

Non-GAAP earnings and board independence

Richard Frankel · Sarah McVay · Mark Soliman

Published online: 17 July 2011
© Springer Science+Business Media, LLC 2011

Abstract We examine the association between board independence and the characteristics of non-GAAP earnings. Our results suggest that companies with less independent boards are more likely to opportunistically exclude recurring items from non-GAAP earnings. Specifically, we find that exclusions from non-GAAP earnings have a greater association with future GAAP earnings and operating earnings when boards contain proportionally fewer independent directors. Consistent with the association between board independence and the permanence of non-GAAP exclusions reflecting opportunism rather than the economics of the firm, we find that the association declines following Regulation G and that managers appear to use exclusions to meet earnings targets prior to selling their shares more often in firms with fewer independent board members. Overall, our results suggest that board independence is positively associated with the quality of non-GAAP earnings.

Keywords Board independence · Non-GAAP earnings · Earnings persistence

JEL Classification M41 · G30

R. Frankel
Olin School of Business, Washington University in St. Louis, Campus Box 1133,
One Brookings Drive, St. Louis, MO 63130, USA
e-mail: frankel@olin.wustl.edu

S. McVay (✉)
David Eccles School of Business, University of Utah, 1645 E. Center Campus Drive,
Salt Lake City, UT 84112, USA
e-mail: sarah.mcvay@business.utah.edu

M. Soliman
University of Washington Business School, Box 353200, Seattle, WA 98195, USA
e-mail: msoliman@u.washington.edu

1 Introduction

We study how the nature of non-GAAP earnings varies with board independence. A non-GAAP earnings number is a “core” earnings measure that excludes components of GAAP earnings. Managers sometimes choose to voluntarily disclose non-GAAP earnings in their press releases, determining the exclusions at their own discretion. Since non-GAAP earnings numbers disclosed in press releases are not subject to audit, opportunism can affect managers’ exclusion choices (Doyle et al. 2003; Bowen et al. 2005; Black and Christensen 2009), and the nature of exclusions varies substantially both across firms and across quarters of the same firm (Bhattacharya et al. 2004).¹ Prior research indicates, however, that non-GAAP earnings are more persistent than GAAP earnings (Bhattacharya et al. 2003), and firms tend to disclose non-GAAP earnings when GAAP earnings are less informative (Lougee and Marquardt 2004), suggesting that core-earnings disclosures aid investors in predicting future earnings despite the voluntary and discretionary nature of non-GAAP earnings.

Prior research links board independence to both management actions and the quality of voluntary disclosures (e.g., Dechow et al. 1996; Ajinkya et al. 2005; Karamanou and Vafeas 2005). We also focus on board independence because this governance feature is tied to earnings-related disclosures as boards of directors tend to review earnings announcements. Accordingly, our analysis amounts to a test of a joint hypothesis: (1) whether board independence affects monitoring of earnings-related disclosures and (2) whether management’s decision to exclude items from non-GAAP earnings reflects an element of opportunism, on average. By rejecting the null hypothesis of no relation between board independence and the persistence of excluded items, we provide evidence consistent with exclusions from non-GAAP earnings, in part, being shaped by opportunism that boards could curb through stronger oversight.

Following prior research, our main measure of opportunism is the predictive ability of the exclusions from non-GAAP earnings (Doyle et al. 2003; Gu and Chen 2004; Kolev et al. 2008). To warrant their exclusion from non-GAAP earnings, non-GAAP exclusions (measured as non-GAAP earnings less GAAP earnings) should be transitory rather than permanent items. Thus, we define “high-quality” exclusions as those that are more transitory and “low-quality” exclusions as those that are more permanent.

We estimate the implications of non-GAAP exclusions for both future GAAP earnings and future operating income by estimating regressions of future earnings on current non-GAAP earnings and non-GAAP exclusions. We then explore how the predictive power of non-GAAP exclusions varies in the cross-section with board independence. For our sample of 4,246 firm-quarter observations from 1998 to 2005, we find that non-GAAP exclusions have significantly larger implications for future earnings (i.e., are of lower quality) when boards contain fewer independent directors. This result is robust to the inclusion of controls for firm size, growth, losses, earnings volatility, and industry membership, suggesting that managers are more likely to exclude recurring

¹ Pursuant to Regulation G, managers are required to reconcile non-GAAP earnings to the closest GAAP earnings figure in the press release. We examine how this affects our results in Sect. 4.2.1. Regulators remain concerned about non-GAAP reporting, however; for example, in January 2010, the SEC stated that it will inquire about significant differences between what firms disclose in their SEC filings and what they disclose in press releases (PwC 2010).

expenses from non-GAAP earnings when boards are less independent. This evidence suggests that, while opportunism can taint the choice of exclusions from non-GAAP earnings, the effect is limited in the presence of more independent boards.

Increased public supervision could substitute for board oversight, dampening the effects of cross-sectional variation in board independence. Regulation G, issued as directed by the Sarbanes–Oxley Act of 2002, requires increased transparency over non-GAAP reporting. Namely, the rule requires that managers reconcile any non-GAAP figures to the closest GAAP figure.² Both Yi (2007) and Kolev et al. (2008) find that the quality of non-GAAP exclusions improves after Regulation G.³ If the relation between board independence and the persistence of non-GAAP exclusions is attributable to oversight, we expect that this relation will diminish in the post-Regulation G era when these disclosures are subject to additional regulatory and investor scrutiny. Consistent with this explanation, we find that the relation between board independence and the quality of non-GAAP exclusions is no longer significant after Regulation G. This result is consistent with managers having less scope for opportunism when disclosing non-GAAP earnings following increased scrutiny.

To provide more direct evidence of private benefits to management—and thus opportunism—we examine insider selling following earnings announcements. To relate insider selling to the opportunistic use of non-GAAP exclusions, we examine the incidence of insider selling after earnings announcements where non-GAAP exclusions make the difference between meeting and missing analyst expectations. Bhattacharya et al. (2003), Lougee and Marquardt (2004), Black and Christensen (2009), and Doyle and Soliman (2009) suggest that non-GAAP exclusions allow managers to report earnings that exceed earnings benchmarks.⁴ Estimating models with insider selling as the dependent variable, we find that insider selling increases when the use of non-GAAP exclusions enables the firm to meet or beat analyst expectations, and this relation is stronger when the firm's board of directors has fewer independent directors. This result provides further evidence that managers are more likely to use non-GAAP exclusions opportunistically when boards are less independent.⁵

Our evidence complements two studies on non-GAAP earnings and board independence. First, Mbagwu (2007) finds that the price reaction to non-GAAP

² Effective March 2003, Regulation G requires that firms disclosing non-GAAP earnings measures (1) provide a comparable GAAP measure, (2) reconcile the non-GAAP measure to the GAAP measure, and (3) file, within five days, a Form 8 K that explains why management believes the non-GAAP measure to be useful to investors.

³ Unlike Yi (2007), Kolev et al. (2008) base their analysis on analysts' determinations of core earnings, which they use to proxy for non-GAAP earnings issued by managers in the press release (see also Doyle et al. 2003, among others).

⁴ Meeting the analyst consensus forecast might be in the best interests of existing shareholders. However, Richardson et al. (2004) find that managers manage analysts' expectations downward in order to meet the analyst forecast before selling their personal shares in the company. Similarly, McVay et al. (2006) find evidence that managers manipulate working capital accruals to meet the analyst forecast before selling their personal shares.

⁵ This result may seem counterintuitive as insiders would likely want to avoid seemingly opportunistic behavior around the time they trade their shares. However, shareholders would have difficulty proving opportunism given the lack of specific regulatory requirements associated with disclosure of non-GAAP earnings. Thus, the benefits of a higher selling price can exceed the expected costs of detection.

earnings is more positive in the presence of independent boards and argues that more independent boards improve the overall quality of the information environment. Our results corroborate this conclusion, as we find that non-GAAP earnings are of higher quality in the presence of independent boards. Second, Jennings and Marques (2010) investigate whether investors are misled by non-GAAP earnings numbers by looking at subsequent market returns before and after Regulation G. They find that this relation changed after Regulation G for firms with weak governance (measured using both board independence and institutional holdings). Their results corroborate our findings that Regulation G complements corporate governance. They do not, however, provide clear evidence of opportunism. By conditioning on managerial incentives—insider trading following the earnings announcement—we document cross-sectional variation in the opportunistic use of non-GAAP earnings prior to SEC scrutiny and find that this opportunism is curbed following SEC intervention.

Our results contribute to both the voluntary disclosure and corporate governance literatures. First, prior research finds that non-GAAP earnings are used both (1) to inform equity investors (e.g., Bradshaw and Sloan 2002; Brown and Sivakumar 2003; Bhattacharya et al. 2003; Lougee and Marquardt 2004) and (2) to opportunistically mislead them (e.g., Bradshaw and Sloan 2002; Doyle et al. 2003; Bhattacharya et al. 2003; Lougee and Marquardt 2004; Bhattacharya et al. 2004; Bowen et al. 2005; Black and Christensen 2009; Doyle and Soliman 2009; Brown et al. 2010). Rather than attempting to distinguish between these alternatives, which need not be mutually exclusive, we provide evidence on cross-sectional variation in opportunism by examining how the nature of the exclusions (recurring versus transitory) and their use to meet the analyst forecast vary with board independence. Our results suggest that investors should weight non-GAAP earnings more heavily in the presence of independent boards, as they appear to be of higher quality, *ex post*.

Second, we add to the literature on the benefits of board independence. While some evidence indicates that board independence improves the quality of financial reporting and disclosure (e.g., Dechow et al. 1996; Beasley 1996; Klein 2002a; Ajinkya et al. 2005; Karamanou and Vafeas 2005), other studies suggest that the effects of board independence are weak or non-existent (e.g., Bhagat and Black 2002; Bushman et al. 2004; Vafeas 2000; Larcker et al. 2007). Unlike GAAP earnings, which are audited, and management forecasts, which can be compared with earnings realizations, the appropriateness of the non-GAAP exclusions are more difficult to verify and thus offers a powerful setting to test the effects of governance on disclosure quality. We provide evidence consistent with board independence constraining opportunism in the disclosure of non-GAAP exclusions and non-GAAP earnings in the absence of regulation.

2 Hypothesis development

2.1 Agency costs, disclosure, and corporate governance

Given the separation between decision rights and residual risk bearing (Fama and Jensen 1983), the reduction of agency costs becomes an important factor in

achieving organizational efficiency.⁶ Combined with legal protection, corporate transparency provides a means of reducing agency costs (La Porta et al. 1998). By disclosing a non-GAAP operating-earnings measure, managers can provide investors with information that is incremental to GAAP earnings, such as information on the transitory nature of specific income-statement items. Accordingly, managers often justify disclosing non-GAAP earnings as it is more indicative of future performance.⁷ According to incentive signaling theory (Ross 1979), managers strive to reduce information asymmetry because they are penalized for the loss in efficiency associated with retaining the ability to profit from private information.

In contrast to research on voluntary disclosure, theoretical research has yet to define the role of corporate boards (Hermalin and Weisbach 2003), though the link between independent directors and board actions has been explored empirically. For example, Core et al. (1999) find that weak governance structures are negatively associated with increased CEO pay (i.e., CEO pay is declining in the number of *inside* directors). Klein (2002a) finds a negative relation between board independence and the magnitude of discretionary accruals, suggesting that board independence curtails earnings management. However, Bowen et al. (2008) find that managerial opportunism is not the dominant reason for the observed excess accounting discretion. Rather, “these results suggest that earnings management, especially smoothing, signals positive news such as managerial competence or positive future operating performance.” They conclude that it is important to examine subsequent performance before concluding opportunism. Along these lines, Bhagat and Black (2002) do not find an association between board independence and long-term firm performance. Thus, empirical evidence is mixed on reporting benefits associated with board independence.

With respect to voluntary disclosure and governance, Byard and Li (2005) find indirect evidence that managers are less able to strategically dampen stock prices through disclosure just prior to stock grants (Yermack 1996; Aboody and Kasznik 2000) when the company’s board has a majority of outside directors. Ajinkya et al. (2005) find that managers of firms with greater institutional ownership and outside

⁶ We focus on the alignment of interests between shareholders and managers, but efficient organizational design would minimize contracting costs between all factors of production (e.g., Jensen and Meckling 1976).

⁷ For example, the July 27, 2004, earnings release of BMC Software included the following language: “This press release includes financial measures for net earnings, earnings per share (EPS) and operating expenses that exclude certain charges and, therefore, have not been calculated in accordance with U.S. generally accepted accounting principles (GAAP). A detailed reconciliation between the GAAP results and results excluding special items (non-GAAP) is included with the financial tables accompanying this press release. BMC Software has provided these non-GAAP measures in its press releases reporting historical financial results *because the Company believes these measures provide a consistent basis for comparison between quarters*, as they are not influenced by certain non-cash or non-recurring expenses and are therefore *useful to investors in helping them understand the financial condition of BMC Software by focusing on the performance of its core operations*. Management uses these non-GAAP financial measures internally to evaluate the Company’s performance and as a key variable in determining management compensation. These non-GAAP measures should not be considered an alternative to GAAP, and these non-GAAP measures may not be comparable to information provided by other companies.” (emphasis added).

directorship are more likely to issue a management forecast, and that these forecasts are more accurate and less optimistic. Finally, Karamanou and Vafeas (2005) find that in firms with more effective board and audit committee structures (where more effective is defined as more independent, expert, larger, and more active), managers are more likely to make or update an earnings forecast, and their forecast is more accurate and elicits a more favorable market response. In sum, many empirical studies in this emerging literature suggest that outside directors appear to benefit shareholders.

2.2 Non-GAAP earnings and board independence

To confirm that boards or audit committees of boards do review the numbers in earnings press releases, we called a number of investor relations departments and executives of firms with non-GAAP exclusions, and all confirmed that this is a common practice of theirs. This is not surprising because the requirement of such reviews is even listed in the NYSE Listed Company Manual, emphasizing their importance. It states that the audit committees of NYSE-listed firms are required to “discuss the listed company’s earnings press releases, as well as financial information and earnings guidance provided to analysts and rating agencies” (Section 303A.07(c)). Given that boards provide oversight with respect to earnings press releases, we argue that the rigor of this oversight can help mitigate the opportunism present in non-GAAP disclosures. That is, more independent boards will act to ensure that non-GAAP earnings coincide with the information-motivated explanations managers offer to justify its inclusion in the press release.⁸

Several studies argue that managers can use non-GAAP earnings opportunistically to increase equity valuations or garner private benefits. For example, Bhattacharya et al. (2004) find that the use of non-GAAP earnings increases dramatically when the earnings and stock prices of the respective firms start to decline. Bowen et al. (2005) look at the strategic emphasis managers place on non-GAAP earnings and find that managers tend to emphasize the metric that portrays better firm performance. Hirshleifer and Teoh (2003) demonstrate analytically that non-GAAP earnings can influence investors with limited attention; consistent with this, both Frederickson and Miller (2004) and Elliott (2006) find in experimental settings that non-GAAP earnings influence nonprofessional investors and induce them to assess a higher stock price for the same firm. Allee et al. (2007) validate these studies using archival data. Along these lines, Bhattacharya et al. (2007) find that non-GAAP earnings influence the trades of less sophisticated investors, in

⁸ Following much of the prior literature, we treat board structure as exogenous. However, to the extent that board structure and disclosure policy are jointly determined, our inferences may be biased. As Hermalin and Weisbach (2003) note, theory and evidence on the determinants of board structure are limited. Research suggests that firm size and growth are related to board independence. Thus, following prior studies, we control for these characteristics in our tests (Klein, 2002b; Lehn et al., 2003; Boone et al., 2007). We also include lagged performance as an additional control in untabulated results. Finally, we use the natural experiment of Regulation G to help mitigate concerns related to endogeneity.

particular. Finally, Black and Christensen (2009) find that managers define non-GAAP earnings in a way that allows them to meet earnings benchmarks.⁹

The mere use of non-GAAP measures, however, does not necessarily imply opportunism on the part of managers. The characteristics of an earnings number useful for equity valuation can differ from those of a number that minimizes contracting costs. Empirical evidence exists on both sides of this issue. Thus, we do not claim that managers always use non-GAAP earnings opportunistically; rather, we simply note that opportunism is possible. To infer opportunism, we examine cross-sectional variation in the persistence of non-GAAP exclusions (e.g., Doyle et al. 2003) and whether the exclusions allowed managers to meet the analyst forecast (e.g., Black and Christensen 2009) before selling their personal shares.

Prior studies have attributed differences in investors' reliance on non-GAAP earnings to the quality of the disclosure. For example, as noted previously, Mbagwu (2007) finds that the price reaction to non-GAAP earnings is more positive in the presence of independent boards and argues that more independent boards improve the overall quality of the information environment. Researchers have also explored the properties of the expenses excluded from non-GAAP earnings to investigate whether non-GAAP earnings contain an opportunistic component. Doyle et al. (2003) find that these excluded expenses are not completely transitory and have implications for future earnings and cash flows.¹⁰ To the degree that items are recurring and permanent, they are useful for valuation (e.g., Lipe 1986; Fairfield et al. 1996); thus, managers probably should not have excluded them if they are going to persist in the future. Gu and Chen's (2004) empirical evidence suggests that items excluded by management but re-inserted by analysts are more permanent (i.e., more predictive of future earnings), suggesting that there is variation in the quality of non-GAAP exclusions among firms. We determine the quality of an excluded expense by its association with 1-year-ahead earnings (GAAP earnings and operating income), where a higher quality exclusion has a lower association with future earnings.¹¹ Doyle et al. (2003), among others, find that, on average, non-GAAP exclusions are not transitory, while Black and Christensen (2009), among others, find that managers appear to use these exclusions opportunistically. If board independence mitigates opportunism, we expect to find cross-sectional variation between the degree of exclusion permanence and board independence. Stated in the alternative form, our hypothesis is as follows:

Hypothesis Non-GAAP exclusions have significantly larger implications for future earnings (i.e., are of lower quality) when a firm's board is less independent.

⁹ Along these lines, Christensen et al. (2010) find that short sellers target stocks with earnings announcements containing pro forma earnings disclosures and that they short stocks more that exclude recurring items and those that use pro forma exclusions to meet analysts' expectations.

¹⁰ Of course excluding these expenses may be optimal if their persistence is significantly lower than that of core earnings. Absent opportunism, however, we should not find that the level of permanence varies with board independence, that this relation changes around Regulation G, and that these exclusions are associated with meeting the analyst forecast preceding insider trading.

¹¹ GAAP earnings is earnings per share before discontinued operations and extraordinary items (data item #9). Operating income is earnings per share before special items, discontinued operations, and extraordinary items on a diluted basis (data item #177 \times #54/#171).

2.3 Additional analysis

Evidence consistent with our hypothesis does not necessarily indicate managerial opportunism. For example, exclusions may relate to unobservable firm characteristics and thus correlate with board independence in a way that the use of control variables cannot mitigate. Therefore, we conduct two additional tests to provide corroborating evidence that opportunism in non-GAAP earnings varies with board independence.

2.3.1 *Quality of exclusions and changes in regulation*

Following a general concern that disclosures of non-GAAP earnings in press releases were misleading investors, the Securities and Exchange Commission began to focus on non-GAAP reporting, releasing a warning in 2001 and issuing Regulation G in 2003.¹² Yi (2007) and Kolev et al. (2008) find that, on average, the quality of non-GAAP exclusions improves following these SEC actions. Several studies document a decline in the use of non-GAAP earnings immediately after the enactment of Sarbanes–Oxley and the issuance of Regulation G (e.g., Entwistle et al. 2006; Marques 2006; Heflin and Hsu 2008).¹³ There is a similar decline in the propensity to use exclusions to meet earnings benchmarks (Heflin and Hsu 2008), and in instances where exclusions allow managers to meet the analyst forecast, these exclusions are less persistent (i.e., of higher quality; Chen 2010). In addition, Jennings and Marques (2010) find that the decline in non-GAAP usage after Regulation G is more prevalent among firms with fewer independent members on the board of directors. The previously mentioned studies find evidence consistent with regulation curbing opportunism in the reporting of non-GAAP earnings, while the results in Jennings and Marques (2010) suggest that there may have been less of a need for regulation among firms with more independent boards. This is consistent with our notion that Regulation G acted as an alternative governance mechanism for firms where governance was lacking.

If the relation we document between board independence and the quality of exclusions reflects monitoring on the part of the board, we would expect a weaker association following Regulation G, when all registrants become subject to additional scrutiny. Alternatively, if the relation we document between board independence and the characteristics of non-GAAP exclusions is due to other

¹² The SEC's cautionary advice stated that "companies need to describe accurately the controlling principles [and] the particular transactions and the kind of transactions that are omitted" (Securities and Exchange Commission, 2001). The SEC also said that it would not deem a non-GAAP figure misleading if the company disclosed in plain English how it deviated from GAAP and the amount of each of those deviations. Following the dictates of Congress in the Sarbanes–Oxley Act, the SEC promulgated Regulation G (see also footnote 3). As previously noted, regulators remain concerned about non-GAAP reporting. For example, in January 2010, the SEC stated that it will inquire about significant differences between what firms disclose in their SEC filings and what they disclose in press releases (PwC 2010).

¹³ Brown et al. (2009), using a more comprehensive dataset find that, although there was an initial dip in the frequency of non-GAAP earnings disclosures after SOX and Reg. G., the frequency of non-GAAP earnings reports has continued to increase in recent years.

underlying characteristics of firms with more independent boards, we would expect no change.¹⁴

2.3.2 Using exclusions to beat the analyst forecast before selling shares

Opportunism suggests that managers garner private benefits at the expense of existing shareholders. The purpose of boards is to limit this behavior. However, our prior tests do not provide direct evidence linking disclosure of non-GAAP earnings to opportunities for private gain by managers. We contend that managers can use non-GAAP exclusions to meet analyst earnings expectations in order to facilitate insider sales. We test whether the link between insider sales and use of non-GAAP exclusions to exceed analyst expectations is stronger when boards are more independent. If we find that managers use non-GAAP exclusions to meet the analyst forecast before selling their shares and that this relation weakens with board independence, then we can conclude that board independence appears to constrain such opportunistic behavior by managers.

3 Empirical analysis

3.1 Sample

Our tests employ data from several sources. Financial statement data are from the Preliminary History Quarterly Compustat File.¹⁵ Quarterly non-GAAP earnings per share is from firms' earnings announcements.¹⁶ The median quarterly consensus analyst forecast is from the split-unadjusted I/B/E/S database. Board of director independence information is from the Investor Research Responsibility Center's (IRRC) corporate governance dataset, and insider trading data is from Thomson Financial. Our sample contains 4,246 firm-quarter observations from 1998 to 2005 with sufficient data to conduct our main test. By construction, each of these observations has a non-GAAP earnings figure reported in the press release.

¹⁴ Our tests do not allow us to determine whether Regulation G disclosure requirements *per se* led to this change. In addition, it is possible that the increased emphasis on board independence and vigilance in recent years has reduced the power of our tests by limiting cross-sectional variation in director oversight (i.e., all firms have increased their levels of independence, reducing the power of our tests). However, even in the final year of our study, the average board committee independence is only 71% (with a standard deviation of 0.14), up from 59% in 1996 (with a standard deviation of 0.19). Thus, there appears to be more variation in board independence than in audit committee independence.

¹⁵ Preliminary History is a dataset (accessible via WRDS) that contains the as-first-filed financial statement figures. Quarterly Compustat routinely overwrites the original values to reflect subsequent discontinued operations and mergers and acquisitions (Standard and Poor's 2003, Ch. 2, p. 9). This "as originally reported" data corresponds to the actual earnings reported in a given 10Q or 10 K, rather than a subsequently adjusted number.

¹⁶ We thank Ted Christensen and Erv Black for the use of their hand-collected non-GAAP earnings data.

3.2 Variable measurement

3.2.1 *Non-GAAP earnings and exclusions*

The difference between non-GAAP earnings and GAAP earnings is defined as non-GAAP exclusions: $\text{non-GAAP exclusions} = \text{non-GAAP earnings} - \text{GAAP earnings}$. When non-GAAP earnings are higher than GAAP earnings, non-GAAP exclusions are positive, indicating that the average exclusion is an expense. Non-GAAP earnings is the “continuing income” or “core” diluted earnings-per-share value reported by managers in their earnings announcement. GAAP earnings are defined as earnings per share before extraordinary items and discontinued operations (Compustat data item #9).¹⁷

3.2.2 *Board Independence*

Our board oversight metric is the proportion of outside directors on the board.¹⁸ Many potential oversight metrics exist (for example, see Brown and Caylor 2006; Larcker et al. 2007; Bowen et al. 2008).¹⁹ However, prior researchers have used board and audit committee independence extensively in examining corporate governance and fraud and earnings management (Dechow et al. 1996; Beasley 1996; Klein 2002a). Moreover, both the SEC and the major stock exchanges impose board independence requirements, indicating that this is an important aspect of corporate governance. For example, both the NYSE and NASDAQ now require a majority of outside directors on the board of directors, and Sarbanes–Oxley, Section 301, requires that all audit committee members be independent. Larcker et al. (2007) provide more recent empirical support that the board of directors is a valid oversight mechanism over financial reporting: of all of their governance metrics, only “insider power” is significant in the predicted direction with both abnormal accruals and restatements. Insider power is the composite of the percentage of independent board members, director ownership, and unequal voting rights.²⁰

¹⁷ Doyle et al. (2003) scale exclusions by assets per share, while Gu and Chen (2004) scale exclusions by price. Following Doyle et al. (2003), we scale our variables by assets per share. Results are similar, though weaker, if we scale using price per share.

¹⁸ For NYSE firms, independence is defined as follows: the director (1) cannot have a material relationship with the company, (2) cannot have been an employee for 5 years, (3) cannot have been an employee of the company’s auditor for 5 years, (4) cannot have been an interlocking director (i.e., an executive of company A serves on the compensation committee of B, and an executive of company B serves on the board of company A), and (5) cannot have an immediate family member who would be disqualified for any of these reasons. The NASDAQ and NYSE rules are similar.

¹⁹ The consensus from these papers is that corporate governance is multifaceted. However, the data used in both of these studies are new and the analyses are thus limited to the years 2002–2004. Alternatively, Bowen et al. (2008) use the G-Score developed in Gompers et al. (2003) as their main corporate governance metric. We do not use a metric of “shareholder rights” but rather focus on financial reporting oversight.

²⁰ While we focus on board independence, this variable is likely correlated with other governance features (e.g., a CEO who is also the chairman of the board).

We measure board independence as the percentage of board members who are “independent” (*%Independent*); our conclusions are similar using alternative specifications such as the decile or quartile rank (not tabulated).

3.2.3 Future earnings

We consider two measures of future earnings. First, *Future GAAP Earnings*, our main dependent variable, is defined as earnings per share before extraordinary items (data item #9) summed over quarters $q + 1$ through $q + 4$. GAAP earnings, however, often includes expenses that are excluded from non-GAAP earnings each year (such as amortization of intangibles or special items). Thus, there might be a systematic relation that does not reflect opportunism. Consequently, we also consider *Future Operating Income*, operating income per diluted share (data item #177) also summed over quarters $q + 1$ through $q + 4$; we adjust this figure to be on a diluted basis by using the implied dilution factor from the most recent annual basic shares outstanding (data item #54) divided by annual diluted shares outstanding (data item #171) reported by Compustat. Both Yi (2007) and Kolev et al. (2008) consider operating earnings, as data item #177 does not include special items, which tend to be positively autocorrelated. However, we consider this variable jointly with *Future GAAP Earnings*, as it is possible for a manager to classify recurring charges as special items for several years in a row (McVay 2006), thereby reducing the power of tests using this dependent variable. While both of our dependent variables have limitations, jointly they speak to the implications of exclusions for future earnings.²¹

3.2.4 Additional variables

We define *Met with Exclusions* as an indicator variable that is equal to one if non-GAAP earnings met or exceeded the median I/B/E/S consensus analyst forecast but GAAP earnings did not meet this earnings benchmark and zero otherwise.²² We aggregate insider trades from Thomson Financial for a 3-week window following each earnings announcement. We begin the window 2 days after the earnings announcement and continue the aggregation for 21 calendar days. We consider only

²¹ Doyle et al. (2003) also consider future cash flows and future abnormal returns as dependent variables. With respect to cash flows, as noted by Easton (2003) and Kolev et al. (2008), this dependent variable is less desirable as current liabilities have future cash flow implications. Consider, for example, expenses that are incurred but not paid. These expenses are paid in future quarters, resulting in a mechanical relation between exclusions from permanent earnings and future cash flows. With respect to returns, unlike our earnings measures, returns are also affected by investors' treatment of the exclusions. Because our focus is on the permanence of the exclusions, we focus on the variables that can speak most directly to the quality of the exclusions (i.e., whether they recur in earnings). Moreover, as noted in Bowen et al. (2005), the placement of non-GAAP earnings within the press release has changed over time; thus, investor treatment may also have changed over our sample period.

²² This variable differs from simply having income-increasing exclusions, as it requires that the exclusion allows the firm to meet the analyst forecast. In our sample, 3,411 observations have income-increasing exclusions, while 1,594 observations have *Met with Exclusions* equal to one.

officers of the company (Thomson also tracks non-officer insiders such as directors or large owners). We create two variables to measure insider trading. The first, *Insider Trading Indicator*, is an indicator variable that is equal to one for firm-quarter observations with net insider selling by the officers of the company following the earnings announcement and zero otherwise. The second variable, *Insider Trading Magnitude*, is the magnitude of net-insider trading in dollars.

We consider four control variables: *Size*, *Growth*, *Loss*, and *Earnings Volatility*. Our first control variable is the size of the firm (the log of total assets). Prior research finds that board independence and size tend to be positively correlated (Klein 2002a, b). Also, the costs of opportunistic behavior can increase with size, as shareholders are more likely to sue larger firms (Francis et al. 1994).

Growth can also act as a correlated-omitted variable if it is correlated with the persistence of non-GAAP exclusions. Klein (2002b) finds that high-growth firms tend to have less independent boards. Following Gaver and Gaver (1993) and Guay (1999), we employ common factor analysis to construct a single variable (*Growth*) that captures variation common to *Book-to-MarketAssets*, *R&D*, *Sales Growth*, and *Investment Expenditures*. *Book-to-MarketAssets* is defined as book value of equity divided by book value of debt plus market value of equity at the end of the quarter (data item #60/[data item #54 + (data item #61 × data item #14)]). *R&D* is calculated as R&D expense divided by the market value of assets (data item #46/[data item #54 + (data item #61 × data item #14)]). *Sales Growth* is the change in sales from quarter $q - 4$ to q (data item #2) and is scaled by diluted shares outstanding (data item #124). *Investment Expenditures* is calculated as capital expenditures divided by market value of assets (data item #30/[data item #54 + (data item #61 × data item #14)]).²³

Some firms, such as loss firms and firms with high earnings volatility, may have less persistent earnings (e.g., Hayn 1995; Dichev and Tang 2008) and appear more likely to have non-GAAP exclusions (Table 3 herein; Lougee and Marquardt 2004). Thus, we include *Loss*, an indicator variable that is equal to one if quarterly GAAP earnings (data item #25) is less than zero and zero otherwise, and *Earnings Volatility*, the standard deviation of return on assets (data item #25 divided by data item #44) over the preceding eight quarters (where we require at least six of the eight quarters to have available data).

We interact each of our control variables with board independence to help ensure that the variation we document with respect to implications for future earnings is variation with governance, not the determinants of governance, which may also be determinants of exclusions.²⁴

²³ We replicate each of our results using each of the growth factor's inputs individually; results are similar. We also consider the age of the firm as a potential correlated-omitted variable. Results are not sensitive to the inclusion of the age of the firm, defined as the number of years the firm was listed on Compustat.

²⁴ We also interact both non-GAAP earnings and each of the control variables with non-GAAP exclusions; results are similar (not tabulated).

3.3 Descriptive statistics

As seen in Table 1, the mean percentage of board independence is 66.0%. Klein (2002a, b), in her hand-collected sample of S&P 500 firms from 1992 to 1993, finds that outsiders, on average, make up 58.4% of boards. Thus outsider representation has increased over time. Non-GAAP earnings per share (GAAP earnings per share) is \$0.35 (\$0.15), on average. This mean is larger than the per-share figures reported by Bhattacharya et al. (2003) of 0.085 (−0.147). The difference is consistent with IRRC covering larger, more profitable firms. Consistent with prior literature, non-GAAP earnings per share tends to exceed GAAP earnings per share. Total non-GAAP exclusions average \$0.18, similar to the \$0.22 of non-GAAP exclusions reported by Bhattacharya et al. (2003). Approximately 38% of our firm-quarter observations met the analyst forecast with non-GAAP earnings but missed the analyst forecast with GAAP earnings, highlighting the importance of non-GAAP reporting. Though this percentage seems high, recall that we require a firm to report non-GAAP earnings to be included in our sample. Approximately 35% of our firm-quarter observations had officers selling their shares in the 3 weeks following the announcement of earnings (where the average magnitude exceeds \$2 million).

Table 2 presents descriptive statistics partitioned by the pre- and post-SEC scrutiny time periods (1998Q1–2001Q2 and 2001Q3–2005Q4). Mean board independence is 62% (69%) in the pre- (post-) SEC scrutiny period. The distance between GAAP and non-GAAP earnings has declined; the mean fell from 0.24 (pre-period) to 0.15 (post-period) among firms reporting non-GAAP earnings. Finally, while the prevalence of insider trading seems similar across the two time periods, the magnitude is much higher in the pre-period (3.29 versus 1.22).

Table 3 displays the pairwise correlations among our variables. In the Pearson correlations in the upper right, GAAP and non-GAAP earnings are correlated at 0.32; this correlation is lower than that reported in prior research examining a larger sample of firms (for example, the correlation is 0.94 in Kolev et al. (2008)), for at least two reasons. First, our sample is conditioned on the existence of a difference between GAAP and non-GAAP earnings; therefore, these two values differ by construction. Second, manager-provided non-GAAP earnings differ more from GAAP earnings than analysts' determinations of core earnings (Gu and Chen 2004).

Non-GAAP exclusions and both non-GAAP and GAAP earnings are negatively correlated, consistent with exclusions including special items, which are more likely to occur when performance is poor (e.g., Elliott and Shaw 1988; DeAngelo et al. 1994); the correlation is weaker among the Spearman (versus Pearson) correlations, consistent with some extreme exclusion amounts for firms with very low earnings (Abarbanell and Lehavy 2007). Consistent with arguments supporting the presentation of non-GAAP measures, non-GAAP earnings appears to be more highly correlated with both future GAAP earnings and future operating earnings than current GAAP earnings—0.57 versus 0.32 for earnings and 0.65 versus 0.32 for operating income. Consistent with opportunism, however, the exclusions are negatively associated with future earnings and operating income. Finally,

Table 1 Descriptive statistics

Variable	Mean	Std Dev	5%	25%	Median	75%	95%
Percent board independent	66.0%	17.2%	33.3%	55.6%	66.7%	80.0%	88.9%
Non-GAAP earnings	0.35	0.37	-0.11	0.10	0.28	0.52	1.04
GAAP earnings	0.15	1.30	-0.94	-0.05	0.19	0.46	1.12
Non-GAAP exclusions	0.18	0.35	-0.11	0.01	0.06	0.20	0.98
Future GAAP earnings	0.75	3.60	-3.17	-0.03	0.86	1.93	4.26
Future operating income	1.17	2.59	-1.55	0.20	1.03	2.07	4.37
Total assets	12,031.8	49,776.0	232.0	719.6	1,915.4	6,665.9	41,343.1
Growth	0.14	2.11	-2.33	-1.27	-0.21	1.11	3.91
Loss	0.28	0.45	0.00	0.00	0.00	1.00	1.00
Earnings volatility	0.03	0.08	0.00	0.00	0.01	0.03	0.09
Met with exclusions	0.38	0.48	0.00	0.00	0.00	1.00	1.00
Insider trading indicator	0.35	0.48	0.00	0.00	0.00	1.00	1.00
Insider trading magnitude	2.03	13.66	-0.01	0.00	0.00	0.31	8.53

The sample contains a maximum of 4,246 firm-quarter observations from 1998 to 2005. All income numbers are reported here on a per-share basis but are scaled by total assets per share at the end of the fiscal quarter in the remaining tables and all statistical tests. The variables are defined as follows: *Percent Board Independent* is the percent of board members who are independent in the fiscal year containing quarter *q*. *Non-GAAP Earnings* is the non-GAAP earnings number disclosed in the earnings announcement. *GAAP Earnings* is basic income per share before extraordinary items and discontinued operations (#9). *Operating Income* is operating income per diluted share ($\#177 \times \#54/\#171$). *Non-GAAP Exclusions* = Non-GAAP earnings – GAAP earnings. *Future GAAP Earnings and Future Operating Income* is each variable, as defined above, summed for four quarters starting with quarter $q + 1$. *Total Assets* (#44) is in millions and measured at the end of quarter *q*. *Growth* is obtained using common factor analysis on the four variables: *Book-to-MarketAssets*, *R&D*, *Sales Growth*, and *Investment Expenditures* (see Sect. 3 for calculations). *Loss* is an indicator variable that is equal to one if GAAP earnings (#25) is less than zero and zero otherwise. *Earnings Volatility* is the standard deviation of return on assets (#25/#44) over the preceding eight quarters. *Met with Exclusions* is an indicator variable that is equal to one if *Non-GAAP Earnings*—*IB/E/S forecast* is greater than or equal to zero, but *GAAP Earnings*—*IBES forecast* is less than zero, and zero otherwise, where *IBES forecast* is the most recent median forecast preceding the earnings announcement date. *Insider Trading Indicator* is an indicator variable that is equal to one if managers of the company cumulatively had net sales from 2 days following the earnings announcement through the end of the quarter and zero otherwise. *Insider Trading Magnitude* is the dollar value of net sales, in millions. All variables are winsorized at the 5 and 95% levels

non-GAAP exclusions are positively associated with both the presence of a loss and earnings volatility but interestingly are associated with less insider trading. In our multivariate tests, we control for performance as insiders are less likely to sell their shares following poor performance. Consistent with our expectations, insider trading is positively associated with the firm meeting the analyst forecast using exclusions.

Table 2 Descriptive statistics pre- and post-SEC scrutiny

Variable	Pre-SEC scrutiny (1998Q1–2001Q2)				Post-SEC scrutiny (2001Q3–2005Q4)				Test of differences	
	Mean	25%	Median	75%	Mean	25%	Median	75%	T-test	Wilcoxon rank sum
Percent board independent	62.0%	50.0%	66.7%	77.8%	68.5%	57.1%	71.4%	81.8%	0.001	0.001
Non-GAAP earnings	0.39	0.13	0.31	0.57	0.32	0.07	0.26	0.49	0.001	0.001
GAAP earnings	0.14	-0.05	0.20	0.49	0.15	-0.05	0.17	0.44	0.890	0.261
Non-GAAP exclusions	0.24	0.02	0.09	0.29	0.15	0.01	0.05	0.17	0.001	0.001
Future GAAP earnings	0.55	-0.19	0.80	1.97	0.87	0.06	0.89	1.89	0.004	0.020
Future operating income	1.04	0.10	0.98	2.09	1.25	0.25	1.05	2.06	0.009	0.065
Total assets	12,179.0	718.1	1,967.5	7,058.0	11,938.1	719.6	1,878.0	6,236.9	0.878	0.038
Growth	-0.15	-1.51	-0.58	0.66	0.32	-1.03	0.02	1.29	0.001	0.001
Loss	0.28	0.00	0.00	1.00	0.29	0.00	0.00	1.00	0.367	0.367
Earnings volatility	0.03	0.00	0.01	0.02	0.03	0.00	0.01	0.03	0.123	0.033
Met with exclusions	0.36	0.00	0.00	1.00	0.39	0.00	0.00	1.00	0.072	0.072
Insider trading indicator	0.34	0.00	0.00	1.00	0.36	0.00	0.00	1.00	0.328	0.328
Insider trading magnitude	3.29	0.00	0.00	0.32	1.22	0.00	0.00	0.31	0.001	0.331

Variables are defined in Table 1. All variables are winsorized at the 5 and 95% levels

Table 3 Correlation matrix

	Pct. board indep.	Non-GAAP earnings	GAAP earnings	Non-GAAP Excl.	Future GAAP earnings	Future operating earnings	Log of total assets	Growth	Loss	Earnings volatility	Met with Excl.	Insider trading indic.
Pct. board independent	-0.034 (0.0248)	0.017 (0.2786)	-0.069 (0.0001)	0.039 (0.0101)	0.042 (0.0059)	0.129 (0.0001)	-0.007 (0.6536)	-0.041 (0.0080)	-0.037 (0.0148)	-0.029 (0.0644)	0.009 (0.5599)	
Non-GAAP earnings	-0.023 (0.1355)	0.321 (0.0001)	-0.238 (0.0001)	0.574 (0.0001)	0.645 (0.0001)	-0.034 (0.0286)	-0.230 (0.0001)	-0.469 (0.0001)	-0.186 (0.0001)	-0.039 (0.0125)	0.180 (0.0001)	
GAAP earnings	0.038 (0.0133)	0.741 (0.0001)	-0.492 (0.0001)	0.322 (0.0001)	0.316 (0.0001)	0.101 (0.0001)	-0.171 (0.0001)	-0.322 (0.0001)	-0.147 (0.0001)	-0.088 (0.0001)	0.062 (0.0001)	
Non-GAAP exclusions	-0.081 (0.0001)	-0.029 (0.0573)	-0.554 (0.0001)	-0.443 (0.0001)	-0.412 (0.0001)	-0.214 (0.0001)	0.237 (0.0001)	0.555 (0.0001)	0.266 (0.0001)	0.262 (0.0001)	-0.050 (0.0011)	
Future GAAP earnings	0.038 (0.0145)	0.624 (0.0001)	0.635 (0.0001)	-0.278 (0.0001)	0.938 (0.0001)	0.110 (0.0001)	-0.287 (0.0001)	-0.486 (0.0001)	-0.217 (0.0001)	-0.144 (0.0001)	0.136 (0.0001)	
Future Op. earnings	0.044 (0.0046)	0.683 (0.0001)	0.661 (0.0001)	-0.242 (0.0001)	0.935 (0.0001)	0.064 (0.0001)	-0.266 (0.0001)	-0.479 (0.0001)	-0.193 (0.0001)	-0.133 (0.0001)	0.138 (0.0001)	
Log of total assets	0.148 (0.0001)	-0.089 (0.0001)	0.059 (0.0001)	-0.287 (0.0001)	0.042 (0.0062)	0.009 (0.5777)	-0.325 (0.0001)	-0.235 (0.0001)	-0.201 (0.0001)	-0.078 (0.0001)	0.056 (0.0003)	
Growth	-0.012 (0.4373)	-0.145 (0.0001)	-0.230 (0.0001)	0.244 (0.0001)	-0.190 (0.0001)	-0.372 (0.0001)	0.285 (0.0001)	0.110 (0.0001)	0.104 (0.0001)	0.104 (0.0001)	-0.114 (0.0001)	
Loss	-0.051 (0.0008)	-0.473 (0.0001)	-0.780 (0.0001)	0.609 (0.0001)	-0.452 (0.0001)	-0.236 (0.0001)	0.292 (0.0001)	0.222 (0.0001)	0.269 (0.0001)	0.269 (0.0001)	-0.123 (0.0001)	
Earnings volatility	-0.061 (0.0001)	-0.047 (0.0023)	-0.199 (0.0001)	0.372 (0.0001)	-0.150 (0.0001)	-0.445 (0.0001)	0.342 (0.0001)	0.409 (0.0001)	0.070 (0.0001)	0.070 (0.0001)	-0.039 (0.0108)	
Met with exclusions	-0.018 (0.2472)	-0.024 (0.1141)	-0.297 (0.0001)	-0.126 (0.0001)	-0.104 (0.0001)	-0.076 (0.0001)	0.130 (0.0001)	0.269 (0.0001)	0.132 (0.0001)	0.132 (0.0001)	0.026 (0.0934)	
Ins. trading indicator	0.003 (0.8240)	0.184 (0.0001)	0.166 (0.0001)	0.173 (0.0001)	0.166 (0.0001)	0.052 (0.0006)	-0.120 (0.0001)	-0.123 (0.0001)	-0.062 (0.0001)	0.026 (0.0934)	0.026 (0.0934)	

The Pearson correlations are above the diagonal and the Spearman correlations below. The full sample consists of 4,246 firm-quarter observations from 1998 to 2005. Variables are defined in Table 1. All income numbers are scaled by total assets per share at the end of the fiscal quarter. All variables are winsorized at the 5 and 95% levels

4 Research design and test results

4.1 Exclusion persistence and board independence

We hypothesize that non-GAAP exclusions have greater implications for future earnings the lower the percentage of board independence. We investigate the implications of non-GAAP exclusions for next year's GAAP earnings and operating income over the next four quarters ($q + 1$ through $q + 4$), by estimating the following regression equation:

$$\begin{aligned} \text{Future Earnings}_{q+1,q+4} = & \gamma_0 + \gamma_1 \text{Non-GAAP Earnings}_q + \gamma_2 \text{Non-GAAP Exclusions}_q \\ & + \gamma_3 \% \text{Independent}_t + \gamma_4 \text{Non-GAAP Earnings}_q \\ & \times \% \text{Independent}_t + \gamma_5 \text{Non-GAAP Exclusions}_q \\ & \times \% \text{Independent}_t + \text{Control Variables} \\ & + \text{Control Variables} \times \% \text{Independent}_t + v_{q+1,q+4}. \end{aligned} \quad (1)$$

Following Kolev et al. (2008), we estimate least squares regressions and allow errors to cluster by firm to account for any residual dependence created by firm effects, as Petersen (2009) shows that this method yields unbiased standard errors. We also include time and industry fixed effects, where industries are defined using the Fama–French 48 industry classification (Fama and French 1997).

Because all variables are denominated in dollars per share and scaled by total assets per share, the coefficients in Eq. (1) can be interpreted as the future-dollar implication of a dollar change in the unscaled independent variable. If the excluded expenses are irrelevant, are non-recurring, and have no future earnings consequences, then the coefficient on non-GAAP exclusions in Eq. (1) (i.e., γ_2) should be zero. We expect this coefficient to be negative, following prior research, indicating that a portion of non-GAAP exclusions is recurring expenses (e.g., Doyle et al. 2003; Gu and Chen 2004; McVay 2006).

The estimated coefficient of interest in this regression is γ_5 . If non-GAAP exclusions of firms with more independent boards are of higher quality than the average non-GAAP exclusion, we expect γ_5 to be positive, countering the expected negative coefficient on γ_2 .²⁵

We present the results in Table 4. The dependent variables are future GAAP earnings and future operating income, and they appear in the first and second column of results, respectively. As seen in the first column of results, the coefficient on non-GAAP earnings is 1.69. The expected coefficient when earnings are completely permanent is 4.0, as future GAAP earnings is the sum of four quarters.

²⁵ An alternative explanation for this result is that some types of firms tend to exclude expenses that are more persistent (e.g., amortization expense) and that these firms are systematically related to board independence (i.e., there is a correlated omitted variable that explains our result). In unreported tests, we check whether the autocorrelation of exclusions varies with board independence and find no significant correlation. In other words, it is the “quality” of the exclusion, not simply the existence of an exclusion, that varies with board independence.

Table 4 Quarterly regressions of future earnings on non-GAAP exclusions and independence

$$\begin{aligned}
\text{Future Earnings}_{q+1,q+4} = & \gamma_0 + \gamma_1 \text{Non-GAAP Earnings}_q + \gamma_2 \text{Non-GAAP Exclusions}_q \\
& + \gamma_3 \% \text{Independent}_t + \gamma_4 \text{Non-GAAP Earnings}_q \times \% \text{Independent}_t \\
& + \gamma_5 \text{Non-GAAP Exclusions}_q \times \% \text{Independent}_t + \text{Control Variables} \\
& + \text{Control Variables} \times \% \text{Independent}_t + v_{q+1,q+4}.
\end{aligned} \tag{1}$$

Dependent variable		Future GAAP earnings	Future operating income
Independent variables	Predicted sign	Coefficient (adjusted t-statistic)	Coefficient (adjusted t-statistic)
Intercept		0.105 (2.39)	0.099 (3.19)
Non-GAAP earnings	(+)	1.688 (3.73)	1.910 (5.49)
Non-GAAP exclusions	(-)	-1.324 (-4.74)	-0.963 (-4.68)
% Independent		-0.158 (-3.02)	-0.117 (-3.37)
Non-GAAP earnings × %independent		1.313 (2.01)	0.672 (1.30)
Non-GAAP exclusions × %independent	(+)	1.030 (2.60)	0.779 (2.72)
Log of total assets		-0.013 (-3.26)	-0.010 (-3.68)
Log of total assets × %independent		0.017 (2.96)	0.013 (3.38)
Growth		-0.011 (-4.06)	-0.007 (-3.10)
Growth × %independent		0.009 (2.44)	0.005 (1.61)
Loss		-0.022 (-1.50)	-0.024 (-2.11)
Loss × %independent		0.011 (0.55)	0.021 (1.26)
Earnings volatility		-0.082 (-1.08)	-0.043 (-0.94)
Earnings volatility × %independent		0.0102 (0.79)	0.072 (0.89)
Industry fixed effects		Included	Included
Year fixed effects		Included	Included
Adjusted R ²		53.47%	58.38%
Number of Obs.		4,246	4,246

The sample consists of 4,246 firm-quarter observations from 1998 to 2005. Variables are defined in Table 1. All variables are winsorized at the 5 and 95% levels. Bold line indicate results corresponding to hypothesized relationships

As expected, γ_2 is negative and significant.²⁶ Essentially, one dollar in quarterly non-GAAP exclusions implies future expenses over the subsequent four quarters of \$1.32. Consistent with prior research, non-GAAP exclusions are less persistent than non-GAAP earnings ($1.32 < 1.69$), but they are not entirely transitory (Doyle et al. 2003; Gu and Chen 2004).

Consistent with our hypothesis, the coefficient on the interaction (γ_5) is positive and significant ($\gamma_5 = 1.03$). The association between non-GAAP exclusions and future GAAP earnings is lower when the board is more independent. Non-GAAP exclusions are associated with lower future GAAP earnings of \$0.29 (1.32–1.03)

²⁶ Recall that our definition of non-GAAP exclusions assigns excluded losses a positive sign and excluded gains a negative sign.

among firms with a completely independent board, compared with \$1.32 for firms with no independent board members—an economically significant difference.

The results are similar when we employ future operating income as an alternative dependent variable. The coefficient on non-GAAP earnings is 1.91, which is similar to the coefficient of 2.33 in Kolev et al. (2008, Table 4). The coefficient on the interaction of non-GAAP exclusions and board independence (γ_5) is positive and significant ($\gamma_5 = 0.78$), again consistent with our hypothesis that non-GAAP earnings are of higher quality in the presence of independent boards.

4.2 Additional tests

Results in Table 4 suggest that managers use non-GAAP earnings and exclusions more opportunistically in firms with lower board independence. We further investigate this result by examining (1) any differential exclusion quality before and after increased SEC scrutiny of non-GAAP reporting and (2) the use of exclusions to meet analyst expectations before insider trading.

4.2.1 *Investor and regulatory scrutiny as a substitute for board oversight*

The first setting we use to provide evidence that non-GAAP earnings exclusions are more opportunistic in firms with lower board independence is an event study around the increased scrutiny of non-GAAP reporting. If the positive relation between exclusion quality and board independence is attributable to factors other than variation in board oversight, we would not anticipate a change in this relation to coincide with increased scrutiny from other sources. However, if governance by independent board members curbs opportunistic behavior, then this relation should diminish as additional attention by other outsiders (i.e., the SEC, analysts or investors) limits the opportunism previously permitted by weak board oversight. We investigate this by estimating Eq. (1) for the two time periods—before and after the increase in attention directed at non-GAAP earnings disclosures.

We present the results in Table 5. As in Table 4, we estimate a least squares regression clustered by firm. Our “pre-scrutiny” estimates are based on quarters preceding the middle of 2001, following Kolev et al. (2008); the post-scrutiny period is the remaining quarters.²⁷ The main effect of non-GAAP exclusions falls from -1.08 to -0.75 , consistent with Kolev et al. (2008), who find that the quality of exclusions improves following the SEC scrutiny. Our variable of interest is the

²⁷ We select this cutoff following Kolev et al. (2008). Results, however, are not sensitive to the cutoff selected. Though it limits the number of observations in the “post” sample, parsing by the first quarter of 2003 following Heflin and Hsu (2008) produces qualitatively similar results, as does excluding all quarters from 2001 and 2002.

Table 5 Quarterly regressions of future operating earnings on non-GAAP exclusions and independence around increased scrutiny

$$\begin{aligned}
 \text{Future Earnings}_{q+1,q+4} = & \gamma_0 + \gamma_1 \text{Non-GAAP Earnings}_q + \gamma_2 \text{Non-GAAP Exclusions}_q \\
 & + \gamma_3 \% \text{Independent}_t + \gamma_4 \text{Non-GAAP Earnings}_q \times \% \text{Independent}_t \\
 & + \gamma_5 \text{Non-GAAP Exclusions}_q \times \% \text{Independent}_t + \text{Control Variables} \\
 & + \text{Control Variables} \times \% \text{Independent}_t + v_{q+1,q+4}.
 \end{aligned} \tag{1}$$

Dependent variable		Future operating income	
		Pre-scrutiny 1998(Q1)–2001(Q2) Coefficient (adjusted t-statistic)	Post-scrutiny 2001(Q3)–2005(Q4) Coefficient (adjusted t-statistic)
Independent variables	Predicted sign		
Intercept		0.162 (3.99)	0.037 (1.39)
Non-GAAP earnings	(+)	2.152 (4.34)	2.322 (4.73)
Non-GAAP exclusions	(−)	−1.083 (−3.25)	−0.754 (−2.66)
%Independent		−0.168 (−2.87)	−0.076 (−1.95)
Non-GAAP earnings × %independent		−0.014 (−0.02)	0.381 (0.56)
Non-GAAP exclusions × %independent	(+)	0.929 (1.91)	0.595 (1.53)
Log of total assets		−0.016 (−3.76)	−0.006 (−1.72)
Log of total assets × %independent		0.022 (3.31)	0.008 (1.90)
Growth		−0.007 (−1.85)	−0.010 (−3.48)
Growth × %independent		0.007 (1.23)	0.007 (1.79)
Loss		−0.023 (−1.23)	−0.009 (−0.79)
Loss × %independent		0.002 (0.08)	0.007 (0.43)
Earnings volatility		−0.003 (−0.05)	−0.092 (−1.58)
Earnings volatility × %independent		−0.003 (−0.03)	0.151 (1.36)
Industry fixed effects		Included	Included
Year fixed effects		Included	Included
Adjusted R ²		56.24%	64.60%
Number of obs.		1,651	2,595

The sample is partitioned based on the beginning of the SEC scrutiny (mid-2001). Variables are defined in Table 1. All variables are winsorized at the 5 and 95% levels. Bold line indicate results corresponding to hypothesized relationships

interaction between non-GAAP exclusions and board independence, which is statistically significant only in the pre-2001 period.²⁸ That the interaction term is not statistically significant in the post-2001 period is consistent with the inference that outside oversight acts as a substitute for board governance features. It is possible that the insignificance in the later period is due to either insufficient variation in board independence or a more responsible outlook by all board members in the post-Sarbanes–Oxley era. Regardless, the results are consistent with the conjecture that the association documented in Table 4 is due to board oversight curtailing the abuse of non-GAAP earnings and exclusions by management.

²⁸ Results are similar for future GAAP earnings (not tabulated).

4.2.2 Exceeding analyst forecasts and selling shares

The second setting we use to provide evidence that managers use non-GAAP earnings and exclusions more opportunistically in firms with lower board independence is the selling of insider shares. We examine the association between insider selling following earnings announcements and the use of non-GAAP exclusions to meet the analyst forecasts. We expect that managers will opportunistically classify more core expenses as transitory when this allows them to meet the analyst forecast before selling their personal shares. To test this, we estimate the following model:

$$\begin{aligned} \text{Insider Trading}_{q+1} = & \gamma_0 + \gamma_1 \text{Met with Exclusions}_q + \gamma_2 \% \text{Independent}_t \\ & + \gamma_3 \text{Met with Exclusions}_q \times \% \text{Independent}_t \\ & + \text{Control Variables} + \text{Control Variables} \\ & \times \% \text{Independent}_t + v_{q+1} \end{aligned} \quad (2)$$

where *Insider Trading* is either *Insider Trading Indicator* or *Insider Trading Magnitude*, described in Sect. 3. *Met with Exclusions* is an indicator variable that is equal to one if non-GAAP earnings met the consensus I/B/E/S analyst forecast, while GAAP earnings did not, and zero otherwise.

We present the results in Table 6. For both insider trading metrics, the coefficient on *Met with Exclusions* is positive and significant, consistent with managers' use of non-GAAP earnings and exclusions to meet the analyst forecast before selling their personal shares. The coefficient on the interaction between *Met with Exclusions* and *%Independent* (γ_3) indicates the ability of independent directors to curtail the seemingly opportunistic behavior associated with using non-GAAP exclusions to meet the analyst forecast before selling personal shares, and γ_3 is negative and statistically significant in both columns of results, consistent with our inference that board independence limits the opportunistic use of non-GAAP exclusions.²⁹

As further evidence that the relation between insider trading and just meeting the analyst forecast using non-GAAP exclusions is at least in part opportunistic, we find that this relation declines significantly following Regulation G, when managers are required to reconcile their non-GAAP earnings numbers to the closest GAAP earnings number, and when both investors and regulators scrutinize these exclusions more closely (Table 7).

²⁹ Results continue to hold if we interact each of our control variables with *Met with Exclusions* (not tabulated). Note that Jennings and Marques (2010) find no evidence that their measure of opportunism (meeting an earnings benchmark with exclusions) varies with governance. As previously mentioned, however, using exclusions to meet an earnings benchmark may be in the best interest of the firm. Thus, we condition on more direct evidence of managerial opportunism, meeting the benchmark using exclusions immediately followed by managers selling their personal shares.

Table 6 Quarterly regressions of insider trading on non-GAAP exclusions and independence

$$Insider\ Trading_{q+1} = \gamma_0 + \gamma_1 Met\ with\ Exclusions_q + \gamma_2 \%Independent_t + \gamma_3 Met\ with\ Exclusions_q \times \%Independent_t + Control\ Variables + Control\ Variables \times \%Independent_t + v_{q+1} \quad (2)$$

Dependent variable		Insider trading indicator Logit estimate (Pr < X ²)	Insider trading magnitude Coefficient (OLS t-statistic)
Independent variables	Predicted sign		
Intercept		-2.611 (0.004)	-13.124 (-2.34)
Met with exclusions	(+)	1.234 (0.001)	4.410 (2.48)
%Independent		2.104 (0.064)	9.016 (1.28)
Met with exclusions × %independent	(-)	-1.468 (0.001)	-6.210 (-2.38)
Log of total assets		0.178 (0.069)	1.728 (2.84)
Log of total assets × %independent		-0.162 (0.236)	-1.141 (-1.31)
Growth		-0.283 (0.001)	-0.820 (-1.83)
Growth × %independent		0.250 (0.031)	0.446 (0.69)
Loss		-0.139 (0.688)	-0.410 (-0.20)
Loss × %independent		-0.637 (0.217)	-0.736 (-0.24)
Earnings volatility		1.585 (0.428)	-0.918 (-0.08)
Earnings volatility × %independent		-3.643 (0.274)	-0.010 (-0.00)
Industry fixed effects		Included	Included
Year fixed effects		Included	Included
Pseudo R ² /adjusted R ²		10.82%	3.06%
Number of insider trading obs.		1,472	1,472
Number of total obs.		4,184	4,184

Variables are defined as follows: *Insider Trading Indicator* is an indicator variable that is equal to one if the net activity of the officers of the company was to sell shares and zero otherwise. *Insider Trading Magnitude* is the net dollars sold by the officers of the company, in millions. *Met with Exclusions* is an indicator variable that is equal to one if GAAP earnings fall below the I/B/E/S forecast, but non-GAAP earnings meet or exceed the I/B/E/S forecast. Additional variables definitions are in Table 1. All variables are winsorized at the 5 and 95% levels. Bold line indicate results corresponding to hypothesized relationships

5 Conclusions

We examine the relation between board independence and the persistence of non-GAAP earnings exclusions. We focus on board independence because this facet of corporate governance remains an open question in the academic literature, though it has recently received a great deal of attention by stock exchanges, the SEC, and the financial press. Further, our conversations with company officials indicate that members of the board generally review earnings press releases and thus have the means to affect earnings disclosures. We focus on non-GAAP earnings as a voluntary disclosure because exclusion choices are not audited and have no clear ex-post confirmation. The non-GAAP earnings literature has found that these disclosures are informative yet contain elements reflecting opportunism. We investigate how the opportunism varies with board independence.

Table 7 Quarterly regressions of insider trading on non-GAAP exclusions and independence around increased scrutiny
$$Insider\ Trading_{q+1} = \gamma_0 + \gamma_1 Met\ with\ Exclusions_q + Control\ Variables + v_{q+1} \quad (2)$$

Dependent variable		Insider trading indicator	Insider trading indicator
Independent variables	Predicted sign	Logit estimate (Pr < X^2)	Logit estimate (Pr < X^2)
Intercept		-2.663 (0.001)	-0.229 (0.629)
Met with exclusions	(+)	0.477 (0.001)	0.167* (0.079)
Log of total assets		0.181 (0.001)	0.021 (0.548)
Growth		-0.213 (0.001)	-0.072 (0.006)
Loss		-0.199 (0.169)	-0.863 (0.001)
Earnings volatility		0.263 (0.693)	-0.812 (0.264)
Industry fixed effects		Included	Included
Year fixed effects		Included	Included
Pseudo R ² /adjusted R ²		16.51%	13.02%
Number of insider trading obs.		552	920
Number of total obs.		1,614	2,570

Variables are defined as follows: *Insider Trading Indicator* is an indicator variable that is equal to one if the net activity of the officers of the company was to sell shares and zero otherwise. *Met with Exclusions* is an indicator variable that is equal to one if GAAP earnings fall below the I/B/E/S forecast, but non-GAAP earnings meet or exceed the I/B/E/S forecast. Additional variables definitions are in Table 1. All variables are winsorized at the 5 and 95% levels. * Signifies that the coefficient is statistically different across the two reporting periods ($P < 0.10$, two-tailed). Bold line indicate results corresponding to hypothesized relationships

We find that non-GAAP exclusions are more strongly related to both future GAAP earnings and future operating income (i.e., are of lower quality) when board independence is low. Our results also suggest that in recent years, the relation between board independence and the persistence of non-GAAP exclusions has diminished, which is consistent with board independence playing less of a role when there is an alternative monitoring mechanism, though this result could also be due to increasing investor suspicion of exclusions or declining cross-sectional variation in board independence. Finally, we find that insider selling following earnings announcements where non-GAAP exclusions allow non-GAAP earnings to beat analyst forecasts occur more frequently prior to insider trading when board independence is low.

These tests provide insight into how board independence shapes disclosure. This question is relevant, given regulatory concerns about the potential for non-GAAP earnings to mislead investors and regulators' focus on independent boards. Our results suggest that board independence limits opportunism in voluntary earnings-related disclosure. A limitation of our paper is that we examine only two facets of non-GAAP earnings quality (persistence and meeting the analyst forecast before selling shares) and only one facet of governance (board independence). In addition, we cannot conclude that board independence curbs opportunism because of board members' explicit knowledge of exclusions or whether it is simply an overall attitude that is conveyed through a company with good governance. Future research

might be able to shed light on this using a different design choice (for example, experimental). Future research might also consider additional characteristics of quality and governance constructs (e.g., Brown and Sivakumar 2003; Gompers et al. 2003).

Acknowledgments We thank Ted Christensen and Erv Black for generously allowing us to use their hand-collected non-GAAP earnings data. We gratefully acknowledge the comments of two anonymous reviewers, David Aboody, Robert Bowen, Dave Burgstahler, Ted Christensen, Asher Curtis, Angela Davis, Zhaoyang Gu, Jack Hughes, Ron Kasznik, S. P. Kothari, Baruch Lev, Carol Marquardt, Dawn Matsumoto, Maureen McNichols, Steve Rock, Stephen Ryan, Philip Shane, Doug Skinner, Brett Trueman, and seminar participants at the 2005 American Accounting Association Annual Meeting, the 2005 Financial Accounting and Reporting Mid-Year AAA Meeting, the 2008 UBCOW Conference, MIT, Morgan Stanley, New York University, Purdue University, Rutgers University, Stanford University, State University of New York – Buffalo, UCLA, University of Colorado, and University of Oregon. All errors are our own.

References

- Abbaranell, J., & Lehavy, R. (2007). Letting the “tail wag the dog”: The debate over GAAP versus street earnings revisited. *Contemporary Accounting Research*, 24(3), 675–723.
- Aboody, D., & Kasznik, R. (2000). CEO stock option awards and the timing of corporate voluntary disclosures. *Journal of Accounting and Economics*, 29, 73–100.
- Ajinkya, B., Bhojraj, S., & Sengupta, P. (2005). The association between outside directors, institutional investors and the properties of management earnings forecasts. *Journal of Accounting Research*, 43, 343–376.
- Allee, K., Bhattacharya, N., Black, E., & Christensen, T. (2007). Pro forma disclosure and investor sophistication: External validation of experimental evidence using archival data. *Accounting, Organizations and Society*, 32(3), 201–222.
- Beasley, M. (1996). An empirical analysis of the relation between the board of director composition and financial statements fraud. *The Accounting Review*, 71, 443–465.
- Bhagat, S., & Black, B. (2002). The non-correlation between board independence and long-term firm performance. *Journal of Corporation Law*, 27, 231–274.
- Bhattacharya, N., Black, E., Christensen, T., & Larson, C. (2003). Assessing the relative informativeness and permanence of non-GAAP earnings and GAAP operating earnings. *Journal of Accounting and Economics*, 36, 285–319.
- Bhattacharya, N., Black, E., Christensen, T., & Mergenthaler, R. (2004). Empirical evidence on recent trends in non-GAAP reporting. *Accounting Horizons*, 18, 27–43.
- Bhattacharya, N., Black, E., Christensen, T., & Mergenthaler, R. (2007). Who trades on non-GAAP earnings information? *The Accounting Review*, 82, 581–619.
- Black, D., & Christensen, T. (2009). US managers’ use of ‘Pro Forma’ adjustments to meet strategic earnings targets. *Journal of Business Finance and Accounting*, 36(3–4), 297–326.
- Boone, A., Field, L., Karpoff, J., & Raheja, C. (2007). The determinants of corporate board size and composition: An empirical analysis. *Journal of Financial Economics*, 85, 66–101.
- Bowen, R., Davis, A., & Matsumoto, D. (2005). Emphasis on street versus GAAP earnings in quarterly press releases: Determinants, SEC intervention and market reactions. *The Accounting Review*, 80, 1011–1038.
- Bowen, R., Rajgopal, S., & Venkatachalam, M. (2008). Accounting discretion, corporate governance, and firm performance. *Contemporary Accounting Research*, 25, 351–405.
- Bradshaw, M., & Sloan, R. (2002). GAAP versus the street: An empirical assessment of two alternative definitions of earnings. *Journal of Accounting Research*, 40, 41–66.
- Brown, L., & Caylor, M. (2006). Corporate governance and firm valuation. *Journal of Accounting and Public Policy*, 25, 409–434.
- Brown, N., Christensen, T., & Elliott, W. (2010). The timing of quarterly “pro forma” earnings announcements. Working paper, Georgia State University.

- Brown, N., Christensen, T., Elliott, W., Mergenthaler, R., (2009). Do managers use pro forma earnings disclosures to cater to investor sentiment? Working paper, University of Southern California.
- Brown, L., & Sivakumar, K. (2003). Comparing the quality of two operating income measures. *Review of Accounting Studies*, 4, 561–572.
- Bushman, R., Chen, Q., Engel, E., & Smith, A. (2004). Financial accounting information, organizational complexity and corporate governance. *Journal of Accounting and Economics*, 37, 167–201.
- Byard, D., & Li, Y. (2005). The impact of directors' option compensation on their independence. Working paper, Baruch College.
- Chen, C. (2010). Do analysts and investors fully understand the persistence of the items excluded from Street earnings? *Review of Accounting Studies*, 15, 32–69.
- Christensen, T., Drake, M., & Thornock, J. (2010). Optimistic reporting and pessimistic investing: Do pro forma earnings disclosures attract short sellers? Working paper, Brigham Young University.
- Core, J., Holthausen, R., & Larcker, D. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics*, 51, 195–218.
- DeAngelo, H., DeAngelo, L., & Skinner, D. (1994). Accounting choice in troubled companies. *Journal of Accounting and Economics*, 17, 113–143.
- Dechow, P., Sloan, R., & Sweeney, A. (1996). Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research*, 13, 1–36.
- Dichev, I., & Tang, V. (2008). Earnings volatility and earnings predictability. *Journal of Accounting and Economics*, 47, 160–181.
- Doyle, J., Lundholm, R., & Soliman, M. (2003). The predictive value of expenses excluded from non-GAAP earnings. *Review of Accounting Studies*, 8, 145–174.
- Doyle, J., & Soliman, M. (2009). Do managers define “street” earnings to meet or beat analyst forecasts? Working paper, Utah State University.
- Easton, P. (2003). Discussion of “the predictive value of expenses excluded from non-GAAP earnings”. *Review of Accounting Studies*, 8, 175–183.
- Elliott, W. (2006). Are investors influenced by non-GAAP emphasis and reconciliations in earnings announcements? *The Accounting Review*, 81, 113–133.
- Elliott, J., & Shaw, W. (1988). Write-offs as accounting procedures to manage perceptions. *Journal of Accounting Research*, 26, 91–119.
- Entwistle, G., Feltham, G., & Mbagwu, C. (2006). Financial reporting regulation and the reporting of pro forma earnings. *Accounting Horizons*, 20, 39–55.
- Fairfield, P., Sweeney, R., & Yohn, T. (1996). Accounting classification and the predictive content of earnings. *The Accounting Review*, 71, 337–355.
- Fama, E., & French, K. (1997). Industry costs of equity. *Journal of Financial Economics*, 43, 153–193.
- Fama, E., & Jensen, M. (1983). Agency problems and residual claims. *Journal of Law and Economics*, 26, 327–349.
- Francis, J., Philbrick, D., & Schipper, K. (1994). Shareholder litigation and corporate disclosures. *Journal of Accounting Research*, 32, 137–164.
- Frederickson, J., & Miller, J. (2004). Non-GAAP earnings disclosures: Do analysts and nonprofessional investors really differ? *The Accounting Review*, 79, 667–686.
- Gaver, J., & Gaver, K. (1993). Additional evidence on the association between the investment opportunity set and corporate financing, dividend and compensation policies. *Journal of Accounting and Economics*, 16, 125–160.
- Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *The Quarterly Journal of Economics*, 118, 107–155.
- Gu, Z., & Chen, T. (2004). Analysts' treatment of nonrecurring items in Street Earnings. *Journal of Accounting and Economics*, 38, 129–170.
- Guay, W. (1999). The sensitivity of CEO wealth to equity risk: An analysis of the magnitude of determinants. *Journal of Financial Economics*, 53, 43–71.
- Hayn, C. (1995). The information content of losses. *Journal of Accounting and Economics*, 20, 125–153.
- Hefflin, F., & Hsu, C. (2008). The impact of the SEC's regulation of non-GAAP disclosures. *Journal of Accounting and Economics*, 46, 349–365.
- Hermalin, B., & Weisbach, M. (2003). Boards of directors as an endogenously determined institution: A survey of the economic literature. *Economic Policy Review*, 9, 7–26.
- Hirshleifer, D., & Teoh, S. (2003). Limited attention, information disclosure and financial reporting. *Journal of Accounting and Economics*, 36, 337–386.

- Jennings, R., & Marques, A. (2010). The joint effects of corporate governance and regulation on the disclosure of manager-adjusted non-GAAP earnings. Working paper, UT Austin.
- Jensen, M., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3, 305–360.
- Karamanou, I., & Vafeas, N. (2005). The association between corporate boards, audit committees, and management earnings forecasts: An empirical analysis. *Journal of Accounting Research*, 43, 453–486.
- Klein, A. (2002a). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33, 375–400.
- Klein, A. (2002b). Economic determinants of audit committee independence. *The Accounting Review*, 77, 435–452.
- Kolev, K., Marquardt, C., & McVay, S. (2008). SEC scrutiny and the evolution of non-GAAP reporting. *The Accounting Review*, 83, 157–184.
- La Porta, R., Lopez-de-Silanes, F., Schleifer, A., & Vishny, R. (1998). Law and finance. *Journal of Political Economy*, 106, 1113–1155.
- Larcker, D., Richardson, S., & Tuna, I. (2007). Corporate governance, accounting outcomes, and organizational performance. *The Accounting Review*, 82, 963–1008.
- Lehn, K., Patro, S., & Zhao, M. (2003). Determinants of the size and structure of corporate boards: 1935–2000. Working paper, University of Pittsburgh and Bentley College.
- Lipe, R. (1986). The information contained in the components of earnings. *Journal of Accounting Research*, 24, 37–64.
- Lougee, B., & Marquardt, C. (2004). Earnings informativeness and strategic disclosure: An empirical examination of “non-GAAP” earnings. *The Accounting Review*, 79, 769–795.
- Marques, A. (2006). SEC interventions and the frequency and usefulness of non-GAAP financial measures. *Review of Accounting Studies*, 11, 549–574.
- Mbagwu, C. 2007. Essays on the value relevance of earnings measures. Ph.D. dissertation, University of Saskatchewan.
- McVay, S. (2006). Earnings management using classification shifting: An examination of core earnings and special items. *The Accounting Review*, 81, 501–531.
- McVay, S., Nagar, C., & Tang, V. (2006). Trading incentives to meet the analyst forecast. *Review of Accounting Studies*, 11, 575–598.
- Petersen, M. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies*, 22, 435–480.
- PricewaterhouseCoopers LLP (PwC). (2010). Non-GAAP measures: Updated guidance to enhance a company’s ability to communicate important information to investors. *Dataline* (January 20th).
- Richardson, S., Teoh, S. H., & Wysocki, P. (2004). The walk-down to beatable analyst forecasts: The role of equity issuance and insider trading incentives. *Contemporary Accounting Research*, 21, 885–924.
- Ross, S. (1979). Disclosure regulation in financial markets: Implications of modern finance theory and signaling theory. In F. R. Edwards (Ed.), *Issues in financial regulation* (pp 177–202). New York: McGraw Hill.
- Securities and Exchange Commission. (2001). Cautionary advice regarding the use of “non-GAAP” financial information in earnings releases. Release Nos. 33–8039, 34–45124, FR–59. <http://www.sec.gov/rules/other/33-8039.htm>.
- Standard and Poor’s. (2003). Standard and Poor’s Compustat User’s Guide. New York: McGraw-Hill.
- Vafeas, N. (2000). Board structure and the informativeness of earnings. *Journal of Accounting and Public Policy*, 19, 139–160.
- Yermack, D. (1996). Good timing: CEO stock option awards and company news announcements. *Journal of Finance*, 52, 449–476.
- Yi, H. (2007). Has regulation G improved the information quality of non-GAAP earnings disclosures? Working paper, University of Oklahoma.

Copyright of Review of Accounting Studies is the property of Springer Science & Business Media B.V. and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.