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Market reaction to non-GAAP earnings around SEC regulation ☆

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A R T I C L E   I N F O

A B S T R A C T

This study examines the impact of *Regulation G* in 2003 and the issuance of *Compliance and Disclosure Interpretations* (C&DIs) in 2010 – on the reporting of non-GAAP earnings. The study finds that (i) both *Regulation G* and C&DIs are associated with an increase in the quality of non-GAAP earnings exclusions (i.e. the exclusions are more transitory and have less predictive power for future operating earnings). (ii) *Regulation G* led to a decrease in the amount of total positive exclusions used to meet or beat analysts' forecasts, but C&DIs partially reversed this result. (iii) *Regulation G* increases, and C&DIs decrease, the earnings response coefficients (ERCs).

1. Introduction

Over the past two decades, the reporting 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 reporting and intervened to regulate the reporting of non-GAAP earnings by issuing *Regulation G*. The SEC also amended Item 10(e) of *Regulation S-K* in 2003 by imposing additional disclosure requirements and restrictions on firms when non-GAAP financial measures are included in their SEC filings. Subsequently, in 2010, the SEC issued new *Compliance and Disclosure Interpretations* (C&DIs). The C&DIs relaxed the rigorous guidelines (Form 8-K Frequently Asked Questions (FAQs) on *Regulation G* and Item 10(e) of *Regulation S-K* without changing the current regulation.[1] They also allowed SEC registrants to use extensive discretion as to how to adjust for recurring items.[2]

This study investigates the effects of both *Regulation G* and C&DIs on the quality of exclusions from non-GAAP reporting on accounting information. Specifically, the objectives of this study are to examine: (i) whether there is an association between the exclusions and future operating earnings, (ii) whether positive non-GAAP exclusions are associated with firm's

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[1] Item 10(e) of *Regulation S-K* applies additional and more stringent requirements to periodic reports and other documents filed with the SEC – this includes non-GAAP financial measures (Source: https://www.sec.gov/divisions/corpfin/guidance/nongaapinterp.htm). Questions 102.03 and 102.04 are examples where C&DIs relaxed the rigorous guidelines of Item 10(e) of *Regulation S-K*.

[2] For example, Question 8 (Item 10(e) of Regulation S-K) previously required firms to "*demonstrate the usefulness of any measure that excludes recurring items*". The burden of demonstrating "usefulness" was a major hurdle that discouraged firms from disclosing non-GAAP earnings. The new C&DIs eliminate this hurdle by giving firms flexibility in adjusting for recurring items, provided these items are not labelled as non-recurring.

meeting or slightly exceeding analysts' forecasts, and (iii) the market response to earnings announcements before and after *Regulation G* and C&DIs. Consistent with prior studies, high quality exclusions are defined as those that are more transitory and have less predictive power for future operating earnings (e.g. Doyle et al., 2003; Gu and Chen, 2004; Kolev et al., 2008).

The motivation for this study is two-fold. First, this study exploits two SEC interventions to investigate whether they achieved their desired outcomes. The two SEC interventions are: the SEC's implementation of *Regulation G* in 2003, imposing additional disclosure and filing requirements on firms publicly disclosing non-GAAP earnings; and the SEC's issuance of new C&DIs in 2010. The restrictive guidelines of *Regulation G* are aimed at mitigating the improper use of non-GAAP reporting. Empirical findings tend to support the implementation of *Regulation G*, as it improves the quality of non-GAAP earnings exclusions and curtails opportunistic behaviour by firms (e.g. Frankel et al., 2011; Heflin and Hsu, 2008; Kolev et al., 2008). However, concerns were raised regarding the significant "administrative burden" imposed on firms that disclosed non-GAAP earnings (specifically those adjusting for recurring items) under *Regulation G*. This resulted in the SEC issuing new C&DIs. The new C&DIs relaxed the regulatory environment and eliminated the "administrative burden" associated with the exclusion of recurring items.[3] The C&DIs provides an interesting setting to examine whether a more relaxed environment encouraged or discouraged firms to better communicate with shareholders through non-GAAP earnings. Empirical evidence on the effectiveness of the issuance of C&DIs is limited (the notable exception being Kyung and Weintrop, 2016).

The second motivation is to add to the debate on the disclosure of non-GAAP earnings. Extant research proposes 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, 2005; 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 (Black and Christensen, 2009; Brown et al., 2012; Doyle et al., 2003; McVay, 2006). In this study, equal weight is placed on these two hypotheses; both motives could affect managers' non-GAAP earnings disclosure practice, and it is difficult to determine which motivation is more pervasive.

Consistent with Doyle et al. (2003) and Kolev et al. (2008), this study separates non-GAAP earnings exclusions into special items (i.e. typically regarded as transitory or non-recurring) and other exclusions.[4] This study first documents that the quality of exclusions has improved following *Regulation G* and C&DIs (i.e. exclusions are more transitory). Specifically, the study documents that the negative association between non-GAAP exclusions (total exclusions, special items and other exclusions) and future operating performance becomes less negative post-*Regulation G* and post-C&DIs. Second, this study documents that the positive association between total positive exclusions and the probability of meeting or beating analysts' forecasts becomes less positive after *Regulation G*, but more positive after C&DIs.[5] Third, the market response test produces opposite results for *Regulation G* and C&DIs. Specifically, the coefficient on earnings surprise (ERC) increases post-*Regulation G* but reduces post-C&DIs, suggesting that more informative earnings are being announced after *Regulation G*, but this effect is reduced by C&DIs. Overall, the results suggest that *Regulation G* and C&DIs had effects: *Regulation G*, as intended, yielded higher quality exclusions; a reduction in the amount of total positive exclusions used to meet or beat analysts' forecasts; and higher ERCs. In contrast, while the introduction of C&DIs resulted in higher quality exclusions, they did not reduce the amount of total exclusions used to meet or beat analyst's forecasts and resulted in lower ERCs.

This study makes numerous contributions to the literature. First, this study extends the study by Kolev et al. (2008) by documenting that the quality of non-GAAP exclusions also increased post-C&DIs, despite C&DIs not being an actual regulation. Second, this study extends the study by Heflin and Hsu (2008) by investigating how *Regulation G* and C&DIs impacted on the amount of positive exclusions used to meet or beat analysts' forecasts. Third, this study extends the investigation of non-GAAP reporting – beyond consideration of how the non-GAAP announcement information maps into future earnings and analyst accuracy – to demonstrate the impact that institutional changes have on the informativeness of earnings, through ERCs. Hence, this research adds to a growing body of literature that investigates the consequences of *Regulation G* (e.g. Heflin and Hsu, 2008; Kolev et al., 2008) and the emerging literature that investigates the consequences of C&DIs (Kyung and Weintrop, 2016). The results reported in this study add to the disclosure regulation literature by providing empirical evidence on the economic consequences of regulations, 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.

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[3] For example, *Regulation G* requires firms to show a reconciliation of the non-GAAP financial measure to the GAAP financial measure. *Regulation G* also discourages firms from reporting non-GAAP measures due to the burden of having to justify the exclusion of recurring items.

[4] Doyle et al. (2003) divide total exclusions into special items and other exclusions and recognize special items as one-time items, 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 and investment costs.

[5] In a similar study, Heflin and Hsu (2008) find a decrease in the likelihood of meeting or beating analysts' forecasts following *Regulation G*, which is consistent with the interpretation of the findings in findings presented here. The main difference between this study and that of Heflin and Hsu (2008) is that Heflin and Hsu (2008) focus on the impact of *Regulation G* on the probability to meet or beat analysts' forecast, whereas this study focuses on the how *Regulation G* impacts on the use of positive exclusions to meet or beat analysts' forecasts (i.e. the interaction term between *Regulation G* and positive exclusions). The results reported in Table 6 suggest that *Regulation G* reduced the amount of positive exclusions used to meet or beat analysts' forecast.

2. Regulatory setting, literature review and hypotheses

2.1. Regulatory setting and literature review

Non-GAAP earnings reporting became increasingly prevalent during the 1990s (Bradshaw and Sloan, 2002). Non-GAAP figures tend to be more value-relevant, on average, than GAAP earnings (Bhattacharya et al., 2003; Bradshaw and Sloan, 2002; Frankel and Roychowdhury, 2005). 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 perspective (i.e. the information hypothesis) of non-GAAP earnings. For 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 (Doyle et al., 2013; Lougee and Marquardt, 2004).

On January 22, 2003, the SEC introduced *Regulation G* to regulate the reporting of non-GAAP earnings. *Regulation G* potentially influences both opportunism and informativeness of non-GAAP earnings. The reconciliation and management-description provisions of the regulations were intended to make opportunism of non-GAAP earnings reporting transparent and costly, thus enhancing the quality of the exclusions from non-GAAP earnings. Empirical evidence is consistent with this view. For example, Kolev et al. (2008) find that after *Regulation G*, the components excluded from non-GAAP earnings are of greater quality by documenting that these exclusions are transitory and non-recurring.[6] However, the disclosure requirements under *Regulation G* imposed a significant administrative burden on firms. This resulted in some firms abandoning the reporting of non-GAAP earnings metrics in their press releases (Heflin and Hsu, 2008).[7]

Motivated by concerns that the restrictive nature of *Regulation G* precludes firms from providing meaningful non-GAAP information, the SEC issued new interpretive guidance (C&DIs) on January 11, 2010. This interpretive guidance replaced earlier guidance from 2003 and 2004 relating to the FAQs.[8] For example, Question 8 previously imposed considerable burden on firms by requiring them to "*demonstrate the usefulness of any measure that excludes recurring items*". Demonstrating "usefulness" was a major hurdle that may have discouraged firms from disclosing non-GAAP earnings. The new C&DIs eliminate this hurdle and allow firms flexibility in adjusting for recurring items, provided these items are not labelled as non-recurring.[9] Fig. 1 presents a timeline of *Regulation G* and C&DIs.

As C&DIs are non-statutory, it is possible for firms to not respond to them. Alternatively, these interpretations may function as efficiently as an actual regulation (for instance, where firms seek to comply with the C&DIs in order to minimise the risk of investigation or prosecution by the SEC Kyung and Weintrop, 2016). Thus, the interpretations may influence SEC registrants' disclosure practices even though they are non-binding (Kyung and Weintrop, 2016). Empirical evidence on the effectiveness of C&DIs is scarce, with the exception of Kyung and Weintrop (2016). Using data from 2006 to 2013, they first examine 3-day cumulative abnormal returns surrounding the announcement of C&DIs for two groups of firms: (i) firms reporting non-GAAP earnings informatively, and (ii) firms reporting non-GAAP earnings aggressively.[10] They find that the announcement of the new C&DIs is positively associated with the 3-day cumulative abnormal returns for firms reporting non-GAAP earnings informatively. Their results suggest that investors viewed C&DIs as an important SEC intervention, despite

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[6] Kolev et al. (2008) report that the quality of exclusions increased following the intervention of the SEC into non-GAAP reporting (post-*Regulation G*). Furthermore, their results indicate that the average quality has improved and that the firms that stopped releasing non-GAAP financial metrics generally tended to have lower quality exclusions before the SEC intervention period. However, they also find that the quality of special items has declined following SEC intervention, as managers adapted to the new disclosure environment by switching more recurring expenses into special items. This result highlights the unintended consequences arising from *Regulation G* (Kolev et al., 2008).

[7] Heflin and Hsu (2008) find that *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 conclude the regulation reduced the frequency and magnitude of non-GAAP earnings because the regulations enhanced managerial emphasis upon GAAP earnings. They also find that, before the regulation, managers were using other exclusions to help them meet or exceed the earnings forecast benchmarks and that the regulation has helped reduce this opportunistic managerial behaviour.

[8] 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 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).

[9] For instance, prior guidance prohibited firms to adjust a non-GAAP financial performance measure 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. The new C&DIs (Question 102.03) clarifies that this prohibition is based on the "description" of the charge or gain being adjusted. In particular, firms can adjust for the charge or gain as they deem appropriate, as long as this charge or gain is not described as non-recurring, infrequent or unusual.

[10] Firms are identified as aggressive non-GAAP reporters when their non-GAAP earnings are greater than GAAP earnings.
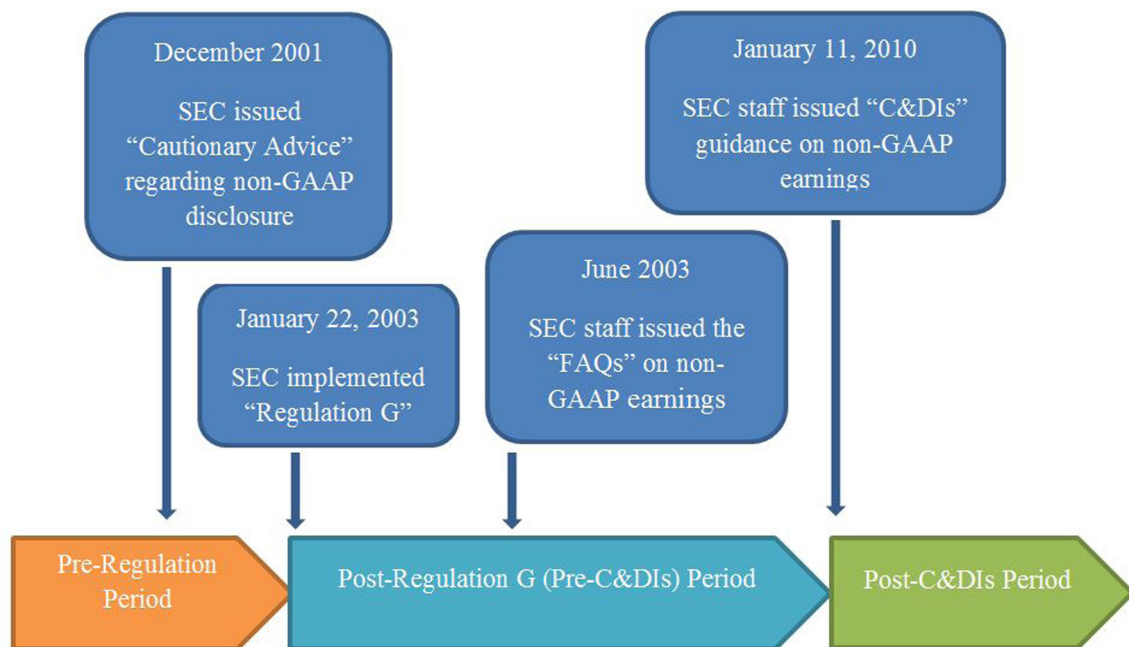
Fig. 1. Timeline of *Regulation G* and C&DIs on non-GAAP earnings.

the fact that the C&DIs are non-statutory, and they affected managers' reporting behaviours, although the benefits appeared to be limited to firms using non-GAAP reporting informatively. The authors then turned their attention to aggressive non-GAAP reporters in the post-C&DIs period and find that managers are more likely to report non-GAAP earnings aggressively when the firm's corporate governance system is poor. Overall their findings highlight that the introduction of C&DIs is an economically important event which improved the quality of information contained in voluntary disclosures.

2.2. Hypothesis development

Theory suggests that both the information and the opportunism hypotheses explain 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. Bhattacharya et al., 2003; Bradshaw and Sloan, 2002; Brown and Sivakumar, 2003; Choi et al., 2007; Lougee and Marquardt, 2004). 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). However, 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. Black and Christensen, 2009; Kolev et al., 2008; McVay, 2006).

The first and second hypotheses of this study address the quality of exclusions, while the third hypothesis explores the relevance of non-GAAP earnings for market participants. The first hypothesis, like Kolev et al. (2008), postulates a quality change for total exclusions, measured by the relationship of exclusions and non-GAAP earnings with future earnings:

H1. The SEC's issuance of Regulation G/C&DIs does not change 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 can 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 null form) as follows:

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

The third hypothesis postulates that both *Regulation G* and C&DIs improve the quality of non-GAAP earnings reported by improving the exclusion process. If, post-regulation, the quality of (non-GAAP) earnings has increased, then such earnings can be said to be more informative and therefore less ambiguous. Accordingly, under the information hypothesis, a stronger market response to earnings announcements would be expected (i.e. a higher ERC). In contrast, under the opportunism hypothesis, managers are expected to use the additional latitude to exclude recurring expenses and meet the analyst forecasts using exclusions. If investors understand this, a lower announcement return is expected. Accordingly, the market response hypothesis (in the null form) is:

H3. Earnings Response Coefficients (ERCs) for firms in the post-Regulation G period/post-C&DIs period are no different than in the pre-period.[11]

3. Empirical tests

With data from IBES, CRSP, and Compustat, the empirical tests examine two distinct sample periods, with some overlap. For the *Regulation G* change, quarterly announcements from 1998 to 2008 inclusive (5 years before and 5 years after) are used. For the C&DIs change, quarterly announcements from 2005 to 2015 (also 5 years before and after) are used.[12] The final sample includes 69,800 and 67,874 firm-quarter observations respectively, with some variation where data for specific variables are not available.

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 and Weintrop, 2016). IBES uses the quarterly press release as its source for the actual earnings per share; Bhattacharya et al. (2003) find that over 65% of their non-GAAP earnings figures hand-collected from press releases perfectly match the IBES actual earnings numbers.[13,14]

This study estimates a variable, *Total_Exclusions* as *Non_GAAP_Earnings* (i.e. Compustat 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), the variable *Special_Items* is determined as operating earnings per share from Quarterly CRSP/Compustat data (OPEPSQ) less *GAAP_Earnings* per share. *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 an indicator variable that equals one if the observation falls on or after *q1* 2003 for *Regulation G* sample, as well as on or after *q1* 2010 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*.[15] For H2, the dependent variable is *MEF* (Meet or Exceed Analysts' Forecasts), which is an indicator variable equal to one if the current quarter *q* earnings surprise[16] is greater than or equal to zero, and zero otherwise. Finally, for H3, the dependent variable is *3_day_CAR*, constructed using a market model estimated from the firm's value-weighted return (inclusive of dividends and other distributions) and the value-weighted S&P 500 as a market portfolio from CRSP Daily Stock/Security file, from one day before to one day after the IBES earnings announcement date.[17] Following Doyle et al. (2003; 2013), all continuous independent variables (except returns) are decile-ranked and take values between zero and one (i.e. $\frac{decile-1}{9}$).

Control variables are identified based on previous studies (Frankel et al., 2011; Kolev et al., 2008) – *Growth, Loss, Earnings_Volatility,* and *Book_to_Market_Assets* – each of which are anticipated to be correlated with both *Non_GAAP_Earnings* and *Future-Operating_Earnings*.[18] The analysis further includes the natural logarithm of Total Assets *(Size)* to deal with skew-

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[11] H1, H2 and H3 are examined using all firms pre- and post- *Regulation G*/C&DIs. In additional analyses (Section 4.5), the study restricts the sample to only include non-GAAP reporters.

[12] Removal of 2008 data to eliminate the effects of the global financial crisis did not change the main results, and so results with 2008 data are retained.

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

[14] Note that the IBES GAAP dataset is quite sparse. This study initially compares the IBES and Compustat GAAP earnings distributions, and finds differences only in the extreme tails. Given the larger number of data-points in Compustat, Compustat GAAP earnings are winsorized at 0.001% in each tail, yielding a similar distribution to IBES non-GAAP earnings. This winsorized Compustat GAAP number was then used for the remainder of the tests.

[15] Curtis et al. (2014), Frankel et al. (2011), Kolev et al. (2008) and Kyung and Weintrop (2016) 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 excludes transitory and non-recurring special items but includes 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.

[16] This is constructed as *Non_GAAP_Earnings* less the median value of IBES actual earnings [IBES item MEDEST].

[17] This study also undertakes the analyses using raw 3-day returns and market-adjusted 3-day returns, using the same market index. As there is no qualitative difference between the results, the study reports results using CAR.

[18] 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 total assets. *Size* is the natural logarithm of the firm's total assets at the end of quarter (CRSP/Compustat item ATQ). *Loss* is an indicator 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 the quarter.

ness in the distribution of the dependant variables. To further control for size effects in the analysis (following 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.[19] The ordinary least squares (OLS) regressions are estimated with robust standard errors.

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). 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 *Regulation G* and C&DIs, the following cross-sectional pooled regression equation:

$$\begin{aligned}
SUM\_FutOpEarn_{q+1\ to\ q+4} = {} & \beta_0 + \beta_1 Non\_GAAP\_Earnings_q + \beta_2 Total\_Exclusions_q + \beta_3 POST_q + \beta_4 Total\_Exclusions_q \\
& \times POST_q + \beta_5 Growth_q + \beta_6 Size_q + \beta_7 Loss_q + \beta_8 Eearnings\_Volatility_q \\
& + \beta_9 Book\_to\_Market\_Assets_q + \upsilon_{q+1\ to\ q+4}
\end{aligned} \tag{1}$$

where:

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.

POST: an indicator variable that is equal to one if the firm-quarter observation occurs after 2003q1 (inclusive, for the *Regulation G* change) or after 2010q1 (inclusive, for the C&DIs change), and zero otherwise.

Special_Items: operating income (CRSP/Compustat item OPEPSQ) less *GAAP_Earnings* from CRSP/Compustat.

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, standardised by Total Assets.

Size: natural logarithm of total assets (CRSP/Compustat item ATQ) corresponding to quarter *q*.

Loss: an indicator 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 DLTTQ) plus market value of equity (CRSP/Compustat item PRCCQ multiplied by CRSP/Compustat item CSHOQ).

To determine whether *Special_Items* and *Other_Exclusions* have different effects, a disaggregated version of Eq. (1) is also estimated:

$$\begin{aligned}
SUM\_FutOpEarn_{q+1\ to\ q+4} = {} & \beta_0 + \beta_1 Non\_GAAP\_Earnings_q + \beta_2 Special\_Items_q + \beta_3 Other\_Exclusions_q + \beta_4 POST_q \\
& + \beta_5 Special\_Items_q \times POST_q + \beta_6 Other\_Exclusions_q \times POST_q + \beta_7 Growth_q + \beta_8 Size_q \\
& + \beta_9 Loss_q + \beta_{10} Eearnings\_Volatility_q + \beta_{11} Book\_to\_Market\_Assets_q + \upsilon_{q+1\ to\ q+4}
\end{aligned} \tag{2}$$

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 to meet or beat analyst forecasts. If there is an incentive to meet or beat, the use of positive exclusions will be more salient for achieving this benchmark, while the use of negative exclusions do not aid in doing so. H2 is tested using a probit regression with *MEF* (meet or beat) as the dependant variable, and the same set of explanatory variables. The following equations are estimated:

$$\begin{aligned}
MEF_q = {} & \beta_0 + \beta_1 Positive\_Total\_Exclusions_q + \beta_2 POST_q + \beta_3 Positive\_Total\_Exclusions_q \times POST_q + \beta_4 SOX_q \\
& + \beta_5 Positive\_Total\_Exclusions_q \times SOX_q + \beta_6 Growth_q + \beta_7 Size_q + \beta_8 Loss_q + \beta_9 Eearnings\_Volatility_q \\
& + \beta_{10} Book\_to\_Market\_Assets_q + \upsilon_q
\end{aligned} \tag{3}$$

$$\begin{aligned}
MEF_q = {} & \beta_0 + \beta_1 Positive\_Special\_Items_q + \beta_2 Positive\_Other\_Exclusions_q + \beta_3 POST_q + \beta_4 Positive\_Special\_Items_q \\
& \times POST_q + \beta_5 Positive\_Other\_Exclusions_q \times POST_q + \beta_6 SOX_q + \beta_7 Positive\_Special\_Items_q \times SOX_q \\
& + \beta_8 Positive\_Other\_Exclusions_q \times SOX_q + \beta_9 Growth_q + \beta_{10} Size_q + \beta_{11} Loss_q + \beta_{12} Eearnings\_Volatility_q \\
& + \beta_{13} Book\_to\_Market\_Assets_q + \upsilon_q
\end{aligned} \tag{4}$$

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[19] Most previous papers winsorized at the top and bottom one percent, but this study winsorized at two percent due to the extreme values of exclusion variables and of the *Growth* control variable.

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

MEF: Meet or Exceed Analysts' Forecasts, an indicator 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: magnitude of positive *Total_Exclusions.*

Positive_Special_Items: magnitude of positive Special_Items.

Positive_Other_Exclusions: magnitude of negative Other_Exclusions.

SOX: an indicator variable set to equal one if quarter q is the third quarter of 2002, zero otherwise.

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

While H1 is similar to Kolev et al. (2008), this study extends their analyses to consider whether C&DIs also impact on the quality of non-GAAP exclusions. While H2 is similar to Heflin and Hsu (2008), the study extends their work by investigating how *Regulation G* and C&DIs impact on the use of positive exclusions to meet or beat analysts' forecasts. Finally, H3 extends the investigation – beyond consideration of how the non-GAAP announcement information maps into future earnings and analyst accuracy – to consider the impact SEC interventions have had 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, indicator variables are included for positive exclusions to examine the effect of firms using income-increasing exclusions, in comparison to those without, as follows:

$$3\_day\_CAR_q = \beta_0 + \beta_1 Surprise_q + \beta_2 Positive\_Total\_Exclusions_q + \beta_3 POST_q + \beta_4 Surprise_q \times POST_q + \beta_5 Growth_q$$
$$+ \beta_6 Size_q + \beta_7 Loss_q + \beta_8 Eearnings\_Volatility_q + \beta_9 Book\_to\_Market\_Assets_q + \upsilon_q \tag{5}$$

$$3\_day\_CAR_q = \beta_0 + \beta_1 Surprise_q + \beta_2 Positive\_Special\_Items_q + \beta_3 Positive\_Other\_Exclusions_q + \beta_4 POST_q$$
$$+ \beta_5 Surprise_q \times POST_q + \beta_6 Growth_q + \beta_7 Size_q + \beta_8 Loss_q + \beta_9 Eearnings\_Volatility_q$$
$$+ \beta_{10} Book\_to\_Market\_Assets_q + \upsilon_q \tag{6}$$

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

3_day_CAR: aggregates Cumulative Abnormal Residuals (CAR) over 3 days surrounding the earnings announcement, using parameters constructed using a market model estimated (over days −150 to −20 relative to the announcement) from the firm's value-weighted return (inclusive of dividends and other distributions) and the value-weighted S&P 500 as a market portfolio from CRSP Daily Stock/Security file.

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

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 two percent to mitigate the effects of extreme outliers. For the *Regulation G* sample (69,800 firm-quarter observations), the mean (median) *GAAP_Earnings* per share is 0.0039 (0.0087) and *Non_GAAP_Earnings* per share is 0.0052 (0.0076). This indicates that *Non_GAAP_Earnings*, on average, exceed *GAAP_Earnings*. The mean of *Total_Exclusions, Special_Items,* and *Other_Exclusions* is 0.0013, 0.0031 and −0.0017, respectively.[20]

For the C&DIs sample (67,874 firm-quarter observations), *Non_GAAP_Earnings* per share has a higher mean (0.0075) and median (0.0100) in the C&DIs sample than the *Regulation G* sample. The mean of *Total_Exclusions* is also higher in the C&DIs sample. *Special_Items* are larger in magnitude in the *Regulation G* period than the C&DIs period 0.0031 and 0.0026, respectively. However, *Other_Exclusions* are larger in the C&DIs period (0.0003), compared with −0.0017 in the *Regulation G* period. *SUM_FutOpEarn* are also larger at 0.0323 for the C&DIs period as compared to 0.0267 for the *Regulation G* period.

The mean (median) of *Growth* is 0.0216 (0.0134) for the *Regulation G* period and 0.0159 (0.0093) for the C&DIs period.[21] Finally, *Earnings_Volatility* is similar in the *Regulation G* sample and 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.

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[20] Note that the sample consists of firms with no exclusions. Table 1 also reports statistics for the exclusions variables restricted to the firm quarters where these are non-zero.

[21] Kolev et al. (2008) find that the mean (median) sales growth is 0.387 (0.160) for the *Regulation G* period. When this study calculates growth using Kolev et al. (2008)'s method, a similar mean (median) of 0.31 (0.05) across both samples are obtained. However, Kolev et al. (2008)'s calculation involves taking a difference in sales dollars and dividing by the number of shares, yielding a dollar dimensionality rather than a dimensionless number. Growth is calculated by dividing change in dollar value by total assets, thus expressing growth as percentage of total assets.

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.
SUM_FutOpEarn	69800	0.0267	0.0372	0.1133	67874	0.0323	0.0405	0.1082
Future4car3	68575	0.0013	0.0003	0.0773	66541	0.0009	-0.0003	0.0754
Future1car3	69593	0.0017	0.0007	0.0778	67632	0.0017	0.0000	0.0758
GAAP_Earnings	69800	0.0039	0.0087	0.0370	67874	0.0046	0.0092	0.0363
Non_GAAP_Earnings	69800	0.0052	0.0076	0.0279	67874	0.0075	0.0100	0.0278
Total_Exclusions (all)	69800	0.0013	0.0000	0.0186	67874	0.0029	0.0000	0.0190
(non-zero only)	52673	0.0017	-0.0005	0.0214	51816	0.0038	0.0002	0.0217
Special_Items (all)	69800	0.0031	0.0000	0.0400	67874	0.0026	0.0000	0.0282
(non-zero only)	23046	0.0092	0.0014	0.0692	29174	0.0061	0.0012	0.0428
Other_Exclusions (all)	69800	-0.0017	-0.0001	0.0368	67874	0.0003	0.0000	0.0237
(non-zero only)	54373	-0.0022	-0.0007	0.0416	54250	0.0004	-0.0002	0.0265
Growth	69800	0.0216	0.0134	0.0505	67874	0.0159	0.0093	0.0485
Size	69800	6.7796	6.6658	1.7972	67874	7.1458	7.0828	1.8248
Loss	69800	0.2129	0.0000	0.4093	67874	0.2127	0.0000	0.4092
Earnings_Volatility	69800	0.0198	0.0094	0.02900	67874	0.0199	0.0091	0.0294
Book_to_Market_Assets	69800	0.3718	0.3253	0.2375	67874	0.4036	0.3526	0.2580
MEF	69800	0.5420	1.0000	0.4982	67874	0.5773	1.0000	0.4940
3_day_MAR	69800	0.0031	0.0022	0.0776	67874	0.0020	0.0003	0.0756
3_day_CAR	69800	0.0017	0.0008	0.0775	67874	0.0013	-0.0002	0.0755
3_day_RAW	69800	0.0035	0.0019	0.0805	67874	0.0029	0.0014	0.0791
Surprise	69800	-0.0007	0.0002	0.0095	67874	-0.0001	0.0005	0.0108

These are the pre-winsorized data. *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*; *Future4car3:* 3-day cumulative abnormal return around q + 4; *Future1car3:* 3-day cumulative abnormal return around q + 1; *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 sales revenue (CRSP/Compustat item SALEQ) over the same quarter in the prior year, on a per share basis; *Size*: natural logarithm of total assets (CRSP/Compustat item ATQ) corresponding to quarter q; *Loss*: an indicator 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 DLTTQ) plus market value of equity (CRSP/Compustat item PRCCQ multiplied by CRSP/Compustat item CSHOQ); *MEF* (Meet or Exceed Analysts' Forecasts): is a dependent indicator 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; *3_day_CAR* (Cumulative Abnormal Residuals): the aggregated abnormals for days −1...+1 around the announcement, calculated from a market model regression estimated over trading days −150...−20 in relation to the announcement; *3_day_RAW* (Raw Return): the aggregated raw return, for day −1 to day +1 around the announcement; *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).
Note (1): A comparison of GAAP earnings from Compustat and IBES reveals that the Compustat GAAP earnings have much more extremes in the tails as compared to IBES data. However, the Compustat data is much more complete, and so Compustat GAAP earnings are used in order to maximise the sample size Comparison of the two distributions (Compustat GAAP earnings and IBES GAAP earnings) indicates that the distributions vary only in the extremes; these differences are removed by the winsorization process. Thus, **GAAP Earnings** is the Compustat GAAP earnings number.

Descriptive statistics are reported for raw 3-day returns (*3_day_RAW*) and 3-day market adjusted returns (*3_day_MAR*), as well as 3-day CARs (*3_day_CAR*). The remainder of the study reports results using only *3_day_CAR*, as results using the other return measures (not tabulated) are qualitatively the same.

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* ($\rho = -0.6798$) and C&DIs ($\rho = -0.6568$). This suggests that poorly performing firms (based on operating earnings) are more likely to disclose non-GAAP earnings. *SUM_FutOpEarn* are positively correlated with *GAAP_Earnings* for *Regulation G* ($\rho = 0.7631$) and C&DIs ($\rho = 0.7321$), and are more strongly positively correlated with *Non_GAAP_Earnings* for *Regulation G* ($\rho = 0.7899$) and C&DIs ($\rho = 0.7909$). This is consistent with prior research (e.g. Bradshaw and Sloan, 2002; Bhattacharya et al., 2003; Frankel and Roychowdhury, 2005) that *Non_GAAP_Earnings* are more permanent and relevant than *GAAP_Earnings* in a firm's valuation.

Further, *Total_Exclusions* and *SUM_FutOpEarn* are negatively correlated for *Regulation G* ($\rho = -0.3322$) and C&DIs ($\rho = -0.2416$); this is consistent with Kolev et al. (2008) who also find non-GAAP earnings may eliminate income-decreasing expenses associated with *SUM_FutOpEarn.* Moreover, *Special_Items* are negatively correlated with *GAAP_Earnings* and *Non_GAAP_Earnings* for both SEC events. *MEF* is positively correlated with *Non_GAAP_Earnings* ($\rho = 0.1541$) but negatively correlated with *Total_Exclusions* ($\rho = -0.0638$), and positively correlated with *SUM_FutOpEarn* ($\rho = 0.1204$) and *GAAP_Earnings* ($\rho = 0.1483$) for the *Regulation G* period. This suggests that meeting or exceeding analysts' forecasts is associated with both *Non_GAAP_Earnings* and *GAAP_Earnings*, although the non-GAAP correlation appears greater. Similar results

Table 2
Pairwise correlations.

	SUM_FutOp Earn	Future4 car3	Future1 car3	GAAP_Earnings	Non_GAAP_Earnings	Total_Exclusions	Special_Items	Other_Exclusions	Growth	Size	Loss	Earnings_Volatility	Book_to_Market_Assets	MEF	3_day_CAR	Surprise
Panel A: Regulation G.																
SUM_FutOpEarn	1.0000															
Future4car3	0.0478***	1.0000														
Future1car3	0.0986***	0.0122***	1.0000													
GAAP_Earnings	0.7631***	0.0296***	0.0186***	1.0000												
Non_GAAP_Earnings	0.7899***	0.0270***	0.0169***	0.8718***	1.0000											
Total_Exclusions	−0.3322***	−0.0184***	−0.0115***	−0.6798***	−0.2334***	1.0000										
Special_Items	−0.0829***	−0.0012	0.0028	−0.2873***	−0.1144***	0.3992***	1.0000									
Other_Exclusions	−0.0782***	−0.0080*	−0.0089***	−0.0322***	0.0060	0.0729***	−0.8853***	1.0000								
Growth	0.2302***	−0.0032	0.0052	0.2609***	0.2373***	−0.1626***	−0.0494***	−0.0288***	1.0000							
Size	0.2257***	0.0244***	0.0238***	0.2297***	0.2445***	−0.0900***	−0.0367***	−0.0057	−0.0768***	1.0000						
Loss	−0.5636***	−0.0278***	−0.0125***	−0.6937***	−0.6143***	0.4572***	0.1599***	0.0580***	−0.2023***	−0.2688***	1.0000					
Earnings_Volatility	−0.3330***	−0.0241***	−0.0241***	−0.3575***	−0.3419***	0.1978***	0.0601***	0.0349***	−0.0240***	−0.3583***	0.3637***	1.0000				
Book_to_Market_Assets	−0.1505***	−0.0042	0.0039	−0.1193***	−0.0904***	0.1015***	0.0502***	−0.0031	−0.1833***	−0.1635***	0.1337***	−0.0113***	1.0000			
MEF	0.1204***	0.0050	−0.0137***	0.1483***	0.1541***	−0.0638***	−0.0243***	−0.0060	0.1598***	0.0482***	−0.1487***	0.0009	−0.0692***	1.0000		
3_day_CAR	0.0971***	0.0152***	−0.0127***	0.0907***	0.0801***	−0.0601***	−0.0125***	−0.0169***	0.0680***	0.0292***	−0.0827***	−0.0282***	0.0335***	0.2193***	1.0000	
Surprise	0.1251***	−0.0070*	−0.0245***	0.2193***	0.2488***	−0.0629***	−0.0675***	0.0415***	0.1522***	0.0517***	−0.2489***	−0.0159***	−0.0780***	0.4768***	0.1557***	1.0000
Panel B: C&DI																
SUM_FutOpEarn	1.0000															
Future4car3	0.0492***	1.0000														
Future1car3	0.1034***	0.0156***	1.0000													
GAAP_Earnings	0.7321***	0.0188***	0.0064*	1.0000												
Non_GAAP_Earnings	0.7909***	0.0275***	0.0168***	0.8571***	1.0000											
Total_Exclusions	−0.2416***	0.0042	0.0122***	−0.6568***	−0.1746***	1.0000										
Special_Items	−0.0539***	0.0146***	0.0198***	−0.3708***	−0.1055***	0.5543***	1.0000									
Other_Exclusions	−0.1296***	−0.0142***	−0.0138***	−0.0856***	−0.0144***	0.1425***	−0.7448***	1.0000								
Growth	0.1926***	−0.0054	−0.0008	0.2467***	0.2218***	−0.1470***	−0.0729***	−0.0311***	1.0000							
Size	0.2465***	0.0155***	0.0114***	0.2389***	0.2455***	−0.0973***	−0.0336***	−0.0381***	−0.0862***	1.0000						
Loss	−0.5169***	−0.0172***	0.0015	−0.6739***	−0.5886***	0.4267***	0.2057***	0.0975***	−0.1997***	−0.2615***	1.0000					
Earnings_Volatility	−0.3146***	−0.0180***	−0.0118***	−0.3225***	−0.3171***	0.1522***	0.0276***	0.0892***	−0.0367***	−0.3532***	0.3161***	1.0000				
Book_to_Market_Assets	−0.0963***	0.0014	−0.0034	−0.0596***	−0.0433***	0.0505***	0.0473***	−0.0157***	−0.1896***	−0.0734***	0.0750***	−0.0478***	1.0000			
MEF	0.1379***	0.0038	−0.0104***	0.1733***	0.2067***	−0.0288***	−0.0404***	0.0250***	0.1290***	0.0634***	−0.1749***	−0.0014	−0.0464***	1.0000		
3_day_CAR	0.0971***	0.0100***	−0.0199***	0.1010***	0.0984***	−0.0490***	−0.0130***	−0.0238***	0.0781***	0.0191***	−0.0972***	−0.0078*	0.0200***	0.2634***	1.0000	
Surprise	0.0969***	−0.0059	−0.0278***	0.2133***	0.2647***	−0.0202***	−0.0987***	0.1012***	0.1326***	0.0217***	−0.2414***	0.0167***	−0.0291***	0.5355***	0.2065***	1.0000

Variables are defined in Table 1. There are a maximum of 84,062 firm-quarters for each variable for Regulation G sample and 68,210 firm-quarters for C&DIs.

* Represents significance level at 10% (two-tailed test).

** Represents significance level at 5% (two-tailed test).

*** Represents significance level at 1% (two-tailed test).

for *MEF* correlation with above variables appear in the C&DIs sample. Finally, *Surprise* is positively correlated with *3_day_CAR* in both event periods.

4.2. Results for H1

Table 3 presents the results for H1, which considers how exclusions map into future earnings. Cross-sectional pooled OLS regressions are estimated with robust standard errors. *Total_Exclusions* are negatively related with *SUM_FutOpEarn* for both *Regulation G* (−0.0086) and C&DIs (−0.0065). This suggests that non-GAAP exclusions are not perfectly transitory items (i.e. recurring items) during both SEC interventions.

Further, the interaction variable between *Total_Exclusions* and *POST* tests whether 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; comparing magnitudes, the effect of this interaction on non-GAAP exclusions is to make the latter less negative. This indicates that the quality of exclusions from non-GAAP earnings is significantly improved in the period after each SEC intervention (i.e. where more transitory items are excluded). Thus, this result is consistent with the information hypothesis, which posits that the quality of non-GAAP earnings exclusions has been enhanced after *Regulation G* and C&DIs.

H1 also considers whether *Regulation G* and C&DIs affect the quality of the exclusion components (i.e. *Special_Items* and *Other_Exclusions*). The coefficients on *Special_Items* are positive and significant at the one percent level for both *Regulation G* and C&DIs (0.0006 and 0.0012, respectively). The interaction between *Special_Items* and *POST* is negative and significant for the C&DIs period (−0.0003). Thus, the sum of *Special_Items* and this interaction term becomes less positive after the introduction of C&DIs. This suggests that the quality of *Special_Items* enhances after the introduction of C&DIs, as the amount of

Table 3
Future operating earnings on exclusions and control variables (H1).

	Regulation G		C&DIs	
	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)
Dependent Variable: SUM_FutOpEarn				
Intercept	−0.0503*** (0.002)	−0.0391*** (0.002)	−0.0691*** (0.002)	−0.0582*** (0.002)
Non_GAAP_Earnings	0.0195*** (0.000)	0.0188*** (0.000)	0.0203*** (0.000)	0.0197*** (0.000)
Total_Exclusions	−0.0086*** (0.000)		−0.0065*** (0.000)	
Special_Items		0.0006*** (0.000)		0.0012*** (0.000)
Other_Exclusions		−0.0091*** (0.000)		−0.0076*** (0.000)
POST	−0.0066*** (0.001)	−0.0059*** (0.001)	−0.0051*** (0.001)	−0.0053*** (0.002)
Total_Exclusions × POST	0.0013*** (0.000)		0.0011*** (0.000)	
Special_Items × POST		0.0003 (0.000)		−0.0003** (0.000)
Other_Exclusions × POST		0.0012*** (0.000)		0.0013*** (0.000)
Growth	0.0013*** (0.000)	0.0012*** (0.000)	0.0012*** (0.000)	0.0011*** (0.000)
Size	0.0052*** (0.000)	0.0045*** (0.000)	0.0057*** (0.000)	0.0051*** (0.000)
Loss	−0.0312*** (0.001)	−0.0428*** (0.001)	−0.0219*** (0.001)	−0.0307*** (0.001)
Earnings_Volatility	−0.0031*** (0.000)	−0.0031*** (0.000)	−0.0029*** (0.000)	−0.0030*** (0.000)
Book_to_Market_Assets	0.0004*** (0.000)	0.0004*** (0.000)	0.0011*** (0.000)	0.0010*** (0.000)
Adjusted-R^2	0.492	0.501	0.467	0.479
Number of firm-quarters	69,800	69,800	67,874	67,874

POST: An indicator variable that equals one if the observation falls after *q1* 2003 for Regulation G sample, as well as after *q1* 2010 for C&DIs sample, and zero otherwise. Other variables are defined in Table 1. All continuous variables are winsorized at the top and bottom 2%. Robust standard errors are reported below the coefficients.

* Represents significance level at 10% (two-tailed test).
** Represents significance level at 5% (two-tailed test).
*** Represents significance level at 1% (two-tailed test).

Table 4
3-day CAR in q + 4 on exclusions and control variables (H1).

	Regulation G		C&DIs	
	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)
Dependent Variable: Future4CAR3				
Intercept	0.0016	0.0023	0.0025	0.0028
	(0.002)	(0.002)	(0.002)	(0.002)
Non_GAAP_Earnings	−0.0001	−0.0002	0.0002	0.0001
	(0.000)	(0.000)	(0.000)	(0.000)
Total_Exclusions	−0.0004**		−0.0003*	
	(0.000)		(0.000)	
Special_Items		0.0002		0.0004***
		(0.000)		(0.000)
Other_Exclusions		−0.0004**		−0.0004***
		(0.000)		(0.000)
POST	0.0008	0.0010	−0.0045***	−0.0043***
	(0.001)	(0.001)	(0.001)	(0.001)
Total_Exclusions × POST	−0.0003		0.0006***	
	(0.000)		(0.000)	
Special_Items × POST		−0.0001		0.0001
		(0.000)		(0.000)
Other_Exclusions × POST		−0.0002		0.0005**
		(0.000)		(0.000)
Growth	−0.0001	−0.0001	−0.0001	−0.0001
	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.0006***	0.0005***	0.0002**	0.0001
	(0.000)	(0.000)	(0.000)	(0.000)
Loss	−0.0028**	−0.0042***	−0.0014	−0.0020*
	(0.001)	(0.001)	(0.001)	(0.001)
Earnings_Volatility	−0.0000	−0.0000	−0.0003**	−0.0003**
	(0.000)	(0.000)	(0.000)	(0.000)
Book_to_Market_Assets	0.0001	0.0001	0.0001	0.0001
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted-R²	0.002	0.002	0.001	0.001
Number of firm-quarters	68,575	68,575	66,541	66,541

POST: An indicator variable that equals one if the observation falls after *q1* 2003 for Regulation G sample, as well as after *q1* 2010 for C&DIs, and zero otherwise. Other variables are defined in Table 1. All continuous variables are winsorized at the top and bottom 2%. Robust standard errors are reported below the coefficients.
  * Represents significance level at 10% (two-tailed test).
  ** Represents significance level at 5% (two-tailed test).
  *** Represents significance level at 1% (two-tailed test).

excluded special items post-implementation is less informative about future earnings.[22] Doyle et al. (2003, 2013) argue that *Other_Exclusions* are considered as 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. The coefficients on *Other_Exclusions* are negative and significant at the one percent level for both *Regulation G* and C&DIs (−0.0091 and −0.0076, respectively). The interaction variables between *Other_Exclusions* and *POST* are positive (0.0012 and 0.0013) and significant for both *Regulation G* and C&DIs. These results suggest that 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 Kolev et al. (2008) who find *Other_Exclusions* are more transitory after *Regulation G.*

In addition to the mapping of exclusions into future operating earnings, this study also tests how exclusions map into future returns. Specifically, the study examines the 3-day CAR at the q + 4 (*Future4CAR3*), as well as at q + 1 (*Future1CAR3*). Results are shown in Tables 4 and 5 respectively. For *Future4CAR3*, there is a negative relationship with *Total_Exclusions* before *Regulation G* (-0.0004) and C&DIs (−0.0003). While the incremental coefficient is enough to reverse the sign of the coefficient for C&DIs (*Total_Exclusions* −0.0003; *Total_Exclusions × POST* 0.0006), the magnitude for Regulation G is unchanged (*Total_Exclusions* −0.0004; *Total_Exclusions×POST* is not significant). This suggests that investors are partly "fooled" by the exclusion process around *Regulation G* and before C&DIs (not after).

The results for *Future1CAR3* (the subsequent quarter, Table 5) show there is a negative relationship with *Total_Exclusions* and their components before *Regulation G*, and the incremental coefficient does not change this (*Total_Exclusions×POST* is not significant). The coefficients on *Total_Exclusions* and *Total_ExclusionsxPOST* are, however, not significant for C&DIs.

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[22] 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. Although the signs are different, the reduction in the overall strength of the relationship between special items and future earnings is consistent with special item removal enhancing the quality of earnings.

Table 5
3-day CAR in q + 1 on exclusions and control variables (H1).

	Regulation G		C&DIs	
	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)
Dependent Variable: Future1CAR3				
Intercept	0.0007	0.0032[*]	0.0016	0.0024
	(0.002)	(0.002)	(0.002)	(0.002)
Non_GAAP_Earnings	−0.0004[***]	−0.0005[***]	−0.0003[*]	−0.0003[**]
	(0.000)	(0.000)	(0.000)	(0.000)
Total_Exclusions	−0.0007[***]		−0.0000	
	(0.000)		(0.000)	
Special_Items		0.0004[***]		0.0007[***]
		(0.000)		(0.000)
Other_Exclusions		−0.0011[***]		−0.0004[***]
		(0.000)		(0.000)
POST	−0.0023[*]	−0.0028[*]	−0.0023[*]	−0.0027[*]
	(0.001)	(0.001)	(0.001)	(0.001)
Total_Exclusions × POST	0.0002		0.0002	
	(0.000)		(0.000)	
Special_Items × POST		−0.0001		−0.0003[*]
		(0.000)		(0.000)
Other_Exclusions × POST		0.0004		0.0005[**]
		(0.000)		(0.000)
Growth	0.0004[***]	0.0004[***]	0.0002[**]	0.0002[*]
	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.0007[***]	0.0006[***]	0.0003[***]	0.0002
	(0.000)	(0.000)	(0.000)	(0.000)
Loss	−0.0000	−0.0011	0.0003	−0.0004
	(0.001)	(0.001)	(0.001)	(0.001)
Earnings_Volatility	−0.0002	−0.0002	−0.0001	−0.0002
	(0.000)	(0.000)	(0.000)	(0.000)
Book_to_Market_Assets	0.0004[***]	0.0004[***]	−0.0000	−0.0001
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted-R^2	0.002	0.002	0.000	0.001
Number of firm-quarters	69,593	69,593	67,632	67,632

POST: An indicator variable that equals one if the observation falls after *q1* 2003 for Regulation G sample, as well as after *q1* 2010 for C&DIs, and zero otherwise. Other variables are defined in Table 1. All continuous variables are winsorized at the top and bottom 2%. Robust standard errors are reported below the coefficients.

[*] Represents significance level at 10% (two-tailed test).
[**] Represents significance level at 5% (two-tailed test).
[***] Represents significance level at 1% (two-tailed test).

The quarter +4 results indicate that around *Regulation G* and before C&DIs, price seems to incorrectly impound the information content of announced earnings, since the price response four quarters later seems to be related to the components of the originally announced earnings. The lack of change to the quarter+1 announcement should, however, be interpreted with care as there may be other, seasonal/quarterly factors that impact on this lack of relationship.

In both *Regulation G* and C&DIs for each forward CAR measure, there is (with the exception of *Future4CAR3* for the *Regulation G Total_Exclusions* model) a significant negative coefficient on *POST*; this suggests that market response to subsequent announcements is reduced after *Regulation G* and C&DIs. This pattern suggests that exclusions allow investors to anticipate future announcements, leading to a lower future (q + 1, q + 4) response after *Regulation G* and C&DIs.

4.3. Results for H2

Table 6 presents the results for H2, which hypothesises that firms using positive exclusions from non-GAAP earnings to increase non-GAAP earnings financial metrics are as likely to meet or slightly exceed analysts' forecasts following *Regulation G* and the SEC's issuance of C&DIs. A probit regression is used to examine the effect of non-GAAP exclusions on the probability of exceeding consensus forecasts. 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 indicator variable, *Positive_Total_Exclusions,* is equal to the magnitude of total exclusions. The coefficient for this variable is significantly positive for both *Regulation G* (3.7230) and C&DIs (2.1068).

This suggests that, prior to *Regulation G* and C&DIs, the use of positive total exclusions helps firms meet or beat analysts' forecasts. When *Total_Exclusions* is replaced by *Special_Items* and *Other_Exclusions*, both the special items and other exclusions components are associated with meet or beat prior to both *Regulation G* (coefficient on *Special_Items* 3.8188; coefficient on *Other_Exclusions* 3.8577) and the introduction of the C&DIs (coefficients 2.4305 and 4.4667, respectively).

Table 6
Probit regressions of 'meet or exceed analysts' forecasts' (*MEF*) on exclusion variables (H2).

	Regulation G		C&DIs	
	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)
Dependent Variable: MEF				
Intercept	0.3751***	0.3645***	0.7569***	0.7329***
	(4.1300)	(3.9700)	(10.0400)	(9.3800)
Positive_Total_Exclusions	3.7230***		2.1068***	
	(5.5000)		(2.9400)	
Positive_Special_Items		3.8188***		2.4305***
		(5.0100)		(3.3400)
Positive_Other_Exclusions		3.8577***		4.4667***
		(3.7000)		(5.6500)
SOX	−0.2257***	−0.2240***		
	(−31.1900)	(−29.2600)		
POST	0.0089	0.0064	0.0313	0.0281
	(0.3100)	(0.2100)	(0.4500)	(0.4100)
Positive_Total_Exclusions × SOX	1.0462***			
	(10.4500)			
Positive_Special_Items × SOX		1.6222***		
		(16.4000)		
Positive_Other_Exclusions × SOX		−0.3059**		
		(−2.0500)		
Positive_Total_Exclusions × POST	−0.5639*		1.8760***	
	(−1.6900)		(3.1100)	
Positive_Special_Items × POST		−0.8765***		0.8792*
		(−3.0500)		(1.9400)
Positive_Other_Exclusions × POST		0.2441		2.8929***
		(0.5300)		(3.2000)
Growth	3.2986***	3.2885***	2.7736***	2.7396***
	(13.6600)	(13.6300)	(4.2700)	(4.1600)
Size	0.0001	0.0015	−0.0111	−0.0094
	(0.0100)	(0.1900)	(−1.4100)	(−1.1400)
Loss	−0.6249***	−0.6311***	−0.7031***	−0.7151***
	(−19.1100)	(−18.4000)	(−32.2600)	(−33.3100)
Earnings_Volatility	2.1839***	2.1080***	1.3592*	1.0863
	(5.4700)	(5.0400)	(1.6800)	(1.3700)
Book_to_Market_Assets	−0.0829	−0.0709	−0.1153*	−0.0937
	(−1.2100)	(−1.0500)	(−1.7900)	(−1.4700)
Pseudo-R^2	0.0586	0.0597	0.0577	0.0602
Number of firm-quarters	19,991	19,991	26,786	26,786

Positive_Total_Exclusions: Equal to the magnitude of *Total_Exclusions* if *Total_Exclusions* are greater than zero, and zero otherwise; *Positive_Special_Items*: equal to the magnitude of *Special_Items* if greater than zero, and zero otherwise; *Positive_Other_Exclusions*: equal to the magnitude of *Other_Exclusions* if greater than zero, and zero otherwise. *POST*: an indicator variable that equals one if the observation falls after *q1* 2003 for Regulation G sample, as well as after *q1* 2010 for C&DIs, and zero otherwise. *SOX* is an indicator variable defined by Heflin and Hsu (2008) for quarters on or after 2002Q3. The *POST* variable here is equivalent to theirs. Other variables are defined in Table 1. All continuous variables are winsorized at the top and bottom 2%. Robust standard errors are reported below the coefficients.
 * Represents significance level at 10% (two-tailed test).
 ** Represents significance level at 5% (two-tailed test).
 *** Represents significance level at 1% (two-tailed test).

Furthermore, this study finds that *Regulation G* reduced the use of total exclusions to meet or beat forecasts: the significant coefficient on the interaction term *Positive_Total_Exclusions × POST* (−0.5639), when added to the coefficient on *Positive_Total_Exclusions* significantly reduces the total coefficient. The study finds similar results on *Positive_Special_Items × POST* (−0.8765). For the C&DIs sample, all interactions are positive. Overall, the results suggest that firms using positive non-GAAP earnings exclusions, particularly to increase non-GAAP earnings metrics, are less likely to meet or exceed analysts' forecasts following *Regulation G*, but that C&DIs relax the environment, enabling the use exclusions to increase the likelihood of meeting or beating analysts' forecasts.

4.4. Results for H3

Table 7 presents the results for H3. The dependent variable, *3_day_CAR* is defined as the aggregated 3-day excess return around the announcement. Following Doyle et al. (2003, 2013), all independent variables are decile-ranked and take a value between zero and one (i.e. $\frac{decile-1}{9}$). Earnings response coefficients (ERCs) are the coefficients on earnings *Surprise*, while the coefficient on *Surprise×POST* represents the change in ERC post-SEC interventions.

Table 7
Market reaction to earnings announcement (H3), with NonGAAPusage × Surprise×Post interaction.

	Regulation G		C&Dis	
	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)	Coefficient (std error.)
Dependent Variable: 3_day_CAR				
Intercept	−0.0159***	−0.0155***	−0.0150***	−0.0149***
	(0.002)	(0.002)	(0.001)	(0.001)
Surprise	0.8992***	0.9046***	1.2998***	1.3137***
	(0.064)	(0.064)	(0.050)	(0.050)
Positive_Total_Exclusions_i	−0.0035***		−0.0040***	
	(0.001)		(0.001)	
Positive_Special_Items_i		0.0009		0.0020**
		(0.001)		(0.001)
Positive_Other_Exclusions_i		−0.0047***		−0.0053***
		(0.001)		(0.001)
POST	−0.0039***	−0.0040***	−0.0017**	−0.0015*
	(0.001)	(0.001)	(0.001)	(0.001)
Surprise × POST	0.3196***	0.3167***	0.2784***	0.2567***
	(0.107)	(0.107)	(0.098)	(0.099)
NonGAAPusage × Surprise × POST	0.2212**	0.2358**	−0.2253**	−0.2191**
	(0.108)	(0.108)	(0.103)	(0.103)
Positive_Total_Exclusions_i × POST	−0.0015		−0.0006	
	(0.002)		(0.001)	
Positive_Special_Items_i × POST		0.0002		−0.0042***
		(0.002)		(0.001)
Positive_Other_Exclusions_i × POST		−0.0011		0.0022*
		(0.002)		(0.001)
Growth	0.0016***	0.0016***	0.0016***	0.0016***
	(0.000)	(0.000)	(0.000)	(0.000)
Size	0.0010***	0.0009***	0.0007***	0.0006***
	(0.000)	(0.000)	(0.000)	(0.000)
Loss	−0.0045***	−0.0050***	−0.0055***	−0.0059***
	(0.001)	(0.001)	(0.001)	(0.001)
Earnings_Volatility	0.0001	0.0001	0.0003***	0.0003***
	(0.000)	(0.000)	(0.000)	(0.000)
Book_to_Market_Assets	0.0016***	0.0015***	0.0010***	0.0010***
	(0.000)	(0.000)	(0.000)	(0.000)
Adjusted-R^2	0.034	0.034	0.050	0.050
Number of firm-quarters	69,800	69,800	67,874	67,874

3_day_CAR: Constructed using a market model estimated from the firm's value-weighted return (inclusive of dividends and other distributions) and the value-weighted S&P 500 as a market portfolio from CRSP Daily Stock/Security file, from one day before to one day after the IBES earnings announcement date; *Surprise*: a firm's earnings surprise divided by firm's market price; NonGAAPusage is 0 if GAAP earnings are equal to "non-GAAP" announced earnings, 1 otherwise; *Positive_Total_Exclusions_i*: an indicator variable equal to one if *Total_Exclusions* are greater than zero, and zero otherwise; *Positive_Special_Items_i*: an indicator variable equal to one if *Special_Items* are greater than zero, and zero otherwise; *Positive_Other_Exclusions_i*: an indicator variable equal to one if *Other_Exclusions* are greater than zero, and zero otherwise. *POST*: an indicator variable that equals one if the observation falls after q1 2003 for Regulation G sample, as well as after q1 2010 for C&DIs, and zero otherwise. Other variables are defined in Table 1. All continuous variables are winsorized at the top and bottom 2%. Robust standard errors are reported below the coefficients.

  * Represents significance level at 10% (two-tailed test).
  ** Represents significance level at 5% (two-tailed test).
  *** Represents significance level at 1% (two-tailed test).

The sample includes firms that report non-GAAP earnings and firms that choose not to. The study also examines whether the effect on ERC is driven by firms that utilise non-GAAP earnings in their reports. In Table 7, an interaction term between *Surprise × POST* is included, as well as a three-way interaction of these components with an indicator variable reflecting the use of non-GAAP numbers (*NonGAAPusage* defined as zero if GAAP earnings are equal to announced non-GAAP earnings, one otherwise). This three-way interaction term (*NONGAAPusage × Surprise × POST*) is significantly positive for *Regulation G* (0.2212) and negative for C&DIs (−0.2253). The results suggests that post-*Regulation G*, the ERCs of firms reporting non-GAAP earnings increased substantially more than for those that did not, indicating that *Regulation G* increased the quality of earnings. In contrast, for C&DIs, the coefficient on the three-way-interaction is negative, suggesting that the relaxation of regulation afforded through the C&DIs resulted in less informative earnings for firms that report non-GAAP earnings.

4.5. Additional analyses

Additional analyses were undertaken to further determine the robustness of the results. These include: analysis with both winsorized and unwinsorized variables (except for exclusions); explicit one-way (firm) and two-way (firm and year) clustering of standard errors; and analysing only those firms which are users of non-GAAP reporting, where this is defined as

having non-zero exclusions for at least 80% of quarters preceding each SEC intervention. The main results reported in this study do not change. To confirm the integrity of the dataset used in this study, replications of Doyle et al. (2013) and Heflin and Hsu (2008) are conducted which yield consistent results.

Mapping exclusions into future returns, rather than future earnings, was also explored as an alternative method of assessing their information content. The results (not tabulated) indicate a significant and consistent set of results for total exclusions when mapping into post-*Regulation G* returns over 4 years and 1 year, but not over the ensuing quarter. The results are not consistent for C&DIs. As the discussion in this study focuses on the properties of accounting numbers rather than the process of markets impounding this information, only the mapping of exclusions into future earnings around *Regulation G* and C&DIs has been reported. Nonetheless, the inconsistency around C&DIs reinforced the overall findings of this study – the regulatory effect of *Regulation G* was more pronounced than that of the C&DIs.

5. Conclusions

This study examines a number of consequences of non-GAAP disclosure resulting from changes to SEC regulatory and interpretive guidance (i.e. *Regulation G* and C&DIs). This study finds that *Regulation G* is associated with an increase in the quality of non-GAAP earnings exclusions. This study contributes to the existing literature by documenting that C&DIs (despite not being a formal regulation) are also associated with an increase in the quality of non-GAAP exclusions. Furthermore, the study investigates whether *Regulation G* and C&DIs decrease the probability of firms using positive exclusions to meet or beat analysts' forecasts. Results indicate that while *Regulation G* decreased the amount of total positive exclusions used to meet or beat analysts' forecasts, C&DIs relaxed the effect of *Regulation G*, increasing the amount of exclusions used to meet or beat analysts' forecasts. Finally, it is hypothesised that the market response, measured as earnings response coefficients (ERCs), will change. However, 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. The study finds an increase in the ERCs during the post-*Regulation G* period, but a reduction post-C&DIs period for firms using non-GAAP earnings.

Overall, results suggest that while *Regulation G* had its intended effects, results on C&DIs are mixed. An interesting tension arises from these mixed results. On the one hand, the introduction of C&DIs was to reduce compliance burden, and the results suggest that the introduction of C&DIs was successful in doing so in terms of an increase in the quality of exclusions. However, C&DIs also resulted in an increase in the use of positive exclusions to meet or beat analysts' forecasts and lower ERCs which highlight the unintended consequences of this regulatory intervention. As the results on C&DIs are mixed, future research is needed to further understand the costs and the benefits associated with the introduction of C&DIs.

A key limitation of this study 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 their press releases (Bhattacharya et al., 2003). Another limitation of the study is the use of future operating earnings as a measure for current disclosure relevance. This is only a valid approach if financial information users fixate on earnings, with non-GAAP earnings 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 provided in this study, using ERCs (which reflect a real market-formed consensus between investors), examines these phenomena while addressing the fixation issue. Alternative future return metrics have also been considered.

This study 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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