

# Incentives and Economic Consequences of Reporting Frequency-Induced Earnings Management

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Received: August 4, 2023; After 2 rounds of review, Accepted: September 25, 2023

## Abstract

This study investigates the impact of increased reporting frequency on earnings management and the choices between accrual-based earnings management (AM) and real earnings management (RM). We focus on the change in the financial reporting frequency of Taiwanese firms from 1983 to 1992 and categorize the sample period into three reporting regimes: semi-annual, quarterly, and monthly. We find a positive relationship between reporting frequency and earnings management. We further find that frequency-induced earnings management tends to favor RM over AM. In addition, we provide evidence that firms experiencing higher capital market pressure, relying more on implicit claims with stakeholders, and operating within less robust information environments are more inclined to frequency-induced RM. Furthermore, we observe that reporting frequency-induced RM leads to a decline in subsequent profitability for firms facing higher capital market pressure, whereas it contributes to an improvement in subsequent profitability for firms with a greater reliance on implicit claims with stakeholders and those operating within less robust information environments.

**Keywords:** reporting frequency, accrual-based earnings management, real earnings management, firm performance

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The authors acknowledge the helpful comments of the field editor and two anonymous reviewers, and take sole responsibility for their views.

Data availability: Data used in this study are available from public sources identified in the study.



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## 1. Introduction

Regulators, professionals, and scholars have maintained a long-standing interest in the selection of reporting frequency. The relentless pressure to meet interim earnings targets has become so formidable that there is a growing concern regarding whether managers might adopt short-term, myopic behaviors in response to heightened capital market pressures stemming from increased reporting frequency (Gigler and Hemmer 1998; Bhojraj and Libby 2005; Gigler, Kanodia, Sapra, and Venugopalan 2014; Ernstberger, Link, Stich, and Vogler 2017). To contribute to this ongoing research, our study delves into the question of whether increased reporting frequency prompts managers to resort to earnings management tactics to attain interim earnings and sales targets. We further explore how firms choose between the two earnings management strategies (i.e., accrual-based earnings management, AM vs. real earnings management, RM) when managers decide to report frequency-induced earnings management. We also investigate the implications of RM for future performance in light of managers' incentives to manipulate real activities to meet interim earnings/sales targets.

We utilize data from Taiwan as the basis for testing our hypotheses, which allows us to explore the capital market implications of reporting frequency in a distinctive context. Rahman and Debreceeny (2010) have noted the increasing preference among securities regulators for continuous or real-time disclosures, owing to the widespread use of online reporting and its global accessibility. Some researchers and regulators have gone so far as to advocate for firms to make regular monthly announcements (e.g., Curtis, McVay, and Whipple 2014). However, it is essential to recognize that the conventional reporting frequencies have primarily revolved around quarterly intervals (as seen in the United States and Canada) and semi-annual intervals (as observed in Belgium and Ireland). Taiwan stands out as a unique case, as it became the only country besides Taiwan to mandate monthly reports. In 1988, regulators in Taiwan mandated that listed firms file financial reports quarterly while also requiring monthly revenue disclosures. This unique regulatory framework in Taiwan offers an ideal opportunity to investigate and compare the various dimensions of the costs and benefits associated with transitioning from a semi-annual reporting regimen to a quarterly reporting regimen and subsequently to a monthly reporting regimen.

Our initial focus is on exploring the relationship between reporting frequency and earnings management. We argue that the myopic investment behaviors exhibited by managers, combined with the heightened pressure from the capital market due to increased reporting frequency would lead firms to engage in earnings management. In line with our expectations, our findings reveal a stronger inclination toward earnings management when transitioning from a semi-annual reporting regimen to quarterly or monthly reporting regimens, as well as when moving from a quarterly reporting regimen to a monthly reporting regimen.

Considering that heightened reporting frequency amplifies the inclination to manage

earnings, we proceed to investigate how this increased reporting frequency influences the choices between AM and RM. Our assertion is that when confronted with more frequent interim reporting, managers are more inclined to opt for RM over AM. This inclination is driven by several factors. Firstly, while managers' myopic investment behaviors may indeed motivate them to engage in RM, they do not exhibit a similar inclination towards AM. Secondly, when considering the discretionary accruals aimed at achieving interim earning or sales targets, managers may favor RM due to concerns about potential reversal of accruals in future quarters or months. Thirdly, increased reporting frequency not only aids regulators and auditors in closely monitoring firms' financial statements but also leads to the imposition of various restrictions on managers engaging in AM. In contrast, RM is more challenging to detect. Consistent with our expectations, we find that managers are more likely to engage in RM than AM for the increased frequency reporting regimes. To the extent that there is direct substitution between RM and AM during the year due to their sequential nature and interim RM accumulates over the fiscal year, we find that increased reporting frequency reduces AM. However, because the magnitude of the increase in RM arising from more frequent reporting outweighs that of a decrease in AM, increased reporting frequency is associated with an increase in the overall earnings management.

To better understand managers' preferences for RM over AM in the context of increased reporting frequency, we delve deeper into the influence of various financial reporting incentives on RM and its subsequent implications for future performance. Prior research suggests that managers engage in RM for three primary reasons: (1) opportunistic incentives (Bushee 1998; Bhojraj, Hribar, Picconi, and McNnis 2009; Cohen and Zarowin 2010), (2) performance-driven incentives (Burgstahler and Dichev 1997; Bartov, Givoly, and Hayn 2002), and (3) signaling incentives (Gunny 2010; Gunny and Zhang 2014). Our findings indicate that these three types of incentives play a crucial role in explaining the variations observed in reporting frequency-induced RM and its subsequent impact on future performance. Specifically, we discover that firms facing higher pressures to meet market expectations are more inclined to resort to reporting frequency-induced RM. Additionally, firms that rely more heavily on implicit claims of stakeholders and operate within less robust information environments are also more likely to engage in reporting frequency-induced RM. The consequences of reporting frequency-induced RM on future operating performance are contingent upon the underlying financial reporting incentives, as elucidated earlier. Specifically, we find that when reporting frequency-induced RM is driven by the need to meet market pressures (i.e., for opportunistic purposes), it tends to result in a subsequent deterioration in profitability. Conversely, when reporting frequency-induced RM arises from a stronger reliance on implicit stakeholder claims (i.e., for performance purposes) or a less robust information environment (i.e., for signaling purposes), it tends to lead to an improvement in subsequent profitability.

This study makes several significant contributions to the literature for three ways. First, it stands out as the inaugural study to conduct a comprehensive analysis of the impacts of increased

reporting frequency on AM and RM. While prior studies such as Gigler et al. (2014) and Kraft, Vashishtha, and Venkatachalam (2018) have explored the effects of increased reporting frequency on firms' myopic investment decisions, and Ernstberger et al. (2017) delved into the effects of reporting frequency on RM, none of these prior investigations specifically examined the effect of reporting frequency on AM. Therefore, by encompassing both AM and RM, our study provides a more holistic understanding of how reporting frequency influences earnings management.

Second, our study sheds light on the impact of frequency-induced RM on future profitability. Critics of frequent reporting have often highlighted concerns about myopic investment behavior and the inclination to report favorable performance as reasons against mandatory quarterly reporting (Kraft et al. 2018). This body of research generally perceives that underinvestment and RM resulting from increased reporting frequency are opportunistic and detrimental to subsequent profitability. However, contrary to this perspective, our findings suggest that firms may engage in reporting frequency-induced RM for purposes that enhance future performance (i.e., performance purposes) or signal future firm value (i.e., signaling purposes). In these cases, RM can actually lead to an improvement in subsequent performance.

Third, unlike most prior studies that have primarily focused on European and U.S. settings to explore the economic consequences of transitioning from semi-annual reporting to quarterly reporting, our study delves into the economic consequences of mandated monthly reporting. This unique approach is motivated by the fact that prevailing accounting standards in Europe and the U.S. typically limit firms to reporting no more frequently than quarterly. Taiwan's Stock Exchange, however, mandated monthly sales disclosure after 1988, providing a distinct opportunity to investigate the effects of increased reporting frequency from a quarterly to monthly regime. By comparing levels of earnings management and the choices between RM and AM across these two reporting regimes, our findings are relevant not only to academics but also to practitioners and securities regulators who seek to understand the economic implications of requiring firms to report more frequently than on a quarterly basis.

The rest of this paper is organized as follows: Section 2 reviews prior literature. Section 3 develops the main hypotheses. Section 4 discusses the measurements for the main variables, covers sample formation, and provides descriptive statistics. Section 5 discusses the empirical results. Section 6 concludes the study.

## 2. Literature Review

### 2.1 The benefits and costs of increased frequent reporting

How often should publicly-traded firms be obligated to report their operational results to the capital market? This question has sparked extensive debates among regulatory bodies

worldwide. The considerable uncertainty and discord surrounding the merits of various disclosure regimes have led to substantial divergence in global reporting frequencies. While the advantages of frequent financial reporting have been a longstanding topic of vigorous discussion, many previous studies have predominantly focused on its benefits.<sup>1</sup> Although most studies emphasize the potential advantages of more frequent reporting in capital markets, some have delved into the associated costs of mandatory frequent disclosures. Increased reporting frequency may indeed impose significant costs by distorting managerial investment decisions. Existing research demonstrates that even within efficient capital markets, managers can sometimes make myopic investment choices that boost short-term profits but come at the expense of the long-term value of the firm.<sup>2</sup>

Our study is related to Ernstberger et al. (2017), which investigates the impact of reporting frequency on RM. Their study relies on cross-sectional variations in reporting frequencies across EU countries, which pose challenges in establishing causal relationships. In contrast, our study is different from theirs by providing causal evidence; we exploit a unique setting with variation in reporting frequency but maintain relative homogeneity across other dimensions. Additionally, we examine comprehensive earnings management tools (e.g., AM and RM) rather than focusing only on RM, which shows how reporting frequency influences the choices of various earnings management tools. Furthermore, Ernstberger et al. (2017) suggest that reporting frequency-induced RM impairs firm value. However, we posit and find that the extent of reporting frequency-induced RM and its future implications vary depending on the earnings management incentives. While reporting frequency-induced RM arising from opportunistic purposes is negatively associated with future financial performance, reporting frequency-induced RM arising from performance/signaling purposes is positively associated with future financial performance.

## 2.2 Managerial choices between AM and RM

Managers choose between AM and RM based on cost-effectiveness. AM is costly due to scrutiny and litigation risk from auditors and regulators. In contrast, RM is harder to detect but

<sup>1</sup> Existing literature has investigated the effect of mandatory reporting frequency on the return-earnings relation (Alford, Jones, Leftwich, and Zmijewski 1993), voluntary disclosure (Gigler and Hemmer 1998), earnings timeliness (Butler, Kraft, and Weiss 2007), stock price volatility (Mensah and Werner 2008), information asymmetry (Fu, Kraft, and Zhang 2012), and accrual anomaly (Tsao, Lu, and Keung 2018).

<sup>2</sup> Gigler et al. (2014) argue that when reporting frequency increases, myopic management behavior gets exacerbated. They identify the following conditions for such an outcome: (i) impatient capital markets and (ii) an informational gap between managers and capital market participants that results from investors' making inferences from noisy summary statistics in interim reports. They show that more frequent reporting leads to price pressures from premature evaluations of long-term projects; these price pressures can lead managers to place greater importance on short-term earnings targets. Kraft et al. (2018) show that increased reporting frequency is associated with an economically large decline in investments. They found that, relative to semi-annual reporters, quarterly reporters generally exhibit higher levels of "real activities management" in the form of myopic decisions that increase short-term cash flows at the expense of long-term value.

harms a firm's competitive advantage, reducing firm value, making it potentially costlier (Ewert and Wagenhofer 2005; Graham et al. 2005). Zang (2012) shows that managers determine real manipulation before accrual manipulation, and the two earnings management strategies act as substitutes. Both real and accrual manipulation are negatively related to their cost determinants and positively tied to earnings management incentives.

Numerous studies explore the impact of corporate governance regulations on RM and AM choices. They reveal that regulations restrict AM but don't eliminate earnings management. Managers, under stricter rules, shift to RM to meet income targets due to regulatory concerns (Graham et al. 2005). Tighter accounting standards also steer managers toward RM. After the Sarbanes-Oxley Act (SOX), firms switched from accrual-based to RM methods (Cohen, Dey, and Lys 2008). Even in countries with strong investor protection, AM is constrained, prompting managers to opt for RM (Enomoto, Kimura, and Yamaguchi 2015). Our study adds causal evidence on reporting frequency's impact on overall earnings management, an essential aspect of corporate governance regulation.

## 2.3 The impact RM on the firm's future performance

Firms that employ AM to boost their current net income by one dollar will ultimately experience a corresponding reduction of one dollar in net income when accruals reverse in the future. However, when it comes to the impact of RM on subsequent operating performance, empirical research has yielded inconclusive results. Both academics and corporate executives acknowledge that RM can reduce the firm value (e.g., Gunny 2005; Roychowdhury 2006; Dichev, Graham, Harvey, and Rajgopal 2013).

Conversely, there is a body of research that offers evidence suggesting that earnings management through RM is not necessarily opportunistic in nature. Instead, it aligns with the idea that managers may be using RM as a means of signaling or obtaining advantages that ultimately contribute to improved future performance. For example, Gunny (2010) revealed that firms achieving earnings benchmarks through activities such as research and development (R&D) or managing selling, general, and administrative expenses (SG&A) experienced significantly higher subsequent industry-adjusted Return on Assets (ROA). Additionally, Zhao, Chen, Zhang, and Davis (2012) found empirical support for a positive relationship between RM and future performance. Furthermore, Al-Shattarat, Hussainey, and Al-Shattarat (2022) provided evidence indicating that manipulating operating activities to meet earnings benchmarks had significantly positive effects on firms' subsequent operating performance and served as a signal of their promising future performance.

In summary, evidence is mixed regarding the relationship between RM and future firm performance. This motivates to examine the impact of reporting frequency on the relationship between RM and future performance.

### 3. Hypothesis Development

We posit that increased reporting frequency has the potential to shape earnings management through two key factors: the myopic investment behaviors of managers and the pressure exerted by the capital market. The notion of myopic investment behaviors centers on the idea that more frequent reporting can influence short-term decision-making (myopia) concerning a firm's investments. This perspective suggests that increased reporting frequency may drive managers to favor projects with lower overall cash flows but higher short-term earnings, possibly bolstering immediate performance while sacrificing long-term prospects.

Stein (1989) introduced a theoretical framework for the short-termism/myopia hypothesis, constructing a model that showcases inefficient managerial conduct within the framework of a rational stock market. In an attempt to manipulate their firms' perceived value and shape market perceptions, managers opt to deviate from promising investments by strategically manipulating signals directed at stockholders. This strategy entails inflating earnings to bolster projected valuations. Gigler et al. (2014) build upon Stein's insights, explicitly relating managerial short-termism to both reporting frequency and the prevailing level of impatience within the capital market. They provide empirical evidence of the costs associated with increased reporting frequency. More specifically, increased reporting frequency amplifies the pressure on insiders, compelling managers to adopt a short-term perspective when making investment decisions. This managerial myopia arises because frequent reporting accelerates the premature assessment of actions whose value primarily materializes in reported financial metrics over the long term. Unfortunately, the adverse consequences stemming from these premature evaluations become formidable when shareholders exhibit a sufficient degree of impatience.

Empirical evidence aligns with the hypotheses proposed by Stein (1989) and Gigler et al. (2014). For example, Bhojraj and Libby (2005) involve an experiment comparing managerial financial reporting decisions between a quarterly reporting system and a semi-annual reporting system. Their findings suggest that managers frequently prioritize projects perceived to maximize short-term earnings (and stock price) over those optimizing total cash flows. This shift in decision-making is attributed to heightened pressure from the capital market, particularly in the context of imminent stock issuances. As a result, managers tend to exhibit a more pronounced myopic approach during the quarterly disclosure regime, where the tension between immediate earnings and total cash flows becomes more pronounced. Teoh, Wong, and Rao (1998) found that firms undergoing Initial Public Offerings (IPOs) tend to exhibit high positive earnings in their issue years and abnormal accruals, achieved through the adoption income-increasing policies. Similarly, Brochet, Loumioti, and Serafeim (2015) identified "suspect firm-years" characterized by a high likelihood of myopic behavior. They provided compelling evidence that during these periods, deliberate efforts are made to align with specific earnings thresholds.



These studies collectively underscore the prevailing culture in corporate settings where achieving or surpassing earnings targets is highly valued, as market capital often rewards firms for meeting or exceeding these benchmarks through earnings management. With increased reporting frequency, there is a higher frequency of interim earnings/sales targets, exposing managers to elevated capital market pressure. Consequently, the intensified pressure leads managers to be more inclined towards earnings management as a response to the increased stock market scrutiny associated with heightened reporting frequency.

In summary, managerial myopic investment behaviors coupled with the heightened capital market pressure stemming from increased reporting frequency render the firm more inclined to partake in earnings management. This leads us to formulate the following hypothesis:

**H1:** *Increased frequent reporting induces managers to engage in earnings management.*

Prior research suggests that managerial decisions regarding AM and RM hinge on cost-benefit assessments that consider the inherent traits of each method (Zang 2012). We contend that when managers choose earnings management in response to increased reporting frequency, they are likely to favor RM over AM for the following reasons. First, as previously demonstrated, managers have the capacity to enhance their current-period earnings through the manager myopic investment behavior mechanism and the capital market pressure mechanism. While both of these mechanisms drive RM, the capital market pressure mechanism only affects AM. Second, owing to the constraints within GAAP and the subsequent reversal of prior accruals, any AM employed by managers to meet quarterly earnings or monthly sales targets will be offset in subsequent quarters or months. These reversals may potentially result in firms failing to meet future quarter earnings or monthly sales targets. Consequently, out of concern for the penalties associated with falling short of future earnings or sales targets due to accrual reversals, managers are more likely to resort to RM to attain their earnings or sales objectives. Third, on the one hand, engaging in AM to achieve interim financial targets during the year would attract more scrutiny from regulators and auditors. King (2018) illustrated that more frequent reporting would help regulators monitor a firm's financial statements, thus imposing various restrictions on managers carrying out AM. At the end of each quarter and month, external auditors in Taiwan are involved in the preparation of interim reports by performing a review of interim financial statements, which are referred to as interim reviews. An auditor's involvement in interim financial reports will curb management's use of earnings management via accruals manipulation during the year. This improves the reporting quality throughout the year (Ettredge, Simon, Smith, and Stone 1994). On the other hand, RM, such as cutting back on R&D or SG&A expenses, overproduction, and sales discounts to boost sales revenue, is considered less likely to be detected by the SEC and auditors. The reason is that real transactions management represents a deviation from optimal business practices taken by managers to achieve certain earnings targets but is unlikely to be deemed improper by auditors and regulators (Cohen, Mashruwala, and Zach 2010;



Roychowdhury 2006). Consistent with this prediction, Cohen et al. (2008) find that while the Sarbanes-Oxley Act (SOX) reduces AM, it causes managers to use real transactions to manage earnings.

In summary, the arguments presented above suggest that increased interim reporting frequency inclines managers towards preferring RM over AM when they opt for earnings management. To state this formally, we propose the following hypothesis:

**H2:** *When firms decide to engage in reporting frequency-induced earnings management, they will be more likely to engage in real earnings management than in accrual-based earnings management.*

As Hypothesis H2 posits a higher likelihood of managerial engagement in RM compared to AM, we conduct an in-depth analysis of the factors influencing the extent of RM resulting from increased reporting frequency. Within this context, we identify multiple incentives that could either exacerbate or mitigate the RM prompted by more frequent reporting.

Gunny (2010) delineates three fundamental motivations that underlie managerial engagement in RM: opportunistic incentives, performance-driven incentives, and signaling incentives. Opportunistic incentives entail that RM offers executives a mechanism for leveraging stakeholders, optimizing personal gains, or potentially misleading investors (Bhojraj et al. 2009; Bushee 1998; Cohen and Zarowin 2010). Performance-driven incentives indicate that RM has the potential to augment the firm's standing and repute among stakeholders, thereby securing advantages that contribute to enhanced future performance (Burgstahler and Dichev 1997; Bartov et al. 2002). Signaling incentives suggest that managers might choose RM as a means to meet specific benchmarks, thereby indicating an expectation of superior upcoming earnings (Gunny 2010; Gunny and Zhang 2014). We hypothesize that certain firm characteristics associated with the above three motivations can explain cross-sectional differences in reporting frequency-induced RM.

First, we argue that higher reporting frequency creates greater pressure from investors to meet/beat interim earnings/sales targets, which leads to an increase in the level of RM. Bhojraj and Libby (2005) point out that the effect of change in disclosure frequency on managerial myopia varies depending on the level of capital market pressure. They find that in the absence of strong capital market pressures, a change from semi-annual to quarterly reporting is unlikely to have large effects on managers' investment choices. Several studies suggest that higher growth opportunities, higher transient institutional ownership, and the occurrence of SEOs are associated with greater capital market pressures. They find that firms under these circumstances are more likely to engage in earnings management to meet or beat various earnings benchmarks. Skinner and Sloan (2002) document that firms with greater growth opportunities are penalized more by the stock market when they miss earnings thresholds. Further, existing studies on executive

compensation show that executives of firms with higher growth opportunities tend to receive more stock options or restricted stock than executives of firms with lower growth opportunities (Murphy 2003). This evidence suggests that managers of growth companies experience a larger financial loss if their firms fail to meet or beat earnings benchmarks relative to value companies; hence they have stronger incentives to achieve interim earnings targets through RM. Prior studies argue that transient institutional investors overemphasize near-term profits. Bushee (1998) finds that firms with a large portion of ownership by transient institutions with high portfolio turnover encourage managers to reduce research and development expenditures to meet short-term earnings goals. Matsumoto (2002) finds that firms with higher transient institutional ownership are more likely to take actions to avoid negative earnings surprises. Cohen and Zarowin (2010) find that firms use multiple earnings management strategies, that is, AM and RM, around SEOs, and RM is more likely than discretionary accruals to be associated with earnings declines. Bhojraj et al. (2009) also find that firms that beat earnings targets with low-quality earnings are more likely to issue equity in the following year. The firms around SEOs may engage in opportunistic RM to achieve interim earnings/sales targets for inflating SEO prices. The aforementioned empirical evidence lead to the following hypothesis:

**H3a:** *In the face of increased reporting frequency, firms experiencing greater capital market pressures are more prone to resort to opportunistic real earnings management.*

Second, we contend that firms heavily relying on implicit commitments with stakeholders derive advantages from real earnings management, which in turn contribute to the firm's future performance. Bowen, DuCharme, and Shores (1995) propose that a firm's financial reputation influences how stakeholders perceive its capacity to honor implied obligations, resulting in more advantageous trade terms. Further supporting this notion, Matsumoto (2002) discovers that firms heavily dependent on implicit commitments with stakeholders are more inclined to take actions aimed at avoiding negative earnings surprises, thereby bolstering their credibility and standing among stakeholders. Consequently, we formulate the ensuing hypothesis:

**H3b:** *Firms that heavily rely on implicit claims with stakeholders are more prone to engage in performance-purpose real earnings management when confronted with increased reporting frequency.*

Finally, information asymmetry is relatively high in firms with less robust information environments; such firms would realize great benefits from signaling their unobservable qualities to gain legitimacy (Beyer, Nabar, and Rapley 2018). Accordingly, we argue that firms with less robust information environments are more likely to engage in reporting frequency-induced RM to signal their unobservable qualities. Stated formally:

**H3c:** *Firms with less robust information environments are more likely to engage in signal-purpose RM when facing increased reporting frequency.*

Lastly, we assess how the three aforementioned types of earnings management incentives influence the consequences of reporting frequency-induced RM on future performance. When RM is pursued for opportunistic purposes, it can potentially diminish the firm's overall value. This is because actions taken in the current period to boost earnings may exert a negative impact on cash flows in subsequent periods. In considering the future implications of signaling-purpose RM, Bartov et al. (2002) indicate that the act of meeting the earnings benchmarks by engaging in RM may provide benefits to the firm that enables better performance in the future and be consistent with signaling managerial competence or future firm performance. Gunny (2010) posits that managers who are confident in their ability to deliver superior future performance may employ RM to meet short-term targets, anticipating that future earnings growth will outweigh any adverse effects of utilizing RM to meet benchmarks. Conversely, firms projecting relatively poorer future performance are unlikely to utilize such signals, as investors may become disillusioned when the firm experiences an earnings impact resulting from the costs associated with RM, such as forfeited future cash flows. If the signaling argument holds true, we should observe a positive relation between RM induced by reporting frequency and the firm's future performance. The arguments presented above lead us to formulate the following hypotheses:

- H4a:** *Reporting frequency-induced RM arising from opportunistic incentives (i.e., with greater capital market pressure) is negatively associated with future financial performance.*
- H4b:** *Reporting frequency-induced RM arising from performance incentives (i.e., with greater reliance on implicit claims with stakeholders) is positively associated with future financial performance.*
- H4c:** *Reporting frequency-induced RM arising from signaling incentives (i.e., with less robust information environments) is positively associated with future financial performance.*

## 4. Sample and Main Variable Definition

### 4.1. Sample

This study is based on publicly listed Taiwanese firms on the Stock Exchange from 1983 to 1992, utilizing data from the TEJ database, which began in 1981. Our sample starts in 1983 since we require two prior years' sales data for calculating abnormal production costs. To isolate the impact of sales management and overproduction on abnormal production costs, we focus on manufacturing firms. This ensures that abnormal production costs solely reflect overproduction and are not influenced by sales management. This research design aids in distinguishing genuine activity manipulations aimed at meeting monthly sales targets.

Table 1 shows the reporting frequency distribution by reporting regime and sample selection. Before 1988, Taiwan's SEC mandated semi-annual financial statements. In 1988, they required quarterly financial statements and monthly revenue reporting for listed companies. However, discussions about quarterly reporting were ongoing in 1986 and 1987, with firms pressured to adopt it. During that time, even though only semi-annual reporting was mandated, many listed firms switched to quarterly reports. Our sample period ended in 1992 to maintain equal sub-sample periods pre- and post-monthly reporting. In the years between 1983 and 1985, when only semi-annual reporting was required, 91.5% of our sample firms complied. In 1986 and 1987, despite the semi-annual mandate, 74.0% of firms reported quarterly, with none voluntarily reporting monthly revenue. We classify 1986 and 1987 as a quarterly reporting regime, 1983 to 1985 as semi-annual, and 1988 to 1992 as monthly. Before 1986, Taiwan's SEC did not require quarterly reports. We exclude firms voluntarily switching to quarterly reporting before 1986 from the semi-annual regime. All listed firms after 1988 are included as they must provide quarterly reports and monthly revenue data. Non-manufacturing firms and observations lacking necessary data are removed, resulting in a sample of 62 firms and 157 firm-years for semi-annual reporting, 73 firms and 139 firm-years for quarterly reporting, and 149 firms and 549 firm-years for monthly reporting.

**Table 1** Sample Selection

Selection criteria	Semiannually 1983-1985	Quarterly 1986-1987	Monthly 1988-1992
Firm-years required to release financial reports	258	281	814
Delete the observations in which firms report quarterly in the semiannually reporting regime or report semiannually in the quarterly reporting regime	(22)	(73)	—
Delete non-manufacturing firms	(56)	(49)	(172)
Delete firm-years with insufficient data	(23)	(20)	(93)
Total number of firm-year observations	<u>157</u>	<u>139</u>	<u>549</u>
Number of unique firms	62	73	149

Note. Taiwanese listed firms are required to issue quarterly earnings that are duly reviewed by a certified public accountant within one month after the end of the first and third quarters and monthly revenue announcements of the preceding month regarding the unaudited net operating revenue before the tenth of each calendar month on the website designated by the Taiwan Stock Exchange pursuant to the listing rules of the Taiwan Stock Exchange commencing January 29, 1988.

## 4.2 Proxies for the main variables

### 4.2.1 Earnings management metrics

#### 4.2.1.1 Accrual-based earnings management (AM)

We use performance-adjusted discretionary accruals as an AM proxy. Specifically, we employ a modified Jones model akin to Ashbaugh, LaFond, and Mayhew (2003), explicitly accounting for lagged return on assets ( $ROA_{t-1}$ ) to mitigate performance-related effects on discretionary accrual measurement. Specifically, we model total accruals by the industry as:

$$ACC_t = \alpha_1 + \alpha_2 \Delta REV_t + \alpha_3 PPE_t + \alpha_4 ROA_{t-1} + \varepsilon_t \quad (1)$$

Following Dechow, Sloan, and Sweeney (1995), accruals are calculated as follows:

$$ACC_t = (\Delta CA_t - \Delta Cash_t) - (\Delta CL_t - \Delta STD_t - \Delta TP_t) - Dep_t \quad (2)$$

where  $\Delta CA_t$  is change in total current assets,  $\Delta Cash_t$  is change in cash and cash equivalents,  $\Delta CL_t$  is change in total current liabilities,  $\Delta STD_t$  is change in short-term debt included in current liabilities,  $\Delta TP_t$  is change in income taxes payable, and  $Dep_t$  is depreciation and amortization expense. The subscripts “ $t$ ” refers to year  $t$ . The estimates from Equations (1) and (2) are used to calculate the expected or non-discretionary accruals ( $NACC_t$ ):

$$NDAC_t = \hat{\alpha}_1 + \hat{\alpha}_2 (\Delta REV_t - \Delta AR_t) + \hat{\alpha}_3 PPE_t + \hat{\alpha}_4 ROA_{t-1} \quad (3)$$

where  $\Delta AR_t$  is the change in accounts receivable, scaled by  $t-1$  total assets;  $\Delta REV_t$  is change in revenue, scaled by  $t-1$  total assets;  $PPE_t$  is property, plant, and equipment, scaled by  $t-1$  total assets;  $ROA_{t-1}$  is the return on total assets for the previous year; and discretionary accruals ( $DAC_t$ ) are the difference between total accruals ( $ACC_t$ ) and non-discretionary accruals ( $NDAC_t$ ).

#### 4.2.1.2 Real earnings management (RM)

As discussed in Roychowdhury (2006), firms can utilize three real activities manipulation methods to avoid earnings disappointments: sales manipulation, reducing the reported cost of goods sold through overproduction, and decreasing operating expenses through reduction of discretionary expenditures. Sales management activities lead to lower current-period cash flows from operations and higher production costs than what is normally given the sales level. Overproduction results in higher production costs relative to sales and lower cash flow from operations. In addition to decreasing operating expenses, the reduction of discretionary expenditures positively affects abnormal CFO from operations. Since sales manipulation/

overproduction and reduction of discretionary expenditures have opposite effects on the level of current period cash flows, the net effect of the above real activities manipulation on abnormal CFO from operations is ambiguous. Considering that the three individual variables underlying the aggregated RM measures may have different implications for earnings that may dilute any results using these aggregated measures, we thus report results mainly corresponding to the three individual RM proxies. Additionally, the overall RM measure also excludes abnormal cash flows.

The individual measures are the residuals from the following corresponding estimation model. Following Roychowdhury (2006), we use the following models to estimate the normal levels of cash flow from operations, production costs, and discretionary expenses:

$$CFO_t = \alpha_0 + \alpha_1 REV_t + \alpha_2 \Delta REV_t + \varepsilon_t \quad (4)$$

$$PROD_t = \alpha_0 + \alpha_1 REV_t + \alpha_2 \Delta REV_t + \alpha_3 \Delta REV_{t-1} + \varepsilon_t \quad (5)$$

$$DISX_t = \alpha_0 + \alpha_1 REV_{t-1} + \varepsilon_t \quad (6)$$

where  $CFO_t$  is measured as the difference between earnings and total accruals;  $PROD_t$  is production costs, defined as the sum of the cost of goods sold and the change in inventories from year  $t-1$  to year  $t$ ;  $DISX_t$  is discretionary expenses, defined as selling, and general and administrative expenses for year  $t$ ; the above three real activities manipulation measures are scaled by  $t-1$  total assets.

The models are estimated for each year and industry cluster with at least eight observations. Abnormal CFO ( $RM\_CFO_t$ ), abnormal production costs ( $RM\_PROD_t$ ), and abnormal discretionary expenses ( $RM\_DISX_t$ ) are calculated as the differences between actual and predicted values from Equations (4), (5), and (6).  $RM\_CFO_t$  and  $RM\_DISX_t$  are multiplied by  $-1$ , such that higher values of these measures indicate higher levels of RM.

#### 4.2.1.3 Overall earnings management measure (Total\_EM)

Given that different real activities manipulations can have overlapping impacts on abnormal cash flows, our comprehensive earnings management measure excludes abnormal cash flows from operations while encompassing abnormal production costs, discretionary operating expenses, and unsigned discretionary accruals.

#### 4.2.2 Proxies for the three reporting regimes

According to the development of financial reporting frequency requirements, we divide our sample period into three reporting regimes: (i) a semi-annual reporting regime, which covers 1983 to 1985, during which listed firms were required to file annual and semi-annual reports; (ii)



a quarterly reporting regime, which covers 1986 and 1987, during which many listed firms filed quarterly financial statements, but did not provide monthly revenue reports; and (iii) a monthly reporting regime, which covers 1988 to 1992, during which listed firms must file both quarterly financial statements and monthly revenue reports. In accordance with Butler et al. (2007), we classify firms that switched from semi-annual reporting to quarterly reporting in 1986 and 1987 as mandatory because their more frequent reporting occurred in anticipation of the impending regulatory change. Many discussions related to the regulations were ongoing during this period, and Taiwan's SEC exerted pressure on its firms to report quarterly. We set three indicator variables to proxy for the three reporting regimes. *SRR* is an indicator variable with a value of 1 for the firm-years belonging to the semi-annually reporting regime (1983 and 1985), and 0 otherwise; *QRR* is an indicator variable with a value of 1 for the firm-years belonging to the quarterly reporting regime (1986 and 1987), and 0 otherwise; *MRR* is an indicator variable with a value of 1 for the firm-years belonging to the monthly reporting regime (1988-1992), and 0 otherwise.

#### 4.2.3 Proxies for the frequency of suspect firm-quarters and suspect firm-months

In the quarterly and monthly reporting regimes, if (a) the quarterly net income divided by  $t-1$  total assets is greater than or equal to 0 but less than 0.01, or (b) the difference between the current quarter's net income and the correspondent quarter for the previous year divided by the total assets of the last quarter is greater than 0 but less than 0.01, the correspondent firm-quarter is defined as the suspect firm-quarter. The frequency of suspect firm-quarters (*FQ*) is between 0 and 8. Accordingly, in the monthly reporting regime, if the difference between the current month's sales revenues and the correspondent sales revenue of the previous year divided by the beginning total assets of the last quarter are greater than or equal to 0 but less than 0.01, the correspondent firm-month is defined as the suspect firm-month. The suspect firm months (*FM*) frequency is between 0 and 12.

#### 4.2.4 Proxies for the incentives of RM

We contend that increased capital market pressure, heightened dependence on implicit stakeholder claims, and greater information asymmetry lead to stronger motivations for engaging in RM. We gauge all incentive variables at the start of the year to enhance the argument regarding causality direction.

##### 4.2.4.1 Capital market pressure

As previously mentioned, higher growth opportunities, increased transient institutional ownership, and seasoned equity offerings are related to greater capital market pressure and opportunistic RM. We measure growth opportunity using the market-to-book ratio, transient institution ownership by total shares held by such institutions, and SEO with a binary variable (SEO) that equals 1 if the firm issues equity during the year. Dichotomous variables include

growth opportunity ( $MB\_H$ ), which equals 1 if the firm-year value exceeds the industry-year median, and transient institutional ownership ( $TINS\_H$ ), which equals 1 if the firm-year value surpasses the industry-year median; otherwise, they both equal 0.

#### 4.2.4.2 Reliance on implicit claims with stakeholders

Bowen et al. (1995) proposed that firms in durable goods industries and those with higher labor intensity are seen as more dependent on implicit stakeholder claims. We define  $DUR$  as 1 for firms in durable goods industries and 0 otherwise. Labor intensity ( $LAB$ ) is calculated as 1 minus the ratio of gross property, plant, and equipment to firm size (measured as total gross assets). The binary labor intensity variable ( $LAB\_H$ ) equals 1 if the firm-year value exceeds the industry-year median, and 0 otherwise.

#### 4.2.4.3 Information asymmetry

Two common measures of information asymmetry are stock return volatility ( $SRV$ ) (Krishnaswami and Subramaniam 1999) and bid-ask spreads ( $BS$ ) (Lang, Lins, and Maffett 2012).  $SRV$  represents the annual dispersion of market-adjusted daily stock returns. The binary  $SRV$  variable ( $SRV\_H$ ) equals 1 if the firm-year value exceeds the industry-year median, and 0 otherwise.  $BS$  is the annual median of daily quoted spreads, calculated as the difference between closing bid and ask prices divided by the midpoint. The binary  $BS$  variable ( $BS\_H$ ) equals 1 if the firm-year value surpasses the industry-year median, and 0 otherwise.

## 5. Empirical Results

### 5.1 Descriptive statistics

Table 2 shows descriptive statistics and univariate test results for our study variables. Quarterly and monthly reporting regimes exhibit significantly higher values for all three real abnormal activity measures compared to semi-annual reporting. Cash flow levels are positively associated with reporting frequency, suggesting that the negative impact of sales management/overproduction on cash flows outweighs the positive effect of discretionary expenditures on abnormal cash flows. The shift from semi-annual to quarterly/monthly reporting seems to incentivize managers to engage in RM through sales management, overproduction, and discretionary expenditures to meet interim earnings targets. However, except for  $RM\_CFO$ , we do not observe significant changes in  $RM\_PROD$  and  $RM\_DISX$  when switch from quarterly to monthly reporting regimes. This indicates that both quarterly and monthly regimes have similar abnormal production costs and operating expenses, with lower abnormal cash flows attributed to sales management in the monthly reporting regime. These results suggest that mandating monthly sales disclosures prompts managers to engage in sales management to achieve monthly sales targets.

Table 2 Descriptive Statistics and Univariate Test Results for Variables

Variables	Semiannually 1983-1985 (N = 157)		Quarterly 1986-1987 (N = 139)		Monthly 1988-1992 (N = 549)		Quarterly - Semiannually		Monthly - Semiannually		Monthly - Quarterly	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>RM_CFO</i>	-0.038	-0.028	0.035	0.041	0.071	0.080	0.073***	0.069***	0.109***	0.108***	0.036***	0.039***
<i>RM_PROD</i>	-0.048	-0.043	-0.020	-0.015	-0.018	-0.016	0.028**	0.028**	0.030**	0.027**	0.002	-0.001
<i>RM_DISX</i>	0.014	0.011	0.041	0.051	0.037	0.048	0.027**	0.040***	0.023**	0.037***	-0.004	-0.003
<i>Total_RM</i>	-0.034	-0.035	0.020	0.017	0.019	0.021	0.054***	0.052***	0.053***	0.056***	-0.001	0.004
<i>AM_POS</i>	0.100	0.090	0.061	0.061	0.040	0.042	-0.039***	-0.029**	-0.060***	-0.048***	-0.021**	-0.019**
<i>AM_NEG</i>	-0.075	-0.072	-0.075	-0.078	-0.067	-0.074	0.000	-0.006	0.008	-0.002	0.008	0.004
<i>AM</i>	0.018	0.015	-0.012	-0.015	-0.023	-0.033	-0.030***	-0.030***	-0.041***	-0.048***	-0.011*	-0.018**
<i>Total_EM</i>	-0.016	-0.022	0.008	0.004	-0.005	0.000	0.024**	0.026***	0.011*	0.022**	-0.013*	-0.004
<i>EMTEND</i>	0.679	1.000	0.790	1.000	0.888	1.000	0.111**	0.000***	0.209***	0.000***	0.098**	0.000***
<i>FQ</i>	0.000	0.000	0.403	0.000	1.188	1.000	-	-	-	-	0.785***	1.000***
<i>FM</i>	0.000	0.000	0.000	0.000	0.413	0.000	-	-	-	-	0.413***	0.000***
<i>SEO</i>	0.142	0.000	0.232	0.000	0.180	0.000	0.090***	0.000***	0.038*	0.000**	-0.052**	0.000*
<i>MB</i>	1.273	1.215	1.535	1.467	1.681	1.501	0.262***	0.251***	0.408***	0.285***	0.147***	0.034*
<i>TINST</i>	0.084	0.074	0.094	0.083	0.108	0.093	0.010*	0.008*	0.024***	0.018***	0.014**	0.010*
<i>DUR</i>	0.432	0.000	0.452	0.000	0.493	0.000	0.021*	0.000**	0.061***	0.000***	0.041***	0.000***
<i>LABOR</i>	0.547	0.546	0.548	0.548	0.574	0.575	0.001	0.003	0.027***	0.030***	0.026***	0.027***
<i>SRV</i>	0.003	0.004	0.010	0.005	0.017	0.009	0.007*	0.002	0.014***	0.005*	0.007*	0.004*
<i>BS</i>	0.028	0.024	0.033	0.026	0.052	0.042	0.004*	0.002	0.023***	0.019***	0.019***	0.017***
<i>MVE</i>	6.168	6.171	6.248	6.311	6.852	6.848	0.080**	0.140***	0.684***	0.677***	0.604***	0.537***
<i>LEV</i>	0.554	0.574	0.504	0.492	0.403	0.396	-0.050	-0.082**	-0.151***	-0.178***	-0.101**	-0.096*
<i>SHARE</i>	5.016	5.021	5.060	5.058	5.224	5.224	0.044	0.037	0.208***	0.203***	0.164***	0.166***
<i>ROA</i>	0.037	0.036	0.068	0.072	0.038	0.040	0.032***	0.035***	0.001	0.003	-0.031***	-0.032***
<i>ZSCORE</i>	1.862	1.630	2.620	2.392	4.955	3.680	0.758***	0.762***	3.093***	2.050***	2.335***	1.289***
<i>MS</i>	0.139	0.092	0.101	0.062	0.070	0.034	-0.038***	-0.030***	-0.069***	-0.059***	-0.031***	-0.029***
<i>INS</i>	0.278	0.243	0.290	0.245	0.247	0.201	0.012	0.002	-0.031*	-0.042**	-0.042**	-0.043***
<i>BIG5</i>	0.287	0.000	0.309	0.000	0.577	1.000	0.023	0.000	0.291***	1.000***	0.268***	1.000***
<i>CYCLE</i>	148.198	116.810	126.198	98.030	151.590	106.770	-22.000	-18.780***	3.392	-10.040**	25.392	8.740
<i>NOAD</i>	0.510	1.000	0.482	0.000	0.495	0.000	-0.028	-1.000	-0.014	-1.000	0.013	0.000
<i>ASSET</i>	6.553	6.542	6.555	6.522	6.667	6.618	0.002	-0.020	0.114***	0.076**	0.112**	0.096**
<i>AGDP</i>	0.077	0.090	0.121	0.127	0.078	0.083	0.044***	0.037***	0.001	-0.007***	-0.043***	-0.044***
<i>EARN</i>	0.024	0.033	0.065	0.085	0.043	0.047	0.041**	0.052***	0.019	0.014	-0.022	-0.038*

Note. Table 2 provides the univariate tests comparing subsamples for cross-sectional tests. See Appendix A for variable definitions. \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% levels, respectively.

Compared to the semi-annual reporting regime, both the quarterly and monthly reporting regimes exhibit similar levels of negative discretionary accruals (*AM\_NEG*). However, they have lower levels of signed discretionary accruals (*AM*) and positive discretionary accruals (*AM\_POS*). The monthly reporting period shows lower levels of signed discretionary accruals and positive discretionary accruals compared to the quarterly reporting period.

In sum, Table 2 reveals that more frequent reporting regimes show higher RM and lower AM levels, suggesting managers use real and accrual manipulation as substitutes in managing earnings for frequent reporting. However, the increases in RM measures generally outweigh the decreases in unsigned AM for the switch from semi-annual to quarterly/monthly reporting. Notably, the increase in *RM\_CFO* surpasses the decrease in unsigned *AM* when switching from quarterly to monthly reporting. These findings suggest that increased reporting frequency leads to increased overall earnings management.

Figures 1 and 2 illustrate trends in AM and RM measures. In Figure 1, we focus on three RM measures: abnormal cash flows (*RM\_CFO*), abnormal production costs (*RM\_PROD*), abnormal discretionary expenses (*RM\_DISX*), and the combined RM (*Total\_RM*). Notably, RM measures increase in both quarterly and monthly reporting compared to semi-annual reporting. Monthly reporting shows a higher level of *RM\_CFO* than quarterly reporting. These findings imply that frequent reporting drives managers to resort to RM to meet interim earnings and sales goals.

Figure 2 reveals trends in signed discretionary accruals, positive discretionary accruals, and negative discretionary accruals over our sample period. In this figure, we observe that signed and positive discretionary accruals rise during the semi-annual reporting, peak just before quarterly

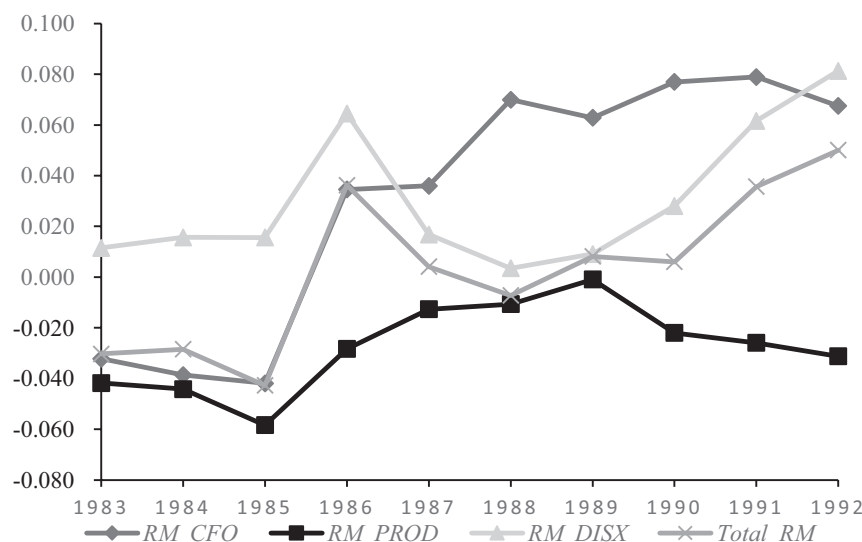
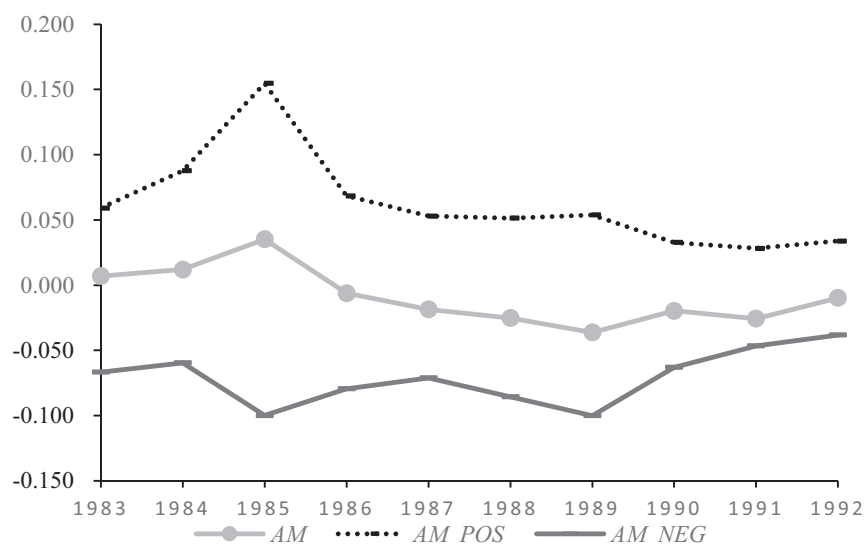


Figure 1 The trends in the four measures of RM.



**Figure 2** The trends of positive, negative, and signed discretionary accruals.

reporting, decline during quarterly reporting, and hit their lowest point in monthly reporting. Additionally, negative discretionary accruals decrease during semi-annual reporting, peak before quarterly reporting, and increase during both quarterly and monthly reporting. These findings indicate that more frequent reporting is linked to reduced levels of AM.

Figure 3 shows the *Total\_EM* (overall earnings management scores) across our sample. *Total\_EM* increases over time. While more frequent reporting reduces discretionary accruals,



**Figure 3** The trends of overall earnings management score.

the rise in aggregated RM due to quarterly and monthly reporting outweighs the AM decrease, resulting in an increase in the overall earnings management score.

In summary, comparing AM and RM trends in our sample period indicates a potential substitution effect. Firms increased RM for interim targets, leading to AM decline. Moreover, during quarterly and monthly reporting, RM's rise outweighs AM's fall, resulting in a higher overall earnings management score with more frequent reporting.

## 5.2 Reporting frequency and earnings management

We estimate the following equation to test H1 that more reporting frequency leads to higher level of earnings management:

$$\begin{aligned} \text{Probit}(EM_t = 1) = & \alpha_0 + \alpha_1 QRR_t + \alpha_2 MRR_t + \alpha_3 QRR_t \times FQ_t + \alpha_4 MRR_t \times FQ_t + \\ & \alpha_5 MRR_t \times FM_t + \text{Controls} + \varepsilon_t \end{aligned} \quad (7)$$

We use the dependent variable EM, based on Cohen and Zarowin (2010), to classify firms as earnings management firms or not. EM is an indicator variable, set to one if any of RM measures (RM\_CFO, RM\_PROD, RM\_DISX) or discretionary accruals (AM) surpass the industry-year median. We employ a Probit model to estimate Equation (7), focusing on the coefficients on *QRR*, *MRR*, *QRR* × *FQ*, *QRR* × *FQ*, and *MRR* × *FM*, which capture the added tendency for earnings management with more frequent (quarterly and monthly) reporting. We also control for various factors influencing earnings management, as per Cohen and Zarowin (2010). Definitions of these control variables are provided in Appendix A.

Table 3 presents estimated coefficients and marginal effects on earnings management probability. We find *QRR* and *MRR* coefficients of 0.205 (*p*-value 0.093) and 0.262 (*p*-value 0.073), indicating stronger earnings management tendencies in quarterly/monthly reporting compared to semi-annual reporting. Additionally, *QRR* × *FQ*, *MRR* × *FQ*, and *MRR* × *FM* coefficients are significantly positive (with *p*-values 0.033, 0.000, and 0.049 respectively), implying heightened earnings management tendencies with more frequent suspect firm-quarters and suspect firm-months. Furthermore, *MRR* shows a stronger effect than *QRR*, and the interaction coefficients *QRR* × *FQ*, *MRR* × *FQ*, and *MRR* × *FM* remain positively significant, indicating a more pronounced impact of increased reporting frequency on earnings management for firms with more frequent suspect firm-quarters and suspect firm-months. Lastly, significant control variables generally align with expected signs.

In summary, our findings support Hypothesis H1, indicating that the switches from semi-annual to quarterly/monthly reporting and from quarterly to monthly reporting positively impact firms' tendency to engage in earnings/sales management.



**Table 3** Reporting Frequency and the Tendency to Engage in Earnings Management

Independence variables:	Dependence variable: <i>Probit</i> ( $EMTEND = 1$ )	
	Coef.	Marginal effects
Constant	2.358 (0.015)	
<i>QRR</i>	0.205 (0.093)	8.12%
<i>MRR</i>	0.262 (0.073)	10.42%
<i>QRR</i> × <i>FQ</i>	0.087 (0.033)	3.45%
<i>MRR</i> × <i>FQ</i>	0.165 (0.000)	6.57%
<i>MRR</i> × <i>FM</i>	0.079 (0.049)	3.16%
<i>MVE</i>	−1.179 (0.000)	−22.48%
<i>MB</i>	0.096 (0.000)	3.50%
<i>LEV</i>	−0.736 (0.006)	−14.09%
<i>SHARE</i>	1.128 (0.000)	21.46%
<i>ROA</i>	−0.605 (0.346)	−12.11%
<i>N</i>	845	
Pseudo $R^2$	0.029	

Note. This table presents the estimated coefficients, two-tailed  $p$ -values of the  $t$ -statistics, and marginal effects for the Probit model which examines the association between reporting frequency and the tendency to engage in earnings management, controlling for a set of control variables. The  $p$ -values are in parentheses. See Appendix A for variable definitions.

### 5.3 The impact of increased frequent reporting on the choices between AM and RM

Given the earlier findings of increased earnings/sales management with more frequent reporting, we explore how this affects the choice between AM and RM. The decision to engage in earnings management and the AM vs. RM choice are endogenous, requiring a two-stage model to address potential bias. Following Cohen and Zarowin (2010), in the first stage, we estimate

a selection model explaining firms' overall earnings management decisions as illustrated in Equation (7), excluding reporting frequency variables. In the second stage, conditional on the first stage analysis, we assess the impact of increased reporting frequency on AM and RM, accounting for the earnings management tendency identified in the first stage.

We then estimate second-stage models by incorporating the inverse miller ratio from the first stage model. Specifically, we use Zang (2012)'s sequential equation system with RM preceding AM to test H2, examining whether managers opt for RM over AM with increased reporting frequency.

$$RM_t = \alpha_0 + \alpha_1 QRR_t + \alpha_2 MRR_t + \alpha_3 QRR_t \times FQ_t + \alpha_4 MRR_t \times FQ_t + \alpha_5 MRR_t \times FM_t + RM\ costs + AM\ costs + Controls + Mills + \varepsilon_t \quad (8)$$

$$AM_t = \alpha_0 + \alpha_1 QRR_t + \alpha_2 MRR_t + \alpha_3 QRR_t \times FQ_t + \alpha_4 MRR_t \times FQ_t + \alpha_5 MRR_t \times FM_t + \alpha_6 Unexpected\ RM_t + RM\ costs + AM\ costs + Controls + Mills + \varepsilon_t \quad (9)$$

where *RM* is the three RM measures; *AM* is the unsigned discretionary accruals, negative discretionary accruals and positive discretionary accruals; as illustrated earlier, to the extent that the net effect of the various real activities manipulations on CFO from operations is ambiguous, the aggregated RM only includes *RM\_PROD* and *RM\_DISX*; *Unexpected RM* is measured as the estimated residual from Equation (8);<sup>3</sup> *Controls* is a set of variables influencing RM, AM and overall earnings management as suggested by prior studies (Chiang, Chien, and Shiue 2014; Chan, Chen, Chen, and Yu 2015; Kung, Lin, and Wang 2017; Lin, Yen, and Liu 2023); the definitions of various control variables are shown in Appendix A.

Tables 4 and 5 show the impact of increased reporting frequency on RM and AM. Table 4 presents results using RM measures, while Table 5 uses signed discretionary accruals and separates them into positive and negative accruals. In Table 4, Models (1) to (3) use *RM\_CFO*, *RM\_PROD*, and *RM\_DISX* as dependent variables. We find significantly positive coefficients on *QRR* and *MRR* in Models (1) to (3). This suggests that quarterly and monthly reporting regimes, relative to semi-annual reporting, are related to lower abnormal cash flows, higher production costs, and lower discretionary expenses. Sales management and overproduction reduce cash flows from operations, while discretionary expenses increase them, creating an ambiguous effect on

<sup>3</sup> As illustrated by Zang (2012), the extent of accrual-based earnings management is determined not only by the costs of earnings management activities, but also by the unexpected amount of real activities manipulation realized. It is expected that managers increase (decrease) the extent of accrual-based earnings management when real activities manipulation turns out to be unexpectedly low (high).

**Table 4** The Determinants of RM

Independence variables:		Dependence variables:		
		<i>RM_CFO</i>	<i>RM_PROD</i>	<i>RM_DISX</i>
		Model 1	Model 2	Model 3
<i>Constant</i>	$\alpha_0$	-0.037 (0.005)	-0.049 (0.003)	0.013 (0.059)
<i>QRR</i>	$\alpha_1$	0.069 (0.008)	0.023 (0.005)	0.022 (0.008)
<i>MRR</i>	$\alpha_2$	0.108 (0.000)	0.024 (0.003)	0.019 (0.014)
	$\alpha_1 - \alpha_2$	-0.038 (0.002)	0.001 (0.405)	0.003 (0.578)
<i>QRR</i> × <i>FQ</i>	$\alpha_3$	0.010 (0.038)	0.012 (0.051)	0.010 (0.056)
<i>MRR</i> × <i>FQ</i>	$\alpha_4$	0.029 (0.000)	0.030 (0.000)	0.022 (0.010)
<i>MRR</i> × <i>FM</i>	$\alpha_5$	0.013 (0.025)	0.016 (0.022)	0.017 (0.018)
<i>Proxies for RM costs</i>				
<i>ZSCORE</i>	$\alpha_6$	0.002 (0.000)	0.001 (0.017)	0.002 (0.023)
<i>MS</i>	$\alpha_7$	0.046 (0.014)	0.047 (0.010)	0.061 (0.096)
<i>INS</i>	$\alpha_8$	-0.004 (0.711)	-0.022 (0.070)	-0.010 (0.220)
<i>Proxies for AM costs</i>				
<i>BIG5</i>	$\alpha_9$	0.003 (0.342)	0.001 (0.756)	0.009 (0.005)
<i>CYCLE</i>	$\alpha_{10}$	-0.001 (0.088)	-0.001 (0.004)	-0.001 (0.083)
<i>NOAD</i>	$\alpha_{11}$	0.017 (0.041)	0.008 (0.026)	0.013 (0.023)
<i>Control variables</i>				
<i>ASSET</i>	$\alpha_{12}$	0.004 (0.399)	0.004 (0.455)	0.002 (0.650)
<i>ROA</i>	$\alpha_{13}$	0.115 (0.003)	0.075 (0.010)	-0.207 (0.053)
<i>MB</i>	$\alpha_{14}$	0.002 (0.070)	0.001 (0.372)	-0.001 (0.083)
$\Delta GDP$	$\alpha_{15}$	-0.221 (0.037)	-0.217 (0.089)	-0.251 (0.071)
<i>MILLS</i>	$\alpha_{16}$	0.058 (0.030)	0.049 (0.049)	0.060 (0.015)
<i>EARN</i>	$\alpha_{17}$	-0.010 (0.000)	-0.028 (0.000)	-0.017 (0.000)
<i>N</i>		845	845	845
<i>Adj. R<sup>2</sup></i>		0.070	0.032	0.001

Note. This table presents the estimated coefficients and two-tailed *p*-values for the ordinary least-squares model which examines the association between RM activities and interim reporting frequency, controlling for a set of control variables. The *p*-values are in parentheses. See Appendix A for variable definitions.

**Table 5** The Determinants of AM

Independence variables:		Dependence variables:		
		<i>AM_POS</i>	<i>AM_NEG</i>	<i>AM</i>
		Model 1	Model 2	Model 3
<i>Constant</i>	$\alpha_0$	0.087 (0.038)	-0.070 (0.067)	0.017 (0.037)
<i>QRR</i>	$\alpha_1$	-0.026 (0.001)	0.004 (0.610)	-0.028 (0.057)
<i>MRR</i>	$\alpha_2$	-0.048 (0.000)	0.006 (0.254)	-0.047 (0.004)
	$\alpha_1 - \alpha_2$	0.022 (0.006)	-0.002 (0.217)	0.019 (0.089)
<i>QRR</i> × <i>FQ</i>	$\alpha_3$	-0.018 (0.017)	-0.001 (0.908)	-0.009 (0.059)
<i>MRR</i> × <i>FQ</i>	$\alpha_4$	-0.018 (0.005)	0.006 (0.219)	-0.013 (0.011)
<i>MRR</i> × <i>FM</i>	$\alpha_5$	-0.014 (0.078)	0.002 (0.450)	-0.008 (0.031)
<i>Unexpected RM</i>	$\alpha_6$	-0.058 (0.076)	0.063 (0.059)	-0.082 (0.000)
<i>Proxies for RM costs</i>				
<i>ZSCORE</i>	$\alpha_7$	0.001 (0.349)	-0.001 (0.217)	-0.000 (0.828)
<i>MS</i>	$\alpha_8$	-0.054 (0.107)	0.132 (0.001)	0.039 (0.389)
<i>INS</i>	$\alpha_9$	-0.018 (0.375)	0.012 (0.414)	-0.036 (0.025)
<i>Proxies for AM costs</i>				
<i>BIG5</i>	$\alpha_{10}$	-0.007 (0.395)	0.001 (0.744)	0.004 (0.425)
<i>CYCLE</i>	$\alpha_{11}$	0.000 (0.077)	0.000 (0.000)	-0.000 (0.237)
<i>NOAD</i>	$\alpha_{12}$	0.002 (0.831)	0.014 (0.002)	0.007 (0.255)
<i>Control variables</i>				
<i>ASSET</i>	$\alpha_{13}$	-0.005 (0.750)	-0.023 (0.014)	-0.021 (0.038)
<i>ROA</i>	$\alpha_{14}$	-0.080 (0.140)	0.162 (0.003)	0.118 (0.029)
<i>MB</i>	$\alpha_{15}$	-0.000 (0.745)	-0.001 (0.369)	0.002 (0.268)
$\Delta GDP$	$\alpha_{16}$	-0.216 (0.059)	0.127 (0.173)	-0.044 (0.664)
<i>MILLS</i>	$\alpha_{17}$	-0.127 (0.099)	-0.239 (0.037)	-0.363 (0.000)
<i>Predicted RM</i>	$\alpha_{18}$	0.263 (0.000)	-0.159 (0.000)	0.318 (0.000)
<i>N</i>		387	458	845
<i>Adj. R<sup>2</sup></i>		0.143	0.141	0.019

Note. This table presents the estimated coefficients and two-tailed *p*-values for the ordinary least-squares model which examines the association between AM and interim reporting frequency, controlling for a set of control variables. The *p*-values are in parentheses. See Appendix A for variable definitions.

abnormal CFO.<sup>4</sup> However, increased reporting frequency's negative impact on cash flows from sales management/overproduction outweighs its positive impact from discretionary expenses. Reduced abnormal production costs imply firms manipulate overproduction to meet interim earnings targets, given our sample's manufacturing firms, while reduced abnormal operating expenses indicate manipulation of operating expenditures for the same purpose. These results align with the univariate test results in Table 2, indicating that quarterly and monthly reporting encourage various real activities manipulations for interim earnings/sales boost.

Differences in coefficients between *MRR* and *QRR* are noteworthy, representing variations in RM measures between monthly and quarterly reporting regimes. Significance is observed only in Model (1), indicating that monthly reporting leads to lower abnormal cash flows compared to quarterly reporting. However, in Models (2) and (3), differences are insignificant, suggesting similar levels of abnormal production costs and discretionary expenditures between monthly and quarterly reporting regimes. As abnormal production costs primarily reflect overproduction, our findings imply both monthly and quarterly reporting regimes exhibit similar overproduction tendencies and discretionary operating expenses. Lower abnormal cash flows in monthly reporting suggest a shift towards sales management to meet monthly sales targets for the switch from quarterly to monthly reporting regime.

Overall, the switch from semi-annual reporting to quarterly/monthly reporting prompts firms to employ three real activities manipulations: overproduction, discretionary operating expenditures, and sales management. However, the switch from quarterly to monthly reporting primarily leads to increased sales management, as it aids in meeting monthly sales targets.

Turning to our regression results of estimating Equation (9), we examine positive discretionary accruals (*AM\_POS*), negative discretionary accruals (*AM\_NEG*), and signed discretionary accruals (*AM*) in Models (1) to (3), respectively. In Model (1), both *QRR* and *MRR* coefficients are significantly negative (*p-value* 0.001 and 0.000), with a significant difference between them (0.022, *p-value* 0.006). This suggests that more frequent reporting reduces positive discretionary accruals. In Model (2), *QRR* and *MRR* coefficients are positive but not significant, indicating no association between reporting frequency and negative discretionary accruals. In Model (3), *QRR* and *MRR* coefficients are negatively significant (*p-value* 0.057 and 0.004), with significant differences between them. Therefore, the switches from semi-annual to quarterly/monthly reporting and from quarterly to monthly reporting reduce unsigned accruals. Our findings align with Zang (2012), indicating that RM substitutes for AM and precedes AM. We note negative significance for *Unexpected RM* in Models (1) and (3) and positive significance in Model (2).

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<sup>4</sup> Because *RM\_CFO* is multiplied by -1, high amount of *RM\_CFO* indicates lower cash flows from operation.

In Table 4 (RM equation), coefficients for  $QRR \times FQ$ ,  $QRR \times FQ$ , and  $MRR \times FM$  in Models (1) to (3) are positively significant. In Table 5 (AM equation), Models (1) and (3) show negatively significant coefficients for these variables. These findings indicate that increased reporting frequency-induced RM and the RM-AM tradeoff are more prominent for firm-years with a higher frequency of suspect firm-quarters and suspect firm-months. These results boost confidence in the relationship between increased reporting frequency, heightened RM, and RM substituting for AM. Significant *MILLS* coefficients suggest that firms' decisions to engage in earnings manipulation are not exogenous. Additionally, significant control variables in both RM and AM equations (Tables 4 and 5) generally align with expected signs.

We further regress the aggregated earnings management score (i.e., *Total\_EM*) on *QRR*, *MRR*, and a set of control variables used in Equations (8) and (9). The results in Table 6 show that *QRR* and *MRR* have significantly positive coefficients, with *p*-values of 0.026 and 0.000,

**Table 6** The Determinants of Overall Earnings Management

Independence variables:		Dependence variables: <i>Total_EM</i>	
		Coefficient	<i>p</i> -value
<i>Constant</i>	$\alpha_0$	−0.021	0.080
<i>QRR</i>	$\alpha_1$	0.031	0.026
<i>MRR</i>	$\alpha_2$	0.021	0.000
	$\alpha_1 - \alpha_2$	0.010	0.247
<i>QRR</i> × <i>FQ</i>	$\alpha_3$	0.027	0.028
<i>MRR</i> × <i>FQ</i>	$\alpha_4$	0.031	0.008
<i>MRR</i> × <i>FM</i>	$\alpha_5$	0.014	0.090
<i>Proxies for RM costs</i>			
<i>ZSCORE</i>	$\alpha_6$	−0.001	0.506
<i>MS</i>	$\alpha_7$	0.129	0.058
<i>INS</i>	$\alpha_8$	−0.085	0.006
<i>Proxies for AM costs</i>			
<i>BIG5</i>	$\alpha_9$	0.008	0.483
<i>CYCLE</i>	$\alpha_{10}$	0.000	0.131
<i>NOAD</i>	$\alpha_{11}$	0.019	0.095
<i>Controls variables</i>			
<i>ASSET</i>	$\alpha_{12}$	−0.029	0.108
<i>ROA</i>	$\alpha_{13}$	−0.047	0.618
<i>MB</i>	$\alpha_{14}$	−0.002	0.430
$\Delta GDP$	$\alpha_{15}$	−0.023	0.907
<i>MILLS</i>	$\alpha_{16}$	−0.437	0.000
<i>N</i>		845	
Adj. <i>R</i> <sup>2</sup>		0.033	

Note. This table presents the estimated coefficients and two-tailed *p*-values for the ordinary least-squares model which examines the association between overall earnings management and interim reporting frequency, controlling for a set of control variables. See Appendix A for variable definitions.



respectively. Additionally, as shown in Table 3, we find that the tendency to manage earnings is more pronounced in quarterly and monthly reporting regimes compared to semi-annual reporting. These findings suggest that the increase in RM associated with frequent reporting outweighs the decrease in AM. Since *Total\_EM* excludes *RM\_CFO*, and the switch from quarterly to monthly reporting primarily affects *RM\_CFO*, the difference between the coefficients for MRR and QRR is not statistically significant.

In summary, Tables 4 and 5 confirm H2a that firms prioritize RM over AM when engaging in reporting frequency-induced earnings management. As RM substitutes AM, increased reporting frequency reduces AM throughout the year. However, the overall earnings management increases with higher reporting frequency, indicating that the boost in reporting frequency-induced RM surpasses the decrease in reporting frequency-induced AM.

#### 5.4 The determinants of reporting frequency-induced RM

We estimate the following equation to test H3:

$$RM_t = \alpha_0 + \alpha_1 QRR_t + \alpha_2 MRR_t + \alpha_3 QRR_t \times Incentives_t + \alpha_4 MRR_t \times Incentives_t + RM\ costs + AM\ costs + Controls + Mills + \varepsilon_t \quad (10)$$

where *Incentives* represent a set of dichotomous incentive variables illustrated in Section 4.2.4, and *RM* represents *RM\_CFO*, *RM\_PROD*, and *RM\_DISX*.

Table 7 summarizes Equation (10) results with Panels A, B, and C using *RM\_CFO*, *RM\_PROD*, and *RM\_DISX* as dependent variables, respectively. Notably, across Panels A to C, we observe consistent trends: The coefficients at the intersections of various dichotomous incentive variables (*MTB\_H*, *TINS\_H*, *SEO*) with *QRR* and *MRR* are significantly positive, suggesting that more frequent reporting encourages firms under heightened market pressure to engage in opportunistic RM, aiming to meet interim earnings or sales targets. Further analysis reveals that coefficients at the intersections of dichotomous variables reflecting reliance on implicit claims with stakeholders (*DUD* and *LAB\_H*) and *QRR* and *MRR* are also positively significant, suggesting that firms heavily rely on implicit claims with stakeholders are more inclined to undertake frequency-induced RM, aiming to enhance credibility and reputation among stakeholders. Lastly, coefficients at the intersections of dichotomous variables reflecting information asymmetry (*SRV\_H* and *BS\_H*) and *QRR* and *MRR* are also positively significant, indicating that firms operating in less robust information environments are more likely to engage in frequency-induced RM as a means to signal superior future performance.

We further compare the effects of reporting incentives on RM measures in quarterly and monthly reporting regimes. In Panel A, differences in coefficients between dichotomous incentive

Table 7 The Determinants of Reporting Frequency-Induced RM

Panel A: Abnormal Cash Flow from Operations ( <i>RM_CFO</i> ) as the Dependence Variable.														
Indep. variables:	Incentive = $\frac{MB}{H}$		Incentive = $\frac{TINS}{H}$		Incentive = $\frac{SEO}{H}$		Incentive = $\frac{DUR}{H}$		Incentive = $\frac{LAB}{H}$		Incentive = $\frac{SRV}{H}$		Incentive = $\frac{BS}{H}$	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
<i>QRR</i>	$\alpha_1$	0.068 (0.009)	0.071 (0.006)	0.069 (0.008)	0.069 (0.008)	0.068 (0.009)	0.073 (0.004)	0.072 (0.005)	0.068 (0.009)	0.068 (0.009)	0.073 (0.004)	0.072 (0.005)	0.068 (0.009)	0.068 (0.009)
<i>MRR</i>	$\alpha_2$	0.112 (0.000)	0.109 (0.000)	0.109 (0.000)	0.112 (0.000)	0.105 (0.000)	0.112 (0.000)	0.102 (0.000)	0.105 (0.000)	0.105 (0.000)	0.112 (0.000)	0.102 (0.000)	0.105 (0.000)	0.105 (0.000)
<i>QRR</i> × <i>Incentives</i>	$\alpha_3$	0.035 (0.094)	0.014 (0.099)	0.018 (0.094)	0.024 (0.078)	0.018 (0.088)	0.042 (0.050)	0.030 (0.067)	0.018 (0.088)	0.018 (0.088)	0.042 (0.050)	0.030 (0.067)	0.018 (0.088)	0.018 (0.088)
<i>MRR</i> × <i>Incentives</i>	$\alpha_4$	0.053 (0.000)	0.034 (0.033)	0.041 (0.009)	0.029 (0.048)	0.046 (0.000)	0.047 (0.022)	0.061 (0.000)	0.046 (0.000)	0.046 (0.000)	0.047 (0.022)	0.061 (0.000)	0.046 (0.000)	0.046 (0.000)
	$\alpha_3 - \alpha_4$	-0.018 (0.071)	-0.020 (0.064)	-0.023 (0.056)	-0.005 (0.235)	-0.028 (0.046)	-0.005 (0.271)	-0.031 (0.041)	-0.028 (0.046)	-0.028 (0.046)	-0.005 (0.271)	-0.031 (0.041)	-0.028 (0.046)	-0.028 (0.046)
<i>N</i>		845	845	845	845	845	845	845	845	845	845	845	845	845
Adj. <i>R</i> <sup>2</sup>		0.029	0.029	0.031	0.029	0.034	0.029	0.036	0.034	0.034	0.029	0.036	0.034	0.036
Panel B: Abnormal Production Cost ( <i>RM_PROD</i> ) as the Dependence Variable.														
Indep. variables:	Incentive = $\frac{MB}{H}$		Incentive = $\frac{TINS}{H}$		Incentive = $\frac{SEO}{H}$		Incentive = $\frac{DUR}{H}$		Incentive = $\frac{LAB}{H}$		Incentive = $\frac{SRV}{H}$		Incentive = $\frac{BS}{H}$	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
<i>QRR</i>	$\alpha_1$	0.022 (0.007)	0.024 (0.003)	0.019 (0.013)	0.025 (0.002)	0.017 (0.016)	0.018 (0.016)	0.020 (0.011)	0.017 (0.016)	0.017 (0.016)	0.018 (0.016)	0.020 (0.011)	0.017 (0.016)	0.017 (0.016)
<i>MRR</i>	$\alpha_2$	0.024 (0.003)	0.024 (0.003)	0.028 (0.000)	0.031 (0.000)	0.027 (0.000)	0.020 (0.007)	0.027 (0.000)	0.027 (0.000)	0.027 (0.000)	0.020 (0.007)	0.027 (0.000)	0.027 (0.000)	0.027 (0.000)
<i>QRR</i> × <i>Incentives</i>	$\alpha_3$	0.016 (0.019)	0.013 (0.009)	0.019 (0.045)	0.021 (0.006)	0.018 (0.044)	0.017 (0.038)	0.015 (0.027)	0.018 (0.044)	0.018 (0.044)	0.017 (0.038)	0.015 (0.027)	0.017 (0.038)	0.015 (0.027)

Table 7 The Determinants of Reporting Frequency-Induced RM (continued)

Panel B: Abnormal Production Cost ( <i>RM_PROD</i> ) as the Dependence Variable.									
<i>MRR</i> × <i>Incentives</i>	$\alpha_4$	0.018 (0.015)	0.019 (0.010)	0.013 (0.036)	0.019 (0.012)	0.017 (0.048)	0.021 (0.006)	0.016 (0.020)	
	$\alpha_3 - \alpha_4$	-0.001 (0.925)	-0.006 (0.689)	0.006 (0.684)	0.002 (0.829)	0.001 (0.877)	-0.004 (0.426)	-0.002 (0.804)	
<i>N</i>		845	845	845	845	845	845	845	
Adj. <i>R</i> <sup>2</sup>		0.007	0.007	0.010	0.009	0.009	0.010	0.007	
Panel C: Abnormal Discretionary Expenses ( <i>RM_DISX</i> ) as the Dependence Variable.									
		Incentive = <i>MB_H</i>	Incentive = <i>TINS_H</i>	Incentive = <i>SEO</i>	Incentive = <i>DUR</i>	Incentive = <i>LAB_H</i>	Incentive = <i>SRV_H</i>	Incentive = <i>BS_H</i>	
Indep. variables:		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	
<i>QRR</i>	$\alpha_1$	0.021 (0.023)	0.018 (0.053)	0.016 (0.070)	0.016 (0.065)	0.011 (0.114)	0.008 (0.149)	0.013 (0.101)	
<i>MRR</i>	$\alpha_2$	0.016 (0.044)	0.009 (0.119)	0.012 (0.082)	0.010 (0.104)	0.015 (0.058)	0.011 (0.094)	0.012 (0.084)	
<i>QRR</i> × <i>Incentives</i>	$\alpha_3$	0.023 (0.016)	0.023 (0.008)	0.024 (0.001)	0.034 (0.000)	0.024 (0.001)	0.026 (0.004)	0.024 (0.002)	
<i>MRR</i> × <i>Incentives</i>	$\alpha_4$	0.019 (0.002)	0.018 (0.011)	0.019 (0.006)	0.031 (0.000)	0.019 (0.001)	0.017 (0.025)	0.017 (0.030)	
	$\alpha_3 - \alpha_4$	0.005 (0.596)	0.004 (0.763)	0.006 (0.470)	0.003 (0.802)	0.005 (0.656)	0.008 (0.273)	0.007 (0.311)	
<i>N</i>		845	845	845	845	845	845	845	
Adj. <i>R</i> <sup>2</sup>		0.006	0.005	0.007	0.005	0.007	0.009	0.006	

Note. This table presents the estimated coefficients and two-tailed  $p$ -values for the ordinary least-squares model which examines the association between RM activities, interim reporting frequency, and RM incentives, controlling for a set of control variables used in Equations (8). The  $p$ -values are in parentheses. All regressions include the constant and the control variables. See Appendix A for variable definitions.

variables and MRR, versus those with QRR, are significantly positive, except for *DUR* and *SRV\_H*. Panels B and C show no significant differences. This suggests that monthly sales disclosures' impact on reducing abnormal cash flows from operations is more pronounced in monthly reporting for firms facing strong market pressure, relying on implicit stakeholder claims, and operating in less transparent information environments.

In summary, our study contributes evidence of cross-sectional differences in motivations for RM to meet interim earnings or sales targets. Specifically, we identify that the three distinct forms of real activities manipulation—sales manipulation, overproduction, and discretionary expenditure reduction—resulting from the switch from semi-annual reporting to quarterly/monthly reporting, are more pronounced among firms facing heightened market pressures, relying significantly on implicit claims with stakeholders, and operating within less robust information environments. Furthermore, considering that monthly sales targets are only relevant within the monthly reporting framework, the switch from quarterly regime to monthly reporting regime predominantly leads to sales management, as opposed to overproduction or discretionary expenditure reduction. We discern that such sales management is more pronounced for the firms exhibiting greater incentives to engage in RM.

## 5.5 The relation between RM and future performance for different firm characteristics

As illustrated in H4, the future implications of reporting frequency-induced RM vary depending on managers' incentives for RM. We address this issue and test H4a, H4b and H4c by estimating the following equation:

$$Performance_{t+j} = \alpha_0 + \alpha_1 RM_t + \alpha_2 RM_t \times QRR_t + \alpha_3 RM_t \times MRR_t + \alpha_4 RM_t \times QRR_t \times Incentives_t + \alpha_5 RM_t \times MRR_t \times Incentives_t + Controls + \varepsilon_{t+j} \quad (11)$$

where *RM* represents the three RM measures; the dependent variables; (*Performance<sub>t+j</sub>*) indicate a firm's industry-adjusted stock returns (*ARET<sub>t+j</sub>*) and the change in the firm's industry-adjusted change in ROA (*ΔROA<sub>t+j</sub>*), where *j*=1 to 3; *Incentives* are the various incentive indicator variables; the control variables including *ΔSIZE*, *ΔMB*, and *ΔLEV* are defined in appendix A.

The coefficient  $\alpha_1$  represents real abnormal activities' impact on future performance in semi-annual reporting. In quarterly (monthly) reporting, it is  $\alpha_1 + \alpha_2$  ( $\alpha_1 + \alpha_3$ ). Moreover,  $\alpha_1 + \alpha_2 + \alpha_4$  ( $\alpha_1 + \alpha_3 + \alpha_5$ ) reflects real abnormal activities' effect on future performance in quarterly (monthly) reporting, particularly for firms with stronger incentives for manipulation.

For brevity, we present results only for year *t*+1 with relevant coefficients. Year *t*+2 and *t*+3 findings align with *t*+1. In Table 8, Panels A, B, C use *RM\_CFO*, *RM\_PROD*, *RM\_DISX*

respectively. Models (1) to (7) use industry-adjusted stock return, while Models (8) to (14) use change in industry-adjusted ROA. The un-interacted RM coefficient  $\alpha_1$  may capture managerial actions unrelated to reporting frequency and incentives.

Table 8 shows that in Panels A to C, many coefficients for *RM\_CFO*, *RM\_PROD*, and *RM\_DISX* are significantly negative. This indicates that firms engaging in real activities manipulation without targeting quarterly or monthly goals experience future financial performance declines. In all models,  $\alpha_2$  and  $\alpha_3$  are insignificant. The combined effect of opportunistic and performance/signaling incentives on reporting frequency-induced RM's future performance impact (i.e.,  $\alpha_2$  and  $\alpha_3$ ) remains unclear. This intricacy renders the coefficients at the intersections of RM and *QRR* (*MRR*) insignificant.

We expand our analyses to examine how different earnings management incentives affect the relationship between RM and future performance.  $\alpha_4$  and  $\alpha_5$  are of particular interest, as they show the added impact of various RM incentives on the outcomes of reporting frequency-induced RM on future performance.

First, we examine opportunistic earnings management incentives, measured by growth opportunity (*MB\_H*), transient institutional ownership (*TINS\_H*), and seasoned equity offerings (*SEO*). Our analysis yields significant results. Using these incentive measures,  $\alpha_4$  and  $\alpha_5$  in Panels A to C are consistently significantly negative, as are  $\alpha_1 + \alpha_2 + \alpha_4$  and  $\alpha_1 + \alpha_3 + \alpha_5$  in Panels A to C.

We also examine performance and signaling earnings management incentives, using *DUR* and *LAB\_H* for performance and *SRV\_H* and *BS\_H* for signaling. Across Panels A to C,  $\alpha_4$  and  $\alpha_5$  are consistently significantly positive. Similarly,  $\alpha_1 + \alpha_2 + \alpha_4$  and  $\alpha_1 + \alpha_3 + \alpha_5$  are significantly positive across Panels A to C. Aligned with H4b and H4c, these results indicate that reporting frequency-induced RM stemming from performance and signaling earnings management incentives contributes to an improvement in future performance. Regarding the difference in future performance implications of RM between monthly and quarterly reporting regimes,  $(\alpha_3 + \alpha_5) - (\alpha_2 + \alpha_4)$  is notable. It is significant only in Panel A, where *RM\_CFO* is used. In Panel A, it is significantly negative for Models (1) to (3) and Models (8) to (10) related to opportunistic incentives (*MTB\_H*, *TINS\_H*, *SEO*), and significantly positive for Models (4) to (7) and Models (11), (13), and (14) related to performance/signaling incentives (*DUD*, *SRV\_H*, *BS\_H*). However, Panels B and C do not show significant differences.<sup>5</sup>

<sup>5</sup> For confirming the robustness of our findings and facilitating comparing with the results of Gunny (2010), we also use the indicator RM variables (i.e., *RM\_CFO\_D*, *RM\_PROD\_D*, and *RM\_DISX\_D*) to replace the three RM measures (i.e., *RM\_CFO*, *RM\_PROD*, and *RM\_DISX*) and re-estimate Equation (11), whereas *RM\_CFO\_D* (*RM\_PROD\_D* and *RM\_DISX\_D*) equals 1 if *RM\_CFO* (*RM\_PROD* and *RM\_DISX*) is in the highest quintile, and 0 otherwise. The empirically untabulated results are similar to those in Table 8.

**Table 8** The Relation between Frequency-induced RM and Future Financial Performance for Different Firm Characteristics

Panel A: Abnormal Cash Flow from Operations ( $RM\_CFO$ ) as the Measure of Frequency-Induced RM		Dependence variables: $ARET_{t+1}$						
Indep. variables:		Incentive = $MB\_H$	Incentive = $TINS\_H$	Incentive = $SEO$	Incentive = $DUR$	Incentive = $LAB\_H$	Incentive = $SRV\_H$	Incentive = $BS\_H$
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
$RM$	$\alpha_1$	-0.202 (0.000)	-0.205 (0.000)	-0.205 (0.000)	-0.200 (0.000)	-0.195 (0.000)	-0.201 (0.000)	-0.197 (0.000)
$RM \times QRR$	$\alpha_2$	-0.001 (0.982)	-0.024 (0.762)	-0.015 (0.793)	-0.061 (0.327)	0.013 (0.858)	-0.054 (0.453)	-0.041 (0.599)
$RM \times MRR$	$\alpha_3$	-0.049 (0.354)	-0.046 (0.260)	-0.020 (0.616)	-0.029 (0.479)	-0.004 (0.923)	0.007 (0.872)	-0.038 (0.359)
$RM \times QRR \times Incentives$	$\alpha_4$	-0.304 (0.000)	-0.367 (0.000)	-0.452 (0.000)	0.397 (0.000)	0.244 (0.000)	0.349 (0.000)	0.312 (0.000)
$RM \times MRR \times Incentives$	$\alpha_5$	-0.385 (0.000)	-0.509 (0.000)	-0.936 (0.000)	0.472 (0.000)	0.323 (0.000)	0.425 (0.000)	0.706 (0.000)
	$\alpha_1 + \alpha_2 + \alpha_4$	-0.507 (0.000)	-0.596 (0.000)	-0.672 (0.000)	0.136 (0.024)	0.062 (0.091)	0.094 (0.063)	0.074 (0.080)
	$\alpha_1 + \alpha_3 + \alpha_5$	-0.636 (0.000)	-0.760 (0.000)	-1.161 (0.000)	0.243 (0.000)	0.124 (0.023)	0.231 (0.000)	0.471 (0.000)
	$(\alpha_3 + \alpha_5) -$	-0.129	-0.164	-0.489	0.107	0.062	0.137	0.397
	$(\alpha_2 + \alpha_4)$	(0.046)	(0.016)	(0.000)	(0.056)	(0.097)	(0.044)	(0.000)
$N$		845	845	845	845	845	845	845
Adj. $R^2$		0.022	0.027	0.021	0.026	0.019	0.021	0.022

(continued)



**Table 8 The Relation between Frequency-induced RM and Future Financial Performance for Different Firm Characteristics (continued)**

Panel A: Abnormal Cash Flow from Operations ( $RM\_CFO$ ) as the Measure of Frequency-Induced RM		Dependence variables: $\Delta ROA_{t+1}$						
Indep. variables:		Incentive= $MB\_H$ Model 8	Incentive= $TINS\_H$ Model 9	Incentive= $SEO$ Model 10	Incentive= $DUR$ Model 11	Incentive= $LAB\_H$ Model 12	Incentive= $SRV\_H$ Model 13	Incentive= $BS\_H$ Model 14
$RM$	$\alpha_1$	-0.130 (0.050)	-0.126 (0.054)	-0.125 (0.054)	-0.127 (0.052)	-0.132 (0.048)	-0.130 (0.050)	-0.131 (0.048)
$RM \times QRR$	$\alpha_2$	-0.018 (0.568)	-0.058 (0.191)	-0.043 (0.161)	-0.033 (0.341)	0.012 (0.761)	-0.022 (0.578)	0.015 (0.741)
$RM \times MRR$	$\alpha_3$	-0.049 (0.101)	-0.022 (0.351)	-0.024 (0.288)	-0.017 (0.468)	-0.021 (0.383)	-0.017 (0.495)	-0.029 (0.224)
$RM \times QRR \times Incentives$	$\alpha_4$	-0.252 (0.019)	-0.284 (0.000)	-0.232 (0.038)	0.223 (0.046)	0.183 (0.082)	0.199 (0.068)	0.166 (0.097)
$RM \times MRR \times Incentives$	$\alpha_5$	-0.331 (0.000)	-0.475 (0.000)	-0.364 (0.000)	0.288 (0.000)	0.241 (0.029)	0.291 (0.000)	0.301 (0.000)
	$\alpha_1 + \alpha_2 + \alpha_4$	-0.400 (0.000)	-0.468 (0.000)	-0.400 (0.000)	0.063 (0.090)	0.063 (0.090)	0.047 (0.047)	0.050 (0.072)
	$\alpha_1 + \alpha_3 + \alpha_5$	-0.510 (0.000)	-0.623 (0.000)	-0.513 (0.000)	0.144 (0.028)	0.088 (0.051)	0.144 (0.000)	0.141 (0.000)
	$(\alpha_3 + \alpha_5) -$	-0.110	-0.155	-0.113	0.081	0.025	0.097	0.091
	$(\alpha_2 + \alpha_4)$	(0.054)	(0.000)	(0.033)	(0.071)	(0.222)	(0.050)	(0.046)
$N$		845	845	845	845	845	845	845
Adj. $R^2$		0.052	0.051	0.060	0.050	0.051	0.050	0.053

(continued)

Table 8 The Relation between Frequency-induced RM and Future Financial Performance for Different Firm Characteristics (continued)

Panel B: Abnormal Production Cost ( $RM\_PROD$ ) as the Measure of Frequency-Induced RM		Dependence variables: $ARET_{t+1}$						
Indep. variables:		Incentive = $MB\_H$	Incentive = $TINS\_H$	Incentive = $SEO$	Incentive = $DUR$	Incentive = $LAB\_H$	Incentive = $SRV\_H$	Incentive = $BS\_H$
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
$RM$	$\alpha_1$	-0.203 (0.000)	-0.305 (0.000)	-0.242 (0.000)	-0.136 (0.054)	-0.414 (0.000)	-0.322 (0.000)	-0.369 (0.000)
$RM \times QRR$	$\alpha_2$	-0.013 (0.907)	-0.016 (0.885)	-0.017 (0.877)	-0.014 (0.900)	-0.023 (0.833)	-0.015 (0.888)	-0.024 (0.825)
$RM \times MRR$	$\alpha_3$	-0.030 (0.456)	-0.024 (0.559)	-0.037 (0.357)	-0.016 (0.708)	0.009 (0.827)	-0.023 (0.579)	0.006 (0.895)
$RM \times QRR \times Incentives$	$\alpha_4$	-0.320 (0.000)	-0.337 (0.000)	-0.502 (0.000)	0.448 (0.000)	0.570 (0.000)	0.485 (0.000)	0.470 (0.000)
$RM \times MRR \times Incentives$	$\alpha_5$	-0.307 (0.000)	-0.339 (0.000)	-0.544 (0.000)	0.429 (0.000)	0.554 (0.000)	0.493 (0.000)	0.450 (0.000)
	$\alpha_1 + \alpha_2 + \alpha_4$	-0.536 (0.000)	-0.658 (0.000)	-0.761 (0.000)	0.298 (0.000)	0.133 (0.027)	0.148 (0.014)	0.077 (0.078)
	$\alpha_1 + \alpha_3 + \alpha_5$	-0.540 (0.000)	-0.668 (0.000)	-0.823 (0.000)	0.277 (0.000)	0.149 (0.032)	0.148 (0.006)	0.087 (0.062)
	$(\alpha_3 + \alpha_5) -$	-0.004	-0.010	-0.062	-0.021	0.016	0.000	0.010
	$(\alpha_2 + \alpha_4)$	(0.957)	(0.887)	(0.196)	(0.596)	(0.678)	(0.991)	(0.920)
$N$		845	845	845	845	845	845	845
Adj. $R^2$		0.027	0.028	0.029	0.029	0.034	0.028	0.032

(continued)

Table 8 The Relation between Frequency-induced RM and Future Financial Performance for Different Firm Characteristics (continued)

Panel B: Abnormal Production Cost ( $RM\_PROD$ ) as the Measure of Frequency-Induced RM									
Dependence variables: $\Delta ROA_{t+1}$									
Indep. variables:	Incentive = $MTB\_H$	Incentive = $TINS\_H$	Incentive = $SEO$	Incentive = $DUR$	Incentive = $LAB\_H$	Incentive = $SRV\_H$	Incentive = $BS\_H$		
	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14		
$RM$	$\alpha_1$	-0.266 (0.000)	-0.129 (0.149)	-0.150 (0.022)	-0.145 (0.024)	-0.367 (0.000)	-0.184 (0.016)		
$RM \times QRR$	$\alpha_2$	-0.030 (0.684)	-0.020 (0.782)	-0.024 (0.749)	-0.021 (0.778)	-0.032 (0.668)	-0.022 (0.765)		
$RM \times MRR$	$\alpha_3$	-0.015 (0.571)	-0.011 (0.700)	-0.000 (0.994)	-0.017 (0.555)	-0.023 (0.411)	-0.022 (0.452)		
$RM \times QRR \times Incentives$	$\alpha_4$	-0.501 (0.000)	-0.337 (0.000)	0.322 (0.000)	0.398 (0.000)	0.593 (0.000)	0.458 (0.000)		
$RM \times MRR \times Incentives$	$\alpha_5$	-0.483 (0.000)	-0.373 (0.000)	0.348 (0.000)	0.427 (0.000)	0.638 (0.000)	0.437 (0.000)		
	$\alpha_1 + \alpha_2 + \alpha_4$	-0.797 (0.000)	-0.486 (0.000)	0.148 (0.014)	0.232 (0.000)	0.194 (0.000)	0.252 (0.000)		
	$\alpha_1 + \alpha_3 + \alpha_5$	-0.764 (0.000)	-0.513 (0.000)	0.198 (0.000)	0.265 (0.000)	0.248 (0.000)	0.231 (0.000)		
	$(\alpha_3 + \alpha_5) -$	-0.036 (0.274)	-0.027 (0.522)	0.050 (0.284)	0.033 (0.440)	0.054 (0.210)	-0.021 (0.627)		
$N$	845	845	845	845	845	845	845		
Adj. $R^2$	0.051	0.052	0.050	0.051	0.053	0.052	0.051		

(continued)

**Table 8 The Relation between Frequency-induced RM and Future Financial Performance for Different Firm Characteristics (continued)**

Panel C: Abnormal Discretionary Expenses ( $RM\_DISX$ ) as the Measure of Frequency-Induced RM		Dependence variables: $RET_{t+1}$						
		Incentive = $MB\_H$	Incentive = $TINS\_H$	Incentive = $SEO$	Incentive = $DUR$	Incentive = $LAB\_H$	Incentive = $SRV\_H$	Incentive = $BS\_H$
Indep. variables:		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
$RM$	$\alpha_1$	-0.328 (0.000)	-0.187 (0.039)	-0.108 (0.119)	-0.142 (0.087)	-0.264 (0.000)	-0.138 (0.090)	-0.239 (0.000)
$RM \times QRR$	$\alpha_2$	0.002 (0.999)	0.015 (0.989)	0.022 (0.984)	-0.007 (0.995)	0.020 (0.985)	0.039 (0.971)	-0.023 (0.983)
$RM \times MRR$	$\alpha_3$	-0.044 (0.269)	-0.044 (0.269)	-0.045 (0.253)	-0.043 (0.276)	-0.044 (0.272)	-0.043 (0.275)	-0.044 (0.273)
$RM \times QRR \times Incentives$	$\alpha_4$	-0.539 (0.000)	-0.350 (0.000)	-0.268 (0.000)	0.231 (0.030)	0.532 (0.000)	0.281 (0.001)	0.465 (0.000)
$RM \times MRR \times Incentives$	$\alpha_5$	-0.507 (0.000)	-0.357 (0.000)	-0.246 (0.000)	0.244 (0.022)	0.552 (0.000)	0.316 (0.000)	0.455 (0.000)
	$\alpha_1 + \alpha_2 + \alpha_4$	-0.865 (0.000)	-0.522 (0.000)	-0.354 (0.000)	0.082 (0.073)	0.288 (0.000)	0.182 (0.000)	0.203 (0.000)
	$\alpha_1 + \alpha_3 + \alpha_5$	-0.879 (0.000)	-0.588 (0.000)	-0.399 (0.000)	0.059 (0.098)	0.244 (0.000)	0.135 (0.000)	0.172 (0.000)
	$(\alpha_3 + \alpha_5) -$ $(\alpha_2 + \alpha_4)$	-0.014 (0.930)	-0.066 (0.132)	-0.045 (0.299)	-0.023 (0.427)	-0.044 (0.290)	-0.047 (0.296)	-0.031 (0.280)
$N$		845	845	845	845	845	845	845
Adj. $R^2$		0.023	0.019	0.021	0.020	0.019	0.019	0.019

(continued)

Table 8 The Relation between Frequency-induced RM and Future Financial Performance for Different Firm Characteristics (continued)

Panel C: Abnormal Discretionary Expenses ( $RM\_DISX$ ) as the Measure of Frequency-Induced RM		Dependence variables: $\Delta ROA_{t+1}$						
Indep. variables:		Incentive = $MB\_H$	Incentive = $TINS\_H$	Incentive = $SEO$	Incentive = $DUR$	Incentive = $LAB\_H$	Incentive = $SRV\_H$	Incentive = $BS\_H$
		Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
$RM$	$\alpha_1$	-0.113 (0.000)	-0.108 (0.000)	-0.074 (0.078)	-0.104 (0.000)	-0.109 (0.000)	-0.063 (0.109)	-0.114 (0.000)
$RM \times QRR$	$\alpha_2$	-0.016 (0.822)	-0.016 (0.827)	-0.017 (0.820)	-0.017 (0.816)	-0.015 (0.840)	-0.015 (0.834)	-0.013 (0.864)
$RM \times MRR$	$\alpha_3$	-0.014 (0.599)	-0.015 (0.568)	-0.014 (0.614)	-0.018 (0.501)	-0.014 (0.603)	-0.015 (0.574)	-0.015 (0.567)
$RM \times QRR \times Incentives$	$\alpha_4$	-0.226 (0.000)	-0.214 (0.000)	-0.175 (0.000)	0.226 (0.000)	0.186 (0.000)	0.160 (0.000)	0.229 (0.000)
$RM \times MRR \times Incentives$	$\alpha_5$	-0.220 (0.000)	-0.197 (0.000)	-0.169 (0.000)	0.206 (0.006)	0.224 (0.000)	0.155 (0.008)	0.220 (0.000)
	$\alpha_1 + \alpha_2 + \alpha_4$	-0.355 (0.000)	-0.338 (0.000)	-0.266 (0.000)	0.105 (0.052)	0.062 (0.091)	0.082 (0.073)	0.102 (0.055)
	$\alpha_1 + \alpha_3 + \alpha_5$	-0.347 (0.000)	-0.320 (0.000)	-0.257 (0.000)	0.084 (0.071)	0.101 (0.056)	0.077 (0.077)	0.091 (0.064)
	$(\alpha_3 + \alpha_5) -$	0.008	0.018	0.009	-0.021	0.039	-0.005	-0.011
	$(\alpha_2 + \alpha_4)$	(0.651)	(0.653)	(0.663)	(0.614)	(0.346)	(0.884)	(0.608)
$N$		845	845	845	845	845	845	845
Adj. $R^2$		0.053	0.052	0.050	0.053	0.051	0.050	0.052

Note. This table presents the estimated coefficients and two-tailed p-values for the ordinary least-squares model which examines the association between frequency-induced RM, RM incentives and future firm performance, controlling for a set of control variables. The p-values are in parentheses. All regressions include the constant and the control variables. See Appendix A for other variable definitions.

In summary, our study provides evidence that firms engage in reporting frequency-induced RM for different motivations, such as opportunistic, performance, and signaling intentions. Opportunistic RM is associated with a decline in future performance, while RM driven by performance or signaling objectives tends to improve subsequent performance.

## 6. Conclusion

This study investigates the influence of increased reporting frequency on earnings management and the preference for either AM or RM. Given the expectation of increased regulatory and auditor scrutiny on interim accrual management, we anticipate firms favoring RM over AM for meeting interim financial objectives. Additionally, we analyze the impact of different reporting incentives on the extent of reporting frequency-induced RM and its consequences for future financial performance.

We utilize a sample of listed firms in Taiwan to test our hypotheses. Taiwan stands out as the only country mandating monthly sales revenue reporting, offering a distinctive opportunity to investigate the economic outcomes of increased reporting frequency within the context of the monthly reporting regime. We categorize Taiwan's reporting history into three sub-regimes: the semi-annual reporting regime from 1983 to 1985, the quarterly reporting regime from 1986 to 1987, and the monthly reporting regime from 1988 to 1992.

Using data from Taiwan spanning 1983 to 1992, our findings reveal that firms are more inclined to manipulate earnings when reporting frequency increases. When firms opt for earnings management, they favor RM over AM. Furthermore, higher reporting frequency corresponds to greater RM and reduced AM, indicating a shift from AM to RM with more frequent reporting. Given that the increase in RM outweighs the decrease in AM stemming from increased reporting frequency, overall earnings management levels rise as reporting frequency increases.

We further investigate specific firm characteristics that are expected to provide stronger incentives for reporting frequency-induced RM. We analyze the relationship between these characteristics and the future performance effects of reporting frequency-induced RM. Our findings reveal that firms under greater market pressure, heavily reliant on implicit stakeholder claims, and operating in less transparent information environments are more incentivized to engage in RM to meet interim earnings or sales targets, making them more likely to partake in frequency-induced RM.

Previous research on the relationship between RM and subsequent financial performance has yielded conflicting findings. Our results contribute to clarifying these discrepancies by emphasizing the influence of firms' incentives for reporting frequency-induced RM on the relationship between RM and future financial performance. Specifically, we observe that a

firm's future financial performance is negatively related to reporting frequency-induced RM for opportunistic purposes (i.e., when facing increased market pressure), while it is positively related to reporting frequency-induced RM for performance/signaling purposes (i.e., when relying more on implicit stakeholder claims and operating in less transparent information environments).

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**Appendix A Variable Definitions**

Variable	Measurement
<i>Proxies for real earnings management (RM)</i>	
<i>RM_CFO</i>	abnormal cash flow from operations.
<i>RM_PROD</i>	abnormal production cost.
<i>RM_DISX</i>	abnormal discretionary expenses.
<i>Total_RM</i>	the first measure of the total amount of real transactions management, computed as the sum of <i>RM_PROD</i> and <i>RM_DISX</i> .
<i>Unexpected RM</i>	the estimated residual from Equation (8).
<i>Proxies for accrual-based earnings management (AM)</i>	
<i>AM_POS</i>	the value of positive performance-adjusted discretionary accruals.
<i>AM_NEG</i>	the value of negative performance-adjusted discretionary accruals.
<i>AM</i>	performance-adjusted discretionary accruals.
<i>Proxies for overall earnings management</i>	
<i>Total_EM</i>	total earnings management, which is the sum of <i>RM_PROD</i> , <i>RM_DISX</i> , and <i>AM</i> .
<i>The tendency to engage in earnings management</i>	
<i>EMTEND</i>	an indicator variable with a value of 1 if either of the three RM measures ( <i>RM_CFO</i> , <i>RM_PROD</i> , and <i>RM_DISX</i> ) or discretionary accruals ( <i>AM</i> ) is above the industry-year median.
<i>Proxies for the three reporting regimes</i>	
<i>SRR</i>	an indicator variable with a value of 1 for semiannually earnings firm-years over the period 1988–1992 for cross-sectional tests and zero otherwise.
<i>QRR</i>	an indicator variable with a value of 1 for voluntary quarterly earnings firm-years over the period 1986–1987 for cross-sectional tests and zero otherwise
<i>MRR</i>	an indicator variable with a value of 1 for monthly revenue firm-years over the period 1988–1992 for cross-sectional tests and zero otherwise.
<i>Proxies for the frequency of suspect firm-quarters and suspect firm-months</i>	
<i>FQ</i>	if (a) the quarterly net income divided by $t-1$ total assets is greater than or equal to 0 but less than 0.01, or (b) the difference between the current quarter's net income and the correspondent quarter for the previous year divided by total assets of the last quarter is greater than 0 but less than 0.01, the correspondent firm-quarter is defined as suspect firm-quarter.
<i>FM</i>	if the difference between the current month's sales revenues and the correspondent sales revenue of the previous year divided by the beginning total assets of the last quarter is greater than or equal to 0 but less than 0.01, the correspondent firm-month is defined as suspect firm-month.

(continued)

**Appendix A Variable Definitions (continued)**

Variable	Measurement
<i>Proxies for the Incentives of RM</i>	
<i>SEO</i>	an indicator variable that equals 1 if the firm issues equity during the year.
<i>MB_H</i>	an indicator variable that equals 1 if market-to-book ratio is above industry median and zero otherwise.
<i>TINS</i>	the percentage of transient institution ownership.
<i>TINS_H</i>	an indicator variable that equals 1 if transient institution ownership is above industry-year median and zero otherwise.
<i>DUR</i>	an indicator variable that equals 1 if the firms belong to the durable goods industries and zero otherwise.
<i>LAB</i>	1 minus the ratio of gross property, plant, and equipment to total assets.
<i>LAB_H</i>	an indicator variable that equals 1 if labor intensity is above industry-year median and zero otherwise.
<i>Proxies for information asymmetry</i>	
<i>SRV</i>	the residual standard deviation in the market-adjusted daily stock returns in the year.
<i>SRV_H</i>	an indicator variable that equals 1 if the yearly dispersion of the market-adjusted daily stock returns is above industry median and zero otherwise.
<i>BS</i>	the yearly median of daily quoted spreads.
<i>BS_H</i>	an indicator variable that equals 1 if the yearly median of daily quoted spreads is above industry median and zero otherwise.
<i>Controls for EMTEND</i>	
<i>MVE</i>	the natural log of market value.
<i>MB</i>	the market-to-book ratio.
<i>LEV</i>	long-term liabilities divided by total assets.
<i>SHARE</i>	the log number of shares outstanding.
<i>ROA</i>	the return on assets.
<i>Proxies for RM costs</i>	
<i>ZSCORE</i>	decile of Altman's Z-score.
<i>MS</i>	the percentage of the company's sales to the total sales of its industry
<i>INS</i>	the percentage of institutional ownership.

**Appendix A Variable Definitions (continued)**

Variable	Measurement
<i>Proxies for AM costs</i>	
<i>BIG5</i>	an indicator variable that equals 1 if the firm's auditor is one of the Big 5, and 0 otherwise
<i>CYCLE</i>	the days receivable plus the days inventory less the days payable at the beginning of the year.
<i>NOAD</i>	an indicator variable that equals 1 if the net operating assets (i.e., shareholders' equity less cash and marketable securities and plus total debt at the beginning of the year divided by lagged sales) is above the median of the corresponding industry-year, and 0 otherwise.
<i>Controls for AM, RM, and Total_EM</i>	
<i>SIZE</i>	the natural log of total assets.
<i>ROA</i>	the return on assets.
<i>MB</i>	the market-to-book ratio.
$\Delta GDP$	one-year GDP growth.
<i>MILLS</i>	the inverse Mills ratio from the Probit regression (Model 6).
<i>Control variable only for RM</i>	
<i>EARN</i>	the earnings before extraordinary items scaled by lagged total assets minus discretionary accruals and production costs, plus discretionary expenditures.
<i>Control variable only for AM</i>	
<i>Predicted RM</i>	predicted value from Equation (8).
<i>Proxies for firm performance</i>	
$\Delta ROA$	the industry-adjusted change in ROA.
<i>ARET</i>	the industry-adjusted stock return.
<i>Controls for firm performance</i>	
$\Delta SIZE$	change in firm size (as measured by total assets).
$\Delta MB$	change in the firm's market-to-book ratio.
$\Delta LEV$	change in the firm's leverage ratio.

## 財務報導頻率、盈餘管理動機與經濟後果

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投稿日期：2023 年 8 月 4 日；2 審後接受，接受日期：2023 年 9 月 25 日

### 摘 要

本文主要探討增加財報頻率對於盈餘管理、應計及真實盈餘管理的影響。以 1983 至 1992 年間，財報頻率自半年報演變為季報與月報的歷史情境為研究背景。我們發現財報頻率與盈餘管理活動呈正向關係。進一步證據顯示財報頻率的增加，使得公司更傾向運用真實盈餘管理，而非應計盈餘管理。真實盈餘管理的運用，可能與公司特徵，以及其所傳達的未來公司盈利能力資訊有關。本文證實當公司面臨較強資本市場壓力、試圖符合利害關係人內隱要求 (implicit claims)，以及位處較差資訊環境，更有可能因較高的財報頻率，運用更多的真實盈餘管理。資本市場壓力下的真實盈餘管理，隱含不利未來績效；迎合利害關係人需求，以及較差資訊環境下的真實盈餘管理，則傳達較佳未來績效。

**關鍵詞：**財務報導頻率、應計盈餘管理、真實盈餘管理、公司績效

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作者感謝領域主編以及兩位匿名評審委員之寶貴意見，文中言論由作者自行負責。

數據可用性：本文使用的數據可從公開資料來源取得。



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## 1. 研究議題

以 1983 至 1992 年間，台灣上市公司財務報導揭露頻率之變化作為研究背景，我們將樣本期間區分為三個時期：半年報、季報與月報。本文調查財務報導揭露頻率增加對於盈餘管理的影響，以及其對於應計與真實盈餘管理間選擇的影響。另外，我們調查公司特徵對於真實盈餘管理的影響，以及其對於真實盈餘管理與未來績效間關聯性的影響。我們測試的公司特徵包含：資本市場壓力、利害關係人內隱要求 (implicit claims) 與資訊環境。

## 2. 研究假說

管理階層的短視投資行為，與財務報導揭露頻率增加所帶來的資本市場壓力，使得公司有更強的盈餘管理傾向。我們建立假說如下：

**H1：財務報導揭露頻率增加，使公司盈餘管理程度提高。**

基於以下理由，我們提出財務報導揭露頻率增加，使經理人更偏好真實盈餘管理，而非應計盈餘管理。第一，過去文獻指出，管理階層的短視投資行為與資本市場壓力，都是真實盈餘管理程度提高之原因。而應計盈餘管理主要僅與資本市場壓力有關。第二，一般公認會計原則主要限制應計盈餘管理，且賦予應計項目在後續期間迴轉之效果。第三，應計盈餘管理之運用，相較於真實盈餘管理，更容易受限於主管機關與審計人員之干預。我們建立假說如下：

**H2：財務報導揭露頻率增加，將使公司更傾向於真實盈餘管理，而非應計盈餘管理。**

Bhojraj and Libby (2005) 指出揭露頻率提升市場壓力，增加了經理人的短視行為。公司如果未達成盈餘門檻目標，股價在市場將受到減損。財務報導揭露頻率增加，使得公司更頻繁的遭受市場檢視，經理人而有較強動機透過真實盈餘管理，達成短期財務目標。我們建立假說如下：

**H3a：財務報導揭露頻率增加，使面臨較強資本市場壓力（具投機動機）之公司，提升其真實盈餘管理水準。**

DuCharme and Shores (1995) 提出公司的財務績效表現，會影響利害關係人對於公司履行隱含義務能力之評價。Matsumoto (2002) 提出重視利害關係人隱性承諾的公司，更傾向於盈餘平穩化，從而增強利害關係人對其之信任。我們建立假說如下：



**H3b：**財務報導揭露頻率增加，使重視利害關係人內隱要求（具績效動機）之公司，提升其真實盈餘管理水準。

資訊環境較差之公司，有較強之資訊不對稱。為提升公司存續合法性，經理人可能透過真實盈餘管理，傳達其私有資訊 (Beyer et al. 2018)。我們建立假說如下：

**H3c：**財務報導揭露頻率增加，使資訊環境較差（具訊號動機）之公司，提升其真實盈餘管理水準。

假說 H3 考慮了三種盈餘管理動機，分別對於財務報導揭露頻率與真實盈餘管理間關聯性之影響。我們進一步提出當基於投機動機，運用真實盈餘管理，將使公司價值下降。當基於績效或訊號動機，運用真實盈餘管理，將使公司價值提升。我們建立假說如下：

**H4a：**財務報導揭露頻率增加，使面臨較強資本市場壓力（具投機動機）之公司，其真實盈餘管理程度與未來績效表現呈負相關。

**H4b：**財務報導揭露頻率增加，使重視利害關係人內隱要求（具績效動機）之公司，其真實盈餘管理程度與未來績效表現呈正相關。

**H4c：**財務報導揭露頻率增加，使資訊環境較差（具訊號動機）之公司，其真實盈餘管理程度與未來績效表現呈正相關。

### 3. 研究方法

我們運用下列模型檢測假說 H1：

$$\begin{aligned} \text{Probit } (EM_t = 1) = & \alpha_0 + \alpha_1 QRR_t + \alpha_2 MRR_t + \alpha_3 QRR_t \times FQ_t + \alpha_4 MRR_t \times FQ_t + \\ & \alpha_5 MRR_t \times FM_t + \text{Controls} + \varepsilon_t \end{aligned} \quad (7)$$

其中，應變數 ( $EM$ ) 為虛擬變數，當公司之真實盈餘管理衡量變數 ( $RM\_CFO$ ,  $RM\_PROD$ ,  $RM\_DISX$ ) 或應計盈餘管理衡量變數 ( $AM$ ) 高於當年度產業中位數設為 1，否則為 0。 $QRR$  為虛擬變數，當樣本公司年度為 1986 年或 1987 年設為 1，否則為 0。 $MRR$  為虛擬變數，當樣本公司年度落在 1988 至 1992 年間設為 1，否則為 0。在季報和月報期間，如果 (a) 季度淨利，除以  $t-1$  年總資產，大於或等於 0，但小於 0.01，或 (b) 本季淨利與去年同期淨利之差額，除以上季總資產，大於 0，但小於 0.01，定義為可疑公司季度，設為 1，否則為

0。季報和月報期間樣本，FQ 之數值應介於 0 到 8 之間。針對月報期間樣本，如果當月銷貨收入與去年同期銷貨收入之差額，除以上季總資產，大於或等於 0，但小於 0.01，定義為可疑公司月份，設為 1，否則為 0。月報期間樣本，FM 之數值應介於 0 到 12 之間。詳細變數定義請參照 Appendix A。根據假說 H1 之預期， $\alpha_1$  與  $\alpha_2$  應顯著為正，顯示財務報導揭露頻率增加，使公司盈餘管理程度提高。 $\alpha_3$ 、 $\alpha_4$  與  $\alpha_5$  顯著若為正，則隱含達成盈餘門檻之市場壓力，為公司提升盈餘管理程度之原因。

我們運用下列模型檢測假說 H2：

$$RM_t = \alpha_0 + \alpha_1 QRR_t + \alpha_2 MRR_t + \alpha_3 QRR_t \times FQ_t + \alpha_4 MRR_t \times FQ_t + \alpha_5 MRR_t \times FM_t + RM\ costs + AM\ costs + Controls + Mills + \varepsilon_t \quad (8)$$

$$AM_t = \alpha_0 + \alpha_1 QRR_t + \alpha_2 MRR_t + \alpha_3 QRR_t \times FQ_t + \alpha_4 MRR_t \times FQ_t + \alpha_5 MRR_t \times FM_t + \alpha_6 Unexpected\ RM_t + RM\ costs + AM\ costs + Controls + Mills + \varepsilon_t \quad (9)$$

其中， $RM$  代表本研究的三種真實盈餘管理衡量變數； $AM$  為本研究的應計盈餘管理衡量變數，即裁量性應計項目。詳細變數定義請參照 Appendix A。依據假說 H2 之預測，在  $RM$  為應變數之方程式中， $\alpha_1$  與  $\alpha_2$  應顯著為正，且  $\alpha_1 - \alpha_2$  顯著小於 0；在  $AM$  為應變數之方程式中， $\alpha_1$  與  $\alpha_2$  應顯著為負，且  $\alpha_1 - \alpha_2$  顯著大於 0。這些結果顯示財務報導揭露頻率增加，使公司運用較多的真實盈餘管理，較少的應計盈餘管理。

我們運用下列模型檢測假說 H3：

$$RM_t = \alpha_0 + \alpha_1 QRR_t + \alpha_2 MRR_t + \alpha_3 QRR_t \times Incentives_t + \alpha_4 MRR_t \times Incentives_t + RM\ costs + AM\ costs + Controls + Mills + \varepsilon_t \quad (10)$$

其中， $Incentives$  為各種盈餘管理動機之虛擬變數。詳細變數定義請參照 Appendix A。若資本市場壓力（具投機動機）、利害關係人內隱要求（具績效動機）與資訊環境較差（具訊號動機）都如同假說 H3 之預期，能提升真實盈餘管理程度，則  $\alpha_3$  與  $\alpha_4$  應顯著為正，且  $\alpha_3 - \alpha_4$  顯著小於 0。

我們運用下列模型檢測假說 H4：

$$Performance_{t+j} = \alpha_0 + \alpha_1 RM_t + \alpha_2 RM_t \times QRR_t + \alpha_3 RM_t \times MRR_t + \alpha_4 RM_t \times QRR_t \times Incentives_t + \alpha_5 RM_t \times MRR_t \times Incentives_t + Controls + \varepsilon_{t+j} \quad (11)$$

其中，*Performance* 為未來公司績效指標。詳細變數定義請參照 Appendix A。若如同假說 H4a 之預期，資本市場壓力（具投機動機）將降低真實盈餘管理與未來公司績效之關聯性，則  $\alpha_4$  與  $\alpha_5$  應顯著為負。若如同假說 H4b 與 H4c 之預期，利害關係人內隱要求（具績效動機）與資訊環境較差（具訊號動機）都能提升真實盈餘管理程度與未來公司績效之關聯性，則  $\alpha_4$  與  $\alpha_5$  應顯著為正。

#### 4. 研究結果與貢獻

本文結果顯示財務報導揭露頻率與盈餘管理程度呈正相關。隨著財務報導揭露頻率的增加，相較於應計盈餘管理，公司傾向採用較高程度的真實盈餘管理。另外，我們發現在財務報導揭露頻率增加的背景下，真實盈餘管理的運用程度，與資本市場壓力及利害關係人需求呈正相關；與資訊環境品質呈負相關。不同的真實盈餘管理動機，對公司未來績效產生不同效果。資本市場壓力下的投機動機真實盈餘管理，傷害公司未來績效；迎合利害關係人的績效動機真實盈餘管理，與資訊環境較差的訊號動機真實盈餘管理，則有益公司未來績效。