

Market reaction to Non-GAAP Earnings around SEC regulation

Abstract

This paper examines the consequences of the non-GAAP reporting resulting from Regulation G as required by Section 401(b) of the Sarbanes-Oxley Act of 2002 and the SEC's issuance of Compliance & Disclosure Interpretations (C&DIs) in 2010. The paper finds (i) that both Regulation G and C&DIs are associated with an increase in the quality of non-GAAP earnings exclusions, (ii) a decline in the probability of meeting or slightly exceeding analysts' forecasts when firms exclude positive non-GAAP exclusions, and (iii) a reduction in the earnings response coefficients (ERCs) during the post-C&DIs period, but an increase in the post-Regulation G period. This study contributes to the voluntary disclosure literature by providing evidence on whether Regulation G and C&DIs have encouraged informative or opportunistic non-GAAP earnings. Furthermore, this study adds to the regulation literature by highlighting the unintended economic consequences of regulation by regulatory bodies.

Keywords: Non-GAAP earnings; Non-GAAP exclusions; Regulation G; C&DIs; Analysts' forecasts; ERCs.

1. Introduction

Over the past two decades, the use of non-GAAP earnings (also known as “pro-forma”, “street”, or “core” earnings) has increased dramatically (Bradshaw and Sloan, 2002; Kolev et al., 2008). In 2003, the U.S. Securities and Exchange Commission (SEC) raised concerns regarding the potential misuse of non-GAAP earnings and intervened to regulate the reporting of non-GAAP earnings by issuing Regulation G. Subsequently, in 2010, the SEC issued new Compliance and Disclosure Interpretations (C&DIs), relaxing the rigorous existing SEC 2003 general guidance (the FAQ) on Regulation G and S-K without changing the current regulation.¹ These new, non-binding, SEC staff interpretations allowed SEC registrants to use extensive discretion in their voluntary disclosure practices, presumably to improve the quality of non-GAAP disclosure following the C&DIs.

This paper investigates the accounting information effects of both regulatory changes on the quality of exclusions from non-GAAP reporting. It considers (i) the association between the exclusions and future operating earnings, (ii) whether positive non-GAAP exclusions are associated with firm’s meeting or slightly exceeding analysts’ forecasts, and (iii) the market response to earnings announcements around each regulatory and interpretive guidance change. Quality of exclusions are defined as those that are more transitory and have less predictive power for future operating earnings, following Doyle et al. (2003), Gu and Chen (2004), Frankel et al. (2007), and Kolev et al. (2008).

The motivation for this study is two-fold. First, this study exploits two regulatory settings to investigate whether the SEC’s interventions achieve their regulatory outcomes. The two regulatory settings are: the SEC’s implementation of Regulation G on January 22, 2003, imposing additional disclosure and filing requirements on firms publicly disclosing non-GAAP earnings; and the SEC’s issuance of new C&DIs on January 11, 2010, relaxing the restrictive guidance of Regulation G. Empirical findings tend to support the implementation of Regulation G, as it improves the quality of non-GAAP earnings exclusions and curtails firm’s opportunistic behaviour (e.g., Heflin and Hsu, 2008; Kolev et al., 2008; Frankel et al., 2011). Empirical evidence on the effectiveness of the issuance of C&DIs, are, however, limited (the notable exception being Kyung, 2014).

The second motivation is to add to the debate on the disclosure of non-GAAP earnings. Extant research propose competing theories to explain the use of non-GAAP earnings. On one hand, the information hypothesis proposes that excluding transitory items when estimating non-GAAP earnings enables managers to provide enhanced earnings measurement (Bradshaw and Sloan, 2002; Brown and Sivakumar, 2003; Doyle et al., 2003; Frankel and Roychowdhury, 2004; Kolev et al., 2008). On the other hand, the opportunism hypothesis argues that excluding certain income-decreasing components enables managers to report non-GAAP earnings metrics that exceed GAAP earnings figures (Doyle et al., 2003; McVay, 2006; Black and Christensen, 2009; Brown et al., 2012). This paper places equal emphasis on these two hypotheses as both motives affect managers’ non-GAAP earnings disclosure practice and it is difficult to determine which motivation is more pervasive.

Consistent with Doyle et al. (2003), Kolev et al. (2008) and Kyung (2014), non-GAAP earnings exclusions are separated into special items (i.e., typically regarded as transitory or

¹ Item 10(e) of Regulation S-K applies additional and more stringent requirements to periodic reports and other documents filed with the SEC that includes non-GAAP financial measures (Source: <https://www.sec.gov/divisions/corpfin/guidance/nongAAPinterp.htm>).

non-recurring) and other exclusions.² We find that the quality of other exclusions has improved following Regulation G and C&DIs (i.e., more transitory). The evidence indicates that firms using positive non-GAAP earnings exclusions (i.e., income-increasing exclusions), particularly to increase non-GAAP earnings metrics, are less likely to meet or slightly exceed analysts' forecasts following Regulation G and C&DIs. Moreover, the market response test produces mixed results. Specifically, investors reduce the value of ERCs following the SEC's new issuance of staff interpretations but increase the coefficient of earnings surprise (ERCs) in the post-Regulation G period.

This study makes two contributions to the literature. First, this paper contributes to the voluntary disclosure literature. The research provides empirical evidence on whether Regulation G and the SEC's issuance of C&DIs have discouraged misleading non-GAAP earnings or encouraged informative non-GAAP earnings. Previous research has documented that non-GAAP earnings both help to inform investors in assessing the firms' core operating performance (e.g., Bradshaw and Sloan, 2002; Brown and Sivakumar, 2003; Bhattacharya et al., 2003; Lougee and Marquardt, 2004; Kolev et al., 2008; Kyung, 2014) but can also mislead investors, thus inflating a firm's equity valuation (e.g., Bradshaw and Sloan, 2002; Doyle et al., 2003; Bhattacharya et al., 2003, 2004; Lougee and Marquardt, 2004; Bowen et al., 2005; Black and Christensen, 2009; Doyle and Soliman, 2009; Brown et al., 2010). Hence, this research adds to a growing body of literature that investigates the consequences of Regulation G and the SEC's C&DIs by examining the impacts of disclosure regulation and interpretive guidance. Second, this study adds to the argument regarding the disclosure regulation literature by providing the economic consequences of regulation by regulatory bodies, which may curtail the frequency and quality of non-GAAP reporting.

The remainder of this study is arranged as follows. Section 2 provides an overview of Regulation G and the C&DIs, reviews previous literature on non-GAAP earnings, and develops the hypotheses. Section 3 provides a description of the sample selection and research design to test the hypotheses. The results are outlined in Section 4, and Section 5 concludes.

2. Regulatory setting, literature review and hypotheses

2.1 Regulatory setting and literature review

Non-GAAP earnings measurements became increasingly prevalent during the 1990s (Bradshaw and Sloan, 2002). These non-GAAP figures tend to be more value-relevant, on average, than GAAP earnings (Bradshaw and Sloan, 2002; Bhattacharya et al., 2003; Frankel and Roychowdhury, 2004). The rationale put forward by managers and in the business press is that the exclusions from non-GAAP earnings are regarded as being transitory and non-recurring, non-cash, or uninformative of the firm's core operating earnings (Doyle et al., 2003; Gu and Chen, 2004). Numerous studies have found evidence supporting this information perspective (i.e., the information hypothesis) of non-GAAP earnings. For

² Doyle et al. (2003) divide total exclusions into special items and other exclusions and recognize special items as one-time items which firms reported in their press releases, such as gains or losses on assets, merger and acquisition costs, stock-related charges, and restructuring charges, while other exclusions include recurring items such as depreciation and amortization expenses, stock-based compensation costs, R&D expenses as well as other adjustments including interest-related charges, tax-related costs, investment costs.

instance, Lougee and Marquardt (2004) find that non-GAAP earnings help predict future profitability when a firm's GAAP earnings informativeness is low and that this firm is more likely to report non-GAAP figures. Empirical evidence also suggests that investors consider non-GAAP earnings as a more informative figure (e.g., Bradshaw and Sloan, 2002; Lougee and Marquardt, 2004).

However, it is possible for firms to use non-GAAP earnings disclosures opportunistically. Non-GAAP earnings disclosures are less regulated and therefore self-determined by corporate managers. For example, Doyle et al. (2003) find that non-GAAP earnings exclusions have predictive ability for future operating earnings and abnormal returns, which indicates that these exclusions may be recurring in the subsequent period. Furthermore, managers seem to use non-GAAP earnings financial metrics to meet or exceed analysts' forecasts (Lougee and Marquardt, 2004; Doyle and Soliman, 2005).

Additional disclosure requirements under Regulation G led some firms to abandon the reporting of non-GAAP earnings metrics in their press releases. However, the majority (60 percent) of the non-GAAP disclosers did not change their disclosure policy in the post-Regulation G (Marques, 2006; Heflin and Hsu, 2008).³ Regulation G potentially influences both opportunism and informativeness of non-GAAP earnings reporting – the reconciliation and management-description provisions of the regulations were intended to make opportunism of non-GAAP earnings reporting transparent and costly, thus enhancing quality of the exclusions from non-GAAP earnings. Empirical evidence is consistent with this view. For example, Kolev et al. (2008) find that after SEC intervention the components excluded from non-GAAP earnings figures are of greater quality by reporting that these exclusions are transitory and non-recurring.⁴ They also suggest that the negative correlation between excluded recurring items and future earnings is more statistically significant in the post-Regulation G period than in the pre-Regulation G period.

Subsequently, on January 11, the SEC issued new interpretive guidance, namely C&DIs. This interpretive guidance replaced earlier guidance from 2003 and 2004 relating to the Form 8-K Frequently Asked Questions.⁵ Figure 1 presents a timeline of the regulatory

³ Heflin and Hsu (2008) find that the Regulation G generated (i) a modest decrease in non-GAAP earnings disclosures, (ii) a decrease in the magnitude of the differences between GAAP and non-GAAP earnings (i.e., total exclusions), (iii) a modest decrease in the probability firms report non-GAAP earnings that meet or slightly exceed analysts' expectations, and (iv) a decrease in the relation between returns and earnings forecast errors. They find the regulations declined the frequency and magnitude of non-GAAP earnings because the regulations enhanced managerial emphasis upon GAAP earnings. They also find, before the regulations, managers were using other exclusions to help them meet or exceed the earnings forecast benchmarks and that the regulations have helped reduce this managerial opportunistic behaviour.

⁴ Kolev et al. (2008) report that the quality of other exclusions has substantially increased after SEC intervention period into non-GAAP earnings disclosures. However, they also find that the quality of special items has declined following SEC intervention, which suggests that managers may have adapted to the new disclosure environment by switching more recurring items into special exclusions. Consistent with this perspective, they further find that a propensity to shift from using other exclusions before SEC intervention period to special items after post-intervention era is related to lower quality of special items in the latter period. Further, their results indicate that the average quality has enhanced and that the firms that stopped releasing non-GAAP financial metrics tended generally to have lower quality before SEC intervention period are generally consistent with Heflin and Hsu (2008)'s findings, though they take a different methodological approach to the issue.

⁵ Form 8-K is the form on which public companies report, on a current basis, the occurrence of significant corporate events. A reportable event is a transaction or occurrence of major significance that identifies

changes. As these are not regulations, it is possible for firms to not act on these C&DIs. On the contrary, these interpretations may function as efficiently as an actual regulation (for instance, compliance is desired if it is likely to reduce the chance of future litigation). Thus, the interpretations may influence SEC registrants' disclosure practices even though they are non-binding.

Empirical evidence on the effectiveness of C&DIs is scarce, with the exception of Kyung (2014) who investigates non-GAAP earnings exclusions and their components (i.e., special items and other exclusions). Special items, by definition, are regarded as high quality exclusions for they have little predictive ability for future operating earnings (i.e., non-recurring), while other exclusions are the exclusions which managers subjectively exclude because they believe the exclusions do not reflect core performance (Doyle et al., 2003). Kyung (2014) finds a positive and significant coefficient on other exclusions but an insignificant and inconclusive result on special items in the post-C&DIs period. This suggests that the enhancement in the quality of exclusions is driven by the quality of other exclusions following the C&DIs. It also implies that a relaxation of restrictive 2003 SEC interpretive guidance on non-GAAP earnings enhances the quality of exclusions by allowing managers to exercise greater discretion to exclude some items to better communicate firm's core performance in the post-C&DIs period. Kyung (2014) also finds that the frequency of meeting or slightly exceeding earnings benchmarks using positive non-GAAP exclusions is lower in the post-C&DIs period, which supports the need for SEC interventions.

INSERT FIGURE 1 HERE

2.2 Hypothesis development

Theory suggests that both the opportunism and information hypotheses effect managers' non-GAAP reporting decisions. Empirical findings support both hypotheses.

Consistent with the information hypothesis, non-GAAP earnings have been found to be more informative to investors relative to GAAP financial metrics, when GAAP earnings are more subjective (e.g., Bradshaw and Sloan, 2002; Bhattacharya et al., 2003; Brown and Sivakumar, 2003; Lougee and Marquardt, 2004; Choi et al., 2007). Non-GAAP financial metrics are also more predictive of future performance, consistent with these earnings numbers providing a better representation of "core" earnings (Brown and Sivakumar, 2003). Consistent with the opportunism hypothesis, empirical findings suggest that exclusions of transitory losses from non-GAAP earnings are related to future operating performance, suggesting that these exclusions recur in subsequent periods of firm's financial reporting (e.g., McVay, 2006; Kolev et al., 2008; Black and Christensen, 2009).

The first and second hypotheses of this study address the quality of exclusions, while the third hypothesis documents the relevance of non-GAAP earnings for market participants. The first hypothesis, similarly to Kolev et al. (2008), postulates a quality change for total

the non-GAAP financial measures contained in the incorporated reports and provides the required reconciliation. The SEC periodically expands the list of items requiring disclosure on Form 8-K and alters the time within which a Form 8-K must be filed (Source: <http://www.sec.gov/answers/form8k.htm>). For example, the new Question 102.03 provides updated guidance which prohibits adjusting a non-GAAP financial performance measurement to eliminate or smooth items identified as non-recurring, infrequent, or unusual when the nature of the charge or gain is such that it is reasonably likely to recur within two years or there was a similar charge or gain within the prior two years.

exclusions, measured by the relationship of exclusions and non-GAAP earnings with future earnings:

H1: *The SEC's issuance of Regulation G/C&DIs enhances the quality of the total exclusions and their components (i.e., special items and other exclusions) from non-GAAP earnings.*

Under the information hypothesis, if analysts anticipate and are able to identify all real non-GAAP exclusions in their expectations, positive non-GAAP exclusions should not be associated with a greater incidence of meeting or exceeding analysts' forecasts. Under the opportunism hypothesis, in contrast, managers construct non-GAAP earnings to mislead analysts, resulting in meeting or slightly exceeding analysts' forecasts (Doyle et al., 2013). Accordingly, it is hypothesised (in the alternative form) as follows:

H2: *Firms using positive exclusions from non-GAAP earnings to increase non-GAAP earnings financial metrics are less likely to meet or slightly exceed analysts' forecasts following Regulation G / C&DIs.*

The third hypothesis postulates that the two regulatory changes examined improved the quality of non-GAAP earnings by improving the exclusion process. If, post-regulation, market participants are able to detect the opportunistic use of non-GAAP earnings exclusions to exceed earnings benchmarks, they will discount the earnings surprise when income-increasing non-GAAP exclusions are used, leading to earnings announcements containing less surprise on average. Thus, a reduction in market response (ERCs) is expected, conditional upon the extent to which the market is able to incorporate the higher quality information into the expectation-forming process. Analysts' forecasts (i.e., a component of earnings surprise estimation) are a proxy for market expectations. Accordingly, the market response hypothesis is, in the alternative form:

H3: *Earnings Response Coefficients (ERCs) for firms in the post-Regulation G period / post C&DIs period are lower than in the pre- period.*

3. Empirical tests

In order to maximise statistical power and capitalise on the availability of machine readable data, this study uses IBES actual earnings per share (IBES item VALUE) to proxy for the non-GAAP earnings figure issued in press releases by managers. With data from IBES, CRSP, and Compustat, the empirical tests employ the 48 quarters from the first calendar quarter of 2000 through the fourth calendar quarter of 2012. This study excludes firm-quarter observations in 2008 due to the U.S. financial crisis. The final sample is 78,634 and 79,160 firm-quarter observations respectively to test for objectives (i) and (ii), while a sample of 13,810 observations is available for testing objective (iii).

To test H1, a cross-sectional pooled regression is used with the sum of earnings in the subsequent four quarters' operating earnings as a dependent variable. To test the association between positive exclusions and analysts' forecasts, a probit regression is estimated with *MEF* (Meet or Exceed Analysts' Forecasts) as a dependent variable (set equal to one if the current quarter *q* of earnings surprise is greater than or equal to zero, and zero otherwise). Secondly, the market response to earnings announcements around the SEC events is examined using the *3_day_MAR* (Market-Adjusted Return) as a dependent

variable.⁶ Dummy variables for positive exclusions are also included to examine the effect of firms with versus without using income-increasing exclusions. Following Doyle et al. (2003; 2013), all independent variables are decile-ranked and take a value between zero and one (i.e., [decile less one]/nine).

The use of IBES actual earnings per share (IBES item VALUE) to proxy for the non-GAAP earnings figures reported by managers in press releases is consistent with prior research (e.g., Bradshaw and Sloan, 2002; Doyle et al., 2003; Heflin and Hsu, 2008; Kolev et al., 2008; Kyung, 2014). IBES uses the quarterly press release as its source for the actual earnings per share; and Bhattacharya et al. (2003) find that over 65 percent of their hand-collected non-GAAP earnings figures in the press releases perfectly match the IBES actual earnings numbers.⁷

Using data from IBES Detail History File, IBES Unadjusted Summary Statistics, CRSP Daily Stock/Security File, and CRSP/Compustat Merged–Fundamentals Quarterly, the empirical tests employ the 48 quarters from the first calendar quarter of 2000 through the fourth calendar quarter of 2012.^{8,9} This study excludes firm-quarter observations in 2008 due to the U.S. financial crisis.

This study estimates a variable, *Total_Exclusions as Non_GAAP_Earnings* (i.e., IBES actual earnings per share [IBES item VALUE]) less *GAAP_Earnings* (i.e., earnings per share before extraordinary items from CRSP/Compustat [EPSPXQ]). Following Doyle et al. (2003; 2013) and Kolev et al. (2008), a variable, *Special_Items*, is determined as operating earnings per share from Quarterly CRSP/Compustat data (OPEPSQ) less *GAAP_Earnings* per share. Then *Other_Exclusions* are determined as *Total_Exclusions* less *Special_Items*. A positive value of *Total_Exclusions*, *Special_Items*, and/or *Other_Exclusions* indicates an income-decreasing expense was excluded from non-GAAP Earnings. *POST* is a dummy variable that equals one if the observation falls between *q1* 2003 and *q4* 2005 (inclusive) for Regulation G sample, as well as between *q1* 2010 and *q4* 2012 (inclusive) for C&DIs, and zero otherwise respectively.

The dependant variable for H1 is *SUM_FutOpEarn*, determined as operating earnings per share from (Compustat item OPEPSQ) summed over quarters *q+1* through quarter *q+4*.¹⁰ For H2, the dependent variable is *MEF* (Meet or Exceed Analysts' Forecasts), which is a dummy

⁶ *3_day_MAR* represents the sum of difference between firm's value-weighted return, inclusive of dividends and other distributions, from one day before to one day after the IBES earnings announcement date, less the return on the value-weighted S&P 500 as a market portfolio from CRSP Daily Stock/Security file.

⁷ Further, investors focus most on IBES derived exclusions, implying that it is most informative to determine the underlying reasons for these exclusions, and using IBES actual earnings maximises the statistical power of the analysis (Marques, 2006)

⁸ This time span allows for equal periods [12 quarters] before and after the initial SEC Regulation G and C&DIs, respectively

⁹ Two different IBES files are used: actual EPS as non-GAAP earnings is from IBES Detail History File (VALUE item) and median value of analysts' forecasts is from IBES Unadjusted Summary Statistics (MEDEST item). Calculation of *3_day_MAR* uses data from the CRSP Daily Stock/Security File.

¹⁰ Kolev et al. (2008), Frankel et al. (2011), Curtis et al. (2014), and Kyung (2014) propose that this dependent variable is well suited for exploring the research questions since operating earnings per share as determined by Quarterly CRSP/Compustat data remove transitory and non-recurring special items but contain recurring components that might appear in firms' other exclusions from non-GAAP earnings. As such, it most approximates the notion of more persistent and permanent earnings.

variable equal to one if the current quarter q earnings surprise¹¹ is greater than or equal to zero, and zero otherwise. Finally, for H3, the dependent variable is 3_day_MAR , constructed as the sum of difference between firm's value-weighted return, inclusive of dividends and other distributions, from one day before to one day after the IBES earnings announcement date, less the return on the value-weighted S&P 500 as a market portfolio from CRSP Daily Stock/Security file. Following Doyle et al. (2003; 2013), all independent variables are decile-ranked and take values between zero and one (i.e., $\frac{decile-1}{9}$).

Control variables, to control for potential correlated omitted variables, are identified based on previous studies (Kolev et al., 2008; Frankel et al., 2011; and Kyung 2014): *Growth*, *Ln(Size)*, *Loss*, *Earnings_Volatility*, and *Book_to_Market_Assets*, each of which is anticipated to be correlated with both *Non_GAAP_Earnings* and *Future-Operating_Earnings*.¹² The analysis further includes the natural logarithm of *Ln(Size)* to deal with skewness in the distribution of the dependant variables. To further control for size effects in the analysis (following Kolev et al., 2008 and Frankel et al., 2011), variables such as *SUM_FutOpEarn*, *GAAP_Earnings*, *Non_GAAP_Earnings*, *Total_Exclusions*, *Special_Items*, *Other_Exclusions*, and *Growth* are standardised by total assets per share. All continuous variables are further winsorized at the top and bottom two percent to avoid undue influence by outliers.¹³ Following Kolev et al. (2008) and Kyung (2014), OLS regressions are estimated with standard errors adjusted for serial correlation and heteroscedasticity in the estimates.

In this study, high quality exclusions are considered to be those which have the least predictive power for future operating earnings, as per Kolev et al. (2008) and Kyung (2014). The average quality of exclusions for a period is estimated by determining the strength with which non-GAAP exclusions map into future earnings. H1 is therefore tested by estimating, separately for each regulatory change, the following cross-sectional pooled regression equation:

$$\begin{aligned} SUM_FutOpEarn_{q+1\ to\ q+4} = & \beta_0 + \beta_1 Non_GAAP_Earnings_q + \beta_2 Total_Exclusions_q + \\ & \beta_3 POST + \beta_4 Total_Exclusions_q \times POST + \beta_5 Growth + \beta_6 Ln(Size) + \beta_7 Loss + \\ & \beta_8 Earnings_Volatility + \beta_9 Book_to_Market_Assets + u_{q+1\ to\ q+4} \end{aligned} \quad (1)$$

where:

SUM_FutOpEarn: operating earnings per share from CRSP/Compustat (OPEPSQ)

¹¹ This is constructed as *Non_GAAP_Earnings* less median value of IBES actual earnings [IBES item MEDEST] as earnings benchmarks

¹² Those control variables are identified as follows, with Quarterly CRSP/Compustat and CRSP Daily Stock/Security data: *Growth* is the increment in sales revenue (CRSP/Compustat item SALEQ) over the same quarter in the prior year, scaled by ordinary shares outstanding. *Ln(Size)* is the firm's total assets at the end of quarter (CRSP/Compustat item ATQ). *Loss* is a dummy variable equal to one if *GAAP_Earnings* figure in quarter q is less than zero, and zero otherwise. *Earnings_Volatility* is the standard deviation of return on assets (ROA) [CRSP/Compustat item NIQ divided by CRSP/Compustat item ATQ] over the previous two years (i.e., eight preceding quarters). *Book_to_Market_Assets* is the book value of equity (CRSP/Compustat item CEQQ) divided by the book value of debt (CRSP/Compustat item DLCQ plus CRSP/Compustat item DLTTQ) plus market value of equity (CRSP/Compustat item PRCCQ multiplied by CRSP/Compustat item CSHOQ) at the end of quarter

¹³ Most previous papers are winsorized at the top and bottom of one percent, but we winsorized at two percent due to the extreme values of exclusion variables and *Growth* control variable.

	summed over quarters from $q+1$ through $q+4$;
<i>GAAP_Earnings</i> :	basic earnings per share before extraordinary items from CRSP/Compustat (EPSPXQ);
<i>Non_GAAP_Earnings</i> :	IBES reported actual basic earnings per share (IBES item VALUE);
<i>Total_Exclusions</i> :	<i>Non_GAAP_Earnings</i> less <i>GAAP_Earnings</i> ;
<i>POST</i> :	a dummy variable that is equal to one if the firm-quarter observation occurs between 2003 <i>q1</i> and 2005 <i>q4</i> (inclusive) as well as 2010 <i>q1</i> and 2012 <i>q4</i> (inclusive), and zero otherwise;
<i>Special_Items</i> :	operating income (CRSP/Compustat item OPEPSQ) less <i>GAAP_Earnings</i> from CRSP/Compustat;
<i>Other_Exclusions</i> :	<i>Total_Exclusions</i> less <i>Special_Items</i> ; a positive value of <i>Total_Exclusions</i> , <i>Special_Items</i> , and/or <i>Other_Exclusions</i> indicates an income-decreasing expense was excluded from non-GAAP earnings;
<i>Growth</i> :	incremental in sales revenue (CRSP/Compustat item SALEQ) over the same quarter in the prior year, on a per share basis;
<i>Ln(Size)</i> :	natural logarithm of total assets (CRSP/Compustat item ATQ) corresponding to quarter q ;
<i>Loss</i> :	a dummy variable equal to one if <i>GAAP_Earnings</i> for the quarter is less than zero, and zero otherwise;
<i>Earnings_Volatility</i> :	standard deviation of return on assets (ROA) over preceding eight quarters (CRSP/Compustat item NIQ divided by CRSP/Compustat item ATQ); and
<i>Book_to_Market_Assets</i> :	book value of equity (CRSP/Compustat item CEQQ) divided by the book value of debt (CRSP/Compustat item DLCQ plus CRSP/Compustat item DLTTQ) plus market value of equity (CRSP/Compustat item PRCCQ multiplied by CRSP/Compustat item CSHOQ);

It is not the direction but the significance of the β_2 and β_4 coefficients that matters. If exclusions are of good quality (i.e., mostly transitory items), then β_2 would be expected to have an insignificant coefficient (i.e., almost zero value). Alternatively, if exclusions are of bad quality, the absolute value of β_2 is expected to be significantly non-zero. Further, if the exclusion is bad quality, but improved with the respective regulatory change, then the absolute values of β_2 and β_4 are expected to be significantly non-zero and in opposite direction to each other – the absolute magnitude of β_4 is less than absolute magnitude of β_2 so that it brings it closer to zero.

For example, in equation (1), if the coefficient on *Total_Exclusions* (β_2) is negative and statistically significant in both pre-event periods, the exclusions include recurring items, which implies that exclusions are of low quality; thus, non-GAAP earnings would include not all permanent earnings (i.e., are less informative). Then if the coefficient on the interaction variable between *Total_Exclusions* and *POST* (β_4) is positive and significant, the incremental effect between β_2 and β_4 is still negative but closer to zero, which indicates that the quality of exclusions is enhanced after introducing SEC new events. To determine whether Special Items and Other Exclusions have different effects, a disaggregated version of equation 1 is also estimated:

$$\begin{aligned}
SUM_FutOpEarn_{q+1\ to\ q+4} = & \beta_0 + \beta_1 Non_GAAP_Earnings_q + \beta_2 Special_Items_q + \\
& \beta_3 Other_Exclusions_q + \beta_4 POST + \beta_5 Special_Items_q \times POST + \beta_6 Other_Exclusions_q \\
& \times POST + \beta_7 Growth + \beta_8 Ln(Size) + \beta_9 Loss + \beta_{10} Earnings_Volatility + \\
& \beta_{11} Book_to_Market_Assets + u_{q+1\ to\ q+4}
\end{aligned} \tag{2}$$

The second hypothesis, H2, addresses whether – irrespective of the intrinsic properties of the relationship between exclusions and future earnings – the exclusion process is associated with the extent to which realised future earnings relate to expectations, measured by analysts forecasts. This is articulated as the ability of earnings meet-or-beat analyst forecasts. If there is an incentive to meet-or-beat, it is clear that the use of positive exclusions will be more salient for achieving this benchmark, while negative exclusions do not aid in doing so. H2 is tested using a probit regression with meet-or-beat as the dependant variable, and the same set of explanatory variables. The following equations are estimated:

$$\begin{aligned}
MEF_q = & \beta_0 + \beta_1 Positive_Total_Exclusions_q + \beta_2 POST + \beta_3 Positive_Total_Exclusions_q \times \\
& POST + \beta_4 Growth + \beta_5 Ln(Size) + \beta_6 Loss + \beta_7 Earnings_Volatility + \\
& \beta_8 Book_to_Market_Assets + u_q
\end{aligned} \tag{3}$$

$$\begin{aligned}
MEF_q = & \beta_0 + \beta_1 Positive_Special_Items_q + \beta_2 Positive_Other_Exclusions_q + \beta_3 POST + \\
& \beta_4 Positive_Special_Items_q \times POST + \beta_5 Positive_Other_Exclusions_q \times POST + \\
& \beta_6 Growth + \beta_7 Ln(Size) + \beta_8 Loss + \beta_9 Earnings_Volatility + \\
& \beta_{10} Book_to_Market_Assets + u_q
\end{aligned} \tag{4}$$

where variables are as previously defined, with the following additional variables:

MEF (Meet or Exceed Analysts' Forecasts): a dummy dependent variable equal to one if the current quarter q of earnings surprise (i.e., *Non_GAAP_Earnings* less median IBES actual earnings (IBES item MEDEST) as earnings benchmarks) is greater than or equal to zero, and zero otherwise;

Positive_Total_Exclusions: a dummy variable equal to one if *Total_Exclusions* are greater than zero, and zero otherwise;

Positive_Other_Exclusions: a dummy variable equal to one if *Other_Exclusions* are greater than zero, and zero otherwise; and

Positive_Special_Items: a dummy variable equal to one if *Special_Items* are greater than zero, and zero otherwise.

In equation (3), if the coefficient on the *Positive_Total_Exclusions* variable (β_1) is positive and statistically significant to the current quarter q of *MEF* (Meet or Exceed Analysts' Forecasts), this indicates that firms with the use of positive exclusions from non-GAAP earnings tend to meet or exceed more often in the pre-event periods.

H1 and H2 are similar to Kolev et al. (2008) and Kyung (2014), to verify their results and the sample selection process in this paper. H3 then extends the investigation – beyond consideration of how the non-GAAP announcement information maps into future earnings

and analyst accuracy – to the impact that the institutional changes have on price informativeness of earnings, through ERCs. The extent of the change in ERCs will depend on the level of exclusions, i.e., the extent to which profits are adjusted for the announcement. Thus dummy variables are included for of positive exclusions to examine the effect of firms using income-increasing exclusions, in comparison to those without, as follows:

$$3_day_MAR_q = \beta_0 + \beta_1 Surprise_q + \beta_2 Positive_Total_Exclusions_q + \beta_3 POST + \beta_4 Surprise_q \times POST + \beta_5 Growth + \beta_6 Ln(Size) + \beta_7 Loss + \beta_8 Earnings_Volatility + \beta_9 Book_to_Market_Assets + u_q \quad (5)$$

$$3_day_MAR_q = \beta_0 + \beta_1 Surprise_q + \beta_2 Positive_Special_Items_q + \beta_3 Positive_Other_Exclusions_q + \beta_4 POST + \beta_5 Surprise_q \times POST + \beta_6 Growth + \beta_7 Ln(Size) + \beta_8 Loss + \beta_9 Earnings_Volatility + \beta_{10} Book_to_Market_Assets + U_q \quad (6)$$

where variables are as previously defined, with the following additional variables:

3_day_MAR (Market-Adjusted Return): this dependent variable represents the sum of difference between firm's value-weighted return, inclusive of dividends and other distributions, from one day before to one day after the IBES earnings announcement date, less the return on the value-weighted S&P 500 as a market portfolio from CRSP Daily Stock/Security file; and

Surprise: a firm's earnings surprise (*Non_GAAP_Earnings* less the consensus median earnings forecast [IBES item MEDEST]) divided by firm's market price (CRSP/Compustat item PRCCQ).

In equation (5), the coefficient on the interaction variable (β_4) between *Surprise* and *POST* is expected to be significant and of opposite sign to the ERC (β_1 – the coefficient on *Surprise*), which would be consistent with the idea that each regulatory change reduces the amount of surprise in earnings. In other words, this pattern would imply that the regulatory change allows information to be impounded in share price prior to the earnings announcement occurring.

4. Results and Discussion

4.1 Descriptive statistics and correlations

Table 1 presents the descriptive statistics for the main dependent and independent variables. All continuous variables are winsorized at the top and bottom of two percent level to control the effect of firm-quarter observations with extreme outliers. For the Regulation G sample (28,790 firm-quarter observations), the mean (median) *GAAP_Earnings* per share is 0.196 (0.130) and *Non_GAAP_Earnings* per share is 0.240 (0.195). This indicates that *Non_GAAP_Earnings*, on average, exceed *GAAP_Earnings* in the before Regulation G periods. The mean of *Total_Exclusions*, *Special_Items*, and *Other_Exclusions* is 0.060, 0.025, and 0.032, respectively.¹⁴

¹⁴ The mean of special items as in Kolev et al. (2008) is exactly the same figure of this study (0.025) in the Regulation G period.

INSERT TABLE 1 HERE

For the C&DIs sample (49,844 firm-quarter observations), *Non_GAAP_Earnings* per share has a higher mean (0.308) and median (0.240) than the Regulation G sample. The mean of *Total_Exclusions* is also higher at 0.127. This is different to Kyung (2014), who suggests that the SEC's issuance of C&DIs reduced the differences between *GAAP_Earnings* and *Non_GAAP_Earnings* per share. *Special_Items* are similar to the mean value in both SEC events (0.025 and 0.026, respectively) but *Other_Exclusions* are larger in the C&DIs period (0.093), compared with 0.032 in the Regulation G period.¹⁵ *SUM_FutOpEarn* are also larger at 0.883 for the C&DI period as compared to 0.861 for the Regulation G period.

Mean (median) *Growth* is -0.301 (0.000) for the Regulation G period and -0.281 (0.000) for the C&DIs period. This result is quite different from Kolev et al. (2008) and Kyung (2014).¹⁶ Finally, *Earnings_Volatility* is slightly higher in the Regulation G sample rather than in the C&DIs sample. Lougee and Marquardt (2004) indicate that firms with high earnings volatility (e.g., IT technology and pharmaceutical firms with high R&D) are more likely to be associated with the disclosure of non-GAAP earnings.

INSERT TABLE 2 HERE

Table 2 presents a pairwise correlation matrix with the main dependent and independent variables. *Total_Exclusions* are negatively correlated with *GAAP_Earnings* for Regulation G ($\rho = -0.900$), and C&DIs ($\rho = -0.741$), which is evidence that the disclosure of non-GAAP earnings appears when firm's operating earnings indicate poor performance. *SUM_FutOpEarn* are positively correlated with *GAAP_Earnings* for Regulation G ($\rho = 0.976$) and C&DIs ($\rho = 0.923$), and are slightly positively correlated with *Non_GAAP_Earnings* for Regulation G ($\rho = 0.079$) and C&DIs ($\rho = 0.067$), which is inconsistent with prior research (e.g., Bradshaw and Sloan, 2002; Bhattacharya et al., 2003; Frankel and Roychowdhury, 2004) that *Non_GAAP_Earnings* are more permanent and relevant than *GAAP_Earnings* in a firm's valuation role.

Further, *Total_Exclusions* and *SUM_FutOpEarn* are negatively correlated for Regulation G ($\rho = -0.897$) and C&DIs ($\rho = -0.716$), consistent with results of Kolev et al. (2008) that non-GAAP earnings may eliminate income-decreasing expenses associated with *SUM_FutOpEarn*. Particularly, *Special_Items* are negatively correlated with *GAAP_Earnings* and *Non_GAAP_Earnings* for both SEC events. *MEF* is positively correlated with *Non_GAAP_Earnings* and *Total_Exclusions* ($\rho = 0.204$ and $\rho = 0.133$, respectively), but is slightly negatively correlated with *SUM_FutOpEarn* ($\rho = -0.076$) and *GAAP_Earnings* ($\rho = -0.079$) for the Regulation G period. This suggests that meeting or exceeding analysts' forecasts is more associated with *Non_GAAP_Earnings* than *GAAP_Earnings*. Similar results for *MEF* correlation with above variables appear in the C&DIs sample. Finally *Surprise* is slightly positively correlated with *3_day_MAR* in both SEC events.

¹⁵ Kyung (2014) indicates the mean of special items as 0.016, which is smaller than that of this study (0.026) for the C&DIs period.

¹⁶ Kolev et al. (2008) find that the mean (median) sales growth is 0.387 (0.160) for the Regulation G period and Kyung (2014) finds that the mean (median) of the same control variable is 0.344 (0.177) for the C&DIs period.

4.2 Results of H1

INSERT TABLE 3 HERE

Table 3 presents the results for H1, which considers how exclusions map into future earnings. Cross-sectional pooled ordinary least squares regressions are estimated with standard errors adjusted for serial correlation and heteroscedasticity in the estimates. The coefficient on *POST* in the C&DIs sample is more positive and significant than that in the Regulation G period, suggesting that SEC staff interpretations allow firms to disclose their non-GAAP earnings more frequently.¹⁷ *Total_Exclusions* are negatively related with *SUM_FutOpEarn* for both Regulation G (-1.275) and C&DIs (-1.096). This suggests that non-GAAP exclusions are not perfectly transitory items (i.e., recurring items) during the both pre-SEC events.

Further, the interaction variable between *Total_Exclusions* and *POST* tests the disclosure of non-GAAP earnings has enhanced the quality of non-GAAP exclusions following the implementation of Regulation G and C&DIs. The coefficient on this interaction is positive and significant in both the Regulation G and C&DIs periods; the effect of this interaction on non-GAAP exclusions is to make the latter less negative (i.e., $-1.275 + 0.244 = -1.031$ and $-1.096 + 0.124 = -0.972$, respectively). This indicates that the quality of exclusions from non-GAAP earnings is significantly improved in each post-period (i.e. more transitory items excluded). Thus, this result is consistent with H1, which both posit that the quality of non-GAAP earnings exclusions has been enhanced after SEC regulatory and interpretive guidance changes.

H1 also considers whether Regulation G and C&DIs affect the quality of exclusion components (i.e., *Special_Items* and *Other_Exclusions*). The coefficients on *Special_Items* are negative (-2.094 and -3.474, respectively) and significant at the one percent level in each pre-period. The interaction between *Special_Items* and *POST* is positive (6.013 and 9.293) and significant in later time of both periods. Thus, the sum of *Special_Items* and this interaction term becomes positive (i.e., $-2.094 + 6.013 = 3.919$ and $-3.474 + 9.293 = 5.819$, respectively) in the later time of both periods. This suggests that the quality of *Special_Items* enhances after SEC regulatory and interpretive guidance changes.¹⁸ Doyle et al. (2003; 2013) argue that *Other_Exclusions* are considered as the low-quality exclusions because those are significantly predictive for *SUM_FutOpEarn*, determined by managers' own voluntary discretions, and used opportunistically to mislead investors before the SEC intervention. Consistent with the prior research (e.g., Doyle et al., 2003; Kolev et al., 2008; Kyung, 2014), the interaction variables between *Other_Exclusions* and *POST* are positive (0.167 and 0.062) and significant in both SEC regulatory and interpretive guidance changes. The quality of *Other_Exclusions* has improved following Regulation G and C&DIs (i.e., more transitory items in the *Other_Exclusions* component). These results are consistent with H1 as Kolev et al. (2008) find *Other_Exclusions* are more transitory after Regulation G.

¹⁷ Kyung (2014) also finds that firms more often disclose non-GAAP earnings following the new staff interpretations, suggesting that non-binding SEC's new guidance affects firm's voluntary disclosure practice.

¹⁸ In contrast, Kolev et al. (2008) finds that the coefficient on special items is significantly positive and the estimated coefficient on the interaction between special items and *POST* is negative and significant, suggesting that special items have become of lower quality over Regulation G period.

4.3 Results of H2

INSERT TABLE 4 HERE

Table 4 presents the results for H2. Firms using positive exclusions from non-GAAP earnings to increase non-GAAP earnings financial metrics are less likely to meet or slightly exceed analysts' forecasts following Regulation G and SEC's issuance of C&DIs. A probit regression is used to examine the effect of non-GAAP exclusions on the probability to exceed consensus forecasts. Standard errors are adjusted for serial correlation and heteroscedasticity in the estimates. If managers opportunistically report non-GAAP earnings to meet or slightly exceed analysts' forecasts, one would expect a positive relation between positive exclusions and the *MEF* dependent variable (e.g., Doyle et al., 2013). The main independent dummy variable of *Positive_Total_Exclusions* is equal to one if IBES actual earnings per share (*Non_GAAP_Earnings*) exceeds *GAAP-Earnings* per share, and zero otherwise (e.g., Bradshaw and Sloan, 2002; Brown and Sivakumar, 2003; Doyle et al., 2003; Heflin and Hsu, 2008; Doyle et al., 2013; Kyung, 2014). In this paper, the coefficient on this variable is positive (0.430 and 0.525, respectively) and statistically significant in the pre-period of both SEC events.

The interaction variable between *Positive_Total_Exclusions* and *POST* is negative (-0.079 and -0.067, respectively) and statistically significant at the one percent level for both SEC events. The net effect of *Positive_Total_Exclusions* and this interaction variable is still positive (i.e., $0.430 + (-0.079) = 0.351$ and $0.525 + (-0.067) = 0.458$, respectively) and significant but reduces the positive effect in both post-periods. This result sheds light on H2 that firms using positive non-GAAP earnings exclusions particularly to increase non-GAAP earnings metrics are less likely to meet or slightly exceed analysts' forecasts following the Regulation G and C&DIs. Further, other dummy independent variables, *Positive_Special_Items* and *Positive_Other_Exclusions* are positive (0.092 and 0.458, respectively) and significant in the pre-Regulation G period; negative (-0.007) and insignificant on *Positive_Special_Items* in the pre-C&DIs period. The interaction variable between *Positive_Special_Items* and *POST* is statistically significant and negative (-0.091) for the Regulation G period, but is positive (0.092) and significant at the one percent level for the C&DIs period.¹⁹ *Positive_Other_Exclusions* interacted with *POST* are both negative (-0.111 and -0.067, respectively) and significant in both SEC periods. Thus, the sum of *Positive_Other_Exclusions* and this interaction variable becomes less positive (i.e., $0.458 + (-0.111) = 0.347$ and $0.537 + (-0.067) = 0.470$, respectively) in both post-periods. This is consistent with H2, that *Other_Exclusions* are less used for exceeding analysts' forecasts post-SEC regulations.

4.4 Results of H3

INSERT TABLE 5 HERE

Table 5 presents the results for H3. Earnings response coefficients (ERCs) for firms in the post-Regulation G (C&DI) period are lower than in the pre-Regulation G period and in the pre-C&DIs period. The dependent variable, *3_day_MAR* (Market-Adjusted Return), is defined as the sum of difference between firm's value-weighted return, inclusive of

¹⁹ In contrast, Kyung (2014) finds an inconclusive result that the coefficient of positive special items is positive (0.059) and significant but its interaction variable (positive special items \times POST) is insignificantly negative (-0.025) in the C&DIs period.

dividends and other distributions, from one day before to one day after the IBES earnings announcement date, less the return on the value-weighted S&P 500 as a market portfolio from CRSP Daily Stock/Security file. Following Doyle et al. (2003; 2013), all independent variables are decile-ranked and take a value between zero and one (i.e., [decile less one]/nine). Cross-sectional pooled ordinary least squares regression are estimated with standard errors adjusted for serial correlation and heteroscedasticity in the estimates. The market response (ERCs) to earnings announcements is estimated around both SEC regulatory and interpretive guidance changes. Dummy variables for positive exclusions are also included to examine the effect of firms with versus without using income-increasing exclusions.

In the Regulation G sample, *Positive_Total_Exclusions* is also negatively (-0.0003) and significantly related with *3_day_MAR*. The coefficient of *Surprise* (ERCs) is negative (-0.0004) and significant ($p = 0.001$). However, the interaction variable between *Surprise* and *POST* is positive (0.0009) and significant at the one percent level. The sum of the coefficient of these two variables is positive (0.0005), (i.e., $-0.0004 + 0.0009$) and significant, indicating that Regulation G increases the earnings surprise (ERCs). This result is not consistent with H3.²⁰ Further, there are similar results from the use of *Positive_Special_Items* and *Positive_Other_Exclusions* (i.e., both positive exclusions are negative and significant) in which the interaction variable between *Surprise* and *POST* are positive (0.0009) and significant at the one percent level in the SEC regulatory change. This unexpected result may be caused by the different size of firm-quarter observations and time periods used in H3 tests compared with other prior research (e.g., Doyle et al., 2003; Marques, 2006; Yi, 2007; Heflin and Hsu, 2008, Doyle et al., 2013). The sample for H3 is collected from merging four different files among IBES Detail History and IBES Unadjusted Summary Statistics files, CRSP Daily Stock/Security File, and CRSP/Compustat Merged-Fundamentals Quarterly. Particularly during the merging of these files, there is a considerable drop in observations due to missing or unmatched accounting data, yielding a sample size of only 13,810 in comparison to those for H1 and H2 (78,634 and 79,160 respectively). Thus, robustness tests are also undertaken for the validity of this sample (H3) and other replication part of hypotheses (H1 and H2) with non-zero exclusions subsamples (summarised below, not reported).

In the C&DIs period, *Positive_Total_Exclusions* is also negatively associated with the dependent variable, *3_day_MAR*, and the ERCs (the coefficient on *Surprise*) is positive (0.0011) and significant ($p = 0.000$). However, in contrast to the Regulation G period, the interaction variable between *Surprise* and *POST* is significantly negative (-0.0013) at the one percent level.²¹ The incremental effect of the coefficients on the *Surprise* and its interaction variables equals -0.0002 [i.e., $0.0011 + (-0.0013)$] and significant at the one percent level. This suggests that investors now negatively value the ERCs following the SEC's new issuance of staff interpretations. This result is consistent with H3. However, the effects of

²⁰ These results are similar to those in Yi (2007) who finds that the Regulation G increases ERCs to non-GAAP earnings with small sample of 2,138 firm-quarters, but Heflin and Hsu (2008) find different results (sample size of 41,611) that the non-GAAP regulations reduce the coefficient on surprise (ERCs) because the investors place less weight on surprise in the post-Regulation G period.

²¹ Firms with positive non-GAAP exclusions may have a more negative effect on ERCs in the post-C&DIs period.

Positive_Special_Items and *Positive_Other_Exclusions* are insignificantly related with the dependent variable, *3_day_MAR* in the C&DIs period.²²

4.5 Robustness tests

As some of the documented findings differ slightly from prior research (e.g., Doyle et al., 2003; Heflin and Hsu, 2008; Kolev et al., 2008; Doyle et al., 2013; Kyung, 2014), a number of non-zero exclusions subsamples are constructed as robustness tests.

The main difference in the robustness tests is the excision of observations where the non-GAAP earnings generation process involved exclusions of zero magnitude. The hypotheses in the main results above investigate whether regulation has enhanced reporting in general. By excising zero exclusions, the robustness tests focus on the observations where regulation would be most likely to lead to change: if firm behaviour around exclusions is expected to change, then it makes sense to consider only the firms likely to be affected by the regulatory and interpretive guidance changes. Each firm-quarter, observations are selected from the full samples. These robustness tests are not reported, but summarised in Figure 2.

INSERT FIGURE 2 HERE

In brief, the robustness tests examined changes to the quality of non-GAAP exclusions, frequency of exceeding analysts' forecasts, and market response (ERCs) in response to SEC regulatory and interpretive guidance changes; most of the large subsamples are consistent with H1 and H3, especially in relation to positive exclusions, while for H2 the evidence is weak at best. Overall, both Regulation G and C&DIs seem to have mitigated the opportunistic use of non-GAAP reporting in compliance with SEC's objective to enhance the quality of the exclusions from non-GAAP earnings.

5. Conclusions

This paper examines various consequences of the non-GAAP disclosure resulting from SEC regulatory and interpretive guidance changes (i.e., Regulation G and C&DIs). Similarly to Kolev et al. (2008) and Kyung (2014), the paper finds (i) that both Regulation G and C&DIs are associated with an increase in the quality of non-GAAP earnings exclusions and, (ii) a decline in the probability of meeting or slightly exceeding analysts' forecasts when firms exclude positive non-GAAP exclusions.

It is hypothesised that the market response, measured as earnings response coefficients (ERCs), will change, but this change will be conditional upon the extent to which the market is able to incorporate the higher quality information into the expectation-forming process. In relation to this, the paper finds a reduction in the ERCs during the post-C&DIs period, but an increase in the post-Regulation G period is found.

A key limitation of this paper is the use of IBES actual earnings figures as a proxy for non-GAAP earnings. This method provides less accurate information about the incidence of disclosure of non-GAAP financial measures, as it has been established there is a significant difference between IBES actual earnings and the earnings figures reported by firms in the press releases (Bhattacharya et al., 2003).

²² In contrast, Kyung (2014) finds that both positive special items and positive other exclusions are significant and negative coefficients.

Another limitation of the study is the use of future operating earnings as a measure for current disclosure relevance. However, this is only a valid approach if financial information users fixate on earnings, with non-GAAP earnings merely being considered as “true earnings” with a measurement error. Fixation means that investors fixate upon earnings and fail to attend separately to its components, whether these are non-GAAP earnings and exclusions, or cash flows and accruals. If one of the components (non-GAAP earnings or cash flow) provides a better forecast of future operating earnings than the other (accruals or exclusions), investors who neglect this distinction become overly optimistic about the future prospects of firms with high accruals or exclusions and overly pessimistic about the future prospect of firms with low accruals or exclusions. As a result, the former become overvalued, and subsequently earn low abnormal returns, while the latter become undervalued and are followed by high abnormal returns. The extension in this paper, using ERCs (which reflect a real market-formed consensus between investors), can examine these phenomena while addressing the fixation issue.

This paper has addressed the usefulness of non-GAAP earnings in terms of how such earnings, in the presence of exclusions, map into future earnings. Future research may address the degree to which current disclosures are informative about future cash flows (e.g., Arthur et al., 2010).

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Figures

Figure 1: Timeline of Regulation G and C&DIs on non-GAAP earnings

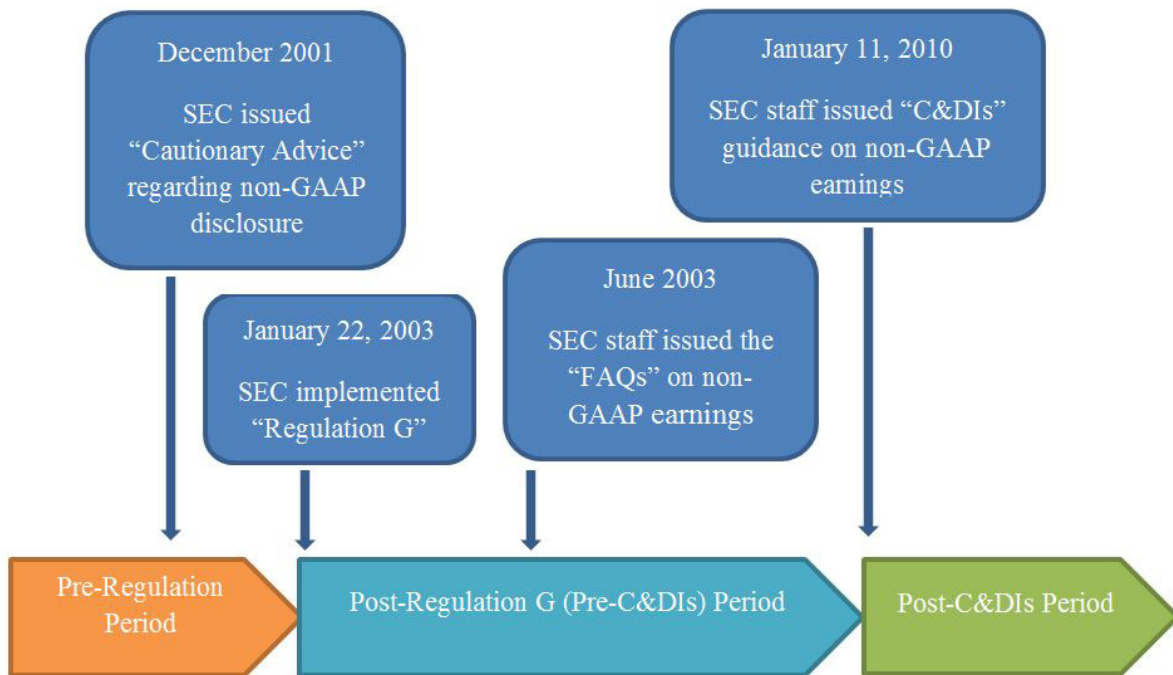


Figure 2 Subsample results summary

Subsamples:	Sample Size		Regulation G			C&DIs		
	H1, H2	H3	H1	H2	H3	H1	H2	H3
1: <i>Top 50 percent of non-zero exclusions</i>	39,205	6,435	☑	×	✓	☑	✓	☑
2: <i>Top and bottom of 25 percent of non-zero exclusions</i>	38,767	6,815	☑	✓	✓	☑	×	☑
3: <i>Top 20 percent of non-zero exclusions</i>	15,504	2,726	✓	✓	☑	✓	×	☑
4: <i>Positive exclusions</i>	45,654	6,160	☑	✓	✓	☑	☑	☑
5: <i>Negative exclusions</i>	33,286	7,651	×	×	×	✓	×	✓
6: <i>Top 20 percent of positive exclusions</i>	9,010	1,211	✓	×	×	✓	✓	✓
7: <i>Top 20 percent of Negative exclusions</i>	6,769	1,525	×	×	×	✓	✓	×
8: <i>Top and bottom 20 percent of positive special items</i>	8,115	1,265	☑	×	×	☑	×	×
9: <i>Top and bottom 20 percent of positive other exclusions</i>	17,702	2,440	☑	✓	✓	☑	✓	✓

Note: ☑ indicates strongly supporting the relevant hypothesis; ✓ indicates partially supporting the hypothesis; × indicates not supporting the hypothesis. Strong support means that coefficients on both the exclusions variable(s) and the interaction term(s) are significant and in the right direction. Partial support means that the consistent result obtains in only one of these two circumstances – the exclusion(s) or the interaction(s).

Tables

Table 1: Descriptive Statistics for Regulation G and C&DIs samples

Variables	Regulation G				C&DIs			
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.
<i>SUM_FutOpEarn</i>	28,790	0.861	0.600	1.684	49,844	0.883	0.630	1.703
<i>GAAP_Earnings</i>	28,790	0.196	0.130	0.497	49,844	0.196	0.140	0.507
<i>Non_GAAP_Earnings</i>	28,790	0.240	0.195	0.485	49,844	0.308	0.240	0.524
<i>Total_Exclusions</i>	28,790	0.060	0.060	0.857	49,844	0.127	0.100	0.869
<i>Special_Items</i>	28,790	0.025	0.000	0.146	49,844	0.026	0.000	0.146
<i>Other_Exclusions</i>	28,790	0.032	0.050	0.770	49,844	0.093	0.090	0.791
<i>Growth</i>	28,790	-0.301	0.000	5.260	49,844	-0.281	0.000	5.318
<i>Ln(Size)</i>	28,790	6.114	6.127	2.254	49,844	6.207	6.238	2.155
<i>Loss</i>	28,790	0.313	0.000	0.464	49,844	0.307	0.000	0.461
<i>Earnings_Volatility</i>	28,790	0.131	0.012	0.425	49,844	0.122	0.012	0.423
<i>Book_to_Market_Assets</i>	28,790	0.470	0.387	0.361	49,844	0.454	0.379	0.348
<i>MEF</i>	28,790	0.401	0.000	0.490	49,844	0.488	0.000	0.500
<i>3_day_MAR</i>	5,815	0.0012	0.0014	0.002	7,996	0.0006	0.0005	0.002
<i>Surprise</i>	5,815	-0.0003	0.0000	0.002	8,069	0.0000	0.0000	0.001

GAAP_Earnings: basic earnings per share before extraordinary items from CRSP/Compustat (EPSPXQ); *SUM_FutOpEarn*: operating earnings per share from CRSP/Compustat (OPEPSQ) summed over quarters from $q+1$ through $q+4$; *GAAP_Earnings*: basic earnings per share before extraordinary items from CRSP/Compustat (EPSPXQ); *Non_GAAP_Earnings*: IBES reported actual basic earnings per share (IBES item VALUE); *Total_Exclusions*: *Non_GAAP_Earnings* less *GAAP_Earnings*; *Special_Items*: operating income (CRSP/Compustat item OPEPSQ) less *GAAP_Earnings*; *Other_Exclusions*: *Total_Exclusions* less *Special_Items*; a positive value of *Total_Exclusions*, *Special_Items*, and/or *Other_Exclusions* indicates an income-decreasing expense was excluded from non-GAAP earnings; *Growth*: incremental in sales revenue (CRSP/Compustat item SALEQ) over the same quarter in the prior year, on a per share basis; *Ln(Size)*: natural logarithm of total assets (CRSP/Compustat item ATQ) corresponding to quarter q ; *Loss*: a dummy variable equal to one if *GAAP_Earnings* for the quarter is less than zero, and zero otherwise; *Earnings_Volatility*: standard deviation of return on assets (ROA) over preceding eight quarters (CRSP/Compustat item NIQ divided by CRSP/Compustat item ATQ); *Book_to_Market_Assets*: book value of equity (CRSP/Compustat item CEQQ) divided by the book value of debt (CRSP/Compustat item DLCQ plus CRSP/Compustat item DLTQ) plus market value of equity (CRSP/Compustat item PRCCQ multiplied by CRSP/Compustat item CSHOQ); *MEF* (Meet or Exceed Analysts' Forecasts): is a dummy dependent variable equal to one if the current quarter q of earnings surprise (i.e., *Non_GAAP_Earnings* less median IBES actual earnings (IBES item MEDEST) as earnings benchmarks) is greater than or equal to zero, and zero otherwise; *3_day_MAR* (Market-Adjusted Return): the sum of difference between firm's value-weighted return, inclusive of dividends and other distributions, from one day before to one day after the IBES earnings announcement date, less the return on the value-weighted market portfolio; *Surprise*: a firm's earnings surprise (*Non_GAAP_Earnings* less the consensus median earnings forecast [IBES item MEDEST]) divided by firm's market price (CRSP/Compustat item PRCCQ). All continuous variables are winsorized at the top and bottom of two percent.

Table 2: Pairwise Correlations

Regulation G (C&DIs) correlations are presented above (below) the diagonal.

	SUM_Fut OpEarn	GAAP Earnings	Non- GAAP Earnings	Total Exclusions	Special Items	Other Exclusions	Growth	Ln(Size)	Loss	Earnings Volatility	Book-to- Market Asset	MEF
<i>SUM_FutOpEarn</i>		0.976***	0.079***	-0.897***	0.004	-0.897***	0.012***	0.455***	-0.233***	-0.038***	0.002	-0.076***
<i>GAAP_Earnings</i>	0.923***		0.080***	-0.900***	-0.128***	-0.895***	0.015***	0.434***	-0.263***	-0.036***	0.007***	-0.079***
<i>Non_GAAP_Earnings</i>	0.067***	0.064***		0.075***	-0.018***	0.075***	-0.008**	-0.031***	-0.010***	-0.008**	-0.012***	0.204***
<i>Total_Exclusions</i>	-0.716***	-0.741***	0.255***		0.006*	0.999***	0.003	-0.355***	0.115***	0.033***	-0.025***	0.133***
<i>Special_Items</i>	0.030***	-0.197***	-0.003	0.068***		-0.025***	-0.010***	0.052***	0.283***	-0.014***	0.008**	0.007*
<i>Other_Exclusions</i>	-0.722***	-0.721***	0.254***	0.995***	0.001		0.004	-0.357***	0.106***	0.033***	-0.026***	0.133***
<i>Growth</i>	0.046***	0.048***	-0.008***	-0.013***	-0.003	-0.012***		0.100***	-0.072***	0.002	-0.048***	0.015***
<i>Ln(Size)</i>	0.370***	0.340***	0.009***	-0.205***	0.032***	-0.208***	0.076***		-0.377***	-0.023***	-0.184***	0.002
<i>Loss</i>	-0.334***	-0.369***	-0.057***	0.107***	0.216***	0.094***	-0.068***	-0.318***		-0.057***	0.107***	0.005
<i>Earnings_Volatility</i>	0.022***	0.014***	-0.023***	0.003	0.025***	0.002	0.003	0.009***	0.009***		0.003	-0.061***
<i>Book_to_Market_Assets</i>	-0.058***	-0.052***	-0.006**	-0.005*	0.014***	-0.006***	-0.045***	-0.147***	0.073***	0.008***		-0.036***
<i>MEF</i>	-0.045***	-0.044***	0.194***	0.119***	0.008***	0.119***	0.007***	0.015***	-0.002	-0.011***	-0.005**	

There are a maximum of 28,790 firm-quarters for each variable for Regulation G sample and 49,844 firm-quarters for C&DIs. See Table 1 for additional information. All continuous variables are winsorized at the top and bottom of two percent. *, **, and *** represent significance levels at 10%, 5%, and 1%, respectively (two-tailed test).

Table 3: Future operating earnings on Exclusions and Control Variables (H1)Dependent Variable: *SUM_FutOpEarn*

	Regulation G		C&DIs	
	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)
<i>Intercept</i>	0.001*** (11.76)	0.001*** (11.97)	0.001*** (23.96)	0.001*** (25.71)
<i>Non_GAAP_Earnings</i>	0.756*** (22.43)	0.886*** (26.54)	0.619*** (20.09)	0.729*** (22.65)
<i>Total_Exclusions</i>	-1.275*** (-37.13)		-1.096*** (-31.05)	
<i>Special_Items</i>		-2.094*** (-2.83)		-3.474*** (-6.08)
<i>Other_Exclusions</i>		-1.443*** (-42.24)		-1.251*** (-33.24)
<i>POST</i>	0.000*** (10.01)	0.000*** (7.51)	0.000*** (2.78)	0.000 (-1.34)
<i>Total_Exclusions × POST</i>	0.244*** (7.73)		0.124*** (4.68)	
<i>Special_Items × POST</i>		6.013*** (5.87)		9.293*** (11.36)
<i>Other_Exclusions × POST</i>		0.167*** (5.35)		0.062** (2.29)
<i>Growth</i>	0.000*** (-3.12)	0.000*** (-2.97)	0.000*** (-3.31)	0.000*** (-3.11)
<i>Ln(Size)</i>	0.000*** (-10.41)	0.000*** (-10.04)	0.000*** (-20.39)	0.000*** (-21.72)
<i>Loss</i>	-0.001*** (-35.41)	-0.001*** (-33.03)	-0.001*** (-48.47)	-0.001*** (-47.60)
<i>Earnings_Volatility</i>	0.000*** (-3.61)	0.000*** (-4.12)	0.000*** (-3.64)	0.000*** (-4.46)
<i>Book_to_Market_Assets</i>	0.000** (1.95)	0.000 (1.19)	0.000 (0.22)	0.000 (0.26)
<i>Adjusted-R²</i>	0.4426	0.5095	0.3617	0.4138
<i>Number of Firm-Quarters</i>	28,790	28,790	49,844	49,844

POST: a dummy variable that equals one if the observation falls between *q1* 2003 and *q4* 2005 (inclusive) for Regulation G sample, as well as between *q1* 2010 and *q4* 2012 (inclusive) for C&DIs, and zero otherwise. See Table 1 for additional information. All continuous variables are winsorized at the top and bottom of two percent. Standard errors are corrected for serial correlation and heteroscedasticity. *, **, and *** represent significance levels at 10%, 5%, and 1%, respectively (two-tailed test). Note: the quality of exclusions in H1 is explicitly measured by positive or negative values of correlation analyses and linear regression coefficients among variables compared with pre- and post-Regulation G and C&DIs.

Table 4: Probit regressions of meet or exceed analysts' forecasts on exclusion variables (H2)

Dependent Variable: *MEF*

	Regulation G		C&DIs	
	Coefficient (z-statistic)	Coefficient (z-statistic)	Coefficient (z-statistic)	Coefficient (z-statistic)
<i>Intercept</i>	-0.491*** (-15.41)	-0.526*** (-16.29)	-0.282*** (-11.39)	-0.297*** (-11.86)
<i>Positive_Total_Exclusions</i>	0.430*** (17.56)		0.525*** (28.63)	
<i>Positive_Special_Items</i>		0.092*** (3.55)		-0.007 (-0.34)
<i>Positive_Other_Exclusions</i>		0.458*** (19.16)		0.537*** (29.62)
<i>POST</i>	-0.011 (-0.50)	0.026 (1.09)	-0.006 (-0.33)	-0.027 (-1.44)
<i>Positive_Total_Exclusions</i> × <i>POST</i>	-0.079*** (-2.62)		-0.067*** (-2.91)	
<i>Positive_Special_Items</i> × <i>POST</i>		-0.091*** (-2.66)		0.092*** (3.58)
<i>Positive_Other_Exclusions</i> × <i>POST</i>		-0.111*** (-3.67)		-0.067*** (-2.93)
<i>Growth</i>	0.003 (0.87)	0.003 (0.82)	0.004 (1.55)	0.004* (1.66)
<i>Ln(Size)</i>	0.018*** (4.99)	0.017*** (4.81)	0.014*** (5.10)	0.015*** (5.42)
<i>Loss</i>	-0.141*** (-7.29)	-0.135*** (-7.01)	-0.204*** (-14.48)	-0.193*** (-13.61)
<i>Earnings_Volatility</i>	-0.022** (-2.03)	-0.024** (-2.21)	-0.018** (-2.50)	-0.020*** (-2.65)
<i>Book_to_Market_Assets</i>	-0.080*** (-4.12)	-0.077*** (-3.96)	-0.110*** (-6.87)	-0.109*** (-6.79)
<i>Pseudo R</i> ²	0.013	0.015	0.020	0.022
Number of Firm-Quarters	29,165	29,165	49,995	49,995

Positive_Total_Exclusions: a dummy variable equal to one if *Total_Exclusions* are greater than zero, and zero otherwise; *Positive_Special_Items*: a dummy variable equal to one if *Special_Items* are greater than zero, and zero otherwise; *Positive_Other_Exclusions*: a dummy variable equal to one if *Other_Exclusions* are greater than zero, and zero otherwise. See Table 1 for additional information. All continuous variables are winsorized at the top and bottom of two percent. Standard errors are corrected for serial correlation and heteroscedasticity. *, **, and *** represent significance levels at 10%, 5%, and 1%, respectively (two-tailed test).

Table 5: Market reaction to earnings announcement (H3)Dependent Variable: *3_day_MAR*

	Regulation G		C&DIs	
	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)	Coefficient (t-statistic)
<i>Intercept</i>	-0.0004*** (-3.92)	-0.0004*** (-3.95)	0.0020*** (17.22)	0.0020*** (16.85)
<i>Surprise</i>	-0.0004*** (-3.27)	-0.0004*** (-3.25)	0.0011*** (8.40)	0.0011*** (8.14)
<i>Positive_Total_Exclusions</i>	-0.0003*** (-5.05)		-0.0002*** (-2.84)	
<i>Positive_Special_Items</i>		0.0000** (-1.96)		0.0001 (1.52)
<i>Positive_Other_Exclusions</i>		-0.0002*** (-4.46)		-0.0001 (-0.87)
<i>POST</i>	0.0020*** (20.63)	0.0020*** (20.60)	-0.0012*** (-9.97)	-0.0012*** (-9.72)
<i>Surprise × POST</i>	0.0009*** (5.44)	0.0009*** (5.47)	-0.0013*** (-7.28)	-0.0014*** (-7.48)
<i>Growth</i>	0.0001 (1.52)	0.0001 (1.52)	0.0004*** (5.79)	0.0004*** (5.84)
<i>Ln(Size)</i>	-0.0002** (-2.33)	-0.0001** (-1.95)	-0.0006*** (-5.88)	-0.0006*** (-5.87)
<i>Loss</i>	0.0002*** (3.65)	0.0002*** (3.59)	-0.0002*** (-2.99)	-0.0003*** (-4.11)
<i>Earnings_Volatility</i>	-0.0002*** (-3.34)	-0.0002*** (-3.34)	0.0004*** (4.77)	0.0004*** (5.11)
<i>Book_to_Market_Assets</i>	0.0001 (1.10)	0.0001 (1.02)	-0.0009*** (-10.88)	-0.0009*** (-11.27)
<i>Adjusted-R²</i>	0.3538	0.3535	0.1731	0.1726
Number of Firm-Quarters	5,814	5,814	7,996	7,996

3_day_MAR (Market-Adjusted Return): the sum of difference between firm's value-weighted return, inclusive of dividends and other distributions, from one day before to one day after the IBES earnings announcement date, less the return on the value-weighted market portfolio; *Surprise*: a firm's earnings surprise divided by firm's market price. See Table 1 and 4 for additional information. *Note*: this hypothesis is measured by earnings response coefficients (ERCs) as returns on earnings surprise. All continuous variables are winsorized at the top and bottom of two percent. Standard errors are corrected for serial correlation and heteroscedasticity. *, **, and *** represent significance levels at 10%, 5%, and 1%, respectively (two-tailed test).