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Non-GAAP Earnings Disclosures on the Face of the Income Statement by UK Firms: The Effect on Market Liquidity[☆]

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ABSTRACT

This study benefits by a special feature of the UK information environment which allows UK firms to disclose non-GAAP earnings on the face of the income statement to examine two interrelated questions. First, we ask whether the decision to disclose non-GAAP earnings on the face of the income statement is related to the firm's financial performance and corporate governance characteristics, and second, we investigate the effect of this disclosure decision on market liquidity. Using a dataset of 1227 hand-collected firm-year observations during the period 2006–2013, we show that better governed firms and firms with weaker financial performance are more likely to disclose non-GAAP earnings. Our evidence also suggests that this disclosure is associated with increased levels of market liquidity and the results hold after controlling for self-selection bias. We conclude that firms' decision to disclose non-GAAP earnings on the face of the income statement is more consistent with the incentive to provide information than to mislead the market.

1. Introduction

Prior research provides evidence that non-GAAP earnings disclosures are becoming more prevalent as an increasing number of firms choose to disclose pro forma earnings in a number of forms and different venues.¹ Extant literature though has not yet settled on what drives the decision to disclose non-GAAP earnings and how it affects the firm's information environment. Non-GAAP earnings capture the “core” or “permanent” part of earnings by excluding components of GAAP earnings that are deemed exceptional or non-recurring. However, given their discretionary and voluntary nature, the disclosure of non-GAAP earnings falls within the realm of positive accounting theory (Watts & Zimmerman, 1978), and it centers around the question of whether such choice is made to benefit managers against the interests of investors or to increase firm value (Bowen, Rajgopal, & Venkatachalam, 2008). Choi and Young (2015) define the former incentive as strategic and the latter as informative. That said, extant literature has been inconclusive as to

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¹ Non-GAAP earnings are also known as pro forma earnings, street earnings, or adjusted earnings.

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which of the two incentives can better explain a firm's decision to disclose non-GAAP earnings. In essence, the issue of whether non-GAAP earnings disclosures provide new and value relevant information to the market or whether they are merely intended to mislead capital market participants is still an open research question. Thus, the aim of this paper is to provide more evidence on this debate by examining the determinants of non-GAAP earnings disclosures and their effects on market liquidity, a market characteristic that is especially affected by changes in the firm's information environment, making it a better indicator of information quality. Specifically, we examine these questions using a sample of UK firms which choose to make non-GAAP earnings disclosures on the face of the income statement.

Even though in recent years a number of studies examined the economic consequences of non-GAAP earnings, there is only scant research in the UK, since the majority of related studies employ US data (Young, 2014). Nevertheless, research on non-GAAP disclosure in the UK is of particular importance, because the corresponding European legislative framework is very different from that of the US. First, the UK is a country with strong legal enforcement and developed capital markets, characteristics that set it apart from other European countries. More importantly though, UK financial reporting is based on IFRS, which is mandatory for the consolidated accounts of public companies across Europe. In sharp contradiction to the requirements regarding non-GAAP earnings in the US, IFRS allow such disclosures to be shown on the face of the income statement. Given their more prominent place in the financial statements, the incentives and effects associated with disclosures of non-GAAP earnings on the face of the financial statements may be fundamentally different from those associated with disclosures which are sparsely incorporated in the notes or which are made in venues other than the financial statements.

Using a hand-collected dataset of 1227 firm-year observations during the years 2006–2013, we first examine whether financial and corporate governance characteristics are associated with the decision to disclose. We conjecture that weaker financial performance drives firms to disclose non-GAAP earnings regardless of whether their incentive is to better inform or mislead investors. On the other hand, better corporate governance should be negatively associated with the disclosure of non-GAAP earnings if the intention is to mislead but positively related to the likelihood of disclosing if the intention is to provide more information to the market. Results show that better governed, less profitable, and higher leveraged firms are more likely to disclose non-GAAP earnings. In our second set of analyses we examine the effects of non-GAAP disclosures on market liquidity controlling for self-selection bias. We hypothesize that if disclosures are motivated by informational (opportunistic) incentives, the effect on liquidity should be positive (negative). Our evidence suggests that disclosing pro forma earnings on the face of the income statement is associated with higher firm liquidity and, hence, lower information asymmetry. We conclude that firms disclose non-GAAP earnings as a means of providing more value relevant information to the market when financial performance is weaker and hence when the need for more information is greater.

Our study contributes to the related literature in a number of ways. First, we examine non-GAAP earnings disclosed on the face of the income statement, a medium of disclosure that has not been examined thus far. We posit that the incentives behind, and the effects of, these non-GAAP disclosures may be fundamentally different from other types non-GAAP disclosures due to their prominence and position in the firm's financial statements. Second, we examine the incentives explaining, and the effects of, the decision to disclose non-GAAP earnings together in a single framework. By examining financial reporting and corporate governance incentives on the decision to disclose and then linking the decision to market liquidity, we obtain a more complete picture of the effects of such decision on the firm's information environment. Third, we examine the effects of the disclosure choice on market liquidity, a market characteristic that is especially affected by changes in the firm's information environment, making it a better indicator of information quality (Daske, Hail, Leuz, & Verdi, 2008). Finally, the effect of non-GAAP disclosures on market liquidity is obtained after correcting for self-selection bias, in essence alleviating concerns that a non-random assignment of the sample firms to the two subgroups may be affecting inferences. Our results should be of particular importance to regulators and accounting standard setters across the world as they have important implications on the information content of different earnings measures.

The remainder of this paper is organized as follows. The next section describes the institutional framework for non-GAAP disclosure in the UK, Europe, and the US. Prior literature, contribution, and expectations are presented in Section 3, while the dataset and the empirical models can be found in Section 4. Results are discussed in Section 5. Section 6 concludes the study.

2. Institutional framework

Regulation and governance systems vary across countries but the common objective of regulators is to improve market efficiency via better disclosure quality and transparency. The manifestation of transparency over non-GAAP earnings metrics is consistent under the philosophies of both the US securities regulations and IAS 33 (Young, 2014). Nonetheless, there are salient differences in the regulations which govern non-GAAP earnings disclosure between the UK and the US. Thus, different legal systems and the use of diverse accounting standards internationally provide increased opportunities for non-GAAP disclosure in some countries and less in others.

The first regulation on non-GAAP earnings disclosure in the UK was part of Financial Reporting Standard (FRS) 3 entitled "Reporting Financial Performance" and went into effect in 1993 (Accounting Standards Board, 1993). The objective of FRS 3 was to highlight the importance of the core components of financial performance in order to assist users in understanding the firm's financial position and to aid them in forming more accurate expectations of the firm's future performance. According to this standard, non-GAAP earnings can be shown as additional measures of earnings per share (EPS). These EPS measures should depict all items used in the calculation in order to facilitate a reconciliation with the GAAP amount. Also, the non-GAAP metric calculation should be presented on a consistent basis over time with less than or equal prominence to the GAAP measure, and firms should adequately explain the reasons behind the decision to present this additional version of EPS. For accounting periods starting on or after January

1st, 2015, FRS 3 is superseded by FRS 102, “The Financial Reporting Standard,” which gives firms more flexibility in adapting the Profit and Loss format and provides guidance on the minimum requirements for entities wishing to take advantage of this flexibility.²

The permission to disclose non-GAAP earnings on the face of the income statement is also allowed under International Financial Reporting Standards (IFRS), which have been applied in the European Union, including the UK, since 2005. Our sample consists of UK firms traded on the London Stock Exchange (LSE), and therefore the regulation of non-GAAP earnings disclosures they need to follow falls within the reign of IFRS. According to IFRS the only items required to be disclosed in the income statement are the following: a) revenues, b) finance costs, c) share of the profit of associates and joint ventures accounted under the equity method, d) tax expense, e) total profits from the operation and assets disposal of discontinued operations net of tax, and f) net profit or loss (PwC, 2007). However, IFRS allow other line items, headings, and subtotals to be presented on the face of the income statement when such information is expected to enhance the understanding of the firm’s financial performance (PwC, 2007). Furthermore, similar to the provisions of FRS 3, International Accounting Standard 33 (IAS 33) also allows the disclosure of alternative EPS measures, but these adjusted numbers should not be given more prominence than the required measures. Specifically, the standard allows the numerator of the EPS to be any number as long as a reconciliation to the income statement number is provided, the adjusted EPS is presented on both a basic and diluted basis, and the company’s notes include disclosures of how the EPS measures are calculated.

In contrast to the regulation of non-GAAP disclosure under IFRS, the regulation in the US is stricter although earlier legislation was more permissive. In 1973, the Securities and Exchange Commission (SEC) issued the Accounting Series Release No.142 warning investors about the possible confusing or misleading information that could arise from the use of any measures outside of GAAP (SEC, 2001). The increasing use of non-GAAP measures in the 1990s forced the SEC to issue additional cautionary advice in 2001 highlighting that the use of non-GAAP information should neither omit material information nor obscure a material result of GAAP figures (SEC, 2001). Since US regulations prohibit registered companies from presenting non-GAAP measures as part of their audited financial statements (Young, 2014), subsequent regulations specifically address the disclosure of non-GAAP earnings measures through other venues, such as in earnings pre-releases or earnings announcements. For example, Regulation G, which went into effect in March of 2003, addresses non-GAAP disclosures in press releases, conference calls, investor presentations, and other media (SEC, 2003). The basic requirements of Regulation G are two. First, the presentation of any non-GAAP measure should be accompanied by a presentation of the most directly comparable financial measure which is calculated and presented in accordance with GAAP. Second, a reconciliation is needed between the non-GAAP measure and the corresponding GAAP measure. Similarly, item 10(e) of Regulation G, which applies to all SEC filings, as well as annual and quarterly reports on Forms 10-K and 10-Q respectively, requires equal or greater prominence for the comparable financial GAAP number, and it also necessitates the reconciliation between the non-GAAP and comparable GAAP measures. Regulation G also requires supportive notes on why non-GAAP measures are useful and, if there are any additional purposes that lead the registrant’s management to use non-GAAP measures, the disclosure of these purposes.

To conclude, although achieving transparency is one of the major objectives of market regulators in both shores of the Atlantic, different perspectives on how to achieve transparency resulted in significant differences in pertinent legislation. Therefore, the decision to disclose non-GAAP earnings and the effects of this decision can differ substantially among different jurisdictions.

3. Literature review, contribution, and expectations

3.1. Literature review

The frequency of non-GAAP measures has increased in the past three decades. Kolev, Marquardt, and McVay (2008) argue that non-GAAP earnings have become more common in the US since the 1990s. Black, Christensen, Ciesielski, and Whipple (2018) confirm that the frequency of non-GAAP reporting in the US has increased in recent years by 35%. Anecdotal evidence also supports that non-GAAP earnings tend to be higher than GAAP earnings. For instance, recent evidence shows that 67% of companies listed in the Dow Jones Industrial average index reported non-GAAP earnings metrics in their communications during the fiscal year 2015 and that non-GAAP earnings per share (EPS) exceed GAAP EPS by 30% on average, compared to 12% in the year 2014 (Butters, 2016). As far as the UK is concerned, Choi, Lin, Walker, and Young (2007) report that there is an increasing trend of non-GAAP earnings disclosures as well. Moreover, a study by the CFA UK Institute (2015) shows that aggregate non-IFRS earnings from the FTSE 100 exceed by 17% the IFRS figure for the fiscal years 2005 to 2014.³

The increased disclosure of non-GAAP earnings in recent years coupled with their relative magnitude in relation to GAAP earnings have led many academics to seek evidence on whether non-GAAP disclosures are more consistent with the informational or opportunistic explanation (Choi & Young, 2015). If non-GAAP measures are used to provide additional insight into the firm’s core earnings by excluding items that are non-recurring, then this measure should exhibit higher persistence and be more useful for valuation (Bradshaw & Sloan, 2002). In contrast, the fact that these disclosures are only lightly regulated and are largely determined at the discretion of management makes them more susceptible to opportunistic motives.

Related research provides mixed evidence regarding the motives underlying non-GAAP earnings disclosures. On the one hand, literature supporting the informational role of non-GAAP earnings disclosures provides evidence that non-GAAP earnings (a) create a larger market response than GAAP earnings (Bhattacharya, Black, Christensen, & Larson, 2003; Bradshaw & Sloan, 2002; Brown &

² <https://www.iasplus.com/en-gb/standards/uk-gaap/frs102>

³ From now on we will use interchangeably the terms IFRS earnings and GAAP earnings, since any differences between IFRS and GAAP are out of the scope of this study.

Sivakumar, 2003; Collins, Li, & Xie, 2009), (b) are more value relevant regarding future stock prices (Entwistle, Feltham, & Mbagwu, 2010; Venter, Emanuel, & Cahan, 2014), (c) are more informative and better at predicting future earnings and cash flows (Bentley, Christensen, Gee, & Whipple, 2018; Leung & Veenman, 2018), and (d) reduce information asymmetry (Huang & Skantz, 2016). Bradshaw and Sloan (2002), using US data, show that in the 1990s the market response was shifted from GAAP earnings towards non-GAAP earnings, while Brown and Sivakumar (2003) and Bhattacharya et al. (2003) conclude that the market reaction to pro forma earnings is greater than that to GAAP earnings. Collins et al. (2009) also find that the interest of market participants has been reallocated from GAAP to non-GAAP earnings. They document that the earnings and volume response coefficients with respect to pro forma earnings surprises have increased from 1985 through 2000, while the coefficients with respect to GAAP earnings surprises have generally decreased over the same time period. Entwistle et al. (2010) explore the value relevance of US GAAP earnings, non-GAAP earnings, and I/B/E/S earnings. They find that all three measures are value relevant, but non-GAAP (GAAP) earnings are the most (least) value relevant. Similar conclusions are also provided by Venter et al. (2014), who investigate how investors price non-recurring items in South Africa, which, according to the authors, is the only country in the world where the identification and disclosure of non-recurring items is mandatory. Bentley et al. (2018) find that non-GAAP reporting is most informative when both managers and analysts provide non-GAAP metrics and that increased informativeness is a significant driver for both managers and analysts to make these disclosures. In a recent study Leung and Veenman (2018) show that non-GAAP earnings disclosures are credible and informative signals of future performance for firms that report GAAP losses. Finally, Huang and Skantz (2016) investigate information asymmetry in the US before and after earnings announcements, measuring the adverse selection component of the bid-ask spread. They find that when information asymmetry is higher in the pre-announcement period, firms are more likely to disclose non-GAAP earnings, whereas the disclosure of non-GAAP earnings reduces information asymmetry in the post-announcement period.

Although many studies have concluded that non-GAAP earnings disclosures are used to better inform the market about permanent earnings, there are also numerous studies which suggest that managers disclose non-GAAP measures to mislead. Evidence for managers' opportunistic behavior is found in the US by Bhattacharya, Black, Christensen, and Mergenthaler (2004), who show that firms have the inclination to use pro forma earnings to meet analyst forecasts and downplay bad earnings. They also find that firms which exclude multiple items of expenses in their pro forma earnings did not exclude the same items in future non-GAAP announcements, providing further support for the opportunistic incentive. McVay (2006) provides evidence that US managers use classification shifting as an earnings management tool to meet the analyst earnings forecast benchmark since special items are generally excluded from both pro forma and analyst earnings definitions. Consistent with this, Doyle, Jennings, and Soliman (2013) provide evidence that US managers determine non-GAAP earnings opportunistically to meet or beat analyst earnings forecasts. They suggest that non-GAAP earnings are an alternative way to earnings management for meeting or beating benchmarks. Furthermore, Marques (2010), using a sample of quarterly earnings press releases of S&P 500 firms for the years 2001–2003, a period in which regulatory interventions regarding non-GAAP disclosure took place, finds that managers give more prominence to pro forma earnings when they meet or beat the benchmark and GAAP earnings fail to do so. Using a European dataset, Isidro and Marques (2015) find that in countries with efficient law and enforcement, stronger investor protection, and more developed financial markets and dissemination of information, managers are more likely to use non-GAAP earnings to meet earnings benchmarks. Their results also suggest that if there is less opportunity to manipulate GAAP earnings, there is more frequent use of non-GAAP earnings disclosures by managers to achieve their goals. Furthermore, Curtis, McVay, and Whipple (2014) find that even though the most pervasive motivation to disclose non-GAAP earnings in the presence of transitory gains is to inform, an economically significant proportion of firms discloses non-GAAP earnings to increase investors' perceptions of core operating earnings, consistent with the opportunistic incentive. Evidence in support of the opportunistic incentive is also found in Barth, Gow, and Taylor (2012), who report that managers exclude stock-based compensation expenses from pro forma earnings to increase or smooth earnings and to meet earnings benchmarks, as well as in Bowen, Davis, and Matsumoto (2005), who find that in earnings announcements managers emphasize metrics that portray a more favorable firm performance that influences investor perceptions. Finally, Doyle, Lundholm, and Soliman (2003) find that the exclusion of certain expenses from pro forma earnings is by no means unimportant, as the informative explanation would predict. Instead, they find that higher levels of exclusions lead to predictably lower future cash flows, a result consistent with the opportunistic motive behind non-GAAP earnings disclosures.

Given the mixed results of prior research, it is possible that the incentive to disclose non-GAAP earnings may relate to specific firm circumstances or characteristics. Consistent with this conjecture, Lougee and Marquardt (2004) provide evidence that when GAAP earnings are of low quality and when strategic considerations are absent, non-GAAP earnings are more useful to investors, although they cannot distinguish between the incentives ex ante. Black and Christensen (2009) also suggest that there are diverse incentives in reporting non-GAAP earnings. They state that some managers use non-GAAP earnings to better reflect core earnings, while others try to meet strategic earnings targets. Their findings show that firms that report non-GAAP earnings sporadically are more likely to use non-GAAP earnings disclosures in an opportunistic manner than firms that report pro forma earnings regularly. Choi and Young (2015), using UK data over the period 1993–2001, show that non-GAAP earnings disclosures are more informative when GAAP earnings are higher than market expectations, while they tend to be more opportunistic when GAAP earnings undershoot market expectations. Finally, Walker and Louvari (2003) report that the probability of UK firms to disclose pro forma earnings increases with the firm's overall disclosure quality. However, they also find that even though for most firms these disclosures are motivated by the need to provide more information to the market, for loss firms the underlying incentive for these disclosures is opportunistic, i.e., driven by the attempt to positively influence market expectations.

The mixed results of prior research have also been confirmed by Abarbanell and Lehavy (2007), who reexamined the robustness, generalizability, and consistency of evidence on the two competing motives underlying the disclosure of non-GAAP earnings. They

conclude that the findings that support either of the two hypotheses in prior literature are not robust. It is thus evident that the questions relating to the motives behind, and consequently the effects of, non-GAAP earnings disclosures are not yet resolved. This is also supported by the results of [Heflin and Hsu \(2008\)](#), who find that while new regulations reduced the opportunistic use of non-GAAP disclosures, they also reduced firms' willingness to use non-GAAP earnings to convey permanent earnings.

In the present study we revisit this fundamental issue by using a UK dataset for two main reasons. First, differences that exist in legislation between the US and Europe make the latter a distinct case where non-GAAP disclosure might have different drivers and outcomes. Specifically, IFRS allow these firms to include non-GAAP measures on the face of the income statement, and unlike other European countries, the local regulator does not disallow such disclosures. Second, the UK is a special case in Europe since a) it is a country with strong legal enforcement and shareholder rights ([Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1998](#)) and b) its capital markets not only are well-developed but also constitute a major financial center in the global economy ([Dudley, 2004](#)). Thus, the UK provides a unique research environment since non-GAAP earnings can be conspicuously presented as part of the financial statements while the information they convey can be of particular relevance to investors.

3.2. Contribution

Our study contributes to the capital markets literature in numerous ways. First, we examine non-GAAP earnings disclosed on the face of the financial statements unlike prior studies which examine non-GAAP earnings disclosures made sparsely in the notes, in other parts of the annual report, or in venues other than the financial statements. We argue that the incentives behind and the effects of disclosures on the face of the financial statements may be fundamentally different from those of other types since these disclosures are not only conspicuous but they are also made in one of the most prominent parts of the firm's annual report, namely the income statement. Second, we extend prior research that examines the incentives behind the decision to disclose non-GAAP earnings by also examining the effects of this disclosure on market liquidity, a characteristic that has been shown to be especially affected by financial disclosures, making it a better indicator of information quality ([Daske et al., 2008](#)). Third, by examining the effects of non-GAAP disclosures on market liquidity, we are able to provide a more complete analysis of the disclosure decision, further corroborating the results and conclusions reached from the analysis of incentives. Examining both the incentives explaining, and the effects of, the decision to disclose non-GAAP earnings together in a single framework allows us to correct for self-selection bias, in essence alleviating concerns that a non-random assignment of the sample firms to the two subgroups may affect the inferences regarding liquidity.

3.3. Expectations

The mixed results of prior research suggest that there may be significant differences in the underlying factors that prompt firms to disclose non-GAAP earnings, in turn also differentially affecting the financial impact of this information. This implies that the decision to disclose non-GAAP earnings can be better examined when it is linked to the different incentives that managers face. We propose that this decision relates to the firm's financial performance and corporate governance quality. With respect to the former, we expect that firms with weaker financial performance will exhibit higher propensity to disclose pro forma earnings. We argue that poor financial performance may induce firms to provide non-GAAP earnings either in an attempt to mislead the market (the opportunistic incentive), or to aid the market in forming better expectations about the firm's future performance (the informational incentive). If firms disclose non-GAAP earnings to change investor perceptions or to meet important performance measures ([Barth et al., 2012](#); [Choi & Young, 2015](#); [Walker & Louvari, 2003](#)), the poorer the firm's performance, the greater the likelihood of such disclosure. Similarly, if firms disclose non-GAAP earnings to provide more information about their underlying core earnings, they will be more likely to disclose non-GAAP measures when their GAAP earnings are negatively affected by transitory expenses ([Leung & Veenman, 2018](#)). Furthermore, poor performance is often associated with greater firm uncertainty, increasing in turn the need to provide more information to the market ([Beyer, Cohen, Lys, & Walther, 2010](#)). Thus, both the informational and opportunistic incentives to disclose non-GAAP earnings should be stronger for firms with poor performance. Therefore, the likelihood of disclosing non-GAAP earnings should be negatively related to firm performance.

Next, we examine the effect of corporate governance quality on the propensity to disclose non-GAAP earnings. Related research suggests that the information environment of firms with more effective corporate governance mechanisms is richer ([Karamanou & Vafeas, 2005](#)). We conjecture that if non-GAAP measures are disclosed to help investors better assess the firm's financial performance, then the relation between corporate governance quality and pro forma earnings should be positive. On the other hand, if the disclosure of non-GAAP measures is an attempt to mislead investors, the relation is expected to be negative. In other words, governance mechanisms should limit management's ability to mislead investors through non-GAAP earnings disclosures. In general, extant evidence suggests that corporate governance increases the quality of non-GAAP disclosure. In his review of the accounting debate surrounding non-GAAP earnings, [Young \(2014\)](#) concludes that these disclosures are of higher quality in the presence of stronger governance systems. Related studies find that different corporate governance characteristics are related to the quality of non-GAAP disclosures. For example, [Frankel, McVay, and Soliman \(2011\)](#) find a positive relation between board independence and the quality of non-GAAP earnings. [Seetharaman, Wang, and Zhang \(2013\)](#) find evidence that the appointment of accounting experts to the audit committee results in a decline in non-GAAP earnings exclusions and increases the quality of non-GAAP earnings. [Isidro and Marques \(2013\)](#) examine the effect of director compensation and find that if executive compensation is based on stock performance, non-GAAP earnings disclosures a) are more consistent with the opportunistic incentive, b) have more adjustments for recurring items, and c) tend to avoid reporting reconciliations. Thus, if non-GAAP earnings in the UK are motivated by the information incentive, the

likelihood of disclosing non-GAAP earnings should be positively related to the quality of the firm's corporate governance. If, instead, non-GAAP disclosures are motivated by opportunistic reasons, the likelihood of disclosing non-GAAP earnings should be negatively related to the quality of the firm's corporate governance.

Examining the link between the decision to disclose non-GAAP earnings and firm financial performance and corporate governance characteristics provides *ex ante* evidence regarding the underlying incentives that can explain such decision. To corroborate this evidence, we also examine the effects of this decision, *i.e.*, by analyzing the *ex post* effects of this disclosure on market liquidity. This enables us to provide further evidence regarding the underlying incentives that prompt managers to disclose non-GAAP earnings on the face of the income statement.

Prior literature documents a link between disclosure quality and firm liquidity. [Beyer et al. \(2010\)](#) argue that liquidity should be increasing in the quality of the firm's voluntary disclosures. [Leuz and Verrecchia \(2000\)](#), explain that a firm's commitment to increased levels of disclosure reduces information asymmetry between the firm and its shareholders, increasing stock liquidity in turn. Similarly, [Daske et al. \(2008\)](#) link the adoption of IFRS to market liquidity based on the premise that better disclosure reduces adverse selection and lowers estimation risk. Based on this premise, [Kim, Li, and Li \(2012\)](#) examine whether the elimination of the 20F reconciliation results in decreased liquidity.

Empirical evidence supports this theoretical link between disclosure quality and market liquidity. Both [Leuz and Verrecchia \(2000\)](#) and [Daske et al. \(2008\)](#) find that the switch to a better quality accounting regime is related to increased market liquidity. Specifically, [Leuz and Verrecchia \(2000\)](#) provide evidence that increased levels of disclosure, captured by the voluntary adoption of international or US accounting standards, are associated with lower bid-ask spreads. Consistent with these findings, [Daske et al. \(2008\)](#) find that market liquidity increases around enhanced financial reporting quality captured by the introduction of IFRS, but their results hold only in countries with strong legal enforcement, such as the UK. [Heflin, Shaw, and Wild \(2005\)](#) also argue that a policy of enhanced financial disclosure should be associated with improved market liquidity and, consistent with this, they find that effective spreads are inversely related to the annual report disclosure ratings of financial analysts. Finally, [Welker \(1995\)](#) finds that the relative bid-ask spreads of firms lying at the bottom third of the empirical distribution of disclosure rankings are much higher than those of firms at the top third, consistent with the notion that better disclosure quality lowers information asymmetry and, in turn, increases market liquidity.

Based on the above discussion, we posit that to the extent that non-GAAP disclosures affect the information environment of the firm, they should also be related to firm liquidity. Specifically, we argue that if the underlying incentive behind the decision to disclose non-GAAP earnings is informational (opportunistic) then the association between this disclosure and market liquidity should be positive (negative).

4. Methodology

4.1. Dataset

In order to examine the disclosure of non-GAAP earnings on the face of the income statement, we use an initial sample of 512 London Stock Exchange (LSE) firms (4096 firm-year observations) for the period 2006–2013, from a list of the main market stocks of the LSE on September 30, 2014 (see Panel A in [Table 1](#)).⁴ Since this initial sample comprises listed firms in the year 2014, our dataset does not include firms that were delisted or liquidated prior to that year. This omission could bias results; thus, our inferences apply only to healthy firms. From this initial sample only 411 firms (3050 firm year observations) have available annual reports in Thomson Reuters. Financial, corporate governance, and liquidity related variables were collected from Datastream. Analyst data were obtained from I/B/E/S. Financial data were not available for 117 companies, restricting our sample to 2038 firm-year observations. Furthermore, corporate governance data were not available for 101 firms (763 firm-year observations), while analyst data were not available for 4 firms (48 observations). Thus, our final dataset consists of 1227 firm-year observations, representing 189 firms. Five-hundred and thirty-nine (539) of the 1227 firm-year observations disclose non-GAAP earnings (43.9% of the final sample), reflecting 112 firms (*i.e.*, 59.3% of total firms) that disclose non-GAAP earnings at least once in the sample period.

Panel B of [Table 1](#) shows the distribution of the sample across industries. > 50% of the sample firms belong to the industrial (62 firms, or 32.8%) and consumer services (50 firms, or 26.46%) sector. The two sectors with the smallest number of companies are the telecommunications sector with 7 firms (3.7%) and the healthcare sector with 6 firms (3.17%). The rest of the sectors represent between 6.88% and 12.17% of the final sample.

4.2. Empirical models and measurement of variables

To examine the drivers of non-GAAP disclosure, we use the following logistic regression model (which is estimated with industry and year fixed effects):

⁴ From the 2467 firms listed on the London Stock Exchange on September 30, 2014, we chose UK-based firms listed in the main market, leaving us with 882 firms. From this sample we excluded firms in financial services and utilities industries, creating an initial sample of 512 UK firms.

Table 1

Sample selection and descriptive statistics. Panel A presents the sample selection process. Panel B presents the distribution of the sample by industry.

Panel A		
	N firms	N year-obs
Initial sample	512	4096
Less: Missing Annual Reports from Thomson Reuters	(101)	(1046)
Sample with Annual Reports	411	3050
Less: Missing financial information	(117)	(1012)
Sample with available financial information	294	2038
Less: Missing Governance information	(101)	(763)
Sample with available governance information	193	1275
Less: Missing analyst information	(4)	(48)
Final Sample	189	1227
Disclosure of non-GAAP earnings		539
Non-disclosure of non-GAAP earnings		688
		1227

Panel B		
Sector	Frequency	Percentage
Industrials	62	32.80
Consumer Services	50	26.46
Consumer Goods	23	12.17
Basic Materials	14	7.41
Oil & Gas	14	7.41
Technology	13	6.88
Telecommunications	7	3.70
Healthcare	6	3.17
Total	189	100.00

$$D \text{ Non GAAP} = \beta_0 + \sum_{i=1}^5 \beta_i \text{ Financial Performance Variables} + \sum_{j=6}^n \beta_j \text{ Corporate Governance Variables} + \sum_{k=n+1}^{n+4} \beta_k \text{ Controls} + \varepsilon \quad (1)$$

where *D Non GAAP* is an indicator variable that takes the value 1 if non-GAAP earnings appear in the company's annual financial statements and 0 otherwise.⁵ We identified three ways by which firms display their non-GAAP earnings on the face of the income statement: a) creation of a separate box for non-GAAP earnings, b) presentation via three different columns on the income statement, one for recurring items of income, one for non-recurring or exceptional items, and one for total income, and c) the inscription of the non-GAAP earnings as a subcategory of the GAAP earnings in the same column. All three ways reflect managers' attempt to decompose GAAP earnings into a permanent and an exceptional component.

The following measures are used as proxies for financial performance: firm profitability captured by the return on assets, *ROA*; three indicator variables that measure significant profitability benchmarks that prior research has identified as important reporting incentives, *Missed Forecast*, *Missed Prior Earnings*, and *GAAP Loss*; and financial leverage, *Leverage*. According to [Daske, Hail, Leuz, and Verdi \(2013\)](#), economic theory suggests that financial performance is a strong incentive for transparent reporting, and, thus, they use *ROA* and financial leverage as part of their reporting incentives variables. [Choi and Young \(2015\)](#) document the importance of profitability benchmarks on the probability of non-GAAP disclosure, while [Walker and Louvari \(2003\)](#) find evidence that firms report positive non-GAAP earnings to divert investor attention away from their negative GAAP earnings. *ROA* is computed as the ratio of GAAP earnings divided by total assets and *Leverage* as the ratio of total liabilities to total assets. *Missed Forecast* takes the value of 1 if

⁵ This study examines the effect of non-GAAP earnings that are disclosed on the face of the income statement. Non-GAAP earnings disclosed elsewhere in the annual report are included in our control sample of non-disclosures. Given that UK firms tend to disclose non-GAAP information in the notes of the financial statements, it is possible that the control sample includes firms that disclose non-GAAP earnings in the notes. To the extent that non-GAAP disclosures in the notes are informative, this disclosure should also have a positive, but possibly smaller, effect on stock liquidity, and thus, it biases against obtaining a significant relation between our variable of interest, *D Non GAAP*, and our liquidity measures. On the other hand, if managers disclose additional non-GAAP information both on the face of the income statement and in the notes to the financial statements, while non-disclosing managers do not disclose non-GAAP information in the notes either, we cannot rule out the possibility that the liquidity effects we document may be affected by the non-GAAP disclosures in the notes. Since there are so many ways that firms can disclose non-GAAP earnings in the notes, future research can utilize contextual analysis to enhance our understanding regarding their effects.

GAAP earnings per share are below the I/B/E/S consensus analyst forecast and 0 otherwise. *Missed Prior Earnings* takes the value of 1 if GAAP earnings per share at year t are below GAAP earnings per share at year $t-1$ and 0 otherwise. *GAAP Loss* takes the value of 1 if GAAP earnings are negative and 0 otherwise.

We capture corporate governance quality with *Board Size*, *Board Ind*, and *CG Score*. Given that *CGScore* is a comprehensive measure of corporate governance and captures other aspects of governance mechanisms beyond board size and independence, it is used as our main proxy for corporate governance. However, we examine the robustness of our results when instead of *CG Score*, corporate governance is captured by board size and board independence, two variables that have been used extensively in the literature. *Board Size* is the natural logarithm of the size of the board of directors, a measure that captures board effectiveness (Boone, Field, Karpoff, & Raheja, 2007). *Board Ind* measures the percentage of independent members of the board of directors. Frankel et al. (2011) provide evidence of a strong association between board independence and non-GAAP disclosures. *CG Score* is provided by Datastream and is a comprehensive metric of the overall corporate governance quality of the firm. It accounts for board structure, compensation policy, board functions, shareholder rights, and vision and strategy. Its value ranges from 0 to 1, with higher values reflecting better corporate governance quality.

FOLL, *STDEV*, *B/M*, and *TA* are used as control variables. *FOLL* is the natural logarithm of the number of earnings forecasts issued by the analysts following the firm, and *STDEV* is the standard deviation of these earnings forecasts.⁶ Both analyst following and the standard deviation of analyst forecasts capture the disclosure quality of the firm (Lang & Lundholm, 1996). *B/M* is book-to-market, computed as the ratio of common shareholders' equity and market value of equity. *TA* is the natural logarithm of the firm's total assets. All variables are measured at time t , where t is the fiscal year of the non-GAAP disclosure.

To examine how the stock's liquidity is affected by the disclosure of non-GAAP earnings, we estimate the following model (which also includes industry and year fixed effects)⁷:

$$Illiquidity\ measure = \beta_0 + \beta_1 D\ Non\ GAAP + \sum_{k=2}^8 \beta_k Controls + \varepsilon \quad (2)$$

where *Illiquidity measure* is one of the following four measures: *Bid-Ask*, *Price Impact*, *Zero Returns %*, and *ILQ index*. We follow prior literature in using measures that express illiquidity, rather than liquidity (e.g., Amihud, 2002; Daske et al., 2008; Harris, 2017; Leuz & Verrecchia, 2000; Welker, 1995). The first three measures are calculated as in Daske et al. (2008). *Bid-Ask* is commonly used as a proxy for information asymmetry (Harris, 2017; Welker, 1995) and it is computed as the yearly median of daily quoted spreads which are estimated as the percentage of the difference between the bid and the ask price at the end of each trading day divided by the midpoint of the two values. *Price Impact* is calculated as the yearly median value of the ratio of the daily absolute stock return divided by the daily trading volume (Amihud, 2002). This illiquidity proxy captures the sensitivity of stock price to trading volume. Following prior literature, we use the natural logarithm of *Bid-Ask* and *Price Impact* when estimating the regression models. *Zero Returns %* is the percentage of trading days with a stock return of zero over all potential trading days in the year. Zero return days occur when the transaction costs are greater than the value of new information not yet impounded in prices, prompting investors not to trade (Lesmond, Ogden, & Trzcinka, 1999). Our fourth measure, *ILQ index*, is an illiquidity index which combines the three previous illiquidity variables. We rank each of the three variables and for each measure we assign the value 1 if the observation's value in the specific variable is above the sample's median and 0 otherwise. In order to get the *ILQ index* we add the three assigned values. Hence, *ILQ index* can take four different values with a maximum score of 3 and a minimum of 0, with increasing values reflecting lower market liquidity.

Following related research, the liquidity models control for the firm's information environment and uncertainty. Following Daske et al. (2008), the models control for share turnover and return variability, two common measures for information asymmetry (see also Leuz & Verrecchia, 2000). *Share Turnover* is the natural logarithm of the annual firm trading volume divided by the market value of equity. *Return Variability* is the natural logarithm of the annual standard deviation of monthly stock returns. *FOLL*, *STDEV*, *B/M*, and *TA* are also included in the models as additional proxies for the firm's information environment. Finally, to control for the quality of the firm's corporate governance, the models also include *CG Score*.⁸ The rest of the independent variables are defined as in Model (1) above.

To account for the possibility that the firm's decision to disclose non-GAAP earnings is endogenous we modify Eq. (2) by controlling for self-selection bias using the Heckman (1979) correction. This method is based on a two-step estimation procedure. For the first step we use the equation of the logistic regression on *D Non GAAP* (Model 1), as it is presented in Table 4, column 2, to estimate the inverse Mills ratio, which is the ratio of the probability density function to the cumulative distribution function of a distribution. The illiquidity estimation model is corrected by including the inverse Mills ratio, λ , as follows:

$$Illiquidity\ measure = \beta_0 + \beta_1 D\ Non\ GAAP + \sum_{k=2}^8 \beta_k Controls + \beta_9 \lambda + \varepsilon \quad (3)$$

Given that liquidity is the willingness of investors to transact in a stock, empirical studies assume that liquidity is affected by the

⁶ To compute both the consensus analyst forecast, as well as the number of earnings forecasts on which the mean value is based, IBES keeps only the most recent earnings forecast issued by each analyst.

⁷ Including firm fixed effects instead of industry and year effects provides qualitatively similar results.

⁸ For parsimony purposes we choose to control for corporate governance by using the *CGScore* variable, as this key variable is a comprehensive measure of corporate governance quality. Results are qualitatively similar if we include other governance variables such as *Board Size* and *Board Ind* instead.

Table 2
Equality of means and medians.

	N obs.	All firms	D Non GAAP = 1	D Non GAAP = 0	Difference	p-value
Bid-Ask						
Mean	1227	0.243	0.238	0.246	-0.008	0.745
Median		0.134	0.121	0.143	-0.022**	0.016
Price Impact						
Mean	1227	2.010	1.825	2.156	-0.331	0.475
Median		0.382	0.335	0.431	-0.096	0.209
Zero Returns %						
Mean	1227	5.904	6.060	5.782	0.278	0.106
Median		5.000	5.000	5.344	-0.344	0.457
ILQ index						
Mean	1227	1.515	1.419	1.590	-0.171**	0.012
Median		1.000	1.000	2.000	-1.000**	0.012
ROA						
Mean	1227	0.088	0.070	0.102	-0.032***	< 0.001
Median		0.076	0.065	0.088	-0.023***	< 0.001
Missed Forecast						
Mean	1227	0.301	0.382	0.237	0.145***	< 0.001
Median		0.000	0.000	0.000	0.000***	< 0.001
Missed Prior Earnings						
Mean	1227	0.387	0.410	0.369	0.041	0.145
Median		0.000	0.000	0.000	0.000	0.145
GAAP Loss						
Mean	1227	0.096	0.134	0.067	0.067***	< 0.001
Median		0.000	0.000	0.000	0.000***	< 0.001
Leverage						
Mean	1227	0.560	0.597	0.531	0.066***	< 0.001
Median		0.579	0.610	0.555	0.055***	< 0.001
CG Score						
Mean	1227	0.752	0.768	0.740	0.028***	0.001
Median		0.783	0.799	0.769	0.030***	0.002
Ln Board Size						
Mean	1227	2.152	2.155	2.149	0.006	0.646
Median		2.197	2.197	2.079	0.118	0.257
Board Ind						
Mean	1214	0.547	0.555	0.540	0.015**	0.024
Median		0.556	0.556	0.546	0.010**	0.021
FOLL						
Mean	1227	2.510	2.554	2.475	0.079***	0.008
Median		2.565	2.639	2.565	0.074**	0.016
STDEV						
Mean	1227	2.174	2.400	1.997	0.403	0.160
Median		1.160	1.250	1.105	0.145**	0.030
B/M						
Mean	1227	0.644	0.711	0.594	0.117***	0.008
Median		0.433	0.456	0.405	0.051***	0.003
TA						
Mean	1227	14.177	14.341	14.048	0.293***	< 0.001
Median		14.024	14.289	13.783	0.505***	< 0.001
Share Turnover						
Mean	1227	6.729	6.789	6.683	0.106**	0.013
Median		6.709	6.754	6.681	0.073**	0.028
Return Variability						
Mean	1227	2.133	2.151	2.120	0.031	0.228
Median		2.062	2.058	2.066	-0.008	0.478

This table presents the mean and median values of the variables used in the main analyses for firms that disclose non-GAAP earnings and those that do not. Mean and median differences are tested for statistical significance based on the t-test and the Wilcoxon test, respectively. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

level of information asymmetry. However, there is no theoretical reason to expect that liquidity should be affected by the level of the firm's profitability since liquidity captures the willingness to transact in a stock whether this is for buying or selling. On the other hand, the decision to disclose non-GAAP earnings is expected to be related to the financial performance of the firm as also depicted in Eq. (1). Thus, the financial performance variables included in Eq. (1) represent appropriate instruments for the reliable estimation of λ .

Table 3
Correlation Analysis.

Variable	Bid-Ask	Price Impact	Zero Returns %	ILQ index	ROA	Missed Forecast	Missed Prior Earnings	GAAP Loss
D Non GAAP	-0.009	-0.020	0.048*	-0.071**	-0.162***	0.159***	0.042	0.112***
Bid-Ask		0.921***	0.618***	0.396***	-0.208***	0.151***	0.092**	0.177***
Price Impact			0.468***	0.261***	-0.143***	0.102***	0.083***	0.101***
Zero Returns %				0.506***	-0.249***	0.153***	0.045***	0.190***
ILQ index					-0.074***	0.103***	0.033	0.087***
ROA						-0.526***	-0.248***	-0.567***
Miss Forecast							0.174***	0.492***
Miss Prior Earnings								0.155***
GAAP Loss								
Leverage								
CG Score								
FOLL								
STDEV								
B/M								
TA								
Share Turnover								

Variable	Leverage	CG Score	FOLL	STDEV	B/M	TA	Share Turnover	Return Variability
D Non GAAP	0.171***	0.092***	0.075***	0.043	0.078***	0.111***	0.071**	0.034
Bid-Ask	0.097***	-0.152***	-0.419***	0.028	0.234***	-0.263***	-0.139***	0.291***
Price Impact	0.052*	-0.079***	-0.317***	0.016	0.192***	-0.186***	-0.161***	0.210***
Zero Returns %	0.113***	-0.058***	-0.392***	-0.005	0.255***	-0.229***	-0.161***	0.201***
ILQ index	-0.006	-0.290***	-0.589***	-0.023	0.072**	-0.605***	-0.262***	0.261***
ROA	-0.187***	-0.057**	0.107***	-0.043	-0.314***	-0.190***	-0.088***	-0.231***
Miss Forecast	0.076***	-0.057**	-0.102***	0.023	0.175***	-0.018	0.040	0.236***
Miss Prior Earnings	0.064**	0.003	-0.013	0.022	0.110***	0.075***	0.042	0.195***
GAAP Loss	0.008	-0.030	-0.047	0.084	0.223***	0.044	0.137***	0.292***
Leverage		0.065 ^b	0.035	0.105	-0.089***	0.209***	0.168***	-0.018
CG Score			0.339***	0.009	0.043	0.345***	0.010	-0.189***
FOLL				0.049*	-0.111***	0.558***	0.265***	-0.241***
STDEV					0.073**	0.126***	0.162***	0.064**
B/M						0.240***	0.026	0.420***
TA							0.183***	-0.181***
Share Turnover								0.220***

This table presents Pearson correlation coefficients of the variables used in the main analyses. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively.

5. Results

5.1. Descriptive statistics

Table 2 presents descriptive statistics for all the dependent and independent variables used in the analyses separately for firms that disclose non-GAAP earnings and for those that do not. We find that firms which report non-GAAP earnings have lower profitability, are more likely to have missed the consensus analyst earnings forecast and to report GAAP losses, and have higher leverage and B/M. We also find that disclosing firms exhibit better corporate governance quality than those that do not report non-GAAP earnings, are larger, and are followed by more analysts. Results also suggest that disclosing firms exhibit lower bid-ask spreads and have lower ILQ index (our comprehensive measure of illiquidity). These results provide preliminary evidence that non-GAAP disclosures in the UK are more consistent with the informational incentive.

Table 3 presents Pearson correlations between the variables used in the empirical models. The signs of the correlation coefficients are consistent with the findings of the descriptive statistics. Profitability, as captured by ROA, is negatively correlated, while *Missed Forecast*, *GAAP Loss*, leverage, and *CGScore* are positively correlated with the decision to disclose non-GAAP earnings, as reflected in *D Non GAAP*. Finally, the negative and statistically significant correlation between *D Non GAAP* and *ILQ index* provides preliminary evidence of a positive relation between disclosure and stock liquidity. We corroborate the univariate results by examining the drivers of non-GAAP earnings disclosure and the effect of non-GAAP disclosure on stock's liquidity in a multivariate setting. Results are presented in Tables 4 and 5, respectively, and are discussed below.⁹

5.2. Drivers of non-GAAP earnings disclosure

We examine the incentives that prompt firms to disclose non-GAAP earnings by estimating Eq. (1), using two different model specifications as shown in Table 4. In Model (1) we examine the drivers of non-GAAP earnings disclosure using board size and board independence as our proxies for corporate governance, while in Model (2) we replace board size and board independence with the overall corporate governance measure, *CG Score*.

Results in both models presented in Table 4 show that profitability is an important factor that affects the probability of disclosing non-GAAP earnings. The coefficients on *Missed Forecast* in both models are positive and statistically significant at the 1% level, indicating that if the firm's GAAP earnings are lower than market expectations, captured by the consensus analyst earnings forecast, the firm is more likely to disclose non-GAAP earnings on the face of the income statement. Also, the coefficient on ROA is negative but significant at the 10% level, providing some additional evidence that profitability affects the decision to disclose non-GAAP earnings. Finally, results in both models indicate that leverage is positively related to the probability of non-GAAP disclosure. Overall, these findings are consistent with our expectations and with extant literature which supports that firms with weaker financial performance face stronger incentives to disclose non-GAAP earnings (Brown, Christensen, Elliott, & Mergenthaler, 2012; Isidro & Marques, 2015).

Results also suggest that better governed firms are more likely to disclose non-GAAP earnings. Specifically, board independence in Model (1) and the *CG Score* variable in Model (2) are both associated with a greater probability of disclosing non-GAAP earnings. The documented positive relation between corporate governance and non-GAAP disclosure likelihood is consistent with the results of prior research (Bentley et al., 2018; Bhattacharya et al., 2003; Leung & Veenman, 2018).

Overall, results in Table 4 are consistent with our expectations regarding the financial performance of the firm, as proxied by both profitability and leverage. Based on the assumption that better governed firms are more likely to disclose non-GAAP earnings for informational reasons, the corporate governance results, in particular, provide evidence that is more consistent with the informational than the opportunistic incentive. We explore this issue further by investigating the effect of non-GAAP disclosure on liquidity.

5.3. Effect of non-GAAP disclosure on stock's liquidity

In this section we investigate whether non-GAAP disclosures on the face of the income statement affect firm liquidity. We argue that if non-GAAP disclosures are used by managers for informative reasons, firm liquidity should be positively related to non-GAAP disclosure, while if they are used opportunistically, the relation should be negative. In Table 5 we present four models, one for each of our illiquidity proxies. In all four models the coefficient on *D Non GAAP* is significantly negative at the 1% level, providing strong and consistent evidence that disclosing firms exhibit lower illiquidity. Thus, firms which disclose non-GAAP earnings on the face of the income statement exhibit higher market liquidity. These results suggest that non-GAAP earnings disclosures are associated with richer information environments and support the conjecture that these disclosures are made for informative reasons.

With respect to the control variables, results in Table 5 provide evidence that liquidity is enhanced for firms which are followed by a larger number of analysts, for larger firms and those with lower book-to-market ratios.¹⁰ *Share Turnover* is negatively and *Return Variability* is positively related to three of the four illiquidity measures, suggesting that greater information asymmetry results in lower liquidity. Results also provide evidence that better governed firms, as proxied by *CG Score*, exhibit higher liquidity for two of the four illiquidity measures. Finally, the inverse Mills ratio, λ , is positive and statistically significant, which suggests that there is

⁹ Consistent with prior literature, all continuous variables have been winsorized at the 1% and 99% levels.

¹⁰ Results remain qualitatively similar when we use the market value of equity, instead of total assets, as a proxy for firm size (untabulated).

Table 4
Explaining the decision to disclose Non-GAAP Earnings.

	D Non GAAP	
	(1)	(2)
ROA	– 1.840*	– 1.605*
	0.054	0.087
Missed Forecast	0.505***	0.521***
	0.002	0.002
Missed Prior Earnings	– 0.085	– 0.078
	0.520	0.550
GAAP Loss	0.126	0.103
	0.644	0.702
Leverage	1.360***	1.340***
	0.001	0.001
Board Size	– 0.308	
	0.335	
Board Ind	1.197**	
	0.030	
CG Score		0.902*
		0.058
FOLL	0.380**	0.292*
	0.022	0.080
STDEV	0.008	0.006
	0.569	0.665
B/M	0.109	0.109
	0.290	0.287
TA	– 0.008	– 0.023
	0.916	0.740
Intercept	– 1.967**	– 2.300***
	0.024	0.006
Industry/Year Fixed effects	Yes	Yes
Pseudo R ²	13.02%	12.22%
Number of Obs.	1214	1227

This table presents the results of the logistic regression where the dependent variable is D Non GAAP. It examines the drivers of the decision to disclose non-GAAP earnings measures. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. *p-values* are presented in italics.

endogeneity in our sample and that the instruments of the first stage model help to mitigate self-selection bias (Larcker & Rusticus, 2010).¹¹

Overall, results in Table 5 corroborate the evidence presented in Table 4 and suggest that firms disclose non-GAAP earnings in response to the informational incentive. We conclude that firms disclose non-GAAP earnings as a means to provide the market with more information about the company's underlying performance, and that this disclosure is associated with higher liquidity. Thus, our evidence suggests that the decision to disclose non-GAAP earnings on the face of the income statement, in a country characterized by strong legal enforcement such as the UK, is more likely associated with the need to provide more information to the market about the firm's core earnings.

5.4. Sensitivity analysis

In this section we employ additional tests to examine the robustness of our findings. First, we examine whether the effect of non-GAAP disclosure is greater for firms which disclose non-GAAP information for the first time in our sample period, to address the concern that other factors may be responsible for the observed change in the dependent variable, a common issue with most association studies. We argue that if other confounding factors affect our inferences, there is no reason to expect that the effect of non-GAAP earnings disclosures on liquidity should be more pronounced during the first year the firm makes this disclosure. In essence, if a stronger relation exists between non-GAAP disclosures and liquidity for first time disclosers, it is less likely that this relation is affected by other unobserved factors.

To examine this conjecture, we create a new indicator variable, *Initiate NGD*, that takes the value 1 if the firm discloses non-GAAP earnings for the first time in our sample period and 0 otherwise. Results are presented in Panel A of Table 6 and are consistent with our expectations. *D Non GAAP* continues to be negative and significant, suggesting that the effect of non-GAAP disclosure on market

¹¹ As an alternative specification, in untabulated models, we use the estimates from the logistic model to calculate a separate coefficient for inverse Mills ratio for the disclosers of non-GAAP and the non-disclosers, consistent with the method used by Christensen, Drake, and Thornock (2014) and Guillamon-Saorin, Isidro, and Marques (2017). The results remain qualitatively similar.

Table 5
Non-GAAP earnings and liquidity.

	Illiquidity measures			
	Bid-Ask	Price Impact	Zero Returns %	ILQ index
D Non GAAP	-0.938*** < 0.001	-1.588*** < 0.001	-2.672*** < 0.001	-2.266*** < 0.001
CG Score	-0.290** 0.013	-0.797*** < 0.001	0.461 0.413	-0.658 0.160
FOLL	-0.607*** < 0.001	-1.056*** < 0.001	-1.961*** < 0.001	-1.619*** < 0.001
STDEV	0.007** 0.040	0.002 0.659	-0.002 0.913	0.023* 0.056
B/M	0.138*** < 0.001	0.357*** < 0.001	0.706*** < 0.001	0.460*** < 0.001
TA	-0.282*** < 0.001	-0.779*** < 0.001	-0.377*** < 0.001	-1.092*** < 0.001
Share Turnover	-0.243*** < 0.001	-0.429*** < 0.001	-0.138 0.373	-0.762*** < 0.001
Return Variability	0.367*** < 0.001	0.574*** < 0.001	0.241 0.305	0.396** 0.047
λ	0.536*** < 0.001	0.944*** < 0.001	1.625*** < 0.001	1.236*** < 0.001
Intercept	5.411*** < 0.001	14.734*** < 0.001	17.331*** < 0.001	Multiple Intercepts
Industry/Year fixed effects	Yes	Yes	Yes	Yes
Adjusted R ²	66.24%	81.72%	28.16%	56.53%
Number of Obs.	1227	1227	1227	1227

The table presents regression results of the second stage of the Heckman test where the dependent variable is a measure of illiquidity. The dependent variable in Model 1 is Bid-Ask, in Model 2 Price Impact, in Model 3 Zero Returns %, and in Model 4 the ILQ index. The models examine the effect of non-GAAP disclosure on the stock's liquidity. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. *p-values* are presented in italics.

liquidity is positive and significant even if the disclosure is recurring. More importantly, we find that the coefficient on *Initiate NGD* is not only negative and statistically significant at the 1% level, but that it is up to ten times greater in magnitude than the coefficient on *D Non GAAP*. We conclude that, as expected, the positive association between non-GAAP disclosures and firm liquidity is stronger during the initiation year, a result that is less likely to be affected by factors that may not be adequately accounted for in the model.¹²

Second, even though our results suggest that, on average, firms disclose non-GAAP information to provide useful information about their GAAP earnings, it is still possible that our sample contains firms that provide this information for opportunistic reasons; hence the effects of non-GAAP disclosures on liquidity may differ across firms in our sample. We examine this possibility by creating two subsamples from the disclosing sample: firms that are more likely to be disclosing for informative reasons and those that are more likely to be disclosing for opportunistic reasons. We create these two subsamples based on the difference between their non-GAAP and GAAP earnings figures, scaled by the firm's total assets. Doyle et al. (2013) find evidence that firms are more likely to meet or beat analyst estimates when their non-GAAP earnings are higher than GAAP earnings. Thus, when the difference between non-GAAP and GAAP earnings is positive, the disclosure is more likely to be opportunistic (Choi & Young, 2015). Doyle et al. (2013) also suggest that firms with negative exclusions of non-GAAP earnings are expected to make more "sincere" exclusions, making their disclosures the least opportunistic and, hence, more informative. Thus, when the difference between non-GAAP and GAAP earnings is negative, the disclosure is more likely to be made for informative reasons. Based on this reasoning, we assume that all observations with a negative difference, ($n = 99$), are made for informative reasons. We then rank all observations for which the scaled difference between non-GAAP and GAAP earnings is non-negative and classify those in the top quartile as the opportunistic group, while the observations of the other three quartiles are also included in the non-opportunistic control group. For this test we only retain observations with non-GAAP disclosures to more reliably classify firms in the opportunistic and non-opportunistic categories. This classification scheme results in 110 observations as opportunistic (20.4% of the disclosing sample) and 429 observations as non-opportunistic (79.6% of the disclosing sample). Results presented in Panel B of Table 6 are consistent with the expectation that the opportunistic disclosure of non-GAAP earnings is associated with lower liquidity.

In Table 7 we perform three additional sensitivity analyses. In Panel A we present three different models of the logistic regression analysis, while Panels B, C, and D present the liquidity models when the self-selection correction is based on Model 1, Model 2 and Model 3 of Panel A, respectively.

¹² Even though results provide strong and robust evidence that non-GAAP disclosures are associated with higher firm liquidity, we cannot preclude the possibility that unobserved factors may be driving the results.

Table 6
Sensitivity Analysis I.

	Illiquidity measures			
	Bid-Ask	Price Impact	Zero Returns %	ILQ index
Panel A				
D Non GAAP	-0.920*** < 0.001	-1.385*** < 0.001	-2.547*** < 0.001	-2.349*** < 0.001
Initiate NGD	-8.148*** < 0.001	-12.767*** < 0.001	-25.198*** < 0.001	-19.116*** < 0.001
CG Score	-0.337*** 0.009	-0.873*** < 0.001	0.187 0.772	-1.229** 0.020
FOLL	-0.675*** < 0.001	-1.165*** < 0.001	-2.194*** < 0.001	-1.683*** < 0.001
STDEV	0.008** 0.043	0.006 0.328	0.016 0.389	0.022 0.136
B/M	0.136*** < 0.001	0.332*** < 0.001	0.739*** < 0.001	0.488*** < 0.001
TA	-0.298*** < 0.001	-0.785*** < 0.001	-0.410*** < 0.001	-1.144*** < 0.001
Share Turnover	-0.236*** < 0.001	-0.414*** < 0.001	-0.132 0.447	-0.763*** < 0.001
Return Variability	0.383*** < 0.001	0.682*** < 0.001	0.243 0.354	0.417* 0.054
λ	0.521*** < 0.001	0.817*** < 0.001	1.595*** < 0.001	1.214*** < 0.001
Intercept	4.977*** < 0.001	15.425*** < 0.001	18.222*** < 0.001	Multiple Intercepts
Industry/Year fixed effects	Yes	Yes	Yes	Yes
Adjusted R ²	67.97%	81.04%	30.58%	57.25%
Number of Obs.	1038	1038	1038	1038
Panel B				
Diff. Pos. Top25	0.256*** < 0.001	0.363*** < 0.001	0.698** 0.030	0.545** 0.020
CG Score	-0.054 0.772	0.010 0.971	2.218** 0.023	-0.670 0.341
FOLL	-0.903*** < 0.001	-1.166*** < 0.001	-2.853*** < 0.001	-1.962*** < 0.001
STDEV	0.015*** < 0.001	0.014** 0.015	0.003 0.900	0.032** 0.022
B/M	0.179*** < 0.001	0.411*** < 0.001	1.128*** < 0.001	0.638*** < 0.001
TA	-0.211*** < 0.001	-0.647*** < 0.001	-0.273* 0.069	-0.980*** < 0.001
Share Turnover	0.003 0.953	-0.585*** < 0.001	-0.177 0.436	-0.330* 0.051
Return Variability	0.273*** 0.001	0.685*** < 0.001	0.389 0.349	0.219 0.473
Intercept	2.342*** < 0.001	12.805*** < 0.001	14.815*** < 0.001	Multiple Intercepts
Industry/Year fixed effects	Yes	Yes	Yes	Yes
Adjusted R ²	62.94%	77.84%	33.08%	53.88%
Number of Obs.	539	539	539	539

This table presents the results of the Sensitivity Analysis I tests. In Panel A, we present results for the additional effect of non-GAAP earnings disclosure on liquidity measures for firms that disclosed non-GAAP earnings for the first time. In Panel B we present results for the additional effect of non-GAAP earnings disclosure on liquidity measures for the firms that are more likely to disclose non-GAAP earnings for opportunistic reasons. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. *p-values* are presented in italics.

In the first model of Panel A, we examine whether the reduction of our sample size in the main models (Tables 4 and 5) due to the unavailability of corporate governance variables affects our results, by running both stages of our analyses excluding these variables. This procedure increases our sample size to 1761 firm-year observations (275 firms) for the first stage model and to 1753 or 1720 for the second, depending on the illiquidity measure used. Results presented in Column 1 of Panel A in Table 7 corroborate the results presented in Table 4. More specifically, results show that firms whose GAAP earnings fall short of analyst expectations, and firms with high leverage are more likely to disclose non-GAAP earnings. Furthermore, results presented in Panel B of Table 7 are qualitatively similar to those presented in Table 5, indicating that non-GAAP earnings disclosures are associated with higher stock liquidity in three out of the four models tested.

Table 7
Sensitivity analysis II.

Panel A	D Non GAAP		
	(1)	(2)	(3)
ROA	-0.738 0.275	-1.524 0.145	-0.804 0.453
Miss Forecast	0.594*** < 0.001	0.684*** < 0.001	0.698*** < 0.001
Miss Prior Earnings	0.071 0.509	-0.097 0.517	-0.146 0.354
GAAP Loss	0.121 0.558	-0.074 0.808	0.209 0.509
Leverage	0.911*** 0.004	1.038** 0.023	1.257*** 0.009
CG Score		1.119** 0.034	0.979* 0.085
FOLL	0.039 0.732	0.241 0.216	0.153 0.445
STDEV	0.009 0.479	0.017 0.398	0.010 0.599
B/M	0.059 0.450	0.180 0.143	0.149 0.244
TA	0.111* 0.051	0.041 0.612	0.178** 0.036
Words Annual Report		0.134 0.247	
Words Financial Section			-0.320*** < 0.001
Intercept	-2.923*** < 0.001	-4.250*** 0.002	-2.221* 0.053
Industry/Year Fixed effects	Yes	Yes	Yes
Pseudo R ²	9.40%	13.29%	16.52%
Number of Obs.	1761	961	897

Panel B	Illiquidity measures based on model (1) of Panel A			
	Bid-Ask	Price Impact	Zero Returns %	ILQ index
D Non GAAP	-0.962*** < 0.001	-1.543*** < 0.001	-2.215 0.159	-3.206*** < 0.001
FOLL	-0.678*** < 0.001	-0.854*** < 0.001	-3.849*** < 0.001	-2.118*** < 0.001
STDEV	0.007* 0.062	-0.003 0.567	0.052 0.313	0.012 0.446
B/M	0.198*** < 0.001	0.281*** < 0.001	2.547*** < 0.001	0.568*** < 0.001
TA	-0.415*** < 0.001	-0.836*** < 0.001	-2.313*** < 0.001	-1.223*** < 0.001
Share Turnover	-0.391*** < 0.001	-0.621*** < 0.001	-2.337*** < 0.001	-0.834*** < 0.001
Return Variability	0.269*** < 0.001	0.693*** < 0.001	-2.192*** 0.001	0.601*** 0.001
λ	0.574*** < 0.001	0.917*** < 0.001	2.156** 0.012	1.858*** < 0.001
Intercept	8.652*** < 0.001	16.068*** < 0.001	68.31*** < 0.001	Multiple Intercepts
Industry/Year fixed effects	Yes	Yes	Yes	Yes
Adjusted R ²	82.11%	83.70%	38.99%	71.80%
Number of Obs.	1753	1720	1753	1720

(continued on next page)

Table 7 (continued)

Panel C				
Illiquidity measures based on model (2) of Panel A				
	Bid-Ask	Price Impact	Zero Returns %	ILQ index
D Non GAAP	-0.745*** < 0.001	-1.168*** < 0.001	-2.107*** < 0.001	-1.541*** 0.001
CG Score	-0.340*** 0.010	-0.689*** < 0.001	0.329 0.562	-0.326 0.532
FOLL	-0.628*** < 0.001	-1.087*** < 0.001	-1.745*** < 0.001	-1.705*** < 0.001
STDEV	0.007* 0.076	0.001 0.931	-0.009 0.603	0.024 0.107
B/M	0.143*** < 0.001	0.370*** < 0.001	0.759*** < 0.001	0.526*** < 0.001
TA	-0.282*** < 0.001	-0.781*** < 0.001	-0.460*** < 0.001	-1.064*** < 0.001
Share Turnover	-0.213*** < 0.001	-0.401*** < 0.001	-0.082 0.596	-0.774*** < 0.001
Return Variability	0.372*** < 0.001	0.584*** < 0.001	-0.069 0.775	0.484** 0.034
λ	0.418*** < 0.001	0.715*** < 0.001	1.229*** < 0.001	0.822*** 0.001
Intercept	5.072*** < 0.001	14.108*** < 0.001	17.707*** < 0.001	Multiple Intercepts
Industry/Year fixed effects	Yes	Yes	Yes	Yes
Adjusted R ²	65.61%	81.35%	28.29%	56.78%
Number of Obs.	961	961	961	961

Panel D				
Illiquidity measures based on model (3) of Panel A				
	Bid-Ask	Price Impact	Zero Returns %	ILQ index
D Non GAAP	-0.512*** < 0.001	-0.848*** < 0.001	-1.404*** 0.002	-1.020** 0.015
CG Score	-0.198 0.146	-0.449** 0.025	0.895 0.133	0.125 0.816
FOLL	-0.652*** < 0.001	-1.094*** < 0.001	-1.853*** < 0.001	-1.820*** < 0.001
STDEV	0.010*** 0.009	0.004 0.466	-0.001 0.965	0.030** 0.040
B/M	0.165*** < 0.001	0.398*** < 0.001	0.825*** < 0.001	0.596*** < 0.001
TA	-0.286*** < 0.001	-0.777*** < 0.001	-0.494*** < 0.001	-1.126*** < 0.001
Share Turnover	-0.169*** < 0.001	-0.358*** < 0.001	0.053 0.743	-0.650*** < 0.001
Return Variability	0.423*** < 0.001	0.671*** < 0.001	0.073 0.774	0.593** 0.012
λ	0.272*** < 0.001	0.507*** < 0.001	0.805*** < 0.001	0.493** 0.018
Intercept	4.525*** < 0.001	13.277*** < 0.001	16.371*** < 0.001	Multiple Intercepts
Industry/Year fixed effects	Yes	Yes	Yes	Yes
Adjusted R ²	64.84%	80.02%	28.63%	56.81%
Number of Obs.	897	897	897	897

This table presents the results of the Sensitivity Analysis II tests. In Panel A we present three models examining the decision to disclose non-GAAP earnings with the addition or subtraction of a variable compared to Model 2 of Table 4. In the first model of Table 7 we do not include corporate governance variables and, thus, we are able to examine the same question as in Table 4 with an increased number of observations. In the second and third model, we include all variables of Model 2 of Table 4 and Words Annual Report or Words Financial Section, respectively, but with the adverse effect of having a smaller sample. In Panels B, C, and D we present results for the effect of the disclosure of non-GAAP earnings on liquidity measures based on the models (1), (2), and (3) of Panel A, respectively. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. *p-values* are presented in italics.

Table 8
Abnormal Volume.

	AVOL [-1, +1]	AVOL [-1, +10]	AVOL [-1, +30]
D Non GAAP	0.246**	0.300***	0.215***
	0.034	0.003	0.010
CG Score	0.134	0.192*	0.082
	0.322	0.099	0.396
FOLL	0.120**	0.027	0.021
	0.012	0.510	0.550
STDEV	-0.010***	-0.009***	-0.006**
	0.006	0.004	0.038
B/M	0.061**	0.019	0.030
	0.037	0.442	0.150
TA	-0.004	0.028*	0.011
	0.841	0.100	0.439
Share Turnover	0.047	0.032	0.005
	0.220	0.328	0.871
Return Variability	-0.064	-0.022	-0.018
	0.267	0.657	0.671
λ	-0.158**	-0.181***	-0.141***
	0.011	0.001	0.002
Intercept	-0.537	-0.855**	-0.262
	0.174	0.012	0.357
Industry/Year fixed effects	Yes	Yes	Yes
Adjusted R ²	6.15%	6.32%	8.77%
Number of Obs.	1201	1201	1201

This table presents the results of the models estimating the abnormal trading volume of the stock in a range of days around the event of the announcement of the annual report. In Model 1 the dependent variable is *AVOL* [-1, +1], in Model 2 the dependent variable is *AVOL* [-1, +10] and in Model 3 the dependent variable is *AVOL* [-1, +30]. The numbers inside the brackets denote trading days and day 0 is the day of the announcement of the annual report. All three *AVOL* variables are based on the estimation window [-160, -10]. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. *p-values* are presented in italics.

In Models 2 and 3 of Panel A, we include an additional variable that captures the quality of firm disclosures based on the length of its annual report. In Model 2 the firm's disclosure quality is proxied by *Words Annual Report* and in Model 3 by *Words Financial Section*. *Words Annual Report* is the natural logarithm of the total number of words in the annual report, while *Words Financial Section* is the natural logarithm of the number of words in the business, financial, and operating review sections with the name of the latter variable shortened for brevity. Data for these two variables were obtained from the Corporate Financial Information Environment (CFIE) project.¹³ The number of observations for these tests is reduced from 1227 to 961 and 897, respectively, due to the unavailability of the information on the length of the annual reports. Including these two variables in the first stage model does not affect inferences regarding the role of financial performance incentives and corporate governance. Results also suggest that even though *Words Annual Report* does not explain the decision to disclose non-GAAP earnings, the coefficient on *Words Financial Section* is negative and statistically significant at the 1% level. This indicates that when the information provided in the financial section is more detailed, the disclosure of a non-GAAP earnings figure is perceived by the management as less important, implying that more detailed financial information mitigates the need for non-GAAP disclosures. The results of Panels C and D are consistent with the results presented in Table 5.

Finally, in Table 8, we examine whether the release of the annual report is related to increased liquidity. Even though our results provide consistent evidence that non-GAAP disclosures are positively related to liquidity, it is possible that this relation captures the effect of non-GAAP disclosures made in other media or announcements and not in the income statement. To address this concern we examine whether liquidity increases in a small window around the release of the annual report. Given that the bid-ask spread and price impact variables exhibit very small variation over time, prior literature uses abnormal volume to measure the short-run effects of information, as this measure is more responsive to changes in information. We thus follow Landsman, Maydew, and Thornock (2012) and measure the market reaction to the release of the annual report on abnormal volume, *AVOL*, which is defined as the mean of the event period volume \bar{V}_{it} divided by the average estimation period volume V_{it} . We use an estimation window starting 160 and ending 10 days prior to the release of the report¹⁴:

$$AVOL_{it} = \ln(\bar{V}_{it}/V_{it}) \quad (4)$$

¹³ We would like to thank an anonymous reviewer for this suggestion. The CFIE is a project of the University Centre for Computer Corpus Research on Language of Lancaster University. Data were downloaded on August 25th, 2017, from: <http://ucrel.lancs.ac.uk/cfie/annual-report-scores.php>.

¹⁴ We also use other estimation windows. Untabulated regressions' results are qualitatively similar to those reported in the study.

To examine whether non-GAAP disclosures have information content when they are included on the face of the financial statements, we measure abnormal volume in the three days around the release of the annual report. We also present results for slightly longer windows, $[-1, +10]$ and $[-1, +30]$, to ensure that our conclusions are robust and that they persist. Results presented in Table 8 show that the coefficient on *D Non GAAP* is positive and significant at the level of 5% or better for the three different event windows used. We conclude that non-GAAP disclosures provide evidence of higher abnormal volume of the stock when the annual report discloses non-GAAP earnings on the face of the income statement. This evidence alleviates concerns that our results are affected by non-GAAP disclosures in earnings or other firm announcements.

6. Conclusions

Using a dataset of 1227 hand collected firm-year observations during the period 2006–2013, we examine the drivers of non-GAAP earnings disclosure as well as the effects of these disclosures on UK stocks' liquidity. Related literature shows mixed results on whether non-GAAP disclosure is used to inform or to mislead investors, by providing evidence that disclosures are made, respectively, for informative or opportunistic reasons. The UK environment is a unique research setting to provide further evidence on this issue since IFRS allow firms to include non-GAAP measures on the face of the income statement and the local regulator does not disallow such disclosures. Given their more prominent place in the financial statements, the incentives and effects associated with non-GAAP earnings disclosures made on the face of the financial statements may be fundamentally different from those associated with disclosures made in other venues.

Our results show that better governed, less profitable firms, firms whose GAAP earnings fall short of market expectations, and firms with higher leverage are more likely to disclose non-GAAP earnings on the face of the income statement. Even though low profitability, profitability benchmarking, and high leverage are all consistent with the informative and the opportunistic incentives, the positive relation between corporate governance and non-GAAP disclosure is consistent only with the former. This conclusion is further corroborated by evidence suggesting that the disclosure of non-GAAP earnings is associated with increased stock liquidity. We conclude that firms use non-GAAP disclosures to reduce information asymmetry and better inform the market about their future earnings. These results should be useful to regulators and to accounting standard setters as they continually assess the informativeness of existing accounting measures.

Appendix A. Variable definitions

Variable	Definition
Main variables	
D Non GAAP	Indicator variable taking the value 1 if the firm disclosed non-GAAP earnings and 0 otherwise.
Bid-Ask	The median value of the daily percentage difference between the bid and the ask price divided by the midpoint of the two measured over the year. In the multivariate models, the natural logarithm of this variable is used, consistent with Daske et al. (2008) .
Price Impact	The median value of the daily percentage ratio of the absolute stock return to trading volume over the year. In the multivariate models, the natural logarithm of this variable is used, consistent with Daske et al. (2008) .
Zero Returns %	The percentage of zero return days over the sum of the trading days in the same year.
ILQ index	The sum of three indicator variables based on the preceding three illiquidity proxies where each indicator takes the value 1 if the observation exceeds the median value of the underlying variable and 0 otherwise. Hence, it can take four different values between a maximum score of 3 and a minimum of 0, with increasing values reflecting lower market liquidity.
Financial variables	
ROA	The ratio of GAAP earnings to total assets.
Missed Forecast	Indicator variable taking the value of 1 if the consensus analyst forecast is greater than GAAP EPS and 0 otherwise.
Missed Prior Earnings	Indicator variable taking the value of 1 if GAAP EPS at year t is less than GAAP EPS at $t-1$, otherwise 0.
GAAP Loss	Indicator variable taking the value of 1 if the firm's GAAP earnings are negative and 0 otherwise.
Leverage	The ratio of total liabilities over total assets.
Corporate governance variables	
CG Score	A comprehensive metric of the overall corporate governance quality of the firm, which is provided by Datastream. It accounts for board structure, compensation policy, board functions, shareholder rights, and vision and strategy. Its value ranges from 0 to 1, with higher values reflecting better corporate governance quality.
Board Size	The natural logarithm of the size of the board of directors.
Board Ind	The percentage of independent directors on the board.

Control variables

FOLL	The natural logarithm of the number of forecast earnings estimates for the firm.
STDEV	The standard deviation of the forecast earnings estimates.
B/M	The ratio of shareholders' equity to market value.
TA	The natural logarithm of the total assets.
Share Turnover	The natural logarithm of annual £ (GBP) trading volume divided by market value of outstanding equity.
Return Variability	The natural logarithm of the annual standard deviation of monthly stock returns.
λ	The inverse Mills ratio estimated by Model 2 of Table 4

Variables of sensitivity analyses

Initiate NGD	Initiate non-GAAP disclosure. Indicator variable taking the value 1 if the firm disclosed non-GAAP earnings for the first time and 0 otherwise.
Diff. Pos. Top25	Indicator variable taking the value 1 if the observation ranks in the top quartile of all observations with positive differences between non-GAAP and GAAP earnings and 0 otherwise.
Words Annual Report	The natural logarithm of the number of words in the annual report.
Words Financial Section	The natural logarithm of the number of words for aggregate business, financial and operating review sections of the annual report.
AVOL	Abnormal volume. The mean value of the event period volume divided by the average estimation period volume.

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