Tone, accounting quality and ex-post verification of UK Interim Management Statement narratives

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20 November 2020

Declaration of Interest
None

Acknowledgements
I thank Martin Walker, Collins Ntim, Niamh Brennan, and Frank Skinner for their helpful comments on this paper.

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Abstract: This study contributes to the literature on the role of accounting quality in ex-post verification of the tone of financial disclosures. In particular, using a sample of Interim Management Statements (IMSs) in the context of UK interim reporting, this study provides evidence that firms with more positive tones are likely to disclose higher quality accounting information. Additionally, it provides evidence that as accounting quality increases, the tone is associated with lower levels of firms' financial performance, growth opportunities and borrowing capacities. Subsequent market reaction tests indicate that with increasing accounting quality, the tone is also associated with lower levels of abnormal market returns between two and four months after the IMS disclosure, when verifiable quantitative disclosures such as the interim or annual reports are likely to be released. Collectively, these results are consistent with the argument that accounting quality plays a pivotal role in ex-post tonal verification. The findings also contribute to the Security and Exchange Commission's (SEC) recent policy debate on the viability of IMSs as an alternative to US quarterly reports.

Keywords: Tone, Accounting quality, Narratives, Interim Management Statement, Ex-post verification.

1. Introduction

Managers disclose quantitative financial statements to communicate summaries of their firms' financial performance to investors and other outsiders (Davis, Piger, & Sedor, 2012; Dechow, Ge, & Schrand, 2010; Iatridis, 2011). Additionally, managers disclose textual narratives to incorporate supplementary information absent in these quantitative statements, perhaps owing to reporting constraints (Huang, Teoh, & Zhang, 2014). The quality of accounting information not only affects the abilities of investors to evaluate the quantitative disclosures (Dechow et al., 2010; Iatridis, 2011) but also their abilities to verify the narrative tone – whether the narrative sentiment is truthful (Abrahamson & Amir, 1996). Although the informativeness of the tone has received considerable attention in accounting research (Davis et al., 2012; Henry, 2008; Henry & Leone, 2016), prior studies have not examined the role of accounting quality in tonal verification. In this study, I contribute to the literature by addressing this gap.

Specifically, I investigate three related research questions. First, I examine the link between tone and accounting quality. Second, I examine the influence of accounting quality on the association between tone and financial performance. Third, I examine the influence of accounting quality on the association between tone and abnormal market returns around the disclosure of financial information.

The first research question is grounded on the use of accounting information in tonal verification. High quality accounting provides relevant and reliable quantitative information in the financial statements (Iatridis, 2011), allowing investors to verify the tone of related narratives. Managers are likely to facilitate this verification if it increases managerial or market rewards (Ambler & Neely, 2008; Merkl-Davies & Brennan, 2007). The extant tone literature document that managers, on average, use the tone to signal their truthful assessments of firms' financial performance to investors (Davis et al., 2012; Price, Doran,

Petersen, & Bliss, 2012), and that investors reward firms with more positive tones by ascribing higher share prices (Henry, 2008; Henry & Leone, 2016; Loughran & McDonald, 2011). Hence firms with more positive narrative tones are likely to disclose higher quality accounting information, to assist investors in verifying the tone, in order for firms to reap the market rewards of the favourable narrative information. Accordingly, I hypothesize that the association between the tone and accounting quality is positive.

The second research question examines the role of accounting quality in ex-post tonal verification. Narratives disclosed concurrently with quantitative reports can be easily synchronized to the numbers, restricting the use of the quantitative information in tonal verification. However, if narratives are disclosed prior to the quantitative reports, then the latter is likely to be important in ex-post tonal verification. Prior research indicates a positive association between the tone and reported financial performance metrics such as earnings or cash flow (Davis et al., 2012; Li, 2010). Accounting quality is measured by reported accounting information and indicates the extent to which the reported numbers are decision-useful (Dechow et al., 2010). Thus, an increase in accounting quality is expected to increase the informativeness of the reported earnings or cash flow numbers relative to the informativeness of the ex-ante narrative tone. Consequently, as accounting quality increases, the association between the tone and financial performance is likely to be less positive. Recent studies also find a positive association between the tone and market-to-book value as a proxy for growth opportunities (Davis, Ge, Matsumoto, & Zhang, 2015). I argue, for reasons aforementioned, that as accounting quality increases, the association between the tone and market-to-book value is also likely to be less positive.

The third research question examines the investor response in verifying the tone. In semi-strong form efficient markets, investors revise their market expectations and correct for share prices if the newly available information shows an initial mispricing (Huang et al.,

2014). Since accounting quality influences investors' expectations of the firm-fundamentals, changes in accounting quality are likely to be associated with share price movements. The extant tone literature is consistent of a positive association between the tone and abnormal market returns around the disclosure of financial information (Henry, 2008; Henry & Leone, 2016). Further, as accounting quality goes up, the association between the tone and financial performance is likely to be less positive. Given this, market efficiency should dictate that with increasing accounting quality, the association between the tone and abnormal market returns is also likely to be less positive around the time verifying information is disclosed.

Testing the above hypotheses requires a research setting where a textual financial performance update is disclosed independently but prior to a complete set of quantitative statements. For this, I examine the tone of Interim Management Statements (IMSs) in the lightly-regulated context of UK interim reporting. The typical IMS is a two-page long financial performance update that UK firms disclose in the first and third quarters of the financial year. They were introduced by the EU Transparency Directive in 2007 with the objective to increase reporting transparency and investor protection in the aftermath of the Enron scandal. IMSs consist almost entirely of textual narratives. They describe firms' financial performances, financial positions, trading outlooks and other material events or transactions for the quarter. However, firms retain complete discretion on which financial line-item to narrate, if any, and how to present it (Deloitte & Touché, 2007; Link, 2012; Schleicher & Walker, 2015: Rahman, 2019). Thus, IMSs allow managers to narrate their assessments of firms' financial performances without the reporting constraints of a financial statement. Each IMS is disclosed within a specified ten-week window in the financial year. The first-quarter (third-quarter) IMS is scheduled for release a few months before the half-yearly (annual) results. This allows me to match the IMS tone with the accounting quality of the interim or annual report that follows. The flexible, de-facto voluntary nature of the IMS

content has attracted attention from the US Securities and Exchange Commission (SEC), which recently initiated a public consultation process to examine the IMS as a potential low-cost alternative to full US-style quarterly reports (SEC, 2018).

I collect a sample of IMSs from the FTSE All-Share Index of non-financial firms in UK. I measure the IMS tone using the Henry (2008) and Loughran and McDonald (2011) lists of positive and negative keywords. Following recent literature (e.g. Bharath, Sunder, & Sunder, 2008; Chen, Liu, Ma, & Martin, 2017), I measure accounting quality as the first principal component of the absolute value of three different discretionary accruals measures – Dechow and Dichev (2002), Teoh, Welch, and Wong (1998) and Dechow, Sloan, and Sweeny (1995). Consistent with my hypotheses, my findings suggest, first, that the IMS tone and accounting quality are positively associated. Second, I find that as accounting quality goes up, the IMS tone is associated with lower levels of earnings, cash flows and market-to-book value. Third, I find that as accounting quality increases, the IMS tone is associated with lower levels of abnormal market returns 60 days, 90 days and 120 days after the IMS announcement, a period during when verifiable quantitative disclosures such as the interim or annual reports are expected to be disclosed. Additional analysis reveals that with increasing accounting quality, the association between the IMS tone and firms' borrowing capacities, i.e. the levels of trade credit and financial leverage, is also less positive. My results are robust to several alternative variable definitions and regression specifications.

This study contributes to the sparse literature on the intersection between accounting quality and the textual features of financial disclosures. To the best of my knowledge, this is the first study to directly examine the association between the tone and accounting quality, and it contributes to examining the role of accounting quality in ex-post tonal verification. This study also contributes to the policy debate on the importance of the IMS as a viable alternative to fully-fledged quarterly reports. This is detailed in the concluding section.

The remainder of this paper is organized as follows. Section 2 reviews the relevant literature on accounting quality and the tone of financial disclosures. This section also sets out the hypotheses and discusses the role of IMSs in the context of UK reporting. Section 3 describes the sampling and variable measurements. Section 4 reports the main results while Section 5 provides some additional analysis. Section 6 outlines the policy significance of IMSs as de-facto quarterly updates in light of the findings and concludes.

2. Related literature, hypotheses and the case for Interim Management Statements

2.1 Literature review on accounting quality

Accounting quality refers to the extent to which accounting provides decision-useful information to investors and other market participants. Decision-usefulness in this context implies the ability of accounting to provide relevant and reliable firm-fundamental information (Beatty, Liao, & Weber, 2010). Financial disclosures comprise of quantitative statements as well as textual narratives. Narratives describe the quantitative information and provide explanations or supplementary information absent in quantitative reports, perhaps owing to reporting restrictions (Huang et al., 2014). High quality accounting information allows investors to verify the narratives (Basu, 2005). Verifiable information is harder to manipulate, and thus deemed more decision-useful to investors (Iatridis, 2011).

Accounting quality is derived from reported financial information (Dechow et al., 2010). Prior research often measures accounting quality in terms of accruals accounting. The basic assumption is that discretionary accruals allow managers to transfer unrealized non-obligatory expenses between periods, to display an earnings number that fits their objectives (DeAngelo, 1986; Healy, 1985; Sloan, 1996). Hence, discretionary accruals indicate the extent to which accruals accounting provides decision-useful information, where low levels of absolute discretionary accruals imply high accounting quality (e.g.

Beatty et al., 2010; Bharath et al., 2008; Biddle & Hilary, 2006; Cahan, Cahan, Lee, & Nguyen, 2017; Chen et al., 2017). The most widely used discretionary accrual measures include the Jones model (Jones, 1991), the Modified Jones model (Dechow et al., 1995) and adjustments to the Modified Jones model (Teoh et al., 1998; Dechow & Dichev, 2002).

The extant accounting quality literature can be categorized into three major streams of research. The first stream focuses on the effect of accounting quality on information asymmetry. These studies conclude that greater accounting quality lowers information asymmetry, based on empirical evidence of samples of US firms (Bhattacharya, Desai, & Venkataraman, 2013), German firms (Leuz & Verrechia, 2000), Australian firms (Chang, Watson, Anna, & Wee, 2008) and a survey of US executives (Graham, Harvey, & Rajgopal, 2005). The second stream examines the relationship between accounting quality and cost of capital. These studies document, in US contexts, that low accounting quality is associated with higher costs of debt (Bharath et al., 2008), higher costs of equity (Francis, LaFond, Olsson, & Schipper, 2004) and greater reliance on trade credit (Chen et al., 2017). The third stream examines the association between accounting quality and investment opportunities. These studies find that greater accounting quality increases access to capital for investments by lowering information asymmetry, based on empirical studies in both the US context (Beatty et al., 2010) and the international context (Biddle & Hilary, 2006).[2]

In addition to these three major streams, prior research documents that accounting quality is positively associated with firm size and financial performance, but negatively associated with earnings management and growth opportunities (Ambler & Neely, 2008; Bharath et al., 2008; Iatridis, 2011; Jensen & Meckling, 1976). For instance, in the context of UK reporting, Iatridis (2011) finds that high profit firms disclose high quality accounting information to inform market participants of the favourable impact of their performance.

[2] See Beatty et al. (2010) for a review of the literature on the relationship between accounting quality, information asymmetry and access to capital for investments.

High leverage firms also provide high quality accounting disclosures to reduce uncertainty for capital providers. Iatridis (2011) also shows that high accounting quality firms are likely to display low levels of discretionary accruals and low market-to-book value ratios.

2.2. Literature review on the tone of financial disclosures

The tone indicates whether the sentiment of narratives in financial disclosures is positive or negative with regards to financial performance (Henry, 2008; Henry & Leone, 2016; Loughran & McDonald, 2011). A positive (negative) tone implies that the narrative sentiment is favourable (unfavourable). While early studies measure the tone by manual textual analysis (e.g. Francis, Philbrick, & Schipper, 1994; Hoskin, Hughes, & Ricks, 1986), recent studies employ computer automated word-counts (Neuendorf, 2002). In particular, specific lists of positive and negative keywords capture the sentiment with regards to favourable and unfavourable financial performance. The tone is typically measured as the difference between the number of positive and negative keywords present in a defined text corpus, where higher tone scores imply more positive sentiment (Henry & Leone, 2016; Loughran & McDonald, 2011). The two most frequently used lists of positive and negative keywords for tone measurement are the Henry (2008) list and the Loughran and McDonald (2011) list (Henry & Leone, 2016).

An ample body of literature indicates that the tone of financial disclosures represents decision-useful information (Henry, 2008). Specifically, studies suggest that managers, on average, use the tone to signal their truthful, value-relevant assessments of firms' financial performances to investors, who in turn respond to such signals by adjusting their buy, hold or sell decisions (Davis et al., 2012; Price et al., 2012). This is consistent with the expectations-adjustment hypothesis of managers using textual narratives to align investor expectations of financial performance with their own assessments. In empirical tone

research, it manifests in two frequently reported findings: (a) a positive association between the tone and financial performance, and (b) a positive association between the tone and abnormal market returns around the disclosure of the financial information. For instance, using the word-count approach, Davis et al. (2012) and Demers and Vega (2011) measure the tone of US quarterly earnings press releases while Price et al. (2012) measure the tone of US conference calls. All three studies find that the tone is positively associated with both the future earnings and abnormal market returns around the release of the financial disclosures. Similarly, Li (2010) examines the MD&A section of annual reports and finds that the tone increases with current earnings.[3] This affirms the role of textual narratives in describing concurrent quantitative statements. Henry and Leone (2016) use four alternative keyword lists to measure the tone of quarterly earnings press releases in the US, and find, in each case, a positive association between the tone and abnormal market returns around the disclosure days of the earnings press releases.

While the extant literature is consistent on a positive association between the tone and financial performance, a separate stream of research segregates the tone into a normal component that proportionately represents the quantitative financial report and an abnormal component that reflects opportunistic narratives. This includes Huang et al. (2014) who examines a sample of US annual earnings press releases and find that the abnormal tone component is negatively aligned with year-end earnings. This suggests that managers use the abnormal tone at the start of the year to mislead the market. Rahman (2019) use a sample of UK Interim Management Statements and finds that the abnormal tone component measured at the first quarter has no association with year-end earnings but at the third quarter is positively associated with year-end earnings. This is akin to the abnormal tone being more reflective of the year-end results as the year progresses.

[3] For measuring the tone, Li (2010) employs a more sophisticated computerized approach using a Naïve Bayesian machine-learning algorithm. See Li (2010) for details.

In addition to the aforementioned research, recent studies examine the association between the tone and firm growth opportunities. For instance, Davis et al. (2015) study the effect of managerial optimism on the tone of US earnings conference calls measured by three alternative keyword lists. In addition to a positive alignment between the tone and both current and future earnings, they demonstrate that the tone is also positively associated with the market-to-book ratio and sales growth. This is consistent with Tong and Reuer (2006, 2010) who suggest that high growth firms are likely to signal their growth potential to the market participants by providing optimistic messages.

2.3. Hypothesis development

2.3.1. The association between tone and accounting quality

The first research question examines the association between the narrative tone and accounting quality. This research question originates from the use of accounting numbers in tonal verification (Basu, 2005; Smith & Taffler, 2000). High quality accounting information lowers information asymmetry and improves investor decision-making by allowing the investors to verify the tone (Ambler & Neely, 2008; Beattie, 2014; Bhattacharya et al., 2013; Graham et al., 2005). Managers are expected to facilitate this verification process, especially if it enhances their credibility or increases market rewards (Ambler & Neely, 2008; Merkl-Davies & Brennan, 2007).

Given that, on average, managers use the tone to signal their truthful assessments of the firm's financial performance to investors (Davis et al., 2012; Henry & Leone, 2016) and that investors ascribe higher share prices to disclosures with more positive tones (Davis et al., 2012; Henry, 2008), I posit a link between the tone and accounting quality. I argue that firms with more positive tones, on average, are likely to disclose higher quality accounting

information, to assist investors in verifying the tone.[4] This allows firms to maximize the market rewards of the favourable narrative information. I therefore hypothesize:

H1. The tone is positively associated with accounting quality.

2.3.2. Accounting quality and the association between tone and financial performance

The second research question examines the influence of accounting quality on the association between the tone and financial performance. Consistent with the expectations-adjustment hypothesis, the positive association between the tone and financial report line-items such as the earnings or cash flow number suggests that the tone represents decision-useful information (e.g. Davis et al., 2012; Henry, 2008; Henry & Leone, 2016; Huang et al., 2014; Price et al., 2012). This implies, the less informative the tone, the less positive the association between the tone and financial performance indicators.

Narratives disclosed concurrently with quantitative reports are easier to adjust to the numbers, limiting the use of the quantitative information in tonal verification. In contrast, if the narratives are disclosed prior to related quantitative disclosures, the latter is likely to be important for ex-post tonal verification. The accounting quality metric is computed from financial statement line-items and represents the degree to which the reported numbers are decision-useful (Dechow et al., 2010; Iatridis, 2011). Therefore, as accounting quality goes up, the informativeness of the quantitative accounting information (e.g. the reported net income) *increases* relative to the informativeness of the ex-ante narrative tone. This is consistent with the argument that the higher the quality of quantitative disclosures, the more likely it is to reveal inconsistencies with the ex-ante tone. Thus, high accounting quality firms are likely to exhibit less positive associations between the tone and reported financial information than low accounting quality firms. Accordingly, I hypothesize:

[4] In theory, managers are likely to adjust the accounting quality both concurrently and ex-post to the narratives, to influence tonal verification. In contexts where narratives are not accompanied by quantitative statements, managers are likely to adjust the accounting quality to the tone of the next available quantitative report.

H2. As accounting quality increases, the tone is associated with lower levels of financial performance.

2.3.3. Accounting quality and the association between tone and growth opportunities

Supplementary to the second research question is the influence of accounting quality on the association between the tone and firm growth opportunities, a key driver of future performance. The market-to-book value is a good proxy for firm growth opportunities, as it reflects the incentives of capital providers to pay for a firm's net assets relative to its book value[5] (Goranova, Dharwadkar, & Brandes, 2010; Lenox, Rockart, & Lewin, 2010; Sharma, Branch, Chgawla, & Qiu, 2013). Prior studies document a negative association between accounting quality and the market-to-book value (Bharath et al., 2008; Biddle & Hilary, 2006; Chen et al., 2017; Iatridis, 2011). This is because financial statements are static by nature and are thus inefficient in capturing the economic fundamentals of high growth firms in rapidly changing business environments (Dumitru & Doina, 2008). In contrast, the tone is positively associated with market-to-book value (Davis et al., 2015), as managers disclose positive narratives to signal their firm's growth potentials to capital providers (Tong & Reuer, 2006), in order to maximize market rewards. As accounting quality increases, the informativeness of the market-to-book value increases relative to the informativeness of ex-ante narrative tone. Thus, increased accounting quality is likely to weaken any positive association between the tone and market-to-book value. I therefore hypothesize:

H3. As accounting quality increases, the tone is associated with lower levels of market-to-book value.

[5] Critics of market-to-book ratio advance Tobin's q as a measure of firm growth opportunities and argue that the denominator in the market-to-book value (of assets) does not capture the replacement cost of asset values (Chen & Zhao, 2006; Sharma et al., 2013). Apart for the subjectivity involved in estimating replacement costs, I am interested in the market-to-book ratio for two reasons. First, unlike Chen and Zhao (2006) who use book value of assets as the denominator (and market value of equity as the numerator), I use book value of equity. Second, Varaiya et al. (1987) provides both theoretical and empirical evidence that the market-to-book ratio and Tobin's q are qualitatively similar measures of firm growth.

2.3.4. Accounting quality and the association between tone and abnormal market returns

The third research question investigates the influence of accounting quality on the association between the tone and abnormal market returns. Semi-strong form efficient markets correct for share prices if newly available information reveals an initial mispricing, as investors revise their expectations of firm fundamentals based on the new information (Huang et al., 2014). Since accounting quality influences investor expectations of the firm-fundamentals, changes in accounting quality are likely to be associated with changes in the share price (Callen, Khan, & Lu, 2011). Typically, the tone is positively associated with abnormal market returns around the disclosure of financial information (Davis et al., 2012; Henry & Leone, 2016). As accounting quality goes up, the tone is expected to be associated with lower levels of financial performance. Given this, market efficiency should dictate that the association between the tone and abnormal market returns is likely to be less positive when higher quality accounting information is used in ex-post tonal verification. This leads to my final hypothesis:

H4. As accounting quality increases, the tone is associated with lower levels of abnormal market returns.

2.4. The case for Interim Management Statements

In this study, I examine the tone of Interim Management Statements (IMSs) in the context of UK interim reporting. An IMS is a lightly-regulated financial performance update disclosed by firms listed in the UK (and other EU regulated markets). The typical IMS is a two-page long disclosure that narrates the firm's financial performance and discusses price-sensitive events and transactions material for decision-making. IMSs were adopted in 2007 by the EU Transparency Directive (TD) (Directive 2004/109/EC) with a view to reducing

information asymmetry and increasing investor confidence in the aftermath of the Enron scandal (Schleicher & Walker, 2015). The adoption of IMSs had introduced for the first time a form of quarterly reporting in the UK and many other EU Member States, increasing their mandatory reporting frequency from two to four disclosures per year. Thus, mandatory IMSs were opposed by some firms from its inception, citing potential problems such as short-termism in reporting practices and information overload for investors. As a result of their sustained pressure on the EU Commission, IMSs were made voluntary disclosures in 2014, although many firms continue to disclose them to date (Rahman, 2019).

Several features make the IMS is an interesting context for this study. First, the typical IMS consists almost entirely of textual narratives. Unlike 10-K or 10-Q disclosures, IMSs do not contain income statements, balance sheets or extracts thereof. While IMSs must describe the firm's financial performance, managers retain complete discretion on which financial line-item(s) to discuss, if any, including whether to use numbers (Deloitte & Touché, 2007; Link, 2012). In essence, IMSs are de-facto voluntary in terms of content, lending the IMS tone is a good proxy for the tone of discretionary narratives.

Second, the TD requirement for an IMS to discuss the firm's financial performance makes the IMS tone a good proxy for the tone of financial performance. This makes the IMS preferable to disclosures such as AGM statements, conference calls or audit reports that have no requirement to discuss financial performance.[6]

Third, firms disclose two separate IMSs in a financial year – one for the first quarter and one for the third quarter (Schleicher & Walker, 2015). In each case, the IMS disclosure is followed by a quantitative report within the next financial quarter. The first-quarter IMS

[6] Additionally, the typical IMS contains a description of the trading environment, the financial position (cash, working capital and net debt changes), and an outlook section on growth potentials. Thus, the IMS tone is likely to encapsulate the sentiment with regards to trade credit, cash flows, borrowings and firm growth opportunities. Given that prior research provides evidence of linkages between accounting quality and market-to-book value (Bharath et al., 2008) and accounting quality and trade credit (Chen et al., 2017), the IMS tone is useful for examining the influence of accounting quality on the relationship between tone and financial indicators such as the market-to-book value, the level of trade credit or borrowings.

is followed by the interim report, and the third-quarter IMS is followed by the annual report. The timing of the IMS disclosure prior to the release of full quantitative report makes it an excellent choice for ex-post tonal verification, and trumps disclosures that are subject to concurrent narrative adjustment, such as the Chairman's statements or MD&A sections of annual reports, which are typically released at the same time with full quantitative reports.

Fourth, the US Securities and Exchange Commission (SEC) has recently expressed their interest in the IMS as a low-cost alternative to full US quarterly reports. Accordingly, the SEC started a consultation process to study the IMS experience in the EU (SEC, 2018; Rahman, 2019). Therefore, the findings of this study can contribute to the policy debate on the usefulness of the IMS narratives in providing relevant firm fundamental information to investors.

3. Sampling and variable measurements

3.1. Sample selection

I adopt the underlying sample of Rahman, Schleicher, and Walker (2019) in this study. It is a sample of UK IMSs obtained from the *Perfect Information (PI) Filings Expert* database of regulatory and non-regulatory filings. The sample period covers the years 2008 – 2013 when IMSs were mandatory disclosures in the UK. This increases the likelihood that IMSs comply with the TD requirements with regards to the timing and frequency of disclosure and on narrating the financial performance. Likewise, the years 2007 and 2014 of the mandatory IMS regime are not included for sampling due to 'teething' issues and low compliance with the TD rules, as documented in Schleicher and Walker (2015).

The date of sample initiation was 30 June 2008. At that date, a total of 668 firms were listed in the FTSE All-Share Index. After eliminating 305 financial firms[7] and 39 US cross-listed firms,[8] it left 324 firms mandated by the TD to disclose an IMS. From this, a random sample of 100 firms were collected. The sample size of 100 firms was chosen to yield an IMS tally over the six-year sample period that is expedient for manual examination, to avoid misclassification of IMSs as trading or production updates in the *PI Filings Expert* database.[9] 15%, 38% and 47% of the sample firms are FTSE 100, FTSE 250 and FTSE Small Cap constituents respectively, which is proportional to the total number of firms in these indexes. The 100 selected firms were required to disclose a maximum of 1200 IMSs over the six-year sample period. A maximum of 69 IMSs are lost due to firm collapse and delisting and another 109 IMSs due to non-disclosure. This yields a sample of 1022 IMSs used by Rahman et al. (2019) in their study. I subsequently perform a manual check on the sample firm documents archived in *PI Filings Expert* database and find that 24 IMSs were misclassified as either AGM statements, trading or operating updates, or production reports. I add these 24 IMSs to the sample, yielding a final tally of 1046 IMSs for this study. This includes 520 first-quarter IMSs and 526 third-quarter IMSs. A breakdown of the IMSs by the years reveals survivorship. A breakdown by the industries indicates that about 75% of the IMSs are from the *Industrials*, *Consumer Services* and *Consumer Goods* industries, proportional to the list of constituents from these three industries in the FTSE All-Share non-financial index. Table 1 illustrates the sample development and composition.

[7] The sample excludes financial firms because although they disclose IMSs, they are subject to reporting different financial line-items in their annual accounts than non-financial firms, and hence may create distortions in measuring accruals-based accounting quality.

[8] The sample also excludes firms cross-listed in the US which are not required to disclose IMSs as they disclose fully-fledged quarterly reports.

[9] This is because trading or production updates are not required to describe the financial performance and position or explain material events and transactions. Further, unlike an IMS, production updates do not necessarily provide a forward-looking outlook on the business environment or growth potentials.

[**Table 1 near here**]

3.2 Measuring tone

Recent studies indicate that wordlists tailored for business communication have greater efficacy in capturing the tone than non-domain specific wordlists (Henry & Leone, 2016; Loughran & McDonald, 2011). Therefore, I choose two wordlists specialised in the domain of financial communication – Henry (2008) and Loughran and McDonald (2011) ('LM'). Both of these wordlists have been used for measuring the tone of earnings press releases, conference calls and annual reports (e.g. Davis et al., 2012, 2015; Henry, 2008; Henry & Leone, 2016; Loughran & McDonald, 2011; Tetlock, Saar-Tsechansky, & Macskassy, 2008). The Henry (2008) list contains 105 positive words and 85 negative words while the LM (2011) list contains 354 positive words and 2355 negative words. I measure the tones using a computer software tool named *Corporate Financial Information Environment – Final Report Structure Extractor* (CFIE-FRSE). This software tool is available at http://ucrel.lancs.ac.uk/cfie/. I first upload each keyword list in CFIE-FRSE, and then upload the IMS document for reading. CFIE-FRSE returns the number of positive and negative words in the IMS document that matches with each keyword list.[10] For each wordlist, I measure the IMS tone, TONE, as the difference between the number of positive and negative keywords in an IMS, denoted POS and NEG respectively, divided by the sum of positive and negative keywords in that IMS. This is consistent with Henry and Leone (2016) and is calculated as follows:

$$TONE_{HENRY} = (POS_{HENRY} - NEG_{NEHRY}) / (POS_{HENRY} + NEG_{NEHRY}) \quad (1)$$

$$TONE_{LM} = (POS_{LM} - NEG_{LM}) / (POS_{LM} + NEG_{LM}) \quad (2)$$

[10] For details on the workings of CFIE-FRSE tool, please see Rahman et al. (2019).

$TONE_{HENRY}$ and $TONE_{LM}$ increase with increasing positive sentiment in the IMS and ranges from –1 to 1.[11] I report the results for $TONE_{HENRY}$ and $TONE_{LM}$ separately.

3.3. Variable measurements

I obtain from *DataStream* six-monthly (i.e. interim) data for measuring the variables in the study. This allows me to match every IMS with its following six-monthly data. All variables in this study are defined in Appendix A.

3.3.1. Measuring accounting quality

I measure accounting quality (AQ) as the first principal component of three accruals-based accounting quality metrics, consistent with recent literature (e.g. Beatty et al., 2010; Bharath et al, 2008; Chen et al., 2017). Principal component analysis preserves the variability of different measurement approaches to discretionary accruals and maximises interpretability without substantial loss of information (Jolliffe & Cadima, 2016). Using six-monthly intervals, I compute three measures of the absolute value of discretionary accruals – ADA1 based on Dechow and Dichev (2002), ADA2 based on Teoh et al. (1998) and ADA3 based on Dechow et al. (1995). Then, I measure AQ by multiplying the first principal component of ADA1, ADA2 and ADA3 with –1 so that larger AQ values indicate higher accounting quality.[12] This measurement process is illustrated in Appendix B.

3.3.2. Measuring earnings management

I measure discretionary accruals (DACC) to proxy for earnings management in my regressions, following the Modified Jones Model (Dechow et al., 1995). This approach is economically intuitive and easy to compute (Peasnell, Pope, & Young, 2000). First, I

[11] I apply equal-weighting of words for measuring TONE, as Henry and Leone (2016) suggest that this approach is simple, intuitive, easy to replicate, and provides qualitatively similar results than a word-based weighted approach.

[12] I find only the first eigenvalue is significantly greater than 1, which indicates that the first principal component captures a significant amount of the common variation of the three metrics of accounting quality.

measure total accruals by deducting cash flow from operations (net of extraordinary items and discontinued operations) from income before extraordinary items. Next, I compute DACC as the residuals of regressing total accruals on: (i) (1 / total assets), (ii) the difference between the six-monthly changes in sales and accounts receivables, scaled by average total assets, and (iii) property, plant and equipment, scaled by average total assets.[13] All items are measured over six-month periods. A higher value of discretionary accruals implies greater earnings management. This process is illustrated in Appendix C.

3.3.3. Other variables

In this section, I describe the other variables listed in Appendix A. To measure contemporaneous abnormal market returns, I follow Huang et al. (2014) and compute three-day cumulative abnormal returns [CAR (–1, +1)] as the sum of the daily market model adjusted returns over the three-day event period including the days before and after the IMS announcement. The market model adjusted returns are based on the difference between the daily return of a firm and the returns of the FTSE All-Share Index on that day. To capture abnormal market returns in the post IMS announcement period, I measure the 60-day, 90-day and 120-day cumulative abnormal returns beginning one day after the IMS disclosure, using market model adjusted returns [CAR (+2, +61), CAR (+2, +91) and CAR (+2, +121)].

In addition, I compute the following variables for my regressions. Following Huang et al. (2014), I measure two financial performance metrics – net operating income scaled by total assets (ROA) and cash flow from operations scaled by total assets (CFO), both measured over six-month periods. I measure the profitability status by an indicator variable that takes the value of 1 if ROA is negative, and 0 otherwise (LOSS), earnings volatility by the standard deviation of ROA over the previous four six-monthly periods (STDROA) and

[13] This step is a minor modification from Dechow et al. (1995) and the step performed for measuring ADA3 as it does not adjust the annual changes in sales of nondiscretionary accruals with the annual changes in accounts receivable, consistent with Huang et al. (2014).

operating activities by the six-monthly change in ROA (CHROA). Following Davis et al. (2012), I measure earnings surprise by taking the difference between the actual I/B/E/S quarterly earnings and the median consensus earnings forecast, scaled by share price at the start of the quarter (SURP). Following Bharath et al. (2008), I measure leverage by dividing six-monthly long-term debt by six-monthly total assets (LEV), firm size by taking the natural logarithm of total assets over six-month period [LOG(ASSET)], asset tangibility by dividing the value of six-monthly property, plants and equipment by six-monthly total assets (TANG) and the market-to-book ratio by dividing the six-monthly market value of equity by the six-monthly book value of equity (MTB). Following Chen et al. (2017), I measure information asymmetry as the difference between the ask price and bid price at the six-month end (INFASYM), the level of trade credit as six-monthly accounts payable scaled by six-monthly total assets (TRCREDIT), total current assets by the ratio of six-monthly total current assets to six-monthly total assets (CURTA). Following Cahan et al. (2017), I measure stock liquidity by dividing the six-monthly total volume of shares traded by the number of shares outstanding (LIQ). LENGTH refers to the number of words in the IMS document.

4. Results

4.1. Descriptive statistics

Table 2 reports the descriptive statistics of the variables in this study for all 1046 IMSs during the years 2008 – 2013. The mean and median of $TONE_{HENRY}$ are both larger than $TONE_{LM}$, implying that $TONE_{HENRY}$ provides a more positive sentiment of financial performance. Both tone measures range [–1, +1], have similar standard deviations and are skewed to the left, with larger median values than the mean. The positive first quartiles of $TONE_{HENRY}$ and $TONE_{LM}$ indicate that the tone of most IMSs is positive. These statistics are

consistent with prior literature comparing the Henry and LM tone scores (Henry & Leone, 2016; Davis et al., 2015). The means and medians of all three accounting quality metrics ADA1, ADA2 and ADA3 are positive by construction and are right-skewed. The mean and median of AQ are negative due to the –1 multiplier. AQ is left-skewed and ranges [–2.55, 0]. These statistics are consistent with recent accounting quality literature (Beatty et al., 2010; Bharath et al., 2008; Cahan et al., 2017; Chen et al., 2017).

The other variables are largely unremarkable and consistent with prior literature (Chen et al., 2017; Davis et al., 2012, 2015; Henry & Leone, 2016; Huang et al., 2014). For instance, the medians of CAR (–1, +1), CAR (+2, +61), CAR (+2, +91) and CAR (+2, +121) are all positive, indicating that most IMSs are associated with an increase in abnormal market returns. The profitability measures CHROA, STDROA, SURP and LOSS display high coefficients of variation (>2), while INFASYM, LIQ and MTB have moderately high coefficients of variation (>1.3). This implies that the inferences made from the results are generalizable because of their high level of variation around the mean. The control variables LIQ and INFASYM likely contain outliers on the right-hand side. However, I do not delete any observations to prevent loss in TONE and AQ data, and also because both variables appear to be right-skewed. 11.9% of sample firms reported a loss, which is comparable to the number of loss firms in the FTSE All-Share Index over this period.[14] The mean (median) length of an IMS document is about 1001 (766) words, and ranges [107, 9401] words. The first- and third-quartiles for length [544, 1190] indicate that the mean IMS length is affected by a small number of long IMSs.

[**Table 2 near here**]

[14] For details on the earnings classification of constituents in the FTSE Index, see Schleicher & Walker (2015).

Table 3 breaks down the means of $TONE_{HENRY,}$ $TONE_{LM}$ and AQ by first- and third-quarter IMSs, years and industries. Overall, there appears to be a positive link between the mean tone and AQ scores. For instance, Panel A reports that the first-quarter IMSs have a more positive mean tone and higher mean AQ score than the third-quarter IMSs. The higher first-quarter mean tones are driven largely by the years 2008 and 2011 and by the *Industrials* and *Telecommunications* industries. In Panel B, the three highest years for mean tone scores – namely 2008, 2010 and 2011 – also have the three highest mean AQ scores. Likewise, the year 2009 has both the lowest mean tone and AQ scores. This positive trend across the years provide some preliminary evidence of the association between the tone and accounting quality and is consistent with H1. The mean tone and AQ scores have remained largely stable over 2010 – 2013, consistent with firms resolving their disclosure 'teething' issues within a couple of years of the IMS adoption. While in Panel C the patterns across the industries are less obvious, it appears that industries that have more positive average IMS tones often have higher mean AQ scores. On average, *Technology* and *Industrials* firms appear to disclose the highest quality accounting information, while *Basic Materials* firms provide the lowest quality disclosures.

[**Table 3 near here**]

Un-tabulated correlation coefficients of the variables in this study are consistent with prior research. For instance, both tone measures exhibit positive correlations with financial performance metrics ROA ($TONE_{HENRY}$ r = 0.123; $TONE_{LM}$ r = 0.148) and CFO ($TONE_{HENRY}$ r = 0.118; $TONE_{LM}$ r = 0.125), consistent with Huang et al. (2014). Further, $TONE_{HENRY}$ and $TONE_{LM}$ are positively correlated with abnormal market returns CAR (–1, +1) (r = 0.121; r = 0.148), CAR (+2, +61) (r = 0.031; r = 0.067), CAR (+2, +91) (r = 0.074;

r = 0.0079) and CAR (+2, +121) (r = 0.1111; r = 0.120), consistent with the literature (Davis et al., 2012; Henry & Leone, 2016; Price et al., 2012). Tone is also positively correlated with accounting quality AQ ($TONE_{HENRY}$ r = 0.011; $TONE_{LM}$ r = 0.010). This provides some prima-facie evidence on the association between the tone and accounting quality and is consistent with H1. In addition, AQ is negatively correlated with ROA (r = –0.124), CFO (r = –0.274), LOSS (r = –0.082) and MTB (r = –0.136), and positively correlated with LOG(ASSET) (r = 0.111), LIQ (r = 0.141) and LOG(1+AGE) (r = 0.172). These findings are consistent with prior research (Bharath et al., 2008; Iatridis, 2011). The size and signs of the remaining intra-variable correlation coefficients are unremarkable and show no evidence of multi-collinearity.

4.2. Test of H1

H1 predicts that the tone is positively associated with accounting quality. To test H1, I follow Iatridis (2011) who examines the factors affecting accounting quality differences in firms and develop the following multivariate regression[15,16]:

$$AQ_{itj} = \alpha + \beta_1 TONE_{itj} + \beta_2 ROA_{itj} + \beta_3 CHROA_{itj} + \beta_4 STDROA_{itj} + \beta_5 DACC_{itj} + \beta_6 INFASYM_{itj} + \beta_7 LIQ_{itj} + \beta_8 LOG(ASSET)_{itj} + \beta_9 MTB_{itj} + \beta_{10} LEV_{itj} + \varepsilon_{itj} \quad (3)$$

In all regression models: (a) the subscripts *itj* indicate *i* = firm; *t* = year; *j* = IMS (quarters 1 or 3) (b) first-quarter IMS tones are matched with interim results and the third-quarter IMS tones are matched with annual results (c) $TONE_{HENRY}$ and $TONE_{LM}$ are standardized for all regressions to have a mean of 0 and standard deviation of 1, so that the tone coefficients and their interaction terms can be directly compared across the models.

[15] My model differs from Iatridis (2011) in two ways. First, Iatridis (2011) does not measure the tone. Second, Iatridis (2011) does not include information asymmetry and stock liquidity in his model. The coefficients of $TONE_{HENRY}$ and $TONE_{LM}$ remain positive and significant if INFASYM and LIQ are excluded from my model.
[16] In this model and throughout the paper, I claim association but not causality between tone and accounting quality, which is beyond the scope and context of this paper.

In Eq. (3), my primary variable of interest is TONE. For H1 to hold, the coefficient of TONE, β_1, needs to be positive. Prior research finds that accounting quality is positively associated with firm performance, stock liquidity, firm size, and leverage and is negatively associated with information asymmetry and market-to-book value (Bhattacharya et al., 2013; Chang et al., 2008; Graham et al., 2005; Iatridis, 2011; Kim & Verrachia, 1994). Thus, in Eq. (3), I expect the coefficients β_2, β_7, β_8 and β_{10} to be positive and β_6 and β_9 to be negative.

The results of Eq. (3) are reported in Table 4. I present the results for $TONE_{HENRY}$ and $TONE_{LM}$ in Columns (1) and (2) respectively. Consistent with H1, in both cases, β_1 is positive and statistically significant at the 5% level, suggesting that the tone and accounting quality are positively associated. With respect to the control variables, AQ is positively associated with ROA (β_2) and LEV (β_{10}) and negatively associated with MTB (β_9), consistent with Iatridis (2011). Overall, the results in Columns (1) and (2) are very similar and the explanatory powers of the two models are indistinguishable.

[**Table 4 near here**]

4.3. Test of H2

H2 predicts that as accounting quality increases, the tone is associated with lower levels of financial performance. I proxy for financial performance by ROA and CFO. Prior research indicates a positive association between the tone and current financial performance (Davis et al., 2015; Li, 2010) and future financial performance (Davis et al., 2012, 2015; Huang et al., 2014). I proxy current performance by the six-monthly ROA or CFO and future performance by one-year ahead ROA or CFO (starting from the end of the six-monthly ROA or CFO). To test H2, I follow Huang et al. (2014) who examine the

determinants of income and cash flows and devise the following sets of regressions (excluding industry and year fixed-effects)[17]:

$$ROA_{itj} \text{ (or } CFO_{itj}) = \alpha + \beta_1 TONE_{itj} + \beta_2 AQ_{itj} + \beta_3 (TONE_{itj} \times AQ_{itj}) + \beta_4 DACC_{itj} + \beta_5 LOG(ASSET)_{itj} + \beta_6 MTB_{itj} + \beta_7 LOSS_{itj} + \beta_8 LEV_{itj} + \varepsilon_{itj} \quad (4a)$$

$$ROA_{it+1j} \text{ (or } CFO_{it+1j}) = \alpha + \beta_1 TONE_{itj} + \beta_2 AQ_{itj} + \beta_3 (TONE_{itj} \times AQ_{itj}) + \beta_4 ROA_{itj} + \beta_5 STDROA_{itj} + \beta_6 DACC_{itj} + \beta_7 LOG(ASSET)_{itj} + \beta_8 MTB_{itj} + \beta_9 LOSS_{itj} + \beta_{10} LEV_{itj} + \varepsilon_{itj} \quad (4b)$$

Eq. (4a) tests H2 for current performance and Eq. (4b) for future performance. In both models, my primary interest is in the interaction term TONE × AQ. For H2 to hold, the coefficient of the interaction term TONE × AQ, β_3, in Eq. (4) should be negative. Overall in Eq. (4), based on prior research, I expect financial performance to be positively associated with market-to-book ratio (Davis et al., 2015) and negatively associated with leverage and loss firms (Davis et al., 2012; Huang et al., 2014). Specifically, in Eq. (4a), I expect the coefficient β_6 to be positive, and β_7 and β_8 to be negative. In Eq. (4b), I expect the coefficients β_4 (for current ROA) and β_8 to be positive, and β_9 and β_{10} to be negative.

Columns (1) – (4) of Table 5 report the results of Eq. (4a). In Columns (3) and (4), I find that the coefficient of the interaction term TONE × AQ, β_3, is negative and significant at the 1% level. This affirms H2 and is consistent with the assertion that as accounting quality goes up, the association between the tone and current CFO is less positive. However, for current ROA in Columns (1) and (2), the lower statistical significance of the β_3 coefficients provides only weak evidence in favour of H2. In the CFO regressions in Columns (3) – (4), the coefficient of TONE, β_1, is negative. In this context, β_1 represents the partial effect of TONE on current performance metrics when AQ=0. Given that an AQ value of 0 implies maximum accounting quality, it is conceivable that TONE is associated with

[17] Industry fixed effects includes eight ICB industry classification 1/0 indicator variables, omitting 'Oil and Gas', Year fixed-effects includes five 1/0 indicator variables, one for each sample year, omitting the year 2008.

lower current cash flows. Overall, in Columns (1) – (4), I observe that the current ROA and CFO are positively associated with MTB (β_6) but negatively associated with LOSS (β_7) and LEV (β_8), consistent with prior studies (Davis et al., 2012; Demers & Vega, 2011).[18] Current CFO is negatively associated with DACC (β_4), consistent with Sloan (1996).

Columns (5) – (8) of Table 5 reports the results of Eq. (4b). Consistent with H2, the coefficient of TONE × AQ, β_3, is negative and significant at the 5% level for both future ROA and CFO. The negative coefficients of TONE, β_1, implies that when AQ=0, the tone predicts lower future ROA and CFO. The remaining control variables often exhibit weaker statistical significance but are qualitatively similar to the results reported in Columns (1) – (4). Overall, in Table 5, the explanatory powers of the LM models are slightly higher than the corresponding Henry models, although this difference is more pronounced in Columns (1) – (4).

[**Table 5 near here**]

For robustness, I repeat Eqs. (4a) and (4b) but replace the dependent variables ROA and CFO with two alternative financial performance metrics – income before extraordinary items and preference shares scaled by total assets (ROCE) and sales revenue scaled by total assets (SALES), both measured over six-month periods. The results are un-tabulated for brevity. Consistent with H2, the results continue to indicate that with increasing accounting quality, the association between the tone and both the current and future ROCE and SALES

[18] Davis et al. (2012) find a negative association between book-to-market ratio and financial performance, which is consistent with the positive coefficient of β_6 in Eq. (4a). Additionally, unlike this study, Davis et al. (2012) measured leverage by dividing total liabilities by total assets.

is less positive.[19] The remaining explanatory variables are qualitatively similar to the results in Table 5.

4.4. Test of H3

H3 predicts that as accounting quality increases, the tone is associated with lower levels of market-to-book value. Consistent with Varaiya, Kerin, and Weeks (1987), I adopt market-to-book value as a proxy for growth opportunities. To test H3, I follow Bharath et al. (2008) who examine the association between market-to-book value and accounting quality and develop the following regression (excluding industry and year fixed-effects):

$$MTB_{itj} = \alpha + \beta_1 TONE_{itj} + \beta_2 AQ_{itj} + \beta_3 (TONE_{itj} \times AQ_{itj}) + \beta_4 ROA_{itj} + \beta_5 LOG(ASSET)_{itj} + \beta_6 TANG_{itj} + \beta_7 LEV_{itj} + \beta_8 LOG(1+AGE)_{itj} + \varepsilon_{itj} \quad (5)$$

In Eq. (5), the coefficient of the interaction term TONE × AQ, β_3, represents the influence of accounting quality on the association between tone and market-to-book value. For H3 to hold, the coefficient β_3 should be negative. As for the control variables in Eq. (5), market-to-book value is expected to be positively associated with earnings (Penman, 1996) and leverage (Chen & Zhao, 2006) and negatively associated with tangible assets (Little, Coffee, Lirely, & Little, 2010) and firm age (Loderer & Waelchli, 2017). Therefore, I expect the coefficients β_4 and β_7 in Eq. (5) to be positive and β_6 and β_8 to be negative.

Table 6 reports the results of Eq. (5). Consistent with H3, for both $TONE_{HENRY}$ and $TONE_{LM}$, the coefficient of TONE × AQ, β_3, is negative and significant at the 5% level. The negative coefficient of TONE, β_1, implies that when AQ=0, TONE predicts lower MTB, consistent with prior literature (Bharath et al., 2008; Chen et al., 2017; Iatridis, 2011). With regards to the control variables, I find that ROA (β_4) and LEV (β_7) are positively associated

[19] The results are significant at the 1% level for current ROCE and SALES, at the 5% level for future ROCE and at the 10% level for future SALES.

with MTB while TANG (β_6) and LOG(1+AGE) (β_8) are negatively associated with MTB, consistent with prior research (Chen & Zhao, 2006; Little et al., 2010; Loderer & Waelchli, 2017; Penman, 1996).

[**Table 6 near here**]

4.5. Test of H4

H4 predicts that as accounting quality increases, the tone is associated with lower levels of abnormal market returns. To test H4, I follow extant literature on the association between tone and abnormal market returns (Davis et al., 2012; Henry & Leone, 2016; Huang et al., 2014; Price et al., 2012) and devise the following regression (excluding industry and year fixed-effects):

$$\text{CAR}\ (-1, +1)\ [\text{or CAR}\ (+2, +61)\ \text{or CAR}\ (+2, +91)\ \text{or CAR}\ (+2, +121)] = \alpha + \beta_1 \text{TONE}_{itj} + \beta_2 \text{AQ}_{itj} + \beta_3 (\text{TONE}_{itj} \times \text{AQ}_{itj}) + \beta_4 \text{ROA}_{itj} + \beta_5 \text{STDROA}_{itj} + \beta_6 \text{CHROA}_{itj} + \beta_7 \text{LOG(ASSET)}_{itj} + \beta_8 \text{MTB}_{itj} + \beta_9 \text{SURP}_{itj} + \beta_{10} \text{LOSS}_{itj} + \beta_{11} \text{LEV}_{itj} + \varepsilon_{itj} \quad (6)$$

Eq. (6) examines the cumulative abnormal returns (CAR) around the IMS disclose days [CAR (–1, +1)] as well as CAR over 60 days [CAR (+2, +61)], 90 days [CAR (+2, +91)] and 120 days [CAR (+2, +121)] after the IMS announcement, when verifying quantitative information is likely to be disclosed via full sets of financial statements. For H4 to hold, the coefficient of TONE × AQ, β_3, should be negative. Further, prior research indicates a positive association between earnings surprises and contemporaneous abnormal market returns (Henry & Leone, 2016). Hence, I expect β_9 of the CAR (–1, +1) regression to be positive.

Table 7 reports the results of Eq. (6). In the CAR (+2, +61), CAR (+2, +91) and CAR (+2, +121) regressions, for both TONE_{HENRY} and TONE_{LM}, the coefficient of TONE ×

AQ, β_3, is negative and significant at the 5% level. This supports H4 and is consistent with the argument that as accounting quality goes up, the association between the tone and abnormal market returns in the post IMS announcement period is less positive. In the CAR (–1, +1) model, the coefficient β_3 is statistically insignificant, consistent with full interim or annual reports not disclosed concurrently with IMSs. SURP (β_9) is positively associated with CAR (–1, +1), consistent with Henry and Leone (2016). Additionally, AQ (β_2) has weak negative associations with CAR (+2, +91) and CAR (+2, +121). This implies, when TONE=0 (i.e. neutral), the post IMS disclosure abnormal returns decrease with increases in accounting quality. The explanatory power of share price movements is between 0.3% – 1% higher with the LM wordlists.

[**Table 7 near here**]

5. Additional analysis

5.1. Accounting quality and the association between tone and borrowing capacity

Recent studies have examined the association between accounting quality and firm borrowings (Chen et al., 2017; Beatty et al., 2010). Supplementary to my analysis on the role of accounting quality in ex-post verification, I now examine the influence of accounting quality on the association between the tone and firms' borrowing capacities. In particular, I investigate two types of borrowings – trade credit and financial leverage. First, information on trade credit is important for capital providers for judging a firm's credit-worthiness. Trade credit provides a convenient means of acquiring raw materials and merchandise without paying on point (Armstrong, Wayne, & Weber, 2010). Prior studies suggest that high accounting quality firms have easier access to traditional financing, allowing trade suppliers to extend their credit lines to low quality disclosers (Antov & Atanasova, 2007;

Petersen & Rajan, 1997). Thus, the association between accounting quality and trade credit is negative (Chen et al., 2017). However, the association between the tone and trade credit is unclear from prior literature. For this reason, I do not provide a directional hypothesis on the influence of accounting quality on the association between tone and trade credit.

Second, financial leverage indicates the amount of capital provided by debt holders relative to equity holders (Beatty et al., 2010). Both debt and equity providers assess a firm's default and solvency risks by examining their financial reports (Bharath et al., 2008; Biddle & Hilary, 2006; Diamond, 1991; Francis et al., 2004). High accounting quality firms are likely to get more attention from both debt and equity providers. Thus, the association between accounting quality on leverage is suspect. The association between leverage and the tone is also unclear. Therefore, I do not provide a directional hypothesis on the influence of accounting quality on the association between tone and financial leverage.

To examine whether accounting quality influences the associations of trade credit (TRDRECIT) and leverage (LEV) with the tone, I follow Chen et al.'s (2017) models that link trade credit and accounting quality and develop the following regressions (excluding industry and year fixed-effects):

$$TRCREDIT_{itj} = \alpha + \beta_1 TONE_{itj} + \beta_2 AQ_{itj} + \beta_3 (TONE_{itj} \times AQ_{itj}) + \beta_4 ROA_{itj} + \beta_5 CHROA_{itj} + \beta_6 INFASYM_{itj} + \beta_7 LIQ_{itj} + \beta_8 LOG(ASSET)_{itj} + \beta_9 MTB_{itj} + \beta_{10} CHDEBT_{itj} + \beta_{11} CURTA_{itj} + \beta_{12} LOG(1+AGE)_{itj} + \varepsilon_{itj} \quad (7a)$$

$$LEV_{itj} = \alpha + \beta_1 TONE_{itj} + \beta_2 AQ_{itj} + \beta_3 (TONE_{itj} \times AQ_{itj}) + \beta_4 ROA_{itj} + \beta_5 CHROA_{itj} + \beta_6 INFASYM_{itj} + \beta_7 LIQ_{itj} + \beta_8 LOG(ASSET)_{itj} + \beta_9 MTB_{itj} + \beta_{10} CHDEBT_{itj} + \beta_{11} CURTA_{itj} + \beta_{12} LOG(1+AGE)_{itj} + \varepsilon_{itj} \quad (7b)$$

In Eqs. (7a) and (7b), the coefficients of the interaction terms TONE × AQ, β_3, indicate the accounting quality influence on the association of tone with TRCREDIT and LEV respectively. In Eq. (7a), TRCREDIT should be positively associated with INFASYM, MTB, and CURTA and negatively associated with ROA, LIQ, LOG(ASSET) and

LOG(1+AGE). Firms with greater information asymmetry, higher market-to-book ratios and current assets are likely to obtain trade credit based on their personal connections with the supplier or due to their perceived creditworthiness (Antov & Atanasova, 2007; Chen, Levy, Martin, & Shalev, 2016, Chen et al., 2017). In contrast, larger firms rely more on debt than trade credit, while older, more liquid and more profitable firms are likely to seek internal sources of financing such as equity or cash flow from operations over trade credit (Bharath et al., 2008; Chen et al., 2017; Petersen & Rajan, 1997). Therefore, I expect the coefficients β_6, β_9 and β_{11} in Eq. (7a) to be positive and β_4, β_7, β_8 and β_{12} to be negative.

In Eq. (7b), I expect LEV to be positively associated with LOG(ASSET) and MTB as larger and high growth firms are likely to obtain more debt (Bharath et al., 2008). I expect ROA to be negatively associated with LEV, as larger firms may find it easier to obtain debt due to larger collateral (Chen et al., 2017). Therefore, I expect the coefficients β_8 and β_9 in Eq. (7b) to be positive and β_4 to be negative.

Columns (1) and (2) of Table 8 report the results of Eq. (7a). In both Columns (1) and (2), the coefficient of TONE × AQ, β_3, is negative and significant at the 5% level.[20] As for the control variables, ROA (β_4) and LOG(1+AGE) (β_{12}) are negatively associated with TRCREDIT while CURTA (β_{11}) is positively associated with TRCREDIT, consistent with Chen et al. (2017).[21]

Columns (3) and (4) of Table 8 report the results of Eq. (7b). For both $TONE_{HENRY}$ and $TONE_{LM}$, the coefficient of TONE × AQ, β_3, is negative and significant at the 1% level. All other statistically significant explanatory variables are in line with prior literature (Bharath et al., 2008; Chen et al., 2016, 2017).[22]

[20] For robustness, I measure trade credit by dividing accounts payable by the cost of goods sold instead of total assets. The coefficient of TONE × AQ continues to be negative but is now significant at the 10% level only.
[21] The results are qualitatively unchanged if LEV is included as an additional regressor in Eq. (6a).
[22] For robustness, I compute leverage as total liabilities divided by total assets. This adds current liabilities to long-term debt as the numerator in the leverage ratio. I find that the results are qualitatively similar to Columns (3) and (4) in Table 8.

[**Table 8 near here**]

5.2. Using alternative measures of the tone

For robustness, I use two alternative approaches of tone measurement. First, I use the Henry and LM wordlists but now adopt the specification of Loughran and McDonald (2011). Under this specification, the tone is measured by dividing the difference between the number of positive and negative words in an IMS by the total number of words in the IMS. I then repeat the regressions in Eq. (3) – Eq. (7) and find that the results are qualitatively identical to the results reported in Tables 4 – 8.

Second, I obtain from Rahman et al. (2019) the manual tone scores of 1022 IMSs from the sample of 1046 IMSs used in this study. Manual tone is likely to capture a more accurate measure of the sentiment than wordlist-based tone because it is able to account for contextual differences (Clatworthy & Jones, 2003).[23] Rahman et al. (2019) read each IMS manually and categorize the tone of each textual clause in the IMS as either of positive, negative or neutral, based on the favourability, adversity or neutrality of the sentiment in the clause. Subsequently, the tone is computed as the difference between the number of positive and negative clauses in an IMS divided by the sum of positive and negative clauses, similar to the approach used in Eqs. (1) and (2) in this study. Using these tone scores for 1022 IMSs, I repeat the regressions in Eq. (3) – Eq. (7). I find that the association between tone and AQ is positive and significant at the 10% level. With increasing accounting quality, the tone is associated with lower levels of ROA, CFO, MTB, CAR, TRCREDIT and LEV, although the results are often insignificant at the 10% level. I believe the weaker statistical significance of these results are reasonable given that manual tone is expected to be more

[23] Rahman et al. (2019) provide evidence that manual tone score yields greater explanatory power for short window announcement event-period abnormal market returns than automated tone scores computed using Henry and LM wordlists.

informative than wordlist-based tone due to its greater context-accuracy (Rahman et al., 2019; Clatworthy & Jones, 2003).

6. Discussion and conclusions

This study contributes to the literature by examining the role of accounting quality in ex-post tonal verification in the lightly-regulated setting of UK interim reporting. In this setting, first, the managerial latitude on the financial line-item(s) to discuss in an IMS allows them to narrate their assessments of financial performance with minimum constraints. Subsequently, the disclosure of full interim and annual reports allows investors to verify these narratives ex-post. I use a sample of mandatory IMSs to ensure firms' compliance with the IMS disclosure requirements of the Transparency Directive. My results are consistent with the argument that the quality of quantitative disclosures is related to the informativeness of the narrative tone. Specifically, I find that firms with more positive IMS tones are likely to disclose higher quality accounting information. In addition, I find that as accounting quality increases, the tone is associated with lower levels of firms' financial performance, growth opportunities and borrowing capacities. Subsequently, I find with increasing accounting quality, the tone is associated with lower levels of abnormal market returns in the months following the IMS disclosure. My results are robust to several alternative variable definitions and regression specifications. Overall, these results accentuate the efficacy of the interim and annual reports in ex-post tonal verification and attests to their stewardship function in broadly efficient capital markets, as investors revise their expectations after verifiable information comes across.

This study also contributes to the policy discussion of the IMS as a viable alternative to US quarterly reports. In this connection, the recent SEC decision to examine the IMS as an alternative to US quarterly reports (Rahman, 2019) is non-trivial because it signals the

prospect to depart from a quarterly reporting regime established in the US since 1971 (Schleicher & Walker, 2015). The primary objectives for abolishing quarterly reports include lowering disclosure costs, avoiding short-termism in financial reporting, reducing information overload and increasing cross-country reporting comparability (SEC, 2018). At the same time, regulators want to ensure that reducing the reporting frequency does not increase information asymmetry or lower investor protection (Schleicher & Walker, 2015). Based on the findings of this study and an examination of the IMS reporting practice in the UK, I argue that a semi-annual reporting regime with mandatory IMSs for the first and third quarters is likely to attain most of these goals. First, the positive association between the IMS tone and accounting quality provides credence to the argument that IMSs comprise largely of decision-relevant narratives.[24] This alignment is also consistent with Davis et al. (2012) who suggest that informative narratives typically outnumber misleading narratives in disclosures. Second, comparing the tone in the UK and US settings (Henry & Leone, 2016; Rahman et al., 2019) reveals that US firms, on average, disclose less positive narratives, consistent with more cautious narratives in the US in a culture of greater litigation (Francis et al., 1994). This should at least partly mitigate concerns of potential narrative inaccuracies. Third, a six-monthly quantitative statement disclosed after the IMS allows investors to ex-post verify the narratives. Managers in this arrangement are unlikely to make easily refutable assertions, as it dampens their future credibility and risks market penalties (Merkl-Davies & Brennan, 2007; Snyder, Stephan, & Rosenfield, 1978). If IMSs are adopted in the US, the quantitative reports prepared under the rules-based US GAAP is also likely to ease narrative verification. Fourth, the influence of accounting quality on the association between the IMS tone and abnormal market returns implies that investors are unlikely to be misled by narrative inaccuracies. Fifth, the length, disclosure window, and content flexibility of

[24] The finding of Schleicher & Walker (2015) that the median IMS is associated with price movements that is in magnitude 80% of the price movements associated with annual reports also attests to its decision-usefulness.

IMSs guarantees to lower firms' disclosure costs, information overload and earnings manipulation efforts for meeting short-term profit targets (Rahman, 2019). Consistent with Crowley (2018), abolishing full quarterly reports for a shorter, simpler and informative disclosure should reduce the investor information gap by creating a more level playing field between institutional and retail investors. Finally, adopting IMSs is likely to enhance cross-border reporting harmony and assist in better capital allocation. This is also consistent with the goals of the EU Transparency Directive (Link, 2012; Rahman, 2019).

The findings of this study should be read with some caution due to limitations in the research setting. First, the study examines tonal verification in a specific reporting context where a textual financial performance update is followed by a full set of quantitative reports. This limits the type of disclosures available for tone measurement. Also, these results should be used with caution when evaluating the verifiability of narratives disclosed concurrently with quantitative reports. Second, abolishing mandatory IMSs in 2014 restricts the number of years studied because voluntary IMSs have lower rates of compliance with Transparency Directive rules. Third, the need for manual examination to avoid misclassification of IMSs in the repository limits the sample size.

There are also a number of avenues for future research. The literature on the link between accounting quality and textual features of financial disclosures can be extended to other linguistic characteristics, such as textual readability, financial performance attributions or forward-looking narratives. Further studies can examine narrative verification in more detailed performance-related settings (e.g. earnings press releases) or in less extensive contexts (e.g. trading statements). Future studies can also examine whether accounting quality is affected by changes in the reporting frequency, particularly in the rare case of reducing reporting frequency in the EU in the post-mandatory IMS regime.

Data Availability

All data used in this study are publicly available from the sources identified in the paper.

Declaration of Competing Interests

I, the author, declare that I have no competing financial interests or personal relationships that could potentially affect the work reported in this paper.

Disclosures

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Table 1
Sample development and composition.

Panel A: Firm sample	*OBS*
Firms in FTSE All-Share Index as at 30 June 2008	668
Less: Financial Firms	(305)
Less: US Cross-listed Firms disclosing Quarterly Reports in 2008	(39)
FTSE All-Share Index Non-Financial Firms disclosing IMS in 2008	**324**
Randomly Selected Non-Financial Firms from 30 June 2008	**100**

Size composition of firms	*OBS*	*%*
FTSE 100	15	15
FTSE 250	38	38
FTSE Small Cap	47	47
	100	**100**

Panel B: IMS sample	*TOTAL OBS*	*Q1 OBS*	*Q3 OBS*
Total Number of Firms	100	100	100
Maximum Possible IMS from Sample Firms	1200	600	600
Less: Maximum IMS Lost by Firm Delisting	(69)	(32)	(37)
Less: Maximum IMS not disclosed	(109)	(61)	(48)
Add: IMS misclassified in PI Filings Expert	24	13	11
Final Sample of IMSs	**1046**	**520**	**526**

Year composition of IMS	*ALL OBS*	*%*	*Q1 OBS*	*%*	*Q3 OBS*	*%*
2008	178	17%	84	16%	94	18%
2009	199	19%	100	19%	99	19%
2010	191	18%	99	19%	92	17%
2011	172	16%	86	17%	86	16%
2012	154	15%	76	15%	78	15%
2013	152	15%	75	14%	77	15%
Total	**1046**	100%	**520**	100%	**526**	100%

Industry composition of IMS	*ALL OBS*	*%*	*Q1 OBS*	*%*	*Q3 OBS*	*%*
ICB 0001 Oil and Gas	39	4%	20	4%	19	4%
ICB 1000 Basic Materials	55	5%	24	5%	31	6%
ICB 2000 Industrials	426	41%	211	41%	215	41%
ICB 3000 Consumer Goods	111	11%	56	11%	55	10%
ICB 4000 Healthcare	21	2%	10	2%	11	2%
ICB 5000 Consumer Services	266	25%	132	25%	134	25%
ICB 6000 Telecommunications	41	4%	20	4%	21	4%
ICB 7000 Utilities	17	2%	9	2%	8	2%
ICB 9000 Technology	70	7%	38	7%	32	6%
Total	**1046**	100%	**520**	100%	**526**	100%

Note: This table presents the sample selection procedure. The sampling period spans the six years 2008 – 2013. 2008 is used as the year of initiating the sampling process. Panel A of the table presents the firm sample and size composition of firms. Panel B of the table presents the IMS sample and the year and industry compositions of IMSs. Q1 = first quarter, Q3= third quarter. OBS: number of observations.

Table 2
Descriptive statistics.

Variables	Mean	Std. Dev	Min	1st Quartile	Median	3rd Quartile	Max
$TONE_{HENRY}$	0.588	0.290	–1.000	0.450	0.636	0.793	1.000
$TONE_{LM}$	0.512	0.291	–1.000	0.333	0.550	0.724	1.000
ADA1	0.297	0.326	0.000	0.120	0.214	0.368	3.163
ADA2	0.098	0.109	0.000	0.029	0.070	0.127	1.034
ADA3	0.229	0.211	0.000	0.067	0.165	0.333	1.435
AQ	–0.357	0.272	–2.547	–0.433	–0.309	–0.137	0.000
ROA	0.103	0.118	–0.874	0.059	0.096	0.151	0.583
CHROA	–0.007	0.079	–0.649	–0.020	–0.002	0.016	0.659
STDROA	0.051	0.146	0.000	0.015	0.024	0.052	2.574
DACC	0.004	0.144	–1.046	–0.044	–0.021	0.020	1.753
CAR (–1, +1)	0.001	0.084	–0.563	–0.027	0.000	0.036	1.224
CAR (+2, +61)	0.008	0.124	–1.077	–0.044	0.015	0.072	0.466
CAR (+2, +91)	0.014	0.186	–1.008	–0.070	0.023	0.100	1.032
CAR (+2, +121)	–0.001	0.199	–1.014	–0.091	0.006	0.100	1.181
SURP	–0.002	0.034	–0.070	–0.010	–0.002	0.011	0.028
INFASYM	0.309	0.459	0.000	0.018	0.176	0.419	4.018
LIQ	0.928	1.346	0.000	0.311	0.570	1.072	17.20
LOG(ASSET)	13.39	1.979	0.000	12.31	13.15	14.32	18.87
MTB	0.626	0.866	–2.303	0.095	0.579	1.095	5.232
LEV	0.181	0.140	0.000	0.065	0.169	0.271	0.669
CURTA	0.438	0.212	0.000	0.266	0.445	0.602	0.891
TANG	0.248	0.216	0.000	0.066	0.186	0.345	0.891
LOSS	0.119	0.323	0.000	0.000	0.000	0.000	1.000
TRCREDIT	0.104	0.090	0.000	0.037	0.083	0.141	0.564
CFO	0.105	0.097	–0.633	0.062	0.100	0.148	0.550
CHDEBT	–0.001	0.123	–0.884	–0.051	–0.004	0.041	0.765
LOG(1+AGE)	1.719	0.251	0.954	1.568	1.748	1.898	2.199
LENGTH	1001.0	815.9	107.0	544.0	765.5	1189.8	9401.0
							OBS = 1046 (for all variables)

Note: This table reports the descriptive statistics of the variables used in this study for 1046 IMSs over the period 2008 – 2013. Std. Dev = standard deviation. The descriptive statistics for $TONE_{HENRY}$ and $TONE_{LM}$ are reported prior to standardization. OBS: number of observations. All variables are defined in Appendix A.

Table 3
Breakdown of tone and accounting quality by year and industry.

	OBS		$TONE_{HENRY}$ (mean)			$TONE_{LM}$ (mean)			AQ (mean)		
	Q1	Q3	Q1	Q3	ALL	Q1	Q3	ALL	Q1	Q3	ALL
Panel A: All IMSs											
Total	520	526	0.598	0.578	0.588	0.527	0.498	0.512	–0.351	–0.363	–0.357
Panel B: Year Breakdown											
2008	84	94	0.698	0.526	0.607	0.634	0.427	0.524	–0.325	–0.334	–0.330
2009	100	99	0.462	0.549	0.505	0.381	0.457	0.419	–0.394	–0.417	–0.406
2010	99	92	0.612	0.641	0.626	0.544	0.555	0.549	–0.339	–0.351	–0.345
2011	86	86	0.650	0.594	0.622	0.584	0.524	0.554	–0.347	–0.349	–0.348
2012	76	78	0.585	0.600	0.593	0.525	0.509	0.517	–0.343	–0.365	–0.354
2013	75	77	0.599	0.567	0.583	0.516	0.528	0.522	–0.351	–0.358	–0.355
Panel C: Industry Breakdown											
Oil and Gas	20	19	0.583	0.622	0.602	0.486	0.423	0.456	–0.577	–0.607	–0.592
Basic Materials	24	31	0.502	0.494	0.497	0.416	0.380	0.396	–0.827	–0.805	–0.814
Industrials	211	215	0.619	0.562	0.590	0.537	0.510	0.523	–0.296	–0.303	–0.300
Consumer Goods	56	55	0.558	0.559	0.559	0.499	0.469	0.484	–0.332	–0.341	–0.337
Healthcare	10	11	0.744	0.722	0.733	0.668	0.652	0.660	–0.328	–0.318	–0.323
Consumer Services	132	134	0.580	0.611	0.595	0.546	0.516	0.531	–0.345	–0.348	–0.346
Telecommunications	20	21	0.684	0.577	0.630	0.554	0.497	0.525	–0.419	–0.449	–0.434
Utilities	9	8	0.471	0.435	0.454	0.377	0.373	0.375	–0.357	–0.400	–0.377
Technology	38	32	0.612	0.628	0.619	0.525	0.519	0.522	–0.248	–0.254	–0.250

Note: This table reports the means of $TONE_{HENRY}$, $TONE_{LM}$ and AQ for 1046 IMSs over the period 2008 – 2013, broken down by IMS quarter, year and industry. The descriptive statistics for $TONE_{HENRY}$ and $TONE_{LM}$ are reported prior to standardization. Q1 = first quarter, Q3= third quarter. OBS: number of observations.

Table 4
Tone and accounting quality.

	Dependent Variable: AQ_{itj}	
Variables	(1)	(2)
	HENRY	LM
$INTERCEPT_{itj}$	–0.4637***	–0.4662***
$TONE_{itj}$	0.0225**	0.0234**
ROA_{itj}	1.1502***	1.1407***
$CHROA_{itj}$	–0.7033	–0.7021
$STDROA_{itj}$	–0.1908	–0.1904
$DACC_{itj}$	–0.1159	–0.1163
INFASYM	–0.0058	–0.0056
LIQ	0.0096	0.0097
$LOG(ASSET)_{itj}$	–0.0008	–0.0005
MTB_{itj}	–0.0856***	–0.0859***
LEV_{itj}	0.2274***	0.2771***
F-STAT	31.36***	31.45***
ADJ. R-SQ	0.2251	0.2256
OBS	1046	1046

Note: This table reports regressions of accounting quality on the tone for 1046 IMSs over the period 2008 – 2013. TONE is standardized to have a mean of 0 and standard deviation of 1. P-values are based on robust standard errors clustered two-way at the firm-level and year-level. ***, **, and * indicate two-tailed significance at the 1%, 5% and 10% level respectively. OBS: number of observations. All variables are defined in Appendix A.

Table 5
Tone, accounting quality and financial performance metrics.

	Dependent Variable: ROA_{itj}		Dependent Variable: CFO_{itj}		Dependent Variable: ROA_{it+1j}		Dependent Variable: CFO_{it+1j}	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HENRY	LM	HENRY	LM	HENRY	LM	HENRY	LM
$INTERCEPT_{itj}$	0.1143***	0.1105***	0.1270***	0.1226***	0.0185	0.0181	0.0292	0.0285
$TONE_{itj}$	–0.0092	–0.0105	–0.0186***	–0.0222***	–0.0092*	–0.0098*	–0.0093**	–0.0115**
AQ_{itj}	0.0888***	0.0769**	0.0542	0.0384	0.0114	0.0085	0.0078	0.0037
$TONE_{itj} \times AQ_{itj}$	–0.0352	–0.0466*	–0.0568***	–0.0717***	–0.0330**	–0.0349**	–0.0293**	–0.0332**
ROA_{itj}					0.6875***	0.6822***	0.5525***	0.5478***
$STDROA_{itj}$					–0.0065	–0.0053	0.0049	0.0067
$DACC_{itj}$	0.0202	0.0164	–0.1438***	–0.1493***	–0.0532	–0.0557	–0.0599**	–0.0623**
$LOG(ASSET)_{itj}$	0.0028	0.0028	–0.0006	–0.0007	–0.0001	–0.0001	–0.0015	–0.0015
MTB_{itj}	0.0442***	0.0432***	0.0357***	0.0345***	0.0099**	0.0099**	0.0111**	0.0110**
$LOSS_{itj}$	–0.0801***	–0.0784***	–0.0429***	–0.0408***	0.0135	0.0137	0.0043	0.0043
LEV_{itj}	–0.1654***	–0.1633***	–0.1571***	–0.1560***	–0.0690**	–0.0699**	–0.0190	–0.0204
INDUSTRY FE	YES	YES	YES	YES	YES	YES	YES	YES
YEAR FE	YES	YES	YES	YES	YES	YES	YES	YES
F-STAT	31.29***	32.25***	32.61***	35.03***	81.68***	81.94***	55.77***	56.15***
ADJ. R-SQ	0.3784	0.3858	0.3885	0.4061	0.6397	0.6403	0.5466	0.5483
OBS	1046	1046	1046	1046	1046	1046	1046	1046

Note: This table reports regressions of year-end and one year-ahead earnings and cash flows on the tone, accounting quality, and the interaction between the tone and accounting quality for 1046 IMSs over the period 2008 – 2013. TONE is standardized to have a mean of 0 and standard deviation of 1. INDUSTRY FE includes eight ICB classification 1/0 indicator variables, omitting 'Oil and Gas', YEAR FE includes five 1/0 indicator variables for each year in sample, omitting the year 2008. P-values are based on robust standard errors clustered two-way at the firm-level and year-level. ***, **, and * indicate two-tailed significance at the 1%, 5% and 10% level respectively. OBS: number of observations. All variables are defined in Appendix A.

Table 6
Tone, accounting quality and market-to-book ratio.

	Dependent Variable: MTB_{itj}	
Variables	(1)	(2)
	HENRY	LM
$INTERCEPT_{itj}$	0.5536	0.5464
$TONE_{itj}$	–0.1118**	–0.1118**
AQ_{itj}	–1.3089***	–1.3303***
$TONE_{itj} \times AQ_{itj}$	–0.3464**	–0.3518**
ROA_{itj}	3.1979***	3.1536***
$LOG(ASSET)_{itj}$	–0.0084	–0.0085
$TANG_{itj}$	–0.8195***	–0.8272***
LEV_{itj}	0.8670***	0.8614***
$LOG(1+AGE)_{itj}$	–0.2714*	–0.2680*
INDUSTRY FE	YES	YES
YEAR FE	YES	YES
F-STAT	19.18***	19.20***
ADJ. R-SQ	0.2675	0.2678
OBS	1046	1046

Note: This table reports regressions of market-to-book value of equity on the tone, accounting quality, and the interaction between the tone and accounting quality for 1046 IMSs over the period 2008 – 2013. TONE is standardized to have a mean of 0 and standard deviation of 1. INDUSTRY FE includes eight ICB classification 1/0 indicator variables, omitting 'Oil and Gas', YEAR FE includes five 1/0 indicator variables for each year in sample, omitting the year 2008. P-values are based on robust standard errors clustered two-way at the firm-level and year-level. ***, **, and * indicate two-tailed significance at the 1%, 5% and 10% level respectively. OBS: number of observations. All variables are defined in Appendix A.

Table 7
Tone, accounting quality and abnormal market returns.

	Dependent Var. CAR (–1, +1)		Dependent Var. CAR (+2, +61)		Dependent Var. CAR (+2, +91)		Dependent Var. CAR (+2, +121)	
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	HENRY	LM	HENRY	LM	HENRY	LM	HENRY	LM
$INTERCEPT_{itj}$	–0.0140	–0.0146	–0.0473	–0.0477	–0.0510	–0.0534	–0.0467	–0.0516
$TONE_{itj}$	0.0111	0.0170**	–0.0091	–0.0080	0.0004	0.0002	0.0001	0.0011
AQ_{itj}	–0.0031	0.0005	–0.0128	–0.0170	–0.0410*	–0.0463*	–0.0383*	–0.0449*
$TONE_{itj} \times AQ_{itj}$	0.0151	0.0209	–0.0409**	–0.0445**	–0.0481**	–0.0544**	–0.0510***	–0.0549**
ROA_{itj}	0.0027	0.0062	–0.0071	–0.0211	0.0324	0.0105	0.0131	0.0143
$STDROA_{itj}$	0.0051	0.0030	0.0652***	0.0656***	0.0736***	0.0742***	0.0998***	0.0884***
$CHROA_{itj}$	–0.0894	–0.0979	0.0472	0.0529	–0.1388	–0.1241	–0.1453**	–0.1486**
$LOG(ASSET)_{itj}$	0.0018	0.0019	0.0020	0.0020	0.0015	0.0017	0.0014	0.0017
MTB_{itj}	–0.0025	–0.0028	–0.0034	–0.0034	–0.0125*	–0.0126*	–0.125*	–0.0131*
$SURP_{itj}$	0.0001***	0.0001***	–0.0001	–0.0001	0.0001	0.0001	0.0001	0.0001
$LOSS_{itj}$	0.0090	0.0094	–0.0186	–0.0184	0.0068	0.0067	0.0254	0.0269
LEV_{itj}	–0.0355	–0.0323	–0.0882**	–0.0890**	–0.0209	–0.0228	–0.0299	–0.0301
INDUSTRY FE	YES	YES	YES	YES	YES	YES	YES	YES
YEAR FE	YES	YES	YES	YES	YES	YES	YES	YES
F-STAT	1.31	1.74**	2.30***	2.44***	1.64**	1.78**	1.90***	2.06***
ADJ. R-SQ	0.0071	0.0167	0.0295	0.0325	0.0146	0.0179	0.0206	0.0241
OBS	1046	1046	1046	1046	1046	1046	1046	1046

Note: This table reports regressions of 3-day, 60-day, 90-day and 120-day cumulative abnormal return CAR (–1, +1), CAR (+2, +61), CAR (+2, +91) and CAR (+2, +121) on the tone, accounting quality, and the interaction between the tone and accounting quality for 1046 IMSs over the period 2008 – 2013. TONE is standardized to have a mean of 0 and standard deviation of 1. INDUSTRY FE includes eight ICB classification 1/0 indicator variables, omitting 'Oil and Gas', YEAR FE includes five 1/0 indicator variables for each year in sample, omitting the year 2008. P-values are based on robust standard errors clustered two-way at the firm-level and year-level. ***, **, and * indicate two-tailed significance at the 1%, 5% and 10% level respectively. OBS: number of observations. All variables are defined in Appendix A.

Table 8
Tone, accounting quality, trade credit and financial leverage.

	Dependent Variable: $TRCREDIT_{itj}$		Dependent Variable: LEV_{itj}	
Variables	(1)	(2)	(3)	(4)
	HENRY	LM	HENRY	LM
$INTERCEPT_{itj}$	0.1195***	0.1159***	0.2035***	0.2034***
$TONE_{itj}$	–0.0018	0.0012	–0.0240***	–0.0229***
AQ_{itj}	0.0235	0.0224	0.0640***	0.0605**
$TONE_{itj} \times AQ_{itj}$	–0.0249**	–0.0248**	–0.0311***	–0.0335***
ROA_{itj}	–0.1674***	–0.1755***	–0.4145***	–0.4174***
$CHROA_{itj}$	0.1358***	0.1373***	0.2647***	0.2674***
$INFASYM_{itj}$	–0.0005	–0.0006	0.0215**	0.0210**
LIQ_{itj}	–0.0025	–0.0026	0.0133**	0.0134***
$LOG(ASSET)_{itj}$	0.0021	0.0022	0.0140***	0.0138***
MTB_{itj}	0.0012	0.0019	0.0329***	0.0327***
$CHDEBT_{itj}$	0.0191	0.0209	0.1558***	0.1556***
$CURTA_{itj}$	0.1866***	0.1866***	–0.2261***	–0.2222***
$LOG(1+AGE)_{itj}$	–0.0496***	–0.0477***	–0.0393**	–0.0392**
INDUSTRY FE	YES	YES	YES	YES
YEAR FE	YES	YES	YES	YES
F-STAT	16.23***	16.68***	32.70***	32.46***
ADJ. R-SQ	0.2670	0.2728	0.4313	0.4294
OBS	1046	1046	1046	1046

Note: This table reports regressions of trade credit and financial leverage on the tone, accounting quality, and the interaction between the tone and accounting quality for 1046 IMSs over the period 2008 – 2013. TONE is standardized to have a mean of 0 and standard deviation of 1. INDUSTRY FE includes eight ICB classification 1/0 indicator variables, omitting 'Oil and Gas', YEAR FE includes five 1/0 indicator variables for each year in sample, omitting the year 2008. P-values are based on robust standard errors clustered two-way at the firm-level and year-level. ***, **, and * indicate two-tailed significance at the 1%, 5% and 10% level respectively. OBS: number of observations. All variables are defined in Appendix A.

Appendix A
Variable Definitions.

Variable	Definition
$TONE_{HENRY}$	The difference between the number of positive and negative keywords divided by the total number of positive and negative keywords in the Henry (2008) wordlist.
$TONE_{LM}$	The difference between the number of positive and negative keywords divided by the total number of positive and negative keywords in the Loughran and McDonald (2011) wordlist.
ADA1	Absolute value of discretionary accruals computed by using the Modified Jones model as per Dechow and Dichev (2002).
ADA2	Absolute value of discretionary accruals computed as per Teoh et al. (1998).
ADA3	Absolute value of discretionary accruals based on the Modified Jones model as per Dechow et al. (1995).
AQ	The first principal component of ADA1, ADA2 and ADA3 multiplied by –1.
ROA	Net operating income scaled by total assets, measured over six-month period.
CHROA	Six-monthly change in ROA.
STDROA	Standard deviation of ROA over the past four six-monthly periods.
DACC	Discretionary accruals based on the cross-sectional Modified Jones model as per Dechow et al. (1995).
CAR (–1, +1)	Three-day cumulative abnormal return, from one day before to one day after the IMS announcement. For abnormal returns, daily market model adjusted returns, u_{id}, is computed as $u_{id} = R_{id} – (\alpha_i + \beta_i R_{md})$, where R_{id} is the return of firm i on day d, R_{md} is the return of the FTSE All-Share Index on day d and where R_{id} and R_{md} are calculated from DataStream Return Indices, RI. α_i and β_i are firm i's estimated market model parameters calculated from the non-event period which runs from d–60 to d–10 and d+10 to d+60 relative to the IMS announcement day d=0. The cumulative abnormal return is calculated as the sum of the daily market model adjusted returns, u_{it}, over the three-day event period (days d–1, d, d+1), such that $CAR(–1, +1)_{it} = u_{id-1} + u_{id} + u_{id+1}$.
CAR (+2, +61)	60-day cumulative abnormal return, starting from the second day after the IMS announcement. The computation is similar to three-day CAR except that firm i's market model parameters are now calculated from a non-event period which runs from d–110 to d–10 and d+70 to d+170 relative to the IMS announcement day d=0. $CAR(+2, +61)_{id} = u_{id+2} + \ldots + u_{id+61}$.
CAR (+2, +91)	90-day cumulative abnormal return, starting from the second day after the IMS announcement. The computation is similar to three-day CAR except that firm i's market model parameters are now calculated from a non-event period which runs from d–140 to d–10 and d+100 to d+230 relative to the IMS announcement day d=0. $CAR(+2, +91)_{id} = u_{id+2} + \ldots + u_{id+91}$.
CAR (+2, +121)	120-day cumulative abnormal return, starting from the second day after the IMS announcement. The computation is similar to three-day CAR except that firm i's market model parameters are now calculated from a non-event period which runs from d–170 to d–10 and d+130 to d+290 relative to the IMS announcement day d=0. $CAR(+2, +121)_{id} = u_{id+2} + \ldots + u_{id+121}$.
SURP	The difference between actual I/B/E/S quarterly earnings and the median consensus earnings forecast, scaled by share price at the start of the quarter.
LOG(ASSET)	Natural logarithm of total assets, measured over six-months.
MTB	The market value of equity divided by the book value of equity, measured over six-months.
LEV	Long-term debt divided by total assets, measured over six-months.
CURTA	Total current assets scaled by total assets, measured over six-months.
TANG	Property plant and equipment scaled by total assets, measured over six-months.
LOSS	Indicator variable taking the value of 1 if ROA is negative, and 0 otherwise.
TRCREDIT	Accounts payable scaled by total assets, measured over six-months.

INFASYM	The difference between the ask and bid prices measured at the end of every six-monthly period.
CFO	Cash funds from operations scaled by total assets, measured over six-months.
LIQ	Total volume of shares traded divided by the number of shares outstanding over six-month periods.
CHDEBT	Six-monthly change in long-term debt.
LOG(1+AGE)	Natural logarithm of (1 + number of years since the firm appears in DataStream).
LENGTH	The length of the IMS document in number of words.

Appendix B
Measuring Accounting Quality.

All the data is based on six-month intervals (half-yearly and year-end).

ADA1 is the absolute value of discretionary accruals based on Dechow and Dichev (2002).
First, firm-specific realised current accruals is measured as:

Realized Current Accruals = –1 × (Δ in Accounts Receivables + Δ in Inventories + Δ in Accounts Payables + Δ in Taxes Payables + Δ in Other Current Assets)

Second, discretionary accruals is calculated as the regression residuals of the following equation:

$$\frac{\text{Realized Current Accruals}}{\text{Average Assets}} = \beta_0 + \beta_1 \left(\frac{\text{Operating Cash Flow}}{\text{Average Assets}}\right)_{t-1} + \beta_2 \left(\frac{\text{Operating Cash Flow}}{\text{Average Assets}}\right)_t + \beta_3 \left(\frac{\text{Operating Cash Flow}}{\text{Average Assets}}\right)_{t+1} + \nu$$

ADA1 is measured as the absolute value of the regression residual ν.

ADA2 is the absolute value of discretionary accruals as per Teoh et al. (1998).
First, realised current accruals is regressed on six-monthly change in assets as follows:

$$\frac{\text{Realized Current Accruals}}{\text{Total Assets}} = \text{Ǫ}_1 \frac{1}{\text{Total Assets}} + \text{Ǫ}_2 \frac{\Delta \text{ in Sales}}{\text{Total Assets}} + \eta$$

Second, discretionary accruals is calculated as:

$$\frac{\text{Realized Current Accruals}}{\text{Total Assets}} - \bar{\text{Ǫ}}_1 \frac{1}{\text{Total Assets}} - \bar{\text{Ǫ}}_2 \frac{\Delta \text{ in Sales} - \Delta \text{ in Accounts Receivables}}{\text{Total Assets}}$$

ADA2 is measured as the absolute value of the above.

ADA3 is the absolute value of discretionary accruals based on Dechow et al. (1995).
First, firm-specific total accruals is measured as:

Total Accruals = Income before Extraordinary Items – (Cash Flow from Operations – Extraordinary Items and Discontinued Operations)

Second, total accruals is regressed on six-monthly change in assets as follows:

$$\frac{\text{Total Accruals}}{\text{Total Assets}} = \alpha_1 \frac{1}{\text{Total Assets}} + \alpha_2 \frac{\Delta \text{ in Sales}}{\text{Total Assets}} + \alpha_3 \frac{\text{Property Plants and Equipment}}{\text{Total Assets}} + \varepsilon$$

Third, discretionary accruals is calculated as:

$$\frac{\text{Total Accruals}}{\text{Total Assets}} - \bar{\alpha}_1 \frac{1}{\text{Total Assets}} - \bar{\alpha}_2 \frac{\Delta \text{ in Sales} - \Delta \text{ in Accounts Receivables}}{\text{Total Assets}} - \bar{\alpha}_3 \frac{\text{Property Plants and Equipment}}{\text{Total Assets}}$$

ADA3 is measured as the absolute value of the above.

Finally, accounting quality (**AQ**) is measured as the first principal component of ADA1, ADA2 and ADA3 multiplied by –1.

AQ = –1 × [(ADA1 × 0.560074) + (ADA2 × 0.585778) + (ADA3 × 0.585817)]

Appendix C

Measuring Discretionary Accruals.

Discretionary accruals (**DACC**) is based on the cross-sectional Modified Jones model as per Dechow et al. (1995), and similar to the measurement of ADA3. All the data is based on six-monthly periods.

First, firm-specific total accruals is measured as in ADA3 as the difference between income before extraordinary items and cash flow from operations, net of extraordinary items and discontinued operations.

Second, DACC is computed as the residuals of the following equation:

$$\frac{\text{Total Accruals}}{\text{Total Assets}} = \beta_1 \frac{1}{\text{Total Assets}} + \beta_2 \frac{\Delta \text{ in Sales} - \Delta \text{ in Accounts Receivables}}{\text{Total Assets}} + \beta_3 \frac{\text{Property Plants and Equipment}}{\text{Total Assets}} + \varepsilon$$

DACC is measured as the regression residual ε.