The Effect of Voluntary Clawback Adoption on Non-GAAP Reporting

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Abstract

We examine the effect of voluntary adoption of clawback provision on non-GAAP earnings disclosures. Previous literature documents that the voluntary adoption of clawback provisions improves financial reporting quality by increasing the costs of misstating GAAP earnings. However, managers may respond to perception of reduced discretion over GAAP reporting by increasing their reliance on non-GAAP earnings disclosures. We find that managers more frequently disclose non-GAAP earnings after the voluntary adoption of clawback provisions, relative to a propensity-matched sample of control firms. In addition, we find that the quality of non-GAAP earnings exclusions deteriorates after clawback adoption, consistent with a more opportunistic use of non-GAAP reporting. We also report evidence that firms are more likely to use non-GAAP reporting to meet or beat earnings benchmarks and that the association between non-GAAP reporting and the use of short-term executive incentive-based pay intensifies after clawback adoption. Our results extend the growing literature on clawback adoption and suggest that the improvement in GAAP reporting quality associated with clawbacks may be achieved at the expense of more opportunistically-motivated use of non-GAAP reporting. This unintended consequence has implications related to the mandatory adoption of clawbacks required under the Dodd-Frank Act of 2010.

JEL Classification: M41, G38, M48

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1. Introduction

This paper examines the effect of voluntary adoption of clawback provisions on firms' non-GAAP earnings disclosure practices. Firms adopt clawbacks to recover executive compensation based on financial performance that is subsequently invalidated, most typically through an earnings restatement. Clawbacks are intended to discourage intentional misstatement of accounting information by imposing an *ex post* penalty on managers, and recent studies document that financial reporting quality improves after their voluntary adoption (see, e.g., Chan, Chen, Chen, and Yu, 2012; deHaan, Hodge, and Shevlin, 2013). This evidence suggests that adopting clawback provisions increases the costs associated with misstating earnings defined under generally accepted accounting principles (GAAP). However, it is possible that managers adapt to this more restrictive reporting environment by disclosing financial performance measures that would be less subject to restatement, such as non-GAAP earnings. We therefore examine whether the voluntary adoption of clawback provisions affects the frequency and quality of firms' non-GAAP earnings disclosures.

Non-GAAP (or "pro forma") earnings disclosures are alternative earnings performance measures provided by individual firms that attempt to measure "core" earnings by making adjustments to reported GAAP earnings. Prior research finds that non-GAAP earnings figures are, on average, more value relevant than GAAP earnings (Bradshaw and Sloan 2002; Bhattacharya, Black, Christensen, and Larson 2003), but there is also evidence that these disclosures are used opportunistically by managers. For example, Doyle, Lundholm, and Soliman (2003) report that items excluded from non-GAAP earnings are predictive of future performance, which suggests that these expenses are recurring and opportunistically excluded from core or permanent earnings. In addition, managers appear to use non-GAAP earnings disclosures to meet earnings benchmarks (Lougee and Marquardt 2004; Black and Christensen 2009; Doyle, Jennings, and Soliman 2013).

While prior research shows that clawback provisions improve GAAP earnings quality, it is unclear how voluntarily adopting these provisions might affect the frequency of non-GAAP earnings disclosures. Lougee and Marquardt (2004) find that the likelihood of non-GAAP disclosure is inversely related to GAAP earnings quality, which suggests that the frequency of non-GAAP disclosures will decrease as GAAP earnings quality improves following voluntary clawback adoption. Alternatively, clawbacks serve as an *ex ante* deterrent of GAAP violations

by increasing managers' costs of manipulating GAAP earnings for their personal benefit. Managers may compensate for this perceived reduction in GAAP reporting discretion by voluntarily releasing non-GAAP earnings measures to investors, which suggests that voluntary clawback adoption will increase the frequency of non-GAAP disclosure.

The effect of clawback adoption on the quality of non-GAAP earnings is similarly ambiguous. On the one hand, Frankel, McVay, and Soliman (2011) find that better corporate governance is associated with higher quality non-GAAP earnings disclosures. Since clawbacks are generally viewed as improving governance practices, one might expect an improvement in the quality of non-GAAP reporting following their adoption. On the other hand, managers may respond to the increased costs of GAAP earnings misstatements by using non-GAAP earnings more aggressively since these performance measures are not subject to clawback provisions. The quality of non-GAAP earnings may consequently decrease following a voluntary adoption of clawback provisions.

To examine these effects, we estimate a probit model of the likelihood of non-GAAP earnings disclosure before and after voluntary clawback adoption using two different samples: (1) a sample consisting of only clawback adopters and (2) a sample where clawback adopters are matched with non-adopters based on a propensity score matched sample (1:1 matching). The propensity-score matching procedure mitigates concerns over omitted variables that are correlated with both clawback adoption and non-GAAP reporting decisions. In addition, propensity-score matching allows us to use a difference-in-differences research design to analyze changes in non-GAAP reporting before and after clawback adoption. After controlling for other determinants of non-GAAP earnings disclosure, we find that firms are significantly more likely to disclose non-GAAP earnings after they voluntarily adopt clawback provisions.

To investigate whether the increase in non-GAAP reporting frequency is motivated by a desire to better inform investors or to mislead investors, we examine the quality of non-GAAP earnings exclusions using two different measures. First, we follow Doyle et al. (2003) and Kolev, Marquardt, and McVay (2008) and define higher quality exclusions as being more transitory and having no predictive power for future operating income. Our second proxy for quality is based on Black et al.'s (2015) definition of 'aggressive' non-GAAP reporting – positive exclusions in excess of analyst Street earnings are assumed to include recurring expenses and therefore provide an inverse measure of exclusion quality. We find that there has been a significant

decrease in both quality measures of non-GAAP exclusions after a firm voluntarily adopts clawback provisions; i.e., future operating income is more negatively correlated with non-GAAP exclusions after adopting clawback provisions, and managers are more 'aggressive' in their exclusion of recurring items. An increase in non-GAAP reporting frequency combined with a decrease in non-GAAP exclusion quality is consistent with *greater opportunistic use* of non-GAAP earnings disclosures after clawback adoption. We confirm this interpretation with a cross-sectional analysis demonstrating that non-GAAP exclusion quality deteriorates more after clawback adoption when managers have less ability to manage GAAP earnings through accruals (Barton and Simko 2002). It thus appears that an increase in the cost of manipulating GAAP earnings relative to non-GAAP earnings can cause opportunistically-motivated managers to shift their focus from GAAP to non-GAAP earnings.

We examine the reasons behind this shift by exploring managerial incentives for non-GAAP reporting. Doyle et al. (2013) document that managers use non-GAAP exclusions to meet or beat analyst forecasts. Using three different definitions of meeting/beating behavior, we document that managers are more likely to use non-GAAP exclusions to exceed analyst forecasts after clawback adoption. We also examine the relation between non-GAAP reporting and incentive-based executive compensation, as Black, Black, Christensen, and Gee (2015) report evidence that non-GAAP disclosure is positively associated with its use. We find a stronger association between non-GAAP disclosure and short-term incentive-based compensation after clawback adoption. These findings suggest that meeting external reporting benchmarks and compensation contracting are two key drivers behind the changes we observe in non-GAAP reporting after clawback adoption.

The above analyses assume an indirect link from clawback adoption to non-GAAP reporting. That is, since clawbacks are unlikely to be triggered by irregularities in non-GAAP reporting, the effects of clawback adoption on non-GAAP reporting must be conditional on actual or perceived changes in GAAP reporting. We confirm this connection by comparing the relation between non-GAAP reporting and GAAP earnings quality before and after clawback adoption. We find that non-GAAP reporting is more positively associated with earnings response coefficients and more negatively associated with income-increasing accruals management after clawback adoption, consistent with managers responding to reduced discretion in GAAP

reporting by shifting to non-GAAP disclosure. These findings help to establish causality between clawback adoption and the changes we observe in non-GAAP reporting.

Finally, to address concerns that our results may be driven by operational changes following clawback adoption rather than by deliberate reporting choices, we perform additional tests related to the recognition of special items after clawback adoption. We find that the deterioration in the quality of non-GAAP reporting is mainly due to changes in the persistence of special items and provide some evidence that firms engage in classification shifting of recurring expenses into special items after clawback adoption (McVay 2006). These tests provide additional evidence consistent with opportunistic non-GAAP reporting after clawback adoption.

These results contribute to existing literature in several ways. First, the study contributes to the growing literature on the consequences of clawback adoption. Prior research has documented significant benefits associated with clawback adoption. For example, Chan et al. (2012) find a reduction in the frequency of accounting restatements and higher earnings response coefficients after voluntary clawback adoption, and deHaan et al. (2013) report reductions in firms' benchmark beating behavior and the dispersion of analyst forecasts. In addition, Iskandar-Datta and Jia (2013) find that clawback adoption enhances firm value for firms with a history of prior restatements, suggesting that investors view clawbacks as a credible corporate governance mechanism. In contrast, we document an increase in the frequency and a decrease in the quality of non-GAAP earnings, consistent with an increase in the opportunistic use of non-GAAP disclosure following clawback adoption. We thus contribute to recent literature documenting unintended consequences related to clawback adoption, such as Chan, Chen, Chen, and Yu (2015), who document a shift from accruals-based to real earnings management following clawback adoption, as well as deHaan et al. (2013), who report higher levels of executive compensation after adoption.

Our findings also extend the literature on non-GAAP reporting by providing new evidence that managers use GAAP and non-GAAP earnings as substitutes to achieve their financial reporting objectives. For example, Doyle et al. (2013) find that managers are more likely to shift to non-GAAP earnings to meet analyst forecasts when the cost of within-GAAP earnings management is high, as indicated by high levels of existing income-increasing accruals on the balance sheet (Barton and Simko 2002). Similarly, our results indicate that when clawbacks increase the cost of within-GAAP earnings management, managers are more likely to

opportunistically disclose non-GAAP earnings figures. These findings also complement those of Kolev et al. (2008), who document a substitution effect between non-GAAP earnings exclusions and within-GAAP classification shifting on the income statement.

Our findings also have practical implications for both corporate boards and regulators as they move toward mandatory adoption of clawback provisions. The Securities and Exchange Commission (SEC) recently proposed on July 1, 2015 the new Rule 10D-1 to implement mandatory clawback adoptions, as required under the Dodd-Frank Wall Street Reform and Consumer Protection Act.[1] While one cannot assume that the effects we observe on non-GAAP reporting will generalize to mandatory adopters, our findings suggest the possibility that mandatory clawback adoption for all public firms may result in a general shift toward the more opportunistic use of non-GAAP earnings disclosure. Future research might address this question when Rule 10D-1 becomes effective.

The paper is organized as follows. Section 2 provides institutional background on clawback provisions, and Section 3 outlines our hypothesis development. Section 4 presents the sample selection procedure and descriptive statistics. In Section 5, we discuss the research design and the empirical results. We perform additional tests in Section 6 and conclude the paper in Section 7.

2. Background on clawback provisions

Clawback provisions allow a firm to recover incentive-based compensation from corporate executives upon the occurrence of some predefined event, typically an earnings restatement. The prevalence of voluntary clawback adoption has grown rapidly since 2002, when the Sarbanes-Oxley Act (SOX) was enacted. The primary objective of SOX was to rebuild investors' confidence in capital markets by imposing stricter disclosure requirements about a firm's internal control system, and Section 304 of SOX authorized the Securities and Exchange Commission (SEC) to enforce compensation recovery when a publicly traded firm restated financial statements due to misconduct. More specifically, Section 304 requires CEOs and CFOs to return to their firms any bonus and incentive-based compensation received and any profits realized from selling their stock within 12 months of accounting restatements due to material

[1] See http://www.sec.gov/news/pressrelease/2015-136.html.

noncompliance with financial reporting requirements as a result of misconduct.[2] More recently, Section 954 of the Dodd-Frank Act of 2010 requires all public companies to adopt a provision for the recovery of incentive-based compensation in excess of what would have been paid under restated financial statements (see https://www.sec.gov/rules/proposed/2015/33-9861.pdf). However, while only CEOs and CFOs are subject to clawback provisions under SOX, the Dodd-Frank Act broadens its coverage to all executive officers as defined in Rule 3b-7 of the Securities Exchange Act of 1934, including the CEO and other officers who are involved in the process of policy-making within the firm.

Unlike the recovery provisions described above under SOX or Dodd-Frank, a firm-initiated clawback is a contractual provision that requires employees to repay compensation when specific events occur, typically one of following three categories: (1) performance-based; (2) fraud-based; and (3) non-compete and restrictive covenants. Performance-based clawback provisions are applicable to all executives who are awarded incentive-based compensation based on misstated financial statements. Fraud-based clawback provisions apply only to executives who committed fraudulent activities or misconduct which subsequently led to restatements. Clawback provisions often include restrictive covenants with non-compete and non-solicitation clauses, allowing firms to recover compensation from employees. The most common type of clawback provision is fraud-based (47%), followed by performance-based (34%) (see Davis-Friday, Fried, and Jenkins 2013).

An increasing number of public firms have voluntarily adopted clawback provisions to recoup performance-based executive compensation based upon financial statements that are subsequently deemed to be misstated. For example, according to the Corporate Library database, in 2003 only 14 companies had voluntarily adopted clawback provisions. By the year 2008, 295 out of 2,121 companies (14%) disclosed that they had voluntarily adopted clawbacks. This increase in the prevalence of voluntary clawback adoption, coupled with eventual mandatory

[2] There was some controversy over whether Section 304 of SOX would be effective in improving investor confidence. For example, Fried and Shilon (2011) argue that the clawback provisions under SOX are unlikely to be deployed, resulting in a reduced *ex ante* deterrent effect, because they are excessively punitive, and Chan et al. (2012) observe that the SEC did not effectively utilize Section 304 until July 2009. On the other hand, Zheng (2011) investigates whether the clawback provisions under SOX are related to the likelihood of accounting misstatement and CEO compensation structures. He finds that the correlation between the likelihood of a misstatement and CEO in-the-money option value significantly decreases, suggesting that SOX clawback provisions have effectively mitigated the agency costs of overvalued equity.

clawback adoptions under SEC Rule 10D-1, naturally raises the question of how clawback adoption effects firms' financial reporting environments, which we discuss in the next section.

3. Hypothesis development

Prior research has examined the consequences of voluntary clawback adoption on various aspects of firms' financial reporting environments.[3] For example, Chan et al. (2012) and deHaan et al. (2013) report evidence that the incidence of restatements declines following voluntary clawback adoption. Consistent with auditors' perception that clawback adopters have lower audit risk, Chan et al. (2012) report that auditors charge lower audit fees and issue their reports on a more timely basis, and deHaan et al. (2013) report a decrease in unexplained audit fees. Both of these studies also provide evidence that firms' earnings response coefficients increase following clawback adoption. In addition, deHaan et al. (2013) report declines in earnings management, as measured by abnormal accruals, and an increase in CEO pay-performance sensitivity following clawback adoption. In sum, the evidence from these two studies is consistent with an overall improvement in the quality of firms' financial reporting under GAAP following clawback adoption.[4]

We extend the literature on the consequences of voluntary adoption of clawback provisions by empirically examining the effect of clawbacks on the frequency and quality of non-GAAP earnings disclosures. Upon first consideration, it is not obvious that clawback adoption would have any significant effect on non-GAAP reporting practices because the lack of a standard definition of non-GAAP earnings would either make the possibility of a restatement highly improbable or would preclude its occurrence altogether.[5] Reporting a non-GAAP earnings figure that selectively excludes certain expenses is therefore extremely unlikely to trigger a

[3] A few studies examine the determinants of clawback adoption decision. Barbenko et al. (2015) find that prior executive misbehavior, governance structure, and executive compensations are related to adoption of a clawback provision. Brown et al. (2015) link clawback adoption to poor M&A decisions and to the acquisition of targets with low accounting quality.

[4] Denis (2012) offers alternative interpretations of the evidence on improved financial reporting quality after clawback adoption. For example, she notes that reduced frequencies of earnings restatements after clawback adoption may be driven by manager's reluctance to disclose restatements and that reduced auditor effort may be based on an erroneous belief that firms that adopt clawbacks will issue more accurate reports. Investor responses to earnings reports may suffer from similar errors in perception. In addition, Chan et al. (2015) find that clawback adopters substitute real earnings management for accruals-based management following clawback adoption.

[5] In fact, there has been only one SEC enforcement action related to non-GAAP earnings disclosures in the post-SOX era (https://www.sec.gov/litigation/litreleases/2009/lr21290.htm). In addition, we are unable to identify any anecdotal examples of non-GAAP earnings "restatements."

clawback of executive compensation, however opportunistically the non-GAAP earnings figure might be defined by firm managers.[6]

However, prior research has linked non-GAAP reporting to the relative informativeness of GAAP earnings, thus any improvement in GAAP earnings quality resulting from clawback adoption may have an indirect effect on the frequency and quality of non-GAAP earnings disclosures. Alternatively, the very fact that non-GAAP disclosures are unlikely to trigger clawback provisions may affect the relative usefulness of non-GAAP disclosure as a tool to potentially mislead investors. We explore both of these possibilities in developing our hypotheses.

3.1. The effect of clawback adoption on the frequency of non-GAAP disclosure

It is well-known that there are two competing incentives underlying the disclosure of non-GAAP earnings. One motivation for releasing non-GAAP earnings is that managers use these disclosures opportunistically. For example, a number of studies report that non-GAAP earnings disclosures are used to meet or beat earnings benchmarks that cannot be reached via GAAP (see, e.g., Doyle et al. 2013; Black and Christensen 2009; Heflin and Hsu 2008). Prior research has also documented that recurring expenses are often excluded from non-GAAP earnings to inflate perceptions of firms' recurring earnings (see Doyle et al. 2003; Black and Christensen 2009). Because clawbacks increase the managerial costs of misstating GAAP earnings, thereby reducing managerial perceptions of reporting discretion under GAAP, managers may be more likely to attempt to reach financial reporting goals through opportunistic disclosure of non-GAAP earnings. This scenario suggests that the frequency of non-GAAP disclosure will *increase* after voluntary clawback adoption.

[6] Although non-GAAP disclosures are very unlikely to trigger clawback provisions, their use as performance measures in incentive-based executive compensation may affect the amount of compensation that is subject to recovery. The SEC's proposed Rule 10D-1 states that recoveries of erroneously awarded incentive-based compensation are triggered when there is "an accounting restatement due to the issuer's material noncompliance with any financial reporting requirements under the securities laws," where "restatement" is defined as "the process of revising previously issued financial statements to reflect the correction of an error in those financial statements." Because non-GAAP earnings do not appear in any "financial statements" *per se*, it is difficult to see how they might trigger a clawback in the absence of a restatement of GAAP earnings. However, the proposed rule does address the issue of compensation based on a non-GAAP measure of performance. It states that "incentive-based compensation" is any compensation that is "granted, earned, or vested based entirely or in part on the attainment of a financial reporting measure." Thus compensation based in part on a non-GAAP performance measure would be considered incentive-based compensation and would be subject to recovery.

A second motivation for releasing non-GAAP earnings is that managers want to inform investors by providing them with a measure of core earnings that is likely to persist in the future. Managers therefore remove non-recurring items from GAAP earnings to better communicate firm performance. Consistent with this motivation, Bradshaw and Sloan (2002) and Bhattacharya et al. (2003) report that non-GAAP earnings are, on average, more value relevant than GAAP earnings, and Heflin et al. (2015) find that the frequency of non-GAAP disclosures increases with GAAP conditional conservatism. It is thus possible that managers who use non-GAAP earnings to better inform investors may provide non-GAAP earnings disclosures more frequently to communicate core earnings to compensate for a perceived reduction in reporting discretion under GAAP after clawback adoption. This scenario also suggests that the frequency of non-GAAP earnings disclosure will *increase* after clawback adoption.

However, Lougee and Marquardt (2004) find that the likelihood of non-GAAP earnings disclosure is inversely related to GAAP earnings quality and that investors view non-GAAP earnings as more useful when GAAP earnings informativeness is low. If managers are using non-GAAP earnings informatively and if clawback adoption improves GAAP reporting quality, as documented in prior literature, then managers may feel less need to provide investors with an alternative measure of firm performance through non-GAAP disclosure. This line of reasoning suggests that voluntary adoption of clawback provisions may result in a *decrease* in the frequency of non-GAAP earnings disclosure.

In addition, voluntary adoption of clawbacks may signal the board's commitment to improving the financial reporting environment overall. Managers with opportunistic motives may be discouraged from using non-GAAP earnings due to an expectation of heightened monitoring by the boards following clawback adoption, resulting in a *decrease* in the frequency of non-GAAP disclosure.

Finally, it is also possible that clawback adoption does not change managerial behavior regarding non-GAAP disclosure if the adoption of clawback provisions is merely a signal of a firm's existing reporting quality. The signaling theory suggests that firms with high reporting quality are more likely to voluntarily adopt clawback provisions to communicate their superior quality to stakeholders (Chan et al. 2012). Firms with high reporting quality are less likely to be adversely affected by clawback adoption because managers in those firms are less likely to use non-GAAP earnings disclosures opportunistically. To the extent that firms with higher financial

reporting quality voluntarily adopt clawback provisions as a credible signal, managers are unlikely to change their non-GAAP reporting patterns. In addition, since non-GAAP earnings are not subject to restatement, managers may have little incentive to change their non-GAAP reporting practicing after clawback adoption.

We therefore make no directional prediction with regard to changes in the frequency of non-GAAP earnings disclosure after a firm voluntarily adopts clawback provisions and present the first hypothesis in null form:

> **H1**. The voluntary adoption of clawback provisions has no effect on the frequency of non-GAAP earnings disclosure.

3.2. The effect of clawback adoption on the quality of non-GAAP exclusions

Prior literature on non-GAAP disclosure assesses the quality of non-GAAP earnings by investigating whether non-GAAP exclusions have implications for future performance (see Doyle et al. 2003). Managers who disclose non-GAAP earnings to better inform investors are likely to exclude items only if those items are transitory, so that non-GAAP measures better reflect core earnings. If excluded items are transitory, they will have no predictive power for future performance; thus "high quality" non-GAAP exclusions are those that have no association with future performance. On the other hand, managers who attempt to mislead investors are more likely to exclude recurring items from non-GAAP earnings; thus "low quality" non-GAAP exclusions are those that have a significant association with future performance.

As with H1, voluntary adoption of clawback provisions could arguably increase or decrease the quality of non-GAAP earnings exclusions. Managers who are opportunistically motivated may compensate for the increased costs of manipulating GAAP earnings by excluding more recurring items from non-GAAP earnings, resulting in lower quality of exclusions. For example, Doyle et al. (2013) find that managers are more likely to use non-GAAP earnings to meet analyst forecasts when the cost of within-GAAP earnings management is high, as indicated by high levels of existing income-increasing accruals on the balance sheet (Barton and Simko 2002). Clawback adoption could induce similar behavior by managers.

However, clawback adoption may signal firms' commitment to carefully monitor all aspects of financial reporting, including non-GAAP disclosures, and prior research has shown that the quality of non-GAAP exclusions is positively correlated with the strength of corporate governance (see Frankel et al. 2011). This suggests that managers may respond to an

improvement in corporate governance structure by increasing the quality of non-GAAP exclusions after clawback adoption, regardless of their motivations for non-GAAP disclosure.

Therefore, the second hypothesis is presented in null form:

H2. The voluntary adoption of clawback provisions has no effect on the quality of non-GAAP earnings exclusions.

3.3. Joint interpretation of H1 and H2 test results

While clawback adoption may affect the frequency or quality of non-GAAP reporting, it is necessary to view the results from both hypothesis tests collectively before drawing any inferences regarding the overall effect of clawbacks on non-GAAP reporting. There are four possible combinations of results: (1) both the frequency and quality of non-GAAP reporting increases; (2) frequency increases but quality decreases; (3) frequency decreases but quality increases; and (4) both frequency and quality decrease.[7] We interpret these four outcomes as follows:

Case 1. More frequent and higher quality non-GAAP disclosure is consistent with an increase in the 'informative' use of non-GAAP reporting.

Case 2. More frequent but lower quality non-GAAP disclosure is consistent with an increase in the 'opportunistic' use of non-GAAP reporting.

Case 3. Less frequent but higher quality non-GAAP disclosure is consistent with a decrease in the 'opportunistic' use of non-GAAP reporting.

Case 4. Less frequent and lower quality non-GAAP disclosure is consistent with a decrease in the 'informative' use of non-GAAP reporting.

These interpretations are summarized in Figure 1.

3.4. Cross-sectional effects of clawback adoption on non-GAAP reporting

In addition to exploring whether voluntary clawback adoption affects the average frequency and quality of non-GAAP reporting, we also examine whether the effect of clawback adoption on firms' non-GAAP reporting varies cross-sectionally with firm characteristics and

[7] For simplicity, we omit cases where there is no change in the frequency or quality of non-GAAP reporting. Instances of no change in frequency accompanied an increase (decrease) in quality would be consistent with an increase in informative (opportunistic) non-GAAP reporting. Instances of no change in quality accompanied by an increase or decrease in frequency do not allow for clear interpretations.

managers' non-GAAP reporting incentives. These additional tests will be useful in confirming the inferences drawn from our tests of H1 and H2.

3.4.1. Non-GAAP disclosures and the ability to manage GAAP earnings

Barton and Simko (2002) argue that high levels of net operating assets (NOA) partly reflect the extent of previous accrual-based earnings management and constrain managers' ability to further optimistically bias reported earnings. Consistent with this argument, Doyle et al. (2013) find that managers are more likely to use non-GAAP earnings to meet analyst forecasts when NOA is high. If voluntary clawback adoption results in an increase in the opportunistic use of non-GAAP disclosure, we expect the decrease in the quality of non-GAAP exclusions following clawback adoption to be more (less) pronounced for clawback adopters with high (low) NOA. However, if clawback adoption increases the informative use of non-GAAP disclosure, we expect no change in the association between the quality of non-GAAP exclusions and NOA. We thus present our hypothesis related to firms' ability to manage GAAP earnings in null form:

> **H3**. The voluntary adoption of clawback provisions has no effect on the association between the quality of non-GAAP earnings exclusions and NOA.

3.4.2. Non-GAAP disclosures and meeting or beating earnings benchmarks

Doyle et al. (2013) and Black and Christensen (2009) document that non-GAAP earnings are used to meet or beat earnings benchmarks when these thresholds cannot be reached via GAAP earnings. If clawback adoption constrains managers' ability to meet reporting objectives using GAAP earnings, as documented by deHaan et al. (2013), then managers may be more likely to rely on non-GAAP disclosures to do so. Alternatively, managers may perceive less pressure to meet earnings thresholds upon clawback adoption, which would suggest no change in the use of non-GAAP disclosures to meet or beat benchmarks after clawback adoption. We thus present our hypothesis in null form:

> **H4**. The voluntary adoption of clawback provisions has no effect on use of non-GAAP earnings disclosures to meet or beat earnings benchmarks.

3.4.3. Non-GAAP disclosures and compensation contracting

Black, Black, Christensen, and Gee (2015) document a positive association between non-GAAP reporting and executive compensation contract structure. In particular, they report a positive relation between the opportunistic use of non-GAAP disclosures and the use of short-

term incentive plans. We thus consider how the incentives provided by executive compensation contracting might impact managers' non-GAAP reporting choices after clawback adoption. If voluntary clawback adoption results in an increase in the opportunistic use of non-GAAP disclosure, we expect the association between aggressive non-GAAP reporting and short-term incentive plan usage to increase upon clawback adoption. However, if managers respond to clawback adoption by increasing their informative use of non-GAAP disclosure, we expect no change in the association between aggressive non-GAAP reporting and short-term incentive plan usage. Presented in null form:

> **H5**. The voluntary adoption of clawback provisions has no effect on the relation between non-GAAP earnings disclosure and the use of short-term incentive plans.

3.4.4. Non-GAAP disclosures and GAAP earnings quality

Our last hypothesis addresses the interaction between GAAP earnings quality and non-GAAP reporting. Because clawbacks cannot be triggered by irregularities in non-GAAP reporting, any documented effects of clawback adoption on non-GAAP reporting must be related to actual or perceived changes in GAAP reporting. Prior literature has documented an improvement in GAAP earnings quality following clawback adoption. It thus follows that changes in the frequency and quality of non-GAAP reporting after clawback adoption are associated with the improvement in GAAP earnings quality. Alternatively, changes in non-GAAP reporting after clawback adoption may be independent of changes in GAAP earnings quality if clawbacks lead to operational changes that affect non-GAAP reporting decisions. Stated in null form:

> **H6**. The voluntary adoption of clawback provisions has no effect on the association between non-GAAP reporting and GAAP earnings quality.

4. Sample selection criteria and data description

Our basic empirical approach, which closely aligns with that of deHaan et al. (2013) and Chan et al. (2012), is as follows. We match each clawback adopter to a non-adopting control firm using propensity score matching and then perform a difference-in-differences analysis to assess pre- versus post-adoption changes in non-GAAP reporting. The difference-in-differences design controls for both cross-sectional and temporal differences between our treatment and control firms, and propensity score matching helps us to further eliminate cross-sectional

differences between the two groups, especially those that may affect or are correlated with the likelihood of clawback implementation or non-GAAP reporting.

To identify our treatment sample of clawback adopters, we follow Chan et al. (2012) and obtain clawback adoption data and other corporate governance characteristics from the Corporate Library, which covers firms in the Russell 3000 Index. We initially identify 297 non-regulated firms as having voluntarily adopted clawback provisions during our sample period from 2005 to 2009. We exclude financial firms from the sample because the majority of them mandatorily adopted clawback provisions under the Emergency Economic Stabilization Act (EESA) of 2008.[8] We then hand-collect more detailed information regarding firms' clawback provisions from their proxy statements filed with the SEC.

We obtain data for the propensity matching procedure and for our hypothesis tests from several sources. As in Chan et al. (2012) and deHaan et al. (2013), we use annual data for the propensity matching procedure; however, because non-GAAP disclosures are released on a quarterly basis, we use quarterly data for our hypothesis tests. We obtain firm financial data from Compustat, CRSP, and I/B/E/S; auditor and accounting restatement information are obtained from Audit Analytics; shareholding information are obtained from Thomson Reuters; CEO variables are obtained from The Corporate Library; and executive compensation data are obtained from Execucomp. We match quarterly financial data with annual data based on the fiscal year.

After eliminating financial institutions and firms that do not have the requisite data, the treatment sample consists of 262 clawback adopters out of 2,148 firms covered in the Corporate Library. Panel A of Table 1 presents the frequency distribution of the sample firms by year. Clawback provisions were infrequent in 2005, with only 8 firms having adopted clawback provisions, but we observe sharp increases in adoption frequency during 2007, 2008, and 2009. This increase in the frequency of clawback adoption is consistent with findings in prior research (Chan et al. 2012; Barbenko et al. 2015).

Panel B of Table 1 compares the means and medians of the sample characteristics of clawback adopters (5,208 firm-quarters) versus non-adopters (38,459 firm-quarters), using all available data from 2005-2009. We include variables that have been identified in prior research

[8] Financial institutions that received TARP funding automatically adopted clawback provisions under EESA of 2008. In addition, financial firms were subject to several additional provisions mandated by the Treasury Department, such as limits on pay.

as important determinants of clawback adoption and of non-GAAP disclosure, as well as other firm characteristics. As shown in Panel B, clawback adopters differ significantly from non-adopters on almost every characteristic examined. Clawback adopters are much larger in size than non-adopters: mean (median) total assets of clawback adopters are $12,318 ($3,702) million, which is six times larger than that non-adopters. Clawback adopters also have significantly higher mean intangible intensity (0.199 vs. 0.143), higher leverage ratios (0.555 vs. 0.486), lower earnings volatility (0.015 vs. 0.030), are more likely to recognize special items (0.599 vs. 0.430) of greater magnitudes (0.055 vs. 0.044), exhibit lower frequencies of losses (0.138 vs. 0.300), and experience more negative accruals (-0.047 vs. -0.033) than non-adopters. Consistent with Chan et al. (2012), clawback firms have a higher percentage of independent directors on the board (0.852 vs. 0.811), have lower insider holdings (0.069 vs. 0.169), greater institutional holdings (0.834 vs. 0.710), and are more likely to hire Big 4 auditors (0.871 vs. 0.678). The CEOs of clawback firms are more likely to also be chairman of the board of directors (0.636 vs. 0.578) but have shorter tenure (5.353 vs. 5.550). Finally, the CEOs of clawback firms tend to earn significantly higher pay.

The numerous differences in the firm characteristics of clawback adopters versus non-adopters, as documented above, illustrate why we undertake a propensity-matching approach to our analysis. A comparison of clawback adopters with the population of all non-adopting firms is unlikely to shed light on the question of whether clawback adoption leads to a particular outcome, such as future non-GAAP reporting decisions. We therefore select a single control firm for each clawback adopter by matching each adopter to the non-adopting firm with the closest predicted value (i.e, "propensity score") from a logit model estimation of clawback adoption. The dependent variable is an indicator variable that equals one if the firm has adopted a clawback provision and zero otherwise (*Claw*) and each of the firm characteristics from Panel B of Table 1 are included as independent variables, as follows:

$$\begin{aligned}\boldsymbol{Claw}_{t+1} = {} & \alpha_0 + \alpha_1 Ln(Total\ Assets)_{i,t} + \alpha_2\ Intangible_{i,t} + \alpha_3 Market\ to\ Book_{i,t} \\ & + \alpha_4 Sales\ Growth_{i,t} + \alpha_5 Leverage_{i,t} + \alpha_6 Earnings\ Volatility_{i,t} + \alpha_7 SI_{i,t} \\ & + \alpha_8 Special\ Items_{i,t} + \alpha_9 Loss_{i,t} + \alpha_{10} Ln(Audit\ Fee)_{i,} + \alpha_{11} Accruals_{i,t} \\ & + \alpha_{12} Restatement_{i,t} + \alpha_{13}\%Outside_{i,t} + \alpha_{14}\%Insiderholding_{i,t} \\ & + \alpha_{15}\%Intitutionalholding_{i,t} + \alpha_{16} Big4_{\ i,t} + \alpha_{17} CEOChairman_{i,t} \\ & + \alpha_{18} CEOTenure_{i,t} + \alpha_{19} CEOTurnover_{i,t} + \alpha_{19} Ln(CashPay)_{i,t} + \alpha_{20} Ln(Option)_{i,t} \\ & + \alpha_{21} Ln(TotalComp)_{i,t} + Industry\ Fixed\ Effect + \varepsilon_{i,t}\end{aligned} \quad (1)$$

We estimate equation 1 separately for each year from 2005 to 2009, using all firms with available data, to accurately match the characteristics of clawback firms with those of non-adopters in the year prior to adoption.[9] Panel A of Table 2 reports the logit estimation results by year.[10] Firm size is the most consistent determinant across the four years, but results for the other determinants vary considerably over time. For example, earnings restatements are a significant determinant of clawback adoption in 2006, while compensation variables are more important in 2008. These findings suggest that firms' motivations for clawback adoption vary considerably across the sample period, reinforcing our decision to match clawback adopters to control firms using propensity scores estimated for each year rather than for the pooled sample.

We match (without replacement) control firms to clawback adopters based on the closest predicted value from equation (1), within a maximum distance of three percent.[11] Matched control firms are assigned with "pseudo" adoption years. For example, if a firm adopts a clawback provision in 2007, its matched control firm is also assigned a "pseudo" adoption year of 2007. We require both clawback adopters and non-adopters to have at least one observation before and after the clawback adoption year so that we are able to employ the difference-in-difference research design. This procedure yields 189 pairs of voluntary clawback adopters and non-adopters. Panel B of Table 2 presents the distribution of matched pairs over 2006 to 2009, which roughly parallels the pattern observed in Panel A of Table 1.

We present descriptive data demonstrating the success of the propensity matching procedure in Panels C and D of Table 2. In Panel C, we compare the means and medians of the independent variables in equation (1) for the clawback adopters and their matched controls in the year prior to clawback adoption. There are no significant differences in the mean or median of any variable, with the exception of median earnings volatility, which suggests that the treatment and control firms are well-matched on these dimensions. Further, in Panel D we find that the mean (median) difference in propensity scores between the two groups is -0.001 (0.000) and standard deviation of the difference is 0.005, indicating that there is no significant difference between the propensity scores of the treatment firms and their matched controls. We conclude

[9] DeHaan et al. (2013) also match clawback firms with non-adopting firms using propensity-score matching and conduct a difference-in-differences analysis. However, they use 2006 year-end data to match 2007, 2008 and 2009 clawback adopters with non-adopters.

[10] We do not report estimation results from 2005 because we were unable to find matched controls for the eight clawback adopters from this year using our chosen caliper width of 0.03.

[11] Lawrence, Minutti-Meza, and Zhang (2011) also use a caliper width of 0.03 in their PSM procedure.

that the propensity-matching procedure has succeeded in identifying appropriate control firms for each clawback adopter.

Next, we collect non-GAAP earnings data for this sample of 189 treatment-control matched firm pairs. The source of non-GAAP earnings data warrants careful consideration. We use manager-adjusted non-GAAP earnings information collected from firms' earnings announcement press releases, similar to Bhattacharya et al. (2003), Lougee and Marquardt (2004), and Zhang and Zheng (2011). This design choice is especially important, as it ensures that the non-GAAP disclosures we are examining are solely the result of managerial decision-making and are uncontaminated by analyst adjustments to reported earnings (e.g., Gu and Chen 2004).

While much of the prior non-GAAP literature used LexisNexis as a datasource for earnings press releases, we are able to use firms' Form 8-K filings with the SEC to obtain press release disclosures because our sample period falls after the enactment of the Sarbanes-Oxley Act (SOX), which requires an 8-K filing within four business days whenever firms disclose quarterly or annual operating results in preliminary earnings releases.[12] We thus view 8-K filings as the most reliable source of press releases that disclose financial information to the general public.[13] We hand-collect company-disclosed quarterly earnings data from 8-Ks for each of our sample clawback adopters and their matched controls for the two-year period both before and after clawback adoption (5,784 firm-quarters).[14] We describe our procedure for identifying non-GAAP earnings disclosures within each press release in Appendix A.

[12] See Form 8-K, Item 2.02(a) Results of Operations and Financial Condition: "If a registrant, or any person acting on its behalf, makes any public announcement or release (including any update of an earlier announcement or release) disclosing material non-public information regarding the registrant's results of operations or financial condition for a completed quarterly or annual fiscal period, the registrant shall disclose the date of the announcement or release, briefly identify the announcement or release and include the text of that announcement or release as an exhibit."

[13] While we believe that the use of 8-K filings is superior to LexisNexis as a means of sourcing press release information, we nonetheless check the validity of our sample collection procedure by comparing 8-K data with non-GAAP disclosures taken from press releases identified using LexisNexis using the following procedure. First, we randomly selected 15 clawback adopters from our sample, for which we have 232 firm-quarters of press release data from 8-K filings. We then searched for earnings announcements disclosed in press releases via LexisNexis and were able to find only 210 firm-quarters (or 91%). Second, we randomly chose a second sample of 15 clawback adopters and searched for earnings announcements during our sample periods using LexisNexis. We find a total of 215 press releases from LexisNexis, all (i.e., 100%) of which were disclosed in 8-K filings on the SEC's EDGAR system. The results of these two-way validity tests give us confidence that samples of press releases collected from 8-K filings are more (or at least as) complete than samples identified using LexisNexis.

[14] Consistent with Chan et al. (2012, 2013, 2015), we include the year of adoption in the post-adoption period, using all four quarters of data. Our rationale is as follows. The Corporate Library defines the year of adoption as the

In Table 3, we present descriptive statistics for the non-GAAP reporting choices of clawback adopters and their matched control firms. As shown in Panel A, clawback adopters are less likely to disclosure non-GAAP earnings over the entire sample period: the frequency is 0.449 for adopters versus 0.502 for non-adopters, and the difference is highly significant. However, there are no significant differences in the magnitude of non-GAAP earnings or of total exclusions across the two groups. For comparison purposes, we also present mean and median frequency and magnitude of special items (*SI* and *Special Items*, respectively). Clawback adopters are more likely to recognize special items than are non-adopters (0.594 vs. 0.564, t = -2.234), but the magnitude of special items does not differ significantly.

In Panel B, we examine non-GAAP reporting patterns before and after clawback adoption. The frequency of non-GAAP disclosure increases markedly after firms adopt clawbacks. Before adoption, there are 565 (out of 1,470) firm-quarters in which we observe non-GAAP disclosure -- a relative frequency of 0.384 -- while there are 712 (out of 1,408) firm-quarters after adoption – a significantly higher relative frequency of 0.501 (Z = -6.549, untabulated). The frequency of non-GAAP disclosure also increases after the "pseudo-adoption" year, from 0.467 (700/1,497) to 0.534 (753/1,409), but not as dramatically as for clawback adopters. Panel B also reveals that there is no significant change, on average, in the magnitude of non-GAAP earnings for either adopters or non-adopters, but that the magnitude of total exclusions increases significantly for both groups.

5. Research design and empirical results

5.1. The frequency of non-GAAP disclosure and voluntary clawback adoption

Our descriptive data from Table 3 suggests that the frequency of non-GAAP disclosure has increased dramatically after firms adopt clawbacks. To formally test H1, we estimate a probit

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calendar year in which a clawback provision was first announced in firms' proxy statement filings with the SEC. The deadline for proxy filing is 120 days after the fiscal year-end, but most firms file proxy statements well ahead of this deadline, i.e., during the first fiscal quarter of the year (see Wei and Yermack, 2011). We therefore include all four quarters in the "post" period because managers are likely to be aware of the firm's intention to adopt clawback provisions during the first fiscal quarter, which should affect their reporting choices for that quarter. Even in the occasional case where firms file proxy statements after the first quarter but before the 120-day deadline, the earnings announcement for the first quarter (in which any non-GAAP disclosures would appear) would not occur for several weeks after the end of the first quarter. For example, Callen, Livnat, and Segal (2006) report that the average lag between the end of the quarter and the preliminary earnings announcement is 22 days. We thus believe that including data for the first quarter of the year is an appropriate design choice. However, our results are not sensitive to excluding the first quarter of the clawback adoption year.

model of the likelihood of disclosing non-GAAP earnings in a given quarter. We model the probability of releasing non-GAAP earnings as a function of clawback adoption and other determinants of non-GAAP disclosures that have been identified in prior literature, as follows:[15]

$$Prob(Non\text{-}GAAP)_{iq} = \alpha_0 + \alpha_1 After_{iq} + Controls\ Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_{iq} \quad (2)$$

$$Prob(Non\text{-}GAAP)_{iq} = \alpha_0 + \alpha_1 Claw_{iq} + \alpha_2 After_{iq} + \alpha_3 After x Claw_{iq} + Controls + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_{iq} \quad (3)$$

The dependent variable, *Non-GAAP*, is an indicator variable that equals 1 if a firm discloses non-GAAP earnings in its earnings release for a given quarter and 0 otherwise. *After* is an indicator variable that equals 1 for periods when clawback provisions (or pseudo-assigned clawback provisions for non-adopters) are in place and 0 otherwise. *Claw* is an indicator variable that equals 1 if a firm is a voluntary adopter of clawback provisions and 0 otherwise. In Model 1, the test sample includes only clawback adopters, and our main variable of interest is *After*. In Model 2, which employs the difference-in-differences research design, the test sample includes both clawback adopters and their matched control firms, and our main variable of interest is *AfterXClaw*. Significant coefficients on these variables would provide evidence that clawback adoption significantly influences the likelihood of non-GAAP disclosure.

We include the following control variables in both models. We include *Ln(Total Assets)* because large firms tend to disclose non-GAAP earnings more frequently, suggesting firm size is an important factor to control for systematic difference between clawback adopters and non-adopters. Firms with high intangibles or high-tech firms have less informative GAAP earnings, and therefore are more likely to release non-GAAP earnings than other firms (Lougee and Marquardt 2004). As such, we include intangible intensity (*Intangible*) and a high-tech indicator variable (*Tech*). Since growth firms are more likely to report non-GAAP earnings, market-to-book ratio (*Market-to-Book*) and sales growth rate (*Sales Growth*) are included in the model (Lougee and Marquardt 2004). *Leverage* is included to control for the increased likelihood of earnings management for highly levered firms, which may result in less informative GAAP earnings. *Earnings Volatility* is used as a control because investors tend to demand additional information when earnings are volatile (Defond and Hung 2003). Firms reporting large special items are more likely to disclose non-GAAP earnings. Following Heflin and Hsu (2008), we

[15]Lougee and Marquardt (2004) examine the economic determinants of pro forma reporting; Marques (2006) and Heflin and Hsu (2008) examine the effect of SEC intervention on the frequency of non-GAAP disclosures.

include two controls for special items: (1) *SI*, which is an indicator variable that equals 1 if a firm discloses special items in quarter *q* and 0 otherwise; and (2) *Special Items*, which is the reported dollar amount of special items divided by total assets.[16] Since firms that miss earnings benchmarks are more likely to disclose non-GAAP earnings, we include a loss indicator variable (*Loss*) that equals one when GAAP earnings before extraordinary items are negative and zero otherwise. In addition, a "big bath" indicator variable (*Big Bath*) is included because firms may be more likely to report non-GAAP earnings when it reports a one-time charge that results in an operating loss. Heflin and Hsu (2008) find that firms are more likely to disclose non-GAAP earnings in the fourth quarter than in other quarters. We therefore include *QTR4*, an indicator variable equal to 1 for all firm-quarter observations that represent the firm's fourth fiscal quarter, and 0 otherwise. Finally, we follow Doyle et al. (2003) and include total accruals (*Accrual*) as a control variable. In addition, we control for time trends in non-GAAP reporting by including year fixed effects, and standard errors are clustered at the firm level.

The results from estimating equations 2 and 3 are presented in Table 4. When we limit the sample to only clawback adopters, as in equation 2, we find that the likelihood of non-GAAP earnings disclosure is significantly higher after clawback adoption – the estimated coefficient on *After* is 0.495 ($p < 0.01$). This result indicates that managers are significantly more likely to release non-GAAP earnings after voluntarily adopting clawback provisions than before, consistent with the descriptive data from Table 3.[17] This result still holds when we employ the difference-in-differences method, as in equation 3 – the estimated coefficient is 0.227 ($p < 0.05$). We therefore reject the null hypothesis H1 and conclude that voluntary clawback adoption significantly increases the likelihood of non-GAAP earnings disclosure.

The estimated coefficients on the control variables are generally consistent with our expectations. We find the expected positive association between *Intangible* and *Tech* and the likelihood of non-GAAP disclosure, suggesting that firms with less informative earnings are significantly more likely to report non-GAAP earnings to communicate their performance. *Earnings Volatility* and both *SI* and *Special Items* are positively associated with the probability of

[16] In addition to these measures, Heflin and Hsu (2008) include the magnitude of industry mean special items because it explains significant portion of probability of disclosing non-GAAP earnings. Our results are insensitive to the inclusion of this variable.

[17] The marginal effect of voluntary clawback adoption in equation 2 is 0.193; i.e., the probability of releasing non-GAAP earnings is 19.3% higher after voluntarily adopting clawbacks than it was previously.

non-GAAP disclosure in both models, while accruals are negatively associated, consistent with prior literature.

In sum, our analysis of non-GAAP disclosure frequency reveals that firms utilize non-GAAP earnings more frequently after the voluntary adoption of clawback provisions. The increases in the frequency of non-GAAP disclosures may be either due to the perceived reduction in GAAP reporting discretion following voluntary clawback adoptions or due to an improvement in GAAP financial reporting quality, depending on whether the underlying managerial motives are to inform or mislead investors. Therefore, we proceed to our tests of non-GAAP disclosure quality after voluntary clawback adoption (H2).

5.2. The quality of non-GAAP exclusions and voluntary clawback adoption

To test H2, we first follow prior research and define higher quality non-GAAP exclusions as being more transitory and having no predictive power for future operating income (Doyle et al. 2003; Kolev et al. 2008). As in our tests of H1, we use both the sample of only clawback adopters and the sample of matched treatment-control pairs to test H2. We employ the following regression models:

$$\begin{aligned} FOPI_{q+1,q+4} = {} & \alpha_0 + \alpha_1 Non\text{-}GAAP\ Earnings_{i,q} + \alpha_2 After_{\,i,q} \\ & + \alpha_3 Non\text{-}GAAP\ Exclusion_{i,q} + \alpha_4 \boldsymbol{After_{\,i,q} x Non\text{-}GAAP\ Exclusion_{i,q}} \\ & + Controls + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_{i,q} \end{aligned} \quad (4)$$

$$\begin{aligned} FOPI_{q+1,q+4} = {} & \alpha_0 + \alpha_1 Non\text{-}GAAP\ Earnings_{i,q} + \alpha_2 Claw_i + \alpha_3 After_{\,i,q} \\ & + \alpha_4 Non\text{-}GAAP\ Exclusion_{i,q} + \alpha_5 Claw_i x Non\text{-}GAAP\ Exclusion_{i,q} \\ & + \alpha_6 After_{\,i,q} x Non\text{-}GAAP\ Exclusion_{i,q} + \alpha_7 After_{\,i,q} x Claw_i \\ & + \boldsymbol{\alpha_8 After_{\,i,q} x Claw_i x Non\text{-}GAAP\ Exclusion_{i,q}} + Controls \\ & + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_{i,q} \end{aligned} \quad (5)$$

Following Kolev et al. (2008) and Curtis, McVay and Whipple (2014), we use future operating income (*FOPI*), defined as earnings per share from operations summed over the four quarters beginning with quarter *q+1*, as the dependent variable for the test of exclusion quality. One advantage of using future EPS from operations as a dependent variable is that Compustat excludes nonrecurring special items but includes recurring items that may be classified as other exclusions from non-GAAP earnings (Kolev et al. 2008). Future operating cash flows, the

dependent variable in Doyle et al. (2003), includes nonrecurring items and is therefore a less desirable proxy for 'core' earnings, which non-GAAP earnings purports to measure.[18]

As noted earlier, non-GAAP earnings (*Non-GAAP Earnings*) are hand-collected from press releases in firms' 8-K filings, and non-GAAP exclusions (*Non-GAAP Exclusions*) are defined as non-GAAP earnings less comparable GAAP earnings disclosed with non-GAAP earnings in the press releases. *Claw* and *After* are as defined in Section 5.1. *After*x*Non-GAAP Exclusion* is the main variable of interest in equation 4, and *After*x*Claw*x*Non-GAAP Exclusion* is our main variable of interest in equation 5. If *Non-GAAP Exclusions* were perfectly transitory, the estimated coefficient on this variable should equal zero. However, prior research (Doyle et al. 2003, Kolev et al. 2008, Curtis et al. 2014) documents that the estimated coefficient on *Non-GAAP Exclusions* is significantly negative. That is, income-decreasing exclusions (expenses and losses) are associated with lower future operating income, while income-increasing exclusions (revenue and gains) predict higher future income. Thus, significantly positive coefficients on our variables of interest would indicate movement toward the benchmark of a zero and that the quality of exclusions has improved after clawback adoption, while significantly negative coefficients would indicate movement away from the benchmark of zero and signal that the quality of exclusions has deteriorated after clawback adoption.

To control for potential confounding factors affecting future operating income and non-GAAP earnings, we include following control variables. Doyle et al. (2003) argue that growing firms tend to have lower future operating cash flows because of long-term investment and increase in the working capital and finds negative association between sales growth rate and future performance. In addition, prior empirical works find that market to book ratio is positively correlated to future earnings and non-GAAP reporting decisions. Therefore, we include two proxies for sales growth: (1) sales growth rate (*Sales Growth*) and (2) Market-to-book ratio (*Market to book*). Firm size (*Ln(Total Assets)*) is included because the costs of opportunistic non-GAAP reporting may increase with firm size. Firms with less persistent earnings could be perceived as lower quality of earnings, creating a demand for additional information (Lougee and Marquardt 2004). Therefore, we include *Earnings Volatility* and *Loss* to control for this effect. We include *Ln(Age)* to consider potential effects of firm age on non-GAAP exclusions and future

[18] Easton (2003) also criticizes the use of future operating cash flows in Doyle et al. (2003). Kolev et al. (2008) provide a more detailed discussion regarding the choice of a dependent variable in the Doyle et al. (2003) model and conclude that future operating income is the preferred choice, given the set of possible alternatives.

earnings. Finally, total accruals (*Accrual*) are included in the model to control for any effects of accrual reversal on future earnings, which may affect the association between non-GAAP exclusions and future earnings.

Table 5 presents the results of the Doyle et al. (2003) exclusion quality tests. The two left-most columns present estimations results for equations 4 and 5. The estimated coefficient on *Non-GAAP Earnings* is 1.578 in equation 4, indicating that reported non-GAAP earnings are not perfectly permanent earnings.[19] Consistent with Doyle et al. (2003) and Kolev et al. (2008), the coefficients on *Non-GAAP Exclusion* in equations 4 and 5, are significantly negatively (-0.370, and -0.572, respectively), suggesting that the excluded items are not transitory but likely to recur within the next four quarters.

If voluntary clawback adoption motivates managers to provide informative non-GAAP earnings disclosures more frequently, the exclusions should be more transitory, suggesting that the relation between the exclusions and future operating income is less negative after clawback adoptions. On the other hand, if voluntary clawback adoption motivates opportunistically motivated managers to disclose non-GAAP earnings more frequently, non-GAAP exclusions should be less transitory, suggesting that the relation is more negative after clawback adoption.

In equation 4, the coefficient on *After*x*Non-GAAP Exclusion* is significantly negative (-0.364), indicating that exclusions become less transitory after voluntary clawback adoption than before. This suggests that managers use non-GAAP earnings more opportunistically after clawback provisions are in place, consistent with the view that clawback provisions impose significant costs on managing GAAP earnings and that managers switch their focus toward non-GAAP earnings as an earnings management tool after the adoption. Equation 5 presents results using the propensity-score matched sample. The coefficient on the main variable of interest, α_8, is significantly negative (-0.710), again suggesting that the exclusion becomes less transitory, i.e., clawback adopters opportunistically use non-GAAP earnings.

The signs of coefficients on control variables are generally consistent with prior literature. *Sales Growth,* firm size (*Ln(Total Assets),* and firm age (*Ln(Age*)) are all significantly positively related to future operating income, which suggests that large, mature firms with good growth opportunities tend to have better future performance. *Earnings Volatility* is negatively related to

[19] Since future earnings are summed over four quarters starting from q+1, the coefficient of α_1 would equal 4 if non-GAAP earnings were perfectly persistent.

future operating income, suggesting that firms with less persistent earnings tend to report lower future earnings. Finally, total accruals (*Accrual*) are associated with lower future operating income, consistent with the reversal of accruals.

In the two right-most columns, we interact *Non-GAAP Earnings* with *After* and *Claw* and add these variables to equations 4 and 5. This addition will allow us to assess the predictive ability of GAAP earnings before and after clawback adoption. Because *Non-GAAP Earnings* is defined as GAAP earnings plus non-GAAP exclusions and because both variables are included as regressors, the coefficient on *Non-GAAP Earnings* represents the dollar amount that future operating (i.e., 'core') income will increase per dollar of current GAAP earnings. While we have no formal hypothesis related to the effect of clawback adoption on the predictive power of GAAP earnings for future operating income, prior literature documenting that GAAP earnings quality improves after clawback adoption would suggest that GAAP earnings would have a stronger relationship with future core earnings.

The results are consistent with this expectation. For the sample of only clawback adopters, the estimated coefficient on *After*Non-GAAP Earnings* is 0.398 and significant at the 0.05 level, suggesting that GAAP earnings has a stronger relationship with future core income after clawback adoption. For the propensity score matched sample, we find that the estimated coefficient on *AfterxNon-GAAP Earnings* is insignificant, which suggests that the predictive power of GAAP earnings for future core income does not change for the matched control sample of non-clawback adopters. However, we find that the coefficient on *ClawxNon-GAAP Earnings* is negative and significant; that is, the predictive power of GAAP earnings for future core income was significantly lower for the clawback sample prior to adoption, consistent with low GAAP earnings quality before the change in governance policies. In addition, the coefficient on *AfterxClawxNon-GAAP Earnings* is positive and significant, consistent with improved GAAP quality earnings after clawback adoption. These findings complement those in the prior literature documenting that earnings quality improves after clawback adoption. We further note that the addition of these interaction terms has virtually no effect on the estimated coefficients on any of the *Non-GAAP Exclusion* variables.

In addition to the Doyle et al. (2003) measure of exclusion quality, we use a simpler measure recently introduced by Black et al. (2015). The variable *Aggressive* is defined as an indicator variable that equals one if *Non-GAAP Earnings* is greater than IBES Actual Earnings

and zero otherwise. This measure of non-GAAP exclusion quality is interpreted as a measure of aggressive non-GAAP reporting since it indicates that the manager's exclusions are not supported by analysts and are likely to represent recurring rather than non-recurring expenses.

To test H2 using this alternative measure, we adopt the same approach as in equations (2) and (3) except that the dependent variable is now *Aggressive* and our choice of control variables is now based on Black et al. (2015):

$$Prob(Aggressive_q) = \alpha_0 + \alpha_1 \boldsymbol{After}_{i,q} + Controls + \varepsilon_q \quad (6)$$

$$Prob(Aggressive_q) = \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,q} + \boldsymbol{\alpha_3 After_{i,q} \times Claw_i} + Controls + \varepsilon_q \quad (7)$$

We present results from estimating equations 6 and 7 in Table 6.[20] As with equations 2 and 3, the variables of interest are *After* and *AfterxClaw*, respectively. For the sample of clawback adopters, the estimated coefficient on *After* is 0.256 and highly significant ($p < 0.01$), while for the propensity matched sample, the estimated coefficient on *AfterxClaw* is 0.215 and also significantly different from zero ($p < 0.05$). These results indicate that aggressive non-GAAP reporting is significantly more likely to occur after clawback adoption, consistent with the results in Table 5 showing that exclusion quality deteriorates after adoption.

Taking the results from the frequency (H1) and quality (H2) tests together, our initial evidence indicates that the frequency of non-GAAP disclosure increases and the quality of non-GAAP exclusions deteriorates after the voluntary adoption of clawback provisions. This is consistent with Case (2) of Figure 1 – i.e., an overall increase in opportunistic non-GAAP reporting following voluntary clawback adoption -- and is not an intended consequence of clawback adoption. Our cross-sectional tests in H3 – H6 should provide additional insight into this finding.

5.3 Cross-sectional tests

5.3.1. Non-GAAP disclosures and the ability to manage GAAP earnings

In H3, we test whether constraints on managers' ability to engage in accruals-based earnings management affects their use of non-GAAP disclosures after clawback adoption. If our inference drawn above that clawback adoption leads to an increase in opportunistically-motivated non-GAAP disclosure is correct, we should observe a greater deterioration in non-

[20] Note that because we follow Black et al. (2015) and include two executive compensation variables as controls, the sample size in Table 6 is somewhat reduced.

GAAP disclosure quality when managers are less able to manage GAAP earnings through accruals. Following Barton and Simko (2002), we use beginning net operating assets (NOA) as our proxy for earnings management constraints. To test H3, we rank clawback adopters by NOA and repeat the analysis in Table 5 using the highest and lowest quintiles of NOA.[21]

As shown in Table 7, the estimated coefficient on the main variable of interest, *AfterxClawxNon-GAAP Exclusion*, is significantly negative for the High NOA column. The estimated coefficient is -1.848 and significant at the 0.01 level, while the estimated coefficient of -0.301 for the Low NOA subsample is not significantly different from zero. We also estimate a pooled analysis (results untabulated) in which we combine the high and low NOA subsamples and use a four-way interaction term (*After*Claw*HighNOA*Non-GAAP Exclusion*) to test for differences in the quality of non-GAAP exclusion across the high and low NOA groups. The estimated coefficient is -1.947 and the t-statistic is -2.11, which is significant at the 0.05 level. These findings indicate that managers tend to exclude more recurring items from non-GAAP earnings when their ability to manage GAAP earnings is constrained by both a clawback provision and high levels of NOA, consistent with opportunistic reporting choices.

5.3.2. Non-GAAP disclosures and meeting or beating analyst forecasts

In H4, we test whether clawback adoption affects managers' use of non-GAAP reporting to meet or beat analyst earnings forecasts. We adopt the model in Doyle et al. (2013), as follows:

$$\begin{aligned} Prob(MBE)_{i,q} &= \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,q} + \alpha_3 PosExc_{i,q} + \alpha_4 After_{i,q} \times Claw_i \\ &+ \alpha_5 Claw_i \times PosEx_{i,q} + \alpha_6 After_{i,q} \times PosExc_{i,q} + \boldsymbol{\alpha_7 After_{i,q}} \\ &\times \boldsymbol{Claw_i \times PosExc_{i,q}} + Control\ Variables + Fixed\ Effect + \varepsilon_{i,q} \end{aligned} \quad (8)$$

We examine three different meeting/beating variables (*MBE*). The first is defined as per Doyle et al. (2013) as an indicator variable that equals one if I/B/E/S actual earnings meets or exceeds the median consensus analyst earnings forecast from I/B/E/S, and zero otherwise (*Street_MBE1*). The main variable of interest in Doyle et al. (2013) is *PosExc*, which is an indicator variable that equals one if non-GAAP earnings exceeds GAAP earnings, and zero otherwise. They report a significantly positive coefficient on *PosExc* and interpret it as evidence that managers opportunistically exclude expenses from GAAP earnings to meet or beat analyst

[21] Our results are similar when we compare the highest quintile of NOA with the bottom four quintiles of NOA.

forecasts. We add to their main model the indicator variables *Claw* and *After* and interact them with *PosExc* as our first test of H4.

The results using *Street_MBE1* are presented in the left-most column of Table 8. Consistent with Doyle et al. (2013), we report a positive coefficient of 0.172 on *PosExc*, though it is only marginally significant at $p < 0.10$. Of greater interest to us, however, is the significantly positive coefficient on *ClawxAfterxPosExc* of 0.350 ($p < 0.05$). This finding indicates that firms are more likely to use positive exclusions to meet or exceed analyst forecast after clawback adoptions. In addition, the significantly positive coefficients on the control variables *Salesgrowth*, *Ln(Total Assets)*, *Profitable*, and *ROA* are consistent with Doyle et al. (2013).

We further refine the definition of *MBE* to obtain greater insight. Because clawback adoption is presumed to affect the ability to manage GAAP earnings, we redefine *MBE* so that it equals one if I/B/E/S actual earnings exceeds the forecast *and* GAAP earnings miss the forecast (*Street_MBE2*). This is a more relevant measure of meeting and beating behavior in our particular setting. The results are shown in the middle column of Table 8. The estimated coefficient on *PosExc* is much higher than previously at 1.734 and is very highly significant, with $t = 8.88$. The strength of this result suggests that this is the instance in which positive non-GAAP exclusive are especially useful to managers, i.e., when GAAP earnings misses the analyst forecast and a positive exclusion will allow managers to reach that benchmark. The estimated coefficient *on ClawxAfterxPosExc* is also positive at 0.588, but is only marginally significant ($p < 0.10$), which indicates that this type of meeting/beating behavior is somewhat more likely to occur after clawback adoption. Notably, the coefficients on the control variables are comparable to those in the first column, with the exception of *ROA*. The negative coefficient on *ROA* indicates that missing the forecast using GAAP earnings (and exceeding it using non-GAAP) is more likely for less profitable firms, an intuitive result.

In our last variation of *MBE*, we replace Doyle et al.′s (2013) proxy for non-GAAP earnings (I/B/E/S actual earnings) with our hand-collected non-GAAP disclosures from press releases (*NonGAAP_MBE*). This measure is most relevant for our purposes, as it is not affected by analyst adjustments to managers′ non-GAAP reporting decisions. The results in the right-most column of Table 8 show that the coefficient on *PosExc* is even more positive than previously at 1.859 with a higher t-statistic of 9.18 and that the coefficient of 1.002 on *ClawxAfterxPosExc* is

significant with t = 2.25 (p <0.01). Thus we again conclude that managers are more likely after clawback adoption to use positive non-GAAP exclusions to meet or beat analyst forecasts that they would miss if they only reported GAAP earnings. In addition, it is worth noting that the coefficient on the interaction term *ClawxAfter* of -0.992 and significant at p < 0.05, which indicates that firms that do not disclose non-GAAP earnings are significantly less likely to meet or beat analyst forecasts after clawback adoption, consistent with prior findings in the clawback literature. Overall, the results from Table 8 are consistent with an increase in the opportunistic use of non-GAAP disclosure after clawback adoption and reveal that meeting external earnings benchmarks is one incentive behind managers′ non-GAAP reporting choices.

5.3.3. Non-GAAP disclosures and compensation contracting

In addition to exploring managers' incentives to meet analyst forecasts through non-GAAP disclosure in H4, we examine in H5 the role that compensation incentives play in determining non-GAAP reporting decisions after clawback adoption. To test H5, adopt an approach similar to Black et al. (2015) and estimate the following probit regression model:

$$\begin{aligned} Prob(Non\text{-}GAAP)_{i,q} &= \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,q} + \alpha_3 After_{i,q} \times Claw_i + \alpha_4 Comp_{i,q} \\ &+ \alpha_5 Claw_i \times Comp_{i,q} + \alpha_6 After_{i,q} \times Comp_{i,q} + \boldsymbol{\alpha_7 After_{i,q} \times Claw_i} \\ &\times \boldsymbol{Comp_{i,q}} + Control\ Variables + Fixed\ Effect + \varepsilon_{i,q} \end{aligned} \quad (9)$$

Our main variable of interest is the interaction term *AfterxClawxComp*, where *Comp* is a measure of current incentive-based executive compensation. We examine both annual bonus and equity-based incentive compensation. Following Efendi, Srivastava, and Swanson (2007), we scale each variable by cash salary for the same fiscal year to capture the relative importance of each component of incentive compensation. However, because deHaan et al. (2013) find an increase in CEO base salaries following clawback adoption, we also scale by total compensation.

We present results in Table 9. The estimated coefficient on *AfterxClawxComp* is 1.432 and highly significantly positive (t=3.05) when we examine the association between bonus over total cash compensation and non-GAAP reporting and is insignificant for equity-based compensation over total cash compensation. However, when we explore the association between

non-GAAP reporting and bonus and equity-based pay as a fraction of total compensation, the estimated coefficient on *AfterxClawxComp* is highly significantly positive in both cases. This finding suggests that non-GAAP disclosures are more likely to be used in setting short-term incentive-based pay after clawback adoption. The use of non-GAAP performance measures in compensation contracting thus appears to provide managers with a strong incentive to alter their non-GAAP reporting choices after clawback adoption, consistent with opportunistic motivations.

5.3.4. Non-GAAP disclosures and GAAP earnings quality

In H6, we examine whether the changes we observe in non-GAAP reporting after clawback adoption are linked with the effects of clawbacks on GAAP earnings quality. We use three measures of GAAP earnings quality that have been examined in the prior literature on clawbacks – earnings response coefficients, accruals-based earnings management, and real earnings management.

Both Chan et al. (2012) and deHaan et al. (2013) report increases in ERCs after clawback adoption. We first confirm whether this effect holds in our sample. Using the standard methodology, we estimate ERCs by regressing three-day abnormal earnings announcement returns on unexpected earnings. However, because in H6 we are interested in the effects that changes in GAAP earnings quality have on non-GAAP reporting, we use seasonally-adjusted quarterly changes in GAAP earnings as our measure of unexpected earnings. We use eight quarters of earnings data for both the pre- and post-adoption periods, which gives us a total of 756 observations (189 matched pairs in the pre- and post-periods). We then regress ERCs on the indicator variables *Claw, After,* and *Claw*After* and find a significantly positive coefficient on *Claw*After*, indicating a significant increase in ERCs after clawback adoption (results untabulated).

We test H6 by examining whether the changes in non-GAAP reporting after clawback adoption are linked to changes in ERCs by estimating the following OLS regression model:

$$\begin{aligned} Freq(Non\text{-}GAAP) = {} & \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,t} + \alpha_3 Claw_i \times After_{i,t} + \alpha_4 ERC_{i,t} \\ & + \alpha_5 Claw_i \times ERC_{i,t} + \alpha_6 After_{i,t} \times ERC_{i,t} \\ & + \alpha_7 After_{i,t} \times Claw_i \times ERC_{i,t} + \alpha_9 Ln(Total\ Assets)_{i,t} \\ & + \alpha_{10} AvgROA_{i,t} + \alpha_{11} StdROA_{i,t} + \alpha_{12} Freq(SI)_{i,t} \\ & + \alpha_{13} Freq(Neg\ FE)_{i,t} + \alpha_{14} Freq(Loss)_{i,t} + Year\ fixed\ effect \\ & + Industry\ Fixed\ effect + \varepsilon_{i,t} \end{aligned} \quad (10)$$

The dependent variable, *Freq(Non-GAAP)*, is the number of quarters that the company discloses non-GAAP earnings scaled by total quarters in the pre- or post-adoption periods. *After* and *Claw* are indicator variables, and *ERC* is as described above. The main variable of interest is *ClawxAfterxERC*. If the change in non-GAAP reporting frequency is related to the effect of clawback adoption on ERCs, we expect to observe a significantly positive coefficient on this variable. Each of the control variables are averaged over the 8 quarters in the relevant period. As reported in Table 10, we find a marginally significantly positive coefficient on *ClawxAfterxERC*, which indicates that the increase in non-GAAP reporting after clawback adoption is weakly linked with GAAP-based ERCs.

To examine the link between the quality of non-GAAP reporting after clawback adoption with the change in ERCs, we replace *Freq(Non-GAAP)* in the above model with *Freq(Aggressive)*, where *Aggressive* is as defined earlier as an indicator variable that equals one if *Non-GAAP Earnings* is greater than I/B/E/S Actual Earnings and zero otherwise. We report a significant positive coefficient on *ClawxAfterxERC* for this model, indicating that the change in ERCs after clawback adoption is strongly associated with increased aggressive reporting of non-GAAP earnings in the same period.

We also examine two alternative measures of GAAP earnings quality – discretionary accruals and real earnings management. If non-GAAP reporting after clawback adoption is related to changes in GAAP earnings quality, we expect to observe a reduced likelihood of income-increasing discretionary accruals for firms that disclose non-GAAP earnings after clawback adoption. For this analysis, we are able to retain most of our larger sample of over 5,000 firm-quarters of data, though we lose a few observations in estimating discretionary accruals using the modified cross-sectional Jones (1991) model. We estimate the following probit regression:

$$
\begin{aligned}
&Prob(Income\ IncreasingDA)_q \\
&\quad = \alpha_0 + \alpha_1 Claw_q + \alpha_2 After + \alpha_3 Non\text{-}GAAP_q + \alpha_4 After \times Claw \\
&\quad + \alpha_5 Claw \times Non\text{-}GAAP_{\ q} + \alpha_6 After \times Non\text{-}GAAP_{\ q} \\
&\quad + \alpha_6 Claw \times After \times Non\text{-}GAAP_{\ q} + \alpha_7 Ln(Total\ Assets)_q \\
&\quad + \alpha_8 Market\ to\ Book + \alpha_9 + \alpha_{10} ROA + \alpha_{10} Sales\ Growth_q + \alpha_{11} QTR4_q \\
&\quad + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_q
\end{aligned} \tag{11}
$$

The dependent variable, *IncomeIncreasingDA*, is an indicator variable that equals one if discretionary accruals for the quarter are positive, and zero otherwise. The main variable of interest is *ClawxAfterxNon-GAAP*. As shown in Table 11, we find a significantly negative association between the likelihood of income-increasing discretionary accruals and the disclosure of non-GAAP earnings after clawback adoption (the estimated coefficient is -0.347, t = -2.33), which suggests that managers are using non-GAAP disclosure as a substitute for accruals-based management of GAAP earnings.

Because Chan et al. (2015) find that managers substitute real earnings management (REM) for accruals-based management after clawback adoption, we also explore the link between REM and non-GAAP disclosure. However, here we make no prediction on the direction of the association. If both REM and non-GAAP disclosure are viewed by managers as viable alternatives to accruals-based management, they could be either substitutes or complements to each other, making a directional prediction regarding their relation difficult.

As in Chan et al. (2015), we use the REM measures developed by Roychowdhury (2006) -- abnormal levels of discretionary expenses, production costs, and cash flow from operating activities – which are estimated as residuals from the following regressions:

$$
\frac{Disx_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t} \tag{12}
$$

$$
\frac{Prod_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + k_4 \frac{\Delta Sales_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{i,t} \tag{13}
$$

$$
\frac{CFO_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t} \tag{14}
$$

We create the indicator variables *IncomeIncreasingAbDisx*, *IncomeIncre*asing*AbProd*, and *IncomeIncreasingAbCFO* that equal one if the residual from estimating equations 12, 13, and 14 is negative, positive, and negative, respectively (i.e., that real earnings management would increase reported income for the quarter, and zero otherwise. As shown in Table 11, we find no relation between abnormal production or discretionary expenses and non-GAAP reporting, but the coefficient on *ClawxAfterxNon-GAAP* is significantly negative for abnormal cash flows, indicating that firms substitute non-GAAP disclosure for cash flow management after clawback adoption. However, when we sum the three REM proxies together into a single variable, as in the right-most column of Table 11, we again find no significant relation between non-GAAP reporting and real earnings management.

Overall, the analyses in Tables 10 and 11 help to establish causality between clawback adoption and the changes we observe in non-GAAP reporting. We argue that managers use non-GAAP earnings disclosure more opportunistically because their ability to manage GAAP earnings is constrained after clawback adoption – i.e., the effect of clawback adoption on non-GAAP disclosure is conditional on its effects on GAAP earnings quality. The analyses in Tables 10 and 11 affirm this link and give us additional confidence that our results are truly driven by clawback adoption and not by correlated omitted variable bias.

6. Additional tests

One concern in the above analyses is the possibility that the changes we observe in non-GAAP reporting following clawback adoption are due to firms' operational changes rather than deliberate reporting decisions by managers. Our matched-sample, difference-in-differences design helps to alleviate this concern, as does the inclusion of well-considered control variables in all of our empirical tests. Nonetheless, we address this issue by examining the relative roles that special items versus "other" non-GAAP exclusions play in driving our results.

Prior research shows that the predictive power of non-GAAP exclusions for future performance is typically limited to "other" non-GAAP exclusions, where "other" exclusions are defined as the difference between total exclusions and special items (Doyle et al. 2003, Kolev et al. 2008). For example, when Doyle et al. (2003) regress future performance on special items and other exclusions, they report a significantly negative coefficient on other exclusions, but the estimated coefficient on special items is insignificant. This suggests that recurring expenses are

being excluded from non-GAAP earnings in the other exclusion component, rather than through recognition of special items. Because excluding recurring expenses is purely a reporting rather than an operational decision, if the deterioration in total exclusion quality can be attributed to other exclusions rather than special items, we may safely conclude that operational changes are not driving our findings.

To explore this possibility, we decompose total exclusions into special items (*Special*) and other exclusions (*Other Exclusions*) and re-estimate equation 5. The results are presented in Table 12. For the sample of only clawback adopters, we observe that the coefficient on *Special* is insignificant and the coefficient on *Other Exclusions* is highly significantly negative (t = -4.11), consistent with Doyle et al. (2003). However, the coefficient on *AfterxSpecial* is -0.647 and significant (t = -2.73), while the coefficient on *AfterxOther Exclusions* is 0.094 and insignificant. This finding suggests that the deterioration in exclusion quality observed after clawback adoption is due to changes in special items rather than other exclusions. In particular, special items after clawback adoption appear to include more recurring expenses. We come to a similar conclusion for the propensity score matched sample, though the coefficient on the variable of interest, *AfterxClawxSpecial*, is only marginally significant (t = -1.85).

Based on this analysis, we cannot immediately rule out the possibility that operational changes are affecting our results. However, even if operational changes affect the recognition of special items because there are more non-recurring items, special items should still be transitory and have little predictive power for future performance. The results in Table 12 suggest the possibility that managers are shifting recurring expenses into special items as part of a financial reporting strategy, as described by McVay (2006).

We examine this issue in Table 13. Following the methodology outlined in McVay (2006), we estimate unexpected core earnings *(UE_CE_q* and *$UE\_\Delta CE_q$)*. Core earnings are measured as sales minus cost of goods sold (COGS) and SG&A expenses, divided by sales. *ΔCE* is calculated as $(CE_{q+4} - CE_q)$. To estimate *UE_CE* and *UE_ΔCE*, we obtain residuals from following models, which are estimated by fiscal quarter and industry:

$$CE_q = \beta_0 + \beta_1 CE_{q-4} + \beta_2 ATO_q + \beta_3 Accruals_{q-4} + \beta_4 Accruals_q + \beta_5 \Delta Sales_q + \beta_6 Neg\Delta Sales_q + \varepsilon_q \quad (15)$$

$$\Delta CE_q = \varphi_0 + \varphi_1 CE_{q-4} + \varphi_2 \Delta CE_{q-4} + \varphi_3 ATO_q + \varphi_4 Accruals_{q-4} + \varphi_5 Accruals_q + \varphi_6 \Delta Sales_q + \varphi_7 NEG\Delta Sales_q + \gamma_q \quad (16)$$

where ATO is asset turnover ratio, Accruals is defined as operating accruals (Net income before extraordinary items minus cash from operation divided by sales), *ΔSales* is percent change in sales and *NEGΔSales* is *ΔSales* if *ΔSales* is smaller than 0 and zero otherwise. The *UE_CE* and *UE_ΔCE* is the difference between actual (reported) and predicted core earnings estimated from regression models above.

We regress UE_CE_q and $UE\_\Delta CE_q$ on *After*, *Claw*, *%SI* (defined as income-decreasing special items divided by total assets), and their interactions, as follows:

$$UE\_CE \text{ or } UE\_\Delta CE = \alpha_0 + \alpha_1 Claw + \alpha_2 After_q + \alpha_3 \%SI_q + \alpha_4 Claw \times \%SI_q + \alpha_6 After_q \times \%SI_q + \alpha_7 After_q \times Claw + \boldsymbol{\alpha_8 After_q \times Claw \times SI\%_q} + \varepsilon_q \quad (17)$$

McVay (2006) interprets a positive (negative) coefficient on %SI when *UE_CE (UE_ΔCE)* is the dependent variable as evidence of shifting special items into core earnings.

We dichotomize our sample based on whether managers engaged in aggressive non-GAAP reporting. As shown in Table 13, there is some evidence of classification shifting for the group of aggressive reporters – the estimated coefficient on *ClawxAfterx%SI* is significantly negatively when *UE_ΔCE* is the dependent variable (t = -8.66). The coefficient on this variable is positive at 1.03 when *UE_CE* is the dependent variable, though not significantly different from zero.[22] In contrast, we do not find any evidence of classification shifting in the sample of non-aggressive reporters. Classification shifting of recurring expenses into special items is thus at least a partial explanation for the results reported in Table 12.[23]

7. Conclusions

The primary objective of compensation recovery provisions, or clawbacks, is to prevent managers from issuing misstated financial numbers in anticipation of higher compensation. Under Section 304 of SOX, the SEC is authorized to recover bonus and incentive-based

[22] However, since there are only 452 observations in this group, this result may be due to low statistical power. McVay (2006) has over 76,000 observations in her main tests of classification shifting.

[23] We also examined the types of items excluded from non-GAAP earnings in an attempt to discern whether operational changes might reveal themselves there. Clawback firms do tend to exclude more operating asset impairments after adoption, but non-adopters are affected equally. In addition, non-adopters exclude more restructuring charges after "pseudo-adoption," but it is difficult to see how this might drive our results.

compensation received by CEOs and CFOs of companies if the companies restate financial statements due to misconduct, and Section 954 of the Dodd-Frank Act also includes provisions on the recovery of compensation given to executive officers based on erroneously reported information in a prior period. Voluntary adoption of clawback provisions has also gained in popularity among public companies.

Consistent with the objective of clawback provisions, the extant literature documents that voluntary adoption of clawback provisions improves financial reporting quality. Investors find earnings more informative after clawback adoption. The presence of clawback provisions may, however, make GAAP earnings more costly for managers to misstate. We argue that an increase in the costs of misstating GAAP earnings is likely to change a manager's non-GAAP reporting behavior because of the relatively lower costs for misstating non-GAAP earnings after clawback adoption.

We find that managers release non-GAAP earnings more frequently after the voluntary adoption of clawback provisions. In addition, the quality of non-GAAP exclusions deteriorates after these provisions are adopted. These findings are consistent with an increase in opportunistic non-GAAP reporting after clawback adoption, suggesting that an increase in the cost of manipulating GAAP earnings relative to non-GAAP earnings can cause opportunistically-motivated managers to shift their focus from GAAP to non-GAAP earnings. Additional cross-sectional tests help to corroborate our findings.

This paper contributes to current literature on voluntary clawback adoption by documenting that the improvement in financial reporting quality prescribed by GAAP is achieved at the expense of opportunistic use of non-GAAP earnings. It also contributes to the literature on non-GAAP earnings by documenting that non-GAAP earnings are a substitute for GAAP earnings in the opportunistic use of earnings metrics when firms are faced with stricter monitoring environments.

Our study has some limitations. First, as with all empirical research, we cannot completely rule out the possibility that opportunistic non-GAAP disclosure after clawback adoption is due to correlated omitted variables. While we have made efforts to address this issue, the results should be viewed with this caveat in mind. Second, while ideally a matched control sample would be chosen using non-GAAP earnings as pre-treatment attributes, this was not possible in this study because these disclosures must be hand-collected from firms' press releases

after the control sample is identified. Finally, our findings are based on voluntary adoption of clawback provisions and therefore cannot necessarily be generalized to the mandatory adoption of clawbacks that is required under Dodd-Frank Act. However, future research might address whether the effects of voluntary adoption extend to mandatory adoption when the SEC's recently proposed Rule 10D-1 becomes effective.

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Appendix A. Identifying Non-GAAP Disclosure

We examine each press release obtained from firms' 8-K filings and classify a firm as having disclosed non-GAAP earnings in these circumstances:

1) The earnings press release includes "non-GAAP", "adjusted", or "modified" earnings in addition to GAAP earnings. Most of companies using these terms provide a table reconciling the non-GAAP earnings figure with GAAP earnings, as per Regulation G. However, we classify a firm as reporting non-GAAP earnings in these instances regardless of whether the company provides a separate reconciliation table.

2) The firm reports earnings excluding certain items (e.g. special items or other expenses) and **clearly mention amounts of exclusions and items excluded**. Most of these cases do not provide separate reconciliation tables, so we carefully read texts and income statements. For example, Valeo Energy Corp.'s 2009 3Q earnings announcement clearly describes items excluded in earnings but does not provide reconciliation tables:

> *SAN ANTONIO, October 27, 2009 — Valero Energy Corporation (NYSE: VLO) today reported a net loss of $219 million, or $0.39 per share, for the third quarter of 2009, excluding special items. This compares to net income of $1.0 billion, or $1.91 per share, for the third quarter of 2008, excluding special items. On a GAAP basis, the company reported a net loss of $489 million, or $0.87 per share, for the third quarter of 2009, compared to third quarter 2008 net income of $1.2 billion, or $2.18 per share.* ***Special items in the third quarter 2009 include an asset impairment loss of $417 million before taxes****, or $0.48 per share after taxes, related primarily to the permanent shutdown of the gasifier complex at the company's Delaware City refinery. The third quarter 2008 special items include a gain of $305 million on the sale of the Krotz Springs, Louisiana refinery and $43 million of asset impairment losses before taxes, which together amount to $0.27 per share after taxes.*
>
> *The third quarter 2009 operating loss was $579 million versus $1.8 billon of operating income in the third quarter of 2008.* ***Excluding the special items discussed above, the third quarter 2009 operating loss was $162 million*** *compared to $1.6 billion of operating income in the third quarter of 2008.*

3) If the company reports standard EBITDA, we do not classify that company as a non-GAAP reporting firm; however, we do classify disclosure of "modified" EBITDA as non-GAAP reporting. Most firms reporting "modified" EBITDA provide separate reconciliation tables. For example, Hovnanian Enterprises, Inc. includes in its 3Q 2009 earnings releases "adjusted" EBITDA, which excludes an inventory impairment loss, land option write-offs, and a gain on extinguishment of debt.

Appendix B. Variable Definitions

Variables used in Propensity Score Matching (annual data)	
Ln(Total Assets)	Natural logarithm of total assets
Intangible	Intangible assets divided by total assets
Market-to-Book	Market value of equity divided by book value of equity
Sales Growth	Annual percentage increase in sales, on a per share basis
Leverage	Total liabilities divided by total assets
Earnings Volatility	Standard deviation of ROA over past 8 quarters
SI	Indicator variable equal to 1 if a company reports special items and 0 otherwise
Special Items	Special items reported in Compustat, divided by total assets and multiplied by -1
Loss	Indicator variable equal to 1 if earnings before extraordinary items < 0 and 0 otherwise
Ln(Audit Fee)	Natural logarithm of audit fees
Accrual	Net income less cash from operations, divided by total assets
Restatement	Indicator variable equal to 1 if a firm restated its financial statements within the prior two years and 0 otherwise
%Outside	The percentage of outside directors on board
%Insiderholding	The percentage of insiders' shareholding
%Intitutionalholding	The percentage of institutional investors' shareholding
Big4	Indicator variable equal to 1 if a company hires a Big 4 auditor and 0 otherwise
CEOChairman	Indicator variable equal to 1 when a CEO is also chairman of the board of directors and 0 otherwise
CEOTenure	Natural logarithm of length of CEO tenure in years
CEOTurnover	Indicator variable equal to one if a CEO is dismissed/resigned and 0 otherwise
Ln(CashPay)	Natural logarithm of annual salary plus bonus
Ln(Option)	Natural logarithm of the fair value of option awards
Ln(TotalComp)	Natural logarithm of total annual compensation
Variables used in Main Analyses (quarterly data)	
Claw	Indicator variable that equals 1 if firm *i* is a voluntary clawback adopter and 0 otherwise
After	Indicator variable that equals 1 if the period *q* is after the voluntary clawback adoption and 0 otherwise. For non-clawback adopters, we assign "pseudo-adoption" years using propensity score matching.
Non-GAAP	Indicator variable equal to 1 if a firm discloses non-GAAP in the quarter and 0 otherwise
Aggressive	Indicator variable equal to 1 if non-GAAP earnings > I/B/E/S actual earnings and 0 otherwise
Non-GAAP Earnings	Non-GAAP Earnings per Share, as reported in firms' press releases
GAAP Earnings	*Basic* EPS before extraordinary items and discontinued operations
Non-GAAP Exclusions	*Non-GAAP Earnings - GAAP Earnings*
Special	*Operating EPS minus Basic EPS*
OtherExclusions	*Non-GAAP Exclusions minus Special*
FOPI (Future Operating Income)	Earnings per Share from operations, summed over four quarters starting from quarter q+1
Tech	Indicator variable equal to 1 if firm i is a high-tech industry as defined in Francis and Schipper (1999) and 0 otherwise
Bigbath	Indicator variable equal to 1 if a firm reports income-decreasing special items and negative earnings in the same quarter and 0 otherwise
QTR4	Indicator variable equal to 1 for 4th quarter and 0 otherwise
Ln(Firm Age)	Natural log of the number of years since the firm first appeared in Compustat
High (Low) NOA	Indicator variable equal to 1 if beginning net operating assets is in the highest (lowest) quintile of clawback firms
NegFE	Indicator variable equal to 1 if I/B/E/S actual earnings < median consensus analyst forecast

PosExc	Indicator variable equal to 1 if *Non-GAAPExclusions* > 0 and 0 otherwise
PosDA	Indicator variable equal to 1 if discretionary accruals (estimated using modified cross-sectional Jones 1991 model) > 0 and 0 otherwise
Profitable	Indicator variable equal to 1 if I/B/E/S actual earnings > 0 and 0 otherwise
ROA	Income before extraordinary items divided by total assets
Meeting/Beating Variables	
Prob(Street_MBE1)	An indicator variable equal to 1 if I/B/E/S actual EPS is greater than analyst consensus EPS forecast and 0 otherwise
Prob(Street_MBE2)	An indicator variable equal to 1 if I/B/E/S actual EPS is greater than analyst consensus EPS forecast and GAAP EPS is less than analyst consensus EPS forecast, and 0 otherwise
Prob(NonGAAP_MBE)	An indicator variable equal to 1 if Non-GAAP EPS is greater than analyst consensus EPS forecast and GAAP EPS is less than analyst consensus EPS forecast, and 0 otherwise
GAAP Earnings Informativeness Test	
Freq (Non-GAAP)	Number of quarters that the company discloses non-GAAP earnings scaled by total number of quarters in the pre- or post-adoption period, respectively.
Freq (Aggressive)	Number of quarters that the company reports *Aggressive* non-GAAP earnings scaled by total number of quarters in the pre- or post-adoption period.
ERC	Mean value of earnings response coefficient in the pre- and post-adoption period using 3 days cumulative abnormal return surrounding the quarterly earnings report date and changes in net income. To estimate ERC, we require at least 8 quarters of earnings surprise and return data.
Ln(Total Assets)	Mean value of log of total assets in the pre- and post-adoption period
AvgROA	Mean value of ROA for pre- and post-adoption period
Std(ROA)	Mean value of Standard deviation of ROA for pre- and post-adoption period
Freq(SI)	Number of quarters that the company reports special items scaled by total number of quarters for pre- and post-adoption period
Freq(NegFE)	Number of quarters that the company reports earnings with negative forecast error scaled by total number of quarters for pre- and post-adoption period
Freq(Loss)	Number of quarters that the company reports loss scaled by total number of quarters for pre- and post-adoption period
Earnings Management Measures	
DA	DA is estimated using following industry adjusted cross-sectional regressions for two digit SICs and quarters: $\frac{Accruals_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{(\Delta Sales - \Delta AR)_{i,t}}{Assets_{i,t-1}} + k_3 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t}$
AbPROD	The normal level of production costs is estimated from following equation: $\frac{Prod_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + k_4 \frac{\Delta Sales_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{i,t}$ where *Prod* represents the production costs in quarter t which is sum of COGS and the change in inventories. Abnormal Production cost (*AbProd*) is calculated as the difference between actual values and the predicted (normal) level of production
AbDISX	The normal level of expenditure is estimated from following equation: $\frac{Disx_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t}$ Abnormal discretionary expenditure (*AbDisx*) cost is calculated as the difference between the actual values and the predicted (normal) level of discretionary expenditure
AbCFO	The normal level of operating cash flow is estimated from following equation:

	$\frac{CFO_{i,t}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{Sales_{i,t}}{Assets_{i,t-1}} + k_3 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t}$ Abnormal operating cash flow (*AbCFO*) cost is calculated as the difference between the actual values and the predicted (normal) level of discretionary expenditure
RM_Proxy	The sum of the standardized variables of *AbProd*, *AbDisx*, and *AbCFO*.
Income Increasing EM	An indicator variable equal to 1 if EM variable increases income and 0 otherwise.
McVay (2006) Classification Shifting Test	
UE_CE	Unexpected core earnings measure by McVay (2006)
UE_ΔCE	Unexpected changes in core earnings ($UE\_CE_{t+1} - UE\_CE_t$)
%SI	Income-decreasing special items as a percentage of sales [Special Items$_t$ × (-1) /Sales$_t$]

Figure 1
Interpretation of H1 and H2 test results

		H2: QUALITY of non-GAAP disclosure	
		Increase (+)	Decrease (-)
H1: FREQUENCY of non-GAAP disclosure	Increase (+)	Increase in INFORMATIVE non-GAAP reporting (Case 1)	Increase in OPPORTUNISTIC non-GAAP reporting (Case 2)
	Decrease (-)	Decrease in OPPORTUNISTIC non-GAAP reporting (Case 3)	Decrease in INFORMATIVE non-GAAP reporting (Case 4)

Table 1
Sample and descriptive statistics

Panel A: Firms by voluntary clawback adoption status

Year	Initial Adopters	Total Adopters	Non-Adopters	Total Number of Firms
2005	8	8	1,950	1,958
2006	25	33	2,044	2,077
2007	81	115	2,101	2,216
2008	78	191	2,094	2,285
2009	71	262	2,077	2,148

Panel B: Mean and median differences between voluntary clawback adopters and non-adopters

	Means			Medians		
	Clawback Adopters	Non-Adopters	Difference t-test	Clawback Adopters	Non-Adopters	Difference Z-test
Total Assets	12,318	2,380	-66.02 ***	3,702	528	-71.07 ***
Intangible	0.199	0.178	-7.26 ***	0.143	0.103	-14.81 ***
Market-to-Book	2.936	3.118	2.10 **	2.482	2.242	-6.93 ***
Sales Growth	0.350	0.300	-1.82 *	0.319	0.163	-7.93 ***
Leverage	0.555	0.486	-19.87 ***	0.557	0.460	-26.75 ***
Earnings Volatility	0.015	0.030	20.71 ***	0.007	0.112	30.39 ***
SI	0.599	0.430	-23.14 ***	1.000	0.000	-23.00 ***
Special Items	0.055	0.044	-3.66 ***	0.000	0.000	-8.29 ***
Loss	0.138	0.300	24.56 ***	0.000	0.000	24.39 ***
Ln(Audit Fee)	8.077	7.054	-63.91 ***	8.050	7.015	-56.50 ***
Accrual	-0.048	-0.032	9.08 ***	-0.039	-0.031	9.30 ***
Restatement	0.105	0.099	-1.16	0.000	0.000	-1.13
%Outside	0.852	0.811	-29.38 ***	0.875	0.833	-34.80 ***
% Insiderholding	0.069	0.169	33.04 ***	0.029	0.078	48.99 ***
%Intitutionalholding	0.834	0.710	-21.48 ***	0.836	0.776	-18.97 **
Big4	0.871	0.678	-28.86 ***	1.000	1.000	-28.59 ***
CEOChairman	0.636	0.578	-2.75 ***	1.000	1.000	-2.75 ***
CEOTenure	5.353	5.550	2.24 **	5.000	5.000	2.39 **
CEOTurnover	0.248	0.321	-0.13	0.000	0.000	-0.14
Ln(CashPay)	6.997	6.938	-2.31 **	6.909	6.889	-2.84 ***
Ln(Option)	5.294	5.050	-2.04 **	6.932	6.706	-2.50 **
Ln(TotalComp)	7.777	7.685	-2.54 **	7.756	7.650	-2.67 ***
N	5,208	38,459		5,208	38, 459	

Variables are defined in Appendix B. Test of differences in means and median are based on two-tailed tests.
*, **, *** indicate p-values of 0.10, 0.05, and 0.01, respectively.

Table 2
Propensity-score matching

Panel A: Logit Estimation Results

$$\boldsymbol{Claw}_{t+1} = \alpha_0 + \alpha_1 Ln(Total\ Assets)_{i,t} + \alpha_2\ Intangible_{i,t} + \alpha_3 Market\ to\ Book_{i,t} + \alpha_4 Sales\ Growth_{i,t} + \alpha_5 Leverage_{i,t} + \alpha_6 Earnings\ Volatility_{i,t} + \alpha_7 SI_{i,t} + \alpha_8 Special\ Items_{i,t} + \alpha_9 Loss_{i,t} + \alpha_{10} Ln(Audit\ Fee)_{i,} + \alpha_{11} Accruals_{i,t} + \alpha_{12} Restatement_{i,t} + \alpha_{13}\%Outside_{i,t} + \alpha_{14}\%Insiderholding_{i,t} + \alpha_{15}\%Intitutionalholding_{i,t} + \alpha_{16} Big4_{i,t} + \alpha_{17} CEOChairman_{i,t} + \alpha_{18} CEOTenure_{i,t} + \alpha_{19} CEOTurnover_{i,t} + \alpha_{19} Ln(CashPay)_{i,t} + \alpha_{20} Ln(Option)_{i,t} + \alpha_{21} Ln(TotalComp)_{i,t} + Industry\ Fixed\ Effect + \varepsilon_{i,t} \quad (1)$$

Variable	2006		2007		2008		2009	
	Coef	*Z-stat*	*Coef*	*Z-stat*	*Coef*	*Z-stat*	*Coef*	*Z-stat*
Intercept	-5.376	-1.64	-2.666	-1.63	-4.472 **	-2.33	-9.103 ***	-5.16
Ln(Total Assets)	0.112	0.62	0.240 **	2.52	0.422 ***	3.80	0.172 **	1.97
Intangible	0.153	0.19	0.121	0.28	-1.014 **	-2.11	-0.334	-0.82
Market-to-Book	0.044	0.97	0.014	0.46	-0.009	-0.27	0.014	0.43
Sales Growth	-1.018	-1.09	-1.514 ***	-3.16	-0.471	-1.09	-0.429	-1.19
Leverage	0.017	0.04	-0.179	-0.70	0.013	0.09	0.015	0.20
Earnings Volatility	-1.241	-0.58	-1.348	-1.22	-0.669	-0.83	-0.498	-0.62
SI	0.376	0.94	-0.035	-0.22	0.472 **	2.29	0.093	0.50
Special Items	0.002 **	2.26	0.001 **	2.08	-0.001	-1.08	-0.001 *	-1.83
Loss	-0.538	-0.85	-0.928 **	-2.11	-0.040	-0.14	0.021	0.10
Ln(Audit Fee)	0.196	0.88	-0.020	-0.17	0.005	0.03	0.387 ***	3.15
Accrual	-1.038	-0.49	-2.424 **	-2.19	-0.621	-0.51	0.638	0.66
Restatement	0.538 *	1.95	0.052	0.27	0.088	0.42	0.228	1.26
%Outside	0.089	0.06	0.336	0.37	0.478	0.49	1.546	1.60
%Insiderholding	-0.140	-0.14	-0.642	-1.12	-2.008 **	-2.28	-0.882	-1.54
%Intitutionalholding	-1.141	-1.36	-0.159	-0.37	-0.097	-0.20	0.400	0.95
Big4	-0.838	-1.56	-0.007	-0.02	-0.315	-1.02	0.068	0.19
CEOChairman	0.035	0.12	-0.068	-0.49	-0.179	-1.18	-0.102	-0.75
CEOTenure	0.099	0.19	0.009	0.07	0.112	1.37	0.075	1.47
CEOTurnover	-0.429	-0.41	0.074	0.20	0.563 *	1.89	0.687	1.30
Ln(CashPay)	0.014	0.05	-0.075	-0.46	0.355 *	1.66	-0.164	-0.95
Ln(Option)	0.040	0.79	0.015	0.55	0.108 **	2.54	-0.020	-0.62
Ln(TotalComp)	-0.068	-0.26	0.001	0.01	-0.522 **	-2.37	0.033	0.18
Industry fixed effect	Yes		Yes		Yes		Yes	
N	560		995		1025		1019	
Pseudo R^2	0.260		0.168		0.232		0.192	

All continuous variables are winsorized at 1 percent and 99 percent. *, **, *** indicate p-values of 0.10, 0.05, and 0.01, respectively.

Panel B: Distribution of Matched Pairs by Year

Year	Clawback Adopters	Non-Adopters
2006	16	16
2007	58	58
2008	60	60
2009	55	55
Total	189	189

Panel C: Propensity Score Matching Results

	Means			Medians		
Variable	Clawback Adopter	Non-Adopters	Difference t-test	Clawback Adopter	Non-Adopters	Difference Z-test
Ln(Total Assets)	8.418	8.366	-0.40	8.241	8.363	-0.15
Intangible	0.186	0.186	-0.04	0.125	0.125	0.04
Market-to-Book	2.812	2.780	-0.14	2.141	1.987	-1.24
Sales Growth	0.071	0.080	0.58	0.079	0.078	0.27
Leverage	0.380	0.372	-0.15	0.170	0.212	0.67
Earnings Volatility	0.052	0.050	-0.32	0.033	0.029	-2.07 **
SI	0.817	0.776	-1.12	1.000	1.000	-1.12
Special Items	0.383	0.342	-0.51	16.781	14.631	-0.40
Loss	0.114	0.118	0.14	0.000	0.000	0.14
Ln(Audit Fee)	14.950	14.960	0.13	14.861	14.954	0.38
Accrual	-0.055	-0.052	0.04	-0.043	-0.045	0.25
Restatement	0.154	0.171	0.49	0.000	0.000	0.49
%Outside	0.845	0.846	0.08	0.875	0.875	-0.47
%Insiderholding	0.066	0.069	0.30	0.029	0.033	1.21
%Intitutionalholding	0.815	0.822	0.49	0.823	0.837	0.64
Big4 Auditor	0.959	0.955	-0.22	1.000	1.000	-0.22
CEOChairman	0.585	0.541	-1.00	1.000	1.000	-1.00
CEOTenure	4.463	4.476	0.09	5.000	5.000	0.14
CEOTurnover	0.077	0.069	-0.35	0.000	0.000	-0.35
Ln(CashPay)	6.909	6.857	-0.93	6.852	6.824	-0.89
Ln(Option)	5.322	5.251	-0.25	6.990	6.748	-0.64
Ln(TotalComp)	7.681	7.631	-0.60	7.741	7.609	-0.62

Panel D: Difference in Matched Propensity Scores

N	Mean	1%	25%	50%	75%	99%	Std. Dev.
189	-0.001	-0.026	-0.001	0.000	0.000	0.007	0.005

Table 3
Non-GAAP earnings descriptive statistics

Panel A: Non-GAAP Earnings Disclosure, Clawback Adopters vs. Non-Adopters (full sample)

	Means			Medians		
Variable	Clawback Adopters	Non-Adopters	Difference t-test	Clawback Adopters	Non-Adopters	Difference Z-test
Prob(Non-GAAP)	0.449	0.502	3.969***	0.000	1.000	3.963***
Non-GAAP Earnings	0.534	0.536	0.168	0.450	0.480	-0.192
Non-GAAP Exclusions	0.069	0.070	0.171	0.000	0.000	-0.943
SI	0.594	0.564	-2.234**	1.000	1.000	-2.233***
Special Items	0.079	0.091	1.55	0.000	0.000	0.550

Panel B: Non-GAAP Earnings Disclosure -- Pre- and Post-Clawback Adoption Periods

Clawback Adopters

	Non-GAAP Disclosure	Non-Disclosure	Total
Before	565	905	1,470
After	712	696	1,408
Total	1,277	1,601	2,878

Non-Adopters

	Non-GAAP Disclosure	Non-Disclosure	Total
Before	700	797	1,497
After	753	656	1,409
Total	1,453	1,453	2,906

Magnitude of Non-GAAP Earnings

	Clawback Adopters	Non-Adopters	Diff. (t-stat)
Before	0.543	0.546	0.030
After	0.513	0.515	0.030
Diff. (t-stat)	1.486	1.412	

Magnitude of Non-GAAP Exclusions

	Clawback Adopter	Non-Adopters	Diff. (t-stat)
Before	0.049	0.054	0.039
After	0.088	0.088	0.034
Diff. (t-stat)	3.72***	2.92***	

Table 4

The effect of clawback adoption on the frequency of non-GAAP disclosure

$$Prob(Non\text{-}GAAP)_{iq} = \alpha_0 + \alpha_1 After_{iq} + Controls + Year\ Fixed\ Effect + Industry\ Fixed\ effect + \varepsilon_{iq} \quad (2)$$

$$Prob(Non\text{-}GAAP)_{iq} = \alpha_0 + \alpha_1 Claw_{iq} + \alpha_2 After_{iq} + \alpha_3 After x Claw_{iq} + Controls + Year\ Fixed\ Effect + Industry\ Fixed\ effect + \varepsilon_{iq} \quad (3)$$

	Only Clawback Adopters			Propensity Score Matched Sample		
	Coef		*Z-stat*	*Coef*		*Z-stat*
Intercept	-3.066	***	-4.23	-1.344	**	-2.20
Claw				-0.274	**	-2.41
After	**0.495**	*******	**3.70**	-0.068		-0.63
After*Claw				**0.227**	**	**2.15**
Ln(Total Assets)	-0.007		-0.14	0.054		1.37
Intangible	2.285	***	5.37	1.042	***	3.46
Tech	0.792	***	3.43	0.586	***	3.52
Market-to-Book	0.006		0.85	0.007		1.46
Sales Growth	0.394	**	2.08	0.167		1.14
Leverage	-0.085		-0.21	-0.253		-0.95
Earnings Volatility	9.055	**	2.50	7.572	***	3.49
SI	0.861	***	7.73	0.807	***	10.72
Special Items	0.475	***	3.40	0.485	***	4.42
Bigbath	0.161		0.81	0.028		0.19
Loss	-0.087		-0.46	-0.160		-1.20
QTR4	0.079		0.97	-0.029		-0.57
Accrual	-1.918	**	-2.42	-1.279	**	-2.54
Year Fixed effect	Yes			Yes		
Industry Fixed effect	Yes			Yes		
N	2,832			5,727		
Pseudo R^2	0.321			0.243		

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The Z-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

Table 5
The effect of clawback adoption on the quality of non-GAAP exclusions

$$FOPI_{q+1,q+4} = \alpha_0 + \alpha_1 Non\text{-}GAAP\ Earnings_{i,q} + \alpha_2 After_{i,q} + \alpha_3 Non\text{-}GAAP\ Exclusion_{i,q} + \alpha_4 \boldsymbol{After_{i,q}} * \boldsymbol{Non\text{-}GAAP\ Exclusion_{i,q}} + Controls + Year\ Fixed\ Effect + Industry\ Fixed\ effect + \varepsilon_{i,q} \quad (4)$$

$$FOPI_{t+1,t+4} = \alpha_0 + \alpha_1 Non\text{-}GAAP\ Earnings_{i,t} + \alpha_2 Claw_i + \alpha_3 After_{i,t} + \alpha_4 Non\text{-}GAAP\ Exclusion_{i,t} + \alpha_5 Claw_i \times Non\text{-}GAAP\ Exclusion_{i,t} + \alpha_6 After_{i,t} \times Non\text{-}GAAP\ Exclusion_{i,t} + \alpha_7 After_{i,t} \times Claw_i + \boldsymbol{\alpha_8 After_{i,t}} \times \boldsymbol{Claw_i} \times \boldsymbol{Non\text{-}GAAP\ Exclusion_{i,t}} + Controls + Year\ Fixed\ Effect + Industry\ Fixed\ effect + \varepsilon_{i,q} \quad (5)$$

		Only Clawback Adopters		Propensity Score Matched Sample		Only Clawback Adopters		Propensity Score Matched Sample	
		Coef	*t-stat*	*Coef*	*t-stat*	*Coef*	*t-stat*	*Coef*	*t-stat*
Intercept	α_0	-3.186***	-5.14	-1.738***	-4.14	-3.132***	-5.12	0.045	0.08
Claw	α_1			-0.163*	-1.78			0.069	0.52
After	α_2	0.073	0.67	0.038	0.43	-0.150	-1.14	0.130	1.00
Non-GAAP Earnings	α_3	1.578***	8.59	1.828***	13.91	1.403***	7.67	1.994***	11.17
After×Claw	α_4			-0.002	-0.03			-0.291**	-2.02
After×Non-GAAP Earnings	α_5					0.398**	2.31	-0.050	-0.29
Claw×Non-GAAP Earnings	α_6							-0.538**	-2.21
After×Claw×Non-GAAP Earnings	α_7							0.531**	2.08
Non-GAAP Exclusions	α_8	-0.370**	-2.20	-0.572**	-2.37	-0.370**	-2.24	-0.571**	-2.35
Claw×Non-GAAP Exclusion	α_9			0.299	1.05			0.290	1.02
After×Non-GAAP Exclusion	α_{10}	**-0.364***	**-1.96**	0.247	0.96	**-0.354***	**-1.91**	0.250	0.96
After×Claw×Non-GAAP Exclusion	α_{11}			**-0.710****	**-2.16**			**-0.700****	**-2.13**
Sales Growth	α_{12}	0.399**	2.48	0.143	1.05	0.362**	2.25	0.137	1.02
Ln(Total Assets)	α_{13}	0.267***	4.91	0.267***	6.74	0.266***	4.96	0.266***	6.75
Earnings Volatility	α_{14}	-7.303***	-3.17	-4.547**	-2.46	-6.971***	-3.08	-4.353**	-2.36
Loss	α_{15}	0.221	1.36	-0.031	-0.26	0.243	1.50	-0.014	-0.12
Market to Book	α_{16}	0.019*	1.82	0.007	1.35	0.019*	1.85	0.007	1.36
Ln(Age)	α_{17}	0.365***	3.14	0.144	1.53	0.362***	3.14	0.150	1.64
Accruals	α_{18}	-0.836*	-1.81	-1.040***	-2.99	-0.762*	-1.69	-0.986***	-2.91
$\alpha_8+\alpha_{10}$		-0.733***	-5.02			-0.723***	-4.94		
$\alpha_8+\alpha_9+\alpha_{10}+\alpha_{11}$				-0.737***	-5.19			-0.730***	-5.19
Year Fixed Effect		Yes		Yes		Yes		Yes	
Industry Fixed Effect		Yes		Yes		Yes		Yes	
N		2,878		5,784		2,878		5,784	
Adjusted R^2		0.589		0.577		0.593		0.581	

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The t-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

Table 6
Aggressiveness of non-GAAP reporting after clawback adoption

$$Prob(Aggressive_q) = \alpha_0 + \alpha_1 \boldsymbol{After}_{i,q} + Controls + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_q \quad (6)$$

$$Prob(Aggressive_q) = \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,q} + \boldsymbol{\alpha_3 After_{i,q} x\ Claw_i} + Controls + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_q \quad (7)$$

Dependent Variable	*Prob(Aggressive)$_{i,t}$*			
	Clawback Only Sample		Propensity Score Matched Sample	
	Coef	*Z-stat*	*Coef*	*Z-stat*
Intercept	0.687 *	1.66	0.152	0.41
Claw			0.004	0.05
After	**0.256** ***	**2.64**	-0.008	-0.10
After*×*Claw			**0.215** **	**2.13**
Ln(Bonus)	0.000	-0.02	0.014	1.25
Ln(Option)	-0.025 **	-2.17	-0.008	-1.12
Ln(Total Assets)	-0.141 ***	-4.82	-0.115 ***	-5.76
Market-to-Book	0.006	0.92	0.006	1.39
Earnings Volatility	-1.558	-0.79	2.569 ***	2.63
Special Items	-0.019	-0.14	0.208 ***	2.56
Sales Growth	0.295 **	2.10	0.115	1.53
Year Fixed effect	Yes		Yes	
Industry Fixed effect	Yes		Yes	
N	2,144		4,625	
Pseudo R^2	0.134		0.093	

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The Z-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

Table 7
Net operating assets and the quality of non-GAAP exclusions

$$FOPI_{q+1,q+4} = \alpha_0 + \alpha_1 Non\text{-}GAAP\ Earnings_{i,q} + \alpha_2 Claw_i + \alpha_3 After_{i,q} + \alpha_4 Non\text{-}GAAP\ Exclusion_{i,q} + \alpha_5 Claw_i \times Non\text{-}GAAP\ Exclusion_{i,q} + \alpha_6 After_{i,q} \times Non\text{-}GAAP\ Exclusion_{i,q} + \alpha_7 After_{i,q} \times Claw_i + \boldsymbol{\alpha_8 After_{i,q}} \times \boldsymbol{Claw_i} \times \boldsymbol{Non\text{-}GAAP\ Exclusion_{i,q}} + Control\ Variables + Fixed\ Effect + \varepsilon_{i,q} \quad (5)$$

	High NOA Group		Low NOA Group	
	Coef	*t-stat*	*Coef*	*t-stat*
Intercept	-2.003 ***	-2.95	-1.536 **	-2.49
Non-GAAP Earnings	1.577 ***	6.98	1.612 ***	7.36
Claw	0.129	0.62	-0.636 ***	-2.90
After	0.166	0.82	-0.189	-0.91
Non-GAAP Exclusions	-0.795 **	-2.16	-1.006 **	-2.08
Claw×Non-GAAP Exclusion	1.114 ***	2.95	0.052	0.26
After*×*Non-GAAP Exclusion	0.715	1.45	0.547	0.96
After×Claw	-0.252	-1.17	0.158	0.31
After*×*Claw*×*Non-GAAP Exclusion	**-1.848** ***	**-2.78**	**-0.301**	**-0.50**
Sales Growth	0.181	0.82	-0.060	-0.25
Ln(Total Assets)	0.229 ***	3.48	0.298 ***	4.18
Earnings Volatility	-4.688 *	-1.73	-2.509	-0.68
Loss	-0.132	-0.69	-0.249	-0.99
Market to Book	0.003	0.62	-0.004	-0.35
Ln(Firm Age)	0.304 *	1.68	0.229	1.63
Accruals	-1.231 ***	-2.64	-2.148 ***	-2.67
Year Fixed effect	Yes		Yes	
Industry Fixed effect	Yes		Yes	
N	1,135		1,134	
Adjusted R^2	0.614		0.659	

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The t-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

Table 8
Meeting/beating analyst forecasts with non-GAAP exclusions

$$Prob(MBE\ Measures)_{i,q} = \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,q} + \alpha_3 PosExc_{i,q} + \alpha_4 After_{i,q} \times Claw_i + \alpha_5 Claw_i \times PosEx_{i,q} + \alpha_6 After_{i,q} \times PosExc_{i,q} + \boldsymbol{\alpha_7 After_{i,q} \times Claw_i \times PosExc_{i,q}} + Controls + Year\ Fixed\ Effect + Industry\ Fixed\ effect + \varepsilon_{i,q} \quad (8)$$

	MBE = 1 if (Street > Forecast) (Doyle et al. 2013)			MBE = 1 if (Street > Forecast) and (Forecast > GAAP)			MBE = 1 if (Non-GAAP > Forecast) and (Forecast > GAAP)		
Dependent Variable	*Prob(Street_MBE1)*			*Prob(Street_MBE2)*			*Prob(NonGAAP_MBE)*		
	Coef		*Z-stat*	*Coef*		*Z-stat*	*Coef*		*Z-stat*
Claw	0.103		1.34	-0.025		-0.10	0.181		0.6
After	0.004		0.05	0.334		1.46	0.454	*	1.87
PosExc	0.172	*	1.65	1.734	***	8.88	1.859	***	9.18
After×Claw	-0.020		-0.19	-0.503		-1.43	-0.992	**	-2.27
Claw×PosExc	-0.220		-1.61	-0.229		-0.82	-0.250		-0.79
After×PosExc	-0.235	*	-1.87	-0.526	**	-2.32	-0.491	**	-2.08
After×Claw× PosExc	**0.350**	****	**2.03**	**0.588**	*****	**1.64**	**1.002**	****	**2.25**
PosDA	0.081		1.63	-0.016		-0.19	-0.078		-0.9
MB	0.003		0.68	0.004		0.64	0.004		0.67
Sales Growth	0.383	***	3.77	-0.140		-0.97	-0.206		-1.38
Ln(Total Assets)	0.048	**	2.27	0.171	***	4.5	0.124	***	3.67
Profitable	0.877	***	9.11	0.749	***	4.53	0.322	**	2.25
ROA	3.552	***	4.01	-4.243	***	-3.26	-3.215	***	-2.62
Year Fixed effect	Yes			Yes			Yes		
Industry Fixed effect	Yes			Yes			Yes		
N	5,553			2,643			2,643		
Pseudo R^2	0.101			0.209			0.214		

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The Z-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

Table 9
Executive compensation and non-GAAP earnings disclosure

$$Prob(Non\text{-}GAAP)_{i,q} = \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,q} + \alpha_3 After_{i,q} \times Claw_i + \alpha_4 Comp_{i,q} + \alpha_5 Claw_i \times Comp_{i,q} + \alpha_6 After_{i,q} \times Comp_{i,q} + \boldsymbol{\alpha_7 After_{i,q} \times Claw_i \times Comp_{i,q}} + Controls + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_{i,q} \quad (9)$$

Compensation measure (*Comp*)	Bonus/Cash Compensation		Equity/Cash Compensation		Bonus/Total Compensation		Equity/Total Compensation	
	Coef	*Z-stat*	*Coef*	*Z-stat*	*Coef*	*Z-stat*	*Coef*	*Z-stat*
Intercept	-1.408 ***	-4.02	-1.349 ***	-3.82	-1.396 ***	-3.98	-1.636 ***	-4.54
Claw	-0.347 ***	-5.13	-0.376 ***	-4.17	-0.365 ***	-5.52	-0.190	-1.25
After	-0.109	-1.55	-0.144	-1.59	-0.118 *	-1.70	0.092	0.66
After×Claw	0.224 ***	2.57	0.404 ***	3.57	0.238 ***	2.77	-0.163	-0.80
Comp	0.377 *	1.72	0.033 ***	2.82	0.405	0.91	0.622 ***	3.28
Claw× Comp	-0.875 **	-2.54	-0.006	-0.37	-1.618 **	-2.23	-0.457	-1.56
After× Comp	-0.656 **	-2.23	-0.002	-0.11	-1.540 **	-2.12	-0.526 **	-2.07
After×Claw× Comp	**1.432 *** **	**3.05**	**-0.025**	**-1.19**	**3.718 *** **	**2.89**	**1.002 *** **	**2.58**
Ln(Total Assets)	0.072 ***	4.44	0.053 ***	3.07	0.072 ***	4.43	0.060 ***	3.63
MB	0.006	1.51	0.005	1.31	0.006	1.46	0.005	1.45
ROA	-1.238 *	-1.96	-1.211 *	-1.92	-1.213 *	-1.91	-1.111 *	-1.76
Earnings Volatility	7.902 ***	6.22	7.503 ***	5.92	7.953 ***	6.24	7.537 ***	5.97
Special Items	0.827 ***	18.65	0.834 ***	18.77	0.830 ***	18.72	0.835 ***	18.79
NegFE	-0.069	-1.39	-0.056	-1.14	-0.066	-1.34	-0.067	-1.36
QTR4	0.096 **	2.05	0.095 **	2.04	0.096 **	2.06	0.097 **	2.07
Year Fixed effect	Yes		Yes		Yes		Yes	
Industry Fixed effect	Yes		Yes		Yes		Yes	
N	4,829		4,829		4,829		4,829	
Pseudo R^2	0.223		0.224		0.223		0.224	

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The Z-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

TABLE 10
Non-GAAP reporting and GAAP earnings informativeness

$$Freq(Non\text{-}GAAP\ or\ Aggressive)_{i,t} = \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,t} + \alpha_3 Claw_i \times After_{i,t} + \alpha_4 ERC_{i,t} + \alpha_5 Claw_i \times ERC_{i,t} + \alpha_6 After_{i,t} \times ERC_{i,t} + \alpha_7 After_{i,t} \times Claw_i \times ERC_{i,t} + Controls + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_{i,t} \quad (10)$$

Dependent Variable	*Freq(Non-GAAP)*		*Freq(Aggressive)*	
	Coef	*t-stat*	*Coef*	*t-stat*
Intercept	-0.165	-0.85	0.219 *	1.72
Claw	-0.108 ***	-2.70	0.009	0.33
After	-0.018	-0.57	-0.015	-0.79
After×Claw	0.064 *	1.69	0.013	0.54
ERC	-0.018	-1.49	0.000	0.08
Claw×ERC	-0.002	-0.12	-0.015	-1.55
After×ERC	-0.021	-1.26	-0.005	-0.61
After×Claw×ERC	**0.037 ***	**1.76**	**0.030 ****	**2.19**
Ln(Total assets)	0.010	0.80	-0.023 ***	-2.60
AvgROA	0.775 *	1.69	0.459	1.40
Std(ROA)	3.646 ***	3.67	1.151	1.22
Freq(SI)	0.385 ***	7.53	0.055	1.49
Freq(NegFE)	0.263 ***	4.50	0.040	0.82
Freq(Loss)	-0.243 ***	-3.18	0.005	0.10
Year Fixed effect	Yes		Yes	
Industry Fixed effect	Yes		Yes	
N	756		756	
Adjusted R^2	0.414		0.138	

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The t-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

Table 11
Non-GAAP reporting and accruals-based and real earnings management

$$Prob(Income\ Increasing)_{i,q} = \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,q} + \alpha_3 Non\text{-}GAAP_{i,q} + \alpha_4 After_{i,q} \times Claw_i + \alpha_5 Claw_i \times Non\text{-}GAAP_{i,q} + \alpha_6 After_{i,q} \times Non\text{-}GAAP_{i,q} + \boldsymbol{\alpha_6 After_{i,q} \times Claw_i \times Non\text{-}GAAP_{i,q}} + Controls + Year\ Fixed\ Effect + Industry\ Fixed\ Effect + \varepsilon_{i,q} \quad (11)$$

	Income Increasing DA		*Income Increasing AbPROD*		*Income Increasing AbDISX*		*Income Increasing AbCFO*		*Income Increasing RM_Proxy*	
	Coef	*Z-stat*	*Coef*	*Z-stat*	*Coef*	*Z-stat*	*Coef*	*Z-stat*	*Coef*	*Z-stat*
Intercept	0.744 **	2.44	-0.333	-0.30	2.240 *	1.82	-0.912	-1.63	-0.447	-0.58
Claw	0.226 ***	3.18	-0.108	-0.81	0.041	0.37	0.018	0.14	0.113	0.93
After	-0.126	-1.50	-0.055	-0.48	0.013	0.11	-0.043	-0.32	0.016	0.15
Non-GAAP	0.134 *	1.74	-0.060	-0.42	-0.129	-1.16	-0.032	-0.23	-0.046	-0.36
After×Claw	0.171	1.64	0.180	1.49	-0.180	-1.36	0.123	0.90	-0.065	-0.57
Claw×Non-GAAP	0.079	0.75	-0.053	-0.29	0.087	0.56	0.166	0.91	-0.255	-1.56
After×Non-GAAP	0.214 **	1.99	-0.076	-0.59	0.027	0.20	0.240 *	1.78	-0.034	-0.30
After*× *Claw*×*Non-GAAP	**-0.347** **	**-2.33**	**0.054**	**0.31**	**0.126**	**0.65**	**-0.414** **	**-2.17**	**0.125**	**0.79**
Ln(Total Assets)	-0.016	-1.16	-0.014	-0.34	-0.109 ***	-3.92	0.139 ***	3.94	-0.012	-0.36
Market-to-Book	-0.009 ***	-2.67	-0.013 *	-1.95	0.016 **	2.56	0.003	0.42	-0.018 **	-2.42
ROA	6.006 ***	7.36	-0.508	-0.29	3.517 **	2.28	-5.384 ***	-3.28	-2.275	-1.49
Growth	-0.482 ***	-6.00	0.310 ***	4.26	0.114	1.45	-0.139 *	-1.78	0.146 *	1.90
Q4	-0.014	-0.34	0.194 **	2.14	0.134	1.61	-0.019	-0.17	0.096	1.05
Time Fixed	Yes		Yes		Yes		Yes		Yes	
Industry Fixed	Yes		Yes		Yes		Yes		Yes	
N	5,546		5,559		5,563		5,632		5,544	
Pseudo R^2	0.110		0.077		0.238		0.179		0.075	

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The Z-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

Table 12
Decomposition of non-GAAP exclusions into special items and other exclusions

$$FOPI_{q+1,q+4} = \alpha_0 + \alpha_1 NonGAAPEarnings_{i,q} + \alpha_2 Claw_i + \alpha_3 After_{i,q} + \alpha_4 Claw_i \times After_{i,q} + \alpha_5 Special_{i,q} + \alpha_6 Claw_i \times Special_{i,q} + \alpha_7 After_{i,q} \times Special_{i,q} + + \boldsymbol{\alpha_8 After_{i,q} \times Claw_i \times Special_{i,q}} + \alpha_9 OtherExclusions_{i,q} + \alpha_{10} Claw_i \times OtherExclusions_{i,q} + \alpha_{11} After_{i,q} \times OtherExclusions_{i,q} + \boldsymbol{\alpha_{12} After_{i,q} \times Claw_i \times OtherExclusions_{i,q}} + Controls + Year\ Fixed\ effect + Industry\ Fixed\ effect + \varepsilon_{i,q}$$

	Only Clawback Adopters		Propensity Score Matched Sample	
	Coef	*t-stat*	*Coef*	*t-stat*
Intercept	-2.706 ***	-4.55	-1.589 ***	-3.65
Non-GAAP Earnings	1.699 ***	8.61	1.952 ***	14.25
Claw			-0.130	-1.49
After	0.075	0.70	0.074	0.87
Claw×After			-0.033	-0.39
Special	0.018	0.08	-0.182	-0.51
Claw×Special			0.451	1.14
After×Special	**-0.647 *** **	**-2.73**	0.032	0.09
After×Claw×Special			**-0.796** *	**-1.85**
OtherExclusions	-1.372 ***	-4.11	-1.627 ***	-3.21
Claw×OtherExclusions			0.144	0.24
After× OtherExclusions	**0.094**	**0.25**	0.569	1.09
After×Claw× OtherExclusions			**-0.609**	**-0.91**
Sales Growth	0.382 **	2.41	0.149	1.12
Ln(Total Assets)	0.258 ***	4.95	0.248 ***	6.64
Earnings Volatility	-6.128 ***	-2.75	-3.578 **	-2.11
Loss	0.106	0.68	-0.196 *	-1.69
Market to Book	0.019 *	1.81	0.008	1.51
Ln(Firm Age)	0.323 ***	2.89	0.134	1.52
Accruals	-0.325	-0.68	-0.354	-0.95
Year Fixed effect	Yes		Yes	
Industry Fixed effect	Yes		Yes	
N	2,878		5,784	
Adjusted R^2	0.600		0.596	

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The t-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.

Table 13

Classification shifting and non-GAAP reporting

$$UE_{CE\,i,q} \text{ or } UE\_\Delta CE_{i,t} = \alpha_0 + \alpha_1 Claw_i + \alpha_2 After_{i,q} + \alpha_4 \%SI_{i,q} + \alpha_3 Claw_i \times After_{i,q} + \alpha_5 Claw_i \times \%SI_{i,q} + \alpha_6 After_{i,q} \times \%SI_{i,q} + \boldsymbol{\alpha_7 Claw_i \times After_{i,q} \times \%SI_{i,q}} + Controls + \varepsilon_{i,q} \quad (17)$$

	Aggressive Non-GAAP Reporting Sample				Non-Aggressive Reporting Sample			
Dependent Variable	*UE_CE*		*UE_ΔCE*		*UE_CE*		*UE_ΔCE*	
	Coef	*t-stat*	*Coef*	*t-stat*	*Coef*	*t-stat*	*Coef*	*t-stat*
Intercept	0.006	0.49	0.020 ***	3.88	0.010 ***	3.45	0.003	1.21
Claw	0.003	0.23	-0.011	-1.41	0.010 **	2.05	-0.001	-0.55
After	0.000	0.02	0.000	-0.01	0.006	1.17	0.030	0.17
%SI	1.382	1.15	-0.167	-0.46	-0.253	-0.97	-0.004	-1.18
Claw×After	-0.001	-0.04	0.006	0.56	-0.017 **	-2.29	-0.091	-0.37
Claw×%SI	0.608	0.5	2.443 ***	6.4	-0.144	-0.39	-0.257	-1.09
After×%SI	-3.788 ***	-3.17	1.406 ***	3.71	0.180	0.43	0.184	0.55
Claw×After×%SI	**1.319**	**1.03**	**-3.521 *** **	**-8.66**	**0.769**	**1.33**	**0.008** ***	**4.5**
N	452		452		3,065		3,065	
Adjusted R^2	0.049		0.050		0.005		0.002	

The sample period covers the first quarter of 2004 through the fourth quarter of 2010 (2004 Q1–2010 Q4). All continuous variables are winsorized at 1 percent and 99 percent. The t-statistics are corrected for heteroscedasticity and firm-level clustering of standard errors. *, **, *** represent significance at the 10%, 5%, and 1% levels, respectively. See Appendix B for variable definitions.