliation requirement further reduces managers' willingness to engage in GAAP earnings management to meet market expectations. While inconsis-

whether the mean is greater than the \$250 MM consensus forecast would reject the null when the forecast is *beat* but fail to reject the null when either the forecast is *missed* or when the forecast is *met*. A nondirectional test would reject the null when the forecast is *beat* or *missed*, but fail to reject when the forecast is *met*.

¹²As the result of our supplemental test of H2 that compares adjacent conditions runs counter to our directional prediction, we present this result as a two-tailed test for ease of exposition.

tent with H2, these results suggest that managers may view the non-GAAP to GAAP reconciliation as increasing the credibility of the non-GAAP earnings number, consistent with prior research that finds that sophisticated investors view reconciled non-GAAP earnings to be more reliable than unreconciled numbers (Elliott [2006]).

Our final hypothesis predicts that making managers aware of increased regulatory attention to non-GAAP earnings disclosures will reduce the ability of non-GAAP reporting to constrain managers' GAAP reporting aggressiveness. As our primary test, we compare the proportions of managers willing to book an impairment that meets or beats the analyst consensus forecast of \$250 MM in the *Informal Regulatory Attention* condition to that in the *Formal Regulatory Attention* condition (63.33% vs. 22.2%). As shown in table 6, panel B, this difference is significant in the predicted direction ($\chi^2_1 = 9.754$, $p = 0.001$, two-tailed).

Supplemental tests support our primary test of H3. Participants in the *Informal Regulatory Attention* condition report higher GAAP net income compared to participants in the *Formal Regulatory Attention* condition (mean = \$249.92 MM vs. \$248.88 MM). This difference, presented in table 7, panel A, is significant ($t_{118} = 5.41$, $p = 0.01$, one-tailed). We also compare the mean GAAP net income in the *Informal Regulatory Attention* condition to the analyst consensus forecast using a 1-sample t -test. As expected and shown in table 7, panel B, reported GAAP net income is not significantly less than the analyst consensus forecast of \$250 MM ($t_{29} = -0.30$, $p = 0.38$, one-tailed). Both our primary and supplemental tests of H3 support our prediction that making managers aware of increased informal regulatory attention to non-GAAP earnings increases managers' willingness to engage in GAAP earnings management to meet market expectations.

4.2 SURVEY EVIDENCE

To validate some of our experimental assumptions about the reporting pressure that managers face, we survey 30 experienced financial reporting professionals sourced from a proprietary database of Corporate Controllers, Accounting Managers, and Chief Financial Officers residing in the United States. Our survey participants, provided by SSI/Research Now, average 44 years of age, and 83% are male.¹³

¹³ Although SSI/Research Now asserts that their survey pool consists solely of Corporate Controllers, Accounting Managers, and Chief Financial Officers residing in the United States, we take additional steps to ensure our participants are appropriate respondents. First, we ask them to reaffirm their experience working as a Controller for a publicly traded company in the United States. Second, we ask two multiple-choice questions related to public company reporting. Our first question asks participants which agency is responsible for reviewing a company's annual report and the second question asks participants how long a company has to file Form 10-K. Finally, we review responses to an open-ended question within the survey designed to capture language and jargon consistent with experience in financial reporting (Leiby, Rennekamp, and Trotman [2021]). Only participants who reaffirm their experience and answer both financial reporting questions correctly are allowed to participate in the survey.

TABLE 8

Survey Results: Pressures Affected by Reporting Adjusted Net Income in Addition to GAAP Net Income

	Number of Survey Respondents	Percentage of Survey Respondents
Meeting analyst forecast expectations	25/30	83%
Delivering a consistent earnings trend	22/30	73%
Ensuring that the most important factors of the firm's performance are communicated to investors	20/30	67%
Maintaining compliance with securities laws and regulations	17/30	57%
Achieving a bonus plan, or other internal, targets	4/30	13%

This table presents the results of a survey of 30 experienced financial professionals who were asked to "...please select all of the pressures, if any, that are affected (weakened or strengthened) by companies reporting Adjusted Net Income in addition to GAAP Net Income." Survey respondents were sourced from a proprietary database of Corporate Controllers, Accounting Managers, and CFOs provided by SSI/Research Now.

To support our theory that providing non-GAAP disclosures reduces the pressure that managers feel to meet market expectations for GAAP earnings, we ask participants to "...please select all of the pressures, if any, that are affected (weakened or strengthened) by companies reporting Adjusted Net Income in addition to GAAP Net Income." As shown in table 8, 83.3% (25/30) report that adding non-GAAP earnings reporting to GAAP net income reporting affects the pressure of "meeting analyst forecast expectations". Consistent with our theory, this pressure was selected most frequently by our survey respondents. The second and third most frequent pressures selected were "delivering a consistent earnings trend" and "ensuring that the most important factors of the firm's performance are communicated to investors". These were selected by 73.3% (22/30) and 66.6% (20/30) of respondents, respectively. These also align with our theoretical expectation that managers view reporting non-GAAP earnings as a channel to satisfy market expectations and to communicate information to financial statement users that is not captured by GAAP earnings alone.

5. Conclusion

Our study investigates how the reporting of non-GAAP earnings measures and regulatory attention to these measures affect managers' willingness to engage in aggressive GAAP earnings management to satisfy market expectations. We begin by providing archival evidence consistent with our prediction that increased regulatory attention to non-GAAP reporting can increase aggressive GAAP earnings management. Specifically, we use the passage of SEC Reg G to proxy for increased regulatory attention to non-GAAP metrics and show that the magnitude of common non-GAAP exclusions used to manage GAAP earnings significantly decrease in the post-Reg G period. However, due to limitations of the setting and method,

we cannot make strong causal inferences or disentangle the effects of formal vs. informal regulatory attention. Accordingly, we also conduct a controlled experiment and a survey with separate groups of financial reporting professionals to provide additional causal evidence for our results.

Our experimental results find some support that the provision of non-GAAP earnings reduces pressure to manage GAAP earnings to meet market expectations. However, we find mixed evidence on the effects of regulatory attention. Although we find that informal regulatory attention to non-GAAP earnings increases GAAP earnings aggressiveness, as expected, we find unexpected evidence that formal regulatory attention, in the form of the Reg G reconciliation requirement, further reduces GAAP earnings aggressiveness. This latter finding is consistent with managers believing that reconciliation increases the credibility of the non-GAAP earnings number, in line with more sophisticated investors viewing it as more reliable (Elliott [2006]). It is also possible that managers believe that investors still attend primarily to non-GAAP earnings when reconciliation is provided, particularly when the firm communicates the importance of non-GAAP metrics. Experienced professionals in our survey reported that non-GAAP earnings can reduce pressure to meet GAAP earnings expectations. Given that their responses were provided in the context of the current reporting environment, where reconciliation is needed, managers may believe that investors still focus primarily on non-GAAP earnings, even when reconciliation is provided. Although we are careful not to overgeneralize our findings, our results provide initial evidence that even while the intent underlying different regulatory actions may be the same, the approach chosen by regulators to achieve their goals could result in different outcomes. Exploring other settings where this could be the case is a fruitful path for future research.

Taken together, our results add to a growing body of literature that investigates the important role that non-GAAP reporting plays in the financial disclosure landscape. Although prior literature in this area primarily focuses on non-GAAP informativeness, we investigate how providing these disclosures affects GAAP earnings management. In addition, we contribute to the earnings management literature more broadly by demonstrating that allowing reporting discretion in an alternative non-GAAP channel can reduce opportunistic GAAP reporting. This suggests that regulatory efforts to reduce non-GAAP opportunism and protect investors may reduce management's ability to use non-GAAP earnings disclosures to exercise accounting discretion, potentially leading to more aggressively managed GAAP earnings. Perhaps most importantly, we provide evidence relevant to standard setters and regulators that non-GAAP measures may serve an important role even if they can be used opportunistically.

Our study is subject to limitations. For example, we made design choices that allow us to most effectively investigate how non-GAAP earnings affect accounting choices that impact GAAP earnings. However, one consequence of this is that we cannot make inferences about the quality or informativeness of non-GAAP earnings or of financial reporting as a whole. Even

though some managers use non-GAAP measures opportunistically, our results suggest that holding all else equal, opportunism in non-GAAP earnings may be at least partially offset by reductions in GAAP earnings management. To allow for strong causal inference, we focus our study on one form of earnings management. Although we would not expect our directional predictions to change as a result of introducing additional expectation management strategies (e.g., classification shifting or real earnings management), the magnitude of our findings could change.

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