Does Non-GAAP Reporting Change after Financial Restatements?

Christian Sofilkanitsch[#]

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Abstract

Non-GAAP reporting is debated as managers might opportunistically exclude less justifiable, yet income increasing, items and mislead investors. In this paper, I investigate whether non-GAAP reporting improves or deteriorates after a firm admits to past GAAP based misreporting through a financial restatement announcement. Hirshleifer and Teoh (2003) propose that the managerial use of inappropriate non-GAAP adjustments increases in investors' responsiveness to earnings and Mehring et al. (2020) show that investors' responsiveness to aggressively reported non-GAAP earnings decreases after the restatement announcement. Consequently, conditional on manager's awareness of reduced expected benefits from aggressive non-GAAP reporting choices, I predict and find a significant decline in the *likelihood* of aggressive non-GAAP reporting choices in form recurring expense exclusions. Moreover, in cross-sectional analyses, I document an improvement in non-GAAP *exclusion quality* for firms that have experienced severe short-term market reactions to the restatement announcement (material restatement firms), but not for those restatement firms that did not. Finally, I disaggregate total exclusions into below-the-line items, special items and recurring items. For material restatement firms, I find that the improvement in quality is found only in recurring expense exclusions; the type of exclusions perceived as most aggressive. In sum, my findings are consistent with the view that increased shareholder monitoring (heightened investor scrutiny) might constrain a firm's aggressive use of non-GAAP disclosure. My findings are novel to the restatement and non-GAAP related literature and hold in the post-Regulation G period.

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[#] Christian Sofilkanitsch, Paderborn University, Department of Taxation, Accounting & Finance, Warburger Straße 100, 33098 Paderborn, Germany. E-mail: christian.sofilkanitsch@uni-paderborn.de.

I. INTRODUCTION

Non-GAAP reporting allows managers to exclude certain expenses and gains, which under GAAP must not be excluded (e.g., stock bases compensation (ASC 718)).[1] While managers claim that the exclusions reduce the noise from one-time effects and therefore non-GAAP earnings reflect core earnings better than GAAP earnings (Bhattacharya et al. 2019; Christensen et al. 2019b), the financial press (Fahey 2016) and the regulators (SEC 2018) are concerned that managers might exploit the discretionary nature of unaudited non-GAAP disclosure for their benefit (e.g., by excluding recurring expenses).[2] Despite the frequent and excessive exclusion of income inflating expenses (Fahey 2016), prior studies find that non-GAAP earnings are informative on average (Lougee and Marquardt 2004; Bhattacharya et al. 2003).[3] Nevertheless, some studies suggest that managers report non-GAAP earnings opportunistically when they exclude "recurring" expenses (Mehring et al. 2020; Doyle et al. 2013). For that reason prior research has focused on determinants that curtail the exclusion *likelihood* of recurring items (Black et al. 2017b; Heflin and Hsu 2008) and increase the *quality* of these exclusions (Kolev et al. 2008; Brown et al. 2012).

Thus far, it is largely unexplored how firm specific investor scrutiny affects firms' non-GAAP reporting choices and non-GAAP exclusion quality.[4] I explore non-GAAP reporting before and after the announcement of financial restatements and find that the improvement in non-GAAP reporting is exclusive to material restatements – those restatements that most reliably capture heightened investor scrutiny.[5] The closest research relative to my study is performed by Christensen et al. (2019b). Christensen et al. (2019b) find that the non-GAAP exclusion quality increases after debt covenant violations and conclude that this finding "is consistent with

[1] While one would expect that firms exclude only recurring expenses (often referred to as special items), firms may also exclude non-recurring items (occasionally referred to as non-special items). "[A]necdotally, non-special-item exclusions include stock-based compensation expenses, payroll taxes on stock option exercises, and amortization costs" (McVay 2006, p. 505).

[2] The exclusion of recurring expenses (also referred to as "other expenses") is perceived as inappropriate, less justifiable and an aggressive non-GAAP reporting choice (Black et al. 2017a; Bhattacharya et al. 2019; Leung and Veenman 2018).

[3] In 2017, 97 percent of S&P 500 firms reported non-GAAP metrics (Usvyatsky and Coleman 2018). Further, acknowledging that in 2015, GAAP earnings declined by –12.7 percent for S&P 500 firms, while non-GAAP earnings grew by 0.4 percent (Lahart 2016), raises the concern that firms excessively exclude (less justifiable) expenses to conceal low GAAP earnings.

[4] Christensen et al. (2019b) find an improvement in recurring expense exclusion quality after debt covenant violations and interpret this improvement as investor scrutiny related. I highlight that in contrast to my paper, Christensen et al. (2019b) do not investigate the likelihood of recurring expense exclusion. Brown et al. (2012) find that firms' recurring expense exclusions increase in investor sentiment. They also find that the recurring expense quality decreases in investor sentiment, suggesting that scrutiny might constrain aggressive non-GAAP reporting. In detail, Brown et al. (2012) posit "that during optimistic (pessimistic) periods, investors will evaluate managers' pro forma disclosures less (more) rigorously and that this reduced (heightened) investor scrutiny will result in managers facing lower (higher) disclosure-related costs" (p. 9). I note that the investor sentiment measure is time-specific (affects all firms in a given month equally), and thus does not translate to firm-specific investor scrutiny. Basu et al. (2019) find that firms report non-GAAP earnings more aggressively when institutional investors are distracted, suggesting that increased investor attention might lead to a decreased likelihood of recurring expenses exclusions. I note that Basu et al. (2019) do not investigate the exclusions' quality.

[5] In order capture the effect (of different degrees) of heightened investor scrutiny on non-GAAP reporting, I in addition investigate non-GAAP reporting cross-sectionally for both material and less severe restatement firms. I identify materiality objectively through the short-term market reaction to the restatement announcement (Albring et al. 2013; Ettredge et al. 2014; Larcker et al. 2007; Wilson 2008). I find a lower likelihood of excluding recurring expenses for both material and less severe restatement firms (in the post-restatement period relative to the pre-period). However, the improvement in the non-GAAP exclusion quality is found only after material restatements.

heightened investor scrutiny following covenant violations" (Christensen et al. 2019b, p. 629).[6] I extent this research to a restatement setting, in which the restatement announcement is applied as an attention grabbing event.

I highlight that restatements are usually the initial public announcement informing on prior financial misreporting (Ronen and Yaari 2008) and trigger highest investors' interest in the SEC's EDGAR databases (Drake et al. 2015). Further, restatements correct GAAP based financial statements (Kyung et al. 2019), suggesting that non-GAAP reporting needs necessarily not be exposed to heightened investor scrutiny after the announcement of financial restatements.[7] These characteristics differentiate restatements from debt covenant violations. Further, prior empirical literature provides evidence of adverse market reactions to restatement announcements (Palmrose et al. 2004; Chen et al. 2014b; Mehring et al. 2020) and firms taking reputation-building actions to restore financial credibility (perhaps as a response to heightened scrutiny) (Hennes et al. 2014; Arthaud-Day et al. 2006). In more detail, prior restatement related literature provides evidence that "GAAP" related financial reporting quality improves after the restatement announcement (Wiedman and Hendricks 2013; Chen et al. 2014a).[8] Moreover, firms reduce voluntary disclosure, suggesting that managers opt against transparency in favor of minimizing future litigation risk (Chen et al. 2016; Ettredge et al. 2013).[9] Overall, these findings suggest that managers might reevaluate expected costs and benefits of GAAP and non-GAAP based earnings management and chose to report mandatory and voluntary information differently (perhaps more conservatively) after a restatement announcement.[10] While intuitively, based on presented findings, one could argue that it will be no surprise to find an improvement non-GAAP reporting after a restatement announcement, it is crucial to recall that financial misreporting reveals past "GAAP" misreporting and leads to increased audit effort (Thammasiri and Tepalagul 2016), which does not affect non-GAAP reporting. Hence, in the post-restatement period GAAP and non-GAAP reporting might compete in terms of expected costs and benefits of earnings management. As a result, managers might choose to shift aggressive reporting choices from audited GAAP to unaudited non-GAAP reporting. In other

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6 Exploring firms' non-GAAP reporting choices in a restatement setting yields different arguments for potential outcomes compared to a debt covenant setting. The differences will be outlined throughout this introduction.

7 Kyung et al. (2019) state that "non-GAAP earnings are not presented within firms' financial statements but are instead voluntarily disclosed in earnings press releases" (p. 179). Therefore, it is rather unlikely that financial restatements correct mistakes that arise from non-GAAP reporting. Consistently they conclude, "[w]hile the required 8-K reconciliations of non-GAAP to GAAP earnings could arguably be subject to restatement in these instances, we were unable to identify a single instance of this occurring" (p. 179). For my research, this is observation is advantageous, as it mitigates endogeneity concerns when I condition firms' non-GAAP reporting choices on market reactions to financial (GAAP-based) restatements.

8 E.g., lower accruals after the restatement announcement (Wiedman and Hendricks 2013); more conservative financial reporting after the restatement announcement (Chen et al. 2014a).

9 E.g., decrease in voluntary balance sheet and cash flow disclosures (Chen et al. 2016); firms are less likely to issue quarterly earnings forecasts after the restatement announcement (Ettredge et al. 2013).

10 E.g., an increase in expected costs could reflect better internal controls after the restatement announcement; e.g., a decrease in expected benefits could reflect decreases in investors' responsiveness to earnings announcements.

words, as outlined by Black et al. (2017b) in a non-restatement setting, non-GAAP earnings management might substitute GAAP earnings management. I highlight that, so far, research has not investigated firms´ non-GAAP reporting choices in a restatement setting.[11]

Focusing on the exclusion of recurring expenses – the type of exclusions referred to as an aggressive non-GAAP reporting choice (Black et al. 2017a; Bhattacharya et al. 2019) – I first investigate whether firms are less likely to exclude these items after the announcement of financial restatements. I find that firms reduce the *likelihood* of recurring expense exclusions after the restatement announcement, suggesting that managers respond to heightened investor scrutiny. In a second step I investigate non-GAAP reporting *quality* consistent with the established measurement of non-GAAP exclusion quality (Leung and Veenman 2018; Kolev et al. 2008; Frankel et al. 2011; Brown et al. 2012; Whipple 2015; Christensen et al. 2019b; Kyung et al. 2019). I find that firms increase the quality of non-GAAP earnings and non-GAAP exclusions in the post-period. This improvement, however, is exclusive to "material" restatements, which I identify based on the immediate market reaction to the restatement announcement.[12] Supposing that negative market reactions to (bad) news are a proxy for heightened investor scrutiny, the improvement in quality is likely attributable to increased shareholder monitoring. Eventually, I compare non-GAAP reporting between the first and the second year after the restatement announcement and find a decrease in quality, suggesting that the improvement in non-GAAP reporting is not long-lived. My findings are novel to the restatement and non-GAAP reporting literature and hold in the post-Regulation G period – a period in which firms are required to reconcile non-GAAP to GAAP earnings.

Why Choose a Restatement Setting?

Investigating non-GAAP reporting in a restatement setting is advantageous as financial restatements signal low audit and low financial reporting quality (Christensen et al. 2016; Pomeroy and Thornton 2008). Further, they "clearly garner the greatest EDGAR access of periodic accounting reports" (Drake et al. 2015, p. 1141), and may arise from intentional and unintentional misreporting (Hennes et al. 2008), potentially indicating agency conflicts (e.g., between the management and shareholders), weak audit quality, high accounting complexity, etc. Most importantly, restatement announcements cause negative short-term price

[11] I highlight that one working paper investigates non-GAAP reporting in a restatement setting (Shiah-Hou 2018). Shiah-Hou (2018) find that restatement firms exclude more recurring expenses before the restatement announcement relative to non-restatement firms. Shiah-Hou (2018) focus on the pre-restatement period and do NOT investigate changes in non-GAAP reporting after the announcement of financial restatements. She finds that restatement firms are more likely to exclude recurring expenses (in 63.9 percent of all observations) relative to non-restating counterfactuals (54.6 percent) before the restatement.

[12] Material restatements reflect those restatement announcements to which the market reaction was more negative (Albring et al. 2013; Ettredge et al. 2014; Larcker et al. 2007; Wilson 2008). As these restatements are destroying investors' wealth, they reliable capture investor scrutiny, which is important in light of alternative explanations (e.g., SEC scrutiny and auditor scrutiny).

reactions (Palmrose et al. 2004) and a decline in the information content of earnings (Chen et al. 2014b; Mehring et al. 2020). Hence, restatements evidence heightened ex-post investor scrutiny. In more detail, Mehring et al. (2020) document that investors reward the non-GAAP exclusion of recurring expenses before the restatement announcement, but punish the same reporting choice after the restatement announcement, suggesting that investors' ability to see through the quality of non-GAAP exclusions has evolved after the restatement announcement.[13]

In addition, auditors (Thammasiri and Tepalagul 2016), analysts (Ye and Yu 2017), and the SEC (SOX 2002) incorporate financial restatements in their decision-making process, suggesting that an overall increase in scrutiny might affect firms (non-GAAP) reporting choices.[14] As a response to heightened (investor) scrutiny, firms strive to restore financial credibility and gain back (investors`) trust. Being precise, firms distance themselves from culpable parties, such as the CEO or the auditor (Hennes et al. 2014; Arthaud-Day et al. 2006) and take reputation-building measures (Chakravarthy et al. 2014). Addressing financial reporting quality, firms improve accrual quality (GAAP based earnings management tool) significantly (Wiedman and Hendricks 2013) and are less likely to issue quarterly earnings forecasts in the post-restatement period (voluntary disclosure) to reduce future litigation risk (Ettredge et al. 2013).

Potential Outcomes

Turning to my research question, whether non-GAAP reporting will change after the restatement announcement, I consider two potential outcomes. Recall that opportunistic reporting choices are influenced by the expected costs and benefits from misreporting (Cressey 1953; Sievers and Sofilkanitsch 2019).[15] For example, when expected costs of GAAP earnings management increase after the restatement (e.g., due to increased audit effort (Thammasiri and Tepalagul 2016)), non-GAAP earnings management, which is not audited, may become cheaper relative to GAAP earnings management after the restatement. If so, managers might shift aggressive reporting choices from GAAP to non-GAAP reporting, leading to an ex-post decline in non-GAAP exclusion quality. Consistent with this idea (of shifting aggressive reporting

[13] Being precise, investors reward the exclusion of recurring expenses in the pre-restatement period, but punish firms when they exclude these items in the post-period.

[14] Thammasiri and Tepalagul (2016) find that the audit effort increases after a restatement, suggesting increased cost of GAAP earnings management. Ye and Yu (2017) document a significant increase in the analyst forecast dispersion, indicating a more uncertain information environment. In addition, the SEC defines financial restatements and substantial share price declines (amongst others) as review criteria (SOX 2002), suggesting heighted SEC scrutiny after restatements. Overall, findings suggest that investors, the auditor, analysts and the SEC are likely to scrutinize financial information after a financial restatement. As an approach to focus on investor scrutiny, I partition the restatement sample based on the market reaction to the restatement announcement. I posit that a market reaction captures the degree to which investors are hurt (or investors' wealth is destroyed), and therefore may capture the degree of heightened investor scrutiny. If investor scrutiny is a determinant of firms' non-GAAP reporting choice, I would assume to find an improvement in GAAP reporting only after material restatement announcements – those that hurt investors' wealth most.

[15] I note that based on the fraud triangle (Cressey 1953) i) incentive or/and pressure (e.g., option based compensation) ii) opportunity (e.g., weak controls) and iii) rationalization of misreporting by the manager (e.g., executive characteristics) are determinants of the likelihood of misreporting.

choices from GAAP to non-GAAP reporting), Black et al. (2017b) document that "companies are more likely to report non-GAAP earnings (and to do so aggressively)" when they are constrained by prior-period accruals management (this finding is not restatement related).[16] In a similar vein, Kyung et al. (2019) find that non-GAAP exclusion quality decreases after clawback adoptions, suggesting that managers seek for an alternative to GAAP based earnings management.[17] Further, Griffin (2003) and Ye and Yu (2017) show that the number of analysts following a firm declines significantly after the restatement announcement, suggesting decreased analyst scrutiny of managerial non-GAAP reporting adjustments.[18] Supporting this view (that analyst oversight has an impact on a firm`s non-GAAP reporting choices), Christensen et al. (2019a) document that non-GAAP reporting becomes more aggressive after analysts terminate coverage. Taken together, non-GAAP reporting might become more aggressive (i.e., of lower quality) after the restatement announcement, as managers might chose to shift aggressiveness from GAAP to non-GAAP earnings management.[19]

Alternatively, heightened investor scrutiny might improve both non-GAAP reporting and GAAP reporting when expected costs and benefits increase for both types of earnings management to a similar degree.[20] For example, prior literature finds that the exclusion quality of non-GAAP earnings increases after debt-covenant violations, suggesting that this improvement is attributable to heightened investor scrutiny (Christensen et al. 2019b). Further, the quality of exclusions improves after an SEC intervention, indicating that increased SEC scrutiny enhances non-GAAP reporting as well (Kolev et al. 2008). Moreover, Heflin and Hsu (2008) show that the *likelihood* of recurring expense exclusions decreases in the post-Regulation G period, suggesting that "the regulations have been effective at reducing the incidence of the type of exclusion most likely to be opportunistic (other-items)" (p. 356). I note that prior literature uses the terms "other items" (Heflin and Hsu 2008), "other exclusions" (Doyle et al. 2013; Kolev et al. 2008), "recurring item exclusions" (Black et al. 2017a; Christensen et al. 2019b), "recurring expense exclusions" (Leung and Veenman 2018; Bradshaw et al. 2018) interchangeably and applies this as a proxy for aggressive earnings exclusions (Black et al. 2017a; Bhattacharya et al. 2019) because these adjustments are

[16] I note that the aggressive reporting choice is captured trough the exclusion of "recurring items". Further, findings suggest that managers "used up their ability to manage earnings in prior periods" (Black et al. 2017b, p. 767).

[17] Recall that when clawbacks are in place, the SEC may recover executive (performance-based) compensation when financial statements are restated in the future. As financial restatements are conditional on prior "GAAP-based" misreporting, the expected costs of GAAP misreporting increase, while non-GAAP earnings management remains a relatively costless tool.

[18] Analysts provide GAAP and non-GAAP based forecasts. Addressing the provision of adjusted earnings numbers (non-GAAP earnings in form of street earnings), suggests that, in contrast to auditors, analysts may influence non-GAAP adjustments and thus non-GAAP reporting quality.

[19] In this case, findings would suggest that investors should not rely on non-GAAP earnings after restatement announcements.

[20] In detail, an increase of expected costs of non-GAAP earnings management might derive from an increased litigation likelihood. The decrease of expected benefits might derive from a decrease in investors' responsiveness to earnings (e.g., when investors become less responsive aggressively reported non-GAAP earnings after the restatement).

perceived as less justifiable (Black et al. 2017a; Leung and Veenman 2018).[21] Moreover, Basu et al. (2019) find that firms report non-GAAP earnings more aggressively when institutional investors are distracted, suggesting that increased investor attention might lead to a decreased likelihood of recurring expense exclusions.[22] Interestingly, Black et al. (2014) provide evidence that audit effort moderates the aggressiveness of non-GAAP earnings, even though non-GAAP earnings are not audited. This is important, as audit effort increases after financial restatements (Thammasiri and Tepalagul 2016). Turning to expected benefits from non-GAAP earnings management, Mehring et al. (2020) highlight that investors reward aggressive non-GAAP reporting choices before the restatement, but punish the same reporting choices after the restatement. Consistently, a firm could respond to this change in investor responsiveness (i.e., the payoff from aggressive reporting choices is smaller after the restatement announcement).[23] This view is supported by theoretical work by Hirshleifer and Teoh (2003), who state that "greater informativeness of earnings (ω) encourages firms to take steps (such as real investment shifts or earnings management) that make investor perceptions more favorable by increasing earnings" (p. 360).[24] In other words, managers will be more likely to report non-GAAP earnings aggressively if they face (highly) responsive investors.[25] Consistently, if investors' responsiveness to earnings decreases after the restatement as found by Chen et al. (2014b), one could argue that managers will report non-GAAP earnings less aggressively in the post-restatement period (as their expected benefit from inappropriate non-GAAP adjustments will have decreased).[26] Eventually, according to Black et al. (2018a) "[w]hen firms deviate from

[21] I highlight that "items" may refer to both gains and expenses. However, since the exclusion of recurring expenses is income inflating, the exclusion of expenses is more frequently discussed in terms of potentially opportunistically motivated adjustment. Excluding gains might be used to smooth earnings.

[22] Interestingly, Black et al. (2014) provide evidence that audit effort moderates the aggressiveness of non-GAAP earnings, even though non-GAAP earnings are not audited. This is important, as audit effort increases after financial restatements (Thammasiri and Tepalagul 2016).

[23] Investors' responsiveness is a proxy for the information content of earnings and perceived financial reporting quality.

[24] Further, according to Hirshleifer and Teoh (2003) "[p]ossible proxies for the earnings signal-to-noise ratio (ω) may include auditor reputation (size), or earnings response coefficients" (p. 360). Being precise, managers' use of inappropriate adjustment increases in investors' responsiveness to earnings (e.g., earnings response coefficients). Since investors' responsiveness to aggressively reported non-GAAP earnings declines after financial restatements (Mehring et al. 2020), I predict that firms will respond to this decline in the earnings response coefficient by decreasing the use of inappropriate non-GAAP adjustments (e.g. recurring expense exclusion). In other words, "more accurate public information is associated with a higher probability of upward pro forma adjustment. Intuitively, when earnings (pro forma or otherwise) are viewed by investors as a stronger indicator of value, there is a stronger incentive for firms to manipulate perceptions of earnings." (Hirshleifer and Teoh 2003, p. 358)

[25] I note that investor's responsiveness to earnings is measured by the earnings response coefficient (ECR). The ERC is frequently used as a proxy for investors' perceived financial reporting/audit quality. Importantly, I highlight, that a high ERC is often also interpreted as the information content of earnings. I believe that some readers might misinterpret a high ERC (high information content of earnings) as high "quality" or "informative" (non-GAAP) earnings. However, being precise, investors may be highly responsive to truthful and misleading information, as long as they "perceive" the financial reporting quality (or the information content of earnings) as high. Therefore, I use investors' responsiveness (e.g., ERC) as a proxy of investors' "perceived" reporting financial reporting quality without any implications about the truthfulness or quality of (non-GAAP) earnings. Moreover, a high ERC is not a proxy for high attention or high scrutiny. This distinction is crucial, as I find that in times of lower ERCs (information content of earnings), the non-GAAP exclusion quality increases, which might be contra-intuitive at the first sight, but aligns well with theory by theory by Hirshleifer and Teoh (2003). In addition, investor responsiveness might be high when earnings are disclosed prominently (e.g., when news are overly optimistic), regardless of its actual truthfulness.

[26] Chen et al. (2014) find a long-lived (10-quarter) ERC-decline for material restatements, and a short-lived decline (2-quarter) for other restatements.

their historical definition of non-GAAP earnings, their deviations are comprised of high-quality adjustments" (p. 2).

Taken together, if the manager believes that investors' ability to see through the quality of non-GAAP earnings has enhanced after the restatement (e.g., due to higher scrutiny), his expected pay off from aggressively reported non-GAAP earnings will most likely be lower in the post-period as compared to the pre-restatement period.[27] As a result, managers might chose to report non-GAAP earnings less aggressively in the post-period. Based on this explanation, I predict that firms will be less likely to exclude recurring expenses after the restatement announcement (H1: *likelihood*).[28] Moreover, in my primary analysis, I assume that the exclusion quality and earnings quality will improve after the restatement announcement (H2: *quality*).[29] My measurement of quality aligns with prior non-GAAP related literature (Leung and Veenman 2018; Kolev et al. 2008; Frankel et al. 2011; Brown et al. 2012; Whipple 2015; Christensen et al. 2019b; Kyung et al. 2019). I investigate the change of non-GAAP reporting after financial restatement announcements based on 804 restatement firms. Being precise, I compare 4 pre- to 4 post-restatement quarters.[30]

Investigation and Findings

To understand whether non-GAAP reporting is affected by increased investor scrutiny, I first investigate the *likelihood* of recurring expense exclusions. Second, in the main analysis, I focus on the *quality* of non-GAAP reporting (earnings and exclusions) following financial restatement announcements. Turning to the first analysis, I document a significant decrease in the *likelihood* of recurring expense exclusions following financial restatements.[31] Specifically, a firm is 7.3 percent less likely to disclose non-GAAP earnings aggressively after the restatement announcement, suggesting an improvement in non-GAAP reporting.[32] Next, I partition the full restatement sample into material and less severe restatements based on the market reaction

[27] Recall, that Mehring et al. (2020) find that the exclusion of recurring expenses was rewarded in the pre-restatement period, but is punished in the post-period.

[28] This prediction is conditional on manager`s beliefs that shareholders' monitoring has increased after the restatement announcement.

[29] Since managers reduce the exclusion of inappropriate items, I am able to observe only the remaining exclusions after the restatement (perhaps those of higher quality).

[30] In robustness tests, I also perform a 1 pre- vs. 1 post-restatement quarter comparison. Findings remain qualitatively similar.

[31] As noted earlier, the exclusion of recurring expenses is perceived as an aggressive non-GAAP reporting choice. I highlight that the decrease in the likelihood of recurring expense exclusion may be interpreted as an improvement. However, this decrease has no implications for the non-GAAP exclusion quality. Being precise, a decrease in recurring expense exclusions could simply be achieved by shifting items from recurring to special items, suggesting that aggressiveness was shifted, but not reduced. Special items are perceived as less suspicious.

[32] Throughout all analyses, I apply a 1-year (4 quarters) pre- and post-period, yielding 8 quarters per firm if data is fully available for all quarters. For material restatements, the decrease in the likelihood of recurring expense exclusions amounts to a 9.1 percentage points. For comparison, Christensen et al. (2019a) investigate the likelihood of non-GAAP reporting disclosure before and after debt covenants violations and find a decrease of 3 percent. I note that I investigate the likelihood of recurring expense exclusions and not the likelihood of non-GAAP disclosure. Importantly, if I apply an observation window of 1 quarter before and 1 quarter after the restatement announcement, the likelihood decrease by approximately 21 percent for after material restatements (see: Table 16).

(cumulative abnormal returns, CAR) to the restatement announcement.[33] I refer to restatements with CARs in the lower quartile as material restatements (201 firms), and restatements with CARs in the upper quartile as less severe restatements (201 firms).[34] Based on the CAR-based quartile classification, restatements are material when they cause a market reaction that is more negative than – 5.7 percent (25th percentile of CAR) and less severe when they cause a market reaction above +3.3 percent (75th percentile of CAR).[35] Assuming that a lower CAR is a more reliable proxy for heightened investor scrutiny relative to a higher CAR, I predict that reductions in the frequency of recurring expense exclusion will be higher (more pronounced) after the announcement of material restatements relative to less severe restatements. Surprisingly, the improvement in the *likelihood* of recurring expense exclusions does not differ between material (marginal effect: – 9.1 percent) and less severe restatements (marginal effect: – 8.1). Potential explanations of this rather surprising finding will be presented in the multivariate analyses part of this article.

In my second analysis, I examine the *quality* of non-GAAP reporting. Being precise, I investigate the persistence of non-GAAP earnings and non-GAAP exclusions. The intuition behind this approach is that non-GAAP earnings should be correlated positively with future operating earnings, and exclusions should not. In particular, if current exclusions are negatively correlated with future earnings, they, in the first place, should not have been excluded, because they are informative for future earnings. Consistent with prior literature (Leung and Veenman 2018; Kolev et al. 2008; Frankel et al. 2011; Brown et al. 2012; Whipple 2015; Christensen et al. 2019b; Kyung et al. 2019) I interpret a negative correlation between exclusions and future operating earnings as a sign of low exclusion quality.[36] For the full restatement sample, I find an improvement in total exclusion quality after the restatement announcement (i.e., ex-post exclusions are less predictive of future earnings compared to the pre-period). In the cross-sectional analyses, I reveal that this improvement is found only after material restatement

[33] The approach of identifying materiality based on the market reaction is in line with a discussion established by the Public Company Accounting Oversight Board (PCAOB 2013), in which the staff acknowledges that "the market reaction of restatements is a more relevant factor to measure materiality objectively". Prior literature applies this approach as well (Albring et al. 2013; Ettredge et al. 2014; Larcker et al. 2007; Wilson 2008). I assume that material restatements are more attention grabbing and a reliable proxy for heightened investor scrutiny. I calculate the market reaction through the cumulative abnormal returns (CARs) around the restatement announcement day (–3,+3 days).

[34] In my investigation the material restatements group has a mean (median) CAR of – 15.3 percent (– 12 percent), and the less severe restatement group has a mean (median) CAR of 9 percent (7.5 percent). While both types of restatements may increase investors' attention (positive news can trigger attention as well), I assume that the material restatement group more reliably reflects heightened investors scrutiny, as it is wealth destroying.

[35] I note that positive CARs can be explained by upward restatements or less severe restatements that are bundled with positive earnings surprises in regular filings. My materiality cut-off value of –5.7 percent (restatements that cause lower CARs than –5.7 percent are considered as material, based on lower quartile of CAR) compares to prior literature that applies static cut of values. For example, Larcker et al. (2007) classify a restatement as "severe" if the market price reaction is more negative than –3 percent and Carcello et al. (2011) apply a cut-off value of –10 percent for material restatements.

[36] For example, Kolev et al. (2008) and Doyle et al. (2003) define higher quality exclusions as being less persistent.

announcements, and not after less severe restatements.[37] This result is essential, as it implies that the improvement of non-GAAP earnings is likely attributable to heightened investor scrutiny. Next, I decompose total exclusions into the below-the-line items, special items, and recurring items. For the material restatement sample, I document that the improvement in quality is found (only) in the category "recurring expenses", which has traditionally been most criticized for being potentially opportunistic. This finding is a strong signal to the capital market, as the improvement takes place in a critical area of non-GAAP reporting.

Contribution to Prior Literature

My empirical findings are novel, as changes in non-GAAP reporting after a financial restatement were not investigated yet. Concerning the most closely related paper to this study, I note that Christensen et al. (2019b) find that the non-GAAP exclusion quality increases after a debt covenant violation and conclude that this finding "is consistent with heightened investor scrutiny following covenant violations" (p. 629). I reinvestigate the impact of heightened investor scrutiny on non-GAAP reporting in a restatement setting and additionally observe the likelihood of recurring expense exclusions following restatement announcements. Further, I partition restatements based on market reactions (to the restatement announcement) to account for different degrees of increased investor scrutiny. Most importantly, the restatement setting allows me to establish a link between restatement related empirical findings on changes of investors' responsiveness (Mehring et al. 2020; Chen et al. 2014b) and potential determinants of inappropriate non-GAAP reporting choices (e.g., investor responsiveness) outlined by theoretical work (Hirshleifer and Teoh 2003). Recall that Hirshleifer and Teoh (2003) propose that managers will report non-GAAP earnings less aggressively when investors are less responsive to earnings disclosed by the firm. Addressing restatements and investor responsiveness, Chen et al. (2014b) document that investors become less responsive to quarterly earnings announcements after the restatement announcement. Also, Mehring et al. (2020) show that investors punish aggressive reporting choices after the restatement announcement, but not before. Taken together, one could strongly assume that non-GAAP reporting will improve after the restatement, as the managerial payoff from aggressive non-GAAP reporting choices decreases after the restatement announcement (e.g., investors punish recurring expense exclusions in the post-restatement period, but not before (Mehring et al. 2020)). This assumption, however, is conditional on managers' belief about investors' enhanced ability to see through the quality of non-GAAP adjustments, which in turn is closely related to heightened

[37] Material restatements are identified through the lower quartile of cumulative abnormal returns around the restatement announcement date.

investor scrutiny and attention (Mehring et al. 2020). Hence, finding an improvement in non-GAAP reporting would provide strong empirical evidence that shareholder monitoring can constrain managers' aggressive use of non-GAAP reporting. Turning back to the closely related literature by Christensen et al. (2019b), I note that while a debt covenant violation setting inherits interesting and unique characteristics to explore, it is limits me in establishing a link between firms non-GAAP reporting choice and equity investor responsiveness to (non-GAAP) earnings. Further, as restatements are viewed "as the most readily available indicator of low audit quality" (Christensen et al. 2016, p. 1675), a manager might assume that GAAP reporting is under higher scrutiny relative to non-GAAP reporting. Consequently, the manager might chose to shift aggressive reporting choices to non-GAAP reporting – this is a strong opposite prediction, which is not given in the debt covenant violation setting.[38] I highlight that the change in non-GAAP exclusion quality has been observed in further event studies (SEC intervention setting (Kolev et al. 2008); clawback adoption setting (Kyung et al. 2019)), but so far lacks intuitive conclusions about investor scrutiny.

Turning to my contribution, I enrich the restatement literature by providing evidence that increased investor scrutiny affects firms' non-GAAP reporting choices. Ettredge et al. (2013) find that managers opt against providing earnings forecast after the restatement announcement, suggesting that managers desire to reduce future litigation risk. I extend this research with the focus on non-GAAP reporting disclosure. Second, I add to the non-GAAP reporting literature by identifying financial restatements as an important determinant affecting a firm's non-GAAP reporting choice. Christensen et al. (2019b) provide evidence that the quality of non-GAAP exclusions increases after a debt-covenant violation. I extend their investigation to the restatement setting.[39] Further, I add to Brown et al. (2012) who posit that during pessimistic periods, investors will evaluate managerial disclosures more rigorously and find that firms' recurring expenses exclusions increase in investor sentiment. I note that Brown et al. (2012) apply a sentiment measure, which is period-specific, meaning it affects all firms equally in a given period (e.g., month). My setting allows capturing firm specific scrutiny upon an

[38] Christensen et al. (2019b) argue that while heightened scrutiny could improve non-GAAP reporting, alternatively firms might also decrease the quality of non-GAAP earnings because debt covenant violations relates often to unprofitability. I would assume that the latter argument (less profitable firms) is also present before the debt covenant violation. Hence, I believe that investigating the effect of heightened investor scrutiny in a restatement setting is s substantial extension, as the alternative outcome is based on a circumstance that is not present before the restatement; expected costs of GAAP related earnings management decrease, while expected costs of non-GAAP earnings management do not.

[39] The advantage of financial restatements over debt covenant violations is that restatements signal low GAAP based financial reporting quality. Further material restatements have been found to change investors' perception about the exclusion of recurring expenses. Moreover, in contrast to Christensen et al. (2019b), I investigate my research questions cross-sectionally for material and less severe restatement. I would expect managers to be more pressured to improve financial reporting in light of material restatements. If improvements do not vary in-between material and less severe restatement, one could argue that the improvement is not driven by investor scrutiny. Eventually, I investigate the likelihood of recurring expense exclusion, while Christensen et al. (2019b) investigate the likelihood of non-GAAP disclosure.

exogenous shock, as ordinary/common investors do not anticipate the restatement announcement and managers have no precise ex-ante knowledge about investors' reactions to the restatement announcement. Eventually, I contribute to theoretical work by Hirshleifer and Teoh (2003) as I establish a link between investors' responsiveness to recurring expense exclusion (Mehring et al. 2020) and managerial on-GAAP reporting choices; in particular the decisions to exclude inappropriate items from non-GAAP earnings.

This study might be helpful for regulatory bodies, as I show that stricter non-GAAP regulation might be not required, if investors were always highly attentive, making the manger belief that inappropriate adjustments will be identified as such, and be punished. Finally, I inform investors, who might ask whether they could rely on non-GAAP earnings after material restatements. Based on my findings, I find support that non-GAAP reporting quality in the first year after the restatement is higher compared to the year before the restatement. However, based on a robustness test in which I compare non-GAAP reporting in the first year after the restatement to the second year after the restatement, I find that non-GAAP reporting quality decreases in the second year after the restatement announcement. This observation could be attributed to investor scrutiny that decreases overtime (as oversight is costly to the investor). I note that I focus only on one-time restatements to mitigate the concern that the observed deterioration in the second year (after the restatement announcement) is attributed to subsequent restatements.

Addressing differences between this paper and the research by Mehring et al. (2020), I note that this research sample includes material and less severe restatements, while Mehring et al. (2020) investigate material restatements. Further, materiality by Mehring et al. (2020) was identified in line with Hennes et al. (2008) and Chen et al. (2014b), who use a fraud based approach, meaning that material restatements are identified based on prior misreporting severity. In contrast, I apply the market reaction based approach in line with Larcker et al. (2007) and Carcello et al. (2011), who identify materiality based on the short-term market reaction to the restatement announcement. I posit that the fraud-based approach suits well to investigate investor reactions to information contained in a financial restatement. In contrast, the market reaction based approach suits well to investigate firm reactions to heightened investor scrutiny. Overall, my design choices lead to a substantially larger sample compared to the sample investigated by Mehring et al. (2020) (804 vs. 264 firms). Lastly, while Mehring et al. (2020) condition *investor* reactions on ex-ante firm non-GAAP reporting, I observe how *firms* respond to heightened investors scrutiny after financial restatement announcement.

II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1 Non-GAAP Reporting

Within non-GAAP reporting, managers may exclude expenses and gains that are otherwise required to be included under GAAP (Cohen et al. 2007). Since non-GAAP reporting is not audited[40], critics argue that managers may distract investors from the actual firm performance at a relatively low cost because misleading non-GAAP numbers are rather challenging to identify.[41] Despite evidence of potential opportunism (Bhattacharya et al. 2003; Bowen et al. 2005; Christensen et al. 2014; Curtis et al. 2014; Bradshaw et al. 2018), on average, non-GAAP reporting has been found to be motivated by managers' incentives to inform investors (Bentley et al. 2018; Black et al. 2018a; Leung and Veenman 2018; Choi and Young 2015; Whipple 2015). While for example, Curtis et al. (2014) find that a significant proportion of firms "only disclose non-GAAP earnings information when it increases investors' perceptions of core operating earnings" (p. 933), Leung and Veenman (2018) find that loss firms' offset the low informativeness of GAAP losses when they provide non-GAAP earnings. Moreover, research has investigated the impact of regulations (Marques 2006; Heflin and Hsu 2008; Kolev et al. 2008) and factors that constrain (aggressive) non-GAAP disclosure (Bhattacharya et al. 2019; Cazier et al. 2019; Christensen et al. 2019a). For example, Cazier et al. (2019) find that litigation risk constrains non-GAAP disclosure, and Christensen et al. (2019a) document that non-GAAP reporting becomes more aggressive after analysts terminate coverage, indicating that analysts' monitoring moderates aggressive non-GAAP reporting. Most importantly, in light of my research, Christensen et al. (2019b) observe that the quality of non-GAAP exclusions increases after debt-covenant violations, suggesting that investor scrutiny may improve non-GAAP reporting. Finally, considering the close relationship between scrutiny and attention, Basu et al. (2019) show that firms disclose non-GAAP metrics more aggressively when institutional investors are distracted.

[40] According to Black et al. (2018b) "[t]he role of auditors in non-GAAP reporting has seen less attention in the extant literature because non-GAAP metrics in the US are primarily reported in 8-K earnings announcements and not in firms' 10-Q/Ks. However, the PCAOB has recently expressed interest in better understanding the role of the auditor in the presence of non-GAAP reporting (PCAOB, 2016)" (p. 286).

[41] The low detection likelihood of managerial "mis-exclusions" increases the opportunity to manipulate earnings without being subsequently punished (e.g., low detection likelihood). Further, within non-GAAP reporting, no accrual has to be later reversed. Consistently, non-GAAP reporting is a relatively inexpensive earnings management tool (Black et al. 2018b) for executives who desire to inflate or sustain the firm value.

2.2 Financial Restatements

Financial restatements describe firms' acknowledgment of past reporting failure and the correction of intentional and unintentional misreporting. Financial market consequences vary in the severity of the restatement (for a comprehensive review: Sievers and Sofilkanitsch (2019)). While firms that announce fraud-related restatements experience market value declines of 20 percent around the restatement announcement date, non-fraud related restatements face declines of only 6 percent (Palmrose et al. 2004). These reactions have become more moderate after the SOX-Act (Hirschey et al. 2010), suggesting an improvement in the informational environment. Nevertheless, restatements continue to signal low financial reporting quality and may trigger sharp share price declines. In particular, Chen et al. (2014b) find that the decline in the earnings response coefficient (ERC) is long-lived after material restatement announcements.[42] Considering that the ERC is a proxy for perceived financial reporting quality and reflects investors' reaction to "non-GAAP" and "GAAP" earnings surprises[43], investors' are likely to respond differently to earnings announcements after a material restatement.

As a response to increased investor scrutiny and related share price declines firms improve accruals management (Wiedman and Hendricks 2013), decrease the likelihood of announcing voluntary earnings forecasts (Ettredge et al. 2013) and provide less accurate and less downwardly biased management guidance (Gordon et al. 2014). These findings suggest that managers i) try to signal their effort by increasing earnings quality (Wiedman and Hendricks 2013), ii) strive to reduce future litigation risk (Ettredge et al. 2013) and iii) were able to manipulate earnings before the restatement announcement likely due to poor ex-ante financial reporting controls (Gordon et al. 2014). Importantly, after the restatement, "strengthened controls curtail opportunistic behavior" (Gordon et al. 2014, p. 872) and make it more difficult to manipulate earnings.

[42] Mehring et al. (2020) show that the ERC-decline is long-lived for those material restatements (identified through fraud relation) that reported non-GAAP earnings aggressively before the restatement announcement.

[43] I/B/E/S and analysts provide GAAP and non-GAAP earnings. In cases in which different analysts report on a different basis (adjusted vs. non-adjusted), I/B/E/S applies the majority rule and uses the basis used by the majority of analysts.

2.3 Hypotheses

In this paper, I investigate whether increased investor scrutiny following a financial restatement influences the *likelihood* that managers will exclude recurring expense exclusions, which are perceived as aggressive non-GAAP reporting choices (Black and Christensen 2009; Doyle et al. 2013). Moreover, I investigate whether the *quality* of non-GAAP earnings changes after financial restatements. As I posit that the improvement in non-GAAP reporting is likely driven by investors' decreased responsiveness to aggressively reported non-GAAP earnings in the post-restatement period, I reexamine one major key finding by Mehring et al. (2020) in supportive tests – investors punish the exclusion of aggressive non-GAAP earnings after the restatement announcement, but not before. Put differently, I reinvestigate whether investors' ability to see through the quality of non-GAAP exclusions after restatement holds in my sample, which is substantially larger compared to Mehring et al. (2020) (804 vs. 264 firms), but covers a shorter post-period (4 vs. 12 quarters).

First, I ask whether financial restatements affect the *likelihood* that a firm will exclude income-increasing recurring expenses. As discussed previously, financial restatements signal low financial reporting quality and reflect heightened investor skepticism towards firms' financial information credibility. As a result of heightened scrutiny, on the one hand, investors might be able to identify aggressive non-GAAP reporting choices more reliably after the restatement announcement (Mehring et al. 2020). Consequently, managers' expected benefits from recurring expense exclusions would decline upon the increase of investor scrutiny, and lead to less aggressive non-GAAP reporting choices after the restatement announcement. On the other hand, considering Black et al. (2017b), who conclude that "companies are more likely to report non-GAAP earnings (and to do so aggressively)" (p. 750) when they are constrained by prior-period accruals management, one could assume that firms will be more likely to exclude recurring expenses ex-post, as a substitute of aggressive GAAP reporting. Lastly, if non-GAAP earnings were informative before the restatement, I should see no changes in the firms' exclusion frequency of recurring expenses. In light of potential outcomes, I carefully consider empirical findings by Mehring et al. (2020) and Chen et al. (2014b), who evidence a change in investor responsiveness to earrings after restatement announcements, and theoretical work by Hirshleifer and Teoh (2003), who assume that managers will report non-GAAP earnings less aggressively when investors' responsiveness to earnings decreases. Consistently, I predict that managers will become less likely to exclude recurring expenses after the restatement announcement as response to decreased expected benefits from aggressive non-GAAP

reporting choices. Importantly, as I propose that the change in non-GAAP reporting is attributable to heightened investor scrutiny, I predict that the improvement will be exclusive to material restatements.

> **H1a:** *After less severe financial restatements, the likelihood that managers exclude recurring expenses will not decrease.*
>
> **H1b:** *After material financial restatements, the likelihood that managers exclude recurring expenses will decrease.*

Second, I investigate whether the *quality* of non-GAAP earnings improves after restatement announcements. While the decrease in the likelihood of recurring expense exclusions is a strong signal for improved non-GAAP reporting, the decrease in the exclusion frequency could also be driven by managers shifting recurring expenses to special items (McVay 2006), indicating little improvement.[44] To mitigate this concern, I investigate the quality of non-GAAP earnings by analyzing the association between current total exclusion and the sum of the next four operating earnings. This procedure follows the research design employed by prior literature (Christensen et al. 2019b; Brown et al. 2012). Analogously to my first hypothesis, I predict that the improvement will be found only after material restatements, as these reflect heightened investor scrutiny more reliably.

> **H2a:** *After less severe financial restatements, non-GAAP reporting quality will not improve.*
>
> **H2b:** *After material financial restatements, non-GAAP reporting quality will improve.*

Eventually, I note that restatements may increase SEC, auditor and investor related scrutiny and thus, my results might be attributable to other factors than only investor scrutiny. To address alternate explanations, I divide the full restatement sample into material and less severe restatements and argue that restatements with a relative low CAR (lower quartile of CAR; market reactions below – 5.7 percent) are the ones to hurt investors' wealth most and therefore capture heightened investor scrutiny reliably. Nevertheless, this argument could also hold for heightened SEC scrutiny, as the SOX review criteria (SOX 2002) include both, financial restatements and substantial share prices declines. To mitigate concerns that the improvement is solely attributable to other than investors scrutiny, I carefully consider prior findings that measure investors' responsiveness to earnings announcements (Chen et al. 2014b) and

[44] Special items are perceived as less suspicious of being opportunistically motived compared to recurring expense exclusions.

aggressive non-GAAP reporting choices (Mehring et al. 2020). Acknowledging this literature, I establish a link between empirical findings (Mehring et al. 2020; Chen et al. 2014b) and theoretical work (Hirshleifer and Teoh 2003) that assumes that managers will less likely exclude inappropriate expenses when investors become less responsive to earnings news.[45] For that reason, I reconcile findings to Mehring et al. (2020), based on a larger sample (this paper: 804 firms, Mehring et al. (2020): 264 firms). Finding a change in investors' responsiveness to the exclusion of recurring expenses would strengthen the view that the non-GAAP improvement is attributable to heightened investors scrutiny (while I do not rule out that the improvement is a joint effect of SEC and investor scrutiny).

H3a: *In the pre-restatement period, firms are not punished when they exclude recurring expenses.*

H3b: *In the post-restatement period, firms are punished when they exclude recurring expenses.*

[45] I argue that the improvement might reflect the manager's response to changes in investor behavior, in particular to aggressive reporting choices. Being precise, my predictions consider that managers will become less aggressive in non-GAAP choices as they face investors who punish aggressive reporting choices in the post-period, which they have not punished before the restatement (Mehring et al. 2020).

III. DATA and DESCRIPTIVE STATISTICS

3.1 Sample Selection

I retrieve restatement data from the GAO reports (GAO 2002, 2007) and the Audit Analytics (AA) database, which cover restatements announced from January 1997 to June 2006 (GAO) and from 1995 to 2019 (AA), respectively. Since I desire a pre- and post-period with little noise from preceding and subsequent restatements, I focus on firms that restate only once.[46] This procedure allows me to capture the increase in investor scrutiny reliably. Panel A in Table 1 illustrates the sample selection process. The requirement of Compustat, CRSP, forecast data from I/B/E/S and institutional ownership data reduces my sample to 804 restatements announced between 1998 and 2016. Since I compare 4 pre-restatement to 4 post-restatement quarters (in terms of non-GAAP disclosure), the total sample consists of 5,236 firm-quarter observations across eight quarters. I require that each firm is at least represented by one quarter observation in the pre- and post-period (Chen et al. 2014b; Wilson 2008), meaning that each firm is represented by at least 2 quarter observations.[47]

While some research focuses on material restatement firms only, I chose to investigate both material and less severe restatements in cross-sectional analyses. Following prior literature, I partition the sample based on the immediate market reaction to the restatement announcement (Albring et al. 2013; Ettredge et al. 2014; Larcker et al. 2007; Wilson 2008). This procedure yields 201 material restatements (1,257 firm quarter-observations, lower quartile CARs), 201 less material restatements (1,292 firm quarter-observations, upper quartile CARs) and 402 mixed-severity restatements (2,687 firm quarter-observations, 2nd, and 3rd quartile CARs). I use the immediate market reaction (– 3, +3 days) to restatement announcements as a proxy for the increase in investor scrutiny. The more negative the reaction to financial restatements is, the higher the increase in investor scrutiny is expected to be. In the regressions, I will refer to material restatements as the "Lower Quartile CAR" group and to less severe restatements as

[46] I classify restatement firms with two total restatement announcements as one-timers as long as the two restatement dates do not fall apart by more than 90 days. This scenario is found for 102 out of 804 firms. On average, the dates fall apart by 20 days. Reasons for this procedure are inconsistencies in announcement dates between the GAO and AA data amongst others. Sometimes, a subsequent restatement may reveal additional information that was not present at the initial date. I include only the initial date in my sample.

[47] In the appendix (Table A5), I provide a frequency table informing about the pattern of the quarter distribution. For example, 307 firms have full 8-quarter coverage (across 4 pre- and 4 post-quarters) and 751 firms have 4 or more quarter observations in total. My investigated sample includes 804 firms with less restrictive criteria (1 firm quarter observation in the pre- and 1 firm quarter observation in the post-period). This design choices is in line with prior literature (Chen et al. 2014b; Wilson 2008). In robustness test, I require 3 pre- and 3 post-quarter observations (yields 537 firms) and find that the findings hold (Table 12 - 15). Addressing the reason for quarter gaps, I highlight that I rely on the calculation of unexpected earnings surprises. For this calculation, I require analyst forecast data 90 days before the earnings announcement data. In some cases, however, analysts do not provide these forecasts 90 days before the earnings announcement date for 1 quarter, but do this for the subsequent quarter for the same firm. Hence, this data issue leads to quarter gaps in a firm-specific quarter timeline.

the "Upper Quartile CAR" group.[48] I note that the "the market reaction of restatements is a more relevant factor to measure materiality objectively" (PCAOB 2013).[49] Table 1, Panel B illustrates the industry distribution, while Panel C outlines the yearly distribution of restatements. Panel D presents the quarterly distribution across 4 pre- and 4 post-restatement quarters. Throughout this paper, I present findings for the full, less severe and severe restatement sample. Findings for the mixed group are not explicitly presented (only within the full sample), because the mixed group is not the focus of my research questions.

Table 1 Sample Selection and Earnings Announcement Frequency

Panel A: Restatement Sample Selection

GAO and Audit Analytics Database		Number of Restatement Announcements
Accounting restatement cases in the period 1995 – 2016		19,504
Less: – Restatement cases by firms not covered in Compustat	3,989	
Less: – Restatement cases by firms not covered in CRSP	6,835	
Less: – Restatement cases by firms not covered in I/B/E/S	38	
Less: – Restatement cases by firms not covered in the Institutional Ownership Database	1,770	
Less: – Restatements by firms that restated multiple times	2,928	
Less: – Restatements cases with missing data throughout either the pre-restatement period (quarters – 4 to 0) or the post-restatement period (quarters 1 to 4)	3,140	
Total Restatement Sample (Number of Firms), in the Period 1998 – 2016[A]		**804**

Panel A reports my selection process in which I combine restatement data from GAO and AA.
[A] Due to missing data and the exclusion of firms with multiple restatements, the final samples period covers years 1998 – 2016.

Panel B: Industry Distribution of Restatement Firms

Industry (per Fama and French 10- Industry Classification)	Number of Firms	Percentage of Total
Business Equipment	206	25.62%
Consumer Durables	21	2.61%
Consumer Non-Durables	43	5.35%
Healthcare, Medical Equipment, and Drugs	84	10.45%
Manufacturing	115	14.30%
Oil, Gas, and Coal Extraction and Products	34	4.23%
Other	152	18.91%
Telephone and Television	21	2.61%
Utilities	23	2.86%
Wholesale, Retail, and Some Services	105	13.06%
Total Firms	**804**	**100%**

Panel B reports the industry distribution for the restatement sample.

[48] I highlight that identifying material restatements based on the market reaction may bias restatement samples towards Security Class Action Lawsuits and the pre-SOX period. Since I control for year fixed effects and do not see any anomalies in the yearly distribution, I mitigate the concerns that a quarterly pattern drives the findings. A bias towards Security Class Action Lawsuits would not be critical, since I am interested in investor scrutiny.

[49] Since I control for year fixed effects and run regressions separately for post-Regulation G periods (in robustness test), I mitigate concerns that my findings are biased towards outdated regulatory environments. As I am interested in the firms' response to heightened investors' scrutiny, the market reaction is a reliable indicator for increased investor skepticism/scrutiny.

Panel C: Yearly Distribution of Restatement Announcements

Restatement Year	Firm Observation			
	Full Sample	Upper Quartile CAR	2nd & 3rd Quartile CAR	Lower Quartile CAR
1998	9	2	2	5
1999	26	10	8	8
2000	38	10	9	19
2001	58	15	23	20
2002	38	6	13	19
2003	43	16	21	6
2004	52	7	26	19
2005	109	28	54	27
2006	68	13	41	14
2007	57	11	37	9
2008	32	9	16	7
2009	31	8	15	8
2010	23	4	13	6
2011	27	12	12	3
2012	34	6	26	2
2013	41	15	18	8
2014	44	7	27	10
2015	42	12	25	5
2016	32	10	16	6
Total Restatement Cases	**804**	**201**	**402**	**201**

Panel C reports the yearly distribution of restatement announcements. The final sample is partitioned into three groups based on their market reaction around the restatement announcement date (over the full time period). The sub-samples yield 201 less-severe, 402 mixed and 201 material restatement firms.

Panel D: Earnings Announcement Frequency

Quarter	Firm-Quarter Observation			
	All	Upper Quartile CAR	2nd & 3rd Quartile CAR	Lower Quartile CAR
Pre-Period				
– 3	615	153	319	143
– 2	646	157	333	156
– 1	682	165	352	165
0	685	168	343	174
Sum Pre-Period	2,628	643	1,347	638
Post-Period				
1	680	175	341	164
2	680	166	350	164
3	639	160	333	146
4	609	148	316	145
Sum Post-Period	2,608	649	1,340	619
Total Firm-Quarter	**5,236**	**1,292**	**2,687**	**1,257**

Panel D reports the number of firm-quarter observations with available data for the variables used throughout this paper. The sample includes 804 restatements and comprises 5,236 firm quarter observations. Quarter 0 refers to the last fiscal quarter with the earnings announcement date before the restatement announcement. Quarter 1 refers to the first fiscal quarter with the earnings announcement date after the restatement announcement.

Table 2 provides details regarding the economic magnitude of the CARs for the different groups. Material restatements have a mean (median) CAR of – 15.3 percent (– 12 percent), less severe restatements have a mean (median) CAR of 9 percent (7.5 percent), the mixed group has a mean (median) CAR of – 0.9 percent (– 0.7 percent), and the total sample has a mean (median) CAR of – 2 percent (– 0.7 percent).

Table 2 Sub-Groups Based on Market Reaction to the Restatement Announcement

Cumulative Abnormal Return around the Restatement Announcement Date

Group	Min	Max	Mean	Median	Quarter Obs.	Firm
Upper Quartile CAR	0.033	0.232	0.091	0.075	1,292	201
2nd and 3rd Quartile CAR	-0.057*	0.032	-0.009	-0.007	2,687	402
Lower Quartile CAR	-0.423	-0.058*	-0.153	-0.120	1,257	201
Total	**-0.423**	**0.232**	**-0.020**	**-0.007**	**5,236**	**804**

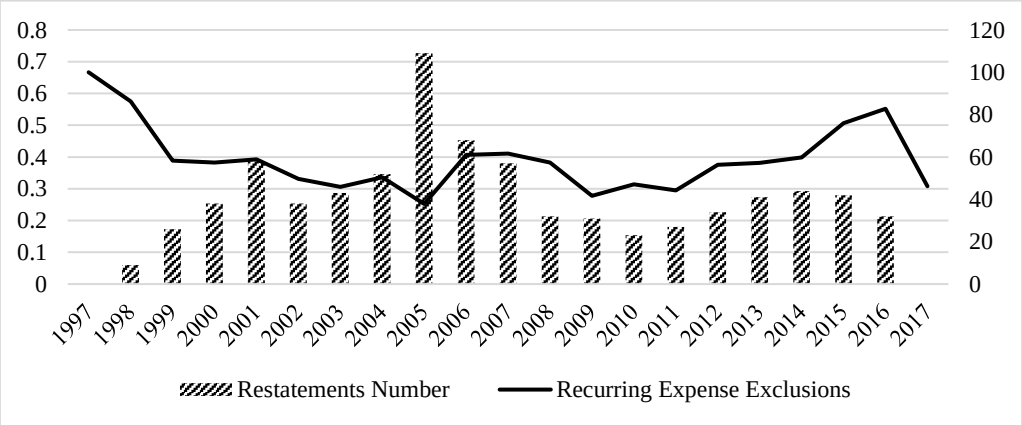
Table 2 provides detailed information on the sub-groups and values of market reactions that they reflect.
*The exact cut off value for the mixed and material restatement group is – 0.0572766.

3.2 Descriptive Statistics

Figure 1 plots the number of financial restatement announcements and the frequency of recurring expense exclusions across the sample period (1997-2017). The distribution of restatements aligns with the restatement related literature review by Sievers and Sofilkanitsch (2019). The frequency of recurring expense exclusions aligns with the distribution of other item exclusions outlined by Whipple (2015).[50]

Figure 1 Restatements and Exclusions

Recurring expense exclusions (*RECUR_EXPENSE*) and restatement number (#) over years



This figure illustrates the frequency of recurring expense exclusions (left scale) and the frequency of restatements (right scale, i.e., number of firms). This figure does not provide the number of restatements for the first (1997) and last year (2017), because the exclusion frequency is provided for 1 year before and 1 year after a restatement announcement.

Table 3 reports descriptive statistics of the variables used in my analyses. All variables are defined in the appendix (Table A1). The appendix additionally provides descriptive statistics for the pre- and post-period (Table A2) and for the material and less severe restatements (Table A3). Importantly, following prior literature (Brown et al. 2012; Doyle et al. 2003; Heflin and Hsu 2008; Kolev et al. 2008; Doyle et al. 2013; Bradshaw and Sloan 2002; Brown and Sivakumar 2003), I apply I/B/E/S street earnings as a proxy for managerial pro-forma earnings (*EPS_NG*). I note that Bentley et al. (2018) provide actual pro-forma earnings for years 2003 to 2015. Since my analyses require data for years 1997 to 2017, I apply I/B/E/S data as a proxy for pro-forma earnings. Given that street earnings (I/B/E/S) closely align with pro-forma earnings (Bentley et al. 2018), I perceive I/B/E/S data as a reliable proxy for pro-forma

[50] Whipple (2015) show the distribution of other item exclusions for most common three industries "(i.e., Business Services, Electronic Equipment, and Petroleum and Natural Gas)" (p. 38).

earnings. Nevertheless, in robustness tests, I replace I/B/E/S data with data from Bentley et al. (2018).[51] Findings are qualitatively similar to main results.

Figure 2 Calculation of Exclusions

EPS Version	EPS ($)	Exclusions	EPS ($)
EPS_NG[52]	0.16		
		– *RECUR*[53]	0.05
EPS_OP[54]	0.11		
		– *SPECIAL*[55]	0.11
EPS_GAAP[56]	0.00		
		– *BELOW*	0.01
EPS_NET[57]	-0.01		

This figure illustrates a hypothetical example in which a firm excludes below-the-line items ($ 0.01 EPS "*BELOW*"), special items ($ 0.11 EPS "*SPECIAL*") and recurring expenses ($ 0.05 EPS "*RECUR*"). The recurring expense exclusions have an income increasing effect (from $ 0.11 EPS to $ 0.16 EPS). Recurring expense exclusions are present whenever non-GAAP earnings are higher than operating earnings.

Following prior literature (Christensen et al. 2019b; Brown et al. 2012; Whipple 2015) I calculate the three types of exclusions; recurring items, special items and below-the-line items (*RECUR, SPECIAL* and *BELOW*). The calculation of these exclusions is based on four earnings measures (*EPS_NG, EPS_OP, EPS_GAAP,* and *EPS_NET*), as illustrated in Figure 2. In Table 3, I show that, on average, managers exclude recurring expenses (*RECUR_EXPENSE*) in 37 percent of all investigated firm-quarters. The recurring expense exclusions translate to an average of 4 cents per share (*RECUR*), while special items amount to 9 cents per share (*SPECIAL*). These values align with those of prior studies (Christensen et al. 2019b; Black et al. 2017b).[58]

[51] Using I/B/E/S data as pro-forma earnings on average underestimates managerial aggressiveness (Bentley et al. 2018). Black et al. (2018) use the term non-GAAP earnings as an umbrella term. Non-GAAP earnings may refer to "pro forma earnings", which are manager based, and/or "street earnings", which refer to metrics from forecast data providers (e.g., I/B/E/S) and are analyst based.

[52] Non-GAAP EPS (EPS_NG) is the "actual" number from I/B/E/S. Non-GAAP EPS is an umbrella term for pro-forma EPS and Street EPS (Black et al. 2018b).

[53] Recurring expenses are excluded whenever the non-GAAP EPS exceeds the EPS from Operations. According to Black and Christensen (2009) "[w]henever the I/B/E/S actual EPS number is higher than Compustat's operating EPS, we can assume that analysts have excluded recurring items from both their forecasts and the actual EPS figure" (p. 305).

[54] Operating GAAP EPS (EPS_OP) is "opepsq" from Compustat, as defined by Curtis et al. (2013) and Doyle et al. (2013).

[55] "Special Items are defined as operating income per share (Compustat item opepsq) less GAAP EPS before extraordinary items (Compustat item epspxq or epsfxq)" (Doyle et al. 2013). Special items present non-recurring items.

[56] GAAP EPS refers to the GAAP EPS excluding extraordinary items and is "epsfxq" from Compustat. This metric is defined as GAAP EPS by Doyle et al. (2013).

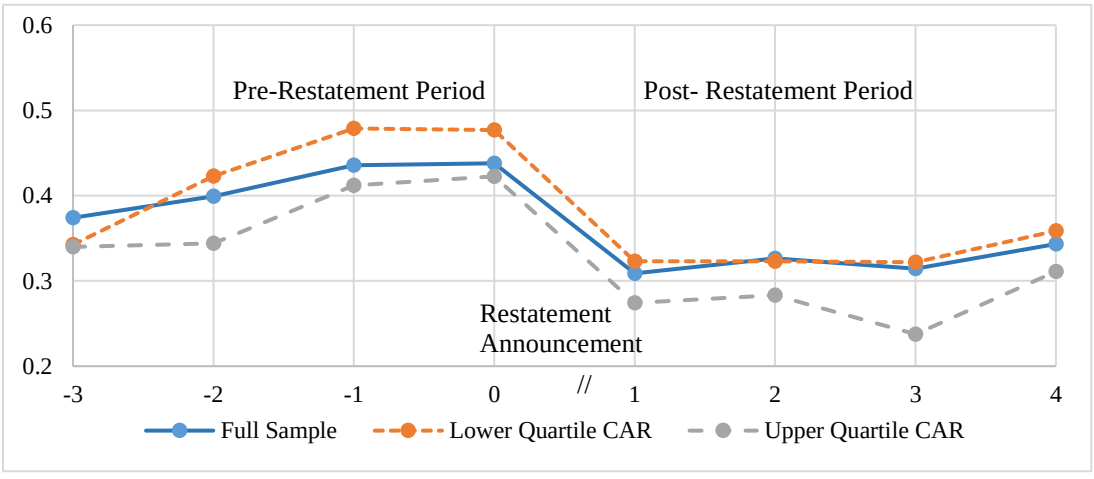
[57] GAAP EPS including extraordinary items.

[58] For example, in this study total exclusions have a mean of 14 cents (*TOTALEXCL*), while Christensen et al. (2019b) report a mean of 16 cents.

Given my focus on recurring expense exclusions, in Figure 3, I plot the frequency of these exclusions across the observation timeframe (4 pre- and 4 post-restatement quarters relative to the restatement announcement, with quarter 0 representing the last quarter before the restatement announcement). Imagine observing no ex-post decline in the exclusion frequency of recurring expenses. In this scenario, one could argue that i) non-GAAP reporting remains to be informative after the restatement announcement or ii) non-GAAP reporting remains to be aggressive after the restatement. Documenting a decline, however, would instead support the view that non-GAAP reporting was aggressive before the restatement and improves after the restatement announcement, perhaps due to heightened investor scrutiny. Turning to my sample, in Figure 3, I graphically show that firms decrease the use of recurring expense exclusions after the restatement announcement, suggesting an improvement, yet not being statistically tested. Interestingly, the graphical decrease for material restatement firms seems to be similar to the decrease of less severe restatements. This observation will be discussed in more detail in the next section, in which I apply a probit model to investigate whether the graphical evidence holds in statistical analyses.

Figure 3 Investigated Timeframe: Exclusions around Restatement Announcements (Timeframe from quarter -3 to quarter +4; Total of 8 quarters)

Recurring expense exclusions (*RECUR_EXPENSE*) relative to the restatement announcement



This figure illustrates the frequency of recurring expense exclusions across the investigated periods 1 year before and 1 year after the restatement announcement (4 pre- and 4 post-restatement quarters). Each firm is required to have at least 1 quarter observation in each period (pre- and post-period), meaning that each firm has at least 2 quarter observations in total. Quarter 0 is the last quarter before the restatement announcement. These graphs show the frequency of the recurring expense exclusions for the full, less severe and material restatement sample.

Table 3 Firm-Quarter Observations

Descriptive Statistics for 804 restatement firms: 5,236 firm-quarter observations

	N	Mean	Std.	1st percentile	25th percentile	Median	75th percentile	99th percentile
Panel A: Dependent Variables								
RECUR_EXPENSE	5,236	0.37	0.48	0.00	0.00	0.00	1.00	1.00
FUTGAAP	5,236	0.20	4.80	-37.00	-0.10	0.60	1.60	7.35
UR	5,236	0.00	0.09	-0.27	-0.04	0.00	0.05	0.25
Panel B: Control Variables - GAAP Measures								
EPS_NG	5,236	0.16	0.92	-6.10	0.01	0.16	0.42	2.82
EPS_OP	5,236	0.11	0.92	-6.12	-0.03	0.14	0.40	2.26
EPS_GAAP	5,236	0.00	1.31	-9.80	-0.06	0.12	0.37	2.80
EPS_NET	5,236	-0.01	1.38	-10.20	-0.07	0.12	0.37	2.82
Panel C: Control Variables - Exclusions								
RECUR	5,236	0.04	0.29	-1.10	-0.01	0.00	0.04	1.80
SPECIAL	5,236	0.09	0.40	-0.40	0.00	0.01	0.03	3.20
BELOW	5,236	0.00	0.07	-0.31	0.00	0.00	0.00	0.43
TOTALEXCL	5,236	0.14	0.57	-0.88	0.00	0.00	0.08	4.98
Panel D: Control Variables								
POST	5,236	0.50	0.50	0.00	0.00	0.00	1.00	1.00
SIZE	5,236	6.75	1.69	3.31	5.53	6.59	7.95	10.89
MTB	5,236	3.52	4.11	0.41	1.45	2.32	3.74	27.81
STDROA	5,236	0.03	0.04	0.00	0.01	0.01	0.03	0.32
GAAPLOSS	5,236	0.27	0.44	0.00	0.00	0.00	1.00	1.00
SALES_GROWTH	5,236	0.41	1.58	-5.77	-0.04	0.21	0.74	7.86
SPECIALCHG	5,236	0.47	0.50	0.00	0.00	0.00	1.00	1.00
MISS	5,236	0.46	0.50	0.00	0.00	0.00	1.00	1.00
ROA	5,236	-0.06	0.36	-2.98	0.00	0.01	0.02	0.17
INST	5,236	0.55	0.35	0.00	0.26	0.64	0.84	1.13
ANALYST	5,236	8.69	6.85	1.00	3.33	6.67	12.33	31.00
LITIGATE	5,236	0.34	0.47	0.00	0.00	0.00	1.00	1.00
LEVERAGE	5,236	1.73	3.10	0.07	0.41	0.86	1.70	22.76
OCF	5,236	0.03	0.08	-0.29	0.00	0.03	0.07	0.26
AGE	5,236	15.23	7.36	4.00	9.00	15.00	21.00	32.00
RECURR_EXPENSE_LA	5,236	0.44	0.50	0.00	0.00	0.00	1.00	1.00
BIG_AUDITOR	5,236	0.91	0.29	0.00	1.00	1.00	1.00	1.00
AUD_TENURE	5,236	9.87	6.99	1.00	4.00	8.00	15.00	30.00
STRING	5,236	0.04	0.21	0.00	0.00	0.00	0.00	1.00
FUTURE_FINANCE	5,236	0.35	0.48	0.00	0.00	0.00	1.00	1.00
POST_REG_G	5,236	0.79	0.41	0.00	1.00	1.00	1.00	1.00
OPERATING_CYCLE	5,236	4.54	0.74	2.12	4.18	4.62	5.01	6.23
ALTMANZ	5,236	4.56	5.14	-6.14	1.91	3.31	5.65	29.74
ACCRUALS	5,236	-0.04	0.11	-0.65	-0.06	-0.02	0.00	0.27
UE	5,236	0.00	0.01	-0.08	0.00	0.00	0.00	0.04
NONLINEAR	5,236	0.00	0.00	-0.01	0.00	0.00	0.00	0.00
BETA	5,236	1.15	0.55	0.03	0.79	1.11	1.50	2.75
NONGAAPLOSS	5,236	0.23	0.42	0.00	0.00	0.00	0.00	1.00
Q4	5,236	0.22	0.41	0.00	0.00	0.00	0.00	1.00
PERSIST	5,236	0.18	0.41	-0.82	-0.11	0.16	0.46	1.44
PREDICT	5,236	0.02	0.12	0.00	0.00	0.00	0.00	1.01
Panel E: Variable Used for Partitioning								
CAR	804	-0.02	0.10		-0.06	-0.01	0.03	

This table provides descriptive statistic for variables applied in Model 1 to 3. CAR is used to partition the restatement sample into material, mixed and less severe subsamples. All variables are defined in the appendix (Table A1).

IV. RESEARCH DESIGN and EMPIRICAL ANALYSES

4.1 The Likelihood of Recurring Expense Exclusions

In the first analysis, I investigate whether firms are less likely to exclude recurring expenses after the restatement announcement. In univariate tests in the appendix (Table A2), I observe that the recurring expense exclusion frequency decreases from the pre- to the post-period (*RECUR_EXPENSE* decreases from 41 to 32 percent). Using a probit model, the dependent variable *RECUR_EXPENSE* equals one if the firm excludes recurring expenses. I note that Mehring et al. (2020) label this term "EXCLUDE". The variable of interest is *POST* and equals one if earnings were released after the restatement announcement. I note that Black et al. (2017b) apply a logit model to investigate the likelihood of recurring item exclusions after the SOX-Act and Christensen et al. (2019b) apply a probit model to investigate the likelihood of non-GAAP disclosure after debt covenant violations. In contrast, I apply a probit model to investigate the likelihood of recurring expense exclusions after financial restatements. I include a full battery of 22 control variables (*CONTROL*) to investigate the exclusion of recurring expenses after a restatement announcement.[59] All control variables are in line with prior literature (Christensen et al. 2019b; Black et al. 2017b). I also control for year fixed effects, industry fixed effects, and fiscal quarter effects. I estimate the following probit model.

$$\Pr(RECUR\_EXPENSE_{i,t} = 1) = \alpha_1 + \beta_1 POST_{i,t} + \sum_{k=2}^{23} \beta_k CONTROLS_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where:

$$CONTROLS_{i,t} = \left\{ \begin{array}{l} SIZE_{i,t}, MTB_{i,t}, STDROA_{i,t}, GAAPLOSS_{i,t}, SALES\_GROWTH_{i,t}, \\ SPECIALCHG_{i,t}, MISS_{i,t}, ROA_{i,t}, INST_{i,t}, ANALYST_{i,t}, LITIGATE_{i,t}, \\ LEVERAGE_{i,t}, OCF_{i,t}, AGE_{i,t}, RECUR\_EXPENSE\_LAG_{i,t}, \\ BIG\_AUDITOR_{i,t}, AUD\_TENURE_{i,t}, STRING_{i,t}, FUTURE\_FINANCE_{i,t}, \\ OPERATING\_CYCLE_{i,t}, ALTMANZ_{i,t}, ACCRUALS_{i,t} \end{array} \right\}$$

I include indicator variables that equal one if a firm did not meet analyst forecasts with operating GAAP earnings *(MISS*), experienced a one-time event (*SPECIALCHG*), or had an operating loss (*GAAPLOSS*). I predict that these factors will have a positive impact on the likelihood of aggressive non-GAAP reporting choices. Further, I include *RECUR_EXPENSE_LAG*, which

[59] Kyung et al. (2019) apply a probit model with a dependent variable "Aggressive", which is 1 if the manager excludes expenses that are not excluded by analysts. They find that firms are more likely to report non-GAAP earnings aggressively after clawback adoptions. As they focus on compensation, they in addition to prior literature (Christensen et al. 2019b; Black et al. 2017b) control for executives' options and bonuses.

equals one if the firm excluded recurring expenses in the previous quarter and zero otherwise. I expect that a firm, which excluded recurring expenses in the previous quarter is more likely to do so again.[60] Further, in line with prior literature (Christensen et al. 2019b; Black et al. 2017b), I control for firm size (*SIZE*), market-to-book ratio (*MTB*), earnings variability (*STDROA*), sales growth (*SALES_GROWTH*), return on assets (*ROA*), stock percentage of institutional ownership (*INST*), number of analysts following the firm (*ANALYST*), litigation risk (*LITIGATE*), leverage (*LEVERAGE*), operating cash-flow (*OCF*), firms' age (*AGE*), audit quality (*BIG_AUDITOR, AUD_TENURE*), earnings momentum (*STRING*), financing need (*FUTURE_FINANCE*), firms' operating cycle (*OPERATING_CYCLE*), bankruptcy risk (*ALTMANZ*), and accruals (*ACCRUALS*). All 22 control variables are defined in the Appendix and will be discussed only selectively as I focus on the variable of interest *POST*. I highlight that some coefficients of the control variables might have unexpected signs compared to prior literature for two reasons. First, neither Black et al. (2017b) nor Christensen et al. (2019b) investigate the likelihood of recurring expense exclusions.[61] Second, I investigate restatement firms, which by construction might have inferior control mechanism ex-ante and have managers in place that are likely to anticipate the restatement announcement. Therefore, my findings for control variables might and shall not be representative for non-restatement samples.

I estimate Model 1 using the full (column 1), less severe (column 2), and material restatement sample (column 3) and report the results in Table 4. All columns present the marginal effects from the regression with the p-values.[62] The marginal effect for the full sample suggests that a firm is approximately 7.3 percent less likely to exclude recurring expenses after the restatement announcement (column 3, *POST*: – 0.073, p-value: 0.00). While I predict and find that material restatements (column 3, *POST*: – 0.091, p-value: 0.00) will improve, I am surprised to document a lower likelihood of excluding recurring expenses for less severe restatement firms in the post-period (column 2, *POST*: – 0.081, p-value: 0.00).[63]

[60] For example, a firm may have a business model that always requires the exclusion of recurring expenses as it otherwise would have difficulties to communicate core earnings to its investors.

[61] Black et al. (2017b) focus on recurring item exclusions, which include both gains and expenses.

[62] The appendix provides coefficients instead of marginal effects for Table 4 (Table A4). Further, I note that the appendix also includes a quarter distribution table (Table A5) that informs the reader on how many firms have full data coverage across all 8 quarters (307 firms).

[63] In a difference-in-difference design, I see no significant difference in the decline between material and less severe restatements (Table 29). Further, if I restrict the observation timeframe to 2 quarters (the last quarter before and the first quarter after the restatement), firms are approximately 9 percent (21 percent) less likely to exclude recurring expenses after (material) restatement announcements (see: Table 16).

Table 4 Likelihood of Recurring Expense Exclusions

(Dependent Variable: *RECUR_EXPENSE*)

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
Variable	Average Marginal Effect	p-value	Average Marginal Effect	p-value	Average Marginal Effect	p-value
POST	**-0.073**	**0.000*** **	**-0.081**	**0.000*** **	**-0.091**	**0.000*** **
SIZE	0.008	0.224	0.002	0.897	0.001	0.948
MTB	-0.001	0.519	0.001	0.887	0.001	0.774
STDROA	0.233	0.113	0.062	0.816	0.440	0.106
GAAPLOSS	0.030	0.070*	0.024	0.436	0.008	0.822
SALES_GROWTH	0.005	0.168	0.009	0.288	0.002	0.704
SPECIALCHG	0.092	0.000***	0.062	0.011**	0.080	0.001***
MISS	0.312	0.000***	0.290	0.000***	0.336	0.000***
ROA	0.019	0.261	0.000	0.997	0.040	0.137
INST	0.035	0.081*	0.012	0.760	0.067	0.107
ANALYST	0.004	0.006***	0.006	0.040**	0.006	0.033**
LITIGATE	0.055	0.006***	0.046	0.350	0.077	0.033**
LEVERAGE	0.000	0.930	-0.002	0.661	-0.002	0.671
OCF	0.019	0.848	-0.011	0.949	-0.106	0.584
AGE	-0.002	0.065*	-0.004	0.071**	-0.003	0.262
RECURR_EXPENSE_LAG	0.216	0.000***	0.198	0.000**	0.194	0.000***
BIG_AUDITOR	0.013	0.573	-0.029	0.549	-0.089	0.040**
AUD_TENURE	0.001	0.223	0.000	0.937	0.003	0.251
STRING	0.038	0.164	-0.045	0.427	0.016	0.726
FUTURE_FINANCE	0.009	0.525	0.017	0.498	-0.043	0.113
OPERATING_CYCLE	0.000	0.992	-0.027	0.180	-0.013	0.502
ALTMANZ	0.001	0.559	-0.002	0.464	0.000	0.950
ACCRUALS	-0.005	0.940	0.020	0.864	-0.106	0.384
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Area under ROC curve	0.8626		0.8755		0.8558	
Pseudo R^2	0.33		0.36		0.31	
N	5,263		1,291		1,255	
Number of Firms	804		201		201	
Median CAR	- 0.01		0.08		-0.12	

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.

Addressing the economic significance of these marginal effects, I note that Christensen et al. (2019b) find that "the likelihood that a firm will disclose non-GAAP earnings decreases" (p.259) after debt covenant violations, which is found to be "consistent with stronger shareholder monitoring during this period of scrutiny" (p. 259). Importantly, their marginal effect is – 2.8 percent (Christensen et al. 2019b). Hence, I believe that my finding for material restatements (marginal effect of – 9.1 percent) can be interpreted as an economically significant

improvement.[64] Noteworthy, if I apply a shorter window of 1 quarter before and 1 quarter after the restatement announcement (instead of 4 quarters before and 4 quarters after the restatement), I find a marginal effect of – 20.5 percent (Table 16).[65]

In univariate tests (Table A2 and A3), I show that the recurring expense exclusion frequency decreases from 41 percent in the pre-restatement period to 32 percent in the post-restatement period for the full sample.[66] Similar declines are found for material (from 43 percent to 33 percent) and less severe restatements (from 38 percent to 28 percent). This rather surprising finding for less severe restatements could be attributable to the manager's anticipation of upcoming restatements, regardless of materiality as defined in this paper (market reaction based approach). In detail, while ex-ante managers might have precise knowledge about past misreporting, managers might fail to anticipate the market reactions to future restatement announcements adequately. In an extreme, yet not impossible, scenario all managers might anticipate adverse market reactions[67] and start reporting non-GAAP earnings aggressively because they desire to boost share prices and extract information rents before the restatement announcement. In this illustrated scenario, I would expect to see an increase in recurring expense exclusion frequency for all restatement firms in the quarters leading to the restatement announcement. Ex-post managers would have extracted rents, and therefore could decrease the use of recurring expenses exclusions. While this scenario is extreme and implies that managers reported non-GAAP earnings unusually aggressive before the restatement announcement, it very closely represents the exclusion frequency development of recurring expenses plotted in Figure 4. Figure 4 illustrates the exclusion frequency across 12 pre- and 8 post-restatement quarters for all, material and less severe restatements. Interestingly I observe a relatively sharp increase in recurring expense exclusions in the 5 quarters leading to the restatement announcement (quarter – 4 to 0) – a period in which the managerial anticipation of financial restatements becomes more likely as these quarters approach the restatement date. This observation supports the view that non-GAAP earnings were reported unusually aggressive before the restatement. It is essential to acknowledge that GAAP misreporting (which subsequently leads to a financial restatement), usually ends approximately 6 quarters before the

[64] In my main analyses, I consciously do not apply a 1 pre-quarter and 1 post-quarter design, but use instead a 4 pre- and 4 post-quarter design. This longer window aligns with prior restatement literature (Chen et al. 2014b; Chakravarthy et al. 2014; Wilson 2008; Sievers and Sofilkanitsch 2019; Gordon et al. 2014) and yields are larger sample, which mitigates concern that my findings are driven by a few observations. My findings also hold in the 1 pre-quarter and 1 post-quarter design (Table 16 - 18).

[65] For my main tables I applied the 4 pre- and 4 post-quarter setting to increase the explanatory power and accounting for potential non-GAAP reporting strategies, which are not detectable in a 1 pre- and 1 post-quarter setting.

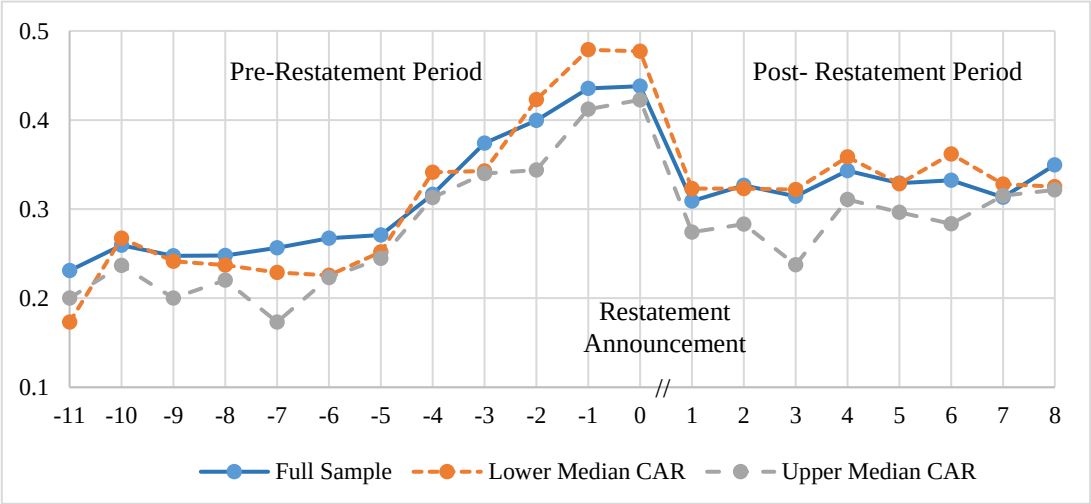
[66] The pre- and post-period comprise 4 quarters before and 4 quarters after the restatement announcement.

[67] Recall that even technical restatements signal reporting failure. I note that this argumentation is backed by the fact that even income-increasing corrections signal reporting failure and may cause share price declines (Agrawal and Chadha 2005). Agrawal and Chadha (2005) find that even restatements that increase earnings "appear to be bad news" (p. 384), with a cumulative average abnormal return of –4 percent. Hence, managers may fear adverse market reactions even in light of income-increasing restatements.

announcement of the restatement (Burns and Kedia 2006). Hence, my investigation period of 4 pre-restatement quarters likely covers the so called "detection period" (Sievers and Sofilkanitsch 2019), which is not exposed to GAAP based misreporting. Figure 4 will be discussed in more detail in robustness tests, in which I shift the pre- and post-periods back and forth (section 4). For my main investigation, I focus on 4 pre- and 4 post-quarters.

Figure 4 Extended Timeframe 1: Exclusions around Restatement Announcements (Timeframe from quarter – 11 to quarter +8; Total of 20 quarters)

Recurring expense exclusions (*RECUR_EXPENSE*) during quarters around the restatement announcement (804 firms)



This figure illustrates the frequency of recurring expense exclusions across an extended timeframe with 3 years before and 2 years after the restatement announcement (12 pre- and 8 post-restatement quarters). Each firm is required to have at least 1 quarter observation in each period (pre- and post-period), meaning that each firm has at least 2 quarter observations in total. Quarter 0 is the last quarter before the restatement announcement. These graphs show the recurring expense exclusion frequency for the full, less severe and material restatement sample.

Addressing control variables (Table 4), I observe that firms are more likely to report non-GAAP earnings aggressively when they face operating GAAP losses (*GAAPLOSS*: – 0.121, p-value: 0.00), missed analyst forecasts with operating GAAP earnings (*MISS*: – 1.263, p-value: 0.00), were exposed to one-time events (*SPECIALCHG*: – 0.371, p-value: 0.00) and excluded recurring expenses in the quarter before (*RECUR_EXPENSE_LAG*: – 0.871, p-value: 0.00). While these findings are in line with prior literature, it is somewhat surprising to see that non-GAAP aggressiveness increases in the number of analysts following the firm (*ANALYST*: 0.015, p-value: 0.01), institutional ownership (*INST*: 0.143, p-value: 0.08) and litigation risk (*LITIGATE*: – 0.224, p-value: 0.01). I note that consistent with prior literature, analysts (Payne and Robb 2000; Matsunaga and Park 2001) and institutional owners (Johnson and Greening

1999) might impair financial reporting quality, as they might create pressure to perform and trigger high market expectations.

Turning to my hypotheses, as predicted, I find a lower likelihood of recurring expense exclusions after material restatements (H1b). Against my prediction (H1a), I find a lower likelihood or recurring expense exclusions after less severe restatements. This finding can be interpreted in various ways. First, one might assume that the improvement for less severe restatements is mechanically driven, as, for example, corrections from restatements might affect recurring expense exclusions in the first quarter after the restatement. However, the long-lived decline in the recurring expense exclusion frequency plotted in Figure 4 suggests that the change is long-lived and not limited to (only) one ex-post quarter. Turning to the second alternative explanation, managers know about the upcoming restatement announcement but are ex-ante NOT able to anticipate the future market reaction to the restatement. Thus, they do not vary substantially in their informational advantages. Consequently, one could expect that opportunistic managers from both material and less severe restatement firms will report non-GAAP earnings similarly; both will desire to extract information rents and report non-GAAP earnings unusually aggressive before the restatement announcement. Consistently, ex-post managers will revert to less aggressive non-GAAP reporting choices. Considering Figure 4, in which I show an increase of the exclusion frequency for material and less severe restatements before the restatement announcement, and a subsequent sharp decline afterward, is consistent with the latter explanation. Testing this argument remains an empirical question for future research.

4.2 The Quality of Non-GAAP Earnings

The evidence, so far, supports the view that managers improve non-GAAP reporting after both material and less severe restatement announcements, as evidenced by the decreased likelihood of excluding recurring expenses. Since firms may shift items from recurring items to special items in order to make non-GAAP earnings look less suspicious, I supplement my analyses by investigating the *quality* of total exclusions (*TOTALEXCL*) (Model 2a given below).[68] In a further step, I disaggregate total exclusions into recurring item exclusions (*RECUR*), special items (*SPECIAL*), and below-the-line items (*BELOW*) (Model 2b). Given that prior literature (Barth et al. 2012; Bhattacharya et al. 2003; Black and Christensen 2009; Doyle et al. 2013) and critics (Fahey 2016; Lahart 2016) are most concerned with inappropriate expense exclusions, it would be a strong signal to find improvements in this critical area. In line with prior literature (Brown et al. 2012; Kolev et al. 2008; Christensen et al. 2019b), I apply an established research design, in which I regress future operating earnings (*FUTGAAP*) on current non-GAAP earnings (*EPS_GAAP*) and current exclusions from non-GAAP earnings (*TOTALEXCL, RECUR, SPECIAL, BELOW*). *FUTGAAP* is the sum of the next four operating GAAP earnings (quarterly), *EPS_NG* represents current non-GAAP earnings (quarterly), and *TOTALEXCL* are items excluded from current non-GAAP earnings.[69] In particular, I examine whether the *quality* of non-GAAP earnings (*EPS_NG X POST*) and non-GAAP exclusions (*TOTALEXCL X POST, RECUR X POST, SPECIAL X POST, BELOW X POST*) improves after the restatement announcement.

$$\begin{aligned} FUTGAAP_{i,t} &= \beta_0 + \beta_1 EPS\_NG_{i,t} + \beta_2 EPS\_NG_{i,t} \times POST + \\ &+ \beta_3 TOTALEXCL_{i,t} + \beta_4 TOTALEXCL_{i,t} \times POST + \sum_{k=5}^{9} \beta_k CONTROLS_{i,t} + \varepsilon_{i,t}, \end{aligned} \tag{2a}$$

$$\begin{aligned} FUTGAAP_{i,t} &= \beta_0 + \beta_1 EPS\_NG_{i,t} + \beta_2 EPS\_NG_{i,t} \times POST \\ &+ \beta_3 RECUR_{i,t} + \beta_4 RECUR_{i,t} \times POST + \beta_5 SPECIAL_{i,t} + \beta_6 SPECIAL_{i,t} \times POST \\ &+ \beta_7 BELOW_{i,t} + \beta_8 BELOW_{i,t} \times POST + \sum_{k=9}^{13} \beta_k CONTROLS_{i,t} + \varepsilon_{i,t}, \end{aligned} \tag{2b}$$

where: $CONTROLS_{i,t} = \{MTB_{i,t}, SIZE_{i,t}, STDROA_{i,t}, GAAPLOSS_{i,t}, SALES\_GROWTH_{i,t}\}$

[68] In a robustness tests I observe whether firms are less likely to exclude special items (see Table 19). I find that restatement announcement has no effect on the likelihood of excluding special items.

[69] The calculation of exclusions is outlined in Figure 1.

By regressing *FUTGAAP* on current quarterly non-GAAP earnings (*EPS_NG*), I investigate the persistence of non-GAAP earnings (*EPS_NG*). Recall that *FUTGAAP* represents the next four quarters' operating earnings. Hence, the closer the coefficient on *EPS_NG* is to 4.00, the more persistent are reported non-GAAP earnings, meaning that they are of high quality. Turning to total expense exclusions (*TOTALEXCL*), one could assume to find no correlation between current exclusions and future operating earnings, if exclusions were transitory (meaning of high quality). Prior literature (Doyle et al. 2003; Kolev et al. 2008; Brown et al. 2012; Christensen et al. 2019b), however, finds that total exclusions are negatively correlated with future operating GAAP earnings. This means that investors who seek to estimate future expected operating earnings, would not price crucial information if they dismiss the information contained in excluded items (by focusing only on non-GAAP earnings).

In line with prior findings, I predict a significant negative coefficient on *TOTALEXCL,* suggesting that the excluded items should not have been excluded in the pre-period because they contain relevant information about future operating earnings. Turning to my primary analysis, I am interested in whether the quality of non-GAAP exclusions and non-GAAP earnings increases after the restatement announcement. Hence, I focus on the change in the quality of non-GAAP earnings (*EPS_NG X POST*) and on the change in quality of non-GAAP exclusions (*TOTALEXCL X POST).* In a second step, I disaggregate exclusions into recurring, special and below-the-line items *(RECUR X POST, SPECIAL X POST,* and *BELOW X POST*). A positive coefficient on exclusion interaction terms items *(RECUR X POST, SPECIAL X POST,* and *BELOW X POST*) will signal an improvement in non-GAAP reporting quality, relative to the pre-restatement period (*TOTALEXCL, RECUR, SPECIAL, BELOW*). I note that prior literature (Leung and Veenman 2018; Kolev et al. 2008; Frankel et al. 2011; Brown et al. 2012; Whipple 2015; Christensen et al. 2019b; Kyung et al. 2019) has accustomed to the term "quality" when using persistence models as applied in this paper (Model 2a and 2b). In the last step, I will disaggregate total exclusions and focus on *RECUR X POST,* since recurring expense exclusions are perceived as less justifiable. Finding an improvement in recurring expense exclusions would be a strong signal as it provides evidence that shareholders are able to enhance non-GAAP reporting quality in the type of exclusions perceived as less justifiable.

Turning to the interpretation of potential findings, I highlight that if exclusions are strictly transitory (of high quality) throughout the pre- and post-period, I should not find a significant coefficient on *TOTALEXCL* and the interaction *TOTALEXCL X POST*. In contrast, if I find a negative coefficient on *TOTALEXCL* and a positive coefficient on *TOTALEXCL X POST*, I then

would evidence an improvement in total exclusion quality. This interpretation follows prior literature (Doyle et al. 2003; Kolev et al. 2008; Brown et al. 2012; Christensen et al. 2019b). Put differently, if exclusions are ex-post less persistent compared to the pre-period, I would see a positive coefficient on the interaction with *POST*, signaling an improvement in quality. I perform all tests analogously for recurring item exclusions (*RECUR*), special items (*SPECIAL*) and below-the-line items (*BELOW*) and focus on their interaction with *POST* (Model 2b: *RECUR X POST, SPECIAL X POST,* and *BELOW X POST*).

Table 5 Persistence of Total Exclusions (Dependent Variable: *FUTGAAP*)

		Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
		FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	β_1	2.427	0.00***	1.562	0.02**	2.707	0.00***
EPS_NG X POST	β_2	**1.005**	**0.02****	-0.212	0.44	**1.306**	**0.05****
TOTALEXCL	β_3	-2.577	0.00***	-0.423	0.02**	-3.713	0.00***
TOTALEXCL X POST	β_4	**1.197**	**0.08***	-0.267	0.49	**2.957**	**0.01*****
POST	β_5	-0.178	0.24	-0.008	0.95	0.543	0.04**
SIZE	β_6	0.279	0.00***	0.252	0.01***	0.189	0.07*
MTB	β_7	-0.008	0.74	-0.037	0.08*	-0.007	0.90
STDROA	β_8	-8.656	0.01**	-6.344	0.13	-6.973	0.22
GAAPLOSS	β_9	0.274	0.28	-0.617	0.01***	0.096	0.82
SALES_GROWTH	β_{10}	0.018	0.66	0.072	0.14	0.035	0.65
CONSTANT		-1.526	0.00***	-0.195	0.73	-1.408	0.05**
Industry fixed effects		Yes		Yes		Yes	
Year fixed effects		Yes		Yes		Yes	
Fiscal quarter effects		Yes		Yes		Yes	
H_0: $\beta_3 + \beta_4 = 0$		F = 16.04		F = 3.01		F = 4.74	
		p-value = 0.00		p-value = 0.08		p-value = 0.03	
Adj. R^2		0.54		0.56		0.65	
N		5,236		1,292		1,257	
Number of Firms		804		201		201	
Median CAR		- 0.01		0.08		-0.12	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.

Table 5 presents the results from estimating Model 2a. In column 1, I estimate the persistence of total exclusion (*TOTALEXCL*) for all restatements. In column 2 and column 3, I provide findings for less severe restatements (column 2) and material restatements (column 3). Turning to the full sample (column 1), I find improvements in total exclusions (*TOTALEXCL*: – 2.577, p-value: 0.00 and *TOTALEXCL X POST*: 1.197, p-value: 0.08), as exclusions become less persistent after the restatement. The negative coefficient on total exclusions (*TOTALEXCL*: – 2.577, p-value: 0.00) is in line with prior literature (Doyle et al. 2003; Kolev et al. 2008;

Brown et al. 2012; Christensen et al. 2019b) and suggests that total exclusions are persistent before the restatement announcement, and thus of low quality. Moreover, I find that non-GAAP earnings become more persistent after the restatement (*EPS_NG X POST*: 1.005, p-value: 0.02). In contrast to exclusion, for non-GAAP earnings higher persistence is a sign of high quality. Recall that Kolev et al. (2008) state that "perfectly permanent earnings would have an estimated coefficient of 4.00" (p. 171) in cases in which they represent the explanatory variable of the next four quarterly operating earnings.

Turning to material and less severe restatements, in my cross-sectional analysis in Table 5, I do not see any improvements for less severe restatement firms (column 2) in the non-GAAP exclusion quality (*TOTALEXCL X POST*: 0.267, p-value: 0.49). I neither find an improvement in non-GAAP earnings for less severe restatements (*EPS_NG X POST*: – 0.212, p-value: 0.44). In contrast, for material restatements (column 3), I find an improvement of non-GAAP exclusion quality (*TOTALEXCL*: – 3.713, p-value: 0.00 and *TOTALEXCL X POST*: 2.957, p-value: 0.01).

Importantly, total exclusions (*TOTALEXCL*: – 3.713, p-value: 0.00 and *TOTALEXCL X POST*: 2.957, p-value: 0.01) are insignificant after the announcement of material restatements (H_0: $\beta_3 + \beta_4 = 0$, p-value: 0.03), meaning that managers' claim of providing informative non-GAAP earnings is warranted, as exclusions are not persistent (of high quality) in the first year after the restatement (4 post-restatement quarters). I highlight that in a robustness test I will compare the first year after the restatement to the second year after the restatement and conclude that the improvement found in the first year is not long-lived. Turning back to the main analysis, I also find an improvement in non-GAAP earnings quality (*EPS_NG*: 2.707, p-value: 0.00 and *EPS_NG X POST*: 1.306, p-value: 0.05). Addressing non-GAAP earnings (*EPS_NG*: 2.707 + *EPS_NG X POST*: 1.306 = 4.013), I highlight that a coefficient of 4.00 suggests that non-GAAP earnings perfectly predict future operating earnings (*FUTGAAP* reflects the next four quarters operating earnings). Hence, this finding can be interpreted as non-GAAP earnings being more informative in the post-period relative to the pre-period. The reported coefficient for non-GAAP earnings (*EPS_NG*) is in line with prior literature (Christensen et al. 2019b; Kolev et al. 2008; Brown et al. 2012).

Table 6 Persistence of Recurring Expense Exclusions (Dependent Variable: *FUTGAAP*)

		Full Sample (1)		Upper Quartile CAR (2)		Lower Quartile CAR (3)	
		FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	β_1	2.754	0.00***	1.779	0.00***	3.415	0.00***
EPS_NG X POST	β_2	**0.963**	**0.01****	-0.171	0.54	**1.005**	**0.02****
RECUR	β_3	-5.390	0.00***	-2.175	0.03**	-8.622	0.00***
RECUR X POST	β_4	2.071	0.21	0.098	0.93	**7.198**	**0.02****
SPECIAL	β_5	-2.079	0.01***	0.023	0.93	-2.087	0.15
SPECIAL X POST	β_6	1.581	0.06*	-0.112	0.76	2.228	0.12
BELOW	β_7	-0.782	0.60	-2.216	0.13	4.057	0.47
BELOW X POST	β_8	2.347	0.19	4.937	0.01***	-3.342	0.44
POST	β_9	-0.269	0.10*	-0.052	0.68	0.399	0.15
SIZE	β_{10}	0.284	0.00***	0.244	0.00***	0.179	0.08*
MTB	β_{11}	-0.004	0.84	-0.037	0.04**	0.014	0.77
STDROA	β_{12}	-7.904	0.02**	-6.052	0.14	-7.132	0.17
GAAPLOSS	β_{13}	0.630	0.01**	-0.367	0.06*	0.728	0.02**
SALES_GROWTH	β_{14}	-0.003	0.93	0.083	0.10*	0.033	0.69
CONSTANT		-1.730	0.00***	-0.319	0.54	-1.459	0.06*
Industry fixed effects		Yes		Yes		Yes	
Year fixed effects		Yes		Yes		Yes	
Fiscal quarter effects		Yes		Yes		Yes	
H_0: $\beta_3 + \beta_4 = 0$		F = 15.09		F = 5.51		F = 2.16	
		p-value = 0.00		p-value = 0.02		p-value = 0.14	
Adj. R^2		0.56		0.58		0.68	
N		5,236		1,292		1,257	
Number of Firms		804		201		201	
Median CAR		- 0.01		0.08		-0.12	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.

In Table 6, I disaggregate total exclusions and investigate the exclusion quality of recurring item exclusions (*RECUR*; *RECUR X POST*), special items (*SPECIAL*; *SPECIAL X POST*) and below-the-line items (*BELOW*; *BELOW X POST*) (Model 2b). In column 3 I see that firms with a material restatement excluded recurring items in the pre-period that are persistent (*RECUR*: – 8.622, p-value: 0.00), signaling low quality. This observation is consistent with opportunistic managers trying to make a firm look more profitable than it actually is by excluding regular expenses from its non-GAAP earnings. Ex-post, however, the quality of recurring item exclusions increases substantially (*RECUR X POST*: 7.198, p-value: 0.02).[70] Interestingly, the improvement is isolated in recurring expense exclusions – the exclusion type perceived as less

[70] While one could argue that this improvement is perhaps attributed to a decreased magnitude of these exclusions, I highlight that I find no significant difference in the exclusion magnitude of recurring expenses between the pre- and the post-period for material restatements firms (Table A3 in the appendix, *RECUR*; pre-period: $ 0.08, post-period $0.06). Even if there were a reduction in the amount excluded, the findings would suggest an improvement.

justifiable. As I find no improvement after less severe restatements (*RECUR X POST*: 0.098, p-value: 0.93), the documented improvement after material restatements supports the view that the improvement is likely attributable to increased shareholder monitoring, suggesting that investor scrutiny is a crucial determinant of firms' non-GAAP reporting choices. Overall, the quality of non-GAAP earnings (*EPS_NG X POST*: 1.306, p-value: 0.05) and non-GAAP exclusions (*RECUR X POST:* 7.198, p-value: 0.02*)* improves significantly after material financial restatements. I highlight that Christensen et al. (2019b) find an improvement in exclusion quality *(RECUR X POST)* after debt covenant violations, but not in earnings quality (*EPS_NG X POST).*

In sum, findings are consistent with my hypotheses (H2a and H2b). I find that non-GAAP total exclusions quality improves after material restatements (H2b) but not after less severe restatements (H2a). After disaggregating total exclusions into its components, I show that the improvement is limited to the most criticized type of adjustments – recurring expense exclusions. Overall, these findings suggest that the improvement in quality is attributable to heightened investor scrutiny after material restatement announcements.

4.3 Investors' Responsiveness to Aggressive Non-GAAP Reporting Choices

So far, I suggested that heightened investor scrutiny improves non-GAAP reporting quality after material restatements. While this interpretation closely follows prior literature (Christensen et al. 2019b), I cannot rule out the possibility that the improvement is solely attributable to other parties (e.g., the auditor is consulted after the restatement and improves non-GAAP disclosure). To establish a link between firms' non-GAAP reporting choice and investor scrutiny, I reinvestigate one of the major findings by Mehring et al. (2020) – investors change their responsiveness to the recurring expense exclusions after the restatement announcement. I investigate investors' reaction to aggressive non-GAAP reporting choices using an ERC-design (Mehring et al. 2020; Wilson 2008; Chen et al. 2014b). Importantly, I focus on investor's responsiveness to the exclusion of recurring expenses (*UE X RECUR_EXP*) in the pre- and post-restatement period. For the purpose of comparison, I note that the corresponding interaction in Mehring et al. (2020) is labeled as "UE X EXLUDE" (model 1, Table 5 in Mehring et al. (2020)).

$$UR_{i,t} = \alpha_1 + \beta_1 UE_{i,t} + \beta_2 RECUR\_EXP_{i,t} + \beta_3 UE_{i,t} \times RECUR\_EXP_{i,t} + \beta_4 NONLINEAR_{i,t} + \sum_{k=5}^{11} \beta_k CONTROLS_{i,t} + \sum_{k=12}^{18} \beta_k \left[UE_{i,t} \times CONTROLS_{i,t} \right] + \varepsilon_{i,t}, \quad (3)$$

where: $CONTROLS_{i,t} = \{MTB_{i,t}, BETA_{i,t}, SIZE_{i,t}, LOSSNONGAAP_{i,t}, Q4_{i,t}, PREDICT_{i,t}, PERSIST_{i,t}\}$

I adopt the ERC-design by prior literature (Mehring et al. 2020; Wilson 2008; Chen et al. 2014b). In the ERC-design (Model 3), the dependent variable is the unexpected returns (*UR*) around the earnings announcement date. *UE* represents the earnings surprise, which is defined as the actual non-GAAP earnings minus the median analyst forecast 90 days prior to the earnings announcement. The coefficient for *UE* is the earnings response coefficient (ERC). The ERC is expected to be positive, meaning that investors respond positively to positive news (positive earnings surprises), and negatively to negative news. *UE* captures the investor's responsiveness to earnings surprises when recurring expenses are not excluded and *UE X RECUR_EXP* captures the ERC-premium or discount when recurring expenses are excluded. A negative coefficient for *UE X RECUR_EXP* will suggest that investors are less responsive to aggressively reported earnings (ERC-discount). The potential ERC-discount (*UE X RECUR_EXP*) can be interpreted as investors' punishment. I control for risk (*BETA*), earnings persistence (*PERSIST*), earning predictability (*PREDICT*), non-GAAP based loss (*NONGAAPLOSS*), size (*SIZE*), growth opportunities (*MTB*) and for the fourth fiscal quarter

(*Q4*). These control variables follow prior literature (Mehring et al. 2020; Wilson 2008; Chen et al. 2014b) and are defined in more detail the appendix (Table A1).

Consistent with prior literature (Mehring et al. 2020), in Table 7, I show that investors are less responsive to aggressively reported earnings in the post-restatement period relative to non-aggressively reported non-GAAP earnings (column 2: *UE X RECUR_EXP*: – 0.703 p-value: 0.06). In the pre-period investors do not punish aggressive non-GAAP reporting choices (column 1: *UE X RECUR_EXP*: – 0.006 p-value: 0.99). This finding suggests that investors' responsiveness has changed from the pre- to the post-period. In detail, after the restatement, investors are by 13.46 percent (0.703/5.220) less responsive to earnings when recurring expenses are excluded. This number aligns with Mehring et al. (2020), who find and an 11.5 percent ERC-discount (for a smaller restatement sample of 264 firms) and Doyle et al. (2013), who find "a 14 % ERC discount from the overall ERC" (p. 54) (for a non-restatement sample) when recurring expenses are excluded.[71]

This finding indicates that investors have become more attentive ex-post and are able to see through the quality of non-GAAP exclusions after the restatement announcement. It also supports the view that managers might have acknowledged investors' ex-post ability to distinguishing between aggressive and non-aggressive non-GAAP reporting choices, and thus have improved non-GAAP reporting. I note that one could assume that investors' will not punish aggressive non-GAAP reporting choices because firms have improved non-GAAP reporting as evidenced by prior tests. However, investors' potential rewarding reaction to firms' improvement in non-GAAP reporting is conditional on the perceived financial reporting quality (e.g., ERC), which is likely to remain low for several quarters some firms (Mehring et al. 2020; Chen et al. 2014b). Moreover, investors can evaluate the quality of current exclusions only in future periods since quality depends on the persistence of current earnings for future GAAP operating earnings, creating a natural time lag. Hence, it might take several quarters until the investor is able to acknowledge the improvement and might regain confidence in provided financial information. In sum, I argue that a change in investors' ability to see through the quality of non-GAAP exclusions and firms' improvement in recurring expense exclusions are consistent with a (causal) relationship between managers reporting choices and investor

[71] I note that Doyle et al. (2013) do NOT investigate a restatement setting. Relative to my research, Mehring et al. (2020) apply a smaller sample (804 vs. 264 firms) and a longer post-restatement period (4 vs. 12 post-restatement quarters). Doyle et al. (2013) "find that the market discounts the firm's earnings surprise by 10% to 14% when the earnings surprise is associated with the use of income-increasing exclusions" (p. 55).

scrutiny. However, overall, it is challenging to disentangle sequential reactions and assumptions of the investors and the managers.

Table 7 Investor Responsiveness to Recurring Expense Exclusion before and after the Restatement Announcement (Dependent Variable: *UR*)

	Pre-Period (1)		**Post-Period (2)**	
	UR		*UR*	
Variable	Coeff.	p-value	Coeff.	p-value
UE	5.805	0.00***	5.220	0.00***
RECUR_EXP	-0.005	0.13	-0.006	0.09*
UE X RECUR_EXP	0.006	0.99	**-0.703**	**0.06***
NONLINEAR	-36.048	0.00***	-39.063	0.00***
MTB	-0.001	0.80	-0.001	0.40
BETA	-0.003	0.08*	-0.003	0.09*
SIZE	0.000	0.85	-0.000	0.88
NONGAAPLOSS	-0.005	0.26	-0.010	0.02**
Q4	0.002	0.66	-0.003	0.34
PREDICT	-0.001	0.80	0.002	0.15
PERSIST	-0.001	0.49	0.002	0.15
UE X MTB	-0.531	0.00***	-0.381	0.01***
UE X BETA	-0.080	0.61	-0.376	0.00***
UE X SIZE	1.200	0.00***	0.530	0.01**
UE X NONGAAPLOSS	-1.554	0.01***	-1.540	0.00***
UE X Q4	-0.628	0.12	-0.790	0.03**
UE X PREDICT	0.242	0.01**	0.402	0.00***
UE X PERSIST	0.107	0.55	0.036	0.77
CONSTANT	0.002	0.96	0.008	0.66
Industry fixed effects	Yes		Yes	
Year fixed effects	Yes		Yes	
Adj. R^2	0.11		0.11	
N	2,545		2,526	
Firms	804		804	
Median CAR	- 0.01		-0.01	

* p<0.1; ** p<0.05; *** p<0.01; This table reports investors' responsiveness to firms quarterly earnings announcement before and after the restatement. I capture investors' response to aggressively reported earnings with *UE X RECUR_EXP*. I investigate the pre-period in column 1 and the post-period in column 2. The reported p-values are based on standard errors adjusted for firm-level clustering.

In sum, my findings align with hypotheses (H3a and H3b). I find that investors do not punish firms for aggressively reported non-GAAP earnings before the restatement announcement (H3a). After the restatement announcement, however, I evidence an ERC-discount, suggesting that investors have become aware of aggressive non-GAAP reporting choices and are able to identify those on average, as evidenced through the ERC-discount for aggressive non-GAAP reporting choices in the post-period (H3b).

V. ROBUSTNESS TESTS and SUGGESTIONS FOR FUTURE RESEARCH

5.1 Implementation of Bentley et al. (2018) Pro-Forma Data

In the robustness test section, I first implement actual pro-forma data and replace I/B/E/S street earnings with data provided by Bentley et al. (2018) in 1,271 cases.[72] Findings for the decreased likelihood of recurring expense exclusions (Table 8), improved non-GAAP exclusion quality (Table 9 and 10), and investor's responsiveness to aggressively reported earnings (Table 11) remain qualitatively similar to main tables. Consistent with my prediction, I show that firms improve non-GAAP reporting after material restatements.

[72] My original set of observations reflects 5,236 firm quarter observations. Out of these 5,236 cases I find a record in Bentley et al. (2018) data for 2,947 observations. Out of these 2,947 observations, the manager reports pro-forma earnings in 1,271. Out of these 1,271 observations, I/B/E/S is identical to actual pro-forma earnings in 1,011 observations (79.54 percent). In the deviating observations (260) the actual pro-forma earnings are higher than the street earnings, supporting findings by Bentley et al. (2018), who document that street earnings (I/B/E/S) on average underestimate managerial aggressiveness.

Table 8 Robust: Likelihood of Recurring Expense Exclusions (Dependent Variable: *RECUR_EXPENSE*), Bentley et al. (2018) data

	Full Sample (1)		Upper Quartile CAR (2)		Lower Quartile CAR (3)	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
POST	**-0.293**	**0.00*** **	**-0.356**	**0.00*** **	**-0.353**	**0.00*** **
SIZE	0.034	0.22	0.008	0.90	0.003	0.95
MTB	-0.005	0.52	0.002	0.89	0.004	0.77
STDROA	0.942	0.11	0.272	0.82	1.707	0.11
GAAPLOSS	0.121	0.07*	0.104	0.44	0.030	0.82
SALES_GROWTH	0.021	0.17	0.041	0.29	0.009	0.70
SPECIALCHG	0.371	0.00***	0.269	0.01**	0.311	0.00***
MISS	1.263	0.00***	1.267	0.00***	1.304	0.00***
ROA	0.079	0.26	-0.000	1.00	0.157	0.14
INST	0.143	0.08*	0.051	0.76	0.260	0.11
ANALYST	0.015	0.01***	0.027	0.04**	0.024	0.03**
LITIGATE	0.224	0.01***	0.200	0.35	0.297	0.03**
LEVERAGE	-0.001	0.93	-0.009	0.66	-0.008	0.67
OCF	0.078	0.85	-0.050	0.95	-0.411	0.58
AGE	-0.009	0.07*	-0.018	0.07*	-0.011	0.26
RECURR_EXPENSE_LAG	0.871	0.00***	0.867	0.00***	0.754	0.00***
BIG_AUDITOR	0.054	0.57	-0.126	0.55	-0.344	0.04**
AUD_TENURE	0.005	0.22	-0.001	0.94	0.010	0.25
STRING	0.152	0.16	-0.199	0.43	0.064	0.73
FUTURE_FINANCE	0.035	0.52	0.076	0.50	-0.166	0.11
OPERATING_CYCLE	0.000	0.99	-0.117	0.18	-0.050	0.50
ALTMANZ	0.004	0.56	-0.009	0.47	0.001	0.95
ACCRUALS	-0.021	0.94	0.088	0.86	-0.413	0.38
CONSTANT	-2.341	0.00***	-1.209	0.08*	-1.703	0.00***
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Area under ROC curve	0.8626		0.8755		0.8558	
Pseudo R^2	0.33		0.36		0.31	
N	5,263		1,291		1,255	
Number of Firms	804		201		201	
Median CAR	- 0.01		0.08		-0.12	
Marginal Effect *POST*	**-0.069**		**-0.061**		**-0.078**	

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.
In regression 2, 1 observations had to be dropped since the year/industry dummy predicts failure perfectly.
In regression 3, 2 observations had to be dropped since the year/industry dummy predicts success perfectly.
The number of firms and the median CAR refer to the sample if observations were not dropped.

Table 9 Robust: Persistence of Total Exclusions (Dependent Variable: *FUTGAAP*), Bentley et al. (2018) data

Variable		Full Sample (1)		Upper Quartile CAR (2)		Lower Quartile CAR (3)	
		FUTGAAP		*FUTGAAP*		*FUTGAAP*	
		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	β_1	2.413	0.00***	1.508	0.01**	2.694	0.00***
EPS_NG X POST	β_2	**0.966**	**0.03****	-0.164	0.54	**1.322**	**0.04****
TOTALEXCL	β_3	-2.562	0.00***	-0.589	0.02**	-3.661	0.00***
TOTALEXCL X POST	β_4	**1.102**	**0.10***	-0.102	0.79	**2.912**	**0.01*****
POST	β_5	-0.163	0.28	-0.034	0.79	0.518	0.05*
SIZE	β_6	0.281	0.00***	0.253	0.00***	0.189	0.07*
MTB	β_7	-0.009	0.71	-0.037	0.08*	-0.008	0.90
STDROA	β_8	-8.729	0.01**	-6.486	0.12	-6.753	0.23
GAAPLOSS	β_9	0.266	0.30	-0.631	0.00***	0.068	0.87
SALES_GROWTH	β_{10}	0.021	0.60	0.074	0.12	0.033	0.66
CONSTANT		-1.526	0.00***	-0.170	0.76	-1.368	0.06*
Industry fixed effects		Yes		Yes		Yes	
Year fixed effects		Yes		Yes		Yes	
Fiscal quarter effects		Yes		Yes		Yes	
H_0: $\beta_3 + \beta_4 = 0$		F = 17.63		F = 3.12		F = 4.72	
		p-value = 0.00		p-value = 0.08		p-value = 0.03	
Adj. R^2		0.54		0.55		0.65	
N		5,236		1,292		1,257	
Number of Firms		804		201		201	
Median CAR		- 0.01		0.08		-0.12	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.

Table 10 Robust: Persistence of Recurring Expense Exclusions (Dependent Variable: *FUTGAAP*), Bentley et al. (2018) data

		Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
		FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	β_1	2.744	0.00***	1.759	0.00***	3.394	0.00***
EPS_NG X POST	β_2	**0.933**	**0.02****	-0.152	0.57	**1.038**	**0.02****
RECUR	β_3	-5.363	0.00***	-2.676	0.01***	-8.417	0.00***
RECUR X POST	β_4	1.929	0.22	0.642	0.50	**6.972**	**0.02****
SPECIAL	β_5	-2.017	0.01**	0.065	0.80	-1.979	0.17
SPECIAL X POST	β_6	1.508	0.06*	-0.161	0.67	2.163	0.13
BELOW	β_7	-0.777	0.61	-2.490	0.10	4.065	0.47
BELOW X POST	β_8	2.206	0.21	5.281	0.01***	-3.326	0.44
POST	β_9	-0.265	0.09*	-0.064	0.61	0.356	0.20
SIZE	β_{10}	0.283	0.00***	0.245	0.00***	0.178	0.09*
MTB	β_{11}	-0.003	0.87	-0.037	0.05**	0.016	0.73
STDROA	β_{12}	-8.017	0.02**	-6.100	0.13	-7.057	0.17
GAAPLOSS	β_{13}	0.639	0.01**	-0.358	0.07*	0.727	0.02**
SALES_GROWTH	β_{14}	-0.001	0.98	0.084	0.09*	0.030	0.72
CONSTANT		-1.721	0.00***	-0.315	0.55	-1.452	0.06*
Industry fixed effects		Yes		Yes		Yes	
Year fixed effects		Yes		Yes		Yes	
Fiscal quarter effects		Yes		Yes		Yes	
H_0: $\beta_3 + \beta_4 = 0$		F = 18.01		F = 5.60		F = 2.41	
		p-value = 0.00		p-value = 0.02		p-value = 0.12	
Adj. R^2		0.56		0.58		0.68	
N		5,236		1,292		1,257	
Number of Firms		804		201		201	
Median CAR		- 0.01		0.08		-0.12	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.

Table 11 Robust: Investor Responsiveness to Recurring Expense Exclusion before and after the Restatement Announcement (Dependent Variable: *UR*), Bentley et al. (2018) data

	Pre-Period (1)		Post-Period (2)	
	UR		*UR*	
Variable	Coeff.	p-value	Coeff.	p-value
UE	5.655	0.00***	5.278	0.00***
RECUR_EXP	-0.006	0.06*	-0.005	0.16
UE X RECUR_EXP	0.404	0.32	**-0.709**	**0.06***
NONLINEAR	-27.741	0.00***	-38.781	0.00***
MTB	-0.001	0.79	-0.001	0.41
BETA	-0.003	0.12	-0.003	0.09*
SIZE	0.001	0.68	-0.001	0.78
NONGAAPLOSS	-0.005	0.33	-0.011	0.01**
Q4	0.002	0.65	-0.004	0.31
PREDICT	-0.001	0.71	0.002	0.16
PERSIST	-0.001	0.59	0.002	0.13
UE X MTB	-0.544	0.00***	-0.379	0.01***
UE X BETA	-0.091	0.56	-0.373	0.00***
UE X SIZE	1.214	0.00***	0.523	0.01**
UE X NONGAAPLOSS	-2.043	0.00***	-1.637	0.00***
UE X Q4	-0.686	0.08*	-0.805	0.03**
UE X PREDICT	0.218	0.02**	0.401	0.00***
UE X PERSIST	-0.003	0.99	0.048	0.70
CONSTANT	0.002	0.94	0.008	0.68
Industry fixed effects	Yes		Yes	
Year fixed effects	Yes		Yes	
Adj. R^2	0.11		0.11	
N	2,542		2,527	
Firms	804		804	
Median CAR	- 0.01		-0.01	

* p<0.1; ** p<0.05; *** p<0.01; This table reports investors' responsiveness to firms quarterly earnings announcement before and after the restatement. I capture investors' response to aggressively reported earnings with *UE X RECUR_EXP*. I investigate the pre-period in column 1 and the post-period in column 2. The reported p-values are based on standard errors adjusted for firm-level clustering.

5.2 Three Pre- and Three Post-Restatement Quarter Observations per Firm

In my main analyses, I required at least one firm quarter observation per firm in the pre- and the post-period. To rule out the concern that my results are purely driven by this design choice, which is also applied by Chen et al. (2014b), I modify the requirement to having at least 3 firm quarter observations in the pre- and post-period, meaning that each firm is represented by at least 6 out of possible 8 quarter observations. My sample size declines from 804 to 537 firms. Findings for the decreased likelihood of recurring expense exclusions (Table 12), improved non-GAAP exclusion quality (Table 13 and 14) and investor's responsiveness to aggressively reported earnings (Table 15) remain qualitatively similar. Consistent with my prediction, I show that firms improve non-GAAP reporting after material restatements.

Table 12 Robust: Likelihood of Recurring Expense Exclusions (Dependent Variable: *RECUR_EXPENSE*), 3obs3obs

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
POST	**-0.262**	**0.00*** **	**-0.274**	**0.01** **	**-0.234**	**0.03** **
SIZE	0.034	0.31	0.007	0.92	0.014	0.82
MTB	0.003	0.84	0.008	0.78	-0.007	0.71
STDROA	1.182	0.18	0.947	0.70	0.045	0.98
GAAPLOSS	0.122	0.13	0.165	0.32	0.202	0.21
SALES_GROWTH	0.036	0.04**	0.066	0.13	0.027	0.35
SPECIALCHG	0.349	0.00***	0.202	0.09*	0.172	0.07*
MISS	1.274	0.00***	1.203	0.00***	1.347	0.00***
ROA	0.071	0.30	0.046	0.65	0.160	0.12
INST	0.134	0.16	0.043	0.82	0.095	0.60
ANALYST	0.013	0.05**	0.020	0.20	0.019	0.08*
LITIGATE	0.154	0.12	0.172	0.56	0.331	0.05*
LEVERAGE	-0.006	0.65	-0.014	0.62	-0.039	0.17
OCF	-0.090	0.86	-0.669	0.53	-0.352	0.71
AGE	-0.008	0.17	-0.020	0.07*	-0.016	0.24
RECURR_EXPENSE_LAG	0.915	0.00***	0.893	0.00***	0.695	0.00***
BIG_AUDITOR	0.169	0.16	0.058	0.83	-0.301	0.11
AUD_TENURE	0.004	0.42	-0.003	0.75	0.007	0.52
STRING	0.164	0.19	-0.055	0.82	0.021	0.92
FUTURE_FINANCE	0.107	0.09*	0.089	0.51	0.039	0.74
OPERATING_CYCLE	0.001	0.98	-0.094	0.42	-0.045	0.64
ALTMANZ	-0.002	0.80	0.000	0.97	-0.005	0.72
ACCRUALS	-0.506	0.14	-0.122	0.87	-0.822	0.12
CONSTANT	-2.497	0.00***	-1.758	0.05*	-1.766	0.01***
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Pseudo R^2	0.35		0.37		0.33	
N	4,008		1,000		993	
Number of Firms	537		134		135	
Median CAR	-0.01		0.07		-0.10	
Marginal Effect *POST*	**-0.064*** **		**-0.061** **		**-0.059** **	

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.
In regression 2, 1 observations had to be dropped since the year/industry dummy predicts failure perfectly.
In regression 3, 2 observations had to be dropped since the year/industry dummy predicts success perfectly.
The number of firms and the median CAR refer to the sample if observations were not dropped.

Table 13 Robust: Persistence of Total Exclusions (Dependent Variable: *FUTGAAP*), 3obs3obs

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	2.608	0.00***	0.886	0.10	2.913	0.00***
EPS_NG X POST	0.646	0.21	-0.188	0.41	0.646	0.38
TOTALEXCL	-3.352	0.00***	-0.455	0.05*	-4.275	0.01***
TOTALEXCL X POST	**2.012**	**0.05***	0.193	0.56	**3.463**	**0.04****
POST	-0.222	0.31	-0.053	0.73	0.700	0.06*
SIZE	0.342	0.00***	0.398	0.00***	0.255	0.05**
MTB	-0.015	0.59	-0.085	0.01***	-0.023	0.72
STDROA	-13.815	0.05*	-0.250	0.94	-9.098	0.26
GAAPLOSS	0.604	0.13	-0.931	0.00***	-0.015	0.98
SALES_GROWTH	0.048	0.39	0.110	0.07*	0.077	0.47
CONSTANT	-1.770	0.01**	-0.970	0.13	-1.876	0.03**
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Adj. R^2	0.57		0.53		0.71	
N	4,008		1,001		995	
Number of Firms	537		134		135	
Median CAR	-0.01		0.07		-0.10	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. This sample is based on firms that fulfill the requirement of at least 3 firm-quarter observations in each period (pre- and post-period)

Table 14 Robust: Persistence of Recurring Expense Exclusions (Dependent Variable: *FUTGAAP*), 3obs3obs

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	2.947	0.00***	1.075	0.04**	3.495	0.00***
EPS_NG X POST	0.561	0.21	-0.327	0.23	0.431	0.37
RECUR	-7.093	0.00***	-2.272	0.10*	-11.062	0.01***
RECUR X POST	3.568	0.13	2.110	0.18	**9.610**	**0.04****
SPECIAL	-2.630	0.02**	-0.023	0.95	-3.037	0.13
SPECIAL X POST	2.358	0.05**	-0.312	0.40	3.586	0.06*
BELOW	-1.244	0.36	-0.308	0.72	4.360	0.34
BELOW X POST	1.036	0.70	4.393	0.06*	-9.874	0.09*
POST	-0.303	0.21	-0.019	0.91	0.411	0.29
SIZE	0.352	0.00***	0.390	0.00***	0.241	0.03**
MTB	-0.005	0.85	-0.079	0.01**	-0.044	0.50
STDROA	-12.865	0.06*	-0.197	0.95	-9.881	0.22
GAAPLOSS	1.019	0.01***	-0.826	0.01**	0.758	0.05*
SALES_GROWTH	0.022	0.58	0.115	0.06*	0.084	0.44
CONSTANT	-2.150	0.00***	-1.079	0.08*	-1.723	0.03**
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Adj. R^2	0.59		0.54		0.74	
N	4,008		1,001		995	
Number of Firms	537		134		135	
Median CAR	-0.01		0.07		-0.10	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. This sample is based on firms that fulfill the requirement of at least 3 firm-quarter observations in each period (pre- and post-period)

Table 15 Robust: Investor Responsiveness to Recurring Expense Exclusion <u>before</u> and <u>after</u> the Restatement Announcement (Dependent Variable: *UR*), 3obs3obs

	Pre-Period (1)		**Post-Period (2)**	
	UR		*UR*	
Variable	Coeff.	p-value	Coeff.	p-value
UE	7.745	0.00***	7.263	0.00***
RECUR_EXP	-0.005	0.13	-0.010	0.01**
UE X RECUR_EXP	0.182	0.72	**-1.016**	**0.04****
NONLINEAR	-87.184	0.00***	-104.478	0.00***
MTB	-0.001	0.40	-0.000	0.98
BETA	-0.002	0.27	-0.004	0.03**
SIZE	0.002	0.39	-0.001	0.50
NONGAAPLOSS	-0.003	0.65	-0.009	0.07*
Q4	0.003	0.52	-0.005	0.16
PREDICT	-0.002	0.24	0.002	0.23
PERSIST	-0.004	0.01**	0.002	0.19
UE X MTB	-0.691	0.07*	-0.737	0.01**
UE X BETA	0.201	0.36	-0.227	0.28
UE X SIZE	1.210	0.00***	0.709	0.07*
UE X NONGAAPLOSS	-2.001	0.01***	-1.613	0.01***
UE X Q4	-2.389	0.00***	-0.605	0.21
UE X PREDICT	0.365	0.00***	0.527	0.00***
UE X PERSIST	0.224	0.25	-0.109	0.55
CONSTANT	0.001	0.99	-0.008	0.49
Industry fixed effects	Yes		Yes	
Year fixed effects	Yes		Yes	
Adj. R^2	0.13		0.13	
N	1,938		1,946	
Firms	537		537	
Median CAR	- 0.01		-0.01	

* p<0.1; ** p<0.05; *** p<0.01; This table reports investors' responsiveness to firms quarterly earnings announcement before and after the restatement. I capture investors' response to aggressively reported earnings with *UE X RECUR_EXP*. I investigate the pre-period in column 1 and the post-period in column 2. The reported p-values are based on standard errors adjusted for firm-level clustering. This sample is based on firms that fulfill the requirement of at least 3 firm-quarter observations in each period (pre- and post-period)

5.3 Observation Window of One Pre- and One Post-Restatement Quarter

In my main analyses, I investigate a pre- and post-period with each reflecting 4 quarters before and 4 quarters after the restatement announcement. This design choice is similar to prior literature that defines the pre-restatement period through five pre-restatement quarters (Wilson 2008; Chen et al. 2014b). Further, this design choice addresses the view that non-GAAP reporting is a multi-period reporting strategy (Black et al. 2018b). However, to rule the possibility that my findings are purely driven by this specified time-window (4 pre- and 4 post-quarters), I also apply a shorter observation time-frame of 1 pre- and 1 post- quarter; the last quarter before and the first quarter after the restatement. This design choice aligns with Gordon et al. (2013) and Christensen et al. (2019b). My sample size declines from 804 to 586 firms. Findings for the decreased likelihood of recurring expense exclusions (Table 16) and improved non-GAAP earnings quality (Table 17 and 18) remain qualitatively similar. In Table 16 (column 3), I document a marginal effect for the material restatement sample of 20.5 percent (an increase from 9.1 percent from the original time-frame). Further, in Table 18 (column 3), I show that the quality of special item exclusions after material restatement announcement increases (*SPECIAL X POST*: 2.418, p-value: 0.01) in addition to the recurring expense exclusion quality.

Table 16 Robust: Likelihood of Recurring Expense Exclusions (Dependent Variable: *RECUR_EXPENSE*), dif1q1q

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
POST	**-0.379**	**0.00*** **	**-0.421**	**0.08***	**-0.930**	**0.00*** **
SIZE	0.055	0.27	-0.021	0.88	0.170	0.12
MTB	0.003	0.85	0.036	0.36	-0.049	0.09*
STDROA	0.926	0.26	-4.010	0.26	1.017	0.68
GAAPLOSS	0.109	0.41	0.414	0.33	0.050	0.87
SALES_GROWTH	0.021	0.53	0.165	0.06*	0.060	0.36
SPECIALCHG	0.295	0.00***	0.417	0.10*	0.174	0.43
MISS	1.371	0.00***	1.657	0.00***	1.356	0.00***
ROA	0.300	0.01**	-0.213	0.57	0.169	0.20
INST	-0.122	0.38	-0.282	0.33	0.497	0.18
ANALYST	0.013	0.18	0.033	0.21	0.015	0.46
LITIGATE	-0.008	0.96	0.044	0.90	0.470	0.14
LEVERAGE	0.029	0.09*	0.018	0.65	0.101	0.02**
OCF	-0.734	0.34	1.132	0.57	-0.075	0.96
AGE	-0.018	0.03**	-0.026	0.24	-0.042	0.03**
RECURR_EXPENSE_LAG	0.938	0.00***	0.769	0.00***	1.020	0.00***
BIG_AUDITOR	0.251	0.14	0.455	0.31	-0.248	0.41
AUD_TENURE	0.011	0.18	0.019	0.40	0.002	0.91
STRING	0.015	0.96	0.189	0.73	-0.691	0.19
FUTURE_FINANCE	0.120	0.26	0.787	0.01***	-0.146	0.46
OPERATING_CYCLE	0.004	0.95	-0.002	0.99	-0.078	0.57
ALTMANZ	0.018	0.11	-0.040	0.36	0.011	0.60
ACCRUALS	-1.260	0.01**	-0.433	0.71	-1.320	0.20
CONSTANT	-3.063	0.00***	-3.188	0.02**	-2.422	0.01**
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Pseudo R^2	0.36		0.48		0.42	
N	1,172		270		287	
Number of Firms	586		146		147	
Median CAR	-0.01		0.08		-0.11	
Marginal Effect *POST*	**-0.090**	**0.00*** **	**-0.081**	**0.093***	**-0.205**	**0.00*** **

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. This sample is based on a pre- and post-period, which reflects the last and first quarter before and after the restatement announcement. In regression 2, 16 (6) observations had to be dropped since the year/industry dummy predicts failure (success) perfectly. In regression 3, 5 (2) observations had to be dropped since the year/industry dummy predicts failure (success) perfectly. The number of firms and the median CAR refer to the sample if observations were not dropped.

Table 17 Robust: Persistence of Total Exclusions (Dependent Variable: *FUTGAAP*), dif1q1q

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	2.628	0.00***	1.545	0.00***	3.058	0.00***
EPS_NG X POST	0.571	0.25	0.068	0.83	0.701	0.33
TOTALEXCL	-1.125	0.05*	-0.153	0.24	-2.663	0.02**
TOTALEXCL X POST	0.380	0.55	-0.599	0.24	1.865	0.14
POST	-0.157	0.39	-0.182	0.30	0.434	0.17
SIZE	0.244	0.00***	0.342	0.00***	0.144	0.36
MTB	-0.042	0.44	-0.034	0.17	-0.192	0.24
STDROA	-7.301	0.15	-1.831	0.45	-18.373	0.03**
GAAPLOSS	0.062	0.84	-0.509	0.06*	-0.264	0.67
SALES_GROWTH	0.045	0.30	0.132	0.11	0.082	0.23
CONSTANT	-1.844	0.00***	-1.038	0.11	-2.404	0.08*
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Adj. R^2	0.55		0.66		0.68	
N	1,172		292		294	
Number of Firms	586		146		147	
Median CAR	-0.01		0.08		-0.11	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. This sample is based on a pre- and post-period, which reflects the last and first quarter before and after the restatement announcement.

Table 18 Robust: Persistence of Recurring Expense Exclusions (Dependent Variable: *FUTGAAP*), dif1q1q

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	3.013	0.00***	1.646	0.00***	4.471	0.00***
EPS_NG X POST	0.392	0.36	0.006	0.99	0.125	0.82
RECUR	-2.974	0.04**	-0.433	0.53	-8.306	0.00***
RECUR X POST	0.462	0.77	-0.653	0.56	**4.746**	**0.07***
SPECIAL	-0.200	0.73	0.110	0.68	-1.922	0.00***
SPECIAL X POST	0.196	0.82	-0.579	0.51	**2.418**	**0.01*****
BELOW	-1.573	0.35	-2.605	0.00***	1.149	0.81
BELOW X POST	2.028	0.09*	1.647	0.14	2.855	0.37
POST	-0.126	0.40	-0.153	0.38	0.291	0.28
SIZE	0.237	0.01***	0.326	0.00***	0.271	0.07*
MTB	-0.026	0.61	-0.033	0.19	-0.129	0.31
STDROA	-6.581	0.20	-1.749	0.46	-13.909	0.02**
GAAPLOSS	0.353	0.25	-0.480	0.09*	0.743	0.08*
SALES_GROWTH	0.047	0.23	0.133	0.11	0.038	0.67
CONSTANT	-2.053	0.00***	-1.050	0.10*	-2.916	0.02**
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Adj. R^2	0.56		0.67		0.75	
N	1,172		292		294	
Number of Firms	586		146		147	
Median CAR	-0.01		0.08		-0.11	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. This sample is based on a pre- and post-period, which reflects the last and first quarter before and after the restatement announcement.

5.4 Likelihood of Special Item Exclusions

So far, I focused on the likelihood of recurring expense exclusions. In an additional robustness test, I investigate the likelihood of special item exclusions and find that this less aggressive exclusion type does not decrease after restatement announcements (Table 19). This finding suggests that the improvement is concentrated in recurring expense exclusions. Moreover, in the appendix (Table A3), I observe that material restatement firms increase the magnitude of special item exclusions from $ 0.06 to $ 0.16, while less severe restatement firms decrease the magnitude of special item exclusion from $ 0.08 to $ 0.06.

Table 19: Likelihood of Special Item Exclusions

(Dependent Variable: *SPECIAL*)

	Full Sample (1)		Upper Quartile CAR (2)		Lower Quartile CAR (3)	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
POST	-0.047	0.43	0.086	0.52	-0.017	0.90
SIZE	0.045	0.22	0.103	0.12	0.087	0.33
MTB	-0.016	0.19	-0.009	0.64	0.044	0.07*
STDROA	2.121	0.00***	1.597	0.40	2.344	0.23
GAAPLOSS	0.263	0.00***	0.377	0.06*	0.330	0.09*
SALES_GROWTH	0.029	0.11	0.036	0.36	0.024	0.45
SPECIALCHG	1.252	0.00***	1.503	0.00***	1.565	0.00***
MISS	0.120	0.09*	0.133	0.34	0.350	0.03**
ROA	0.262	0.07*	5.843	0.06*	0.218	0.41
INST	-0.030	0.78	0.030	0.89	0.308	0.32
ANALYST	-0.011	0.23	-0.027	0.09*	0.008	0.66
LITIGATE	0.026	0.83	0.095	0.72	-0.209	0.47
LEVERAGE	0.002	0.91	-0.041	0.05*	-0.047	0.08*
OCF	2.348	0.00***	0.170	0.91	4.114	0.00***
AGE	0.015	0.02**	0.019	0.15	0.035	0.04**
RECURR_EXPENSE_LAG	-0.001	0.98	0.000	1.00	-0.041	0.77
BIG_AUDITOR	0.280	0.02**	0.733	0.03**	0.009	0.97
AUD_TENURE	0.001	0.87	-0.007	0.57	0.019	0.16
STRING	0.100	0.52	0.017	0.97	-0.245	0.44
FUTURE_FINANCE	-0.010	0.90	-0.159	0.35	0.112	0.48
OPERATING_CYCLE	-0.010	0.86	-0.060	0.64	-0.025	0.82
ALTMANZ	-0.004	0.67	-0.008	0.64	-0.023	0.22
ACCRUALS	2.049	0.00***	1.529	0.32	4.192	0.00***
CONSTANT	-2.988	0.00***	-3.013	0.00***	-5.072	0.00***
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Pseudo R^2	0.18		0.27		0.31	
N	5,194		1,234		1,223	
Number of Firms	804		201		201	
Median CAR	- 0.01		0.08		-0.12	

This table presents the effect of financial restatements on the likelihood of special items and not recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.
In regression 1, 42 observations had to be dropped since the year/industry dummy predicts failure perfectly.
In regression 2, 58 observations had to be dropped since the year/industry dummy predicts failure perfectly.
In regression 3, 34 observations had to be dropped since the year/industry dummy predicts success perfectly.
The number of firms and the median CAR refer to the sample if observations were not dropped.

5.5 Placebo Test - Time Shift

Backward Time Shift

To rule out the possibility that my findings are random (or mechanically driven) and to support the view that the improvement is attributable to increased investor scrutiny (due to the restatement announcement), I shift the pre- and post-period 4 quarters backward, meaning that I compare non-GAAP reporting between an artificial pre-period (quarters – 7 to – 4 relative to the restatement announcement) and an artificial post-period (quarters – 3 to 0 relative to the restatement announcement). Consistent with my assumption, I neither find a decreased likelihood of recurring expense exclusions (Table 20) nor improved non-GAAP earnings quality (Table 21 and 22). Interestingly, I observe the opposite, suggesting that non-GAAP exclusion quality decreases when approaching the restatement date. In more detail, the placebo test allows me to investigate changes in non-GAAP reporting from year t-2 to t-1 relative to the restatement announcement. In Table 20 (column 3), I see that the likelihood of excluding expenses increases from t-2 to t-1 for firms that will subsequently announce a material restatement (Marginal Effect *POST*: 7.8 percent, p-value: 0.00). Moreover, in Table 21 (column 3), I show that the quality of non-GAAP earnings decreases (*EPS_NG X POST*: – 1.090, p-value: 0.07) for material restatement firms from year t-2 to t-1 (t-1 is the last year before the restatement announcement). For less severe restatement firms (Table 20 and Table 21, column 2), I find neither an increase in recurring expenses exclusions (Marginal Effect *POST*: 12.8 percent, p-value: 0.15) nor a decrease in non-GAAP earnings quality (*EPS_NG X POST*: 0.268, p-value: 0.27). For supportive purpose, in Figure 4, I plot the exclusion frequency for an extended timeframe of 20 quarters (12 quarters before and 8 quarters after the restatement) and see an increase of recurring expense exclusions leading to the restatement announcement and a sharp decrease after the first quarter of the restatement announcement. To assure that the illustrated increase (leading to the restatement announcement) in Figure 4 is not attributable to gaps in quarter observations, I plot the same graph for a sample, in which each firm is required to have full eight-quarter coverage (full 4 pre- and 4-post quarters) in the appendix (Figure A1). I note that the graph in Figure A1 represents 307 instead of 804 firms, but shows a similar pattern as in Figure 4 (804 firms).

Table 20 Robust: Likelihood of Recurring Expense Exclusions (Dependent Variable: *RECUR_EXPENSE*), 4 quarter back shift

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
POST	**0.175**	**0.00*** **	0.128	0.15	**0.325**	**0.00*** **
SIZE	0.058	0.04**	0.028	0.62	-0.038	0.49
MTB	-0.027	0.00***	-0.024	0.15	-0.009	0.52
STDROA	1.246	0.04**	1.203	0.34	2.578	0.07*
GAAPLOSS	0.112	0.08*	0.150	0.29	-0.096	0.45
SALES_GROWTH	0.015	0.26	0.002	0.94	0.023	0.46
SPECIALCHG	0.297	0.00***	0.132	0.18	0.398	0.00***
MISS	1.363	0.00***	1.200	0.00***	1.477	0.00***
ROA	-0.010	0.93	-0.527	0.00***	0.292	0.14
INST	0.239	0.00***	0.358	0.02**	0.302	0.10
ANALYST	0.013	0.02**	0.013	0.21	0.038	0.01***
LITIGATE	0.151	0.05*	0.246	0.11	0.192	0.17
LEVERAGE	0.016	0.20	0.003	0.92	0.014	0.55
OCF	-0.636	0.12	0.209	0.78	-1.258	0.08*
AGE	-0.005	0.29	-0.015	0.07*	0.005	0.62
RECURR_EXPENSE_LAG	0.886	0.00***	0.802	0.00***	0.771	0.00***
BIG_AUDITOR	0.052	0.56	0.069	0.73	-0.105	0.49
AUD_TENURE	-0.002	0.61	-0.010	0.21	-0.004	0.66
STRING	-0.056	0.57	-0.395	0.07*	-0.064	0.75
FUTURE_FINANCE	-0.030	0.57	-0.172	0.09*	-0.103	0.33
OPERATING_CYCLE	-0.029	0.47	-0.007	0.93	0.087	0.32
ALTMANZ	0.007	0.21	0.010	0.42	0.008	0.44
ACCRUALS	-0.415	0.16	-0.186	0.74	-0.802	0.09*
CONSTANT	-2.512	0.00***	-2.423	0.00***	-2.908	0.00***
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Pseudo R^2	0.35		0.36		0.31	
N	5,564		1,349		1,335	
Number of Firms	849		213		212	
Median CAR	0.00		0.08		-0.12	
Marginal Effect *POST*	**0.042*** **		**0.030**		**0. 078*** **	

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to an artificial pre-period that covers quarter -7 to -4 (relative to the actual restatement announcement date) and a post-period that covers quarters -3 to 0 (relative to the actual restatement announcement date), with quarter 0 being the last quarter before the restatement.

In regression 2, 6 observations had to be dropped since the year/industry dummy predicts failure perfectly.
In regression 3, 2 observations had to be dropped since the year/industry dummy predicts failure perfectly.
The number of firms and the median CAR refer to the sample if observations were not dropped.

Table 21 Robust: Persistence of Total Exclusions (Dependent Variable: *FUTGAAP*), 4 quarter back shift

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	2.754	0.00***	2.309	0.00***	3.326	0.00***
EPS_NG X POST	-0.330	0.26	0.268	0.27	**-1.090**	**0.07***
TOTALEXCL	-1.050	0.00***	-0.370	0.22	-0.805	0.04**
TOTALEXCL X POST	-0.294	0.42	-0.017	0.94	-0.806	0.18
POST	-0.060	0.48	-0.033	0.67	-0.403	0.06*
SIZE	0.242	0.00***	0.255	0.00***	0.168	0.08*
MTB	-0.004	0.83	-0.008	0.65	-0.044	0.34
STDROA	-4.207	0.02**	-3.377	0.00***	-1.403	0.67
GAAPLOSS	-0.123	0.36	-0.108	0.57	-0.140	0.62
SALES_GROWTH	-0.001	0.99	0.014	0.76	0.009	0.90
CONSTANT	-1.394	0.00***	-0.878	0.04**	-1.357	0.03**
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Adj. R^2	0.47		0.59		0.47	
N	5,564		1,349		1,335	
Number of Firms	849		213		212	
Median CAR	0.00		0.08		-0.12	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to an artificial pre-period that covers quarter -7 to -4 (relative to the actual restatement announcement date) and a post-period that covers quarters -3 to 0 (relative to the actual restatement announcement date), with quarter 0 being the last quarter before the restatement.

Table 22 Robust: Persistence of Recurring Expense Exclusions (Dependent Variable: *FUTGAAP*), 4 quarter back shift

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	2.860	0.00***	2.389	0.00***	3.597	0.00***
EPS_NG X POST	-0.264	0.35	0.324	0.21	**-1.073**	**0.05***
RECUR	-2.437	0.00***	-1.906	0.00***	-2.124	0.02**
RECUR X POST	-0.391	0.64	0.094	0.88	-0.740	0.69
SPECIAL	-0.253	0.65	0.327	0.26	-0.307	0.54
SPECIAL X POST	-0.488	0.52	-0.274	0.51	-0.687	0.63
BELOW	0.159	0.91	-0.414	0.65	0.447	0.84
BELOW X POST	-1.650	0.39	-0.177	0.84	-4.817	0.24
POST	-0.058	0.46	-0.036	0.63	-0.389	0.04**
SIZE	0.248	0.00***	0.252	0.00***	0.178	0.05*
MTB	-0.001	0.96	-0.002	0.89	-0.039	0.41
STDROA	-4.122	0.01**	-3.217	0.00***	-1.780	0.57
GAAPLOSS	0.082	0.52	0.030	0.87	0.178	0.49
SALES_GROWTH	-0.026	0.62	0.016	0.73	-0.016	0.81
CONSTANT	-1.446	0.00***	-0.966	0.02**	-1.310	0.03**
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Adj. R^2	0.49		0.60		0.47	
N	5,564		1,349		1,335	
Number of Firms	849		213		212	
Median CAR	0.00		0.08		-0.12	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to an artificial pre-period that covers quarter -7 to -4 (relative to the actual restatement announcement date) and a post-period that covers quarters -3 to 0 (relative to the actual restatement announcement date), with quarter 0 being the last quarter before the restatement.

Forward Time Shift

Next, I shift the observation period forward by 4 quarters and assume to find no improvement of non-GAAP reporting, since I have no attention grabbing between the artificially generated pre- and post-period (the pre- and post-period cover quarters 1 to 8 relative to the restatement announcement, where 1 is the first quarter after the restatement announcement). Consistent with my assumption, I neither find a decrease in the likelihood of recurring expense exclusions (Table 23), nor improved non-GAAP earnings quality (Table 24 and 25). In line with my main findings, I see that recurring expense exclusions are not negatively correlated with future firm performance in quarters 1 to 4 (Table 25, *RECUR*: – 0.803, p-value: 0.35). This supports my main findings. In more detail, the placebo test allows me to investigate changes in non-GAAP reporting from year t+1 to t+2 relative to the restatement announcement. Importantly, if I hypothetically saw no change in non-GAAP reporting, I could argue that the improvement is long-lived. In contrast, if I saw a deterioration of non-GAAP reporting, one might claim that the improvement in recurring expense exclusions would be rather short-lived. The latter finding would align with the view that investor scrutiny decreases over time, and so does non-GAAP reporting quality. Supporting the latter view, in Table 23 (column 3), I see that the likelihood of excluding expenses increases from t+1 to t+2 for firms that announced a material restatement (Marginal Effect *POST*: 4.0 percent, p-value: 0.04). In addition, in Table 25 (column 3), I document that the quality of recurring expense exclusions decreases in the second year after the restatement announcement, relative to the first year after the restatement (*RECUR X POST*: – 3.662, p-value: 0.08) for material restatement firms.[73]

[73] I note that the number of firms may deviate from the original sample, as I shift periods and still require at least 1 firm-quarter observation in each period (in the artificial pre- and post-period).

Table 23 Robust: Likelihood of Recurring Expense Exclusions (Dependent Variable: *RECUR_EXPENSE*), 4 quarter forward shift

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
POST	**0.070**	**0.08***	0.118	0.20	**0.180**	**0.04****
SIZE	0.087	0.01***	0.076	0.26	0.099	0.10*
MTB	-0.014	0.17	0.007	0.73	-0.026	0.15
STDROA	0.777	0.24	-1.616	0.37	0.799	0.39
GAAPLOSS	0.179	0.02**	0.296	0.08*	0.416	0.00***
SALES_GROWTH	0.034	0.06*	0.068	0.12	0.046	0.31
SPECIALCHG	0.556	0.00***	0.620	0.00***	0.546	0.00***
MISS	1.256	0.00***	1.339	0.00***	1.167	0.00***
ROA	0.025	0.60	0.557	0.00***	0.040	0.56
INST	0.203	0.02**	0.062	0.75	0.237	0.21
ANALYST	0.011	0.06*	0.024	0.09*	0.011	0.35
LITIGATE	0.261	0.01***	0.112	0.68	0.261	0.10
LEVERAGE	-0.004	0.75	0.001	0.96	-0.021	0.40
OCF	0.250	0.56	-0.525	0.61	-0.039	0.96
AGE	-0.005	0.36	-0.012	0.23	-0.021	0.05**
RECURR_EXPENSE_LAG	1.011	0.00***	0.958	0.00***	0.934	0.00***
BIG_AUDITOR	0.045	0.68	-0.091	0.73	-0.250	0.14
AUD_TENURE	0.002	0.72	0.003	0.77	0.012	0.29
STRING	0.053	0.66	-0.449	0.14	0.225	0.24
FUTURE_FINANCE	0.189	0.00***	0.410	0.00***	0.102	0.36
OPERATING_CYCLE	0.105	0.02**	-0.020	0.86	0.044	0.60
ALTMANZ	-0.003	0.69	-0.014	0.28	-0.008	0.56
ACCRUALS	-0.367	0.22	-0.444	0.43	-0.729	0.16
CONSTANT	-3.632	0.00***	-2.560	0.00***	-2.990	0.00***
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Pseudo R^2	0.37		0.42		0.37	
N	4,954		1,237		1,216	
Number of Firms	747		187		187	
Median CAR	-0.01		0.07		-0.11	
Marginal Effects *POST*	**0.016***		**0.023**		**0.040****	

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to an artificial pre-period that covers quarter 1 to 4 (relative to the actual restatement announcement date) and a post-period that covers quarters 5 to 8 (relative to the actual restatement announcement date), with quarter 1 being the first quarter after the restatement.

In regression 2, 1 observations had to be dropped since the year/industry dummy predicts success perfectly.

The number of firms and the median CAR refer to the sample if observations were not dropped.

Table 24 Robust: Persistence of Total Exclusions (Dependent Variable: *FUTGAAP*), 4 quarter forward shift

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	3.761	0.00***	2.257	0.00***	4.475	0.00***
EPS_NG X POST	-0.443	0.19	0.424	0.34	**-1.006**	**0.03****
TOTALEXCL	-0.927	0.00***	-0.384	0.08*	-0.313	0.22
TOTALEXCL X POST	-0.468	0.28	-0.200	0.51	-1.129	0.15
POST	0.071	0.56	-0.341	0.16	-0.046	0.83
SIZE	0.130	0.01***	0.002	0.99	0.228	0.01**
MTB	0.013	0.35	-0.011	0.78	0.028	0.19
STDROA	-4.051	0.04**	-8.513	0.03**	-2.466	0.21
GAAPLOSS	0.284	0.11	-0.548	0.03**	0.505	0.11
SALES_GROWTH	0.044	0.19	0.004	0.92	0.014	0.80
CONSTANT	-1.396	0.04**	1.300	0.19	-3.114	0.01***
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Adj. R^2	0.67		0.51		0.76	
N	4,954		1,237		1,216	
Number of Firms	747		187		187	
Median CAR	-0.01		0.07		-0.11	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to an artificial pre-period that covers quarter 1 to 4 (relative to the actual restatement announcement date) and a post-period that covers quarters 5 to 8 (relative to the actual restatement announcement date), with quarter 1 being the first quarter after the restatement.

Table 25 Robust: Persistence of Recurring Expense Exclusions (Dependent Variable: *FUTGAAP*), 4 quarter forward shift

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	3.953	0.00***	2.400	0.00***	4.650	0.00***
EPS_NG X POST	-0.410	0.19	0.500	0.19	**-1.008**	**0.01****
RECUR	-2.767	0.00***	-1.015	0.07*	-0.803	0.35
RECUR X POST	0.227	0.84	-2.238	0.10	**-3.662**	**0.08***
SPECIAL	-0.052	0.89	-0.118	0.59	0.259	0.60
SPECIAL X POST	-0.714	0.34	0.232	0.64	0.618	0.58
BELOW	-0.069	0.96	3.804	0.05**	-0.258	0.90
BELOW X POST	-0.859	0.71	1.865	0.66	-2.672	0.39
POST	0.038	0.72	-0.300	0.14	-0.162	0.45
SIZE	0.131	0.00***	0.041	0.59	0.224	0.01**
MTB	0.017	0.20	-0.017	0.57	0.040	0.08*
STDROA	-4.222	0.03**	-8.482	0.03**	-2.995	0.12
GAAPLOSS	0.529	0.01***	-0.209	0.23	0.676	0.03**
SALES_GROWTH	0.043	0.15	0.012	0.74	-0.022	0.69
CONSTANT	-1.664	0.02**	0.759	0.30	-3.342	0.01***
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Adj. R^2	0.66		0.56		0.76	
N	4,954		1,237		1,216	
Number of Firms	747		187		187	
Median CAR	-0.01		0.07		-0.11	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to an artificial pre-period that covers quarter 1 to 4 (relative to the actual restatement announcement date) and a post-period that covers quarters 5 to 8 (relative to the actual restatement announcement date), with quarter 1 being the first quarter after the restatement.

5.6 Regulation G

Given that the prior literature finds improvements of non-GAAP reporting after the Regulation G release, which became effective as of March 28th, 2003, (Whipple 2015; Black et al. 2012; Marques 2006), I test my findings separately for the post-regulation G period. The sample size declines from 804 to 616 restatement firms. My main findings for the decreased likelihood of recurring expense exclusions (Table 26) and improved non-GAAP exclusions quality (Table 27 and 28) remain qualitatively similar.

Table 26 Robust: Likelihood of Recurring Expense Exclusions (Dependent Variable: *RECUR_EXPENSE*), Post Reg-G

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
POST	**-0.267**	**0.00*** **	**-0.359**	**0.00*** **	**-0.306**	**0.00*** **
SIZE	0.013	0.68	-0.029	0.66	-0.127	0.05**
MTB	-0.003	0.77	0.007	0.73	-0.007	0.66
STDROA	0.383	0.60	-1.351	0.35	1.205	0.27
GAAPLOSS	0.072	0.35	-0.005	0.98	0.028	0.85
SALES_GROWTH	0.006	0.74	0.058	0.20	-0.031	0.28
SPECIALCHG	0.335	0.00***	0.199	0.09*	0.385	0.00***
MISS	1.196	0.00***	1.209	0.00***	1.101	0.00***
ROA	0.025	0.74	-0.068	0.59	0.245	0.07*
INST	0.134	0.13	0.034	0.85	0.117	0.46
ANALYST	0.016	0.01**	0.032	0.03**	0.032	0.02**
LITIGATE	0.229	0.02**	0.134	0.56	0.377	0.03**
LEVERAGE	0.003	0.83	0.002	0.94	-0.013	0.47
OCF	0.317	0.52	0.048	0.96	-0.002	1.00
AGE	-0.008	0.12	-0.017	0.10	0.002	0.84
RECURR_EXPENSE_LAG	0.892	0.00***	0.954	0.00***	0.727	0.00***
BIG_AUDITOR	0.091	0.36	-0.147	0.52	-0.178	0.27
AUD_TENURE	0.006	0.24	0.004	0.72	0.001	0.95
STRING	0.199	0.14	0.002	0.99	0.218	0.31
FUTURE_FINANCE	0.035	0.59	-0.031	0.80	-0.244	0.04**
OPERATING_CYCLE	0.028	0.50	-0.101	0.27	0.065	0.46
ALTMANZ	0.003	0.70	0.004	0.79	-0.001	0.94
ACCRUALS	-0.069	0.87	0.330	0.71	-0.403	0.57
CONSTANT	-2.260	0.00***	-0.569	0.49	-1.625	0.08*
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Area under ROC curve	0.8551		0.8761		0.8386	
Pseudo R^2	0.32		0.36		0.31	
N	4,035		996		977	
Number of Firms	616		154		154	
Median CAR	- 0.01		0.08		-0.12	
Marginal Effects *POST*	**-0.067*** **		**-0.081*** **		**-0.082*** **	

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to the post Regulation G period.

Table 27 Robust: Persistence of Total Exclusions (Dependent Variable: *FUTGAAP*), Post Reg-G

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	2.198	0.00***	1.473	0.03**	2.361	0.01***
EPS_NG X POST	**0.929**	**0.01*** **	-0.207	0.51	**1.613**	**0.00*** **
TOTALEXCL	-2.411	0.00***	-0.497	0.05**	-3.501	0.01**
TOTALEXCL X POST	1.018	0.20	0.004	0.99	**2.800**	**0.07***
POST	-0.228	0.10*	0.037	0.80	0.372	0.12
SIZE	0.344	0.00***	0.333	0.00***	0.214	0.01**
MTB	-0.005	0.79	-0.060	0.03**	0.019	0.67
STDROA	-9.652	0.01***	-10.459	0.03**	-1.984	0.59
GAAPLOSS	0.271	0.27	-0.387	0.11	0.131	0.65
SALES_GROWTH	0.044	0.30	0.089	0.13	-0.033	0.66
CONSTANT	-0.856	0.08*	-0.502	0.47	-1.093	0.23
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
H_0: $\beta_3 + \beta_4 = 0$	F = 9.77		F = 2.15		F = 5.04	
	p-value = 0.00		p-value = 0.14		p-value = 0.03	
Adj. R^2	0.56		0.57		0.69	
N	4,035		996		977	
Number of Firms	616		154		154	
Median CAR	- 0.01		0.08		-0.12	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to the post Regulation G period.

Table 28 Robust: Persistence of Recurring Expense Exclusions (Dependent Variable: *FUTGAAP*), Post Reg-G

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
	FUTGAAP		*FUTGAAP*		*FUTGAAP*	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
EPS_NG	2.466	0.00***	1.830	0.00***	2.793	0.00***
EPS_NG X POST	**0.838**	**0.01*** **	-0.161	0.67	**1.236**	**0.00*** **
RECUR	-5.012	0.00***	-2.876	0.02**	-7.649	0.02**
RECUR X POST	1.721	0.34	0.553	0.70	**7.323**	**0.06***
SPECIAL	-1.660	0.08*	0.041	0.89	-1.783	0.45
SPECIAL X POST	1.159	0.23	-0.309	0.43	0.804	0.73
BELOW	-2.251	0.07*	-3.891	0.19	-1.697	0.78
BELOW X POST	5.052	0.01**	9.705	0.02**	0.904	0.89
POST	-0.245	0.12	0.021	0.89	0.382	0.11
SIZE	0.345	0.00***	0.323	0.00***	0.219	0.00***
MTB	0.001	0.95	-0.052	0.03**	0.023	0.55
STDROA	-8.829	0.02**	-9.830	0.05**	0.255	0.95
GAAPLOSS	0.476	0.07*	-0.125	0.59	0.361	0.16
SALES_GROWTH	0.013	0.72	0.094	0.11	-0.034	0.70
CONSTANT	-1.040	0.03**	-0.628	0.37	-1.229	0.15
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
H_0: $\beta_3 + \beta_4 = 0$	F = 11.33		F = 5.28		F = 0.14	
	p-value = 0.00		p-value = 0.02		p-value = 0.71	
Adj. R^2	0.58		0.59		0.70	
N	4,035		996		977	
Number of Firms	616		154		154	
Median CAR	- 0.01		0.08		-0.12	

This table presents the effect of financial restatements on the non-GAAP earnings and non-GAAP exclusion quality. It reports results for an OLS regression for three samples. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering. These findings relate to the post Regulation G period.

5.7 Difference-in-Difference

While I opted against a difference-in-difference design in Table 4, in this section, I test material against less severe restatements in one regression and find that the decline in the exclusion frequency of recurring expenses in not significantly different between these two groups (Table 29).

Table 29 Robust: Likelihood of Recurring Expense Exclusions
(Dependent Variable: *RECUR_EXPENSE*)

	Upper vs. Lower CAR Quartile			
Variable	Coeff.	p-value	Average Marginal Effect	p-value
LOWER_QUARTILE_CAR	0.041	0.64	0.010	0.64
POST	**-0.356**	**0.00*****	**-0.088**	**0.00*****
POST X LOWER_QUARTILE_CAR	0.012	0.92	0.003	0.92
SIZE	0.000	0.99	0.000	0.99
MTB	0.003	0.79	0.001	0.79
STDROA	1.042	0.21	0.258	0.21
GAAPLOSS	0.073	0.44	0.018	0.44
SALES_GROWTH	0.025	0.24	0.006	0.24
SPECIALCHG	0.284	0.00***	0.070	0.00***
MISS	1.276	0.00***	0.315	0.00***
ROA	0.131	0.09*	0.032	0.09*
INST	0.159	0.16	0.039	0.16
ANALYST	0.028	0.00***	0.007	0.00***
LITIGATE	0.246	0.03**	0.061	0.03
LEVERAGE	-0.008	0.58	-0.002	0.58
OCF	-0.374	0.49	-0.092	0.49
AGE	-0.017	0.02**	-0.004	0.02**
RECURR_EXPENSE_LAG	0.819	0.00***	0.202	0.00***
BIG_AUDITOR	-0.246	0.06*	-0.061	0.06*
AUD_TENURE	0.008	0.22	0.002	0.22
STRING	-0.014	0.92	-0.003	0.92
FUTURE_FINANCE	-0.044	0.55	-0.011	0.55
OPERATING_CYCLE	-0.080	0.15	-0.020	0.15
ALTMANZ	-0.004	0.57	-0.001	0.57
ACCRUALS	-0.202	0.57	-0.050	0.57
CONSTANT	-1.399	0.00***		
Industry fixed effects	Yes			
Year fixed effects	Yes			
Fiscal quarter effects	Yes			
Area under ROC curve	0.8468			
Pseudo R^2	0.33			
N	2,549			
Number of Firms	804			
Median CAR	- 0.03			

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the 10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The reported p-values are based on standard errors adjusted for firm-level clustering.

5.7 Future Research Suggestions

Providing additional evidence on the evolution of non-GAAP earnings before the restatement announcement, I plotted the frequency of recurring expense exclusions over 12 pre- and 8 post-restatement quarters (see Figure 4).[74] One could be surprised to observe that the exclusion frequency of recurring expenses increases gradually 5 quarters before the restatement announcement, and declines sharply afterwards. This observation is consistent with the view that managers might try to extract rents from private information before the restatement announcement by inflating share prices though inappropriate non-GAAP adjustments. This idea aligns with prior literature (Griffin 2003; Thevenot 2012). Griffin (2003) shows that "net insider selling peaks before a corrective disclosure and falls dramatically following a disclosure" (p. 515) and Thevenot (2012) show that insider trading is higher for restatement firms with more negative market reactions to their restatement announcements. Altogether, these findings indicate that managers might inflate share prices and extract rents due to ex-ante information asymmetries. This leads me to the potential future research questions: "Do firms exploit the discretionary nature of non-GAAP reporting and report non-GAAP earnings more aggressively when they anticipate the release of financial restatements?"[75]

[74] Figure 3 illustrates the frequency of recurring expense exclusions for 4 pre- and 4 post-restatement quarters. Figure 4 illustrates the frequency of recurring expense exclusions for 12 pre- and 8 post-restatement quarters.

[75] The duration between the end of the misreporting period and the restatement announcement is referred to as the detection period. The detection period spans 1.47 years on average (Burns and Kedia 2006). The misreporting period suits well to study the determinants of misreporting and the post-restatement period suits best when investigating the consequences of restatements. For more details on the chronology of restatements, I suggest Karpoff et al. (2017) and the review on restatements by Sievers and Sofilkanitsch (2019).

VI. CONCLUSION

Non-GAAP reporting allows managers to exclude items, which under GAAP must not be excluded. While managers claim that non-GAAP reporting reduces the noise from one-time effects, critics argue (Fahey 2016; Lahart 2016) that exclusions might be targeted towards artificially inflating non-GAAP earnings (e.g., to distract investors from low GAAP earnings). Given the rise of non-GAAP disclosures and the disparity between GAAP and non-GAAP earnings, it is of interest whether firms report non-GAAP earnings less aggressively when they are watched closely by shareholders. If managers would indeed report non-GAAP earnings differently (less aggressively) under heightened investor scrutiny, one could assume that firms disclose non-GAAP earnings more aggressively when investors are distracted. Such a finding would be alarming to regulatory bodies and shareholders alike, as it implies that some non-GAAP adjustment are of low quality. Nevertheless, such a finding would also suggest that investor attention might moderate aggressive non-GAAP reporting and increase informativeness on average. So far, non-GAAP reporting literature provides little evidence on whether investor scrutiny enhances the quality of non-GAAP earnings. I note that Christensen et al. (2019b) find an improvement in non-GAAP exclusion quality after debt covenant violation, while Kolev et al. (2008) document an improvement after a SEC intervention. I extend this non-GAAP focused research to the restatement setting and observe non-GAAP reporting *quality* and the *likelihood* of recurring expense exclusions around the announcement of attention grabbing financial restatements.

To investigate firm's response to heightened investor scrutiny, I focus on the *likelihood* of recurring expense exclusions and the *quality* of non-GAAP earnings following both material and less severe restatements. Since financial restatements are an informational shock to the capital market and a sign of low financial reporting quality, investors will likely increase their scrutiny to restatement firms' financial reporting quality. Consistent with managers facing increased expected costs and decreased expected benefits of providing opportunistic disclosures after the restatement announcement, I find that the *likelihood* of excluding recurring expenses decreases after both material and less severe restatements. This is a strong signal considering that these exclusions are most criticized for being opportunistically motivated. Moreover, I find that non-GAAP earnings and non-GAAP exclusion *quality* improves. This improvement, however, is exclusive to material restatements and limited to recurring expense exclusions. Lastly, I re-examine findings by Mehring et al. (2020) and find that investors punish the exclusion of recurring expenses after the restatement, but not before. This observed change

of investors' behavior, could be a strong force to reduce managers' expected benefits from aggressive non-GAAP reporting choices. In other words, investors' enhanced ability to see through the quality of non-GAAP adjustments might influence managerial non-GAAP exclusion choices. The latter view is consistent with heightened investor scrutiny improving non-GAAP reporting. Altogether, my findings provide evidence that increased investor scrutiny, investors' ability to see through the quality of non-GAAP earnings, and investors' capability to punish firms for aggressive reporting choices leads to enhanced non-GAAP disclosure. Put differently, non-GAAP earnings may become more informative when investors pay close(r) attention to firms financial non-GAAP reporting choices. Importantly, I find that this improvement is NOT long-lived, which is consistent with decreasing investor attention over time.

This paper contributes to the restatement literature by providing evidence that firms improve non-GAAP reporting as a response to adverse market reactions. Ettredge et al. (2013) find that managers opt against providing earnings forecasts after the restatement announcement to reduce future litigation risk. I show that firms change non-GAAP reporting for the benefit of the investor. I also support the non-GAAP reporting literature by identifying that investor scrutiny may deter aggressive non-GAAP reporting choices – the exclusion of recurring expenses. So far, Christensen et al. (2019b) provide evidence that the quality of non-GAAP earnings increases after a debt-covenant violation. I extend their investigation to the restatement setting. Most importantly, I contribute to theoretical work by Hirshleifer and Teoh (2003) and empirical findings by Mehring et al. (2020). Overall, the observed improvement in non-GAAP reporting is consistent with manager's response (Hirshleifer and Teoh 2003) to changes in investors' ability to distinguish between aggressive and non-aggressive non-GAAP reporting choices after the restatement announcement (Mehring et al. 2020).

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Appendix

"Does Non-GAAP Reporting Change after Financial Restatements?"

Table A1 Variable Definitions

Variable	Definition	Data Sources
Dependent Variables		
RECUR_EXPENSE	1 if *RECUR* >0, 0 otherwise.	Compustat, I/B/E/S
FUTGAAP	The sum of *EPS_OP* over the next four quarters starting from t + 1	Compustat
UR	Cumulative abnormal returns in the three-day window [-1;1] around the earnings announcement date, where the abnormal return is calculated as the firm's return less the CRSP value-weighted market return. (ret – vwretd)	CRSP
Earnings Measures		
EPS_NG	Non-GAAP EPS (actual)	I/B/E/S
EPS_OP	Operating GAAP earnings (opepsq)	Compustat
EPS_GAAP	GAAP earnings (epsfxq, epspxq)	Compustat
EPS_NET	Net GAAP earnings (epsfiq)	Compustat
Exclusions Types		
RECUR	Recurring items: expense exclusions if positive (*EPS_NG – EPS_OP*)	Compustat, I/B/E/S
SPECIAL	Special item (*EPS_OP – EPS_GAAP*)	Compustat
BELOW	Below the line items (*EPS_GAAP – EPS_NET*)	Compustat
TOTALEXCL	Recurring items + special items + below-the-line items (*RECUR + SPECIAL + BELOW*)	Compustat, I/B/E/S
Other Variables		
POST	1 if the quarter belongs to the pre-restatement period, 0 otherwise.	
SIZE	The nature logarithm of market value, log(prccq x cshoq)	Compustat
MTB	Market to book ratio: Market value of equity (prccq x cshoq) / book value of equity (seqq).	Compustat
STDROA	Standard deviation of return on assets (ibq/atq) over at least three of the prior eight quarters.	Compustat
GAAPLOSS	1 if *EPS_OP* < 0 otherwise.	Compustat
SALES_GROWTH	Sales growth: sales (saleq) in quarter q less sales in quarter q– 4, scaled by total assets (atq)	Compustat
SPECIALCHG	1 if special items (spiq) is non-zero, 0 otherwise.	Compustat
MISS	1 if *EPS_OP* < median analyst forecast 90 days prior to the earnings announcement, 0 otherwise.	Compustat, I/B/E/S
ROA	Return on assets (ibq/atq) of the current quarter.	Compustat
INST	Percentage of shares owned by the institutional investors, as reported on the Thomson Reuters 13f Institutional Holdings database.	Thomson Reuters 13f Institutional Holdings database
ANALYST	Number of analysts following the firm.	I/B/E/S
LITIGATE	1 for firms operating in the biotechnology (SIC 2833-2836; 8731-8734), computers (3570-3577; 7370-7374), electronics (3600-3674), and retailing (5200-5961) industries; "0" otherwise.	CSRP
LEVERAGE	Total liabilities over book value of equity, ltq/ceqq	Compustat

OCF	Cash flows from operations scaled by total assets: oancfy/atq	Compustat
AGE	Company age, calculated as the number of years to date during which the company reports total assets (AT) greater than 0	Compustat
RECURR_EXPENSE_LAG	Lagged *RECUR_EXPENSE*, 1 if the firm excluded recurring expenses the prior quarter	Compustat, I/B/E/S
BIG_AUDITOR	1 if a company is audited by a Big N auditor, 0 otherwise	Compustat
AUD_TENURE	Number of years during which the company has been audited by the current auditor	Compustat
STRING	1 if *EPS_GAAP* did not decrease in the previous 4 quarters, 0 otherwise.	Compustat
FUTURE_FINANCE	1 if the number of shares outstanding (cshoq) increased by at least 10 percent during the quarter, or if long-term debt increased (dlttq) by at least 20 percent during the year, zero otherwise.	Compustat
POST_REG_G	1 for all calendar quarters after the Regulation G became effective (March 28, 2003), 0 otherwise.	Compustat
OPERATING_CYCLE	Length of the company′s operating cycle	Compustat
ALTMANZ	Altman's Z-score	Compustat
ACCRUALS	Calculated as the difference between net income before extraordinary items per share and cash from operations per share, and is scaled by assets per basic share outstanding: (epspxq - (oancfy/cshprq)) / prccq (epsfxq - (oancfy/cshprq)) / prccq	Compustat
UE	Unexpected quarterly earnings at the earnings announcement date, scaled by price at the end of the fiscal quarter, with expected earnings proxied by the median of analysts' forecasts issued within 90 days prior to the earnings announcement date. Earnings surprise is based on non-GAAP earnings: (actual – median value) / (prccq /ajexq)	Compustat, I/B/E/S
NONLINEAR	Calculated as: *UE**Absolute(*UE*)	Compustat, I/B/E/S
BETA	Market-model beta estimated over 250 days ending two days prior to the earnings announcement date (I require a minimum of 120 days).	CRSP
NONGAAPLOSS	1 if EPS_NG < 0, 0 otherwise.	I/B/E/S
Q4	1 if the earnings announcement is for the fourth quarter of the fiscal year.	Compustat
PERSIST	Autoregressive coefficient from (Foster 1977)model estimated over the two-year period prior to the earnings announcement.	Compustat
PREDICT	Variance of the absolute values of unexpected earnings over the two-year period prior to the earnings announcement, where unexpected earnings are based on a seasonal random walk.	Compustat
CAR	Cumulative abnormal returns in the three-day window [-3;3] around the restatement announcement date, where the abnormal return is calculated as the firm's return less the estimated return, using the market model and the value-weighted CRSP index, where the estimation window is [-200, -20]. Unexpected returns are calculated as: ret – predicted_return	GAO, AA, CRSP

Table A2 Descriptive Statistics: Pre- to Post-Period Comparison

		Pre-Period (1)		Post-Period (2)		Pre- to Post-Period Change
	N	**Mean**	Std.	**Mean**	Std.	**Dif. in Mean (1)-(2)**
Panel A: Dependent Variables						
RECUR_EXPENSE	5,236	**0.41**	0.49	**0.32**	0.47	**-0.09*** **
FUTGAAP	5,236	**0.18**	4.72	**0.22**	4.87	**0.04**
UR	5,236	**0.00**	0.09	**0.00**	0.09	**0.00**
Panel B: Control Variables - GAAP Measures						
EPS_NG	5,236	**0.19**	0.85	**0.12**	0.99	**-0.06****
EPS_OP	5,236	**0.12**	0.86	**0.09**	0.98	**-0.03**
EPS_GAAP	5,236	**0.04**	1.20	**-0.03**	1.42	**-0.07***
EPS_NET	5,236	**0.03**	1.25	**-0.05**	1.49	**-0.08****
Panel C: Control Variables – Exclusions						
RECUR	5,236	**0.05**	0.29	**0.04**	0.28	**-0.01***
SPECIAL	5,236	**0.08**	0.36	**0.10**	0.43	**0.01**
BELOW	5,236	**0.00**	0.07	**0.00**	0.06	**0.00**
TOTALEXCL	5,236	**0.15**	0.63	**0.16**	0.66	**0.01**
Panel D: Control Variables						
POST	5,236	**0.00**	0.00	**1.00**	0.00	**1.00**
SIZE	5,236	**6.73**	1.65	**6.76**	1.72	**0.03**
MTB	5,236	**3.52**	4.00	**3.52**	4.22	**0.00**
STDROA	5,236	**0.03**	0.04	**0.03**	0.04	**0.00**
GAAPLOSS	5,236	**0.26**	0.44	**0.29**	0.45	**0.03****
SALES_GROWTH	5,236	**0.43**	1.62	**0.38**	1.53	**-0.05**
SPECIALCHG	5,236	**0.45**	0.50	**0.49**	0.50	**0.04*****
MISS	5,236	**0.47**	0.50	**0.44**	0.50	**-0.03****
ROA	5,236	**-0.05**	0.33	**-0.07**	0.39	**-0.02***
INST	5,236	**0.54**	0.35	**0.56**	0.35	**0.02***
ANALYST	5,236	**8.64**	6.78	**8.73**	6.92	**0.09**
LITIGATE	5,236	**0.35**	0.48	**0.33**	0.47	**-0.02**
LEVERAGE	5,236	**1.65**	2.96	**1.81**	3.24	**0.16***
OCF	5,236	**0.03**	0.08	**0.03**	0.09	**0.00**
AGE	5,236	**14.83**	7.26	**15.63**	7.44	**0.80****
RECURR_EXPENSE_LAG	5,236	**0.46**	0.50	**0.42**	0.49	**-0.04*****
BIG_AUDITOR	5,236	**0.92**	0.27	**0.90**	0.30	**-0.02****
AUD_TENURE	5,236	**9.87**	6.83	**9.87**	7.14	**0.00**
STRING	5,236	**0.05**	0.22	**0.04**	0.19	**-0.02*****
FUTURE_FINANCE	5,236	**0.36**	0.48	**0.34**	0.47	**-0.01**
POST_REG_G	5,236	**0.76**	0.43	**0.81**	0.39	**0.05*****
OPERATING_CYCLE	5,236	**4.55**	0.73	**4.54**	0.75	**-0.01**
ALTMANZ	5,236	**4.70**	5.16	**4.42**	5.12	**-0.28***
ACCRUALS	5,236	**-0.04**	0.11	**-0.04**	0.11	**0.00**
UE	5,236	**0.00**	0.01	**0.00**	0.01	**0.00**
NONLINEAR	5,236	**0.00**	0.00	**0.00**	0.00	**0.00**
BETA	5,236	**1.15**	0.55	**1.16**	0.54	**0.00**
NONGAAPLOSS	5,236	**0.21**	0.41	**0.24**	0.43	**0.03*****
Q4	5,236	**0.21**	0.41	**0.22**	0.41	**0.01**
PERSIST	5,236	**0.18**	0.41	**0.17**	0.41	**-0.01**
PREDICT	5,236	**0.02**	0.12	**0.02**	0.11	**0.00**

Panel E: Variable Used for Partitioning		**Mean**	Std.
CAR	804	**-0.02**	0.10

This table provides descriptive statistic for variables applied in Model 1 to 3. *CAR* is used to partition the restatement sample into material, mixed and less severe subsamples. All variables are defined in the appendix (Table A1).

Table A3 Descriptive Statistics: Pre- to Post-Period, Material to Less Material Comparison

	Upper Quartile CAR (1)			Lower Quartile CAR (2)		
Period	Pre	Post	Dif. in means	Pre	Post	Dif. in means
# of firm quarter obs.	N=643	N=649		N=638	N=619	
Panel A: Dependent Variables						
RECUR_EXPENSE	0.38	0.28	0.11***	0.43	0.33	0.10***
FUTGAAP	0.68	0.64	0.05	-1.46	-1.10	-0.36
UR	0.00	0.01	-0.01	0.00	-0.01	0.01***
Panel B: Control variables - GAAP measures						
EPS_NG	0.17	0.16	0.01	0.03	-0.18	0.21***
EPS_OP	0.16	0.17	-0.01	-0.07	-0.25	0.17**
EPS_GAAP	0.08	0.13	-0.05	-0.21	-0.51	0.30***
EPS_NET	0.07	0.12	-0.06	-0.23	-0.56	0.32***
Panel C: Control variables – Exclusions						
RECUR	0.02	0.01	0.01	0.08	0.06	0.02
SPECIAL	0.08	0.06	0.03	0.09	0.16	-0.07**
BELOW	0.00	0.00	0.00	0.00	0.01	0.00
TOTALEXCL	0.12	0.07	0.05***	0.20	0.26	-0.06
Panel D: Control variables						
POST	0.00	1.00	-1.00	0.00	1.00	-1.00
SIZE	6.63	6.61	0.02	6.29	6.32	-0.03
MTB	3.71	3.68	0.03	3.62	3.33	0.29
STDROA	0.03	0.03	0.00	0.03	0.04	0.00
GAAPLOSS	0.26	0.29	-0.03	0.33	0.38	-0.05*
SALES_GROWTH	0.50	0.30	0.20**	0.43	0.36	0.07
SPECIALCHG	0.45	0.48	-0.03	0.40	0.49	-0.09***
MISS	0.44	0.42	0.02	0.51	0.50	0.01
ROA	-0.03	-0.02	-0.01	-0.11	-0.17	0.06*
INST	0.52	0.52	-0.01	0.49	0.51	-0.02
ANALYST	8.62	8.55	0.07	7.73	7.80	-0.08
LITIGATE	0.38	0.35	0.03	0.39	0.38	0.01
LEVERAGE	1.73	1.87	-0.14	1.59	1.74	-0.15
OCF	0.03	0.03	0.00	0.02	0.02	0.01
AGE	13.89	14.41	-0.52	13.15	14.01	-0.86**
RECURR_EXPENSE_LAG	0.43	0.38	0.05*	0.50	0.45	0.06
BIG_AUDITOR	0.93	0.90	0.03**	0.87	0.86	0.02
AUD_TENURE	9.42	9.37	0.05	8.70	8.32	0.38
STRING	0.03	0.02	0.01	0.08	0.06	0.02
FUTURE_FINANCE	0.36	0.36	0.00	0.39	0.35	0.04
POST_REG_G	0.75	0.81	-0.06**	0.64	0.67	-0.03
OPERATING_CYCLE	4.64	4.61	0.03	4.57	4.57	0.00
ALTMANZ	4.35	4.38	-0.03	5.04	4.34	0.71**
ACCRUALS	-0.04	-0.04	0.00	-0.04	-0.05	0.01
UE	0.00	0.00	0.00	0.00	0.00	0.00
NONLINEAR	0.00	0.00	0.00	0.00	0.00	0.00
BETA	1.15	1.16	-0.02	1.20	1.24	-0.04
NONGAAPLOSS	0.22	0.24	-0.03	0.28	0.34	-0.06**
Q4	0.22	0.21	0.01	0.19	0.22	-0.03
PERSIST	0.19	0.20	-0.01	0.14	0.18	-0.04
PREDICT	0.02	0.02	0.00	0.04	0.04	0.01

This table provides descriptive statistic for variables applied in Model 1 to 3. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1). The material restatements (lower quartile CAR) have a mean (median) CAR of -15.3% (-12%), and less severe restatements (lower quartile CAR) have a mean (median) CAR of 9% (7.5%).

Table A4 Likelihood of Recurring Expense Exclusions (no marginal effects)

(Dependent Variable: *RECUR_EXPENSE*)

	Full Sample (1)		**Upper Quartile CAR (2)**		**Lower Quartile CAR (3)**	
Variable	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
POST	**-0.293**	**0.00*** **	**-0.356**	**0.00*** **	**-0.353**	**0.00*** **
SIZE	0.034	0.22	0.008	0.90	0.003	0.95
MTB	-0.005	0.52	0.002	0.89	0.004	0.77
STDROA	0.942	0.11	0.272	0.82	1.707	0.11
GAAPLOSS	0.121	0.07*	0.104	0.44	0.030	0.82
SALES_GROWTH	0.021	0.17	0.041	0.29	0.009	0.70
SPECIALCHG	0.371	0.00***	0.269	0.01**	0.311	0.00***
MISS	1.263	0.00***	1.267	0.00***	1.304	0.00***
ROA	0.079	0.26	-0.000	1.00	0.157	0.14
INST	0.143	0.08*	0.051	0.76	0.260	0.11
ANALYST	0.015	0.01***	0.027	0.04**	0.024	0.03**
LITIGATE	0.224	0.01***	0.200	0.35	0.297	0.03**
LEVERAGE	-0.001	0.93	-0.009	0.66	-0.008	0.67
OCF	0.078	0.85	-0.050	0.95	-0.411	0.58
AGE	-0.009	0.07*	-0.018	0.07*	-0.011	0.26
RECURR_EXPENSE_LAG	0.871	0.00***	0.867	0.00***	0.754	0.00***
BIG_AUDITOR	0.054	0.57	-0.126	0.55	-0.344	0.04**
AUD_TENURE	0.005	0.22	-0.001	0.94	0.010	0.25
STRING	0.152	0.16	-0.199	0.43	0.064	0.73
FUTURE_FINANCE	0.035	0.52	0.076	0.50	-0.166	0.11
OPERATING_CYCLE	0.000	0.99	-0.117	0.18	-0.050	0.50
ALTMANZ	0.004	0.56	-0.009	0.47	0.001	0.95
ACCRUALS	-0.021	0.94	0.088	0.86	-0.413	0.38
CONSTANT	-2.341	0.00***	-1.209	0.08*	-1.703	0.00***
Industry fixed effects	Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes	
Fiscal quarter effects	Yes		Yes		Yes	
Area under ROC curve	0.8626		0.8755		0.8558	
Pseudo R^2	0.33		0.36		0.31	
N	5,263		1,291		1,255	
Number of Firms	804		201		201	
Median CAR	- 0.01		0.08		-0.12	
Marginal Effect *POST*	**-0.073**		**-0.081**		**-0.091**	

This table presents the effect of financial restatements on the likelihood of recurring expense exclusions in light of non-GAAP reporting. A probit regression of Model 1 is used. *, **, and *** indicate significance at the10%, 5%, and 1% levels (two-sided), respectively. I define all variables in the appendix (Table A1).
In regression two 3 observations and in regression one 2 observations had to be dropped since the year/industry dummy predicts the outcome perfectly.

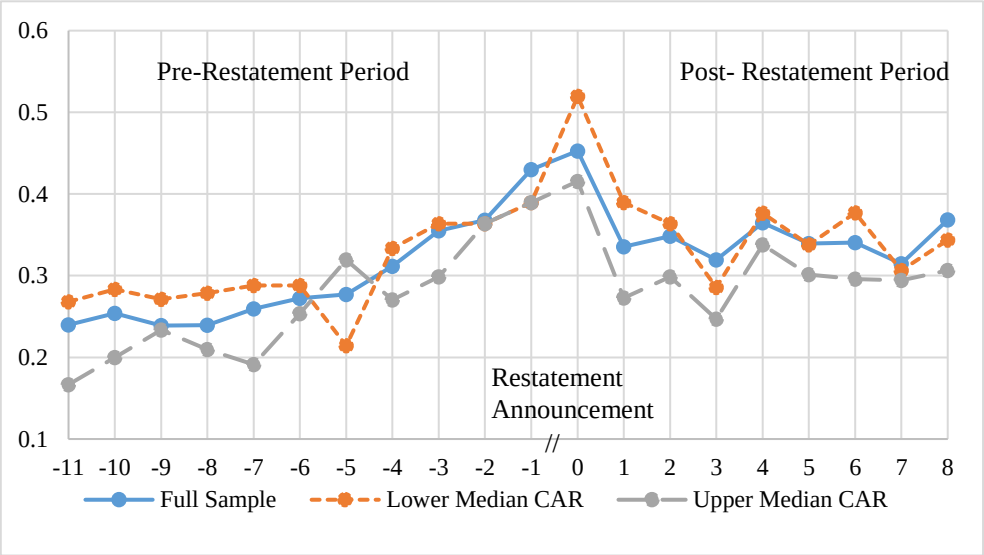
Table A5 Quarter Distribution

Total Quarter	# Firms	Cumulative Firms	%
1	0	0	0%
2	18	18	2%
3	35	53	7%
4	43	96	12%
5	111	207	26%
6	118	325	40%
7	172	497	62%
8	307	804	100%

This table presents the panel structure of the firms included in the sample (i.e.., how many firms do have how many quarters of available data?). For example, one observes that 307 firms have full coverage with 8 quarters of data while 18 firms have partial coverage with 2 quarters of data. I note that 708 firms (111+118+172+307) have data for 5 or more quarters regarding the investigated time span.

Figure A1 Extended Timeframe and 8 Full Quarter Coverage: Exclusions around Restatement Announcements (Timeframe from quarter – 11 to quarter +8; Total of 20 quarters, 4obs4obs)

Recurring expense exclusions (*RECUR_EXPENSE*) during quarters around the restatement announcement (307 firms)



This figure illustrates the frequency of recurring expense exclusions across an extended timeframe with 3 years before and 2 years after the restatement announcement (12 pre- and 8 post-restatement quarters). Each firm is required to have full data coverage for 4 quarter before and 4 quarters after the restatement announcement, meaning that each firm has at least 8 quarter observations. Quarter 0 is the last quarter before the restatement announcement. These graphs show the recurring expense exclusion frequency for the full, less severe and material restatement sample.