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Management's performance justification and failure to meet earnings thresholds

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Introduction

Performance justification with embedded causal language is a key component of management commentary reports. Regulators and standard-setters, such as the Securities and Exchange Commission (SEC) and the International Accounting Standards Board (IASB), have pointed to the need for more meaningful causal explanation of performance outcomes. For example, the IASB issued an IFRS practice statement 'Management Commentary' in 2010, claiming that a management commentary report should offer a context within which to interpret the performance, position and progress of the company. As a discursive practice, management commentary may, however, sustain impression management as well as informational purposes(Cho *et al.*, 2010).According to the IASB (2010), management should provide its perspective on the business and its analysis of the interaction of the relevant intervening factors to help users contextualize the firm's financial statements and understand management's objectives and strategies for achieving those objectives. In that regard, the management commentary report should supplement and complement the financial statements with explanations of the financial statement figures and the conditions and events that shaped that information (IASB, 2010). In a similar vein, the SEC argued that the basic requirement for the Management Discussion and Analysis report (MD&A) is to 'provide such other information that the registrant believes to be necessary to provide an understanding of its financial condition, changes in financial condition and results of operations' (SEC, 2002). How these framing objectives should be accomplished is largely left to the discretion of the reporting entity.

In this paper we use the term 'causal disclosure(s)' (and, relatedly, 'causal language intensity') for the whole range of performance explanation and justification that may arise in the discursive context of a management commentary report. As an institutional practice with a strong discretionary component, causal disclosures can be expected to reflect a firm's purposive sense-giving and remedial practices for maintaining or repairing interactional alignment with its intended audience. Given the prominence of performance explanation and justification in the mindset of regulators and standard-setters, the paucity of empirical research on the role and constraints of causal language in management

commentary is striking. From the overview article of Koonce, Seybert and Smith (2011) on causal reasoning in financial reporting and voluntary disclosure, it becomes clear that the concept of causal explanation has been central in a considerable body of behavioural and cognitive research in reporting-related fields, but that large-scale archival research on the presence, determinants and consequences of causal disclosure in management commentary is largely deficient. This research will partly fill this gap by looking into the association between the intensity of causal language and the presence of performance predicaments as incentives for remedial performance justification. Not meeting behavioural earnings thresholds, such as positive earnings, positive earnings change and analyst earnings expectations, is argued to be a significant accountability predicament to which firms tend to respond with more intense use of causal performance disclosures in order to affect audience perception and mitigate expected negative consequences of these events, such as increased market scrutiny induced by reported earnings, higher litigation risk, disproportionate adverse market reaction and lower firm reputation. Prior research provides only indirect evidence of how management might react to performance predicaments in its communication to outsiders. For example, Matsumoto, Pronk, and Roelofsen (2011) show that, in conference calls to analysts, discussions are generally longer when reported performance is poor and the time spent in explaining increases significantly when earnings benchmarks are missed. Brown and Tucker (2011) find that MD&A content increases significantly more after an earnings decline than after an earnings increase and conclude that this is probably due to longer and more differentiated discussion and explanations. In this paper we document that firms tend to increase their use of causal language and related performance justification in the MD&A section of the annual report in response to threshold-related financial predicaments. In addition, we provide evidence that the association between not meeting an earnings threshold and causal language intensity is strengthened in a weaker information environment.

Causal disclosure in management commentary reports typically tries to settle ‘why’ and ‘how’ corporate achievements and performance outcomes came about. Offering such outcome explanations responds to institutional expectations and accountability demands (SEC, 1989, 2002). For our purposes, the term ‘causal language’ refers to the broad portfolio of explanatory language used in response to those ‘why’ and ‘how’ questions. By

offering incremental information on the link between performance outcomes and its underlying antecedents, causal disclosure in accounting narratives is generally seen as a relevant and useful extension of the financial reporting model (Baginski *et al.*, 2000, Baginski *et al.*, 2004, Koonce *et al.*, 2011). Given its institutional embeddedness, causal language use may also reflect self-presentational practices to sustain interactional alignment with its institutional environment. In that respect, causal language use can be expected to become more intense, when a significant accountability predicament arises (Merkl-Davies and Brennan, 2007, Waring, 2007, Bloomfield, 2008, Sonenshein *et al.*, 2011). Not meeting a behavioural earnings threshold may be such a predicament. Prior research (*e.g.*, Degeorge, Patel, and Zeckhauser, 1999) typically identifies three behavioural earnings thresholds: positive profits (an earnings level threshold), sustaining recent performance (an earnings change threshold) and meeting analysts' earnings expectations (an analyst forecast threshold). Failure to meet these earnings thresholds are generally considered to be a serious performance predicament. Firms that miss these earnings benchmarks are likely to suffer disproportionate adverse reactions to the failure event. Additionally, missing earnings benchmarks is likely to engender increased market scrutiny of the reported earnings number, to heighten litigation risk and negatively affect firm reputation (Graham *et al.*, 2005). Given the remedial nature of causal language, firms missing earnings thresholds have strong incentives to mitigate expected adverse consequences by offering an interpretative framework to 'normalize' the performance environment, create an understanding of what happened and produce a degree of closure for the past and direction for the future (Orbuch, 1997).

In this study, we use automated content analysis of the performance-related MD&A sections of the 10-K filing of listed US firms to measure the intensity of causal language on performance and study its relationship with failure to meet earnings thresholds. Our sample covers a period of 10years, from fiscal year 1998 to 2008. Consistent with expectations, our results show a positive and significant association between threshold failure and causal language intensity. These results hold for alternative specifications of causal language intensity and for a model with a lagged dependent variable to control for sticky narrative behaviour. In addition, we document that the association between not meeting an earnings threshold and causal language use is stronger in a weak information

environment, where analyst following is low or non-existent. This suggests that the perceived adequacy of additional performance justification in the context of an accountability predicament is higher in a weak information environment with low information intermediation by third parties. Moreover, we document that firms that miss a key earnings threshold and use more causal language on earnings-related outcomes in their annual management commentary report, experience less share price volatility after the MD&A release, suggesting that causal language intensity may indeed be instrumental to attenuate negative share price reaction following the annual earnings failure news.

Our study extends the literature in several ways. First, to the best of our knowledge, this study breaks ground by examining the association between financial behavioural thresholds and causal language use in a large sample of US firms. It provides evidence of the close alignment between the failure to meet significant earnings thresholds and the use of causal language in commenting on performance outcomes. Additionally, it adds to the behavioural threshold literature by evidencing verbal behavioural responses to missing key earnings thresholds. Second, the study adds to the information disclosure literature by showing how failure to meet earnings thresholds drives the need to justify performance outcomes. Third, this study contributes to the impression management literature by underpinning the discretionary (selective) use of causal language on performance and by evidencing incentives for the remedial use of causal language in management commentary. The results of our research are consistent with the argument that public causal language use is basically a communicative act, driven by social and organizational needs (Buttny and Morris, 2001). In that sense, causal explanation is a discursive practice that can be used to posit a selective ordered representation of (incremental) cues that may be instrumental in changing or recasting the circumstantial meaning of a performance outcome (or one's responsibility for it) and thereby transform the audience's perception and evaluation of it.

In the remainder of the paper we first discuss the importance of causal language in management commentary as an accountability mechanism, the incentives provided by missing behavioural earnings thresholds for more intense causal language, and the potential impact of the firm's information environment. Second, we elaborate data and content analysis issues and present our empirical models. Next, we present the empirical analyses and results, followed by concluding remarks.

Causal language and accountability predicaments

Causal language use as an accountability mechanism

Causal disclosure in annual reports involves issues of strategic, moral, legal, circumstantial and practical conduct and refers to agency, strategy, difficulties, blame, responsibility, external forces, mitigating circumstances, accounting-technical issues, and the like. Causal language elaborating on performance outcomes is a key element in the management commentary section of annual reports and its linking of corporate achievements and outcomes with internal and external antecedents is generally seen as useful by regulators (SEC, 2002; IASB, 2010) and market participants(Baginski *et al.*, 2000, Baginski *et al.*, 2004, Koonce *et al.*, 2011). Causal language on performance commonly refers to internal and external intervening factors and may be provided in terms of unintentional causes, in terms of needs and motives or even so by elaborating accounting-technical calculative relationships (Aerts *et al.*, 2013). Causal disclosure can be effected using different linguistic and discursive formats (*e.g.*, through the use of verbs, particles, clausal structures, sequences of sentences) and can be indirectly displayed through descriptions of related events (Edwards and Potter, 1993, Antaki, 1994). In addition to commonly known structures of cause ("because"), causal reasoning may also refer to intention ('reasons') and circumstance (enabling or inhibiting factors)(Xu, 1999). In fact, it is the full range of discursive responses to the 'why' and the 'how' questions with regard to performance outcomes that matters for our purposes.

Causal disclosure as exhibited in management commentary reports conforms to institutional accountability demands (SEC, 1989) and is expected to facilitate accountability relationships between the firm and its institutional environment[1]. Telling the corporate story 'through the eyes of management' is a key objective of management

[1]The Securities and Exchange Commission (SEC) has promulgated considerable requirements and guidance for the form and content of management commentary reports. The general objective of the rules/guidance is to promote detailed discussion to assist users' interpretations of the information provided in the financial statements. The basic requirement for the MD&A is to 'provide such other information that the registrant believes to be necessary to provide an understanding of its financial condition, changes in financial condition and results of operations' (SEC, 2002). The MD&A is a mandatory report for all listed companies. Specific components of the MD&A are required by Regulation S-K, Item 303, SEC releases including 33-8056, 33-8182, 34-45321, 34-47264, FR-67 and the SEC Act 1934, section 13(j).a.

commentary as promulgated in normative guidelines (IASB, 2010; SEC, 1989). Firms narratively account for their actions, decisions and performance outcomes such that relevant others can make sense of what they have been doing for all practical purposes of the envisioned audience. In that respect, exhibited causal language is an ongoing feature of the accountability relationship between a firm and its external audience. Prior research shows, however, that accountability brings people to act as intuitive politicians (Tetlock, 1999), guided by the goal of maintaining good working relationships with the diverse constituencies to whom they believe they are accountable. Firms develop a coping attitude in their managerial sense-giving, contingent on the news content to be disclosed and the context of the disclosure process. In that vein, proactive as well as remedial discursive practices for securing interactional alignment with its intended audience can be expected in management commentary reports. Language is used to, mainly retrospectively, describe related experiences and events, and make them meaningful and comprehensible among audience constituents. By providing ordered representations of previously unordered external cues (Antaki, 1994), causal reasoning helps to build cognitive legitimacy and establish appropriateness and rationality. By connecting events and outcomes to causes, intervening factors and reasons, causal language prompts the critical elements of the firm's operating environment on which to judge the appropriateness and reasonableness of its actions and outcomes. This rationale-giving behaviour is generally expected in listed firms which act under strong norms of rationality(Staw, 1980) and may become especially important in a context of increased uncertainty (Blair, 2012). In such a context, the use of argument and proper reasoning can be expected to be effective in demonstrating competence(Gowler and Legge, 1983). As operational ambiguity increases, firms tend to be perceived as more effective when they are able to demonstrate evidence of rational and reasoned behaviour and provide appropriate causal disclosures, capable of explaining away perceived sources of ambiguity(Staw, 1980). Even if such verbal behaviour is to a large extent symbolic rather than substantive, it shows to be effective in changing audience perceptions of expertness, competency and credibility of the actor (Elsbach and Elofson, 2000).

As an institutionalized accountability mechanism, causal language in annual reports is likely to be embedded in routine narrative reporting schemes and exhibit a significant

degree of inertia. Explanatory assertions in annual reporting are framed to a large extent by repetitive common-sense typifications and understandings of antecedent-consequence relationships and even by taken-for-granted conventional accounting-technical relationships (Aerts, 1994, Aerts and Cheng, 2012). In this regard, Nelson and Pritchard (2007) show that MD&A disclosures are increasingly 'sticky' with a general tendency to 'cut and paste' disclosure from the prior year. Such a tendency may result in relatively rigid commentary patterns, with a preference for replicable, easily defensible and socially endorsed explanatory categories (Tetlock, 1985, Tetlock, 1999).However, there may be circumstances in which such relatively routine referencing frames become insufficient. A more active causal disclosure position may be triggered by actual accountability predicaments demanding remedial talk for problematic or questionable actions and/or performance outcomes (Messner, 2009).

Causal disclosure and failure events

Unexpected or untoward conduct and performance are generally regarded as problematic, because they make behaviour unpredictable and untrustworthy. If such events and outcomes are consequential and if relations are on-going, such acts call for a response that explains them in order to restore predictability and trust (Massey *et al.*, 1997). In a seminal paper, Scott and Lyman (1968) refer to this type of remedial explanation as 'accounts' [2] or verbal responses of an actor to an audience designed to protect a consequential relationship from the disruptive consequences of problematic events. Scott and Lyman (1968) define an account as "a linguistic device employed whenever an action is subjected to valuative inquiry" (p.46). Causal language ('accounts') is thus used to explain apparently troublesome events as understandable, or at least to minimize the actor's responsibility for them. When successful, accounts preventor repair, problematic situations and restore social equilibrium between participants(Buttny and Morris, 2001)[3].

[2]Scott and Lyman (1968) define accounts in a retroactive sense, as "statements made to explain unanticipated or untoward behaviour". Most authors on account-giving, approach public causal disclosures in that sense, although later research has acknowledged other, more proactive uses of accounts as well (Firth, 1995; Sonenshein *et al.*, 2011; Waring, 2007).

[3]Scott and Lyman's (1968) views are in this respect consistent with Goffman's (1959/1971) arguments about how people present themselves to others, often in a self-protective fashion. A core issue is to control the responsive conduct of others and this can be accomplished by providing accounts to nullify any negative implications flowing from failure events (Elsbach, 2003; Elsbach & Elofson, 2000).

Several arguments can be put forward to underpin the effectiveness of causal language use as a facilitator of ongoing accountability processes. First, causal explanation offers a supplementary source of information about the firm next to the financial accounting descriptive portrayed in the financial statements. While this supplementary information may be somewhat biased because of favourable impression management motives[4], it nevertheless offers additional information, with corresponding attributions about how respectable, responsible and credible a firm's management might be, based on the causal claims put forward. Moreover, actively pursuing such causal statements counteracts the audience's tendency to fill in the blanks[5] (Bruner, 1990). Second, in the absence of situational knowledge, disclosure recipients tend to suffer from actor-observer bias (Jones and Nisbett, 1971), whereby observers, when confronted with negative information on the actor's situation, will tend to make negative dispositional attributions regarding the actor (Weiner, 1985). The offering of situational knowledge with regard to the firm's performance environment could alleviate this phenomenon and lead to more positive attributions and related impressions on the side of the audience. The causal claims made by the firm could prompt audience members to make more positive dispositional attributions about the firm's management, such as whether management is trustworthy because of what he or she said. Causal statements would provide situational cues about a firm's performance environment necessary to provide a window into why the firm behaved and performed in a particular way (Shapiro *et al.*, 1994). This explanation provides context to the audience, thereby bringing the audience to forgive or reduce the negative perceptions they may have about the firm and its abilities. That is, once the message recipient has a better understanding of why a firm acted in a specific way or ended up in a particular situation, the recipient is less likely to make negative attributions about management's agency and competency. Such attributions, regardless of their ultimate veracity, affect decision-making (Sonenshein *et al.*, 2011). Third, providing causality-based information

[4]The social psychology literature, which has been a source of a lot of research on account-giving, usually assumes that account-giving involves a significant degree of 'reframing to the positive', whereby the meaning of an event or performance outcome is reframed in a more positive light (Leary & Kowalski, 1990; Schlenker, 1980).

[5]People tend to construct a story about an actor and his or her circumstances to make more abstract performance information concrete. Individuals often think in story form and causal statements provide an important way of completing the story (Bruner, 1990).

to external audiences is not costless and may be perceived as inconsistent with a firm's self-interest. Arguments related to proprietary costs, litigation risk and disclosure precedent avoidance support the view that external causal language is potentially costly (Aerts *et al.*, 2013).If the external audience perceives additional causal disclosure on performance as costly, it may consider the underlying messages as incentive-inconsistent and, thus, the firm's reporting attitude as more credible and trustworthy. Fourth, as an argument to the negative, one could also posit that the absence of the narrative causal framing of a firm's negative performance, the audience may reason that the firm is withholding important information relevant to the discharge of its responsibilities. Denial to give a proper explanation may be interpreted as an account in itself (Messner, 2009). This argument may be more relevant in the context of an ongoing accountability relationship where precedent is taken into account and may grow in importance when uncertainty increases.

Taken together, these arguments and auxiliary evidence (Sitkin and Bies, 1993, Kim *et al.*, 2004, Sonenshein *et al.*, 2011) support the facilitating role of causal language in fostering interactional alignment with the firm's external constituents and sustaining perceptions of appropriateness, reasonableness and, ultimately, credibility and trust. When conditions of risk and uncertainty increase, the need for credibility-sustaining mechanisms will become even more prominent. In this paper, we will more specifically investigate whether financial reporting related failure events, *in casu* not attaining behavioural earnings thresholds, significantly affect exhibited causal language use in firms' management commentary in annual reports. Although causal language in accounting narratives tends to behighly conventional and repetitive, we expect that causal disclosure in its remedial mode will be significantly triggered by such experiences of threshold failure.

Missing earnings thresholds as an accountability predicament

Behavioural thresholds in financial reporting

Prior accounting research has shown the importance of behavioural thresholds for both preparers and users of financial reporting (Burgstahler and Dichev, 1997, Degeorge *et al.*, 1999, Graham *et al.*, 2005), with earnings numbers performing a pivotal role in the benchmarks used by market participants. Reported earnings have taken up this role because they are generally endorsed, widely accepted and routinely available. They offer a most

convenient device for investor assessment and play an important role in equity valuation and contracting, such as debt negotiation and management employment and compensation contracts.

The prominent role of earnings numbers has promoted earnings benchmarks as behavioural heuristics used by a firm's key stakeholders when evaluating firm performance(Burgstahler and Dichev, 1997, Degeorge *et al.*, 1999).Such behavioural heuristics usually involve the use of reference points as thresholds and somewhat biased decision making around the threshold values as people exhibit greater sensitivity to losses than to equivalent gains (Barberis and Huang, 2001). Kahneman and Tversky's (1979) psychology-based 'prospect theory' would predict that people perceive a small negative difference relative to a reference point as roughly twice as displeasing as an equal-sized positive difference relative to that threshold would be perceived as pleasing. This perceptual pattern also grounds the behavioural tendency of 'loss aversion' and feeds significantly different risk attitudes when confronted with a loss or a gain relative to strongly held natural reference points (Koonce and Mercer, 2005, Fennema and Koonce, 2011).

The reference points are key in this respect as they determine whether the observed outcomes are perceived as gains or losses, whereby observers are disproportionally more sensitive to losses than to gains. Prior research has delivered ample evidence that at least the following three earnings thresholds are perceived as important: avoiding losses (an earnings level threshold), increasing earnings over last year's earnings (an earnings change threshold) and meeting earnings relative to financial analysts' earnings forecast consensus (an analyst forecast threshold). Burgstahler and Dichev (1997) and Degeorge*et al.* (1999) document that there is a higher than expected frequency of firms in the US with slightly positive reported earnings (and earnings changes) and a lower-than expected frequency of firms with slightly negative reported earnings (and earnings changes). Such discontinuities in the distributions are consistent with managers trying to beat the earnings thresholds in question. In their survey of financial executives of public US firms, Graham *et al.* (2005) reveal that respectively 65.2%, 73.5% and 85.1% of the respondents agree that the earnings level, earnings change and analyst forecast benchmark are important. Beating those benchmarks are seen as important for building credibility with the capital market and

maintaining or increasing the firm's stock price. Moreover, implicit contracts of capital market participants and management tend to be defined in terms of such simple thresholds. For example, prior research shows that shareholders are likely to increase their monitoring activities when a loss or a decline in earnings is reported, with significant knock-on costs for management in the form of reduced compensation and an increased probability of dismissal. Another reason might be the fear that failing to meet a threshold will result in a large decline in stock price (Graham *et al.*, 2005).

Prior research robustly documents that, after controlling for the magnitude of earnings performance, firms that beat earnings benchmarks have higher equity valuations than those missing the thresholds. For example, Barth *et al.* (1999) find that firms that consistently exceed previous years' earnings have higher price-earnings multiples than firms without consecutive increases, and that when the pattern is broken, price-earnings multiples decrease significantly. Brown and Caylor (2006) find positive abnormal returns around quarterly earnings announcements for firms reporting a profit, earnings increase, or beating analysts' earnings forecasts (or any combination of these events). Bartov*et al.*(2002), and Kasznik and McNichols (2002) find that firms meeting or beating analysts' earnings forecasts have higher abnormal returns and higher earnings response coefficients than firms that do not, and this relationship persists after controlling for risk and growth. Consistent with this, Skinner and Sloan (2002) document that growth stocks in the US tend to exhibit an asymmetrically large negative price response to negative earnings surprises. Focusing on debt market consequences, Jiang (2010) finds that beating earnings benchmarks is associated with a lower cost of debt.

Beating earnings threshold may also be motivated by managerial compensation concerns. Cheng and Warfield (2005) report that firms with high equity incentives (proxied by option grants, unexercisable options, exercisable options, stock grants and stock ownership) are more likely to meet or just beat analyst forecasts. Relatedly, Matsunaga and Park (2001) find that CEOs' cash bonuses are significantly lower when firms miss analyst forecasts or experience earnings decreases.

Given the market consequences of beating the earnings thresholds, it is not surprising to observe that earnings benchmarks hold strong incentives for earnings management (Dechow and Skinner, 2000). Prior research shows that the incidence of earnings

management is particularly pronounced when earnings fall below earnings thresholds. The cross-sectional distribution approach of Burgstahler and Dichev (1997) and of Degeorge*et al.* (1999) (see above) provides first evidence of the frequency of earnings management around earnings benchmarks. Burgstahler and Eames (2006) find similar cross-sectional results for the analyst forecast threshold ('Missed earnings consensus').

Missing earnings thresholds as a failure event

The capital market reaction to missing earnings thresholds is likely to be considerably worse in absolute terms than potential benefits from beating those thresholds. For example, Skinner and Sloan (2002, p.299) measure these adverse consequences and document that growth firms missing analyst forecasts by 0.5% of stock price bear a significantly negative abnormal return of minus 10% to minus 15%. Moreover, missing earnings benchmarks is likely to engender increased market scrutiny of the reported earnings number and closer monitoring of management contracts, to heighten litigation risk and negatively affect corporate reputation (Graham *et al.*, 2005). These negative expectations constitute considerable incentives for firms missing earnings thresholds to mitigate or ease the adverse consequences of the threshold failure event. Given its remedial potential, causal disclosure on performance outcomes could be highly instrumental in reducing the negative implications flowing from a threshold-related accountability predicament. Being instrumental in (re-)establishing order in shared experiences, causal language provides interpretative cues to 'normalize' the performance environment, creating an understanding of what happened and leading to a greater sense of control of the current situation. Consequently, it produces a degree of closure for what happened in the past and a sense of direction and of what can be expected for the future (Orbuch, 1997). This could be done, *inter alia*, by presenting events and performance outcomes as resulting from intentional, reasoned and goal-directed behaviour and by disclosing descriptive causal mechanisms which normalize predicaments to a certain extent or at least imply direction of how future events may or should evolve.

In the accounting literature, Graham *et al.* (2005) indicate that missing earnings benchmarks would necessitate additional investment in time and effort in order to justify the predicament. Relatedly, it has been suggested that investors demand more complete

explanations for poor performance (Bloomfield, 2008). Matsumoto, Pronk, and Roelofsen (2011) document that, in conference calls to analysts, discussions are generally longer when reported performance is poor and the time spent in explaining increases significantly when earnings benchmarks are missed. In such a context of failed expectations, the focus shifts from a more prospective stance to talking about the 'why' of past performance results (Graham *et al.*, 2005). When examining inter-temporal changes in MD&A content, Brown and Tucker (2011) find that MD&A content increases significantly more after an earnings decline than after an earnings increase and conclude that this is probably due to longer and more differentiated discussion and explanations. Moreover, prior research in the field of narrative impression management assumes that the remedial nature of account-giving and related causal language often implies that explanatory activity tends to portray the actor offering the explanations in a more positive light. Whether true or biased, such explanations can provide important diagnostic information in times of uncertainty through delivering broader (even if partial and potentially misleading) situational knowledge (Sonenshein *et al.*, 2011). One way of providing more situational knowledge is through using a wider repertoire of causal claims. This can be done by using multiple causal explanations for single performance outcomes, by broadening the range of arguments used (*e.g.* by elaborating more explicit cause-effect and agency relationships, possibly in a more self-serving way) and by searching for positive news (Aerts, 2005), commenting on additional segment or fragmented performance outcomes which enable the firm to reposition the diagnostics of its performance environment and stress more positive performance metrics. In line with these arguments, we predict a significant positive association between missing behavioural earnings benchmarks and the intensity of causal language when performance outcomes are commented on the in management commentary report.

Impact of information environment

The adequacy of the use of more performance justification in management commentary to mitigate adverse consequences of earnings threshold failure may, however, depend on the quality of the firm's information environment. A firm's framing activities may be considerably less effective in changing audience perception in a strong information environment with prominent and timely interpretation and monitoring channels than in an

environment where management commentary is the primary source of performance interpretation.

The extent of analyst coverage is generally seen as a key determinant of the quality of a firm's information environment and tends to interact with a firm's disclosure policy. The effectiveness of external monitoring and the market liquidity of its shares are enhanced when the number of analysts following the firm is higher (Lang and Lundholm, 1996). Moreover, prior studies (Imhoff and Lobo, 1992, Marquardt and Wiedman, 1998) argue that analyst following functions as a proxy for the amount of company information that is publicly available. If analyst information is quickly disseminated to large numbers of market participants, then high analyst following represents a good information environment for uninformed and partially informed market participants.

As information intermediaries, financial analysts add information value through two distinct roles: the discovery of private information and the interpretation of public information (Asquith *et al.*, 2005). Prior research finds evidence for both roles (Shores, 1990, Francis *et al.*, 2002; Frankel *et al.*, 2006, Chen *et al.*, 2010, Livnat and Zhang, 2012). Chen *et al.* (2010) argue that both roles are important and that the relative prevalence of one of both depends on the timing of the release of the analyst reports relative to the firm's earnings announcement, with information discovery being dominant before the earnings release and information interpretation after the earnings announcement.

When financial analysts discover and publish material private information, this will tend to pre-empt subsequent corporate disclosures (Chen *et al.*, 2010). In such circumstances, management's causal disclosures would become less useful. Consistent with this, Dempsey (1989) and Shores (1990) document that the information content of earnings announcements decreases with analyst following. Similarly, Bushee *et al.* (2003) find that firms with greater analyst following were more likely to prefer closed over open conference calls. The interpretation role of analyst reports, on the other hand, would lead to the interpretation of existing public information and could add to, but also substitute for interpretive material provided by corporate management. Especially the information discovery role of analysts suggests that the relative importance of corporate disclosures, and of causal performance disclosures in particular, would be significantly reduced by the availability of non-corporate information sources and of analyst reports in particular. Firms

with larger analyst following already tend to provide more voluntary disclosure and may not be in a position to significantly increase qualitative disclosures or to add to public information provided by analyst intermediation when earnings thresholds are missed. Moreover, analyst following pressure may lead to earlier disclosure of bad news by firms with many analysts so that the effectiveness of performance justification in management commentary would be negatively affected.

Data and content analysis

Sample

This study examines the association between behavioural financial thresholds and the use of causal language when commenting on earnings-related financial outcomes in the MD&A section of the 10-K filing of US firms, covering the ten-year period of fiscal years 1998 to 2008. We collect our data from the following datasets: CRSP/COMPUSTAT Merge (CCM), Compustat segment file, CRSP monthly stock return file (annually updated) and SEC Edgar. The MD&A sections of the 10K-filing are downloaded from SEC Edgar and the causal language content is identified and measured through automated text analysis procedures (see below).

Measuring causal language intensity

We use PERL coding and Java procedures to perform programmed content analysis of a firm's management commentary with regard to performance outcomes. PERL has been used successfully in prior accounting research. Leone, Rock, and Willenborg (2007) use PERL to analyze text on the use of IPO proceeds in IPO prospectuses. Li (2008) uses PERL to extract MD&A text from the 10-K filing of US firms in order to investigate readability and related issues. In this study, Java and PERL will enable us to (1) download 10-K filings from the SEC Edgar database, (2) extract relevant Management Discussion and Analysis (MD&A) sections from the filing, (3) extract performance-related paragraphs, and (4) measure causal language content. In the following, we describe the content analysis process by elaborating these four steps.

Step 1 - Downloading the electronic 10-K filing

We use Java to download the 10-K filings (annual reports) of our sample firms for the period 1997-2009 from the SEC Edgar ftp website[6]. We use an external open source java package, FTP[7] Client Apache package[8] in this phase of programming. We first download the company index files from SEC Edgar. Each company index file contains the firm name, central index key (*i.e.* CIK), report type, report URL, and so on. Then, we filter out all information that relates to the 10-K filing (*i.e.* company name, URL, and CIK). The CRSP/COMPUSTAT Merge (CCM) database and the SEC Edgar data both include a central index key (*i.e.* CIK code) as an identifier. In general, each firm has an unique CIK code. We retain the CIK code for later data merge purposes. Finally, we download the 10-K filing using the company index file.

Step 2 - Extracting the MD&A sections from the 10-K filing[9]

Each file is analyzed twice (*i.e.* in two rounds). First, we process the file line by line. Then, in a second round, we process the file paragraph by paragraph (for reasons elaborated below). Consistent with Li (2008) we next proceed as following:

a) Transfer html language to plain text language- First, we extract 'central index key', 'conformed period of report' (refers to fiscal year end date), and 'filed as of date' (refers to 10-K filing submitting date) from each 10-K filing. Second, all the tables that begin with <TABLE>[10] and end with </TABLE> are deleted[11]. All the paragraphs that contain <S> or <C> are also deleted. Third, we replace html language format ' ' with blanks and remove other html language format[12]. Finally, we clean each file again by reading paragraph by paragraph (i.e. the second round), to make sure that all the tables, tabulated

[6] http://ftp.sec.gov

[7] FTP is an acronym for File Transfer Protocol. FTP is used to transfer files between computers on a network. You can use FTP to download files from remote computer accounts.

[8] http://www.apache.org/licenses/LICENSE-2.0

[9] We move to PERL coding in step 2 and step 3. We follow Li's (2008) MD&A section extraction procedures.

[10] All html tag language is matched on a case-insensitive basis.

[11] Li (2008) notes that <S> and <C> html tags are used by some firms to present tables

[12] Li (2008) replaces all html tags with blanks. We believe that our treatment will deliver similar results as Li (2008), since we already replaced ' ' with blanks. Moreover, it is possible that some files may use html tags to decorate the MD&A section header. If we replace these html tags with blanks, it may cause a defective matching pattern. For example, if we replace in the extract '<B>M</B>anagement's discussion and analysis…' the html tag (*i.e.* <B> and </B>) with blanks, the line would become: ' M anagement's discussion and analysis…', whereas if we remove the html tag, the line would be read as: 'Management's discussion and analysis…'.

text or financial statements are excluded. In this round, all the paragraphs with more than 50% of non-alphabetic characters (*e.g.* white spaces or numbers) are deleted.

b) Extract the MD&A section- Within the remaining text, the program first removes the leading and tailing blanks in each line. The MD&A section is the content lying in between the starting matching content (i.e. the 'starting point') and the ending matching content (i.e. the 'ending point'). The program identifies a line that satisfies one of the following criteria as the beginning of the MD&A section (i.e. starting point): (1) the line starts with 'management's discussion'; (2) the line contains both of 'management's discussion' and ('item' + one or more white space + '7') or ('item' + one or more white space + '6')[13] and does not contain the word 'see', 'refer to', or 'refers to'; (3) the line starts with 'management's discussion'; or (4) the line contains 'management's discussion' and ('item' + one or more white space + '7') or ('item' + one or more white space + '6') and does not contain the words or phrases: 'see', 'refer to', or 'refers to'. We save the matching content of the beginning MD&A section (i.e. starting point).

The program identifies a line that satisfies one of the following criteria as the ending of the MD&A section (*i.e.* ending point): (1) the line begins with 'Financial Statements'; (2) the line contains 'item'+ one or more white spaces + '8' and the matching content of the beginning of the MD&A section (*i.e.* starting point) does not contain '6'; (3) the line contains 'Supplementary Data'; or (4) the line begins with 'SUMMARY OF SELECTED FINANCIAL DATA'; (5) the line contains 'item'+ one or more white spaces + '7' and the line does not contain 'management' and the beginning of the matching content contains '6'.The MD&A section is the content lying in between the starting matching content and the ending matching content. If the matching content (*i.e.* MD&A section) is less than 20 lines, the program re-searches the starting point and the ending point. The MD&A extraction program will stop when the matching content is larger than 20 lines, or when the end of the file is reached.

Step 3 - Extracting financial performance related paragraphs from the MD&A section

First, we split each identified management commentary text into paragraphs. The paragraph is based on PERL's paragraph definition. Second, we identify whether the

[13] We add the 'item 6' into the beginning matching pattern, because some firms present their MD&A section in item 6.

paragraph contains performance-related content, based on a dictionary of 'financial performance' items. If a paragraph includes at least one of the words in the performance word list, it is retained for further analysis. The dictionary list contains expense-related words and income-related words. The expense-related word list includes the following words or phrases: amortization, cost, depreciation, disposition, expense, research and development, R&D, impairment, loss, write off. The income-related word list includes earnings, EBIT, income, sale, revenue, profit, margin, benefit, break even, contribution, EPS, and return.Before identifying causal language content, we correct for dot-signs such as: 'i.e.' to 'ie', 'U.S.' to 'US', 'No.' to 'number', 'Corp.' to 'corporation', 'et al.' to 'et al'.

Step 4 - Measuring causal language content

For each performance-related paragraph identified in the previous step, we identify two types of measures of causal language content: a word-based and a sentence-based measure. We measure 'causal language word intensity' by counting the relative frequency of causal words in the performance-related paragraphs of the MD&A. The identification of the causal words is based on a list of causal words of the LIWC software package. Linguistic Inquiry and Word Count (LIWC) is a text analysis software program designed by James W. Pennebaker, Roger J. Booth, and Martha E. Francis[14]. It is an automated content analysis software for the purpose of analyzing linguistic features of text. The software[15] processes text on a word-by-word basis and calculates the number of words that match pre-defined word categories (Pennebaker *et al.*, 2007, Merkl-Davies and Brennan, 2011). According to LIWC, insertion of causal words in a sentence has a substantial impact on comprehension and memory for text. The LIWC causal words list is shown in Appendix A. Causal language word intensity is thus measured as the amount of causal words scaled by total number of words in the performance-related MD&A paragraphs.

An alternative measure (referred to as 'causal language sentence intensity') is based on a sentence[16] as unit of analysis. A causal language sentence is defined as a sentence that

[14]http://www.liwc.net/

[15]The LIWC Dictionary is composed of 2,290 words. Each word or word-stem defines one or more word categories or sub-dictionaries. For example, the word 'cried' is part of four word categories: sadness, negative emotion, overall affect, and a past tense verb. Hence, if it is found in the target text, each of these four sub-dictionary scale scores will be incremented. Many of the LIWC categories are arranged hierarchically.

[16] A sentence is identified on the occurrence of a dot '.', after the procedure explained in step 3 of the content

includes at least one of the causal words of the LIWC causal words list. Examples of causal language sentences with identified causal words are shown in Appendix C. Causal language sentence intensity is measured as the amount of causal language sentences in the performance-related MD&A paragraphs scaled by the total number of sentences in the performance-related MD&A paragraphs. Whereas the causal language sentence intensity measure may better capture the 'reasoning' feature which stresses causal phrases and interconnected causal discourse, the causal language word intensity allows to account for multiple causal disclosures within one sentence.

Empirical models

Base model

We model the association between causal language intensity and earnings thresholds as follows:

$$
\begin{aligned}
&Causal\ language\ intensity_{it} \\
&= constant \\
&+ \gamma_1 Profit2loss_{it}(\gamma_2 Earnings\ decline_{it}, \gamma_3 Missed\ earnings\ consensus_{it}) \\
&+ \beta_1 Analyst\ following_{it} + \beta_2 ROA_{it} + \beta_3 Sales\ growth_{it} \\
&+ \beta_4 Litigation - sensitive\ industry_{it} + \beta_5 Firm\ size_{it} + \beta_6 Return_{i,t-1} \\
&+ \beta_7 Discretionary\ accruals_{it} + \sum \beta_i Year\ dummies + \sum \beta_j Industry\ dummies \\
&+ \varepsilon_{it}
\end{aligned}
$$

(Base model)

The base model is examined using panel data regression adjusting for standard errors and clustering at firm level on a sample ranging from 1998 to 2008. In our tests we use causal language word intensity and causal language sentence intensity as proxies for management's performance justification. We use three indicator variables for behavioural earnings thresholds; 'Profit2loss', 'Earnings decline', 'Missed earnings consensus'. 'Profit2loss' is an indicator variable that equals 1 if the firm made a profit in the previous

analysis procedures.

year (year t-1), but suffers a loss in the current year (year t), and 0 otherwise. Profit or loss is measured as earnings before extraordinary items. 'Earnings decline' is an indicator variable which equals 1 if a firm's earnings before extraordinary items in year t is less than earnings before extraordinary items in year t-1, otherwise 0. 'Missed earnings consensus' is an indicator variable which equals 1 if a firm's actual EPS minus the mean of the forecasted EPS is less than 0, otherwise 0. The latter values are taken from the IBES summary database, with the recording date set as that most closely preceding the earnings announcement date. So, the missed earnings consensus dummy equals 0 if a firm meets or beats the average analyst's earnings forecast or if the firm lacks analyst coverage and, as such, does not have a forecast threshold concern. We use the following control variables: analyst following, return on asset (ROA), sales growth, litigation-sensitive industry dummy, firm size, annualized adjusted stock return in prior year. Analyst following stands for the number of analysts following the firm.

Prior research shows that there is a significant association between corporate information disclosure and analyst following (Biddle *et al.*, 2009, Lehavy *et al.*, 2011). Firms with greater information intermediation provide better quality information. Analyst following is a proxy for quality of the firm's information environment (Frankel *et al.*, 2006). The number of analysts is taken from the IBES summary database, with the recording date closest to (but preceding) the earnings announcement date. Consistent with prior research, missing values of analyst following[17] are assumed to be zero (Barth *et al.*, 2001, Lehavy *et al.*, 2011). As a robustness check, we also test the Base model in a reduced sample retaining firms that are covered by at least one analyst.

The firm's profitability level, growth potential, and litigation risk have been shown in prior research to significantly affect the quality of disclosure (Ohlson, 1995, Abrahamson and Amir, 1996, Penman, 1998, Aerts and Tarca, 2010). Miller (2002) finds that managers' disclosure choice is associated with firm performance. We use ROA as a proxy for profitability level, measured as earnings before interest and taxes divided by total assets. Sales growth is used to control for firm growth and for mergers and acquisitions(Harford, 2005, Doyle *et al.*, 2007). Sales growth is defined as change in sales (*i.e.* sales in the current

[17] We also test our models after we drop analyst following. Results are largely unchanged (*i.e.* sign of coefficients and significance level).

year minus previous year sales) scaled by total assets. We use the natural logarithm of a firm's market value to proxy for firm size.

We use a litigation-sensitive industry dummy to control for ex ante litigation risk (Kim and Skinner, 2011). Arguments on how disclosure affects litigation risk go both ways. Field *et al.* (2005) find evidence that disclosure deters litigation. Brown *et al.* (2005) document that higher litigation risk firms provide more disclosure. Johnson*et al.* (2001) show that firms with high litigation risk issue more earnings forecasts including specific quantitative as well as qualitative information. On the other hand, voluntary disclosure can be used by plaintiffs as evidence of managerial mis-representation. Rogers and Van Buskirk (2009) suggest that firms tend to reduce their information disclosure level after litigation. In line with this, Cao and Narayanamoorthy (2005) present evidence that firms with higher litigation risk provide less disclosure. Because of the potentially ambiguous relationship between causal disclosures and litigation risk, we control for litigation risk but refrain from directional predictions. Kim and Skinner (2011) confirm that industry and litigation risk are related. We include a litigation-sensitive industry dummy which equals 1 if the industry classification 'SIC' code is within the following ranges: 2833-2838 (Biotech firms), 3570-3577 (Computer firms), 3600-3674 (Electronics firms), 5200-5961 (Retail firms), 7370-7374 (Computer firms) and 8731-8734 (Biotech firms), and 0 otherwise.

Since a firm may manage earnings to avoid missing earnings thresholds, we use discretionary accruals to proxy for earnings management (Rusmin, 2010).Most empirical earnings management studies decompose total accruals into discretionary accruals and non-discretionary accruals and employ aggregate discretionary accruals regression models, such as the modified Jones model or a performance-adjusted modified Jones model for estimation purposes (Jaggi *et al.*, 2009). In this study, we use the performance-adjusted modified Jones model in an industry and year cluster-based estimation. Total accruals are estimated as follows:

$$\frac{TAC_{i,t}}{TA_{i,t-1}} = \beta_1 \frac{1}{TA_{i,t-1}} + \beta_2 \frac{\Delta SALES_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{TA_{i,t-1}} + \beta_4 ROA_{it} + \epsilon_{it}$$

The use of beginning total assets as a deflator is intended to mitigate heteroskedasticity concerns. $TAC_{i,t}$ stands for total accruals. Total accruals is defined as earnings taken from the cash flow statement minus cash flow from operations, also taken from the cash flow statement (Ball and Shivakumar, 2006). $\Delta SALES_{i,t}$represents change in sales.$\Delta TR_{i,t}$stands for change in trade receivables. $ROA_{i,t}$ return on assets, is the financial performance proxy. $PPE_{i,t}$ is defined as gross property, plant, and equipment. We predict the value of the error term and use the predicted error term as our proxy for discretionary accruals. In addition, all our regressions include industry-fixed effects and year-fixed effects to capture variation in causal disclosures across industries and over time.

Sensitivity test: Base model with additional control variables and a reduced IBES sample

We use a lagged model (adding a lagged dependent variable to the base model) to test the robustness of the association between missing earnings thresholds and performance justification after taking into account the stickiness of narrative disclosure behaviour. Lagged causal language intensity is added to the base model in order to capture inertia in causal disclosures. Adding the lagged dependent variable also controls for omitted variables in the base model. However, in a lagged model the coefficient on the lagged dependent variable tends to dominate the regression and may lead to over-specification of the model. This may affect the coefficients and significance levels of the other independent variables. In addition, we also add the following control variables: capital intensity, leverage, industry concentration, and the natural logarithm of the market-to-book ratio. The market-to-book ratio is a proxy for a firm's growth potential and is measured as the market value of equity at the end of the fiscal year divided by the book value of equity at that date. Leverage is an indicator of financial risk and tends to be associated with disclosure level (Korfiatis *et al.*, 2008, Aerts and Cheng, 2011). Higher financial leverage could induce firms to become more sensitive to impression management (Aerts, 2005). We measure leverage as total long-term debt divided by total assets. Capital intensity may drive the need for causal disclosures (Aerts, 2001, Aerts and Cheng, 2011), and is measured as gross property plant and equipment on total assets. As argued before, causal disclosure may be costly due to proprietary costs. We use industry concentration to proxy for proprietary costs

of disclosure. We measure industry concentration using the Herfindahl index, which is calculated as

$$\text{Herfindahl}_j = \sum_{i=1}^{I} s_{ij}^2$$

where s_{ij} is the market share of firm i in industry j. As higher industry concentration means a less competitive environment and lower proprietary costs, we expect causal language intensity to be positively related to industry concentration.

Moreover, we also test whether our main results hold in a reduced I/B/E/S sample, where we limit the observations to firms with at least one analyst following the firm.

Empirical results

Table 1 presents descriptive statistics of the dependent and independent variables[18]. Average causal language word intensity amounts to2.80, meaning that the performance-related management commentary contains on average 2.80% causal words as defined in the LIWC word lists. With regard to the sentence-based measure, we document that on average 42.74% of the relevant management commentary sentences, contain at least one of the LIWC causal words.

<Insert Table 1 here>

The average of 'Profit2loss' (one of the threshold indicator variables) is 0.10, meaning that about 10% of the firms showing a profit in the prior year (t-1), suffer a loss in the current year (t). For the two other threshold indicator variables, the average 'Earnings decline'is0.42, and the average 'Missed earnings consensus amounts to 0.36. So, about 42% of our sample firms (firm-years) fail to show an increase in earnings, while 36% of the firms fail to meet financial analysts' earnings consensus. Firms are, on average, followed by 4.46 analysts. The median value of analyst following is however equal to two, indicating

[18] All variables are winsorized at the 95% level.

a highly skewed distribution with more than 50% of the sample firms having less than three analysts following the firm[19]. The mean for the natural logarithm of a firm's market value is 5.68. Thirty-one percent of the observations in our sample relate to a firm operating in a litigation-sensitive industry.

<Insert Table 2 here>

Table 2 shows the correlation matrix for the causal language measures, the earnings threshold indicators and the control variables of the base model. As expected, the two causal language intensity measures are highly correlated and are also significantly and positively correlated with the three earnings threshold variables, indicating miss one of the earnings thresholds is positively related to more intense performance justification. Analyst following is positively correlated with both the word-based causal language measure (0.027) and with the sentence-based causal language measure (0.013), suggesting that firms with a more developed information environment (more analyst intermediation) provide more causal disclosures and, thus, higher quality disclosures. The correlation coefficients of the litigation-sensitive industry indicator and the causal language measures are significantly positive, indicating a strong positive relationship between litigation-sensitivity and intensity of causal disclosures. The correlation coefficients between the other control variables of the base model are relatively low.

<Insert Table 3 here>

Table 3 presents findings (regression coefficients and corresponding t-value in parentheses) for the association of missing the earnings thresholds and performance justification (causal language intensity) adjusted for standard errors and clustering at firm level. Models 1, 2, and 3 of Table 3 show the results of causal language word intensity regressed on the three types of earnings threshold failure respectively. Models 4, 5 and 6 of Table 3 show the results of similar causal language sentence intensity regression models.

[19] Following Barth *et al.* (2001) and Lehavy *et al.* (2011), missing values for analyst following are assumed to be 0.

Overall, the results are consistent with our predictions. Model 1 and Model 4 of Table 3 show that 'Profit2loss' is positively and significantly associated with causal language intensity (t = 3.026, p = 0.001; t = 4.233, p = 0.000). Model 2 and Model 5 of Table 3 indicate that 'Earnings decline' is also positively and significantly related to causal language intensity (t = 2.741, p = 0.003; t = 2.437, p = 0.008). In Model 3 and Model 6 of Table 3, the coefficient of the 'missed earnings consensus' indicator also proves to be positive and strongly significant (t = 3.707, p = 0.000; t = 3.255, p = 0.001). The overall positive and significant relation between the earnings threshold failure indicators and causal language intensity is consistent with the argument that firms tend to increase their use of causal disclosures on performance (performance justification) in the MD&A section of their annual reports in response to threshold-related financial predicaments. The association between the level of discretionary accruals and causal language intensity is positive and significant in all models of Table 3, suggesting that firms provide more causal disclosures when earnings management propensity is higher. The coefficients of the litigation-sensitive industry dummy are generally positive and significant, indicating that firms with higher ex ante litigation risk tend to provide more causal disclosures on performance outcomes. This finding is consistent with the argument that disclosure is able to deter litigation risk to some extent (Field *et al.*, 2005).

<Insert Table 4 here>

Table 4 presents regression results with regard to the impact of the firm's information environment on the relationship between earnings threshold failure and performance justification. Models 1, 2 and 3 use causal language word intensity as dependent variable, while Models 4, 5 and 6 of Table 4 report on causal language sentence intensity. 'Low analyst following' is a binary indicator which equals 1 if the number of analysts following the firm is less than the median value of analyst following, otherwise 0. Table 4 shows that the association between the intersection term (earnings threshold failure × low analyst following) and causal language intensity is generally in the expected direction, but that the significance levels differ for the different models with generally higher significance for the causal sentence intensity measure. Overall, these results do suggest that firms which

fail on an earnings threshold, tend to use more performance justification in a weak information environment with low or non-existing analyst intermediation. Differences in the significance level and robustness of the results may be related to the fact that managers do not equally weigh the three earnings thresholds. The relations between causal language intensity and the other control variables are similar as the results documented in Table 3.

<Insert Table 5 here>

Table 5 presents findings for the association of missing earnings thresholds and causal language intensity after adding more control variables and of the Base model in a reduced I/B/E/S sample, where we limit the observations to firms with at least one analyst following the firm. In general, the coefficients and significance levels of the threshold failure indicators are similar as those in Table 3. The lagged dependent variable is positively and significantly associated with causal language intensity, suggesting a strong routine or inertia factor in causal language use in MD&A. The fact that the predicted association holds after taking into account the stickiness of causal disclosure, adds to the robustness of our main findings.

Supplementary tests to assess the effectiveness of causal language intensity

In the following tests we will assess the effectiveness of causal language intensity in performance justification by investigating its association with abnormal stock return volatility. Zhang (2006) finds that firms with greater information uncertainty tend to exhibit relatively higher expected return volatilities. This suggests that if causal language intensity would be capable of effectively attenuating adverse consequences of unfavourable earnings news (and reducing related information uncertainty), stock return volatility should be lower for firms providing more causal disclosures in their performance commentary after an earnings failure event.

We investigate the association of causal language intensity and abnormal stock return volatility during an event period following the 10-K filing date of firms missing an earnings threshold. In Table 6, we regress the causal language intensity proxies on abnormal stock return volatility for the subsamples of firms missing positive earnings (Profit2loss - Model

1), for firms experiencing a decrease in earnings (Earnings decline -Model 2) and for firms missing financial analysts' consensus earnings (Missed earnings consensus - Model 3). If causal language intensity is effective in attenuating the negative consequences of missing a behavioural earnings benchmark, we expect a negative association between the volatility of a firm's abnormal stock return in the event period after the 10-K release date and the intensity of causal language in the accompanying performance commentary. We use the following empirical models:

$$Abnormal\ stock\ return\ volatility_{it} = constant + \gamma_1 Causal\ language\ intensity_{it} + \beta_1 Analyst\ following_{it} + \beta_2 ROA_{it} + \beta_3 Sales\ growth_{it} + \beta_4 Litigation - sensitive\ industry_{it} + \beta_5 Firm\ size_{it} + \beta_6 Return_{i,t-1} + \beta_7 Discretionary\ accruals_{it} + \beta_8 Filing\ time\ lag_{it} + \sum \beta_i Year\ dummies + \sum \beta_j Industry\ dummies + \varepsilon_{it}$$

(Abnormal stock return volatility model)

We use event study methods to measure abnormal stock return volatility. Firstly, we use CAPM to predict the abnormal stock return in both the event period and the non-event period (with, alternatively, an event window of 3 days, 5 days, and 10 days).The event window is measured as a specific number of trading days after the 10-K filing date. The non-event window is defined as a specific number of trading days following a period of 30 days after the10-K filing release. Secondly, we calculate the standard deviation of the firm's abnormal stock return in the event period and in the non-event period. Finally, we measure abnormal stock return volatility as the standard deviation of a firm's predicted abnormal stock return during the event window scaled by the standard deviation of predicted abnormal stock return in the non-event window. With regard to causal language intensity, we use both the word-based measure (causal word intensity) and the sentence-based measure (causal sentence intensity). We control for analyst following, litigation-sensitive industry, adjusted stock return, sales growth, ROA, firm size, and discretionary accruals[20]as in the base model. Moreover, firms may provide causal disclosures in their

[20] Variables as defined and measured for the Base model.

annual earnings announcement. If the date of the earnings announcement precedes the 10-K filing date, this may pre-empt the effect of the annual report causal disclosures[21].In this regard, we control for the number of days between the earnings announcement date and the 10-K filing date ('filing time lag') in our model.

<Insert Table 6 here>

Table 6 documents the main regression results for the three subsamples of firms missing one of the behavioural earnings thresholds. Overall, the association between causal language intensity and abnormal stock price volatility is negative, but significance levels vary. With regard to the 3-day event window, the association between causal word intensity and abnormal stock return volatility becomes significant in Model 2 (t = -1.932, p = 0.053)[22] and Model 3 (t = -2.964, p = 0.003). Similarly, the relation between causal sentence intensity and abnormal stock return volatility is negative (t = -0.076, p = 0.939) in Model 1, but becomes stronger and significant in Model 2 (t = -1.777, p = 0.076) and in Model 3 (t = -2.502, p =0.012). In a 5-day event window, the association between causal language intensity and abnormal stock return volatility is negative and significant in all three models. The association between causal language intensity and abnormal stock return volatility in the 10-day event window shows a similar pattern. Overall, these consistent results suggest that more intense use of causal language in performance commentary may indeed be effective in reducing investors' negative reaction when a firm communicates an earnings-related predicament.

Concluding remarks

Causal disclosure on performance as displayed in management commentary reports is largely discretionary and offers considerable leeway to develop coping mechanisms to handle accountability demands. In this paper, performance justification (causal disclosures

[21]To the extent that a firm's annual earnings announcement includes causal performance disclosures, these are typically much less extensive than those in the MD&A report and tend to extract some key factors from the MD&A report. If there is a time gap between the date of the earnings announcement (including causal disclosures) and the filing date of the 10-K filing, this would work against finding the results that we document.

[22] When we run the abnormal stock return regression models for the whole sample, the association between the causal language intensity proxies and abnormal stock return volatility is not significant.

on performance and related causal language use) stands for the firm's discretionary verbal responses to the 'why' and 'how' questions with regard to the performance indicators extracted from its financial statements. In the mainly retrospective context of management commentary(Merkl-Davies *et al.*, 2011), the discursive elaboration of the 'how' question - commenting on the underlying factors that bring about financial statement outcomes - is probably the most straightforward and prominent response. Although the need for causal disclosure on performance is institutionally embedded (IASB, 2010; SEC, 1989), we argue that its intensity is expected to increase with the presence of accountability predicaments, such as earnings threshold failure.

Prior research has shown the importance of earnings thresholds as behavioural benchmarks for both firms and market participants and documents the benefits of meeting or beating earnings thresholds and the diverse consequences of missing such behavioural thresholds (*e.g.* higher scrutiny and monitoring, decreasing management reputation and costly capital market effects). Firms that miss earnings benchmarks are likely to suffer disproportionate adverse reactions to the failure event. Prior research also suggests that missing earnings benchmarks is seen as informative for predicting future prospects of the firm (You and Zhang, 2009, Miller, 2010) and for evaluating management's financial reporting credibility (Matsunaga and Park, 2001, Hertzog *et al.*, 2003, Graham *et al.*, 2005, Miele and Molden, 2010). Our key argument is that the failure to meet specific earnings benchmarks is perceived as a considerable accountability predicament that provides strong incentives for firms to mitigate the costly consequences of such an event by offering increased justification of performance in order to normalize accountability relationships and temper disproportionate adverse consequences.

Using computer-intensive techniques to identify and measure causal language intensity in the MD&A section in a large sample of 10-K filings of US firms over a ten-year period (1998 to 2008), we document results that are generally consistent with the assertion that managers tend to use more causal language to explain earnings-related financial outcomes in response to a threshold-related accountability predicament. These results hold for the three earnings benchmarks that we study: the earnings level threshold, the earnings change threshold and the analyst forecast threshold. Threshold failure on all three is positively and significantly associated with more intense performance justification.

The arguments underpinning the effectiveness of performance justification in facilitating accountability relationships build to a large extent on the relative absence of firm-specific situational knowledge that goes beyond information from the financial statements. In line with this, we find that the effect of earnings threshold failure on the intensity of causal performance disclosures in management commentary is especially important a lower quality information environment with no or low analyst intermediation. In a high quality information environment, incremental firm-specific information is more likely to be impounded in public knowledge, which would pre-empt management's causal performance disclosures and diminish the remedial value of additional causal explanation in management commentary. A more developed information environment would also decrease the degrees of freedom of management to create new information and limit the potential of self-serving causal explanation. Consistent with this, our findings suggest that incentives for management to use more causal language on performance to mitigate adverse reactions on earnings failures are significantly lower for firms in a stronger information environment.

Finally, we find that firms which use more performance justification when facing an earnings threshold predicament, exhibit a less volatile abnormal stock return compared to firms which use less causal language in commenting on their earnings-related performance outcomes, providing proof of the effectiveness of using causal disclosures on performance as a remedial narrative tactic.

Appendix A. Variable definition

Causal language word intensity	Amount of LIWC causal words in the performance-related MD&A sections scaled by total number of words of those sections.
Causal language sentence intensity	Amount of LIWC causal languagesentences in the performance-related MD&A sections scaled by total number of sentences in those sections.
Profit2loss	Earnings level threshold indicator thatequals 1 if a firm made a profit in the previous year (year t-1), but suffers a loss in the current year (year t), otherwise 0. Profit or loss is measured as earnings before extraordinary items
Earnings decline	Earnings decline threshold indicator which equals 1 if a firm's earnings before extraordinary items in year t is less than earnings before extraordinary items in year t-1, otherwise 0.
Missed earnings consensus	Earnings forecast consensus threshold indicator which equals 1 if a firm's actual EPS minus the mean of the forecast EPS is less than 0, otherwise 0. The values are taken from the IBES summary, with the recording date set as that most closely preceding the earnings announcement date.
Discretionary accruals	We use the performance-adjusted modified Jones model in an industry and year cluster-based estimation. $$\frac{TAC_{i,t}}{TA_{i,t-1}} = \beta_1 \frac{1}{TA_{i,t-1}} + \beta_2 \frac{\Delta SALES_{i,t} - \Delta TR_{i,t}}{TA_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{TA_{i,t-1}} + \beta_4 ROA_{it} + \epsilon_{it}$$ $TAC_{i,t}$ stands for total accruals. Total accruals is defined as earnings taken from the cash flow statement minus cash flow from operations, also taken from the cash flow statement.$\Delta SALES_{i,t}$represents change in sales.$\Delta TR_{i,t}$stands for change in trade receivables. $ROA_{i,t}$, return on assets, is the financial performance proxy. $PPE_{i,t}$ is defined as gross property, plant, and equipment. We predict the value of the error term and use the predicted error term as our proxy for discretionary accruals.
ROA	Earnings before interests and taxes divided by total assets.
Analyst following	The number of analysts following the firm. It is taken from the IBES summary database, with a recording date closest to (but preceding) the announcement date. The missing values of analyst following are assumed to be 0.
Sales growth	Change in sales (*i.e.* sales in the current year minus previous year sales), scaled by total assets.
Litigation-sensitive industry dummy	Equals 1 if the industry classification 'SIC' code belongs to the following range, 2833-2838 (Biotech firms), 3570-3577 (Computer firms), 3600-3674 (Electronics firms), 5200-5961 (Retail firms), 7370-7374 (Computer firms), 8731-8734 (Biotech firms), otherwise 0.
Firm size	The natural logarithm of a firm's market value.

Capital intensity	Gross property plant and equipment on total assets.
Leverage	Total long-term debt divided by total assets.
Industry concentration	We measure industry concentration using the Herfindahl index, which is calculated as $$\text{Herfindahl}_j = \sum_{i=1}^{I} s_{ij}^2$$ where s_{ij} is the market share of firm i in industry j.
Market-to-book	The natural logarithm of the market-to-book ratio. The market-to-book ratio is measured as the market value of equity at the end of the fiscal year divided by the book value of equity at that date.
Abnormal stock return volatility	We use event study methods to measure abnormal stock return volatility. First, we use CAPM to predict a firm's abnormal stock return in both an event period and a non-event period (3-day, 5-day, and 10-day event windows).The event window is defined as a specific number of trading days after the 10-K filing release date. The non-event window is defined as a specific number of trading days after the 30 days following the 10-K release. Second, we calculate the standard deviation of abnormal stock return in the event period and non-event period. Finally, we measure abnormal stock return volatility as the standard deviation of a firm's predicted abnormal stock return during the event window scaled by the standard deviation of predicted abnormal stock return in the non-event window.

Appendix B

The LIWC causal words list

activat*	changes	depended	how's	lead*	permit*	solves
affect	changing	depending	ignit*	led	pick	solving
affected	compel*	depends	implica*	made	produc*	source*
affecting	compliance	effect*	implie*	make	provoc*	stimul*
affects	complie*	elicit*	imply*	maker*	provok*	therefor*
aggravat*	comply*	experiment	inact*	makes	purpose*	thus
allow*	conclud*	force*	independ*	making	rational*	trigger*
attribut*	consequen*	foundation*	induc*	manipul*	react*	use
based	control*	founded	infer	misle*	reason*	used
bases	cos	founder*	inferr*	motiv*	response	uses
basis	coz	generate*	infers	obedien*	result*	using
because	create*	generating	influenc*	obey*	root*	why
boss*	creati*	generator*	intend*	origin	since	
caus*	cuz	hence	intent*	originat*	solution*	
change	deduc*	how	justif*	origins	solve	
changed	depend	hows	launch*	outcome*	solved	

Source: LIWC software package (version: 2007)

Appendix C. Examples of LIWC causal language sentences

File name in SEC Edgar: 0000001952-97-000003.txt

Increased competitive pressures and deregulation in the power generation industry have **caus**ed a decline in contracting revenues from this industry.

The improvement is largely **attribut**able to a renewed emphasis on project execution and continued strong safety performance, which has decreased outlays for project overruns and workers' compensation costs, respectively.

The growth in operating expenses in 1996 is primarily **attribut**able to expansion of the distribution business, which added four branches between the third quarter of 1995 and the second quarter of 1996.

File name in SEC Edgar: 0000001952-98-000002.txt

Since contracting margins in 1997 were down only slightly compared to 1996, the decrease in gross profit is mostly **attribut**able to a decrease in revenues during this period. Although the contracting operations reported similar gross profit in both 1997 and 1995, margins were actually a full percentage point better in 1997.

The $[23] million increase in inventories in 1997 compared to 1996 is primarily the **result** of acquisitions and new distribution facilities as turnover of inventories was relatively unchanged during the period.

The Company's effective tax rate is primarily dependent upon the amount of operating income and its effect on the rate **attribut**able to the 50% disallowance for meals and entertainment, the impact of state rates on deferred tax assets and the sources of state taxable income.

File name in SEC Edgar: 0000002178-09-000007.txt

Absent the inventory items, crude oil earnings from operations were reduced in 2008 as a **result** of escalated prices for the diesel fuel consumed in the trucking function of this business.

Refined product driven operating earnings were reduced during 2008 **because** of an increased allowance for doubtful accounts receivable through a bad debt charge of $.

[23] Money numbers are removed before causal reasoning sentence classification.

Crude oil operating earnings improved in 2007 relative to 2006 **because** of the $ million in inventory liquidation gains coupled with improved end-market pricing received from the companies customers relative to crude oil acquisition costs.

File name in SEC Edgar: 0000849343-97-000004.txt

Because of the strong positive acceptance of the Company's product by the marketplace, the Company was unable to meet the demand during the past hurricane season due to production capacity limits.

All of these areas are susceptible to hurricanes and **therefore** have a need for the Company's products.

Table 1. Descriptive statistics of dependent and independent variables (N=34,648)

	Mean	Min	Median	Max	Std. dev.
Causal word intensity	2.80	1.41	2.75	4.26	0.78
Causal sentence intensity	42.74	21.00	43.58	58.89	10.07
Profit2loss	0.10	0.00	0.00	1.00	0.30
Earnings decline	0.42	0.00	0.00	1.00	0.49
Missed earnings consensus	0.36	0.00	0.00	1.00	0.48
Discretionary accruals	52.88	-392.86	62.82	330.40	146.79
Analyst following	4.46	0.00	2.00	42.00	5.91
Litigation-sensitive industry	0.31	0.00	0.00	1.00	0.46
Adjusted stock return$_{t-1}$	-0.01	-0.63	-0.06	1.01	0.42
Sales growth	0.07	-0.35	0.04	0.48	0.19
Firm size	5.68	1.27	5.62	13.05	2.03
ROA	-0.01	-0.48	0.05	0.21	0.42
Capital intensity	0.42	0.00	0.30	36.07	0.46
Leverage[24]	0.17	0.00	0.10	0.60	0.18
Industry concentration	0.07	0.03	0.06	0.22	0.05
Market-to-book	0.70	-0.65	0.65	2.27	0.75

The variables are defined in Appendix A.

[24]The valid number of observations for leverage is 34,550.

Table 2. Correlation table of test variables (N=34,648)

	A	B	C	D	E	F	G	H	I	J	K
Causal word intensity (A)	1.000										
Causal sentence intensity (B)	**0.796**	1.000									
	0.000										
Profit2loss (C)	**0.029**	**0.029**	1.000								
	0.000	0.000									
Earnings decline (D)	**0.028**	**0.027**	**0.387**	1.000							
	0.000	0.000	0.000								
Missed earnings consensus (E)	**0.050**	**0.036**	**-0.087**	**-0.149**	1.000						
	0.000	0.000	0.000	0.000							
Discretionary accruals (F)	**0.052**	**0.048**	**0.029**	**0.013**	**0.087**	1.000					
	0.000	0.000	0.000	0.013	0.000						
Analyst following (G)	**0.027**	***0.013***	**-0.061**	**-0.092**	**0.351**	**-0.370**	1.000				
	0.000	0.016	0.000	0.000	0.000	0.000					
Litigation-sensitive industry (H)	**0.218**	**0.169**	0.007	**0.033**	**0.036**	**-0.016**	**0.086**	1.000			
	0.000	0.000	0.193	0.000	0.000	0.004	0.000				
Adjusted stock return$_{t-1}$ (I)	-0.004	*-0.011*	**-0.063**	**-0.094**	**-0.085**	**0.016**	**0.084**	***-0.012***	1.000		
	0.505	0.050	0.000	0.000	0.000	0.003	0.000	0.030			
Sales growth (J)	**0.019**	-0.006	**-0.159**	**-0.249**	**0.131**	***0.012***	**0.130**	**0.016**	**0.222**	1.000	
	0.001	0.237	0.000	0.000	0.000	0.033	0.000	0.004	0.000		
Firm size (K)	**-0.021**	**-0.021**	**-0.134**	**-0.163**	**0.324**	**-0.415**	**0.690**	**-0.025**	**0.180**	**0.180**	1.000
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
ROA (L)	**-0.064**	**-0.065**	**-0.026**	**-0.121**	**0.096**	**-0.037**	**0.131**	**-0.157**	**0.118**	**0.161**	**0.229**
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bold numbers imply significance at the 99% level, ***bold+italic*** significance at the 95% level, and *italic* significance at the 90% level. The variables are defined in Appendix A.

Table 3. Pooled regression of causal language intensity from 1998 to 2008

	Causal word intensity			Causal sentence intensity		
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Profit2loss	0.037***			0.693***		
	(3.026)			(4.233)		
Earnings decline		0.021***			0.256**	
		(2.741)			(2.437)	
Missed earnings consensus			0.035***			0.426***
			(3.707)			(3.255)
Discretionary accruals	0.000***	0.000***	0.000***	0.002***	0.002***	0.002***
	(3.521)	(3.471)	(3.082)	(3.402)	(3.259)	(2.914)
Analyst following	0.002	0.002	0.001	0.018	0.018	0.010
	(1.379)	(1.399)	(0.881)	(0.908)	(0.935)	(0.484)
Litigation-sensitive industry	0.188***	0.188***	0.188***	2.067***	2.053***	2.062***
	(5.244)	(5.229)	(5.250)	(4.180)	(4.156)	(4.175)
Adjusted stock return$_{t-1}$	-0.006	-0.006	-0.007	-0.165	-0.165	-0.178
	(-0.709)	(-0.694)	(-0.819)	(-1.413)	(-1.415)	(-1.526)
Sales growth	0.065***	0.069***	0.052**	0.245	0.236	0.030
	(2.672)	(2.790)	(2.145)	(0.745)	(0.710)	(0.090)
Firm size	-0.011***	-0.012***	-0.014***	-0.152**	-0.159***	-0.187***
	(-2.654)	(-2.678)	(-3.214)	(-2.505)	(-2.627)	(-3.087)
ROA	-0.001	0.000	-0.002	-0.204	-0.177	-0.202
	(-0.112)	(0.041)	(-0.129)	(-1.406)	(-1.233)	(-1.383)
Constant	2.685***	2.681***	2.700***	41.314***	41.336***	41.575***
	(44.728)	(44.567)	(45.281)	(51.651)	(51.386)	(52.273)

Year fixed effects	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Industry fixed effects	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
N	*34,648*	*34,648*	*34,648*	*34,648*	*34,648*	*34,648*
Adjusted R^2	*25.59%*	*25.58%*	*25.61%*	*15.71%*	*15.68%*	*15.70%*

*Statistical significance at the 0.10 level; **Statistical significance at the 0.05 level; ***Statistical significance at the 0.01 level (two-sided; one-sided for predicted threshold coefficients).
The variables are defined in Appendix A. Industry and year fixed effects are included but omitted from table to conserve space.

Table 4. Pooled regression of causal language intensity with regard to the impact of information environment

	Causal word intensity			Causal sentence intensity		
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Profit2loss	0.051***			1.263***		
	(2.547)			(4.778)		
Profit2loss×Low analyst following	0.026			0.849***		
	(1.040)			(2.558)		
Earnings decline		0.029***			0.421***	
		(2.585)			(2.685)	
Earnings decline×Low analyst following		0.017			0.323*	
		(1.133)			(1.570)	
Missed earnings consensus			0.015*			0.034
			(1.299)			(0.209)
Missed earnings consensus×Low analyst following			0.034**			0.544**
			(1.783)			(2.016)
Low analyst following (dummy)	-0.043***	-0.039***	-0.050***	-0.794***	-0.615***	-1.007***
	(-3.210)	(-2.668)	(-3.322)	(-4.259)	(-3.030)	(-4.804)
Discretionary accruals	0.000***	0.000***	0.000***	0.003***	0.002***	0.002***
	(3.158)	(3.093)	(2.772)	(4.580)	(4.420)	(4.081)
Litigation-sensitive industry	0.188***	0.188***	0.189***	2.110***	2.109***	2.114***
	(5.251)	(5.247)	(5.258)	(4.285)	(4.285)	(4.293)
Adjusted stock return$_{t-1}$	-0.006	-0.006	-0.007	-0.202*	-0.196*	-0.214*
	(-0.736)	(-0.698)	(-0.827)	(-1.718)	(-1.669)	(-1.826)
Sales growth	0.061**	0.065***	0.050**	0.092	0.136	-0.103
	(2.521)	(2.652)	(2.080)	(0.280)	(0.409)	(-0.314)

Firm size	-0.015***	-0.015***	-0.017***	-0.158***	-0.164***	-0.193***
	(-3.759)	(-3.778)	(-4.329)	(-2.792)	(-2.898)	(-3.417)
ROA	-0.002	0.000	-0.002	-0.263*	-0.240*	-0.261*
	(-0.146)	(-0.026)	(-0.158)	(-1.838)	(-1.692)	(-1.821)
Constant	2.739***	2.734***	2.758***	43.992***	43.924***	44.409***
	(43.964)	(43.827)	(44.269)	(53.509)	(53.152)	(53.830)
Year fixed effects	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Industry fixed effects	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
N	*34,648*	*34,648*	*34,648*	*34,648*	*34,648*	*34,648*
Adjusted R^2	*25.63%*	*25.63%*	*25.65%*	*13.97%*	*13.94%*	*13.93%*

*Statistical significance at the 0.10 level; **Statistical significance at the 0.05 level; ***Statistical significance at the 0.01 level (two-sided; one-sided for predicted threshold coefficients).The variables are defined in Appendix A. Industry and year fixed effects are included but omitted from table to conserve space.

Table 5. Sensitivity tests, pooled regression of causal language intensity with additional control variables and of base model in a restricted sample

	Causal word intensity				Causal sentence intensity			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Profit2loss	0.040***				0.641***			
	(3.417)				(3.915)			
Earnings decline		0.021***				0.193**		
		(3.073)				(1.889)		
Missed earnings consensus			0.015**	0.025***			0.199**	0.232**
			(1.988)	(2.559)			(1.722)	(1.728)
Causal language intensity$_{t-1}$	0.508***	0.509***	0.508***		0.543***	0.543***	0.542***	
	(76.229)	(76.225)	(76.180)		(57.726)	(57.706)	(57.660)	
Capital intensity	-0.003	-0.003	-0.004		-1.089***	-1.089***	-1.091***	
	(-0.304)	(-0.277)	(-0.315)		(-5.300)	(-5.296)	(-5.317)	
Leverage	-0.199***	-0.200***	-0.196***		0.070	0.083	0.123	
	(-9.732)	(-9.751)	(-9.570)		(0.182)	(0.213)	(0.319)	
Industry concentration	0.102	0.102	0.110		4.948***	4.970***	5.059***	
	(1.225)	(1.220)	(1.315)		(3.285)	(3.294)	(3.356)	
Market-to-book	0.006	0.005	0.004		-0.046	-0.062	-0.073	
	(1.045)	(0.967)	(0.750)		(-0.459)	(-0.626)	(-0.737)	
Discretionary accruals	0.000*	0.000*	0.000	0.000	0.001**	0.001**	0.001*	0.001
	(1.899)	(1.798)	(1.464)	(1.295)	(2.234)	(2.064)	(1.857)	(1.272)
Analyst following	0.002**	0.002**	0.001*	0.005***	0.021	0.021	0.017	0.077***
	(2.080)	(2.135)	(1.738)	(2.882)	(1.388)	(1.433)	(1.140)	(3.286)
Litigation-sensitive industry	0.126***	0.126***	0.126***	0.309***	1.531***	1.529***	1.530***	3.643***
	(11.320)	(11.304)	(11.315)	(13.657)	(8.043)	(8.031)	(8.034)	(13.070)

Adjusted stock return$_{t-1}$	-0.015*	-0.015*	-0.015*	0.008	-0.202*	-0.200*	-0.205*	0.169
	(-1.775)	(-1.751)	(-1.804)	(0.694)	(-1.720)	(-1.701)	(-1.746)	(1.177)
Sales growth	0.064***	0.067***	0.053**	0.041	0.418	0.387	0.256	0.144
	(3.074)	(3.182)	(2.586)	(1.270)	(1.337)	(1.225)	(0.823)	(0.336)
Firm size	-0.008***	-0.008***	-0.009***	-0.043***	-0.115**	-0.122**	-0.135**	-0.670***
	(-2.735)	(-2.825)	(-3.199)	(-7.080)	(-2.155)	(-2.295)	(-2.521)	(-8.020)
ROA	-0.009	0.014	-0.009	-0.008	-0.711***	-0.670**	-0.719***	-0.398
	(-0.618)	(0.898)	(-0.578)	(-0.335)	(-2.620)	(-2.485)	(-2.627)	(-1.282)
Constant	1.365***	1.363***	1.378***	3.032***	24.752***	24.814***	24.952***	43.880***
	(18.756)	(18.605)	(18.888)	(19.229)	(27.752)	(27.696)	(27.971)	(24.881)
Year fixed effects	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Industry fixed effects	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
N	*33,186*	*33,186*	*33,186*	*23,880*	*33,186*	*33,186*	*33,186*	*23,880*
Adjusted R^2	*43.68%*	*43.68%*	*43.67%*	*23.09%*	*28.15%*	*28.12%*	*28.12%*	*14.97%*

*Statistical significance at the 0.10 level; **Statistical significance at the 0.05 level; ***Statistical significance at the 0.01 level (two-sided; one-sided for predicted threshold coefficients).
The variables are defined in Appendix A. Industry and year fixed effects are included but omitted fromtable to conserve space.

Table 6. Pooled regression of abnormal stock return volatility in subsamples of firms missing a behavioural earnings threshold

Event window length		Model 1 Profit2loss=1 N=3,424		Model 2 Earnings decline=1 N=14,658		Model 3 Missed earnings consensus=1 N=12,324	
3 days	**Causal word intensity**	-0.045		-0.046*		-0.072***	
		(-1.012)		(-1.932)		(-2.964)	
	Causal sentence intensity		-0.000		-0.003*		-0.005**
			(-0.076)		(-1.777)		(-2.502)
	Adjusted R^2	*1.63%*	*1.61%*	*1.21%*	*1.21%*	*0.87%*	*0.86%*
5 days	**Causal word intensity**	-0.070**		-0.046***		-0.051***	
		(-2.083)		(-2.667)		(-2.821)	
	Causal sentence intensity		-0.007***		-0.005***		-0.004***
			(-2.614)		(-3.974)		(-3.360)
	Adjusted R^2	*1.53%*	*1.59%*	*1.62%*	*1.68%*	*1.34%*	*1.37%*
10 days	**Causal word intensity**	-0.038		-0.046***		-0.035***	
		(-1.608)		(-3.880)		(-2.839)	
	Causal sentence intensity		-0.0038*		-0.004***		-0.004***
			(-1.886)		(-4.527)		(-3.877)
	Adjusted R^2	*1.82%*	*1.84%*	*1.85%*	*1.89%*	*1.20%*	*1.26%*

*Statistical significance at the 0.10 level; **Statistical significance at the 0.05 level; ***Statistical significance at the 0.01 level.
The variables are defined in Appendix A. Control variables, industry and year fixed effects are included but omitted from the table to conserve space.

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