STOCKHOLM SCHOOL OF ECONOMICS
Department of Accounting
BE351 Degree Project in Accounting and Financial Management
Fall 2025

Earnings Management Around Seasoned Equity Offerings: Evidence from the Nordic Markets

Hugo Brandt (26131) and Frans-Gorm Petersson (50945)

Abstract

In this study we examine whether publicly listed Nordic firms engage in earnings management during the fiscal year of conducting a seasoned equity offering. Using data from 2005 to 2022, we apply one model to detect accrual-based earnings management and one model to capture real earnings management. The association between seasoned equity offerings and the earnings management measures is evaluated through univariate tests and multivariate regressions. We find no evidence suggesting that firms increase reported earnings through discretionary accruals in the seasoned equity offering year. Instead, our results provide partial support for the use of real earnings management, particularly through sales-related manipulation, as indicated by a significant decline in abnormal cash flow from operations. In contrast, we find no evidence of abnormally high production costs, suggesting no use of production-based manipulation. These findings indicate that earnings management around seasoned equity offerings is more likely to be exercised through specific real activities than through discretionary accruals.

Keywords: Accrual-based Earnings Management, Real Earnings Management, Seasoned Equity Offering (SEO)

Supervisor: Katerina Hellström

Acknowledgements: We would like to express our deepest gratitude for the guidance and support we have received from our supervisor Katerina Hellström. In addition, we want to thank our fellow students for their feedback and interesting discussions.

Table of Contents

1. Introduction

At the beginning of the twenty-first century, Enron was widely regarded as a symbol of American corporate innovation. However, this reputation collapsed almost instantly as the company's stock price plummeted in 2001 and it ultimately filed for bankruptcy, leaving investors facing massive losses, thousands of employees without jobs, and several senior executives imprisoned. Subsequent investigation revealed that Enron had used systematic accounting manipulation to hide billions of dollars in debt and to disguise substantial financial losses (Ewing, 2022). The scandal triggered substantial regulatory reform, most notably the Sarbanes-Oxley Act, which imposed stricter requirements on auditors, executives, and internal controls within public firms (Constable, 2021). Because of the scale of the collapse and the systematic use of financial reporting discretion, Enron remains one of the most prominent examples of earnings management in the modern era.

Within accounting research, earnings management has been examined extensively. Early work primarily focused on detecting manipulation through discretionary accruals and understanding how managers use judgment in financial reporting for opportunistic purposes (Healy & Wahlen, 1999). Subsequent research broadens this view, recognizing that manipulation can also occur through firms' underlying operations rather than through accounting practices alone. For instance, Roychowdhury (2006) provides empirical evidence that managers can manipulate earnings by adjusting price, production, or discretionary expenses.

Recent studies suggests that firms' preferred method of managing earnings has evolved in response to changes in regulation and monitoring. While early work documented extensive use of discretionary accruals, stricter reporting standards have made accrual manipulation both easier to detect and more costly. Survey evidence from Graham et al. (2005) reveals that managers in the US therefore rely on real operational actions since these interventions are less visible to auditors and regulators. Consistent with this view, empirical studies find that real activities manipulation becomes more relevant when regulatory or audit constraints limit the scope for accrual-based earnings management (Cohen et al., 2008; Barth et al., 2008)

A setting in which these reporting incentives intensify is the issuance of new equity. When firms conduct a seasoned equity offering, they seek to raise capital from public investors, making perceived financial strength especially important. Prior research shows that managers

therefore face strong incentives to present favorable performance, as offer proceeds and investor demand are closely tied to reported results (Kothari et al., 2016). At the same time, firms conducting seasoned equity offerings are subject to heightened scrutiny from investors, analysts, and auditors, which increases the cost of using accrual manipulation and may encourage the use of real activities management. Empirical evidence from the US supports this view, documenting that firms adjust reported performance upward around equity issues through both discretionary accruals and real operational manipulation. It is also found that such actions may contribute to subsequent operating underperformance and overvaluation at the time of the issuance (Rangan, 1998; Cohen & Zarowin, 2010; Kothari et al., 2016).

Although earnings management around equity offerings is well documented in the US, far less is known about whether similar patterns exist in the Nordic markets. The Nordics differ in several dimensions, including regulatory environments, investor protections, and ownership structures. These institutional features could influence both the extent and the form of earnings management. Most existing literature examine regulatory conditions that differ from those in the Nordic region, where public firms report under IFRS-standards. Whether firms in this setting still manage earnings around seasoned equity offerings, and whether such behavior occurs through accrual or real activity manipulation remains underexplored.

Thus, the purpose of this study is to examine whether Nordic firms manage reported performance in the fiscal year of conducting a public seasoned equity offering, and to identify the mechanisms through which such behavior occurs. Building on prior research, the analysis focuses on both accrual-based earnings management and real activity manipulation. Drawing on the institutional setting of the Nordic markets and the incentives outlined above, this study is guided by the following research question:

In Nordic equity markets, do firms engaging in public seasoned equity offerings manage earnings to inflate performance through accruals and real earnings management?

Our findings show no evidence of publicly listed Nordic firms engaging in accrual-based earnings management in the fiscal year of a seasoned equity offering. Instead, evidence points to adjustments in operating activities, as shown by a decline in abnormal cash flow from operations, whereas production-related measures remain unaffected. These findings suggest that earnings management in the context of a public seasoned equity offerings occur through

sales-related actions rather than through accruals or production decisions, indicating a selective use of real activities when raising new equity.

1.1 Contribution

This study contributes to the earnings management and public offering literature in two main ways. First, it provides evidence from the Nordic markets, a setting where research on earnings management around seasoned equity offerings remains limited. To our knowledge, no prior research has examined real earnings management in this context. The Nordic institutional environment therefore offers a distinct setting in which to assess whether existing findings generalize across capital market settings. Second, the analysis covers the post-IFRS period (2005-2022), during which reporting standards are harmonized across the Nordic region. Most existing literature examines earlier regulatory environments, making updated evidence valuable for understanding reporting incentives under modern accounting standards. Collectively, these contributions broaden the evidence on earnings management around equity offerings and show how such practices appear in a setting beyond the widely studied US market. This offers insight for investors, regulators and other stakeholders concerned with the reliability of financial reporting around capital-raising events.

1.2 Delimitation

In this study, we focus on earnings management around public seasoned equity offerings conducted by listed firms in the Nordics, particularly Sweden, Denmark, Norway, and Finland. To maintain comparability and internal validity, we apply several restrictions that narrow the study's scope and limit the broader generalization. First, we only examine seasoned equity offerings carried out between 2005 and 2022. The starting year is chosen to ensure that all observations fall under the post-IFRS reporting period, increasing consistency in accounting standards across countries. Thus, this study does not compare earnings management behavior across different regulatory periods, specifically pre- vs post-IFRS, nor does it aim to identify changes in manipulation practices over time. Second, the analysis is restricted to public equity offerings, including rights issues. We exclude private placements, directed issues, secondary sales, hybrid securities, and other corporate actions that do not raise new external equity for the firm. These transactions could differ in both investor base and managerial incentives and are therefore outside the definition of our research question, which focuses specifically on whether firms manage earnings when raising capital from the broader public market.

Third, consistent with prior literature, it is standard that firms operating in the financial services industry are excluded. Their regulatory environment and accounting standards differ substantially from those of non-financial firms and would reduce comparability in our earnings management measures. Lastly, this study examines earnings management only through accrual-based measures using the modified Jones model (Dechow et al., 1995) and real activities manipulation following Roychowdhury's (2006) framework. Other potential mechanisms fall outside the scope of this study. The analysis focuses specifically on whether earnings management occurs within the event window surrounding the equity offering, rather than evaluating long-run performance or post-issue market outcomes.

1.3 Disposition

This study is structured as follows. Section 2 presents the theoretical framework and summarizes key findings from previous research. Section 3 outlines our hypotheses, their development, and the methods used to evaluate them. In section 4, we describe the construction of the sample and the rationale behind the selection criteria. Section 5 presents the empirical results, which are further examined in the discussion presented in Section 6. Lastly, Section 7 includes our conclusions and gives insights into potential future research.

2. Literature Review & Theory

In this section, we will present the theoretical framework and the literature our study is built upon. We begin by explaining agency theory and information asymmetry to establish the basis for opportunistic managerial behavior. Thereafter, we review existing literature on accrual-based and real earnings management. This is followed by a discussion on evidence suggesting a methodological shift from using discretionary accruals to real activities to manipulate reported performance. Finally, we relate earnings management to seasoned equity offerings.

2.1 Agency Theory

The agency theory describes the relationship between the principal and an agent, where the agent is responsible for performing tasks on the behalf of the principal (Jensen & Meckling, 1976). Agency theory assumes that individuals are rational, risk adverse, and motivated to maximize their own utility (Grabke-Rundell & Gomez-Mejia, 2002). Because agents act in their own self-interest, there is a risk that their behavior deviates from what was agreed. This creates

what is referred to as the agency problem, as the principal and agent have different goals and the principal cannot determine whether the agent has acted appropriately or not (Eisenhardt, 1989). To handle this issue, firms employ monitoring mechanisms to mitigate the conflicts of interest between the agent and principal, however, such monitoring is resource intensive and costly to maintain (Fama & Jensen, 1983). Furthermore, an example of this dynamic is referred to as positive accounting theory, which is an extension of the agency theory. It suggests that managers may be inclined to use discretion in financial reporting to serve their own interests (Watts & Zimmerman, 1990).

2.2 Information Asymmetry

Information asymmetry exists when one party possesses more information than the other. As defined by Akerlof (1970), in the automobile market sellers know the true quality of their cars while buyers do not, which creates an imbalance of information between the involved parties. Translating this concept into a setting of equity issues, the market timing hypothesis suggests that managers are inclined to issue shares during periods of high valuation and repurchase at low (Baker & Wurgler, 2002). This is based on the theory that managers possess an information advantage compared to investors, implying that they have a better understanding of their firms' true value. Thus, since investors may misprice the firm because of this information gap, managers can use their informational advantage when deciding to issue equity. supports this by presenting evidence that managers may avoid issuing equity when their firms are undervalued by the market.

From the information asymmetry and agency conflict, a growing demand for more credible financial reporting and disclosure has risen (Healy & Palepu, 2001). With the introduction of the new regulations for financial reports, such as the International Financial Reporting Standards (IFRS), research has found that comparability between firms have increased (Armstrong et al., 2010; Yip & Young, 2012). In addition, more recent evidence from Neel (2017) suggests that this increase in comparability reduces insiders' private information advantage. This reduction, observed by lower abnormal insider-purchase returns, suggests a possible decrease in information asymmetry after the introduction of IFRS.

2.3 Earnings Management

The presence of information asymmetries between firms' managers and outside stakeholders has created a demand for reporting that summarizes firm performance. The purpose behind this is to provide said stakeholders with information regarding the firm's ability to generate cash flows. However, a major challenge for these external stakeholders lies in the fact that, while managers possess superior knowledge of the firm's operations, their own evaluation and subsequent compensation often is closely connected to the reported performance of their firm, which negatively impacts the reliability of their reporting (Dechow, 1994). For financial reports to accurately convey the information managers' have on their firm's performance, the standards must allow for them to exercise judgement in their reporting. This will allow the managers to use their experience and knowledge when choosing their reporting method, estimates, and disclosures to better match the firms' characteristics (Healy & Wahlen, 1999).

The allowance for discretion can in turn be used to either signal their private information or to manage earnings with opportunistic intent (Healy & Wahlen, 1999). Building on this notion, earnings management is defined as the deliberate use of managerial discretion in financial reporting and transaction design to modify reported results. Such manipulation aims to either distort different stakeholders' perception of the firm's real economic performance, or to affect the outcomes that are dependent on accounting figures, such as contractual agreements or regulatory measures. In other words, earnings management can be defined as the purposeful adjustment of reported performance for private gain (Schipper, 1989). Within the universe of earnings management, the literature often differentiates between accrual-based and real earnings management; both methods are presented below.

2.3.1 Accrual-based earnings management

Accruals were first introduced to address the limitations in using cash flows as a measure of firm performance over fixed reporting intervals. The primary issue is that cash flows are affected by both timing and matching problems, which in turn makes them an unreliable measure of firm performance over a specific period. To mitigate these issues, accrual accounting frameworks guided by revenue recognition and matching principles were adopted. This alignment reduces noise in performance measurement and simultaneously allows for earnings to better reflect a firm's true economic activity (Dechow, 1994).

When discussing accruals, it is crucial to distinguish between discretionary and non-discretionary accruals, constituting what is referred to as total accruals (Dechow et al., 1995). Non-discretionary accruals represent adjustments primarily driven by the firm's underlying economic conditions and therefore constitute accrual recognition outside managerial control. Discretionary accruals, in contrast, capture the portion of accruals that arises from managerial reporting choices (Teoh et al., 1998). For research on earnings management, the distinction between non-discretionary and discretionary accruals is vital, as the latter can be used to manage earnings and influence the perception of firm performance. (Healy & Wahlen, 1999).

2.3.2 Development of accrual-based models

Early approaches, such as the Healy (1985) model, estimate earnings management by comparing average total accruals across periods where managers are predicted to manage earnings upward or downward. This assumes that non-discretionary accruals are constant over time, so the mean accruals in the benchmark period represent normal accruals, and deviations in other periods discretionary earnings management. DeAngelo (1986) later introduces a simpler benchmark by assuming that nondiscretionary accruals should remain unchanged from the prior year. Under this view, last year's total accruals represent normal accruals, and the change of the current year is defined as manipulating earnings.

These models were extended by (Jones, 1991) by recognizing that nondiscretionary accruals change with a firm's economic conditions. Instead of assuming they are constant, normal accruals are modelled as a function of changes in revenues and property, plant, and equipment, allowing the benchmark to adjust for legitimate variation in working capital and depreciation. This represents a major improvement, as it accounts for economic activity rather than relying solely on historical accrual levels. However, the Jones model assumes that all revenue changes are discretionary. When managers inflate earnings by accelerating revenue recognition, often through credit sales, the model incorrectly treats part of this manipulation as normal. To address this limitation Dechow et al (1995) developed the modified Jones model, which adjusts revenue changes by subtracting the change in receivables in the event period, thereby isolating discretion over credit sales. Because of these adjustments, the modified Jones model has become a widely used benchmark in accrual-based earnings management research (Dechow et al., 2010).

Subsequent research further developed accrual-based models by addressing their sensitivity to performance and the substantial noise in residual-based measures. Kothari et al., (2005) show

that discretionary accruals are mechanically correlated with firm performance and propose performance matching, meaning pairing each firm with an industry peer of similar return on assets, to reduce this bias. While this improves model specification when firms differ in performance, it can also reduce test power by unintentionally removing part of the manipulated accrual component. McNichols (2002) provided a new perspective of earnings management, integrating the Jones models with the cash flow framework of Dechow & Dichev (2002), modelling accruals as a function of both sales activities and cash flow timing. This distinguishes normal working capital adjustments from estimation error, providing a clearer framework for interpreting the residuals from discretionary accruals.

2.3.3 Real earnings management

Research suggest that earnings manipulation does not occur solely through the usage of discretionary accruals. Instead, firms can also influence reported performance by altering underlying operating decisions. Dechow & Skinner (2000) note that managers may accelerate sales or defer expenditures such as research & development and maintenance to affect short-term earnings, indicating that earnings management can arise from real business activities. Building on this idea, Roychowdhury (2006) developed an empirical framework designed to detect departures from normal operating behavior. The model examines expected levels of cash flows from operations, production costs, and discretionary expenses, where deviations may indicate real activities manipulation. For example, unusually low operating cash flows can reflect sales boosted through price discounts or lenient credit terms, while abnormally high production costs may suggest overproduction aimed at decreasing reported cost of goods sold by lowering fixed costs per unit. Similarly, discretionary expenditures that are lower than expected can temporarily increase reported margins. Roychowdhury (2006) also finds evidence showing that managers may adjust real operations to influence reported performance.

In contrast to accrual-based manipulation, earnings management through real activities has a direct impact on firm cash flows, as these actions require actual operational decisions. This impact on cash flows also affects firm value, since the actions that improve reported performance in a certain period could reduce cash flows in the future. For instance, price discounts will likely increase current sales volume, but it may lead to customers expecting similar prices in the future, thereby lowering future margins. Likewise, overproduction can generate excess inventory that impose holding costs (Roychowdhury, 2006).

2.4 Earnings Management Methodological Shift

Although earlier research emphasizes accrual-based earnings management, subsequent literature suggests that firms increasingly rely on real activities to influence reported performance. Survey evidence from Graham et al. (2005) indicates that chief financial officers in the US tend to favor real operational adjustments, such as reducing research and development, advertising, or maintenance costs, to achieve short-term performance targets. After the introduction of the Sarbanes Oxley Act, they view such actions as less likely to attract auditor or regulatory scrutiny, making them a lower-risk alternative to discretionary accruals despite their potentially significant economic costs. This perception arises partly because operational decisions take place in uncertain business environments, making it difficult for external stakeholders to determine what constitutes normal operational behavior (Lo, 2008).

Institutional conditions can also shape the extent of earnings management. Leuz et al. (2003) find that stronger investor protections and stricter enforcement are associated with lower levels of manipulation, underscoring the importance of governance and regulatory environments. Barth et al. (2008) further show that the adoption of the International Accounting Standards is associated with higher reporting quality, such as less accrual-based earnings management and more timely loss recognition, suggesting that tighter recognition and disclosure requirements constrain managerial discretion over accruals. Consistent with this perspective, Cohen et al. (2008) document that, in the US market, accrual-based earnings management declined substantially after the passage of the Sarbanes-Oxley Act while real activities manipulation increased. Their findings indicate that when regulation and oversight restrict accrual adjustments, firms shift toward real activities to manage reported performance.

Extending this reasoning, Zang (2012) demonstrates that managers systematically trade-off between accrual-based and real earnings management based on the relative costs and constraints they face. When accrual discretion is limited, firms rely more on real activities, whereas higher operational costs lead managers to increase their use of discretionary accruals. This substitution indicates that regulatory pressure reshapes, rather than eliminates, earnings management, making firms alternate between accrual-based and real activities as the relative costs and constraints of each method change.

2.5 Seasoned Equity Offerings

A seasoned equity offering occurs when a publicly listed company issues new shares to raise additional capital after its initial public offering. Firms rarely rely only on retained earnings to finance growth. Hence, they frequently return to equity markets with new share issues (Berk & DeMarzo, 2024). Seasoned equity offerings can take several forms, such as cash offers or rights issues. In a cash offer, new shares are sold to investors at large, while in a rights offer, existing shareholders receive the right to buy additional shares, thereby protecting them from dilution and potential underpricing (Berk & DeMarzo, 2024).

Since the amount of capital a firm manages to raise in a seasoned equity offering depends directly on its share price during the offering date, and as market valuations are heavily influenced by reported earnings, managers have strong incentives to overstate their performance to maximize the proceeds from the equity issue (Kothari et al., 2016). This reasoning is consistent with the market timing hypothesis, which suggests that managers are inclined to use their informational advantage to issue equity when the market value of their firm is high (Baker & Wurgler, 2002). Moreover, firms who conduct equity issues are also subjected to significant scrutiny from financial analysts and investors, who require higher-quality reporting and auditing. This suggests that only the more hidden earnings management practices go undetected. For these reasons, seasoned equity offerings provide a suitable setting for assessing the possibility of earnings management around equity issues (Kothari et al., 2016).

2.6 Earnings Management Around Public Offerings

Earnings manipulation around equity offerings has been documented extensively in a US setting, with early studies focusing primarily on detecting discretionary accruals. Teoh et al. (1998) show that initial public offering firms report unusually high discretionary accruals in the listing year. Rangan (1998) finds a similar pattern for seasoned equity offerings, documenting an increase in discretionary accruals during both the announcement quarter and the following quarter. The studies further report that these inflated accruals contribute to the post-issue stock underperformance commonly observed among issuing firms. However, more recent studies suggest a shift in the way firms manage earnings around public offerings. Alhadab and Clacher (2018) show that, when firms conducting initial public offerings face higher auditor quality, they reduce their accrual manipulation and discretionary expense cuts. Simultaneously, they

increase sales-based manipulation, indicating a move towards real earnings management practices that are less constrained by higher levels of scrutiny.

In parallel with this evidence, further research in the seasoned equity offering context from the US also highlights the importance of real activities manipulation. Cohen & Zarowin (2010) show that seasoned equity offering firms use both accrual-based and real earnings management in the issuance year, making use of all major real activities manipulation techniques to enhance reported performance. Consistent with this, Kothari et al. (2016) find that the frequency of real activities manipulation is significantly higher in the seasoned equity offering years, whereas the presence of firms relying solely on accrual-based manipulation does not differ meaningfully between the event and non-event years. This pattern supports the view that, because seasoned equity offerings attract heightened public and analyst scrutiny, managers favor real activities manipulation due to its more opaque and less easily detectable nature.

3. Method

Under this section we begin by formulating the hypotheses. Then, we describe the models we use for measuring earnings management and our method choices. Thereafter, we outline our research design, presenting both the univariate and multivariate regressions used to examine the presence of earnings management around public seasoned equity offerings.

3.1 Hypotheses Development

Building on agency theory and information asymmetry, managers have incentives to present stronger short-term performance when issuing new equity. Because seasoned equity offerings heighten managerial attention to the firm's stock price, the event can motivate managers to adjust reported earnings in ways that support more favorable valuations (Kothari et al., 2016). Prior research on accrual-based earnings management around equity offerings presents mixed evidence. Early studies report income-increasing accruals in issuance years (Rangan, 1998; Teoh et al., 1998), while more recent evidence suggests that reliance on accrual-based manipulation may be replaced by real activity manipulation (Alhadab & Clacher, 2018). However, the potential increase in real activities manipulation does not eliminate the use of accrual-based earnings management. Zang (2012) shows that managers substitute between the two methods depending on their relative costs and constraints. Given the economic costs associated with real activities manipulation and earlier evidence of accrual-based adjustment

around equity offerings, it remains plausible that Nordic firms also rely on discretionary accruals in issuance years. Therefore, we propose the following hypothesis:

- ***H1:*** *Firms use accrual-based earnings management to inflate reported earnings in the year of conducting a seasoned equity offering*

With our second hypothesis, we examine whether Nordic firms use real activities manipulation during seasoned equity offering years. Evidence from other markets suggests that stricter accounting standards, increased auditor scrutiny, and stronger governance mechanisms can limit managers' discretion over accruals, making real activity manipulation a relatively more attractive tool (Graham et al., 2005; Barth et al., 2008; Cohen et al., 2008). Real earnings management is also more difficult to detect, as operational decisions rarely have clear external benchmarks (Lo, 2008). Moreover, studies on equity offerings document that firms increasingly use real activities to influence reported performance (Cohen & Zarowin, 2010; Kothari et al., 2016; Alhadab & Clacher, 2018). Given these developments, and the stricter reporting requirements introduced through IFRS in the Nordic region, it is reasonable to expect that Nordic firms engage in manipulation through real activities in the issuance years. Therefore, we propose the following hypothesis:

- ***H2:*** *Firms use real earnings management to inflate reported performance in the year of conducting a seasoned equity offering*

3.2 Earnings Management Models

We use two established empirical models to measure earnings management: the modified Jones model (Dechow et al., 1995) for accrual-based manipulation and Roychowdhury's (2006) framework for real activities manipulation.

3.2.1 Modified Jones model

To measure accrual-based earnings management, we use the modified Jones model (Dechow et al., 1995) as it provides a more reliable benchmark for discretionary accruals than earlier frameworks. By adjusting revenue changes for movements in receivables, it mitigates the tendency of the Jones (1991) model to treat earnings inflation through credit sales as non-

discretionary. This adjustment yields a more accurate estimate of discretionary accruals and has become the standard approach in the earnings management literature, see Section 2.3.2.

The modified Jones model identifies discretionary accruals by isolating the portion of total accruals that cannot be explained by normal economic drivers (Dechow et al., 1995). First, *Total Accruals* are calculated as the difference between *Net Income* and C*ash Flow from Operations*:

$$\textit{Total Accruals} = \textit{Net Income} - \textit{Cash Flow from Operations} \tag{1}$$

Non-discretionary accruals are then estimated as a function of changes in revenue adjusted by accounts receivables and property, plant, and equipment, with all variables scaled by lagged assets. The cross-sectional regression estimated for each industry-year is:

$$\frac{TA_{it}}{A_{i,t-1}} = \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{(\Delta REV_{it} - \Delta AR_{it})}{A_{i,t-1}} + \beta_3 \frac{(PPE_{it})}{A_{i,t-1}} + \varepsilon_{it} \tag{2}$$

where TA_{it} denotes total accruals, REV_{it} represents net sales, AR_{it} accounts receivables, PPE_{it} gross property, plant, and equipment, and $A_{i,t-1}$ representing beginning-of-the-year total assets in firm *i* for year *t*.

3.2.2 Roychowdhury's framework

Following the modified Jones model, we will use the framework suggested by Roychowdhury (2006) to detect earnings management through abnormal operational activities. This approach provides a structured way to estimate normal relationships between sales and operating variables, allowing deviations from these benchmarks to be interpreted as potential real activities manipulation. The model's ability to detect abnormal operating behavior makes it a common choice in empirical work on real earnings management surrounding corporate events.

Due to limited disclosure of discretionary expenses in Nordic accounting data, we focus on abnormal cash flow from operations and abnormal production costs in this study.

Abnormal Cash Flow from Operations

To estimate the normal level of operating cash flows, the variable is regressed on current sales and changes in sales for each industry and year, as shown in *equation 3*.

$$\frac{CFO_{it}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_1\left(\frac{REV_{it}}{A_{i,t-1}}\right) + \beta_2\left(\frac{\Delta REV_{it}}{A_{i,t-1}}\right) + \varepsilon_{it} \quad (3)$$

CFO_t represents cash flow from operations, REV_{it} the net sales, and ΔREV_{it} the change in sales during year *t* for firm *i*. All regressions are scaled by beginning of the year total assets ($A_{i,t-1}$).

Abnormal Production Costs

Production costs, defined as the sum of *cost of goods sold* and the annual change in i*nventory*, are expected to scale with both current and lagged change in sales. Normal production costs are estimated using:

$$\frac{PROD_{it}}{A_{i,t-1}} = \alpha_0 + \alpha_1\left(\frac{1}{A_{i,t-1}}\right) + \beta_1\left(\frac{REV_{it}}{A_{i,t-1}}\right) + \beta_2\left(\frac{\Delta REV_{it}}{A_{i,t-1}}\right) + \beta_3\left(\frac{\Delta REV_{i,t-1}}{A_{i,t-1}}\right) + \varepsilon_{it} \quad (4)$$

where $PROD_{it}$ represents total production costs, REV_{it} denotes net sales, ΔREV_{it} the change in sales during year *t*, and $\Delta REV_{i,t-1}$ changes in sales during year *t-1* for firm *i*. ΔREV_{it} and $\Delta REV_{i,t-1}$ captures timing effects in production decisions.

3.2.3 Measuring earnings management

For both the accrual-based and real earnings management measures, the empirical identification of abnormal behavior requires estimating a benchmark of normal activity, in line with Dechow et al. (1995) and Roychowdhury (2006). Using *equations (2)*, *(3)*, and *(4)*, we derive normal accruals and operating activities through cross-sectional regressions conducted separately for each industry-year, see discussion under Section 3.3.1. This procedure yields industry-year specific coefficient estimates ($\widehat{\alpha_n}$, $\widehat{\beta_n}$) which represent the normal level of accruals and operating activities. The estimated coefficients will then be used to establish the expected behavior for a specific firm-year. The residual term (ε_{it}) then captures the deviation between the observed and normal value, which represents earnings management (EM_{it}):

$$\varepsilon_{it} = Abnormal\ Behaviour_{it} = EM_{it} \quad (5)$$

A positive residual from the modified Jones model indicates income-increasing discretionary accruals, consistent with managers inflating reported earnings. For the Roychowdhury proxies, abnormally high production costs (positive residuals) signal upward earnings manipulation through overproduction, whereas abnormally low operating cash flows (negative residuals) indicate real activities manipulation achieved through sales acceleration or lenient credit terms.

3.3 Method Choices

This section outlines several methodological decisions that shape the construction and interpretation of our earnings management measures. Specifically, we address the choice between time-series and cross-sectional estimation, the use of absolute versus non-absolute values, the reliance on annual rather than quarterly data, and the treatment of outliers.

3.3.1 Time series vs cross sectional approach

There are two common approaches for estimating normal accruals and operating activities: time-series and cross-sectional estimation. The time-series method relies on several years of a firm's own historical data to estimate model parameters (Jones, 1991), allowing coefficients to reflect firm-specific economic patterns. However, DeFond and Jiambalvo (1994) note that at least six years of pre-event observations are required for sufficient degrees of freedom, and Subramanyam (1996) shows that this approach reduces sample size and increases the risk of model misspecification when the available sample period is restricted. These limitations are particularly relevant for our Nordic setting, where the number of seasoned equity offerings is already modest. Requiring long pre-event histories would substantially reduce the number of eligible firms. Consistent with prior studies such as , Roychowdhury (2006), and Cohen Zarowin (2010), we therefore employ a cross-sectional estimation approach in which model parameters are estimated using all firms within the same industry-year. This provides a benchmark based on firms facing similar economic conditions and avoids the significant data loss associated with time-series models.

Our implementation is consistent with Roychowdhury (2006), who estimates normal operating activities using the full set of firms within each industry-year, including those undertaking seasoned equity offerings. This approach assumes that industry-year peer groups provide an appropriate benchmark for normal behavior. Given the size and structure of our firm universe,

see Section 4.2, the industry-year groups are sufficiently large to ensure stable coefficient estimates, preventing any individual firm from materially influencing estimated normal levels.

To group firms by industry, prior studies have primarily relied on Standard Industry Classification codes (SIC) (Roychowdhury, 2006; Cohen & Zarowin, 2010). However, more recent research comparing the Global Industry Classification (GIC) to SIC finds that GIC in general produces significantly better estimates of discretionary accruals (Hrazdil & Scott, 2013). Based on this evidence, our study employs GIC to classify firms by industry.

3.3.2 Absolute vs non-absolute values

A central methodological choice in accrual-based earnings management research concerns whether discretionary accruals should be analyzed in absolute or non-absolute form. The decision effects both the interpretation of the results and the subsequent conclusion that can be drawn. Using absolute values is appropriate when the aim is to assess the magnitude of earnings management, as they capture abnormal behavior regardless of whether firms manipulate earnings upward or downward. Removing the sign mitigates the risk that opposite forms of manipulation offset each other, which can otherwise make it harder to detect earnings management at the at the aggregate level. In contrast, using non-absolute values preserves information about the direction of the deviation from expected behavior. For accrual-based models, positive or negative signs typically reflect unusually high or low accruals. For real earnings management proxies, however, the sign reflects the specific activity being manipulated, such as abnormally high production costs or deviations in operating cash flows.

Considering these aspects, and because our study investigates whether firms boost reported performance in the event of a seasoned equity offering, the direction of the manipulation is directly relevant to our analysis. Non-absolute measures preserve this direction and therefore allow us to identify whether firms adjust their accruals or real activities in a manner consistent with upward earnings management. For this reason, our study relies on non-absolute values.

3.3.3 Annual vs quarterly reports

Our analysis is based on annual financial statements rather than quarterly data. A potential advantage of using quarterly data is that it can capture managerial actions more precisely over shorter intervals, improving the detection of earnings management around seasoned equity offerings. However, quarterly financials could introduce several complications such as

seasonality among firms and various operating cycles. Moreover, implementing quarterly accrual- and real-activity models requires consistent interim data for all underlying components, which was not available for a sufficiently large share of our Nordic sample. For these reasons, and in line with prior research on earnings management around seasoned equity offerings, we rely on annual data in our study (Cohen & Zarowin, 2010; Kothari et al., 2016).

3.3.4 Winsorization

The main tests are estimated using raw, non-winsorized data, meaning that we avoid altering the data distribution. As a robustness test, we re-estimate all regression models using winsorized versions of all continuous variables. The variables are winsorized at the 1st and 99th, as well as the 5th and 95th percentiles to evaluate the sensitivity of the results to extreme observations.

3.4 Research Design

Under this section the study's empirical strategy used to test whether firms employ earnings management around seasoned equity offerings will be presented. The test will be conducted in two different stages, a univariate evaluation of abnormal behavior over time and a multivariate regression that will control for firm specific characteristics and industry-year effects.

3.4.1 Univariate test

The first step in testing our hypotheses starts with a univariate median comparison, following Cohen and Zarowin (2010). The goal is to identify potential spikes in the earnings management proxies for firms conducting seasoned equity offerings. We focus on median values in our main analysis, as they are less sensitive to extreme observations. To assess whether the median abnormal value or discretionary accrual differs significantly from zero, we apply the one-sample Wilcoxon signed-rank test, which evaluates whether the central tendency of the abnormal measures systematically shifts in the event years. This test provides a directional indication of whether firms engage in upward manipulation around seasoned equity offerings.

The univariate analysis is performed over a five-year event window centered around the seasoned equity offering year, where the issuance year is defined as $t = 0$ and the surrounding years are $t = -2, -1, +1, +2$. This allows us to observe whether abnormal behavior intensifies in the period prior- and post the offering. However, it does not factor in unobserved heterogeneity.

3.4.2 Multivariate regression

To control for firm characteristics and industry specific effects, a multivariate regression will be conducted separately for each earnings management proxy as presented in *equation 6.*

$$EM_{it} = \beta_0 + \beta_1 SEOYEAR + \beta_2 ROA_{it} + \beta_3 Leverage_{it} + \beta_4 SalesGrowth_{it} + \beta_5 Size_{it} + \beta_6 Industry_{it} + \beta_7 Year_{it} + \beta_8 Country_{it} + \varepsilon_{it} \quad (6)$$

Appendix A summarizes all independent variables, their construction, and the expected coefficient signs for our empirical tests.

Dependent Variables

EM_{it} denotes the earnings management measure for firm *i* in year *t*. Three non-absolute proxies are employed: *Discretionary Accruals* estimated using the modified Jones model (Dechow et al., 1995), as well as abnormal cash flow from operations (*Abnormal CFO*) and abnormal production costs (*Abnormal PROD*) estimated following Roychowdhury (2006). Because the variables are kept in their non-absolute form, they allow us to capture the direction of manipulation rather than only its magnitude. This is essential for testing our hypotheses, which examines whether firms issuing seasoned equity offerings systematically inflate performance.

Main Independent Variable

The key explanatory variable, *SEOYEAR*, is a dummy equal to one for the fiscal year in which the firm conducts a seasoned equity offering, and zero otherwise. We define the seasoned equity offering year as the year the offering was announced, rather than when it was completed. This choice is motivated by the timing of managerial incentives. Evidence from (Rangan, 1998) shows that earnings manipulation, in the form of discretionary accruals, are significantly inflated in both the announcement and subsequent quarter, indicating that managerial manipulation intensifies around the time the offering becomes public. In our sample, the average time from announcement to completion is 40.34 days, with only nine offerings spanning fiscal years. This suggests that defining the seasoned equity offering year based on the announcement date should not introduce significant distortions. If firms engage in earnings management around seasoned equity offerings, the SEOYEAR dummy should be associated with higher discretionary accruals, lower abnormal cash flow from operations, and abnormally high production costs.

Control Variables

ROA is calculated as the net income divided by total assets at the beginning of the year and is included to control for the influence of firm performance on earnings management. Prior research shows that abnormal accruals often contain measurement errors correlated with performance, potentially biasing results (Dechow et al., 1995). Including ROA helps isolate discretionary earnings manipulation by separating it from performance-driven accrual variation. ROA is relevant for both accrual-based and real earnings management, as underperforming firms face greater incentives to inflate earnings (Roychowdhury, 2006). Higher ROA is thus predicted to be associated with lower discretionary accruals, higher abnormal cash flow from operations, and lower abnormal production costs.

Leverage is derived by dividing beginning-of-year total debt by beginning-of-year total assets. DeFond and Jiambalvo (1994) show that firms report significantly positive abnormal accruals prior to covenant violations, indicating that highly levered firms have stronger incentives to inflate earnings. Roychowdhury (2006) further finds that firms with debt outstanding engage more aggressively in real activities manipulation. As prior studies show that leverage increases earnings management pressure it will thus be a relevant control in our setting. We expect that higher leverage results in higher discretionary accruals, lower abnormal cash flow from operations and higher abnormal production costs.

SalesGrowth is defined as the annual percentual change in sales. Ashbaugh-Skaife et al. (2008) show that firms with higher sales growth report larger abnormal accruals and greater noise, implying that growth is a necessary determinant of variation in reported earnings. By controlling for growth, we account for differences in firms' underlying expansion that might otherwise influence our earnings management measures. Higher sales growth is expected to show higher discretionary accruals, lower abnormal cash flow from operations, and higher abnormal production costs.

Size represents the natural logarithm of total assets at the beginning of the fiscal year. The log reduces the skewness in the size distribution and reflects the non-linear relation between firm size and reporting behavior. Prior research argues that firm size is closely linked to firms' political visibility, monitoring intensity, and incentives to manage reported performance (Watts & Zimmerman, 1990). Larger firms tend to face greater scrutiny from regulators, auditors, and analysts, which can restrict aggressive reporting but also increase incentives to manage earnings

downward to reduce political costs. Including firm size as a control therefore helps isolate discretionary manipulation from size-related differences in reporting environments. Larger companies are expected to exhibit lower discretionary accruals, higher abnormal cash flow from operations, and lower abnormal production costs.

Fixed Effects and Clustering

To account for systematic differences across groups, industry-, year- and country-fixed effects are included through corresponding dummy variables. These absorb broad macroeconomic, sector-specific, and institutional influences that could otherwise bias the estimated seasoned equity offering effect. In addition, standard errors are clustered at the firm level to address serial correlation in earnings management behavior within firms over time, avoiding inflated test statistics that can arise when observations within a firm are not independent (Petersen, 2009).

4. Empirical Data

Below we outline the scope of our analysis, including how the sample was constructed and how observations were classified into seasoned- and non-seasoned equity offering years.

4.1 Scope of Work

We define seasoned equity offerings as issuances of new shares by publicly listed firms to raise equity from the public market. Our sample includes public cash offerings, in line with Cohen and Zarowin (2010) and Kothari et al. (2016), as well as rights issues which represent a common form of equity offerings among European and Nordic firms (Bobenhausen et al., 2020; Engstedt, 2023). We exclude secondary offerings, private placements, directed issues, hybrid or debt securities, and other transactions that do not raise equity from the public market. These issuance types differ in structure, investor access, and potential managerial incentives, and therefore fall outside the definition of seasoned equity offerings used in this study.

We analyze seasoned equity offerings conducted between 2005-2022. The starting year ensures that all firms report under post-IFRS standards or under national accounting frameworks aligned with EU directives (European Parliament and Council of the European Union, 2002). This allows us to examine a homogenous reporting environment throughout sample period.

We include firms listed on the regulated markets Nasdaq Stockholm, Nasdaq Helsinki, Nasdaq Copenhagen, Oslo Børs, and Euronext Expand Oslo. Firms listed on these exchanges are required to prepare financial statements in accordance with IFRS. Prior research indicates that the adoption of IFRS increases comparability across firms and jurisdictions (Armstrong et al., 2010; Yip & Young, 2012; Neel, 2017).

We also include firms listed on First North in Sweden, Denmark, and Finland, as well as Euronext Growth Oslo. Although IFRS is not mandatory on these markets, firms apply national accounting standards based on EU directives, which have been updated in line with EU/EEA standardization of financial reporting (The European Union and Council of the European Union, 2013). Since all frameworks are based on EU directives, including these firms does not substantially reduce the homogeneity of the reporting requirements within our sample.

4.2 Sample Selection

This section describes how we constructed both the firm-level universe and the final sample of seasoned equity offerings. The process involved two steps. First, we established the firm universe, consisting of all publicly listed Nordic firms for which the necessary accounting variables are available to estimate the industry-year benchmarks for the earnings management measures, and to conduct the multivariate tests. Second, we constructed the sample of seasoned equity offering observations that forms the basis of our analysis.

4.2.1 Sample selection of firm universe

To construct the firm universe, we first retrieved financial statement data from Compustat Global – Fundamentals Annual via WRDS for all firms listed on the Nordic exchanges included in our study (see Section 4.1). Because our seasoned equity offering events occur between 2005-2022, and the estimation of earnings management variables requires data from two years before, we extracted financial data for the full period of 2001-2024. Following standard practice in the earnings management literature, we exclude firms in the financial industry due to their distinct regulatory environment and accounting rules. We also restricted the sample to firms with fiscal year ending in December to ensure comparability of annual measures. These filters resulted in an initial sample of 21,264 firm-years.

Compustat Global occasionally reports financial data for years preceding a firm's listing date. To address this, we collected initial public offering dates from S&P Capital IQ, identifying 977 initial public offerings. We then matched the listing year to the Compustat dataset and removed all firm-years prior to the initial public offering for each firm. This procedure excluded 2,131 firm-years, leaving 19,132 observations. Since Capital IQ did not provide initial public offering dates for all firms in the dataset, we acknowledge the possibility that a small number of pre-listing years remain. However, as firms approach the initial public offering, their reporting quality typically converges toward the standards of a listed firm, while financial data far before the listing date are more likely to be incomplete. Any remaining pre-listing years therefore pose limited risk to the validity of our results.

Thereafter, the remaining 19,132 firm-years were grouped by GIC and fiscal year. Earnings management proxies can solely be estimated when sufficient observations exist within an industry-year. Following Cohen Zarowin (2010), we required a minimum of eight usable firm-year observations per industry and year to estimate the cross-sectional models for discretionary accruals and real activities manipulation. Firm-years belonging to underpopulated industry-years were therefore excluded. After computing the earnings management measures and adding the control variables, we removed all observations with missing values. This step eliminated 6,281 firm-years, yielding a final firm-universe sample of 12,851 firm-years.

Table 1: Sample selection of firm universe

Selection Criteria	*Adjustments*	*# of company years*
Original sample		*21,264*
Pre-IPO firm-years removed	*-2,131*	*19,132*
Insufficient industry-year coverage & missing values	*-6,281*	*12,851*
Final sample firm universe including SEO years		*12,851*

4.2.2 Sample selection of seasoned equity offerings

To construct the sample of seasoned equity offerings, we extracted all follow-on equity issuance events from S&P Capital IQ between 2001-2024. The initial dataset yielded 4,254 equity capital market transactions classified as follow-ons.

We first removed observations that did not represent a public equity issuance by the firm. This included secondary offerings, directed issues, private placements, and other non-public or

investor-specific issuances, see Section 4.1. This step excluded 2,686 observations, leaving 1,568 equity offerings.

To ensure that each event represents a distinct setting in which managers may face incentives to manipulate earnings, we imposed a restriction for issue frequency. We therefore excluded seasoned equity offerings announced within four years of another public seasoned equity offering by the same firm, retaining only the earliest event in each window. This filter removed 589 observations, reducing the sample to 970 seasoned equity offerings.

We then excluded seasoned equity offerings conducted within four years of the issuing firm's initial public offering to avoid capturing the post initial public offering adjustment period, reducing the sample to 771 seasoned equity offerings. Because our empirical analysis begins in 2005, we also removed seasoned equity offerings announced prior to this year, resulting in 723 observations.

Next, we matched the seasoned equity offering sample to the firm universe constructed in Section 4.2.1. Since the firm universe already excludes financial firms, firms with fiscal year-end other than December, and industry-years with insufficient observations to estimate earnings management proxies, this match allowed us to identify seasoned equity offering firms that did not meet these criteria. For each seasoned equity offering, we checked whether complete data were available in the firm universe for the entire test window ($t = -2, -1, 0, +1, +2$). Any seasoned equity offering for which the firm universe lacked the required observations were removed. This procedure eliminated 470 offerings, leaving 253 observations.

Because Capital IQ does not provide complete initial public offering date coverage, we manually collected missing initial public offering dates using alternate sources such as Skatteverket, Nasdaq, Avanza, Euronext, and company websites. We also retrieved the date on which each seasoned equity offering firm entered one of the target exchanges. With this additional information, we reapplied the four-year post initial public offering filter and excluded seasoned equity offerings conducted while firms were listed on markets outside our scope (see Section 4.1). After these corrections, the sample consisted of 219 seasoned equity offerings.

Since Capital IQ occasionally mislabels issuance types, we manually reviewed all events to ensure they represented the seasoned equity offerings as defined in our study (see Section 4.1).

This validation step removed 60 misclassified events, yielding a final sample of 159 seasoned equity offerings.

Table 2: Sample selection of seasoned equity offerings

Selection Criteria	*Adjustments*	*# of SEOs*
Original sample		*4,254*
Removed secondary, directed, and private SEOs	*-2,686*	*1,568*
Removed frequent issuers	*-589*	*970*
Removed SEOs within 4-years of an IPO	*-199*	*771*
Removed SEOs issued before 2005	*-48*	*723*
Removed SEOs with insufficient data	*-470*	*253*
*2nd removal of SEOs within 4-years of an IPO (manual)**	*-34*	*219*
2nd removal non-public SEOs (manual)	*-60*	*159*
Final sample of firm SEO years		*159*

**Exclusion of SEOs issued before accessing a target exchange*

5. Findings & Analysis

In this section, we begin with presenting our descriptive statistics, followed by diagnostic checks of our sample, the main empirical findings, and finally the additional robustness tests used to assess the reliability and consistency of our model.

5.1 Descriptive Statistics

Appendix B reports the annual distribution of the seasoned equity offering years (*SEO years*) and the non-seasoned equity offering years (*non-SEO years*). The yearly distribution shows that seasoned equity offering activity has a relatively even distribution across the sample period. Each year accounts for less than ten percent of the observations, except for 2009, which represents approximately 13 percent of all *SEO years*. The increase in 2009 likely indicates a period of heightened need for financing. The *non-SEO years* are similarly distributed across the sample with a slight increase over time, indicating that industry-year estimates are not driven by specific periods.

The industry composition of the *SEO-years*, as shown in Appendix C, is more uneven. Certain sectors, such as *Capital Goods and Pharmaceuticals*, *Biotechnology & Life Sciences*, represent between 12 and 16 percent of observations, respectively. The *non-SEO* years shows a similarly

broad representation across industries, supporting the comparability of the *SEO*-years with the underlying population of listed Nordic firms. In addition, the country distribution is greatly skewed towards firms conducting seasoned equity offerings being listed on the Swedish exchanges, see Appendix D.

In Table 3, the summary statistics for the *non-SEO years* and *SEO years* are presented. Across the three earnings management measures, *Discretionary Accruals* show no meaningful difference statistically between *SEO years* and *non-SEO years,* with both the mean and median differences being statistically insignificant. In contrast, *Abnormal CFO* is significantly lower in *SEO years*, with both the mean and median tests indicating a statistically significant difference at the 1% level. *Abnormal PROD* displays no systematic difference across the two groups. Finally, the distribution of offer sizes in our seasoned equity offering sample differs from Cohen and Zarowin, (2010) as the mean is higher while the median is noticeably lower, indicating a more skewed seasoned equity offering size distribution.

With respect to firm characteristics, *SEO year* firms are smaller when *Size* is measured as the natural logarithm of total assets, as reflected in a significantly lower mean log-size. The median log-size, on the other hand, does not differ between the groups. When examining total assets in unscaled terms, however, *SEO year* firms display a higher median. *SEO year* firms are less profitable, as shown by their *ROA*, and they also display higher *Leverage*. For both variables, the differences in mean and median values are statistically significant. Moreover, *Sales Growth* is lower for *SEO year* firms, with a significant difference in the mean, while the median difference remains insignificant. The observed differences between *SEO year*s and *non-SEO years* firms confirms the need of controlling for firm-level characteristics to isolate the specific impact of seasoned equity offerings on earnings management. Some variables, including *Sales Growth* and the earnings management proxies, exhibit wide variation, suggesting the presence of extreme values in the underlying distributions. We therefore conduct robustness tests using winsorized data to ensure that our results are not driven by outliers, see Section 5.5.2.

Table 3: Descriptive statistics

	SEO years			Non-SEO years			Difference in	
	Mean	Median	STD	Mean	Median	STD	Means (t-stat)	Medians (z-stat)
Discretionary Accruals	0.0072	0.0094	0.2756	0.0026	0.0037	0.2545	0.0046 (0.21)	0.0057 (-0.59)
Abnormal CFO	-0.0614	-0.0333	0.2199	-0.0032	0.0155	0.2952	-0.0582*** (-3.30)	-0.0487*** (-4.75)
Abnormal PROD	-0.007	0.0031	0.2642	-0.0018	0.0024	0.2748	-0.0053 (-0.25)	0.0007 (0.22)
ROA	-0.1543	-0.0614	0.3238	-0.0444	0.0298	0.5366	-0.1098*** (-4.21)	-0.0912*** (-7.42)
Leverage	0.2990	0.3036	0.2261	0.2212	0.1829	0.2766	0.0778*** (4.30)	0.1207*** (5.04)
Sales Growth	0.7314	-0.0093	5.0794	1.6919	0.0521	84.356	-0.9596*** (-1.13)	-0.0614 (-1.41)
Size (ln Assets)	4.8682	4.7840	2.1701	4.9910	4.8716	2.2807	-0.1228*** (-0.71)	-0.0876 (-0.54)
Total Assets (M$)	899.969	1199.583	2034.915	1634.614	130.529	6699.083	-734.645 (-4.27)	-10.946 (-0.54)
Sales (M$)	772.288	113.708	1820.329	1324.127	120.549	5264.361	-551.839 (-3.64)	-6.841 (-0.63)
Offer Amount (M$)	114.578	13.010	547.923	N/A	N/A	N/A	N/A	N/A

*. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Note: The table represents descriptive statistics of raw data for the full sample of 12,851 firm-years. The SEO-years consist of 159 observations, while the non-SEO years consist of the remaining 12,692 observations. Above the line, we present the variables used in the multivariate regression. Below the line we have included additional firm characteristics. M$ denotes million USD.*

5.2 Pearson Correlation

The Pearson correlation matrix, found in Appendix E, reports correlations between our earnings management proxies and control variables for the full sample of firm-years. Since *Discretionary Accruals*, *Abnormal CFO*, and *Abnormal PROD* costs capture different forms of earnings management, strong correlations are not expected. Consistent with prior literature, including Cohen and Zarowin (2010), the correlations among the variables are statistically significant, but the magnitudes are modest with absolute values of < 0.24. *Discretionary Accruals* are negatively correlated with *abnormal CFO* and positively correlated with *Abnormal PROD*, reflecting the different mechanisms. This pattern can indicate that firms are using accrual-based and real earnings management simultaneously, and that certain real manipulation strategies generate opposite effects across the proxies.

The earnings management proxies show modest but relatively expected significant correlations with the control variables. *Discretionary Accruals* are positively associated with *ROA* and *Size*, and *Abnormal CFO* from operations shows similar correlation. *Abnormal PROD* is negatively correlated with *ROA* and positively correlated with *Leverage* and *Size*. Overall, the correlations

are relatively low, implying that the earnings management variables are not primarily driven by the control variables.

The control variables show relatively low correlation with one another. *ROA* is negatively correlated with *Leverage* and *Sales Growth* and positively correlated with *Size*, while *Leverage* and *Sales Growth* show opposite association with *Size*. Although several of these relationships are statistically significant, the magnitudes are once again relatively low, with the highest absolute correlation around 0.45 between *Sales Growth* and *ROA*. Thus, the overall correlation effect among the control variables does not indicate potential multicollinearity issues.

5.3 Diagnostic Tests

5.3.1 Multicollinearity

Multicollinearity occurs when two or more independent variables in a regression are highly correlated with each other, which makes it difficult for the model to tell which variable that is responsible for explaining the outcome of the regression. Consequently, this leads to arbitrary coefficient estimates, inflated standard errors, and high sensitivity to specification choices (Farrar & Glauber, 1967). Even though our Pearson correlation did not show any substantial issues with multicollinearity, we perform a *Variance Inflation Factor* (*VIF*) test to assess how multicollinearity between our variables affect the stability and interpretability of our coefficients. There is some uncertainty regarding at what level its multicollinearity should be regarded as a problem. However, a commonly used cut-off point by researchers is for *VIF* values exceeding 10 (O'brien, 2007). The *VIF* analysis presented under Appendix F shows no indication of problematic multicollinearity, as all values are far below the cut-off point. Thus, it is unlikely that the coefficients are distorted due to inflated variance.

5.3.2 Heteroskedasticity

To test the validity of our analysis we test for heteroskedasticity by conducting a *Breusch-Pagan test* for each model, see Appendix G. Across all models we observe that the test statistics are strongly significant, as their respective p-values are far below 1%. Thus, we reject the null hypotheses for our residuals being homoscedastic. This implies that the variance of our residuals is inconstant, which could make standards errors unreliable. To address this, we adjust our standard errors by clustering them at the firm-level, as observations from the same firm tend to be related. This approach is in line with Petersen (2009) who deem it essential to cluster residuals at the firm level when conducting research on earnings management.

5.4 Results

To test our hypotheses, we begin by stating our findings from the univariate test, see Table 4. Thereafter, we continue by outlining the results from our multivariate tests where we control for firms specific and fixed effects, see Table 5.

5.4.1 Univariate tests

Accrual-Based Manipulation

The proxy *Discretionary Accruals* displays the expected upward shift in the seasoned equity offering year ($t = 0$) and negative values in the year prior- and post the seasoned equity offering. However, these differences are not statistically significant and therefore do not provide evidence of accrual-based earnings management around seasoned equity offerings.

Abnormal Cash Flow from Operations

We observe that *Abnormal CFO* is significantly lower in years surrounding the seasoned equity offering, a pattern consistent with real activities manipulation. Two years before the offering, *Abnormal CFO* declines by –0.0249 and is statistically significant at the 5% level, while the seasoned equity offering year displays a larger decrease of –0.0333, significant at the 1% level. This reflects weaker operating cash flows relative to sales around the issuance and is consistent with the pattern documented by Cohen and Zarowin (2010). Similar to their findings, the decline in year –2 suggests that adjustments to operating activities may begin before the issuance year, although this early change is smaller in magnitude and statistically weaker than the effect observed in the seasoned equity offering year.

Abnormal Production Costs

The univariate results further indicate no significant differences in the variable *Abnormal PROD* during the seasoned equity offering year or in any other year of the event window. Although the measure shows an upward movement peaking in year –1 and a subsequent decline in the post-seasoned equity offering period, these findings are not statistically supported. Hence, the univariate analysis provides no evidence of manipulation through production activities.

Table 4: Median univariate test

Year	-2	-1	0	1	2
Discretionary	0.0053	-0.0041	0.0094	-0.0069	0.0035
Accruals	(-1.02)	(-1.25)	(-0.35)	(-0.39)	(-0.17)
Abnormal CFO	-0.0249**	0.0018	-0.0333***	-0.0047	-0.0102
	(-2.54)	(-0.60)	(-3.38)	(-0.08)	(-0.95)
Abnormal PROD	0.0100	0.0243	0.0031	-0.0158	-0.0120
	(-0.36)	(-1.07)	(-0.41)	(-1.03)	(-0.92)

, **, and * indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Note: The table shows the coefficients and z-stat for our sample of 159 seasoned equity offerings, using raw data.*

5.4.2 Multivariate tests

Accrual-Based Manipulation

The multivariate regression using the modified Jones model, presented in Table 5, shows no statistically significant effect for the *SEOYEAR* dummy. The *SEOYEAR* coefficient is positive, consistent with the predicted direction, but remains far from significant once firm-level controls and industry, year, and country fixed effects are included. The adjusted R^2 of 0.082 shows that the model explains approximately 8.2% of the variation in *Discretionary Accruals*. Regarding the control variables, *ROA* is positively and significantly associated with *Discretionary Accruals*, which deviates from our anticipated negative relation. This suggests that higher performing firms rely more on accruals to manage earnings. In contrast, *Leverage* and *Sales Growth* show positive and significant coefficients in line with expectations.

Abnormal Cash Flow from Operations

From the multivariate results, the coefficient on *SEOYEAR* is negative and statistically significant at the 1% level (-0.0571), indicating that firms exhibit lower *Abnormal CFO* in seasoned equity offering years relative to non-seasoned equity offering years, after controlling for firm characteristics and fixed effects. This result is consistent with our expectations of firms adjusting operating activities in the year of the equity issuance, specifically by inflating sales. Among the control variables, *ROA* and *Size* shows a positive and significant coefficient, aligning with our expectations, while *Sales Growth* also is statistically significant but displays a coefficient with a sign opposite to the one predicted. Lastly, the adjusted R^2 for the regression model is 0.1194, meaning that it successfully explains 11.94% of the variation in *Abnormal CFO*.

Abnormal Production Costs

The multivariate estimates further show that the *SEOYEAR* coefficient is not statistically significant for *Abnormal PROD*. This suggests that firms do not manipulate through production activities in the issuance year once observable firm characteristics and fixed effects are considered. While the coefficient is negative, which differs from our expectations, it is not statistically significant, and thus no conclusions can be drawn. *ROA* show significant results, displaying signs consistent with our predictions. *Sales Growth* and *Size*, however, are also significant but present coefficient signs which are not in line with our expectations. The adjusted R^2 of 0.0364 shows that the model explains a small portion of the variation in the *Abnormal PROD* proxy.

Table 5: Multivariate regressions

	Discretionary Accruals	**Abnormal CFO**	**Abnormal PROD**
Intercept	-0.0068	-0.3326***	-0.0314
	(-0.25)	(-4.97)	(-0.66)
SEOYEAR	0.0092	-0.0571***	-0.0201
	(0.45)	(-3.68)	(-0.94)
ROA	0.1658***	0.1705***	-0.0771***
	(3.00)	(5.27)	(-3.98)
Leverage	0.0746**	0.0534	-0.0057
	(1.99)	(1.46)	(-0.22)
Sales Growth	0.0005**	0.0005***	-0.0002***
	(2.03)	(3.04)	(-2.89)
Size	-0.0067	0.0073***	0.0114***
	(-1.51)	(2.59)	(3.47)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Adjusted R^2	0.082	0.1194	0.0364

, **, and * indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Note: the regressions were estimated using raw data for the full set of 12,851 firm-year observations.*

5.5 Robustness Tests

5.5.1 Mean univariate

For our first robustness test, we re-estimate the univariate tests using mean values instead of medians, given that the mean is more sensitive to extreme observations. The results in Appendix

H show that the decline in *Abnormal CFO* for year –2 becomes significant at the 1% level, in contrast to the 5% level in the main univariate test, see Table 4. Additionally, year 2 also becomes newly significant at the 5% level. These shifts suggest that extreme values influence the average level of *Abnormal CFO*, indicating that the mean is driven downward by a small number of extreme negative observations. Importantly, the seasoned equity offering year effect remains significant at the same level as in the main test, implying robustness across both mean and median. For *Discretionary Accruals* and *Abnormal PROD*, the results remain statistically insignificant across all event years.

5.5.2 Handling of outliers

As indicated by the descriptive statistics and the mean-based univariate test, several variables display dispersion, suggesting that extreme observations may influence the baseline regression estimates. To evaluate the robustness of our results to such outliers, we rerun the multivariate regressions using winsorized versions of all continuous variables at two alternative thresholds: the 1st and 99th and the 5th and 95th percentiles, following Kothari et al. (2005).

The results, presented in Appendices I and J, show that winsorization materially affects the explanatory power of the models, particularly for *Abnormal CFO*. The adjusted R^2 increases substantially under both percentile thresholds. Most notably, under the 1st and 99th percentiles, adjusted R^2 rises from 0.1194 in the main regression to 0.3074, suggesting that extreme observations contributed noise to our main specifications. Furthermore, the coefficient on the *SEOYEAR* dummy for *Abnormal CFO* remain negative and statistically significant across both robustness tests. The significance level declines to 5% under the 1st and 99th percentile winsorization. However, it returns to the 1% significance level under the 5th and 95th percentile winsorization, demonstrating that the observed decline in *Abnormal CF*O for the *SEOYEAR* is not driven by outliers and remains robust to various treatments of extreme values. The *SEOYEAR* dummies for the other earnings management proxies remain insignificant.

Regarding the control variables, *ROA* remains significant at the 1% level across all the earnings management proxies for both winsorizations. *Size* shows greater sensitivity to outliers, most notably in the *Abnormal CFO* regression, where the coefficient changes sign under the 1st and 99th percentile winsorization and becomes insignificant under the 5th and 95th percentile threshold. This shows that that the main test effects were partly influenced by extreme values.

5.5.3 Event-time regression

To assess whether the estimated seasoned equity offering year effect is sensitive to the event-window definition, we extend the main regression by adding dummy variables for the year before and after conducting a seasoned equity offering. This allows us to test whether the *SEOYEAR* coefficient accurately captures earnings management occurring around the offering date. This will thus allow us to assess the relevancy of the *SEOYEAR* dummy. The results are presented in Appendix K.

For *Discretionary Accruals* and *Abnormal PROD*, none of the event-time dummies are statistically significant, which is consistent with the main analysis. For *Abnormal CFO*, the *SEOYEAR* dummy remains negative and statistically significant at the 1% level, while the coefficients for the pre- and post-issuance years are negative but statistically insignificant. This indicates that the reduction in *Abnormal CFO* is concentrated in the issuance year, and that the event-time specification thus provides further support for the main *SEOYEAR* estimate.

5.5.4 Overproduction and manufacturing firms

As noted by Roychowdhury (2006), managers in manufacturing firms are more capable to engage in earnings manipulation via overproduction, since this strategy relies on the capacity to produce beyond current demand. To ensure that our insignificant findings for the variable *Abnormal PROD* were not driven by the inclusion of firms for which this mechanism is limited, we re-estimated our tests using only seasoned equity offering firms in manufacturing industries, based on the definition GIC according to MSCI. Only approximately 53% of our seasoned equity offering years fall into this group, making this a relevant robustness check. Replicating our univariate and multivariate tests, using both winsorized and non-winsorized variables, produces results similar to our main findings. The *SEOYEAR* coefficient, although positive, remain insignificant, indicating that firms in our sample do not appear to use overproduction as an earnings management strategy around seasoned equity offerings. However, since the manufacturing sample solely includes 85 seasoned equity offering years, the reduced sample size may limit the statistical power, and the results should therefore be interpreted with caution.

6. Discussion

In this section we first summarize our findings from Section 5 to answer our hypotheses. Thereafter, we compare our findings to previous literature, followed by a discussion on the

validity, reliability, and comparability of our study. Finally, we present limitations that may have biased the results of the study.

6.1 Earnings Management Findings

For our first hypothesis, which predicts that firms engage in accrual-based earnings management during the seasoned equity offering year to inflate earnings, the results consistently show no evidence of such behavior. Neither the univariate, multivariate nor robustness tests identify a statistically significant increase in discretionary accruals. While the coefficient in the regression model is positive, aligned with our expectations, it remains far from significant once firm characteristics and fixed effects are included. Based on this evidence, we conclude that hypothesis one is not supported, suggesting that firms do not rely on discretionary accruals in the issuance year to inflate earnings.

Regarding our second hypothesis, testing whether firms inflate their performance through real earnings management, we find mixed evidence. For abnormal cash flow from operations, we observe a significant decline in the seasoned equity offering year, consistent with firms adjusting operating activities in ways that result in unusually low operating cash flow relative to sales. This effect remains robust across all empirical modifications, the winsorized thresholds and the event-time model. Therefore, these results provide support for firms using real earnings management to overstate performance through sales-based manipulation.

In contrast, the second real earnings management proxy, abnormal production costs, does not indicate evidence of manipulation. There is no significant increase in abnormal production costs shown in the results for the seasoned equity offering year for neither the univariate, multivariate, nor the robustness tests. This suggests that production-related adjustments are not a strategy firms appear to employ around seasoned equity offerings to manage earnings.

In conclusion, these findings indicate that firms in our sample do not employ accrual-based earnings management and make selective use of real earnings management. While we find consistent evidence of sales-based manipulation, we do not detect similar behavior in production-related activities. As a result, hypothesis two receives partial support.

6.2 Comparison with Previous Research

Accrual-Based Earnings Management

The absence of accrual-based earnings management in our study could be explained by previous research. One possible explanation is that most firms in our sample report under IFRS, which is associated with enhanced comparability and stricter recognition requirements, possibly limiting managerial discretion. Prior studies show that IFRS adoption improves the credibility of financial reporting and reduces managers' opportunities to exercise discretion in manipulating accruals (Armstrong et al., 2010; Yip & Young, 2012). Consistent with this, Neel (2017) finds that the increased comparability following IFRS reduces insiders' private information advantage, suggesting that the scope for opportunistic accrual manipulation may be more limited under such reporting conditions.

These observations align with evidence from other regulatory settings. Cohen et al. (2008) document a substantial decline in accrual-based manipulation in the United States following the introduction of the Sarbanes-Oxley Act, which they associate with heightened monitoring and closer scrutiny of financial reporting. Graham et al. (2005) similarly report that managers view accrual adjustments as more likely to attract auditor or regulatory attention, making them less appealing in that setting.

Research presented by Teoh et al. (1998), Rangan (1998), and Cohen and Zarowin (2010) documents inflated discretionary accruals around seasoned equity offerings, providing evidence of accrual-based manipulation. On the other hand, these findings largely reflect a setting characterized by weaker reporting standards and lower levels of scrutiny, with samples from periods prior to major regulatory reforms, such as the Sarbanes-Oxley Act. The wider discretion in those settings may help to explain why earlier studies detect accrual-based manipulation, whereas we do not.

Abnormal Cash Flow from Operations

Our findings for abnormal cash flow from operations align closely with prior research documenting the use of sales-based real earnings management around equity offerings. Studies such as Roychowdhury (2006) and Cohen and Zarowin (2010) show that managers rely on actions such as price discounts or more lenient credit terms to inflate reported sales performance. These actions increase sales while leaving operating cash flows

disproportionately low, which is consistent with the decline in abnormal cash flow from operations we observe during the seasoned equity offering year.

The finding can also be explained with the broader literature on how firms shift between earnings management mechanisms depending on the constraints they face. When monitoring and regulatory scrutiny increase, such as surrounding the event of equity issuances, firms tend to move away from accrual manipulation and toward operational adjustments that are more difficult for external parties to detect (Cohen et al., 2008; Zang, 2012). Kothari et al. (2016) similarly emphasize that real activities manipulation is comparatively more opaque, making it an attractive alternative in settings where the costs of accrual-based manipulation are high. Graham et al. (2005) adds to this perspective, showing that managers themselves view real actions as less likely to be questioned by auditors and regulators. Similarly, institutional features of our sample may further contribute to the tendency of using sales-based manipulation. The firms included in our sample operate under post-IFRS reporting standards, which has resulted in stricter recognition requirements and increased comparability among firms (Barth et al., 2008; Armstrong et al., 2010; Yip & Young, 2012). As stated above, such developments could potentially constrain the scope for accrual-based discretion, making adjustments to operating activities a comparatively more feasible alternative for influencing reported performance.

Finally, the evidence of real earnings management surrounding a seasoned equity offering aligns with theories of information asymmetry and market timing (Myers & Majluf, 1984; Baker & Wurgler, 2002), which suggest that managers have incentives to present stronger short-term performance when issuing equity. Boosting sales may therefore be used by managers as they believe it will create a perception of higher performance and subsequent valuation among investors, thereby exploiting information asymmetry when issuing seasoned equity offerings.

Abnormal Production Costs

Prior research offers several potential reasons why firms may not rely on production-related adjustments when managing earnings around equity offerings. Roychowdhury (2006) emphasizes that manipulating earnings through overproduction requires firms to increase output beyond demand, creating excess inventory and holding costs, which could expose firms to operational risks. These frictions mean that production manipulation potentially could be a less flexible mechanism for managers to use than other earnings management mechanisms.

Zang (2012) provides further insight into this perspective by arguing that managers weigh the relative costs, risks, and timing constraints associated with different earnings management mechanisms. Since overproduction implies tangible operational changes and may be difficult to reverse, managers can potentially consider it a less suitable option around seasoned equity offerings, during which firms may prioritize maintaining stable operations.

The perception of detectability may also influence the choice of earnings management techniques. Graham et al. (2005) show that managers tend to avoid forms of manipulation that they believe external stakeholders can more readily identify. Although real activities are often difficult for external stakeholders to detect (Lo, 2008), some types of real manipulation may leave clearer traces than others. In the context of production-related adjustments, changes to inventory levels or cost-structures may create patterns that stakeholders more easily observe. This could make such actions comparatively more noticeable than sales-based manipulation, and managers may therefore view it as less effective in enhancing the perceived firm value. If investors, analysts, and auditors scrutinize operational developments more closely around equity issuance, this could potentially contribute to firms being less inclined to engage in overproduction during these periods.

6.3 Validity, Reliability, and Comparability

With regards to the validity of our research, we recognize that discretionary accruals and the real earnings management proxies are imperfect measures. Models such as the modified Jones model and Roychowdhury's (2006) framework depend on estimated normal levels of accruals, operating cash flows, and production costs. Thus, by construction, these models may omit variables that also drive changes in the proxies, leading to variation potentially being misclassified as abnormal. This may help explain the generally low adjusted R^2 values observed in our findings. Although we include control variables to capture other drivers of the proxies, there could be other relevant factors that are not accounted for. While our industry, year, and country fixed effects address broad forms of unobserved heterogeneity, other cross-country differences may influence the proxies. Taken together, these factors highlight the possibility that other determinants of the proxies remain unobserved, raising the concern of omitted variable bias. Additionally, the substantial reduction of seasoned equity offering observations during sample selection also introduces a risk of survivorship bias, with larger firms being more likely to remain due to having more comprehensive financial disclosures.

The reliability of our study is strengthened by our use of large administrative database, such as Capital IQ and Compustat Global, which provide consistent and systematically collected data. While we found some flaws and inconsistencies in the data, these were verified and corrected manually, see Section 4.2.2. However, this could introduce a minor risk of human error. Furthermore, our variable construction follows transparent and replicable procedures, which enables the replication of the research. Our results also exhibit consistent patterns across mean and median comparisons, alternative winsorization levels, and event-time specifications, indicating that our findings do not depend on a single specification.

Lastly, our study's comparability is enhanced through the use of the modified Jones model for estimating discretionary accruals and Roychowdhury's (2006) proxies for estimating real earnings management, which are standard in earnings management literature. We also follow earlier empirical practice by applying fixed effects and firm-clustered standard errors (Petersen, 2009). However, differences in institutional and regulatory settings between our study and previous research mitigates its comparability.

6.4 Limitations

Our study has certain limitations that must be acknowledged. First, our inclusion of non-regulated markets undermines the homogeneity of our sample, as the adherence to different reporting frameworks could impact the underlying normal estimations of accruals, operating cash flows, and production costs. Differences in accounting standards may lead to normal variation being misclassified as abnormal, increasing model noise and making true earnings management harder to identify.

Furthermore, the listing data for the firms in our sample has been extracted from WRDS, who provide current rather than historical exchange info. Consequently, there are non-seasoned equity offering firm-years that may remain in our firm universe despite the firm not being listed on the relevant exchange at the time of interest. This could potentially weaken the construction of our firm universe and reduce the comparability between non-seasoned and seasoned equity offering years.

We identified a small number of firms that WRDS incorrectly classified as non-financial in our dataset. However, since these cases represent less than 1% of the sample, and as we include

industry fixed effects in all specifications, this misclassification is unlikely to have any material impact on our results.

Lastly, due to the absence of the necessary data to measure real earnings management through discretionary expenses, this proxy has been excluded from our study. This is concerning as other studies have identified discretionary expenses as a central channel for real earnings management (Graham et al., 2005; Kothari et al., 2016). Without this measure, we cannot assess whether firms adjust discretionary spending when performing a seasoned equity offering or not, and our evidence on earnings management through the manipulation of real activates is therefore less comprehensive compared to previous research.

6.5 Future Research

Prior research documents how the use of accrual-based and real earnings management can explain the long-term operating and stock underperformance following seasoned equity offerings (Rangan, 1998; Teoh et al., 1998; Cohen & Zarowin, 2010; Kothari et al., 2016). Since our study finds partial evidence suggesting that firm use real earnings management around seasoned equity offerings, it raises the question whether similar post-seasoned equity offering underperformance occur in the Nordics. By examining this, future research could help broaden the existing empirical understanding of earnings management in the Nordics and its implications for investors.

While we fail to find evidence of accrual-based earnings management, our study is limited to the period after the implementation of IFRS. This limits our ability to assess whether accrual-based earnings management was more prevalent before reporting standards were modernized. Comparing the pre- and post-IFRS period help determine whether our observed patterns are specific to the IFRS environment or not, the effectiveness of reporting reforms in the EU.

Additionally, another interesting research opportunity would be to examine whether the offering size of the seasoned equity offering moderates the relationship between the seasoned equity offering year and the earnings management proxies. It is plausible to assume that the offering size influences the managerial incentives, as larger equity issues increase the potential benefits of presenting stronger financial performance. Future research could therefore examine whether larger equity issues amplify the extent of accrual-based or real activities manipulation.

7. Conclusion

The purpose of this study is to examine whether publicly listed Nordic firms manage reported earnings in the fiscal year of a public seasoned equity offering. Focusing on Sweden, Denmark, Norway, and Finland during the post IFRS period, we analyzed both accrual-based earnings management using the modified Jones model and real activities manipulation following Roychowdhury's framework. This allowed us to assess not only whether firms inflate reported performance around equity issuance, but also which mechanisms they appear to rely on when doing so.

Our findings show no indication that Nordic firms engage in accrual-based earnings management during the issuance year. Instead, we document consistent evidence of sales-based real activities manipulation, reflected in a significant decline in abnormal cash flow from operations. In contrast, abnormal production costs do not display results consistent with overproduction. These findings suggest that listed Nordic firms do not rely on discretionary accruals but may adjust operating activities that are more flexible and less scrutinized. Overall, the evidence points to firms relying on real activities to inflate earnings, consistent with more recent research. In our setting, however, such behavior only appears concentrated in sales-related adjustments rather than production decisions.

This study adds to existing earnings management literature by providing evidence from a Nordic setting that has been relatively underexplored in prior research. While previous studies have largely focused on other markets, our findings show that, in a post-IFRS environment, earnings management is more likely to occur through selected real activities rather than through discretionary accruals. This highlights that even in settings with strengthened reporting consistency, firms may still influence reported performance through operational decisions. By analyzing both accrual-based and real earnings management, the study provides a more comprehensive view of the mechanisms used around equity issuance and offer relevant insights for investors, regulators, and other stakeholders assessing reliability of reported performance in this context.

References

Akerlof, G. A. (1970). The Market for "Lemons: Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, *84*(3), 488–500.

Alhadab, M., & Clacher, I. (2018). The impact of audit quality on real and accrual earnings management around IPOs. *The British Accounting Review*, *50*(4), 442–461.

Armstrong, C. S., Barth, M. E., Jagolinzer, A. D., & Riedl, E. J. (2010). Market Reaction to the Adoption of IFRS in Europe. *The Accounting Review*, *85*(1), 31–61.

Ashbaugh-Skaife, H., Collins, D. W., Kinney, W. R., Jr., & LaFond, R. (2008). The Effect of SOX Internal Control Deficiencies and Their Remediation on Accrual Quality. *The Accounting Review*, *83*(1), 217–250.

Baker, M., & Wurgler, J. (2002). Market Timing and Capital Structure. *The Journal of Finance*, *57*(1), 1–32.

Barth, M. E., Landsman, W. R., & Lang, M. H. (2008). International Accounting Standards and Accounting Quality. *Journal of Accounting Research*, *46*(3), 467–498.

Berk, J. B., & DeMarzo, P. M. (2024). *Corporate finance* (Sixth edition, global edition). Pearson.

Bobenhausen, N., Breuer, W., & Salzmann, A. (2020). Determinants of discounts in equity rights issues: An international comparison. *Review of Financial Economics*, *38*(2), 300–320.

Cohen, D. A., Dey, A., & Lys, T. Z. (2008). Real and Accrual-Based Earnings Management in the Pre- and Post-Sarbanes-Oxley Periods. *The Accounting Review*, *83*(3), 757–787.

Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics*, *50*(1), 2–19.

Constable, S. (2021, December 2). *How the Enron Scandal Changed American Business Forever*. TIME. https://time.com/6125253/enron-scandal-changed-american-business-forever/ [Accessed:05.12.2025]

DeAngelo, L. E. (1986). Accounting Numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Stockholders. *The Accounting Review*, *61*(3), 400–420.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of Accounting and Economics*, *50*(2), 344–401.

Dechow, P. M. (1994). Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics*, *18*(1), 3–42.

Dechow, P. M., & Dichev, I. D. (2002). The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review*, *77*(s-1), 35–59.

Dechow, P. M., & Skinner, D. J. (2000). Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators. *Accounting Horizons*, *14*(2), 235–250.

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting Earnings Management. *The Accounting Review*, *70*(2), 193–225.

DeFond, M. L., & Jiambalvo, J. (1994). Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics*, *17*(1), 145–176.

Eisenhardt, K. M. (1989). Agency Theory: An Assessment and Review. *Academy of Management Review*, *14*(1), 57–74.

Engstedt, P. (2023). *Nyemissioner—Så funkar det | Handelsbanken*. https://www.handelsbanken.se/sv/ekonomi-i-livet/privatekonomi/spara-klokt/aktiehjalpen/nyemissioner-sa-funkar-det [Accessed:06.12.2025]

European Parliament and Council of the European Union. (2002). Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the Application of International Accounting Standards, 243 OJ L (2002). http://data.europa.eu/eli/reg/2002/1606/oj [Accessed:06.12.2025]

European Parliament and Council of the European Union. (2013). Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the Annual Financial Statements, Consolidated Financial Statements and Related Reports of Certain Types of Undertakings, Amending Directive 2006/43/EC of the European Parliament and of the Council and Repealing Council Directives 78/660/EEC and 83/349/EEC, (2013). http://data.europa.eu/eli/dir/2013/34/oj [Accessed:06.12.2025]

Ewing, J. (2022). *Enron collapse | Research Starters | EBSCO Research*. EBSCO. https://www.ebsco.com/research-starters/business-and-management/enron-collapse [Accessed:06.12.2025]

Fama, E. F., & Jensen, M. C. (1983). Agency Problems and Residual Claims. *The Journal of Law and Economics*, *26*(2), 327–349.

Farrar, D. E., & Glauber, R. R. (1967). Multicollinearity in Regression Analysis: The Problem Revisited. *The Review of Economics and Statistics*, *49*(1), 92–107.

Grabke-Rundell, A., & Gomez-Mejia, L. R. (2002). Power as a determinant of executive compensation. *Human Resource Management Review*, *12*(1), 3–23.

Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, *40*(1), 3–73.

Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics*, *7*(1), 85–107.

Healy, P. M., & Palepu, K. G. (2001). Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, *31*(1), 405–440.

Healy, P. M., & Wahlen, J. M. (1999). A Review of the Earnings Management Literature and Its Implications for Standard Setting. *Accounting Horizons*, *13*(4), 365–383.

Hrazdil, K., & Scott, T. (2013). The role of industry classification in estimating discretionary accruals. *Review of Quantitative Finance and Accounting*, *40*(1), 15–39.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360.

Jones, J. J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, *29*(2), 193–228.

Kasznik, R. (1999). On the Association between Voluntary Disclosure and Earnings Management. *Journal of Accounting Research*, *37*(1), 57–81.

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, *39*(1), 163–197.

Kothari, S. P., Mizik, N., & Roychowdhury, S. (2016). Managing for the Moment: The Role of Earnings Management via Real Activities versus Accruals in SEO Valuation. *The Accounting Review*, *91*(2), 559–586.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics*, *69*(3), 505–527.

Lo, K. (2008). Earnings management and earnings quality. *Journal of Accounting and Economics*, *45*(2), 350–357.

McNichols, M. F. (2002). Discussion of the Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review*, *77*(s-1), 61–69.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221.

Neel, M. (2017). Accounting Comparability and Economic Outcomes of Mandatory IFRS Adoption. *Contemporary Accounting Research*, *34*(1), 658–690.

O'brien, R. M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity*, *41*(5), 673–690.

Petersen, M. A. (2009). Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches. *The Review of Financial Studies*, *22*(1), 435–480.

Rangan, S. (1998). Earnings management and the performance of seasoned equity offerings. *Journal of Financial Economics*, *50*(1), 101–122.

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics*, *42*(3), 335–370.

Schipper, K. (1989). Earnings Management. *Accounting Horizons*, *3*(4), 91–102.

Subramanyam, K. R. (1996). The pricing of discretionary accruals. *Journal of Accounting and Economics*, *22*(1), 249–281.

Teoh, S. H., Welch, I., & Wong, T. j. (1998). Earnings Management and the Long-Run Market Performance of Initial Public Offerings. *The Journal of Finance*, *53*(6), 1935–1974.

Watts, R. L., & Zimmerman, J. L. (1990). Positive Accounting Theory: A Ten Year Perspective. *The Accounting Review*, *65*(1), 131–156.

Yip, R. W. Y., & Young, D. (2012). Does Mandatory IFRS Adoption Improve Information Comparability? *The Accounting Review*, *87*(5), 1767–1789.

Zang, A. Y. (2012). Evidence on the Trade-Off between Real Activities Manipulation and Accrual-Based Earnings Management. *The Accounting Review*, *87*(2), 675–703.

Appendix

Appendix A - *Expected sign table*

Variables	Construction	Discretionary Accruals	Abnormal CFO	Abnormal PROD
SEO Year	*1 / 0*	+	-	+
ROA	$Net\ Income_t / Assets_{t-1}$	-	+	-
Leverage	$Debt_{t-1} / Equity_{t-1}$	+	-	+
Sales Growth	$(REV_t - REV_{t-1}) / REV_t$	+	-	+
Size	$Ln\ (Total\ Assets_{t-1})$	-	+	-

Ln = Natural Logarithm, REV = Net Sales

Appendix B - *Distribution across years*

	SEO years		Non-SEO years	
Year	*Frequency*	*%*	*Frequency*	*%*
2003	N/A	N/A	340	2.68
2004	N/A	N/A	363	2.86
2005	8	5.03	416	3.28
2006	5	3.14	451	3.55
2007	5	3.14	501	3.95
2008	5	3.14	525	4.14
2009	21	13.21	522	4.11
2010	11	6.92	502	3.96
2011	13	8.18	498	3.92
2012	6	3.77	533	4.20
2013	11	6.92	524	4.13
2014	10	6.29	522	4.11
2015	14	8.81	530	4.18
2016	13	8.18	563	4.44
2017	15	9.43	588	4.63
2018	5	3.14	644	5.07
2019	3	1.89	688	5.42
2020	1	0.63	721	5.68
2021	8	5.03	736	5.80
2022	5	3.14	788	6.21
2023	N/A	N/A	890	7.01
2024	N/A	N/A	847	6.67
Total	**159**	**100.00**	**12 692**	**100.00**

Appendix C - *Distribution across industries*

		SEO years		Non-SEO years	
GIC	Industry Group	Frequency	%	Frequency	%
1010	Energy	12	7.55	965	7.60
1510	Materials	18	11.32	845	6.66
2010	Capital Goods	25	15.72	2478	19.52
2020	C&PS	7	4.40	801	6.31
2030	Transportation	8	5.03	609	4.80
2510	Automobiles & Components	0	0.00	15	0.12
2520	Consumer Durables & Apparel	1	0.63	449	3.54
2530	Consumer Services	4	2.52	292	2.30
2540	Media	0	0.00	23	0.18
2550	CDDR	3	1.89	424	3.34
3020	Food, Beverage & Tobacco	7	4.40	607	4.78
3030	Household & Personal Products	1	0.63	71	0.56
3510	Health Care Equipment & Services	12	7.55	722	5.69
3520	PB&LS	20	12.58	859	6.77
4020	Financial Services	0	0.00	105	0.83
4510	Software & Services	10	6.29	1543	12.16
4520	Technology Hardware & Equipment	21	13.21	983	7.75
5010	Telecommunication Services	2	1.26	186	1.47
5020	Media & Entertainment	8	5.03	564	4.44
5510	Utilities	0	0.00	151	1.19
Total		**159**	**100.00**	**12 692**	**100.00**

C&PS = Commercial & Professional Services, CDDR = Consumer Discretionary Distribution & Retail, PB&LS = Pharmaceuticals, Biotechnology & Life Sciences

Appendix D - *Distribution across exchange countries*

Exchange Country	Frequency	%
Sweden	97	61.01
Norway	27	16.98
Denmark	9	5.66
Finland	26	16.35
Total	**159**	**100.00**

Appendix E

Pearson correlations

	Discretionary Accruals	Abnormal CFO	Abnormal PROD	ROA	Leverage	Sales Growth	Size
Discretionary Accruals	1.000***						
Abnormal CFO	-0.140***	1.000***					
Abnormal PROD	0.020**	-0.226***	1.000***				
ROA	0.242***	0.238***	-0.103***	1.000***			
Leverage	-0.004	0.002	0.021**	-0.191***	1.000***		
Sales Growth	-0.003	0.004	-0.004	-0.450***	-0.013	1.000***	
Size	0.025***	0.132***	0.022**	0.243***	0.174***	-0.031***	1.000***

, **, and * indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Note: The table shows Pearson correlation based on our full set of 12,851 firm-year observations using raw data.*

Appendix F - *VIF test for multicollinearity*

	Tolerance	*VIF*
SEO Year	0.99	1.01
ROA	0.72	1.39
Leverage	0.55	1.83
Sales Growth	0.78	1.28
Size	0.58	1.74

Appendix G - *Breusch-Pagan test for heteroscedasticity*

	Breusch-Pagan Statistic	*p-value*
Discretionary Accruals	1464.84	0.0000
Abnormal CFO	1810.06	0.0000
Abnormal PROD	1853.33	0.0000

Appendix H - *Mean univariate test*

Year	-2	-1	0	1	2
Discretionary	-0.0215	-0.0187	0.0072	0.0275	-0.0091
Accruals	(-0.55)	(-1.53)	(0.33)	(0.88)	(-0.75)
Abnormal CFO	-0.0730***	-0.0217	-0.0614***	-0.0116	-0.0339**
	(-3.16)	(-1.52)	(-3.52)	(-0.73)	(-2.00)
Abnormal PROD	-0.0120	0.0003	-0.0070	-0.0160	-0.0215
	(-0.56)	(0.02)	(-0.34)	(-0.94)	(-1.11)

, **, and * indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Note: The table shows the coefficients and z-stat for our sample of 159 seasoned equity offerings, using raw data.*

Appendix I - ***Multivariate tests winsorized at the 1st and 99th percentiles***

	Discretionary Accruals	Abnormal CFO	Abnormal PROD
Intercept	0.0191*	-0.0309	-0.0941**
	(1.93)	(-1.19)	(-2.04)
SEOYEAR	0.0078	-0.0275**	-0.0313
	(0.73)	(-2.10)	(-1.53)
ROA	0.1756***	0.4278***	-0.2199***
	(18.40)	(25.49)	(-10.31)
Leverage	0.0086	0.0177	0.0182
	(0.98)	(1.19)	(0.68)
Sales Growth	0.0028	-0.0038	0.0043
	(1.35)	(-1.51)	(1.61)
Size	-0.0056***	-0.0045***	0.0176***
	(-6.67)	(-2.70)	(5.38)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Adjusted R^2	0.1065	0.3074	0.0608

, **, and * indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Note: the regressions were estimated using winsorized data at the 1st and 99th percentiles for the full set of 12,851 firm-year observations.*

Appendix J - ***Multivariate tests winsorized at the 5th and 95th percentiles***

	Discretionary Accruals	Abnormal CFO	Abnormal PROD
Intercept	0.0229***	0.0087	-0.1156***
	(2.86)	(0.42)	(-2.72)
SEOYEAR	0.0071	-0.0269***	-0.0255
	(0.95)	(-2.60)	(-1.52)
ROA	0.1700***	0.3797***	-0.2497***
	(22.72)	(26.07)	(-10.47)
Leverage	-0.0044	0.0138	0.0210
	(-0.62)	(1.03)	(0.80)
Sales Growth	0.0078**	-0.0081*	0.0063
	(2.50)	(-1.86)	(1.04)
Size	-0.0040***	-0.0024	0.0163***
	(-5.91)	(-1.56)	(5.41)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Adjusted R^2	0.1075	0.2467	0.0631

, **, and * indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Note: the regressions were estimated using winsorized data at the 5th and 95th percentiles for the full set of 12,851 firm-year observations.*

Appendix K - ***Multivariate tests for event-time robustness***

	Discretionary Accruals	Abnormal CFO	Abnormal PROD
Intercept	-0.0066	-0.3335***	-0.0321
	(-0.25)	(-4.98)	(-0.67)
Pre-SEOYEAR	-0.0157	-0.0216	-0.0119
	(-1.31)	(-1.64)	(-0.58)
SEOYEAR	0.0093	-0.0581***	-0.0209
	(0.45)	(-3.67)	(-0.96)
Post-SEOYEAR	0.0198	-0.0223	-0.0241
	(0.64)	(-1.58)	(-1.41)
ROA	0.1658***	0.1705***	-0.0771***
	(2.99)	(5.27)	(-3.98)
Leverage	0.0745**	0.0538	-0.0053
	(1.98)	(1.48)	(-0.21)
Sales Growth	0.0005**	0.0005***	-0.0002***
	(2.02)	(3.04)	(-2.89)
Size	-0.0067	0.0073***	0.0114***
	(-1.51)	(2.59)	(3.47)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Adjusted R^2	0.082	0.1194	0.0364

, **, and * indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Note: the regressions were estimated using winsorized data at the 5th and 95th percentiles for the full set of 12,851 firm-year observations.*

AI Appendix

In this study, the large language model Chat GPT (version 5 and 5.1) has been employed to handle complex parts in the coding process and to identify errors within the code. It has also assisted in correcting spelling inconsistencies, grammar, and punctuation to improve its interpretability. We want to emphasize that all ideas and arguments are our own and that only completed drafts have been uploaded for revision based on the points above. In addition, the model has been used to support the process of locating sources for very specific information, however, we want to be clear with that all sources cited in this study have been carefully verified manually by both authors. Furthermore, we noticed that a clear risk when using Chat GPT was its tendency to sometimes dilute the main points of the draft if not prompted correctly, which could result in the loss of our core idea with that specific section. Therefore, careful consideration was taken both when prompting and when verifying the langue model's output.