Journal of International Accounting, Auditing and Taxation 43 (2021) 100383

Contents lists available at ScienceDirect

Journal of International Accounting, Auditing and Taxation

Managerial tools used to meet or beat analyst forecasts: Evidence from the UK

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ARTICLE INFO

Article history:
Available online 16 March 2021

JEL classification:
C53
G17
M4
M41
M1

Keywords:
Earnings management
Managerial tools
Hitting analyst forecasts
Managerial guidance

ABSTRACT

This paper examines the tools that managers use to meet or beat analyst forecasts in the post-International Financial Reporting Standards (IFRS) period, using a sample of UK firms for the period 2005 to 2015. Our results are consistent with the view that managers utilize both classification shifting and managerial guidance to hit analyst forecasts. The results suggest that managers are more likely to continue to exercise their discretion in using these two tools following the adoption of IFRS. This paper supports the argument that managers engage in classification shifting, and IFRS adoption is more likely to increase market demand for more disclosuresthrough managerial guidance. In contrast, there is weak evidence to suggest that real earnings management or accrual earnings management are used to hit analyst forecasts. Our results are expected to be of interest to policymakers, regulators, and external auditors.

1. Introduction

Meeting or beating analyst forecasts has become a fruitful area of research for many scholars. There is a growing interest in investigating the tools that managers use to achieve this objective. Firms tend to meet or beat forecasts to report better earnings performance (Zang, 2012), and these firms are considered less risky by both investors and external auditors (Rickling, Rama, & Raghunandan, 2013). This has motivated researchers to explore the tools that managers are likely to employ in this regard. The accounting literature focuses on four managerial tools: accrual earnings management (Matsumoto, 2002; Burgstahler & Eames, 2006), real earnings management (Athanasakou, Strong, & Walker, 2011; Doyle, Jennings, & Soliman, 2013), classification shifting (McVay, 2006; Fan, Barua, Cready, & Thomas, 2010; Athanasakou et al., 2011; Doyle et al., 2013; Fan & Liu, 2017), and managerial guidance (Ng, Tsang, & Yang, 2012; Li & Yang, 2016; Rhee, Yoo, & Cha, 2016). However, the existing literature provides mixed results on which tool the managers use to meet or beat analyst forecasts.

These mixed results are linked to the differences in countries regulatory and institutional settings, including the legal system and the accounting standards used (Athanasakou et al., 2009, 2011; Doyle et al., 2013; Zalata & Roberts, 2017; Malikov, Manson, & Coakley, 2018). For example, Athanasakou et al. (2009, 2011) provide evidence that UK firms used managerial guidance to meet analyst forecasts in the UK Generally Accepted Accounting Principles (GAAP) period. However, the existing research shows that adoption of International Financial Reporting Standards (IFRS) increases market demand for disclosures

https://doi.org/10.1016/j.intaccaudtax.2021.100383
1061-9518/

and allows managers to employ managerial guidance even more (Houston, Lev, & Tucker, 2010; Li & Yang, 2016). Athanasakou et al. (2011) suggest that IFRS adoption could increase the scope of managerial guidance in the UK and propose that this area of research be investigated further in the post-IFRS era.

Therefore, our study extends the growing accounting literature by reporting detailed evidence on the relationship between meeting or beating analyst forecasts and the four managerial tools of accrual earnings management, real earnings management, classification shifting, and managerial guidance in the UK after the adoption of IFRS. The UK context is interesting for two reasons. The first is related to the differences in the institutional settings among countries. For instance, the UK uses a common law system. Ball, Kothari, and Robin (2000) document that the UK operates in a more loosely regulated system, in which the accounting environment is less litigious compared to other common law countries. They document that this flexibility allows firms to deviate from standards, but that firms are required to disclose the effects of these choices on their accounts. This regulated system allows managers to take advantages of shifting from one tool to another after evaluating the costs and benefits of each tool. This explains why accrual earnings management was significant in other common law countries such as the US, but not for the UK (Athanasakou, Strong, & Walker, 2009). The second reason is related to managers' motives to manipulate earnings. For instance, firms' managers in the UK are less likely to use earnings management to avoid reporting bad news, but they can use these techniques for other motives (Brown & Ngo Higgins, 2001). Thus, it is more likely that managers intend to use specific tools to hit analyst forecast post-IFRS era.

In light of this, Athanasakou et al. (2009, 2011) examine those managerial tools used to meet or beat analyst forecasts in the UK pre-IFRS period (UK GAAP period). Our study extends this research and examines those tools in the UK post-IFRS period. In this regard, the differences between UK GAAP and IFRS have attracted many researchers (e.g. Armstrong, Barth, Jagolinzer, & Riedl, 2010; Horton & Serafeim, 2010; El Guindy, 2014). For example, Horton and Serafeim (2010) note six main differences between UK GAAP and IFRS in the areas of employee benefits, leases, share-based payments, intangible assets, income tax, and financial instruments. Though it is often asserted that IFRS and UK GAAP are similar, there was substantial change in financial reporting among listed UK firms following the adoption of IFRS[1].

One significant difference between UK GAAP and IFRS relates to the treatment and disclosure of non-recurring items. For instance, as Zalata and Roberts (2017) claim, UK GAAP provides information on how to treat and disclose non-recurring items, while IFRS provides no guidance on this issue. These differences could encourage managers to shift and exploit the opportunity provided by the existing standards. For example, using accrual earnings management as a main tool post-IFRS would probably be less likely compared to the other three tools. Managers intentionally evaluate the costs and benefits of each tool before they engage with any particular earnings management tool.

In general, the effects of IFRS adoption on managerial tools rely on whether these standards can detect or reduce this kind of managerial behavior. A strong set of standards would probably reduce managerial discretion over accounting choices or restrict the intention to engage in such behavior. In other words, if IFRS are of higher quality than UK GAAP, then it would be expected that the adoption of IFRS in the UK would lead to improvements in financial reporting and a reduction in such managerial behavior. Contrarily, if IFRS are of lower quality and allow managers to use opportunistic managerial tools more easily than UK GAAP, then it would be expected that IFRS will reduce the reliability of the accounting numbers reported in financial statements. Thus, if IFRS leave room for managers to use opportunistic managerial tools to meet or beat analyst forecasts, then we could expect that some tools are used more significantly compared to others in the UK context. It is an interesting research question to examine the relationship between managerial tools and analyst forecasts post-IFRS.

Our study reports the following findings: First, we find a significant positive association between classification shifting and meeting or beating analyst forecasts. Our results are consistent with Zalata and Roberts (2017) and Malikov et al. (2018) and provide evidence that UK firms are motivated to use this tool post-IFRS adoption. Despite the evidence provided by Athanasakou et al. (2011), who claim that the equity market in the UK does not reward firms that hit analyst forecasts through classification shifting, UK firms continue to employ this tool to meet or beat analyst forecasts. Second, this study provides evidence that there is a positive relationship between meeting or exceeding analyst expectations and the use of the managerial guidance tool. It is likely that UK firms will continue to guide analyst expectations to hit their forecasts. Third, we find a weak relationship between real earnings management and meeting or beating analyst forecasts, which indicates that managers might view the adoption of this tool as expensive. Finally, our results provide no evidence of a relationship between accrual earnings management and meeting or beating analyst forecasts. This finding is consistent with both Athanasakou et al. (2009, 2011), who do not provide any evidence that managers could use accrual earnings management or real earnings management to meet or beat analyst forecasts during the UK GAAP period. Managers are unlikely to use accrual earning management because it is not common in the UK even pre-IFRS, and to avoid detection by auditors or regulators.

This study contributes to the literature in several ways. Firstly, this paper extends the studies by Athanasakou et al. (2009, 2011). While those studies focused on the UK during the UK GAAP period, our study examines these four managerial tools in the post-IFRS era. It provides evidence that managers still use both classification shifting and managerial guidance to hit analyst forecasts. This suggests that UK managers are not incentivized to use real earnings management post-IFRS, as it might be considered costly for them compared to other tools. Second, our study adds to the debate among scholars on the impact of

[1] For example, in 2005 Vodafone showed a net profit of £6.5 billion under IFRS and a net loss of £6.9 billion under UK GAAP. This was due to the different treatment of the goodwill amortization between these two sets of standards (De George, Li, & Shivakumar, 2016).

IFRS on the use of managerial tools and the quality of accounting information. We find that both classification shifting and managerial guidance are used at statistically significant levels. Therefore, we support prior research that IFRS adoption does not improve accounting quality and could increase the use of opportunistic managerial tools (Jeanjean & Stolowy, 2008; Ahmed, Neel, & Wang, 2013; Daske, Hail, Leuz, & Verdi, 2013; Doukakis, 2014; Christensen, Lee, Walker, & Zeng, 2015; Zalata & Roberts, 2017; Malikov et al., 2018). That is, managers can use substantial discretion even after IFRS adoption (Jeanjean & Stolowy, 2008; Doukakis, 2014). Third, the significant relationship between meeting or beating analyst forecasts and managerial guidance in both periods (UK GAAP and IFRS) enhances and supports the existing argument on the earnings game between managers and financial analysts (Chen & Matsumoto, 2006; Mayew, 2008; Gu, Li, & Yang, 2013; Soltes, 2014; Brown, Call, Clement, & Sharp, 2015).

The remainder of this paper is structured as follows: Section 2 presents the literature review and the research hypotheses. Section 3 outlines the research design and sample selection. Section 4 reports the empirical results, while the robustness check is presented in section 5. Section 6 concludes the study and provides some suggestions for future research.

2. Literature review and hypotheses development

Many countries agreed to adopt IFRS as they expected that the use of IFRS would lead to increased transparency and would improve financial reporting quality (Jeanjean & Stolowy, 2008). Iatridis (2010) claims that there are several benefits to IFRS adoption. These benefits are not limited to harmonizing accounting practices across countries but also lead to providing higher comparability, lowering transaction costs, and enhancing international investments among adopters. Therefore, IFRS are expected to reduce the use of managerial opportunistic tools such as accrual earnings management. Prior studies provide mixed evidence regarding the effect of IFRS adoption on accounting quality for UK firms. For instance, Almaharmeh and Masa'deh (2018) report that mandatory IFRS adoption leads to improvements in earnings quality for UK firms. They claim that adoption requires UK firms to provide additional disclosure, and this improves the comparability and transparency of accounting information. El Guindy (2014) finds evidence that accounting quality improved for UK firms under IFRS, and this is reflected in a reduction in earnings management. In contrast, Jeanjean and Stolowy (2008) find no evidence to support the suggestion that these standards improve the quality of financial reporting, and in fact, UK firms still engage in accounting manipulation. Furthermore, both Zalata and Roberts (2017) and Malikov et al. (2018) document that IFRS adoption led firms to engage in earnings management through classification shifting. Collectively, these studies suggest that IFRS adoption resulted in the continued use of accounting manipulation and that this led to lower earnings quality in the UK.

The effect of IFRS adoption on the capital markets is seen in countries where there is a large difference between the local GAAP and the IFRS, especially in countries where the legal enforcement regimes are strong and reporting is transparent (Daske, Hail, Leuz, & Verdi, 2008; Aharony, Barniv, & Falk, 2010). Kvaal and Nobes (2010) examined whether there are any systematic differences between a selection of countries (Australia, France, Germany, Spain, and the UK). The results show that each country adopted its own version of the IFRS. These countries tend to maintain the accounting practices related to their local GAAP even after the adoption of IFRS. This produces inconsistent results regarding the impact of the IFRS on managerial tools.

In the UK, Peasnell, Pope, and Young (2000) provide empirical evidence to support the notion that working capital accruals are being managed upwards to achieve target earnings using data during the period of using UK GAAP. However, neither Athanasakou et al. (2009, 2011) study support the argument that accruals earnings management can be used to meet or beat analyst expectations during the UK GAAP period. The majority of studies on the UK post-IFRS adoption tend to focus on the impact of IFRS on classification shifting (e.g. Zalata & Roberts, 2017; Malikov et al., 2018). Therefore, we cannot assume that managers in the UK will not employ accrual earnings management post-IFRS. We predict that there will be a relationship between meeting or beating analyst forecasts and the use of the accrual earnings management tool. Therefore, the following hypothesis was developed:

Hypothesis (1): Ceteris paribus, IFRS have a significant effect on the relationship between accrual earnings management and meeting or beating analyst forecasts.

Several studies focus on examining the shift in behavior from accrual earnings management to real earnings management (Cohen & Zarowin, 2010; Gunny, 2010; Zang, 2012; Alhadab, Clacher, & Keasey, 2013; Kothari, Mizik, & Roychowdhury, 2016). While there is a lack of prior evidence (Athanasakou et al., 2011) in support of the suggestion that real earnings management were employed during the period of the UK GAAP, there is evidence for a growing trend internationally of utilizing the real earnings management tool following IFRS adoption. For instance, Ewert and Wagenhofer (2005) report that managers intend to shift to real manipulations when accounting standards setters make it difficult for managers to use accrual earnings management. They state that tightening accounting standards increases the quality of earnings, but, on the other hand, the standards encourage managers to use real earnings manipulation. This is supported by Jeanjean and Stolowy (2008), who claim that IFRS have a limited effect on improving the quality of financial reporting. These standards involve some judgment and use of private information. Hence, managers may use substantial discretion even with IFRS adoption. Jeanjean and Stolowy (2008) find empirical evidence that even after IFRS adoption, standards do not prevent earnings man-

agement, and their results show that mandatory adoption of IFRS led to an increase in earnings management in France, but that it remained constant in the UK and Australia.

Capkun, Collins, and Jeanjean (2016) argue that due to a lack of clear guidance on the IFRS implementation process, these standards resulted in an increase in earnings management. One of the most recent studies conducted in the UK was by Malikov et al. (2018). They provide evidence that after IFRS adoption, firms tend to increase the practice of inflating operating revenue. They suggest that IFRS provides managers with greater scope to manage earnings. Based on the above discussion, we address the question of whether IFRS influence managers to use real earnings management and utilize the advantages of accounting choices to hit analyst forecasts. In this paper, we draw the following hypothesis based on the previous literature:

Hypothesis (2a): Ceteris paribus, IFRS have a significant effect on the relationship between real earnings management and meeting or beating analyst forecasts.

Moreover, managers employ the classification shifting tool as a substitute for both accrual earnings management and real earnings management. McVay (2006) claims that managers may reclassify expenses or revenue to manage earnings, and that, although this tool does not violate GAAP, it presents a picture that is not one of economic reality. Alfonso, Cheng, and Pan (2015) argue that the classification shifting tool has some advantages over accrual earnings and real earnings management. For example, classification shifting is less likely to be detected by external auditors. Accrual earnings management, meanwhile, affects future earnings negatively, whereas shifting operating expenses to non-recurring expenses does not affect the bottom line of income. In addition, classification shifting is less costly for managers than both accrual earnings and real earnings management. Again, with real earnings management, managers may postpone some real activities to increase reported earnings, but this is at the expense of future benefits. Classification shifting is a type of manipulation that has the lowest cost compared to other tools (Alfonso et al., 2015). Abernathy, Beyer, Masli, and Stefaniak (2014) find similar results and report that managers use the classification shifting tool when they face certain constraints. They document that managers use it instead of accrual earnings if there is less flexibility in the accounting system. Managers avoid using real earnings management and use this tool instead if there are certain constraints related to poor financial conditions, a low industry share price, and a high level of institutional ownership. Classification shifting tool is well documented in the existing literature (McVay, 2006; Athanasakou et al., 2009; Haw, Ho, & Li, 2011; Alfonso et al., 2015; Zalata & Roberts, 2015; Zalata & Roberts, 2017; Malikov et al., 2018).

Recent studies in the UK focus on the impact of IFRS on classification shifting (e.g. Zalata & Roberts, 2017; Malikov et al., 2018). Zalata and Roberts (2017) find that UK firms are motivated to reclassify recurring items into non-recurring in order to inflate core earnings post-IFRS. Further evidence from the UK provided by Malikov et al. (2018) shows that firms use this tool to inflate operating revenues. They find an increasing trend for this tool post-IFRS, and they suggest that the IFRS provide managers with another tool to manage earnings. Baik, Cho, Choi, and Lee (2016) document that following IFRS adoption, firms in financial distress tend to shift their interest payments from operating cash flow to financing cash flow in order to inflate the total figure of operating cash flow. They suggest that managers also use this tool to manage cash flow statements.

Prior studies suggest that IFRS adoption does not deter managers from using this tool. However, whether IFRS increases or decreases the ability of managers to use classification shifting to meet or beat analyst forecasts remains an empirical question. Prior research indicates that managers engage in classification shifting to meet or beat analyst forecasts (McVay, 2006; Fan et al., 2010; Athanasakou et al., 2011; Haw et al., 2011; Doyle et al., 2013; Fan & Liu, 2017). With respect to the UK context, both Athanasakou et al. (2009, 2011) studies find evidence that managers in the UK used the classification shifting tool during the UK GAAP period. IFRS adoption could allow managers to use classification shifting to improve their core earnings. Thus, it is likely that managers engage in classification shifting to meet or beat analyst forecasts post-IFRS. This discussion leads to the following hypothesis:

Hypothesis (2b): Ceteris paribus, IFRS have a significant effect on the relationship between classification shifting and meeting or beating analyst forecasts.

Managerial guidance is now a common behavior in firms' disclosures, and whether it is beneficial to release this information to the capital markets is the focus of significant academic interest. Han (2013) claims that there could be an interrelationship between managerial guidance and analyst forecasts. Managers have the ability to time their guidance to before the actual reported earnings are announced (Hirst, Koonce, & Venkataraman, 2008). Bhojraj, Libby, and Yang (2012) find a positive relationship between guidance frequency and firm reputation. Firms tend to develop reputations through their guidance. They also document that 34.45% of firms in their sample used guidance ten times or more each year. Studies that examine the impact of IFRS adoption on use of the managerial guidance tool provide conflicting arguments and return mixed results (Ng et al., 2012; Li & Yang, 2016; Rhee et al., 2016). For instance, Ng et al. (2012) document that managerial guidance is more likely to be employed by managers in countries where the legal system and regulations are strong. They claim that the IFRS are considered principles-based standards as opposed to rule-based standards, and that IFRS might lead to more risk of litigation. Therefore, managers attempt to disclose more voluntary accounting information in order to reduce this risk. Li and Yang (2016) also provide consistent results and document that IFRS adoption increases market demand for disclosures. This increases managers' incentives to employ the managerial guidance tool.

Alternatively, Rhee et al. (2016) find that managerial guidance is reduced post-IFRS, suggesting that investors understand managerial behavior and do not consider it useful information to them. Thus, investors do not prefer managers to disclose their earnings forecasts in the form of voluntary information. Moreover, the managerial guidance tool allows managers to engage in myopic behavior at the expense of a firm's long-term growth (Houston et al., 2010). Houston et al. (2010) claim that traditionalists would prefer the practice of guidance to cease and that managers focus on their business and leave the responsibility of valuing their securities and predicting the future performance of their firms to investors and analysts.

Choi, Walker, and Young (2006) claim that earnings guidance can also be considered a common practice in the UK context. This is supported by Athanasakou et al. (2009, 2011), who provide evidence that UK firms used managerial guidance to meet analyst forecasts pre-IFRS. However, there is a lack of evidence concerning the use of this tool to meet or beat analyst expectations post-IFRS. Therefore, if IFRS adoption is a principles-based standard and causes an increase in the demand for managerial earnings disclosures, then it is expected that UK firms will continue using this tool to hit analyst expectations. However, if the UK market places less importance on this voluntary information post-IFRS, then it is less likely that managers will use this tool to meet or beat analyst forecasts. Thus, under these conditions, it is difficult to determine the exact direction in regards to whether managers use managerial guidance to meet or beat analyst forecasts post-IFRS. Hence, the following hypothesis is developed:

Hypothesis (2c): Ceteris paribus, IFRS have a significant effect on the relationship between managerial guidance and meeting or beating analyst forecasts.

3. Research design

3.1. Measuring managerial tools

We examined whether UK managers employ accrual earnings management, real earnings management, classification shifting, or earnings forecast guidance to meet or beat analyst forecasts. To test this relationship, we initially estimated abnormal working capital accruals, abnormal real earnings management, abnormal classification shifting, and unexpected managerial guidance, as follows:

3.1.1. Estimation of discretionary accruals

In this study, we use the cross-sectional modified Jones model[2] to estimate working capital accruals as in Matsumoto (2002) and Athanasakou et al. (2009).

$$\frac{\mathrm{WCA_{i,t}}}{\mathrm{A_{i,t-1}}} = \alpha_1\left[\frac{1}{\mathrm{A_{i,t-1}}}\right] + \alpha_2\left[\frac{(\Delta\mathrm{REV_{i,t}} - \Delta\mathrm{REC_{i,t}})}{\mathrm{A_{i,t-1}}}\right] + \alpha_3\left[\frac{(\mathrm{PPE_{i,t}})}{\mathrm{A_{i,t-1}}}\right] + \alpha_4\mathrm{ROA_{i,t-1}} + \varepsilon_{\mathrm{i,t}} \quad (1)$$

AWCA is the residual from the above regression (1) estimated cross-sectionally for each industry-year.[3] See Appendix A for detailed variable definitions and calculations.

3.1.2. Estimation of real earnings management measures

Roychowdhury (2006) developed measures for real earnings activities (abnormal cash flows[4] and abnormal production costs), while Gunny (2010) introduces another measure to estimate expected selling, general, and administration expenses. Since previous studies document measurement errors in earnings management proxies related to extreme firm performance (Kothari, Leone, & Wasley, 2005), we add the lagged of return on assets to these models. Thus, we employ these three models to construct real earnings measures. We use Model 2 to estimate the expected level of cash flow from operations for all UK firms for each industry and year.[5]

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \alpha_0 + \beta_1\left[\frac{1}{A_{i,t-1}}\right] + \beta_2\left[\frac{S_{i,t}}{A_{i,t-1}}\right] + \beta_3\left[\frac{\Delta S_{i,t}}{A_{i,t-1}}\right] + \beta_4 ROA_{i,t-1} + \varepsilon_{i,t} \quad (2)$$

[2] Dechow, Sloan, and Sweeney (1995) evaluate the ability of alternative models to detect earnings management. They evaluate the performance of the specification and the power of accrual models. The specification test is evaluated by Type I error, which arises when the researcher's hypothesis is rejected and when the null hypothesis is true, whereas the power is evaluated through Type II error, which occurs when the researcher's hypothesis is not rejected and when the null hypothesis is false. Dechow et al. argue that there is a measurement error in regards to discretionary accruals and to resolve this issue they deducted change in receivables from the change in revenue. They found that a modified version of the model developed by Jones (1991) provides the most powerful tests of earnings management. Thus, we use the modified Jones model to measure accrual earnings management.

[3] Deflating all variables in the regression model by lagged total assets minimizes the problem of heteroscedasticity. This is more likely to occur because the researcher uses different sizes of firms, which leads to a massive discrepancy between the largest and the smallest value of the independent variables, and in the Jones case, total accruals are calculated using a different sample size.

[4] A deep sales discount is an indication of operational activity deviating from its regularities. As Roychowdhury (2006) and Cohen and Zarowin (2010) report, managers manage sales using price discounts to temporarily affect sales volume in the current period before prices return to their original levels in subsequent periods.

[5] Roychowdhury (2006) states it is common to include a scaled intercept $\beta_1(1/A_{i,t-1})$ when estimating nondiscretionary accruals, to avoid a spurious correlation between scaled *CFO* and scaled sales due to variation in the scaling variable of total assets. He also includes an unscaled intercept of α_0 to ensure that the mean of abnormal *CFO* for every industry per year is zero. Including these intercepts in the model allows the average $(CFO_{i,t}/A_{i,t-1})$ for each industry-year to be non-zero even through explanatory variables tend to be zero.

The above equation is expressed as a linear function of sales and change in sales in the current period. Firms could manage cash flow from operations *(CFO)* through offering deep sales discounts or more lenient credit terms. These practices lead to a reduction in cash inflow during the period of sales as these firms might not get similar offers from their suppliers. Firms that engage in *CFO* tend to report lower cash flows in the current period, and therefore the residual in equation (2) is multiplied by −1. This indicates that managers manage earnings through offering deep sales discounts to improve reported earnings.

Model 3 is used to estimate the expected production costs *(PROD)*, expressed as a linear function of sales and changes in sales in the current period:[6]

$$\frac{\mathrm{PROD_{i,t}}}{\mathrm{A_{i,t-1}}} = \alpha_0 + \beta_1\left[\frac{1}{\mathrm{A_{i,t-1}}}\right] + \beta_2\left[\frac{\mathrm{S_{i,t}}}{\mathrm{A_{i,t-1}}}\right] + \beta_3\left[\frac{\Delta \mathrm{S_{i,t}}}{\mathrm{A_{i,t-1}}}\right] + \beta_4\left[\frac{\Delta \mathrm{S_{i,t-1}}}{\mathrm{A_{i,t-1}}}\right] + \beta_5 ROA_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

Similarly, firms reduce production costs through lowering the costs of goods sold, which leads to an increase in the bottom line of earnings. A negative abnormal level indicates that firms are engaging in earnings management. Thus, a higher value suggests that managers reduce these real earnings expenses in order to report higher earnings. Following Gunny (2010),[7] Model 4 is used to estimate the expected level of selling, general, and administration expenses *($SGA_{i,t}$)*:[8]

$$\frac{\mathrm{SGA_{i,t}}}{\mathrm{A_{i,t-1}}} = \alpha_0 + \alpha_1\left[\frac{1}{\mathrm{A_{i,t-1}}}\right] + \beta_1 \mathrm{Q_{i,t}} + \beta_2\left[\frac{\mathrm{INT_{i,t}}}{\mathrm{A_{i,t-1}}}\right] + \beta_3\left[\frac{\Delta \mathrm{S_{i,t}}}{\mathrm{A_{i,t-1}}}\right] + \beta_4\left[\frac{\Delta \mathrm{S_{i,t}}}{\mathrm{A_{i,t-1}}}\right] * \mathrm{DD} + \beta_5 \mathrm{ROA_{i,t-1}} + \varepsilon_{i,t} \quad (4)$$

Managers may reduce *SGA* expenses to inflate reported earnings. A negative abnormal level indicates that firms are engaging in earnings management. The abnormal level is multiplied by −1 so that a higher value suggests a higher chance of upward earnings management through lowering *SGA* expenses. Thus, abnormal cash from operations *(ACFO)*, abnormal production costs *(APROD)*, and abnormal selling, general, and administrative expenses *(ASGA)* are the residuals from the above regressions (2, 3, and 4), estimated cross-sectionally for each industry-year.

3.1.3. Estimation of classification shifting measure

To measure whether managers use the classification shifting tool, we employ the McVay (2006) model,[9] and expected core earnings are estimated with cross-sectional data for each industry-year as follows:

$$CE_{i,t} = \alpha_0 + \beta_1 CE_{i,t-1} + \beta_2 ATO_{i,t} + \beta_3 WCA_{i,t-1} + \beta_4 WCA_{i,t} + \beta_5 \Delta SALES_{i,t} + \beta_6 NEG\_\Delta SALES_{i,t} + \varepsilon_{i,t} \quad (5)$$

Thus, based on Model 5, unexpected core earnings *(UCE)* for each firm are calculated as the difference between reported core earnings and expected core earnings. Then Model 6 is used to estimate whether UK firms misclassify recurring expenses as non-recurring to meet or beat analyst forecasts.

$$\mathrm{UCE_{i,t}} = \alpha_0 + \beta_1 \mathrm{NREC_{i,t}} + \beta_2 \mathrm{CFO_{i,t}} + \beta_3 \mathrm{LEV_{i,t}} + \beta_4 \mathrm{ROA_{i,t}} + \beta_5 \mathrm{MBV_{i,t}} + \beta_6 \mathrm{SIZE_{i,t}} + \varepsilon_{i,t} \quad (6)$$

We follow Athanasakou et al. (2009) and Zalata and Roberts (2017), and non-recurring items *(NREC)* are calculated as the difference between reported core earnings and actual reported earnings scaled by sales. Therefore, if classification shifting serves as a mechanism to meet analyst expectations, we expect to see a positive association between *NREC* and *UCE*. Two conditions are set to check whether firms engage in classification shifting (*CS*) to meet or beat analyst forecasts: 1) if unexpected core earnings is positive (i.e. core earnings are higher than expected) and 2) I/B/E/S earnings per share *(EPS)* is higher than actual reported *EPS*.

3.1.4. Estimation of managerial guidance measure

Matsumoto (2002) developed a measure of forecast guidance by modeling an expected forecast based on previous earnings changes and yearly cumulative stock returns as follows:[10]

$$\frac{\Delta EPS_{i,t}}{P_{i,t-1}} = a_{1,t} + a_{2,t}\left(\frac{\Delta EPS_{i,t-1}}{P_{i,t-2}}\right) + a_{3,t} CERET_{i,t} + e_{i,t} \quad (7)$$

[6] Production costs *PROD* is the sum of the cost of goods sold. To manage earnings upward, managers tend to produce an excessive inventory to report a high level of operating margin, which causes the fixed cost per unit to decrease as the production volume increases.

[7] The dummy control *(DD)* is included to control for 'sticky' cost behavior, as identified by Anderson, Banker, and Janakiraman (2003). It indicates that managers attempt to cut resources when sales drop even when this drop is temporary. It is more likely to occur as a result of managers' incentives to meet earnings targets (Kama & Weiss, 2013).

[8] See Appendix A for detailed variable definitions and calculations.

[9] McVay (2006) claims that classification shifting does not require a change in the final reported earnings; instead, it reclassifies some items on financial statements in order to mislead users. To test whether UK firms are involved in classification shifting of core expenses, we use the method introduced by McVay (2006) to measure the expected core earnings level.

[10] This strategy shows how the system is supposed to work with inside information. Following Matsumoto (2002) approach and to identify whether analysts downgrade their forecasts, unexpected managerial guidance is calculated as the difference between the last earnings forecast before the release of the earnings announcement and the expected earnings forecast.

Following Matsumoto (2002) approach and to identify whether analysts downgrade their forecasts, analysts' unexpected earnings forecast *(UEF)* is calculated as the difference between the last earnings forecast before the release of the earnings announcement *(AF0)* and the expected earnings forecast *(EF)*. Therefore, the unexpected latest analyst forecast is as follows:

$$EF_{i,t} = (AF0) - (EF_{i,t}) \tag{8}$$

where the expected earnings forecasts *(EF)* is shown as follows:

$$EF_{i,t} = EPS_{i,t-1} + E(\Delta EPS_{i,t} \tag{9}$$

Thus, the predicted estimate is compared with the consensus analyst forecast. If the consensus forecast tends to be lower than the model forecast, then this indicates that firms have the ability to reduce expectations. A negative result of *UEF* suggests that managers are able to guide analyst expectations downward.

3.2. Regression model

This study investigates four common managerial tools, accrual earnings management, real earnings management, classification shifting, and managerial guidance. To examine the relationship between these four tools and the probability of meeting or beating earnings *(MBE)* forecasts of analysts post-IFRS, we estimate the following random-effect logistic model[11], which was initially developed by Athanasakou et al. (2009):

$$\begin{aligned} Prob(MBE = 1/X) = F(&\alpha_0 + \beta_1 AWCA_{i,t} + \beta_2 ACFO_{i,t} + \beta_3 APROD_{i,t} + \beta_4 ASGA_{i,t} + \beta_5 ACS_{i,t} + \beta_6 UEF_{i,t} + \beta_7 PROF_{i,t} \\ &+ \beta_8 P\Delta EARN_{i,t} + \beta_9 GROWTH_{i,t} + \beta_{10} SIZE_{i,t} + \beta_{11} LID_{i,t} + \beta_{12} INDPROD_{i,t} + \beta_{13} INDD_{i,t} + \upsilon_{i,t} \\ &+ \varepsilon_{i,t} \end{aligned} \tag{10}$$

$$MBE = \begin{cases} 1 & \text{if} \quad \text{Surprise} \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

$$\text{AWCA} = \begin{cases} 1 & \text{if} \quad AWCA \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

$$ACFO = \begin{cases} 1 & \text{if} \quad ACFO \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

$$APROD = \begin{cases} 1 & \text{if} \quad APROD \geq 0 \\ 1 & \text{otherwise} \end{cases}$$

$$ASGA = \begin{cases} 1 & \text{if} \quad ASGA \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

$$ACS = \begin{cases} 1 & \text{if} \quad ACS \geq 0 \\ 0 & \text{otherwise} \end{cases}$$

$$UEF = \begin{cases} 1 & \text{if} \quad UEF < 0 \\ 0 & \text{otherwise} \end{cases}$$

$$\text{Where} \quad F\left(B'X\right) = e^{B'X}/(1 + e^{B'X})$$

Earnings surprise is calculated as the difference between actual reported *EPS* and the final analyst forecast made before the announcement date (from I/B/E/S). Therefore, MBE = 1 if earnings surprise is expected to be zero or a positive value, and 0 otherwise. If UK firms guide analyst forecasts to meet analyst expectations, then we expect the coefficient on *AWCA, ACFO, APROD, ASGA, ACS* and *UEF* to be positive. Degeorge, Patel, and Zeckhauser (1999) point out that there are three main earnings benchmarks available to managers: profit, prior-year earnings, and analyst forecasts. They claim that managers focus on meeting analyst expectations if both the other targets are met. Brown (2001) documents that profitable firms are most likely to meet or just beat analyst forecasts. Dopuch, Seethamraju, and Xu (2008) also find evidence that firms are motived to meet

[11] Several diagnostic tests were performed to test the statistical assumptions of the logistic model. For the Box-Tidwell Test, the interaction terms of continuous variables obtained by this test appear not to be significant ($p > 0.05$; two-tailed). Our results pass this test. For the multicollinearity test, variance inflation factor (VIF) and correlation matrix both indicate that there is no potential collinearity problem. To account for heteroscedasticity, a robust standard error is included in the regression model. To check the model's performance in terms of goodness of fit, the Hosmer-Lemeshow test was conducted for the logistic regression model. Based on this test, the p-value are not significant ($p > 0.05$; $\chi 2 = 5.98$), indicating a good fit of the model. Further, using the classification table, the model can predict approximately 66.75%.

analyst forecasts if these firms already matched previous-year earnings, while Graham, Harvey, and Rajgopal (2005) report that managers are more likely to be motivated to meet previous-year earnings and then attempt to hit analyst expectations as the second target. Hence, it seems that firms put meeting or beating analyst forecasts as the last target compared with other targets. Similarly, in this study, these targets need to be controlled, therefore, two control variables are added: profit *(PROF)* and positive change in earnings *(PΔEARN)*. Both are expected to have positive signs.

Dechow, Richardson, and Tuna (2000) show that firms that meet analyst expectations have special characteristics, with high growth and high market-to-book ratios. McVay (2006) finds that managers with growth firms have strong incentives to hit analyst forecasts. Zang (2012) documents that firms engaged in earnings management to meet or just beat the analyst forecast consensus tend to have more analyst coverage, higher growth, and better earnings performance. Athanasakou et al. (2011) find that the pressure of growth encourages firms to use opportunistic analyst forecast guidance. Hence, to control for a firm's growth opportunities, a growth proxy *(GROWTH)* is added to minimize this effect. It is calculated as the market value of equity divided by the book value of equity (Roychowdhury, 2006; Gunny, 2010). Similarly, we use the market-to-book value *(MBV)* to control for firms' growth. The growth proxy is expected to have a positive sign.

The size of the firm is an essential indicator of firm performance because larger firms may have better performance and they also have advantages of economies of scale over small firms (Frank & Goyal, 2003). Hu, Hwang, and Jiang (2014) report that larger firms are more heavily monitored by analysts and investors, and consequently these firms are less likely to engage in managing earnings. Larger firms are less likely to engage in managing earnings because these firms tend to have strong internal control systems and competent auditors compared to small firms. Furthermore, larger firms are normally audited by large auditing firms, and it can easily be detected if these firms engage in earnings management (Francis, Maydew, & Sparks, 1999). Zang (2012) uses the value log of total assets to control for size. Therefore, we include an indicator variable for size *(SIZE)* to control firm performance for the effect of size, and we calculate it as the log of total assets.

In some cases, managers are concerned about the risk of litigation from shareholders. Managers have more motives to meet or beat analyst expectations when this risk is high. So following Matsumoto (2002), we use a dummy *(LID)* to control for high risks in some industries, such as biotechnology, computers, electronics, and retail. This proxy was found to provide a better measure of ex-ante litigation risk. It is also expected that the *LID* coefficient will be positive. To control for the effect of macroeconomic conditions, average annual growth in industrial production *(INDPROD)* is included, as suggested by Athanasakou et al. (2009). Industry dummies *(INDD)* are used to control for industry differences which cannot be explained by the control variables.

3.3. Sample selection

Table 1 shows a summary of our sample selection. The sample is made up of 651 firms listed in the FTSE All-Share Index between 2005 and 2015. Financial data were collected from Thomson Reuters DataStream and Thomson Reuters I/B/E/S databases.

Following the approach of Roychowdhury (2006) and Gunny (2010), the sample excludes financial institutions, as these companies tend to have a different financial reporting structure compared to non-financial institutions. Financial companies are all excluded because a high leverage ratio for a non-financial company is an indication that the firm is in distress (Fama & French, 1992). These accounted for approximately 44.5% of the initial sample.

The sample also excludes utility firms (1.99%) as they are highly regulated by accounting rules (Gunny, 2010). Due to data unavailability for some key variables and the use of a lagged form of some variables, the sample is further reduced by 10.4%. Thus, the final sample includes 280 firms and 2406 firm-year observations. To deal with outliers, extreme observations for all variables are winsorized at 1% and 99% of their distribution (Gunny, 2010; Dechow, Hutton, Kim, & Sloan, 2012; Zang, 2012; Alhadab et al., 2013; Doyle et al., 2013).

We use annual financial data as annual data is audited and is more reliable and more accessible compared to quarterly data. Also, prior evidence shows that around 40% of published accounts used discretionary accruals in the fourth quarter (Guthrie & Sokolowsky, 2010). In this study, a minimum requirement is set of six observations per industry year, as Athanasakou et al. (2009) suggest, to estimate normal working capital accruals for UK firms. Similar industries are all integrated into one group to avoid any inefficiency in estimating the regression coefficient. It is also essential to fit the criteria of minimum observations used for each industry.

This paper follows the Industry Classification Benchmark (ICB) approach, according to the FTSE Russell classification. After excluding financial services and utilities, we use the seven remaining ICB industries: industrial, consumer goods, basic materials, oil and gas, healthcare, consumer services, and technology.[12]

4. Empirical analysis

4.1. Descriptive statistics and correlations

Table 2 shows descriptive statistics for our key variables. The mean, median, standard deviation, 25th percentile, and 75th percentile are reported for each variable. The mean ratio for *MBE* is 55.2%, which may suggest that half of the sample attempt

[12] See Appendix B for the full distribution of sample size per industry.

Table 1
Sample selection for firms between 2005 and 2015.

Description	Percentage
Initial sample (FTSE All-Share)	100%
Excluded:	
Financial, insurance and investment companies	(44.5%)
Utility firms	(1.99%)
Data unavailability and the use of lagged	(10.4%)
Final sample size	43.11%

Table 2
Descriptive statistics for the key variables.

Variable	Mean	Median	SD	p25	p75
Panel A: Meet or beat proxy					
MBE	0.552	1.000	0.497	0.000	1.000
Panel B: Managerial measures					
AWCA	0.572	1.000	0.495	0.000	1.000
ACFO	0.096	0.000	0.188	1.000	1.000
APROD	0.092	0.000	0.143	1.000	1.000
ASGA	0.009	0.000	0.096	0.000	0.000
ACS	0.565	1.000	0.496	0.000	1.000
UEF	0.299	0.000	0.458	0.000	1.000
Panel C: Control variables					
PROF	0.959	1.000	0.199	1.000	1.000
PΔEARN	0.676	1.000	0.468	0.000	1.000
GROWTH	3.125	2.260	6.772	1.350	3.843
SIZE	13.749	13.620	1.690	12.588	14.789
LID	0.366	0.000	0.482	0.000	1.000
INDPROD	−0.001	0.009	0.024	−0.012	0.014

Notes: See Appendix A for detailed variable definitions and calculations. Variables are winsorized at 1% and 99% of their distribution. The 25% quartile indicates the value of the 25th percentile of the frequency distribution and the 75% quartile is the third quarter of the frequency distribution.

to hit analyst forecasts. This result is consistent with the findings of previous research; for instance, Athanasakou et al. (2009) reported a mean ratio for *MBE* of 60% pre-IFRS. Thus, it is likely that managers have high incentives to hit analyst forecasts post-IFRS. Furthermore, classification shifting has a higher ratio compared to other tools. This may suggest that managers are more likely to utilize this tool to meet or beat analyst forecasts. This evidence is consistent with the expectation that managers use some tools as substitutes for other tools. Overall, the average size of firms, measured by the log of total assets, is approximately £13.74 million. This reflects that the sample includes firms of different sizes, which are distributed among seven different industries.

Table 3 reports a summary of Spearman correlations between our key variables. This table shows that the meeting or beating analyst forecasts *(MBE)* proxy is positively correlated with the classification shifting measure. This might indicate that managers intentionally attempt to shift operating expenses to non-recurring expenses. It is probably the case that this tool is one of the most significant methods used by UK managers in the post-IFRS era. However, profitable firms are highly correlated with *MBE*. This could suggest that these firms have more incentives to hit analyst expectations than loss-making firms. Moreover, the table reports that the size of firms is negatively correlated with the explained variable *(MBE)*. This implies that smaller firms may have greater incentives to meet or beat forecasts in comparison to larger firms.

4.2. Regression results

Table 4 reports both the coefficients for the random and the fixed logistic models' findings. However, the focus of this study is on the random effect logistic model, as suggested by the Hausman test, in which the null hypotheses are rejected. Therefore, the fixed effect logistic model's results are included only to increase robustness. It predicts the relationship between *MBE* proxy and managerial measures.

The results show that there is a positive and significant relation between *MBE* and *ACS*, indicating that managers misclassify operating expenses to non-recurring expenses to meet or beat analyst forecasts. Classification shifting is more difficult for external auditors to detect because shifting operating expenses to non-recurring expenses does not affect the bottom line of income. Also, managers find this tool to be less costly than both accrual earnings management and real earnings management (Alfonso et al., 2015). Abernathy et al. (2014) report that managers use the classification shifting tool when they face certain constraints and restrictions. IFRS are more likely to influence managers decisions in the UK to prefer using classification shifting compared to other tools. Malikov et al. (2018) find that firms use the classification shifting tool more during

Table 3
Spearman correlation between the key variables for MBE regression model.

Variable	*MBE*	*AWCA*	*ACFO*	*APROD*	*ASGA*	*ACS*	*UEF*	*PROF*	*PΔEARN*	*GROWTH*	*SIZE*	*LID*
AWCA	0.0196											
ACFO	0.0281	0.0186										
APROD	0.0115	0.0249	0.0424**									
ASGA	0.0357*	−0.0102	−0.1662***	−0.0405**								
ACS	0.0502***	−0.0460**	0.0539***	−0.0224	0.0310							
UEF	0.0208	−0.0681***	−0.0205	−0.0213	0.569***	0.0975***						
PROF	0.1191***	0.0586***	0.3340***	0.0960***	−0.0596***	0.1008***	−0.0493**					
PΔEARN	0.2688***	0.0873***	0.0548**	0.0473**	−0.0324*	−0.0520***	−0.6798***	0.1643***				
GROWTH	−0.0114	0.0333*	0.0676***	0.0015	−0.0203	−0.0592***	−0.0592***	0.0560***	0.0660***			
SIZE	−0.0590***	−0.0184	0.01209***	0.0248	0.0620***	0.0595***	0.0595***	0.1488**	−0.0369*	−0.0444**		
LID	0.0198	−0.1414***	−0.0114	−0.0213	−0.0334*	−0.0317*	−0.0659***	−0.0176	0.0149	0.0531***	0.0063	
INDPROD	0.0119	0.0549***	−0.0188	−0.0022	0.0391**	−0.0477**	−0.1872***	0.0512***	0.1423***	0.1081***	0.0058	0.0023

Notes: See Appendix A for detailed variable definitions and calculations. *: significant at 10% level; **: significant at 5% level; ***: significant at 1% level.

Table 4
Logistics analysis of the relationship between MBE proxy and managerial tools measures.

Variable	Fixed-Effect Logistic Model Coefficient	e z-statistic	Random-Effect Logistic Model Coefficient	z-statistic
	(1)		(2)	
Constant			−2.817	−2.87***
AWCA	0.028	0.22	0.022	0.18
ACFO	−0.031	−0.08	−0.242	−0.62
APROD	−0.823	−1.42	−0.383	−0.75
ASGA	1.894	3.04***	1.77	3.05***
ACS	0.291	2.11**	0.311	2.39**
UEF	3.143	7.07***	3.171	7.83***
PROF	3.775	1.66*	1.034	1.77*
PΔEARN	3.775	8.22***	3.793	9.08***
GROWTH	0.0022	0.23	−0.0017	−0.21
SIZE	−0.042	−0.23	−0.0969	−2.02*
LID			0.175	0.83
INDPROD	2.948	1.39	3.45	1.63
INDD			Yes	
No. of observations	2190		2406	
Wald $\chi 2$	108.67		216.04	
p-value	<0.001		<0.001	

Notes: See Appendix A for detailed variable definitions and calculations. *: significant at 10% level; **: significant at 5% level; ***: significant at 1% level.

the IFRS period compared to the pre-IFRS period, suggesting that IFRS offers more scope for the misclassification of income statement items compared to UK GAAP. Moreover, Zalata and Roberts (2017) claim that UK GAAP provides information on how to treat and disclose non-recurring items, while IFRS does not provide any guidance on this issue. So, the IASB does not see a need to disclose information about unusual transactions. The prior evidence supports our results and justifies why managers increase their practice of utilizing the classification shifting tool post-IFRS adoption.

Furthermore, *MBE* is positive and statistically significant with *UEF*, revealing that UK managers continue to employ managerial guidance as a tool to hit analyst forecasts. Given the prior research we discussed by Choi et al. (2006), Ng et al. (2012), Zang (2012), and Rickling et al. (2013), it should not be a surprise to discover that managers in the UK use managerial guidance to meet or beat analyst forecast post-IFRS adoption. Our results are consistent with prior evidence obtained by Athanasakou et al. (2009, 2011) in the UK pre-IFRS. Our findings support prior studies' results that IFRS adoption does not improve accounting quality and could increase the use of opportunistic managerial tools (Jeanjean & Stolowy, 2008; Ahmed et al., 2013; Daske et al., 2013; Capkun et al., 2016; Zalata & Roberts, 2017; Malikov et al., 2018). Thus, our findings are consistent with this study's hypothesis that there is a relationship between meeting or beating analyst expectations and use of the classification shifting and managerial guidance tools.

However, there is no evidence to suggest a relationship between accrual earnings management and meeting or beating analyst forecasts. These results are inconsistent with prior studies (e.g. Matsumoto, 2002; Burgstahler & Eames, 2006). However, Athanasakou et al. (2009, 2011) do not provide any evidence that managers could use accrual earnings management to meet or beat analyst expectations during the UK GAAP period. Thus, managers are unlikely to use accrual earning management because it is not common in the UK even pre-IFRS and because it is difficult to avoid detection by auditors or regulators. Moreover, except for the selling, general, and administration expenses activity, there is weak evidence to suggest a relationship between the real earnings management tool and the MBE proxy. This could indicate that real earnings management is expensive for UK managers, and that they prefer not to utilize this tool to hit analyst forecasts.

In relation to some of the control variables in Model 2, both signs of profit *(PROF)* and change in earnings *(PΔEARN)* as predicted are positive. This result supports Degeorge et al. (1999), who claim that managers tend to focus on meeting analyst expectations if both of the other targets are met. This result is also consistent with the findings of Brown (2001) and Dopuch et al. (2008). However, firm size is negatively significant and correlated to *MBE*. This is consistent with previous studies which document that larger firms may exhibit better performance and that they also have advantages of economies of scale over small firms (e.g. Frank & Goyal, 2003). Therefore, these firms have earnings that can be more stable. This result is consistent with the argument that larger firms are less likely to engage in managing earnings because these firms tend to have a strong internal control system and competent auditors compared to small firms. Furthermore, larger firms are normally audited by large auditing firms, and it can easily be detected if these firms engage in earnings management (Francis et al., 1999).

5. Robustness check

In this section, we discuss three additional tests to measure the robustness of the empirical findings. Unlike the main test, we identify only those firms that beat analyst forecasts. The results reported in Table 5 are consistent with prior findings,

showing that both classification shifting and managerial guidance are significantly correlated with the exceeding analyst forecast proxy.

In prior tests, we use selling, general, and administration expenses *(SGA)* as one of the real earnings management activities. However, several previous studies (Kothari et al., 2005; Roychowdhury, 2006; Cohen, Dey, & Lys, 2008; Bhojraj, Hribar, Picconi, & Mcinnis, 2009; Abad, Cutillas-Gomariz, Sánchez-ballesta, & Yague, 2016) report that earnings could also be managed using discretionary expenses. These expenses are the aggregation of both research and development costs *(R&D)* and selling, general, and administration expenses *(SGA)*.

Therefore, the model is re-estimated by replacing the measure of *ASGA* with the abnormal discretionary expenses *(ADISCEX)* measure. The results are reported in Table 6, and the random-effect logistic model shows that the abnormality of discretionary expenses is positive but not statistically significant. This supports our previous findings, suggesting that UK managers might not prefer to use real earnings management.

Finally, several studies (e.g. Dechow et al., 2000; McVay, 2006; Athanasakou et al., 2011; Zang, 2012) support the argument that growth firms are more likely to manage earnings to meet or just beat analyst forecasts. We do another robustness test to check whether our results are influenced by high growth firms. So, we divided the sample into two groups, high-growth firms and the rest of the sample.

Table 5
Logistics analysis of the relationship between exceeding analyst forecasts proxy and managerial tools measures.

Variable	Fixed-Effect Logistic Model		Random-Effect Logistic Model	
	Coefficient	z-statistic	Coefficient	z-statistic
	(1)		(2)	
Constant			−2.695	−2.61***
AWCA	−0.0004	−0.04	0.0083	0.07
ACFO	−0.009	−0.02	−0.287	−0.79
APROD	−0.959	−1.52	−0.557	−1.04
ASGA	2.098	2.98***	1.889	3.04***
ACS	0.316	2.28**	0.32	2.50**
UEF	3.607	7.43***	3.503	8.18***
PROF	1.9543	1.66***	1.402	3.57***
PΔEARN	4.289	8.64***	4.166	9.55***
GROWTH	−0.0014	−0.13	−0.0046	−0.53
SIZE	−0.043	−0.23	−0.105	−2.25*
LID			0.308	1.46
INDPROD	2.295	1.09	2.784	1.32
INDD			Yes	
No. of observations	2223		2406	
Wald $\chi 2$	132.18		204.54	
p-value	<0.001		<0.001	

Notes: See Appendix A for detailed variable definitions and calculations. *: significant at 10% level; **: significant at 5% level; ***: significant at 1% level.

Table 6
Logistics analysis of the relationship between MBE proxy and managerial tools measures.

Variable	Fixed-Effect Logistic Model		Random-Effect Logistic Model	
	Coefficient	z-statistic	Coefficient	z-statistic
	(1)		(2)	
Constant			−2.093	−2.10**
AWCA	0.0316	0.26	0.02	0.17
ACFO	−0.092	−0.25	−0.296	−0.77
APROD	−0.874	−1.55	−0.461	−0.92
ADISCEX	2.469	2.20**	1.832	1.53
ACS	0.292	2.11**	0.315	2.43**
UEF	3.172	7.12***	3.195	7.88***
PROF	1.315	1.67*	1.008	1.74*
PΔEARN	3.782	8.23***	3.799	9.10***
GROWTH	0.0021	0.22	−0.0018	−0.22
SIZE	−0.032	−0.17	−0.0932	−1.95*
LID			0.168	0.8
INDPROD	3.129	1.48	3.508	1.67
INDD			Yes	
No. of observations	2190		2406	
Wald $\chi 2$	100.1		212.26	
p-value	<0.001		<0.001	

Notes: See Appendix A for detailed variable definitions and calculations. *: significant at 10% level; **: significant at 5% level; ***: significant at 1% level.

Table 7
Logistics analysis of the relationship between MBE proxy and managerial tools measures with two sub-samples (high-growth firms and the rest of sample).

	Fixed-Effect Logistic		Random-Effect Logistic		Fixed-Effect Logistic		Random-Effect Logistic	
	Sample A: High-Growth Firm				**Sample B: Remaining Firm Sample**			
	Coefficient	z-stat	eCoefficient	z-stat	Coefficient	z-stat	Coefficient	z-stat
Variable	(1)		(2)		(3)		(4)	
Constant			−2.183	−2.14**			−2.716	−2.16**
AWCA	0.028	0.22	0.022	0.18	0.112	0.62	0.081	0.50
ACFO	−0.031	−0.08	−0.383	−0.62	−0.33	−0.83	−0.232	−0.56
APROD	−0.823	−1.42	−0.383	−0.75	−1.195	−1.13	−0.696	−1.02
ASGA	1.889	3.04***	1.77	3.05***	1.291	1.96*	1.494	2.53**
ACS	0.291	2.11**	0.317	2.38**	0.507	2.76***	0.418	2.52**
UEF	3.144	7.07***	3.171	7.83***	3.639	4.64***	3.456	6.43***
PROF	1.301	1.66*	1.036	1.78*	1.053	1.41	1.155	2.06**
PΔEARN	3.775	8.22***	3.793	9.08***	4.159	5.16***	4.069	7.37***
GROWTHD	0.0022	0.23	−0.0017	−0.21	0.0206	0.79	0.0053	0.32
SIZE	−0.042	−0.23	−0.0969	−2.03*	0.216	0.55	−0.081	−1.33
LID			0.175	0.83			0.369	1.32
INDPROD	2.95	1.39	3.45	1.63	3.217	1.07	2.593	0.91
INDD			Yes				Yes	
No. of observations	2190		2406		1029		1255	
Wald χ2	108.67		216.04		57.64		116.5	
p-value	<0.001		<0.001		<0.001		<0.001	

Notes: See Appendix A for detailed variable definitions and calculations. *: significant at 10% level; **: significant at 5% level; ***: significant at 1% level.

We follow Krishnaswami and Subramaniam (1999) approach in which a firm is classified as a high-growth if its market-to-book ratio is above the median of the entire sample. The growth dummy (*GROWTHD*) is an indicator variable, which is 1 if the firm is high-growth, and 0 otherwise. The results in Table 7 show that both the classification shifting and managerial guidance tools are significantly associated with the analyst forecast proxy. However, the control variable of *GROWTHD* in both groups is not significant. Thus, the regression results obtained are robust and consistent with previous findings.

6. Conclusions

This study employed recent data to investigate the tools that UK firms use to meet or beat analyst forecasts in the post-IFRS period. The results show that classification shifting and managerial guidance are utilized by managers in the UK. Our results show a positive and significant association between meeting and beating analyst forecasts and classification shifting, indicating that managers misclassify operating expenses to non-recurring expenses to meet or beat analyst forecasts. We support both Zalata and Roberts (2017) and Malikov et al. (2018), providing evidence that UK firms are motivated to use the classification shifting tool following IFRS adoption.

Furthermore, we find a positive relationship between meeting or exceeding analyst expectations and use of the managerial guidance tool. It is likely that UK firms will continue to guide analyst expectations to hit their forecasts. Managers might believe that analyst forecasts are overly optimistic and attempt to avoid surprising the market with unexpected earnings. This is consistent with Li and Yang (2016), who document that IFRS adoption increased market demand for disclosures. This increases managers' incentives to employ these managerial guidance tools. Our study supports Jeanjean and Stolowy (2008), who claim that accounting standards have a limited effect on improving the quality of financial reporting. These standards involve some judgment and the use of private information. Hence, managers may use substantial discretion even with IFRS adoption. Our results are consistent with Athanasakou et al. (2009, 2011), who do not provide any evidence that managers could use accrual earnings management or real earnings management to meet or beat analyst forecasts during the UK GAAP period.

The regulator in the UK could use this research to identify the sort of firm that is most likely to utilize these practices. Another important implication of this study is for external auditors. Several prior studies (e.g. Graham et al., 2005; Fan et al., 2010; Alfonso et al., 2015) document that managers use some tools instead of others to avoid the attention of auditors. Rickling et al. (2013) find that firms that meet or beat analyst expectations repeatedly are considered less risky not only by investors but also by auditors, and this is reflected in low fees charged by auditors to these firms. Thus, independent auditors should detect material cases of earnings management and report them to the appropriate authority. Furthermore, it seems that investors are fooled by managers, as they are misled by managed financial reporting. Thus, investors should interpret financial statements with caution.

This study has some limitations and provides avenues for future research. One flaw is that the sample used is relatively small due to data limitations, and it could be subject to sample bias. Therefore, this study could be expanded with a larger sample. Also, the sample used is based on UK firms, thus, it leaves an interesting research question as to what extent other European countries would produce similar results. Furthermore, it is argued that firms constrained from using accruals are

more likely to use other methods (Fan et al., 2010). Thus, this study could be extended to differentiate between firms that have high and low flexibility in use of accruals. Our results indicate that both classification shifting and managerial guidance are still used by UK managers following the adoption of IFRS. This raises a question as to why managers continue to guide analyst forecasts since both pre-IFRS and post-IFRS periods provide similar conclusions. Moreover, the focus of prior research is on how managers meet or beat analyst forecasts, but our understanding of the earnings game is incomplete because most existing studies do not consider how analysts react to these managerial tools. Eiler, Filzen, Jackson, and Tama-Sweet (2016) claim that the association between real earnings management and analyst forecasts is unstudied. We agree that researchers should focus attention on the importance of investigating this relationship in order to better understand the earnings game between managers and analysts. Put another way, how analysts react to managerial tools is an essential empirical question. Therefore, this area could be of high interest for future research.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

We are especially grateful to Editor-in-Chief Professor Robert K. Larson and anonymous reviewers for their extensive and helpful comments.

Appendix A. Variable definitions

Variable	Definition
$MBE_{i,t}$	Equal to 1 if earnings surprise is expected to be 0 or positive value and otherwise 0. Earnings surprise is calculated as the difference between actual reported *EPS* and the final analyst forecast made before the announcement date (from I/B/E/S).
$AWCA_{i,t}$	Abnormal working capital accrual is calculated as the difference between the actual working capital accrual and expected (normal) working capital accrual.
$ACFO_{i,t}$	Abnormal cash flow from operating is calculated as the difference between the actual level of cash flow from operating and the normal level of cash flow from operating.
$APROD_{i,t}$	Abnormal production cost is calculated as the difference between the actual level of production costs and the normal level of production costs.
$ASGA_{i,t}$	Abnormal selling and general and administration expenses is the difference between the actual level of selling and general and administration expenses and the normal level of selling and general and administration expenses.
$ADISCEX_{i,t}$	Abnormal discretionary expense is the difference between the actual level of discretionary expenses and the normal level of discretionary expenses where discretionary expenses are the sum of *R&D* expenses and advertising, selling, and administration expenses *(SGA).* As long as SGA expenses are available, *R&D* costs are set to 0 if they are missing.
$ACS_{i,t}$	Abnormal classification shifting and equals to 1 if it has both positive unexpected core earnings and *I/B/E/S EPS* is higher than actual reported *EPS*, otherwise 0.
$UEF_{i,t}$	Unexpected managerial guidance is measured as the difference between the last earnings forecast before the release of the earnings announcement *(AF0)* and the expected latest earnings forecast *(EF).*
$PROF_{i,t}$	Equal to 1 if I/B/E/S is positive in the current accounting period and otherwise 0.
$P\Delta EARN_{i,t}$	Equal to 1 if annual change in I/B/E/S is positive and otherwise 0.
$GROWTH_{i,t}$	Calculated as the market value of outstanding shares at the end of the year divided by the book value of common equity at the end of the year.
$GROWTHD_{i,t}$	The growth dummy and a firm is classified as a high-growth if its market-to-book ratio is above the median of the set of all sample. It is an indicator variable, which is 1 if the firm is high-growth, and 0 otherwise.
$SIZE_{i,t}$	The logarithm of total assets.
$LID_{i,t}$	Equal to 1 if the firm belongs to a high-risk industry (e.g. biotechnology, computers, electronics, or retail) and otherwise 0.
$INDPROD_{i,t}$	Average annual growth in industrial production is calculated using the UK industrial production index and is adjusted for inflation.

Appendix A (*continued*)

Variable	Definition
$INDD_{i,t}$	Industry dummies *(INDD)* are used to control for industry differences which cannot be explained by the control variables.
$WCA_{i,t}$	Working capital accruals are calculated as change in current assets minus change in current liabilities minus change in cash and cash equivalent plus change in short term debt.
$\Delta REC_{i,t}$	Change in accounts receivable.
$\Delta REV_{i,t}$	Change in accounts revenue.
$PPE_{i,t}$	Gross property, plant, and equipment.
$ROA_{i,t-1}$	Return on assets, calculated as earnings before interest, tax, depreciation, & amortization divided by total assets.
$CFO_{i,t}$	Cash flow from operations.
$S_{i,t}$, $\Delta S_{i,t}$	Net sales and change in net sales.
$PROD_{i,t}$	Production costs are the sum of cost of goods sold and the change in inventory.
$SGA_{i,t}$	Selling and general and administration expenses.
$CS_{i,t}$	Classification shifting.
$MV_{i,t}$	Marker value is calculated as log of market value of equity.
Tobin's Q	Total assets minus book value of equity plus total market value of equity divided by total assets.
$CE_{i,t}$	Core earnings are calculated as I/B/E/S actual earnings per share multiplied by the weighted average number of shares (scaled by total sales).
$INT_{i,t}$	Internal funds available for investment, calculated as income before exceptional items, *R&D* and deprecation.
$ATO_{i,t}$	The assets-turnover ratio: total sales divided by average net operating assets *(NOA),* where *NOA* is operating assets minus operating liabilities. Operating assets is total assets minus cash and cash equivalent. Operating liabilities is total assets minus total debt, total equity, and minority interest.
$NEG\_\Delta SALES_{i,t}$	Negative change in sales, equal to 1 if ΔSales is negative, 0 otherwise.
$UCE_{i,t}$	Unexpected core earnings *(UCE)* is calculated as the difference between core earnings *(CE)* and expected core earnings *(ECE).*
$NREC_{i,t}$	Non-recurring items and calculated as the difference between reported core earnings and actual reported earnings scaled by sales.
$LEV_{i,t}$	leverage, measured as long term debt scaled by equity.
$MBV_{i,t}$	Market value to book value measured as market capitalization divided by book value of equity
$CERET_{i,t}$	Return Index for stock price over 12 months, extracted from the DataStream Database.
$AF0_{i,t}$	Latest forecast for the year made prior to the earnings announcement date.
$EF_{i,t}$	The expected latest earnings forecast is calculated as lagged I/B/E/S actual *EPS* plus the expected change in earnings *E (ΔEPS).*
$EPS_{i,t}$	I/B/E/S reported actual earnings per share.
$A_{i,t}$	Total assets

Appendix B. Industry classification benchmark (ICB)

Industry	Sub-sector	Sector	Total
2000 Industrials	2700 Industrial Goods & Service	2710 Aerospace & Defence	9
		2720 General Industries	7
		2730 Electronics & Electrical Equipment	11
		2750 Industrial Engineering	12
		2770 Industrial Transportation	7
		2790 Support Services	50
	2300 Construction & Materials	2350 Construction & Materials	11
Total			107
3000 Consumer Goods	3500 Food & Beverage	3530 Beverage	4
		3570 Food Producers	8
	3300 Automobiles & Parts	3353 Automobiles	1

(*continued on next page*)

Appendix B (*continued*)

Industry	Sub-sector	Sector	Total
	3700 Personal & Household Goods	3720 Household Goods & Home Construction	11
		3740 Leisure Goods	2
		3760 Personal Goods	5
		3780 Tobacco	2
Total			33
1000 Basic Materials	1300 Chemicals	1350 Chemicals	7
	1700 Basic Resources	1730 Forestry & Paper	1
		1750 Industrial Metals & Mining	2
		1770 Mining	17
Total			27
0001 Oil & Gas	0500 Oil & Gas	0530 Oil & Gas Producers	9
		0570 Oil Equipment & Service & Distribution	6
Total			15
4000 Health Care	4500 Health Care	4530 Health Care Equipment & Service	3
		4570 Pharmaceuticals & Biotechnology	10
Total			13
5000 Consumer Services	5300 Retail	5330 Food & Drug Retailers	6
		5370 General Retailers	23
	5500 Media	5550 Media	17
	5700 Travel & Leisure	5750 Travel & Leisure	26
Total			72
900 Technology	9500 Technology	9530 Software & Computer Services	7
		9570 Technology Hardware & Equipment	6
Total			13
Overall sample size			280

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