International Financial Reporting Standards and Sales Manipulation in Failed Firms

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Abstract

Purpose: I examine whether sales manipulation in failed firms that adopted the International Financial Reporting Standards (IFRS) differ from that of failed firms that did not. This inquiry is motivated by a paucity of research on the consequences of IFRS reporting for failed firms given the recent changes in accounting standards affecting revenue recognition and normal levels of cash flows.

Design/methodology/approach: Using a sample of United Kingdom (UK) firms that declared bankruptcy between 2006 and 2016, I apply regression analysis and a difference-in-differences approach to assess whether firms that adopted IFRS and failed display a significant difference in abnormal levels of cash flows given the level of revenue.

Findings: The results show that IFRS adopters exhibit earnings management as opposed to non-adopters by implementing real operating actions. The results show that failed firms adopting IFRS generally have negative abnormal cash flows given their reported levels of sales while this is not the case for non-adopters.

Originality/value: I explore the reason for these observations by analysing the setting of the UK Generally Accepted Accounting Principles (GAAP) and IFRS. The contribution of this study is that it demonstrates that while failed firms have been reported to manage earnings, this appears to persist with IFRS-failed firms when compared to non-IFRS-failed firms. This suggests that IFRS standards may inadvertently facilitate failed firms that adopt IFRS in exploring real earnings management avenues, particularly concerning sales manipulation, in contrast to non-IFRS-failed firms.

Keywords: sales manipulation, firm failure, real earnings management, bankruptcy, IFRS

JEL: M40, M41, M48, M49

1. Introduction

Existing research on the effect of the International Financial Reporting Standards (IFRS) highlights the role of management's financial reporting incentives in shaping the perceived benefits and costs of IFRS (Christensen et al., 2015) while studies in bankruptcy literature demonstrate that failed firms have incentives to manage earnings in the years leading up to their failure (García Lara et al., 2009). Certain forms of earnings management such as real earnings management also persist even after adoption of IFRS (Ipino & Parbonetti, 2017). This study aims to compare the extent of sales manipulation, a type of real activities earnings management, between failed firms that have adopted IFRS and those that have not.

Sales manipulation involves managers' attempts to temporarily boost sales through strategies like price discounts and lenient credit terms, which often lead to lower margins and cash flow problems (Roychowdhury, 2006). This practice has significant implications for stakeholders. For example, the collapse of Enron illustrates how sales manipulation can severely affect shareholder value, resulting in substantial losses for investors and pension funds. Creditors and suppliers relying on inflated sales figures may also face financial losses and operational challenges when the true extent of financial distress is revealed. In the era of technological innovation, examples such as the collapse of WeWork and the Wirecard scandal in Germany underscore how sales manipulation can undermine investor trust and confidence in regulatory oversight. These examples stress the importance of scrutinising sales figures to assess a firm's financial viability following IFRS application.

The existing evidence suggests that accounting-based earnings management decreases with IFRS adoption compared to real activities earnings management (Ipino & Parbonetti, 2017) and

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failed firms engage in earnings management up to four years before failure (García Lara et al., 2009). Given these findings, it is anticipated that with IFRS application, earnings management in failed firms will decrease in the years leading up to failure compared to non-IFRS firms. However, if IFRS firms replace accounting-based earnings management with real activities earnings management, it is more likely that earnings management through real activities will increase for IFRS firms compared to non-IFRS firms, even among failed firms that have exhausted accounting-based options.

This study investigates real earnings management in failed firms under IFRS by analysing sales manipulation among both IFRS-adopting firms and non-adopters during the post-IFRS application period (2006 – 2016). The study seeks to: assess if real earnings management continues in failed firms after IFRS adoption; examine changes in earnings management post-IFRS adoption using a sample of failed firms only; and explore whether observed benefits of IFRS such as enhanced accounting quality are affected by management incentives, particularly the incentive for sales manipulation to conceal failure indicators.

I explore sales manipulation because revenue is of paramount significance in financial statements (FASB, 2002; Peterson, 2012), serving as a key metric for investors to evaluate historical growth patterns and future cash flow prospects (D'Augusta, 2023). However, revenue recognition has posed challenges for standard setters, with previous standards failing to align with modern business models (Wüstemann & Kierzek, 2005). By examining the impact of sales manipulation on firms that have adopted IFRS compared to those that have not, particularly when both groups have incentives for earnings management, this study contributes to discussions on IFRS revenue recognition and the International Accounting Standard Board (IASB) and Financial Accounting Standard Board (FASB) asset-liability approach (Biondi et

al., 2014; Wagenhofer, 2014). Debates persist about the suitability of the asset-liability approach for all firms given the diversity in earning cycles among entities (Laux, 2014). The transition from the United Kingdom's (UK) Generally Accepted Accounting Principles (GAAP) to IFRS involved adopting a more stringent revenue standard with refined recognition criteria and reduced emphasis on underlying principles (PWC, 2005).

The following section will discuss the existing literature and develop hypotheses, followed by a discussion of the research methodology applied. The findings will be reported in Section 4 and conclusions will be provided in Section 5.

2. Prior literature and hypotheses development

2.1. Earnings management and IFRS application

Dechow et al. (2010, p. 344) define higher-quality earnings as earnings that provide "*more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision-maker*". They note that the concept of decision usefulness is not constrained to the context of equity valuation. Category one of their earnings quality proxies, known as properties of earnings, includes abnormal accruals. It highlights that managing earnings (the gap between actual earnings and a target) can diminish earnings quality. The IASB has taken steps to restrict accounting alternatives to limit managerial discretion and accrual-based earnings management. For example, the new revenue standard: IFRS 15 Revenue from Contracts with Customers (IASB, 2014) focuses on control of the asset as opposed to management's subjective assessment of the transfer of risk and rewards.

Despite efforts to understand the effect of IFRS adoption on earnings management, the literature suggests varying effects (Jeanjean & Stolowy, 2008). While some studies indicate an increase

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in accounting-based attributes, others (Zeghal et al., 2012) propose a shift towards real earnings management over accrual-based methods. Callao & Jarne (2010) contend that earnings management has intensified post-IFRS adoption, citing an increase in discretionary accruals. Although consensus on the net effect of IFRS adoption on earnings management is lacking, there is agreement in the literature that changes in earnings quality are influenced by the regulatory environment, indicating a nuanced relationship between IFRS adoption and earnings management (Callao & Jarne, 2010; Evans et al., 2015; Ipino & Parbonetti, 2017).

2.2. UK regulatory environment

When firms perceive greater benefits from IFRS adoption compared to the associated costs, accounting quality is likely to improve. Conversely, if the perceived benefits are minimal, accounting quality may decline. The UK is among the countries that have undergone significant changes in their enforcement mechanisms during the period of IFRS adoption, indicating the advantages linked with this transition (Christensen et al., 2013). This aligns with the expectation that changes observed in the characteristics of earnings in countries with rigorous enforcement practices will also be evident in the UK. Investigating the regulatory landscape in the UK, Christensen et al. (2007) discover that the consequences of IFRS adoption vary among firms and are contingent on their perceived benefits. Christensen et al. (2015) underscore the predominant influence of reporting incentives on the adoption of accounting standards and, consequently, on accounting quality.

In the UK where firms transitioned from UK GAAP to IFRS, there may have been limited flexibility due to mandatory adoption and minimal adjustments in accounting number recognition on switching to IFRS and the research indicates varying perspectives. Some studies suggest minimal divergence between UK GAAP and IFRS, while others highlight substantive

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differences affecting the recognition of earnings, intangible assets and liabilities (Bae et al., 2008; Horton & Serafeim, 2010).

Changes in lease classification under IFRS such as the reclassification of leases from operating to finance leases affect finance income recognition, thus influencing earnings and accruals (Horton & Serafeim, 2010). Modifications in handling pension surpluses and deficits and compensation charges under IFRS 2 Share-based Payment (IASB, 2004) also contribute to earnings volatility. The adoption of IFRS also brought about changes in revenue recognition and cash flow accounting standards, affecting measurements related to sales manipulation.

Unlike UK GAAP which lacked a comprehensive revenue recognition standard, International Accounting Standard (IAS) 18 Revenue (IASB, 1995) offered detailed guidelines, albeit with more discretion in classification (Ernst & Young, 2011; Zalata & Roberts, 2017). Malikov et al. (2018) found that following mandatory IFRS adoption, firms were associated with inflated operating revenues, potentially due to increased opportunities for manipulation afforded by IFRS. Managers' discretionary classification choices under IFRS were found to align with opportunistic practices (Charitou et al., 2018), highlighting the distinctive contribution of the UK to discussions on revenue recognition following IFRS adoption.

2.3. IFRS earnings and firm failure

The evidence suggests that failed firms often resort to concealing performance using income-increasing accruals and real operating activities (García Lara et al., 2009). While UK GAAP is considered comparable to IFRS, the accounting adjustments in calculating earnings numbers

(IAS 38 Intangible Assets[1] and IFRS 2 Share-based Payment[2]) can affect earnings distributions and subsequently debt covenants (Christensen et al., 2009). IFRS introduces changes that affect asset fair values and earnings (Horton & Serafeim, 2010). IAS 38, while similar to UK GAAP, does not involve automatic amortisation of goodwill but instead assesses impairment. This implies a potential increase in earnings volatility due to the absence of automatic amortisation.

Evidence suggests that firms experiencing debt covenant violations exhibit positive abnormal accruals (DeFond, 2010). Consequently, the changes in reported earnings influenced by accruals are magnified in failed firms. In cases where firms have discretion when applying IFRS, failed firms tend to opt for choices that bolster financial reporting. For instance, under IFRS, historically classified operating leases can be reclassified as finance leases. Jones (2011) indicates that failing firms, given managerial discretion, tend to more aggressively capitalise on intangible assets compared to non-failing firms, particularly leading up to failure. This tendency correlates with heightened earnings management, especially in failing firms. Hence, it is expected that failed firms adopting IFRS are more inclined towards heightened earnings management compared to non-failing firms.

2.4. Hypothesis development

IFRS provides firms with substantial discretion in interpreting accounting rules, facilitating judgement calls and potentially enhancing financial reporting outcomes. Holthausen (1990) highlighted pivotal moments in accounting research, recognising the interpretative flexibility

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[1] https://www.ifrs.org/issued-standards/list-of-standards/ias-38-intangible-assets/ (IASB, 2001)
[2] https://www.ifrs.org/issued-standards/list-of-standards/ifrs-2-share-based-payment/ (IASB, 2004)

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in accounting standards. This flexibility enables managers to manipulate financial reporting in their favour by selectively applying rules to present a rosier picture of the company's financial performance.

Studies have documented instances of sales manipulation in firms facing financial distress or eventual failure. Jones (1991) and Dechow et al. (1996) found evidence of revenue recognition manipulation in firms experiencing financial difficulties. These studies provide empirical support for the notion that failed firms may resort to sales manipulation to artificially inflate reported revenues and mask underlying financial problems. For instance, the Enron scandal and subsequent bankruptcy highlighted the use of sales manipulation to inflate reported revenues. The literature also shows that failed firms extensively engage in sales manipulation (García Lara et al., 2009; Xu et al., 2021).

I hypothesise that failed firms adopting IFRS are more likely to engage in real earnings management, particularly sales manipulation, for the following reasons. Firstly, as firms near bankruptcy and exhaust accruals-based earnings management options, they tend to resort to real earnings activities (García Lara et al., 2009; Ipino & Parbonetti, 2017). Secondly, IFRS adoption in institutional settings with stricter oversight reduces the leeway for accounting manipulation (Christensen et al., 2013). The broad revenue recognition policies under IFRS, coupled with discretion in classification and recognition, support manipulation hypotheses (Malikov et al., 2018). Thirdly, the cost of bankruptcy compounded by the expenses of IFRS compliance incentivises failing firms to resort to real earnings management as a sub-optimal strategy.

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Firms adopting IFRS may also face challenges in raising local funds due to investors' unfamiliarity with IFRS (Pownall & Wieczynska, 2018). Differences in earnings calculations for debt covenants between IFRS and UK GAAP may also affect wealth distribution (Christensen et al., 2009). Given these factors, I argue that failed firms adopting IFRS are more likely to engage in increased real earnings management as compared to non-adopters, particularly as they approach bankruptcy. The proposition is that a significant difference in earnings management between failed firm adopters and non-adopters post-IFRS adoption supports the dominance of incentives in changes in accounting quality.

The research question for this study is whether changes in sales manipulation differ between failed firm adopters and non-adopters post-IFRS adoption. While Doukakis (2014) found no significant effect of IFRS adoption on real earnings management, Sundvik (2019) observed an increase in real earnings management with rules-based standards. For the UK, with minimal differences between UK GAAP and IFRS, I expect a change in real earnings management post-IFRS adoption due to the elimination of exemptions in cash flow recognition and the shift to a reduced principles-based revenue recognition approach. This expectation aligns with the conclusions of Sundvik (2019) and underscores the effect of firm-level incentives on reporting quality (Charitou et al., 2018; Doukakis, 2014).

When confronted with financial challenges, firms may resort to real earnings management tactics such as accelerating revenue recognition (Dechow et al., 1995). They may exploit the ambiguities in accounting standards to tailor financial outcomes to their advantage, consistent with Holthausen's (1990) opportunistic perspective. In particular, firms facing impending financial distress might intensify their earnings manipulation efforts to obscure underlying fiscal difficulties and stave off defaulting on debt obligations. Real earnings management often

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capitalises on the interpretative flexibility inherent in accounting standards, especially in areas like fair value measurement and revenue recognition (Roychowdhury, 2006). Despite regulatory interventions aimed at curbing such manipulative practices, companies on the brink of bankruptcy are inclined to adapt their strategies to circumvent regulations, thereby maximising the discretion afforded by IFRS. Thus, the hypothesis emerges:

H1: Failed firms engage in sales manipulation, which will be more pronounced for failed firms that have adopted IFRS.

3. Research methodology

3.1. Measurement of sales manipulation

I begin with the premise that failing firms may attempt to mask declining performance through strategies like inflating income accruals and the mandatory adoption of IFRS is linked to enhanced earnings quality (García Lara et al., 2009; Zeghal et al., 2012). I aim to compare earnings quality between failed firms that adopted IFRS and those that did not. Though 'earnings quality' encompasses various aspects, my focus is on real earnings management, especially through sales manipulation. To ensure unbiased estimates, I calculate earnings management measures using the entire sample, including active firms.

Sales manipulation is assessed following the methodology outlined by Roychowdhury (2006) and García Lara et al. (2009). The initial step involves determining normal cash flow activities by conducting the following regression for each industry-year combination.

$$CFO_t[1/TA_{t-1}] = \beta_0[1/TA_{t-1}] + \beta_1 REV_t[1/TA_{t-1}] + \beta_2 \Delta REV_t[1/TA_{t-1}] + \varepsilon, \qquad \text{(i)}$$

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where CFO_t is cash flow from operations, REV_t is revenue and ΔREV_t is the change in revenue from the prior year. All items in the equation are weighted by the beginning of year total assets: TA_{t-1}. Abnormal cash flow is calculated for every observation by subtracting the normal cash flow from the actual cash flow. Consistent with prior literature, I use the estimated coefficients from equation (i) to calculate the normal level of cash flow (Ipino & Parbonetti, 2017). After the estimation of the abnormal levels of cash flow, I adopt the method used in model 5 by García Lara et al. (2009) to test the hypothesis that failed firms adopting IFRS have increased earnings management – by comparing the cash flow of failed adopters with the sample of non-adopters. The following regression applies:

$$ACFO_t = \beta_0 + \beta_1 FirmSize_{t-1} + \beta_2 NetIncome_t + \beta_3 IFRSFail_t + \varepsilon, \tag{ii}$$

where $ACFO_t$ is abnormal cash flow measuring real earnings management (sales manipulation). $FirmSize_{t-1}$ is defined as the natural logarithm of total assets. $NetIncome_t$ is the net income scaled by total assets at the beginning of the period. $IFRSFail_t$ is a dummy variable, indicating if a firm has adopted IFRS and has failed. It takes the value of one for IFRS-failed firms and zero for non-IFRS-failed firms. If the sales manipulation hypothesis holds, it is expected that cash flow levels will be abnormally low given the level of sales. If failed firms adopting IFRS manipulate sales, the coefficient of *IFRSFail* variable will be negative and significant. This will imply that failing firms adopting IFRS have abnormally low levels of cash flow from operations given the reported sales level when compared to failing firms not adopting IFRS. If abnormal cash flow is low or negative; actual cash flow from operations is lower than the expected levels of cash flow from operations.

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3.2. Difference-in-differences design

I use a control sample of failed non-IFRS adopters and employ a difference-in-differences (DID) design to analyse the difference in real earnings management between failed firms that have adopted IFRS and those that have not. For the DID approach, I need a control sample similar to the treated firms – IFRS-failed firms (Doukakis, 2014). A suitable sample comprises firms experiencing conditions similar to those of the treatment group. I choose failed firms because they share similar conditions with the treatment group, differing primarily in IFRS adoption. They exhibit regulatory uniformity (all UK public quoted firms) and demonstrate identical earnings management traits (García Lara et al., 2009). I do not use active firms as a control sample since the study aims to assess the disparity in earnings management when firms have failed while adopting IFRS, making active firms unsuitable for the research design.

However, this implies that the main effect of firm failure in equation (iii) (*FailedFirm*) remains constant across the treatment and control samples. I introduce an interaction term, *IFRS#FailedFirm*, in equation (iii) of the model, which takes the value of one for IFRS-adopting firms that have failed. This variable of interest captures the incremental change in real earnings management for IFRS-adopting failed firms compared to non-IFRS-adopting failed firms.

A drawback of using this standard DID approach is that firms in the UK tend to adopt IFRS simultaneously. Studies investigating IFRS in the UK often use a single interaction variable (Almaharmeh & Masa'deh, 2018), consistent with the model in equation (ii). Other studies examining IFRS in the UK compare the differences in the coefficients' magnitude under UK GAAP and IFRS (Paananen & Parma, 2008) or develop a counterfactual proxy to capture

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voluntary UK adoption by using similar firms in countries with voluntary adoption (Christensen et al., 2007).

The choice of a DID approach to examine IFRS application and failed firms in the UK setting is subject to debate. However, for a robust analysis of the results (Doukakis, 2014), I opt for a DID approach using a control sample of failed non-adopting firms.

To contextualise the results in the framework of IFRS and failure in a UK setting, while isolating failed firms and IFRS (given collinearity), I employ marginal effect analysis to identify the coefficients for the interaction of IFRS and failed firms. This statistical method has been applied to estimate the interaction terms in a fitted model (Wolfe, 2018). Given redundant variables, it estimates the adjusted predictions for each combination of the interaction term based on the fitted empirical model (Williams, 2012).

$$ACFO_t = \beta_0 + \beta_1 FirmSize_{t-1} + \beta_2 NetIncome_t + \beta_3 IFRS_t + \beta_4 FailedFirm_t +$$

$$\beta_5 IFRS\#FailedFirm_t + \beta_6 Growth_t + \beta_7 Leverage_t + \beta_8 BIG4_t + \beta_9 AB\_ACC_t + \varepsilon, \qquad \text{(iii)}$$

I include the following control variables: The $IFRS_t$ variable serves as a control to isolate the baseline impact of IFRS on real earnings management, independent of the firm failure effect. The $FailedFirm_t$ variable serves as a control to isolate the baseline effect of firm failure, independent of IFRS adoption. $Growth_t$ is the percentage of sales and captures the effect of growth on earnings management (Roychowdhury, 2006). $Leverage_t$ is the ratio of total liabilities to the beginning of the year's total assets and captures the incentives of leveraged firms to use earnings management (Park, 2017). $Big4_t$ is an indicator variable that equals one for firms with a Big 4 auditor and zero otherwise. AB_ACC_t is abnormal accruals and captures

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the earnings management strategy of the firm. The inclusion of these control variables is consistent with prior literature (Doukakis, 2014).

3.3. Research method and sample selection

3.3.1. General sampling

I use the FAME database for financial data collection and firm bankruptcy data. FAME is a database with financial data for public and private British and Irish companies. For this study, all UK publicly quoted firms included in the active company file at the time of data collection are in the continuing sample. UK firms with the public legal form included in the FAME database inactive company file are selected for the failed firms sample. The inactive company file includes companies that are in liquidation or dissolved. For a failed firm to qualify for the sample, it had to declare insolvency under the Insolvency Act 1986 and exist between 2006 and 2016. The post-IFRS adoption period of 2006 is used to allow for IFRS application in the adoption year, usually the year ending 2005.

3.3.2. Failed firms and earnings management sampling

The sampling for failed firms starts with firms existing in the sample period of 2006 and 2016 and going into bankruptcy. The cutoff of 2016 is used for several regulatory reasons. First, the UK voted to leave the European Union (EU) in 2016 (Brexit referendum) which had a significant effect that changed company disclosures post-2016 (Vasilescu et al., 2023). Existing research shows that firms affected by the Brexit uncertainty exhibit higher real activities management after the Brexit vote (Makarem et al., 2023), thus excluding the post-Brexit vote period allows for clarity of research design focused on IFRS adoption effects. Second, IFRS

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firms starting their financial year on 1 January 2018 had to apply the new revenue recognition standard, IFRS 15. Previous studies anticipated that IFRS 15 would prompt operational changes due to its five-step revenue recognition approach and effect on cash flows (Napier & Stadler, 2020). This transition resulted in significant revenue deferrals for affected firms (Kabir & Su, 2022). Hence, excluding the IFRS 15 early adoption and adoption period of 2017 and 2018 ensures research design clarity by eliminating the influence of IFRS 15.

Insert Table 1 Here

To conduct the IFRS and sales manipulation analysis, I need to identify two variables: the failed firms and the IFRS adoption variable. The date of bankruptcy reported in FAME is used to identify the year of bankruptcy with the variable 'status date' in the FAME database. Firms with status date-year post-2006 are included in the initial failed firm sampling. This includes inactive firms in liquidation or dissolved and active firms in receivership or administration. IFRS adoption variable is identified using the 'accounting practice' identifier in FAME. Firms with less than three years of data before bankruptcy are excluded from the sample and financial firms are excluded. The sample of firms with at least six years of data is used for the earnings management test. Finally, firms with accounting practice data are kept for statistical analysis. The final sample consists of 998 failed firm years split into 594 firm years for IFRS adopters and 404 firm years for non-IFRS adopters.

For the earnings management test, I merge the failed firms and IFRS adoption variable to obtain the variable for *IFRSFail* as follows. First, classify firms into two groups: firms that are active and firms that are inactive (see Table 1). Next, I identify firms that have accounting practice data. The variable of interest is the interaction of inactive and IFRS applications where 1 identifies inactive firms that have adopted IFRS and 0 identifies inactive firms that have not

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adopted IFRS. This implies that firms that have adopted IFRS and are inactive are qualified as 1, while firms that are inactive and have not adopted IFRS are assigned a 0. All other firms that have accounting practice reporting data and are active are set to 'missing' for this variable called *IFRSFail* reporting data. The detailed sampling distribution is below.

Insert Table 2 Here

4. Findings

The observed results are reported based on the descriptive analysis of the sample followed by the test of the hypothesis.

4.1. Descriptive analysis

Using the methods for classification of firms described in Section 3.3.2, Table 3 reports descriptive statistics for the active firms post-2005 (panel A) and the sample of failed firms post-2005 (panel B). Failed firms are classified into two groups: IFRS non-adopters (panel C) and IFRS adopters (panel D). Active firms and failed firms are of similar sizes in the sample. The average ranges from £0.2 million to £1.2 million, with a standard deviation of over £0.5 million for both active and failed firms.. However, active firms tend to have higher average revenue, net income and cash flow from operations. This is expected as these firms are continuing in operation and will tend to perform better than firms that have gone bankrupt.

Panels C and D report descriptive statistics for adopters and non-adopters of IFRS only for failing firms. IFRS-failed firms are on average bigger than non-IFRS-failed firms, but it appears non-IFRS firms tend to have higher revenue when comparing total assets. Non-IFRS firms tend

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to have higher current accruals suggesting that IFRS firms have fewer opportunities to manage earnings using accounting-based techniques. This can be attributed to the additional costs and scrutiny for these firms when compared to the subset of IFRS firms not adopting IFRS. It supports the first view set out in the hypothesis that IFRS firms that tend to have increased enforcement and stricter oversight will have a reduced allowance to implement accounting-based earnings manipulation.

Insert Table 3 Here

To further investigate the descriptive statistics and assess whether IFRS firms have lower accounting accruals due to a lower bankruptcy risk compared to the sample of non-adopting firms, I estimate the probability of distress for both samples of firms, albeit with limited sample size due to data availability. If the bankruptcy risk is lower, it will imply that these firms are not as close to bankruptcy and do not use all forms of earnings management. Table 4 shows that despite IFRS-failing firms having a higher probability of distress (*probability_failure*), they still tend to have lower absolute abnormal accruals when compared to non-adopters. Rosner (2003) finds that firms that do not show signs of failure engage in more aggressive earnings management practices. This is consistent with the investigation of this study to understand whether firms that are close to bankruptcy adopting IFRS tend to seek other avenues of earnings management when compared to non-adopters.

Insert Table 4 Here

4.2.   *Discussion of results – Sales manipulation in IFRS-failed firms*
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Panel A of Table 5 reports descriptive statistics identifying normal and abnormal levels of cash flow from operations for each subset of firms (IFRS adopters and non-adopters). The statistics are consistent with the hypothesis that IFRS-failed firms tend to have more negative levels of abnormal cash flow when compared to non-IFRS-failed firms. It supports the hypothesis, focusing on real earnings activities tied to revenue recognition management. After IFRS adoption, the revenue recognition policy was broad, lacking detailed implementation guidance and revealing differences between IFRS and UK GAAP (Pownall & Wieczynska, 2018). Increased discretion in classification and recognition was more likely to support the manipulation hypotheses with the classification of revenues (Malikov et al., 2018). Kvaal and & Nobes (2010) show that UK firms adopting IFRS were more likely to designate assets to fair value, which provides an allowance for accelerated revenue not aligned to cash flows when firms are moving towards bankruptcy.

Panel B of Table 5 reports a t-test of the absolute mean value of cash flow comparing IFRS and non-IFRS firms. It shows that the mean of IFRS firms is lower than of non-IFRS firms indicating these firms tend to manage earnings through negative abnormal cash flows. It supports the view in the hypothesis development that while real earnings management is costly and reduces the firm's value, the cost of bankruptcy is higher thus making it the option for firms with a high risk of bankruptcy. Given increased IFRS compliance costs, IFRS firms are more likely to rely on these sub-optimal strategies before failure.

Panel C of Table 5 reports the regression for the test of the hypothesis of whether IFRS adoption firms exhibit sales manipulation that is more pronounced compared to non-IFRS-adopting failed firms. The regression equation shows that IFRS-failing firms tend to have lower cash

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flow relative to sales exhibited by the significant negative abnormal cash flow levels. The results support the hypothesis that IFRS-failed firms increase sales manipulation and thus rely on real earnings management strategies to boost reported income when compared to non-IFRS-failed firms.

Insert Table 5 Here

This study also performs an analysis to assess consistency with prior studies on earnings management and failed firms using active and inactive firms. Panel D of Table 5 reports regression analysis results from running equation (ii) for the sample of both active and inactive firms. The regression equation has the dummy variable; inactive firms take the value of one and active firms take the value of zero. The results are consistent with prior literature that inactive firms tend to have lower levels of cash flow when compared to their sales level.

4.3. Discussion of results – DID approach

Table 6 presents the empirical findings for the real earnings management DID model. Column 1 reports the basic model as presented in equation (ii) with the main effect and interaction effect included. Column 2 adds the control variables as reported in equation (iii), while column 3 includes the effect of controlling for abnormal accruals. Column 4 includes industry and time effects. The DID model aims to assess the incremental effect of IFRS on real earnings management given firm failure. The significantly negative coefficient of the interaction variable *IFRS#FailedFirm* (-0.0420, t-stat = -2.36) suggests a decrease in abnormal cash flows for IFRS adopters when compared to non-IFRS adopters. This is consistent across the four models

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indicating the presence of IFRS application and firm failure tend to provide the conditions for real earnings management.

The coefficient of IFRS application alone (-0.0450, t-stat = -1.61) shows a significant decrease in abnormal cash flows given IFRS application. However, this significant effect disappears in the other three models when other control variables are included, it does remain negative and insignificant. The coefficient of *FailedFirm* is not significant but this variable is not relevant in the research design as firm failure is a one-level indicator variable, given that all firms in the regression model are failed firms. Regarding other control variables, Table 6 shows that bigger firms, growth firms and firms with Big 4 auditors are associated with real earnings management. Consistent with prior literature, the model in columns 4 and 5 shows that abnormal accruals are associated with real earnings management (coefficient = -0.572, t-stat=-3.28 – column (4)).

Insert Table 6 here

4.4. Additional analysis

The results are consistent with the hypothesis that failed firms engage in sales manipulation, which will be more pronounced for failed firms that have adopted IFRS. The literature on IFRS suggests that IFRS firms are bigger with likely higher earnings given that the EU regulation required listed firms to adopt IFRS in 2005. Thus, observable characteristics might motivate engagement in sales manipulation. To correct for endogenous selection on these characteristics, I perform propensity score matching analysis. I use a matched design that pairs each treatment observation with a control observation that did not receive the treatment but exhibits similarities

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along the relevant dimension. This will allow any differences between the treatment and control samples to be isolated and attributable to the treatment effect.

The treatment of interest is whether an IFRS firm engages in real earnings management by exhibiting abnormal levels of cash flow given reported levels of sales. Therefore, I need the propensity score model to estimate the conditional probability of being an IFRS firm based on observable covariates. Previous studies indicate that IFRS firms tend to be larger and have higher earnings (Efretuei et al., 2021). Considering the EU regulation mandating the adoption of IFRS for listed firms, firm size is likely to be a more significant factor in determining IFRS firms. I estimate the following logit model following André & Kalogirou (2020):

$$IFRS_t = \beta_0 + \beta_1 FirmSize_t + \beta_2 NetIncome_t + \beta_3 IFRS_t + \beta_4 Growth_t + \beta_5 Leverage_t + \beta_6 BIG4_t + \varepsilon, \qquad \text{(iv)}$$

IFRS is a binary variable equal to one if the firm has adopted IFRS in the financial year and zero otherwise. The other variables are as defined in Section 3. The model includes industry and time-fixed effects. Panel A of Table 7 presents the first stage model used for estimating the propensity scores (column (1)). The Pseudo R^2 is 0.3513. The results suggest that there are substantial and significant differences in characteristics between the IFRS and non-IFRS groups. I compute a propensity score that predicts that a firm will adopt IFRS. Then I form matched pairs by selecting an IFRS firm (treatment) and non-IFRS firm (control) with the closest propensity score. I check the success of the matching procedure by re-running the logit regression restricted to the matched sample and report the results in Table 7 (column (2)). All the independent variables are now insignificant and the pseudo R^2 drops to 0.0301. This shows that the independent variables do not explain the variation in whether a firm adopts IFRS

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following the matching. This indicates a successful matching procedure (Park, 2017). In panel B of Table 7, the descriptive statistics also show that the difference in firm characteristics between the two groups is not significant.

Insert Table 6 here

As a robust matching procedure, I also employ entropy balancing in the sample selection used for the estimation. This ensures that the covariate imbalance after matching will be lower than before matching (Hainmueller, 2012). It also reduces researcher discretion in the estimation process relative to propensity score matching. For example, researchers do not have to specify calliper distance, match with or without replacement or one-to-one matching (McMullin & Schonberger, 2020). However, this implies that if the treatment sample differs largely from the control sample, it may assign large weights to a small set of observations and can be sensitive to outliers, particularly in cases where there are differences between treatment and control samples in at least one covariate (McMullin & Schonberger, 2020). For these reasons, I report the matched regressions for both the propensity score matched sample regressions and the entropy balancing regression.

Table 8 presents the results of the DID regression equation (iii) using the propensity score matched sample (column 1) and entropy balance weights for the control sample (column 2). Entropy balance identifies weights for each observation in the control sample over the full sample. This ensures the weighted control and treated sample have similar covariate distributions. Table 8 column (1) only includes the observation with a non-missing weight in

the propensity score estimation (propensity score matched sample). I examine whether the results from the DID analysis are robust enough to use propensity score matching. The estimated coefficient on the IFRS-failed firm variable is significantly negative, consistent with prior results. However, using the matched sample significantly reduces the size of the sample and the inferences can be sensitive to the matching design choices.

Column 2 of Table 8 displays the results of the entropy balance weighted sample regression. Consistent with the propensity score matching method, the estimated coefficient on the variable for IFRS-failed firms is significant and negative, aligning with previous findings. These estimates incorporate all observations in the dataset, but the weights ensure that control observations dissimilar to the treated sample have no influence. Overall, these findings suggest that it is the adoption of IFRS in failed firms, rather than other factors, that exacerbates sales manipulation.

4.5. Economic significance

The findings from this study suggest that failed firms adopting IFRS tend to exhibit negative abnormal cash flows, indicating potential manipulation of sales figures. These firms may be extending credit terms for sales beyond acceptable norms to artificially inflate reported revenues. This empirical investigation delves into the impact of regulatory interventions, particularly IFRS, on the behaviour of real earnings management. While regulatory measures aim to mitigate manipulation, companies may adjust their tactics in response to changes in regulations.

Firms facing financial distress often resort to aggressive earnings management practices to conceal underlying financial difficulties and avoid defaulting on debt obligations. However,

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such manoeuvres can exacerbate the firm's financial troubles in the long term, potentially leading to bankruptcy. The study reveals that failed firms under IFRS jurisdiction demonstrate up to a 6% disparity in negative cash flow compared to their non-IFRS counterparts. This suggests that IFRS creates significant opportunities for real earnings management, thereby contributing to economic inefficiencies.

Efficient capital markets rely on the accuracy and timeliness of financial information to operate effectively. Discrepancies between reported sales and cash flows in failed firms may indicate weaknesses in internal controls, governance practices and regulatory compliance. Regulatory authorities play a pivotal role in ensuring adherence to financial reporting standards and maintaining the accuracy and reliability of financial information.

Understanding the economic implications of discrepancies in reported financial numbers can inform the application of the IFRS 15 asset-liability approach in the new revenue recognition standard, particularly considering the diversity in earning cycles for failed firms. This can also enhance enforcement efforts aimed at upholding market integrity and safeguarding investor interests. By addressing these discrepancies and enhancing transparency in financial reporting, regulators can foster trust and confidence in capital markets, promoting economic stability and growth.

5.   Conclusions

The results support the hypothesis that sales manipulation in IFRS firms that have failed tends to be more pronounced when compared with non-adopting firms that have failed. These results contribute to the literature as follows. It observes sales manipulation in failed firms with IFRS

application, using non-adopting IFRS-failed firms as the benchmark. It provides further evidence of changes in sales manipulation post-IFRS using the sample of failed firms only. Finally, it adds to the literature on whether observed IFRS benefits of increased accounting quality are moderated by management incentives, specifically earnings management incentives to obscure failure indicators.

I estimate expected levels of cash flow using changes in revenue and find that failing firms that have adopted IFRS tend to report more negative abnormal cash flows. This aligns with the literature that UK firms adopting IFRS were more likely to designate assets to fair value. This provides an allowance for accelerated revenue not aligned with cash flows when firms are moving towards bankruptcy (Kvaal & Nobes, 2010). It indicates that high-quality IFRS standards may have the unintended consequence of assisting failed firms adopting IFRS in exploring real earnings management options when compared to non-IFRS-failed firms. I apply the model in equation 5 of García Lara et al. (2009) to test the real earnings management in failed firms post-IFRS. This allows for clarity on using a tested model while only introducing the IFRS effect into the model. It takes this further by applying a DID approach (Doukakis, 2014) to assess incremental changes. However, applying the DID model with a one-level main effect (failed firm) implies that the failed firm effect is redundant because all firms have failed. This limitation makes it different from other DID models with a two-level effect for both interacting variables. To assess the impact of this, the regression is estimated using marginal effect analysis. It captures the difference given the research design setting, where all firms are failed firms. There is the opportunity for further studies to consider using the model with other control variables to further test if this effect holds and to consider capturing a pre-post-IFRS setting with active and inactive firms. This aspect is beyond the scope of this study.

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The study compares two sets of firms more likely to have fundamental differences in firm characteristics. Firms that have not adopted IFRS post-2005 are more likely to be smaller. However, it uses a standardised variable in its analysis to reduce this effect. It also applies a propensity score matching and entropy-balanced sample to mitigate these concerns. The study also proposes the use of other earnings management methods which may add to the contribution of this study, particularly the use of narrative earnings management methods which may show whether there is a difference in earnings management between firms adopting IFRS and non-adopters. Finally, the findings hold significance for the ongoing development of IFRS standards, especially considering the shift towards an asset-liability approach to revenue recognition and the implementation of the new revenue standard. This evidence will aid standard setters in gaining a deeper understanding of how management incentives moderate the costs and benefits of IFRS adoption.

Overall, the results show evidence of real earnings management for firms that have failed and had also adopted IFRS before failure. It appears this effect subsumes that of failure alone. However, the research design does not isolate the effect of both firm failure and IFRS given the control sample of active firms. Future studies can explore this effect using continuing IFRS-adopting firms as a control sample. These findings are consistent with the expectation that the detailed rules required in IFRS standards such as revenue recognition and cash flow standards, as opposed to UK GAAP, can lead to reduced opportunities for accrual earnings management leading to managers using more real earnings management strategies given the dominant role of rules-based standards (Sundvik, 2019) and firm-level incentives (Doukakis, 2014) play in shaping reporting quality.

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Tables

Table 1 Sample selection procedure

Search steps	Action	No. of firms after event	Firm years after event
Step one: General sampling			
Full sample	Retrieve active and inactive files from FAME database	239,417	
Location	Set criteria to include firms registered in the UK using FAME's country identifier	211,931	
Public	Set criteria to include only public firms using the firm's 'public' identifier under 'legal form'	5,465	98,262
Step two: Failed firms and earnings management test sampling			
Starting with the universe of UK inactive and active firms in FAME database that are of the form 'public'		5,465	98,262
Less: Firms with less than three years of data before bankruptcy		1,308	10,065
Less: Financial firms		708	5,594
Less: Firms with less than 6 years of data for accruals model test		471	4,533
Less: Firms with no accounting practice data[3]		411	1,483
Keep firms with data available in FAME entering bankruptcy (2006 – 2016)[4]		398	1,236
Keep failed Firms with IFRS adoption data		387	998

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[3] There are 60 firms with no Accounting Practice data (471 – 411). There are 3,050 firm years with no accounting practice data (4,533 – 1,483). The limited availability of Accounting Practice data significantly reduces firm years because FAME database populates accounting practice data comprehensively from 2010. Prior to 2010 about 50% of firm years have no Accounting Practice data compared to later years. Excluding these firm years without accounting practice data, implies the data is balanced with firm years with no missing Accounting Practice data across the sample period. Other studies that have used FAME IFRS data include (André & Kalogirou, 2020; Hsu & Chen, 2023).

[4] Include only inactive firms that are dissolved or in liquidation as reported by FAME database.

Failed firms for earnings management test
Split into:
    • IFRS adopters
    • Non-IFRS adopters
	387
	
	183
	204
		998
		
		594
		404

Continuing firms for earnings management test	1,709	13,949

Table 2: Firm-year sample distribution

Panel A: Distribution of failed firms by type of failure used in the hypothesis test

Company status	*Dissolved*	*In liquidation*	*Total*
Number of firms	287 (74.16%)	100 (25.83%)	387
Firm years	641 (64.23%)	357 (35.77%)	998

Panel B: Distribution of firm-year by accounting practice

Firmyear	Accountingpractice==IFRS		
	IFRS:0	IFRS:1	Total
2006	73	33	106
2007	39	68	107
2008	5	78	83
2009	5	60	65
2010	65	50	115
2011	68	80	148
2012	55	77	132
2013	41	61	102
2014	22	46	68
2015	20	25	45
2016	11	16	27
Total	404	594	998

The sample consists of 134 IFRS dissolved firms and 153 UK GAAP dissolved firms, which makes up 362 IFRS firm years and 279 UK GAAP firm years. For firms in liquidation, the sample consists of 49 IFRS firms and 51 UKGAAP firms, which makes up 232 IFRS firm years and 125 UKGAAP firm years.

Table 3: Sample descriptive statistics for variables in model equations (i) and (ii)

	Mean	p50	sd	p10	p95	N
Panel A: Active firms						
FirmSize	10.4788	10.0465	2.4551	7.6746	15.0559	13949
Revenue	1.3788	1.0524	1.3799	0.1201	3.7510	13949
NetIncome	-0.0048	0.0368	0.5196	-0.1231	0.2000	13933
CurrentAcc	0.0990	0.0541	0.1748	0.0089	0.3392	11939
CF Operations	0.0590	0.0733	0.2928	-0.0948	0.3063	13949
AB_ACCR	-0.0251	-0.0209	0.1584	-0.1468	0.1457	12903
ACFO	0.0227	0.0344	0.2634	-0.1963	0.3138	13929
Leverage	0.8697	0.7452	1.1464	0.2842	1.7467	13949
Growth	-0.0052	0.0005	0.1996	-0.0025	0.0047	13945
BIG4	0.3235	0.0000	0.4678	0.0000	1.0000	9441
Panel B: Failed firms						
FirmSize	10.1473	9.9974	2.2547	7.4313	14.2657	997
Revenue	1.1933	0.7508	1.5872	0.0215	3.9333	997
NetIncome	-0.0865	-0.0063	2.5618	-0.5101	0.1299	997
CurrentAcc	0.1034	0.0451	0.2389	0.0021	0.3616	727
CF_Operations	-0.0337	0.0063	0.5677	-0.2759	0.2957	997
AB_ACCR	-0.0665	-0.0438	0.2249	-0.2584	0.1763	742
ACFO	-0.0301	0.0002	0.6218	-0.2804	0.2853	986
Leverage	1.1164	0.8555	1.4696	0.2825	2.6868	996
Growth	-0.0035	0.0002	0. .0469	-0.0057	0.0071	997
BIG4	0.4269	0.0000	0.4949	0.0000	1.0000	993
Panel C: Non-IFRSFail						
FirmSize	8.7661	8.5891	1.7494	6.6970	11.8751	403
Revenue	1.8280	1.1552	2.1157	0.0418	6.2762	403
NetIncome	-0.1836	-0.0089	0.8896	-0.5102	0.1593	403
CurrentAcc	0.1218	0.0396	0.3349	0.0030	0.3741	305
CF_Operations	-0.0157	0.0126	0.3910	-0.3001	0.4238	403
AB_ACCR	-0.0703	-0.0421	0.2638	-0.2739	0.2125	312
ACFO	-0.0281	0.0012	0.9294	-0.3056	0.4225	397
Leverage	1.2523	0.8638	2.0309	0.2196	3.3669	404
Growth	-0.0050	0.0002	0.0576	-0.0054	0.0074	404
BIG4	0.1663	0.0000	0.3728	0.0000	1.0000	403
Panel D: IFRSFail						
FirmSize	11.0844	10.9397	2.0708	8.4564	14.7454	594
Revenue	0.7628	0.6139	0.8588	0.0198	2.1751	594
NetIncome	-0.0208	-0.0059	3.2367	-0.5048	0.1230	594

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CurrentAcc	0.0901	0.0513	0.1305	0.0011	0.3077	422
CF_Operations	-0.0459	0.0043	0.6613	-0.2504	0.2386	594
AB_ACCR	-0.0638	-0.0448	0.1922	-0.2484	0.1409	430
ACFO	-0.0315	0.0001	0.2570	-0.2638	0.2296	589
Leverage	1.0241	0.8471	0.8984	0.3390	2.3818	594
Growth	-0.0025	0.0002	0.0379	-0.0060	0.0068	594
BIG4	0.6051	1.0000	0.4892	0.0000	1.0000	590

Active firms are firms reported as active and are not in receivership, dormant, default or in administration. Firms are classified as failed firms if they are reported as inactive and are either a form of dissolved or in liquidation. *IFRSFail* firms are failed firms that have adopted the International Financial Reporting Standard. *IFRSFail* is an indicator variable where firms with accounting practice data as 'IFRS' are set to one and zero for 'UK GAAP' labelled *IFRSFail* and *Non-IFRSFail* respectively on the table. *FirmSiz*e is the natural logarithm of total assets. All other variables are scaled by the total assets as at the beginning of the period. *Revenue* is reported sales for the firm. *NetIncome* is net income reported for the firm. *CurrentAcc* is short term accruals as reported on the firm's balance sheet, which is the sum of total accruals and deferred income under current liabilities. *CF_Operations* is cashflow from operations. *AB_ACCR* is abnormal accruals. *ACFO* is abnormal cashflow measuring real earnings management. *Leverage* is ratio of total liabilities to the beginning of the year total assets. *Growth* is the annual percentage in revenue change. *BiG4* is an indictor variable that equals one for firms with a *BIG4* auditor. The sample period is from 2006 to 2016 for the whole sample covering the post-IFRS period to the pre-IFRS period.

Table 4: Probability of distress and abnormal accruals

	Mean	p50	sd	p10	p95	N
Non-IFRSFail						
probability_failure	0.1656	0.0033	0.2743	0.0000	0.9911	401
abs_AB_ACCR	0.1549	0.0762	0.2246	0.0183	0.6114	312
IFRSFail						
probability_failure	0.1974	0.0038	0.3352	0.0000	0.9952	594
abs_AB_ACCR	0.1293	0.0756	0.1558	0.0150	0.4574	430

probability_failure is a firm's probability of failure. A firm's probability of failure is calculated using the bankruptcy prediction model proposed by Charitou et al. (2004) and tested using UK firms. The method is used to obtain the ex-ante probability that a firm would be bankrupt and is subsequently used to identify firms that are more likely to be aggressive in earnings management practices. *abs_AB_ACCR* is the absolute value of abnormal accruals calculated using Kaznik (1999) model – This model incorporates the change in operating cash flow as an explanatory variable in the modified jones model. This proxy accounts for the relationship between accruals and cash flow.

Table 5: Test of hypothesis

Panel A: Abnormal and normal levels of cash flow

	mean	p50	sd	p10	p95	N
IFRSFail : 0						
ACFO	-0.0281	0.0012	0.9294	-0.3056	0.4225	397
NCFO	-0.0796	0.0029	0.7454	-0.2093	0.2614	397
IFRSFail :1						
ACFO	-0.0315	0.0001	0.2570	-0.2638	0.2296	589
NCFO	0.0184	0.0041	0.1367	-0.0747	0.1807	589

Panel B: Statistical t-test of real earnings management

Group	mean	std.err.	sd	[95%Conf.	Interval]	N
IFRSFail:0	0.2684	0.0447	0.8902	0.1806	0.3562	397
IFRSFail :1	0.1374	0.0090	0.2195	0.1196	0.1551	589
diff	0.1310	0.0383		0.0559	0.2062	
diff = mean(0) - mean(1):	t = 3.4226					

Panel C: IFRS-failed firms real earnings management test

	Intercept	FirmSize	NetIncome	IFRSFail	R2	N
Parameter	0.0023	0.0032	0.2409	-0.0536	0.0869	805
t-stat	0.0200	0.2400	4.0700	-2.0700		
p-value	0.9870	0.8110	0.0000	0.0390		

Panel D: Inactive firms and active firms real earnings management test

	Intercept	FirmSize	NetIncome	Inactive	R2	N
Parameter	0.0021	0.0018	0.1796	-0.0302	0.0979	14,176
t-stat	0.1400	1.3700	2.5300	-2.2600		
p-value	0.8870	0.1710	0.0120	0.0240		

Table 5 reports the test of hypothesis using equation (ii). Panel A shows descriptive statistics of abnormal (*ACFO*) and normal (*NCFO*) levels of cash flow for the two groups of firms in this study. Panel B shows the t-test for the difference between the sample means for the two group of firms for ACFO. Panel C reports the regression analysis for the test of hypothesis where the main variable is the dummy variable taking the value of one for IFRS-failed firms (IFRSFail: 1) and zero for non-IFRS-failed firms (IFRSFail: 0) and panel D reports the regression analysis where the main variable is the dummy variable taking the value of one for inactive firms and zero for active firms.

Table 6: Difference-in-Differences approach

Dependent variable	(1) ACFO	(2) ACFO	(3) ACFO	(4) ACFO
FirmSize	-0.0004	0.00005	0.0173[*]	0.0184[*]
	(-0.03)	(0.00)	(1.72)	(1.85)
NetIncome	0.2432[***]	0.2275[***]	0.376[**]	0.344[**]
	(4.11)	(2.60)	(2.32)	(2.22)
IFRS	-0.0450[*]	-0.0451	-0.0268	-0.0238
	(-1.61)	(-1.85)	(-0.82)	(-0.70)
FailedFirm	0.0029	0.0025	-0.0275	-0.0293
	(0.13)	(0.13)	(-1.38)	(-1.42)
IFRS#FailedFirm	-.0420[**]	-0.0425[**]	-0.0543[***]	-0.0531[***]
	(-2.36)	(-2.41)	(-3.04)	(-2.98)
Growth		0.900[**]	0.747	0.873[*]
		(2.18)	(1.62)	(1.75)
Leverage		-0.0120	-0.0269	-0.0295
		(-0.28)	(-0.86)	(-0.96)
BIG4		-0.0089	-0.0449[*]	-0.0240
		(-0.20)	(-1.74)	(-0.96)
AB_ACCR			-0.581[***]	-0.572[***]
			(-3.24)	(-3.28)
Industry effects				yes
Time effects				yes
_cons	0.0338	0.0458	-0.145	-0.250[***]
	(0.22)	(0.25)	(-1.60)	(-2.71)
N	804	801	636	636
adj. R^2	0.083	0.083	0.325	0.393

t statistics in parentheses
[*] $p < 0.10$, [**] $p < 0.05$, [***] $p < 0.01$

Table 6 reports the results of the difference-in-differences analysis examining the impact of the application of IFRS on real earning management (sales manipulation). Firms are classified as failed firms if they are reported as inactive and are either a form of dissolved or in liquidation. Three levels of IFRS interactions are included: IFRS1:FailedFirm0 [*IFRS*]; IFRS0:FailedFirm1 [*FailedFirm*] and IFRS1:FailedFirm1 [*IFRS#FailedFirm*]. The values of *FailedFirm and IFRS#FailedFirm* indicate the predictive coefficients when IFRS is zero and Failed firm is one; and where IFRS is one and Failed firm is one respectively. Controls are defined in Table 3 footnote.

Table 7: Propensity score matching

Panel A: Propensity score regression
Dependent variable: IFRS

	(1)	(2)
	Pre-match	**Post-match**
FirmSize	0.521***	-0.124
	(7.61)	(-1.29)
NetIncome	-0.206	-0.583
	(-0.99)	(-1.35)
Growth	-0.785	17.26
	(-0.17)	(1.10)
Leverage	-0.228**	0.0963
	(-2.59)	(0.80)
BIG4	0.967***	0.256
	(3.75)	(0.74)
Industry effects	yes	yes
Time effects	yes	yes
_cons	-5.758***	1.208
	(-7.84)	(1.05)
N	796	268
Pseudo. R^2	0.3513	0.0301

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Panel B: Summary statistics for matched controls

0 – Non-IFRS	Mean	Median	SD	p10	p95	N
FirmSize	9.7344	9.3702	1.7044	8.0574	12.8722	181
NetIncome	-0.1061	-0.0031	0.3424	-0.3352	0.1467	181
Leverage	1.0338	0.8563	1.3478	0.2196	2.3466	181
Growth	-0.0021	0.0002	0.0190	-0.0053	0.0061	181
BIG4	0.2873	0.0000	0.4538	0.0000	1.0000	181
1 -IFRS						
FirmSize	9.5866	9.4795	1.6290	7.8485	12.6459	181
NetIncome	-0.1797*	-0.1061	0.4179	-0.5957	0.1878	181
Leverage	1.1538	0.7532	1.3506	0.2429	3.5779	181
Growth	-0.0020	-0.0001	0.0141	-0.0064	0.0060	181
BIG4	0.3204	0.0000	0.4679	0.0000	1.0000	181

The sample is constructed by matching each IFRS observation with a non-IFRS observation based on the propensities derived from the estimation of equation (iv). This procedure yields a sample of 362 observations. To ensure that only closely matched pairs are used in the analysis, a calliper of 0.01 is imposed, resulting in the smaller sample presented in the table. Panel A of Table 7 presents the first stage logit regression used for estimating propensity scores for the matching procedure (column (1)) and the diagnostic logit regression restricted to the matched sample (column (2)). The dependent variable is an indicator variable (IFRS) coded one if the firms' IFRS=1, and zero otherwise. Panel B of Table 7 presents the descriptive statistics of covariates for treatment and matched control samples in columns. The significance of sample differences is assessed by t-tests for the means of variables. ***/**/* marks two-sided significance at the 1/5/10% level.

Table 8: Difference-in-Differences approach for matched sample

Dependent variable	(1) (Propensity score matched sample) ACFO	(2) (Entropy-balanced weighted sample) ACFO
FirmSize	0.0109	0.0208
	(0.99)	(1.92)
NetIncome	0.0962	0.369*
	(0.90)	(2.07)
IFRS	-0.0159	-0.0267
	(-0.51)	(-0.93)
FailedFirm	-0.0446	-0.02659
	(-2.08)	(-1.46)
IFRS1#FailedFirm	-0.0604**	-0.0533**
	(-2.93)	(-3.58)
Growth	2.519**	0.902*
	(3.29)	(2.51)
Leverage	-0.102***	-0.00453
	(-3.39)	(-0.17)
BIG4	-0.00520	-0.0288
	(-0.13)	(-1.40)
AB_ACCR	-0.361*	-0.493**
	(-2.14)	(-2.96)
Industry effects	yes	yes
time effects	yes	yes
_cons	-0.105	-0.250**
	(-0.78)	(-2.85)
N	217	636
adj. R^2	0.479	0.374

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8 reports the results of the difference-in-differences analysis examining the impact of the application of IFRS on real earning management (sales manipulation) using the matched sample. Two matching techniques are reported the propensity score matching technique and the entropy balance weighted sample techniques. Firms are classified as failed firms if they are reported as inactive and are either a form of dissolved or in liquidation. Three levels of IFRS interactions are included: IFRS1:FailedFirm0 [*IFRS*]; IFRS0:FailedFirm1 [*FailedFirm*] and IFRS1:FailedFirm1 [*IFRS#FailedFirm*]. The values of *FailedFirm and IFRS#FailedFirm* indicate the predictive coefficients when IFRS is zero and Failed firm is one; and where IFRS is one and Failed firm is one respectively. Controls are defined in Table 3 footnote.