The Implications of Earnings Management in Initial Public Offerings

– *Evidence from the Nordic Stock Markets*

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ABSTRACT

This paper evaluates how earnings management in initial public offerings (IPOs) affects long-term stock performance of Nordic firms, focusing on the role of current accruals. We provide evidence that current accruals above the industry standard reliably predict future stock underperformance given a 36-month time period. Issuers with the highest level of discretionary current accruals (DCA) underperform IPO firms with the lowest level of DCA by 30% on average. Additionally, we observe an almost complete reversal of abnormal accruals in the year after the IPO. This reversal is accompanied by a decline in net income for the high-DCA firms, suggesting that managers opportunistically manage earnings in the IPO year.

1. INTRODUCTION

Few corporate events are surrounded by such controversy as initial public offerings (IPOs). One of the most intensely debated aspects of IPO firms is their well-documented average long-run underperformance (see e.g. Loughran and Ritter, 1995), which has puzzled economists and investors alike for decades. Extensive empirical literature has evolved on the subject, but there is still little consensus on if and why IPOs underperform, and whether long-term underperformance can be predicted beforehand. This paper examines the role of opportunistic earnings management in initial public offerings, and argues that the level of abnormal accruals in the IPO year is a reliable indicator of long-term underperformance.

The unique aspects of an IPO provide managers with both incentives and opportunities to engage in earnings management. By inflating reported earnings, issuers can increase the price of equity, and thus the capital inflows at the sale of the stock.[1] A high share price is not only beneficial at the time of the offering, but also at lock-up expiration, which usually occurs six months after the listing date. At this point, pre-IPO shareholders may chose to sell off part of – or even liquidate – their stakes in the company.[2] The often limited press coverage and publicly available financial information of privately held firms result in a high level of information asymmetry between the investor and the issuer. In general, investors have to rely on the information provided in the prospectus when assessing the company, providing managers with a lot of discretion.

A measure that has gained a lot of traction as a proxy for earnings management in empirical literature is the level of abnormal accruals. The purpose of accrual accounting is to allow for a more accurate representation of underlying economic conditions by allowing for revenue (costs) to be recognized on the financial statement as income (expenses) when it has been *earned* rather then when the actual cash inflow (outflow) *occurs*. However, if managers seek to inflate firm earnings in order to obtain a higher equity valuation, this can be achieved by reporting an unusually high level of accruals. These accruals will not reflect actual favourable long-term firm prospects, implying that the stock price will be overstated relative to its fundamental value. Since this strategy cannot be upheld forever, the initial mispricing

[1] There is a lot of empirical evidence supporting the view that reported earnings are a significant factor in determining the initial market values of IPO firms, see e.g. Perez (1984).

[2] Lock-up agreements are voluntary agreements prohibiting insiders from selling their shares for a specified period of time following the IPO, typically around six months. An influential study by Field and Hanka (2001) documents a substantial increase in trading volume at the time of lock-up expiration, indicating significant selling activity by pre-IPO shareholders.

will eventually be corrected, resulting in negative returns. We therefore predict lower average returns for companies employing a more aggressive earnings management strategy as compared to more conservative IPO companies.

The question of if and how managers inflate earnings around the IPO is not without controversy. Prior research puts forward mixed results as well as interpretations. In a high profile study, Teoh, Welch and Wong (1998a) link abnormal positive accruals in the IPO year to long-run underperformance, interpreting this finding as evidence of opportunistic earnings management to maximize pre-IPO shareholder returns. Many recent studies however question whether firms actually manage earnings and argue that positive abnormal accruals reflect normal operating, investing, and financing decisions of IPO firms (see e.g. Armstrong, Foster and Taylor, 2015).

The sheer size and economic role of the IPO market alone motivates additional attempts to disentangle the effects of earnings manipulation and IPO firm characteristics on post-IPO stock performance. This paper builds on previous research by adopting established models for measuring abnormal accruals and returns, but at the same time addresses potential biases and concerns presented in more recent financial literature.

Our study differs from previous research in the following ways: (1) Instead of focusing on the US market, we use a sample of Nordic IPO firms – or more specifically of Swedish, Danish, Norwegian and Finnish firms – going public between 1996 and 2014. (2) We consider several different measures of post-IPO performance to evaluate how robust our findings are with respect to alternative return specifications and benchmarks. (3) We split our sample of Nordic IPO firms into four groups based on nationality in order to examine potential country-specific differences. (4) As an additional robustness test, we consider two different approaches for measuring accruals in addition to our main approach.

In order to address the question of whether earnings management is a reliable predictor of long-run stock underperformance, we need to estimate the level of abnormal accruals. Because the incentives to manage earnings are likely to persist during the months subsequent to the offering, we measure accruals in the fiscal year when the firm goes public, which includes both pre- and post-IPO months. We use an extension of the cross-sectional Jones (1991) model to decompose accruals into current and noncurrent discretionary and nondiscretionary components. Nondiscretionary variables represent expected accruals from a cross-sectional regression using an estimation sample of all non-issuing two-digit SIC code peers trading in that year in the same country. The discretionary variables are the residuals, i.e. the difference between the actual and fitted values. Since managers are expected to have

greater control over current versus long-term accruals, the level of discretionary current accruals is used as a proxy for earnings management in this paper.

Following Teoh et al. (1998a) we divide the IPO firms into four quartile portfolios based on their level of asset-scaled discretionary accruals (DCA). We then calculate the average buy-and-hold as well as cumulative average returns (CAR) for each quartile over a 36-month holding period, using a set of different benchmarks.

We find that, irrespective of return or benchmark specification, IPO firms in the high DCA portfolio (quartile 4) exhibit lower returns on average than IPO firms in the low DCA portfolio (quartile 1). On a buy-and-hold measure, quartile 4 underperforms quartile 1 by 18% to 41%. The equivalent differential between quartile 4 and 1 for the cumulative average return measure is 24% to 29%. The underperformance is significant at a 5% level for raw and index-adjusted buy-and-hold returns as well as peer-adjusted cumulative average returns. In contrast to the findings of Loughran and Ritter (1995) on long-term post-IPO performance, we only observe significant underperformance for our full sample of Nordic issuers on a peer-adjusted CAR measure. On a raw and index-adjusted basis, the average 36-month return ranges from 5% to 22%.

Looking at the returns per event-month for the quartile portfolios, we find that the performance of quartile 4 starts to deteriorate after about one year. This is consistent with the notion that issuers engaging in earnings manipulation will continue to do so during the months following the listing date in order to maintain a high share price until lock-up expiration and reduce the risk of being exposed of earnings manipulation.

The time-series pattern of abnormal accruals in the years following the offering also supports a scenario in which managers of IPO firms opportunistically manage earnings to inflate equity prices. We find that the level of discretionary current accruals as well as return on sales peak in the IPO year for quartile 4. After issue, when the high abnormal accruals cannot be sustained, both earnings and stock performance deteriorate.

The results are robust with respect to a variety of alternative specifications and controls.[3] We find that discretionary current accruals reliably predict long-run stock returns also after adjusting for other risk-factors known to affect performance; such as size, market

[3] Robustness tests have been performed on both a buy-and-hold and a CAR basis. For the sake of simplicity, only buy-and-hold results have been reported. No contradictory results have however been found on a CAR basis.

exposure and issue period.[4] The results remain significant also after controlling for cash flows from operations and changes in net income.

We observe return patterns similar to our main result section when extending our DCA regression with a cash flow variable. In addition, we estimate the likelihood of earnings management using the Beneish M-score model. Also for this approach, the results indicate that firms deemed more likely to manipulate earnings in the IPO year perform worse over time, except on a peer-adjusted buy-and-hold measure. However, we find that discretionary current accruals as predicted by the Jones (1991) model appear to be a much more reliable predictor of long-run underperformance.

To summarize, our results suggest that firms with a high level of discretionary abnormal accruals in the IPO year are likely to underperform more conservative firms, given a holding period of three years. We find that this pattern is persistent across several different benchmarks and specifications, and that there are no apparent differences between countries. The fact that firm performance starts to deteriorate approximately a year after trading has been initiated reinforces the view that managers use discretionary accruals to inflate earnings and consequently share prices.

The remainder of the paper is organized as follows. Section 2 provides a review of related empirical literature and research. Section 3 presents our hypotheses and the underlying theories. Section 4 describes the sample selection process and the estimation methods for our earnings management proxies as well as our abnormal return measures. Section 5 and 6 discuss our empirical findings on the relationship between abnormal accruals in the IPO year and long-run stock performance. Section 7 and 8 conclude the paper and provide direction for future research.

2. LITERATURE REVIEW

This section discusses prior research on post-IPO stock performance and earnings management in the IPO year.

[4] We control for size and market exposure both by estimating abnormal returns using the Fama and French Three Factor model as well as by including market-return and logged market value variables in a cross-sectional regression.

2.1 Post-IPO Stock Performance

The stock price performance of initial public offerings (IPOs) during the years following the issue has been the focus of numerous financial studies and extensive empirical literature, and may very well be the most controversial area of IPO research. According to the efficient market hypothesis (Fama, 1969), stock prices should reflect all publicly available information and risk-adjusted differences in returns should not be predictable. Many studies do however point to a significant long-run underperformance of IPOs relative to comparable companies and the overall market. As demonstrated by Ritter and Welch (2002), the average IPO between 1980 and 2001 underperformed the CRSP value-weighted market index by 23.4% over a three-year holding period. Other studies on the long-run underperformance of IPOs include Loughran (1993), Loughran and Ritter (1995), and Brav and Gompers (1997).

The explanation for the long-run underperformance of IPOs is a much-debated subject, and usually theories fall either in the asymmetric information or the behavioural category. Miller (1977) is a supporter of the former, and argues that shorting constraints on IPO firms induces only the most optimistic investors to participate in the IPO. Eventually, the variance in investor valuations will converge towards the mean, resulting in a lower stock price as the mispricing becomes corrected. Schultz (2001) provides a different view and claims that a number of successful IPOs will induce a large group of "underperforming" firms to follow suit in the hopes of replicating the success. Another popular explanation is the overconfidence of managers, as put forward by Bernardo and Welch (2001), as well as of investors (Daniel, Hirshleifer and Subramanyam, 1998).

2.2 Earnings Management in Initial Public Offerings

Initial public offerings tend to be made by relatively small firms with limited operating histories and publicly available financial information. Investors often have to rely heavily on the information provided in the prospectus, which gives rise to high information asymmetry between investors and issuers. As initially demonstrated by Schipper (1989), these circumstances provide both incentives and opportunities to manage earnings.

A firm's reported earnings tend to receive a lot of attention in financial press, and whether or not a firm manages to meet analysts' earnings expectations usually has a substantial effect on the stock price. The view that reported earnings also constitute an important factor in determining the initial market values of IPO firms is commonly supported, with empirical evidence provided by for example Perez (1984) and Ritter (1984).

A measure that has gained a lot of traction in literature as an indicator of earnings quality is accruals. Large positive accruals indicate that a firm's accounting earnings are higher than its underlying cash flow, which in turn might indicate that the company is recognizing a large portion of unrealized revenue as earnings today. This strategy cannot be upheld forever, and as it has been shown by Sloan (1996) as well as by Houge and Loughran (2000), stocks with high accruals tend to underperform stocks with low accruals.

But by inflating earnings prior to going public in this manner, the company might obtain a higher IPO valuation. According to evidence provided by Teoh and Wong (1997), new equity issuers are commonly misleading analysts by using abnormally high accruals to increase reported earnings. In a later study, Teoh et al. (1998a) also find a negative relationship between abnormal accruals measured during the year of offer and stock returns over a three-year post-IPO period.

Additional research on earnings management in initial public offerings has been performed by Chan, Chan, Jegadeesh and Lakonisho (2006), confirming the view that accruals are reliably, negatively associated to future stock return.

While pre-IPO shareholders have a clear incentive to maximize the IPO valuation, it also lies in their best interest to maintain a high share price during the months following the listing date; at least until firm-imposed selling restrictions (lockups) expire. In fact, a recent study by Ertimur, Sletten, Sunder and Weber (2017) finds a higher level of earnings manipulation around the lock-up period rather than prior to the issue date. The paper provides evidence that IPO firms exhibit positive abnormal accruals in the quarter before and the quarter of lockup expiration, with positive abnormal accruals predominantly concentrated in firms with higher predicted insider selling.

There are also some conflicting studies, providing evidence against the presence of earnings management. Armstrong et al. (2015) relate the growth in accruals in the IPO year to the investment of IPO proceeds in working capital, and concludes that abnormal accruals are a result of normal economic activity. Other studies go even further, and argue that the extensive scrutiny of financial statements reported in the prospectus imposes firms to use more conservative accounting methods, leading to a lower-than-normal level of accruals (Ball and Shivakumar, 2008; Venkataraman, Weber and Willenborg, 2008).

3. THEORETICAL FRAMEWORK

Our hypothesis, that the level of accruals predicts long-run post-IPO stock return performance, is based on two assumptions. Firstly, managers have both the incentive and the ability to manage earnings. Secondly, the marginal investor is unable to fully comprehend and rationally discount for earnings management when forming expectations about future cash flows.

The following chapter aims to explain the underlying rationale for these assumptions and is organized as followed: The first section focuses on the *why*, by outlining the managerial incentives for engaging in earnings management. In the second section we decompose the *how*, by describing relevant accounting principles and taking a closer look at the components of accruals. In the third and final section we take the view of the investor and discuss the difficulty of detecting earnings management.

3.1 Motives for Earnings Management in Initial Public Offerings

Investors devote a great deal of attention to a firm's earnings when assessing profitability and financial performance. With stock price movements as well as manager compensation often tied to income growth, meeting or beating the market expectation is of utter importance. The market's obsession with accounting earnings has sparked concerns that not enough focus is directed towards operating performance and earnings quality, thus creating incentives for managers to engage in earnings management. Several papers put forward evidence of the existence of managerial manipulation of earnings; see e.g. Degeorge, Patel and Zeckhauser (1999) and Burgstahler and Eames (2006).

An IPO creates even stronger incentives as well as opportunities for earnings management. The level of information asymmetry between insiders and investors is particularly high in an IPO. Because the news coverage and publicly available financial information are limited, investors are forced to rely on the information provided in the prospectus when evaluating the company.

The prospectus contains the firm's financial statements for up to the most recent three years, information about the business and market, the details of the offering, potential risk factors and other relevant information. Since the transition from a private to a public company often involves a change in accounting frameworks, the issuing firm is allowed to alter their accounting methods retroactively for all the financial statements presented in the offering prospectus in order to ensure comparability. This however also provides the issuers with

plenty of opportunity to adjust accounting earnings for the pre-issue fiscal years to show an increase in reported earnings.

The potential wealth transfer from new investors to original owners amplifies the incentives to manage earnings in connection to an IPO. A higher offering price benefits issuers in two ways: retained shares are worth more, and more cash is received for the secondary shares sold. Furthermore, enhancing the perceived financial performance of the firm may also increase chances of full share subscription.

Managers also have incentives to engage in earnings management subsequent to the IPO date in order to maintain a high stock price. Firms commonly impose selling-restrictions, known as lock-up periods, on the personal holdings of top managers and major owners. After approximately six months, at the end of the lock-up period, pre-IPO shareholders may reduce or liquidate their stake in the company by selling at the prevailing market price.

Insider trading regulations and the negative signalling of managers reducing their ownership stakes is likely to deter the original entrepreneurs from engaging in earnings management for their own benefit. Ertimur, Sletten and Sunder (2013) emphasize the importance of selling incentives of pre-IPO shareholders rather than of managers at lockup expiration. Consistent with this theory, they find that executives sell infrequently and only small quantities after lockup expiration.

Issuers will also face pressure to support the initial offer price and meet the earnings projections set when marketing the IPO. Failure to meet these projections could severely damage firm reputation as well as the relationship with larger investors, analysts and underwriters.

A further incentive to maintain high earnings after the issue concerns avoiding the potential costs of being exposed as a manipulator. Reversing accounting entries or switching to more conservative methods immediately after the lockup expiration could spark earnings management allegations serious enough to trigger a class action suit. The potential cost of litigation is in certain cases large enough to force the defendant company into bankruptcy (Alexander, 1991), and managers may be held personally accountable. Even if no criminal charges are filed against the directors of the company, accusations of earnings management may severely damage their reputations.

In summary, issuers who engage in earnings management in connection to the offering are likely to continue to do so in the subsequent months. To capture the effect of earnings manipulation in initial public offerings, this paper will therefore focus on measuring accruals in the IPO year.

3.2 Accounting Principles and the Components of Accruals

The accrual accounting concept is built on the *matching principle*, stating that revenues should be recognized as income when they have been earned, rather than when the actual cash flow occurs. Similarly, costs should be expensed in the period in which the underlying resource is consumed. Consequently, the net income reported on the profit and loss statement will not match the income on the cash flow statement.

In Sweden, Denmark, Norway and Finland alike, the annual consolidated accounts of a public company shall be prepared in accordance with International Financial Reporting Standards (IFRS). Companies whose stocks are not traded on a regulated market may choose to follow another accounting framework. For example, Swedish companies listed on e.g. Aktietorget or NASDAQ First North may choose to adopt either the K2 or K3 framework depending on their size and turnover. These frameworks mostly conform to the principles outlined in IFRS, but do not require the same level of detail in the financial accounts.

The accrual accounting system is very flexible and permits alternate treatments of many accounting events. For example, the manager has significant discretion over when and how revenues, expenses and certain events will be recognized in the financial accounts, in order to provide a more accurate representation of firm performance in a particular period. This however also provides the management with many opportunities to manipulate the financial statements.

One way to think about accruals is that they should reflect the expectation of probable future cash inflows or outflows, by recognizing the financial effects of these benefits or obligations prematurely. This implies that accruals should reverse when these events have been realized, but without impacting earnings. Dechow, Khimich and Sloan (2011) however demonstrate that extreme accruals exhibit a high frequency of subsequent reversals that do impact future earnings as well as stock returns.

While the total level of accruals is likely to capture evidence of earnings manipulation, it is also likely to vary as a result of changing business condition (see e.g. Kaplan, 1985). Thus, a model is needed to determine which accruals have resulted from managerial intervention and which components are dictated by changing business conditions. Following Teoh, Wong, and Rao (1998b) we use an extension of the cross-sectional Jones (1991) model to decompose total accruals into *discretionary* (adjustments due to unusual managerial choices) and *nondiscretionary* (adjustments reflecting business conditions) components. The methodology is described in detail in Chapter 4.3.

The model also distinguishes between current and long-term accruals, since items in the former category are more susceptible to earnings management (Guenther, 1994). Managers can for example increase current accruals by recognizing revenues prematurely, deferring recognition of expenses or allocating overheads to inventory rather than COGS. Long-term discretionary accrual adjustments can for instance involve refraining from writing off bad loans or impaired assets or decreasing deferred taxes.

3.3 Investor Behaviour and Market Efficiency

The predictive power of accruals on long-run post-IPO returns rests on the assumption that investors do not accurately account for the impact of earnings management in their models for expected returns. In other words, this represents a deviation from the efficient-market hypothesis (Fama, 1969), which states that all publicly available information should be reflected in asset prices. Managers can therefore benefit by exploiting market credulity to maximize firm value. Since the strategy does not accurately reflect favourable long-term prospects and abnormal accruals will eventually reverse, earnings in the post-IPO years will decline. As investors alter their assessments of firm earnings potential, the price will adjust downwards.

To understand this phenomenon, it is important to note that a change in the level of accruals can have many different implications. For example, an increase in inventory could imply that managers are expecting a spike in future sales. However, it may also signal that managers are delaying write-offs of obsolete inventory or allocating more overheads to inventory instead of cost of goods sold. Similarly, an increase in accounts receivable could reflect both an increase in sales as well as more aggressive revenue recognition.

In this context, it is also important to consider that abnormally high accruals in the IPO year may also be a consequence of normal economic activities of newly public companies, resulting from the investment of IPO proceeds in working capital (Armstrong et al., 2015). Taking all traded companies into account, Subramanyam (1996) even finds a positive link between discretionary accruals and future profitability, claiming that managerial discretion improves the ability of earnings to reflect economic value.

The conflicting views regarding the implications of high accruals combined with the scarcity of information about newly public firms make it difficult for investors to assess the appropriateness of IPO-firm accruals as indicators of future performance.

It may seem puzzling that any rational investor would be willing to hold IPOs in the aftermarket, given their well documented underperformance and the limitations for fundamental analysis. One potential explanation lies in the skewed distribution of stock returns. Although median return is low, investing in IPOs offers the rare chance of extremely high rewards. Three-year buy-and-hold returns of over 1,000% are for example much more common amongst IPO firms than their non-issuing peers (Field and Lowry, 2009). Enticed by the chance of identifying the next Alphabet (Google) or Facebook, less risk-averse investors might therefore choose to place their money in IPOs.

4. SAMPLE SELECTION AND DATA

This chapter outlines our research and sample selection methodology. In the first section, we describe our data collection process and the sample criteria. In the following two parts, the calculations of discretionary current accruals, which are used as a proxy for earnings management, and of performance measures are accounted for in detail. Lastly, we provide more information regarding the characteristics of our sample firms.

4.1 Sample Selection

The data sample is comprised by initial public offerings (IPOs) which are (1) listed on either a Swedish, Danish, Finnish or Norwegian stock exchange[5] and have an (2) initial listing date between 1996 and 2014. The list of IPO firms fulfilling the above criteria was extracted from Reuters Eikon.

The original sample consisted of 721 entries, from which we excluded (1) financial and real estate firms (SIC codes 60-69), (2) companies with an offer price below 5 SEK, (3) double listings and (4) initial listings of foreign companies.

For each company, the following financial data items were extracted from COMPUSTAT: Net Revenues (COMPUSTAT annual data item SALE); Net Income (item IB); Accounts Receivable (item RECT); Inventories (item INVT); Other Current Assets (item ACO); Accounts Payable (item AP); Taxes Payable (item TAXPAY); Other Current Liabilities (item LCO); Total Assets (item AT); and Operating Activities - Net Cash Flow

[5] Firms on our sample were listed on the following exchanges: Nasdaq Stockholm, Nasdaq Copenhagen, Nasdaq Helsinki, Oslo Stock Exchange, NGM Nordic MTF, Aktietorget and Nasdaq First North.

(item OANCF). Companies with insufficient financial records for the year before or the year of the offering were excluded from the sample. Companies that could not be identified by COMPUSTAT either by company name or ISIN were also excluded.

Stock return data were retrieved from FinBas for the Swedish firms, and from COMPUSTAT for the Danish, Norwegian and Finnish firms. We used monthly returns to limit the size of the data set and facilitate our analysis. Since COMPUSTAT stock prices are not adjusted for stock splits and distributions, the market value was used for the respective firms to calculate monthly returns. Companies with insignificant trading activity in the months after the offering were excluded, yielding a final sample size of 290 firms.

In order to calculate abnormal accrual and return measures, a list of all public Nordic companies traded at some point during the period 1996-2016, along with their annual financial data, was retrieved from COMPUSTAT. Monthly stock return data was obtained either from FinBas or COMPUSTAT, depending on nationality. After eliminating companies with insufficient records, our final control sample contained 2623 firms.

Consistent with the previously proposed view that managers are incentivized to manage earnings both in the months prior to and after the IPO date, we measure the level of abnormal accruals in the IPO year. The fiscal year in which the IPO occurs is defined as *year 0* and thus captures both pre- and post-IPO accounting activity. Financial data from both the year prior – defined as *year -1* – as well as the year of the IPO will be used to calculate the levels of accruals.

4.2 Calculation of Earnings Management Measures

Accruals do not only reflect the choice of accounting methods, but also capture more subtle income management techniques such as early recognition of income, late recognition of expenses and unusual gains. In order to measure the effect of earnings manipulation, we decompose total accruals into three parts: discretionary and nondiscretionary current accruals, and long-term accruals. Nondiscretionary accruals capture the effects of current business conditions whereas discretionary accruals reflect earnings management techniques imposed by the manager.

Following the approach suggested by Teoh et al. (1998a), we use an extension of the cross-sectional Jones (1991) model to distinguish between the different components of accruals. *Nondiscretionary current accruals* (NDCA) represent the expected level of current accruals, calculated using the estimates from a cross-sectional regression including all firms

with the same nationality and two-digit SIC code as the issuer. The level of discretionary current accruals (DCA) is defined as the deviation from the fitted value of current accruals and will be used as a proxy for earnings management in this paper.

Long-term accruals will not be included in our analysis since our interest lies in measuring the earnings manipulation of managers at the time of the IPO and lock-up expiration. As demonstrated by Guenther (1994), managers have greater control over current versus long-term accruals, and DCA is therefore considered a better proxy for earnings management.

Both discretionary and nondiscretionary accruals are components of total accruals, which is simply the difference between net income and cash flow from operations. Current accruals (CA) are defined as the change in noncash current assets less the change in operating current liabilities:

$$\begin{aligned} CA \equiv\ & \Delta[account\ receivables + inventory + other\ current\ assets] \\ & - \Delta[accounts\ payables + tax\ payables + other\ non \\ & - interestbearing\ current\ liabilities] \end{aligned}$$

The normal level of accruals differs across time and between companies depending on the nature of the business and prevailing industry conditions. To control for the effects of fluctuating industry-wide economic conditions that influence accruals, nondiscretionary current accruals are defined as the expected current accruals of an IPO firm in a certain year based on the average level of current accruals of *trading industry peers* during the same period. Since economic and industry-specific conditions are likely to vary between countries, only peers with the same nationality as the issuer were considered. The two-digit SIC codes were used to classify companies into different industries. IPO firms were excluded from the estimation sample. Firms with less than two non-issuing trading peers during the IPO year were either omitted or grouped together with firms in a similar industry. The estimation is based on the following cross-sectional OLS regression:

$$\frac{CA_{j,t}}{TA_{j,t-1}} = a_0\left(\frac{1}{TA_{j,t-1}}\right) + a_1\left(\frac{\Delta Sales_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t}$$

where TA is total assets and *j* refers to each firm *j* in the estimation sample.

Using the average estimated intercept $\hat{a}_0$ and slope coefficient $\hat{a}_1$, nondiscretionary current accruals for every firm *i* are calculated as:

$$NDCA_{i,t} \equiv \hat{a}_0 \left(\frac{1}{TA_{i,t-1}}\right) + \hat{a}_1 \left(\frac{\Delta Sales_{i,t} - \Delta AR_{i,t}}{TA_{i,t-1}}\right)$$

where ΔAR is the change in account receivables. ΔAR is subtracted from the change in sales to account for the possibility of sales inflation imminent before the offering. The discretionary current accruals are defined as the residual of the fitted current accruals:

$$DCA_{i,t} \equiv \frac{CA_{i,t}}{TA_{i,t-1}} - NDCA_{i,t}$$

The estimate of discretionary current accruals is treated as a proxy for the level of earnings manipulation in the IPO, and will be used as the key explanatory variable in this paper. To further illustrate how discretionary current accruals are calculated, an example is provided in Appendix C.

We divide IPO firms into four quartiles based on the level of asset-scaled discretionary current accruals to avoid the linear parameterization of regressions. For the purpose of this paper, we will predominantly focus on the DCA portfolio containing the lowest abnormal accrual firms (quartile 1) along with the DCA portfolio with the highest abnormal accrual firms (quartile 4).

4.3 Calculations of Performance Measures

We rely on two main approaches to calculate stock performance: (1) cumulative average adjusted returns (CAR); and (2) buy-and-hold returns (BH). The CAR-approach implicitly assumes monthly rebalancing of the portfolio, whereas the buy-and-hold return strategy measures the total return from buying a stock at the offer price and holding it until either the end of the measurement period or it is delisted. From an investor point of view, the latter might be considered more realistic. However, this approach imposes the risk of a bad-model problem (Fama, 1998), arising from the compounding effects of initially small measurement errors over longer holding periods. We therefore report both CAR and BH portfolio returns.

In order to obtain the *abnormal* returns, as well as ensure comparability across time, returns are measured in excess over a benchmark in both of these approaches.

Throughout this paper, we rely on a quartile portfolio division of firms based on their level of discretionary current accruals. We therefore focus on measuring the stock return performance of the quartile portfolios, rather than of the individual stocks.

To measure portfolio CAR, raw stock returns have been calculated on a monthly basis as the percentage change in the last traded price of a stock at the end of the month. The first month of trading is defined as *t=0*. We only measure returns in the aftermarket period, defined as the 36 months after the IPO, excluding the initial return. The initial return is calculated based on the offer price and first month closing price, and would require additional consideration since the offer price in our dataset is not adjusted for stock splits, dividends or distributions. Furthermore, in accordance with prior empirical literature on post-IPO performance (see e.g. Ritter, 1995), initial returns are separated from the calculations of long-run stock performance.

The monthly benchmark-adjusted returns equal the raw monthly stock returns less the monthly benchmark return for the corresponding period:

$$ar_{i,t} = r_{i,t} - r_{m,t}$$

The average benchmark-adjusted return for each of the four quartiles in month *t* is calculated as:

$$AR_t = \frac{1}{n}\sum_{i=1}^{n} ar_{i,t}$$

where *n* is the number of IPO firms in the quartile trading during month *t*. As previously mentioned, this approach automatically assumes monthly rebalancing of the portfolio.

The cumulative average benchmark-adjusted return equals the sum of average benchmark-adjusted returns for each month *t* in the estimation period:

$$CAR_{t=0,T} = \sum_{t=0}^{T} AR_t$$

In the alternative approach, using a buy-and-hold strategy, DCA portfolio abnormal returns are defined as:

$$BH_{t=0,T} = \frac{\sum_{i=1}^{n}\left[\prod_{t=0}^{T}(1 + r_{i,t}) - \prod_{t=0}^{T}(1 + r_{m,t})\right]}{n}$$

The return equals the total benchmark-adjusted return of the holding period – either 36 months or until the stock is delisted from the exchange. In other words, this equals the abnormal return of a passive trading strategy in which the investor holds the portfolio for three years without rebalancing or reinvesting the proceeds from delisted stocks.

We use two different benchmarks to measure the abnormal stock returns. To assess the relative market performance of the IPO firm, raw stock returns have been benchmarked against a market index. For Swedish firms, we use the OMX Stockholm PI (OMXSPI). This index includes all stocks traded at the Stockholm Stock Exchange and can therefore be considered to provide a comprehensive picture of the performance of the stock market as a whole. Similarly, we use the Copenhagen All Share Index (OMXCPI) as a proxy for Danish stock market performance. The Helsinki All Share Index (OMXHPI) is used to benchmark the returns of the Finish companies and the Oslo Børs Benchmark Index (OSEBX) is applied to Norwegian firms. Due to limited index data availability for the earlier years in our sample period, Finnish companies listed prior to 1998 are excluded from the sample.

As an alternative benchmark, we assign each issuing firm a set of non-issuing peers, matched on size, industry classification and country. The matching firms are selected from our control sample of non-issuing traded companies, and are the two or three firms closest in market capitalization to the issuer with the same nationality and two-digit SIC code. Market capitalization is measured at the end of the first month of trading (month 0) for both the IPO and the control sample. The peer-adjusted returns are then calculated as the raw stock return of the IPO less the average peer return for the same period. If one of the matched firms is delisted before the end of the holding period, the buy-and-hold return up until that time will be carried forward until month 36 and used to calculate the average BH peer return. The rationale behind this approach is to ensure consistency between the handling of IPO and control firms, as well as avoiding survivorship bias.

In addition to equal-weighted portfolio returns, we also calculate the value-weighted buy-and-hold as well as cumulative average return for our four DCA quartile portfolios. The results are reported in Appendix B.

Table I

Distribution of IPOs by Year of Listing

The samples comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The sample firms must also have sufficient COMPUSTAT data to calculate the components of accruals in fiscal year 0 (see chapter 4.2). The sample distribution in terms of year of listing is presented below.

Year	No. of Swedish IPOs	No. of Danish IPOs	No. of Norwegian IPOs	No. of Finnish IPOs	Total no. of IPOs	% of sample
1996	1	0	0	0	1	0.34%
1997	3	4	2	0	9	3.10%
1998	5	1	1	0	7	2.41%
1999	9	2	0	3	14	4.83%
2000	14	4	5	8	31	10.69%
2001	7	8	1	4	20	6.90%
2002	5	1	0	0	6	2.07%
2003	0	0	0	0	0	0.00%
2004	4	0	6	0	10	3.45%
2005	6	1	10	2	19	6.55%
2006	17	5	11	3	36	12.41%
2007	13	6	13	1	33	11.38%
2008	5	1	4	0	10	3.45%
2009	6	1	0	0	7	2.41%
2010	9	2	4	1	16	5.52%
2011	9	0	2	0	11	3.79%
2012	1	0	1	0	2	0.69%
2013	12	0	2	1	15	5.17%
2014	34	1	5	3	43	14.83%
Total	**160**	**37**	**67**	**26**	**290**	**100.00%**

4.4 Sample Characteristics

The sample consists of 290 Nordic companies going public between 1996 and 2014. The distribution of the number of initial public offerings by calendar year and country is reported in Table I.

The number of IPOs is not evenly distributed throughout the time period, and certain sample years have zero or very few observations. Table I also reveals clustering of IPOs in three periods: 2000; 2006-2007; and 2014.

The first “hot issue” period is known as the dot-com bubble, characterized by a stock market surge driven by the many early-stage IT firms going public during this time. These companies could see their stock prices double in days, further fuelling the exuberance of IPOs and invested capital. After the dot-com boom followed the dot-com crash, with the Nordic stock markets not fully recovering until 2006. This can explain the clustering of IPOs in 2006

Table II
Distribution of IPO Companies by Industry

The samples comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The sample firms must also have sufficient COMPUSTAT data to calculate the components of accruals in fiscal year 0 (see chapter 3.2). The sample distribution in terms of industry classification is presented below.

Industry	**SIC codes**	**No. of firms**
Mining	10, 12, 14	3
Oil and Gas Extraction	13	17
Construction	15-17	2
Food Products	20	12
Apparel Manufacturing and Retail	23, 56	6
Paper and Paper Products	24-27	10
Chemicals and Biotechnology	28	47
Metal and Metal Products	33, 34	4
Machinery and Computer Equipment	35	20
Electronics	36	25
Transportation	37, 40-45, 47	16
Scientific Instruments	38	18
Miscellaneous Manufacturing Industries	39	2
Public Utilities	46, 48, 49	10
Wholesale trade	50, 51	4
Retail trade	52-55, 57-59	6
Hotel and Lodging	70	2
Business Services	73	77
Amusement and Recreation Services	79	3
Health Services	80	1
Management and Research Services	87	4
Nonclassifiable	99	1
Total		**290**

and 2007 – a development that was however brought to an abrupt ending by the global financial crisis in 2008. The year 2014 marks the beginning of the most recent big wave of new listings, which has since accelerated. The increase is most notable for Sweden. In 2016, 75 new companies were listed on the Nasdaq Stockholm Stock Exchanges, and the increase in number of firms going public each year continues during 2017 (Turula, 2017).

Table II presents the industry distribution of the IPO firms by two-digit SIC code. The sample includes 32 different two-digit SIC codes, indicating that despite the rather small sample size we have managed to obtain a wide industry distribution. We observe a slight concentration of firms within the Chemicals and Biotechnology sector as well as the Business Services sector. The large number of IT consultancy firms going public during the dot-com

Table III

Summary Statistics of Firm Characteristics in the IPO year by Quartile

The samples comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The sample firms must also have sufficient COMPUSTAT data to calculate the components of accruals in fiscal year 0 (see chapter 4.2). The sample distribution in terms of year of listing is presented below. This table reports summary statistics of firm characteristics in the issue year by DCA quartile for: asset-scaled discretionary current accruals (measured as the percentage deviation from expected accruals); market capitalization in the first month of trading (MV); and median sales, net income and cash flow from operations growth in the IPO year.

	Quartile 1	**Quartile 2**	**Quartile 3**	**Quartile 4**	**All firms**
No. of firms	*73*	*72*	*72*	*73*	*290*
Mean DCA	-177.07%	-3.48%	4.57%	91.19%	-21.35%
Median DCA	-29.48%	-3.11%	4.05%	26.13%	0.72%
SD DCA	1086.59%	2.77%	2.68%	401.18%	586.36%
Median MV (MSEK)	313.7	547.0	492.1	299.3	394.6
Median Sales Growth	52.81%	12.98%	22.65%	32.62%	26.70%
Median Net Income Growth	-40.82%	-13.29%	-15.35%	5.52%	-13.29%
Median Operating Cash Flow Growth	-5.22%	2.80%	-15.91%	-79.42%	-15.31%

bubble in 1999-2000 can explain the dominance of the latter category.

Based on their level of asset-scaled discretionary current accruals in the IPO year, the 290 firms in our sample have been sorted into four quartiles. Each quartile contains 72 or 73 firms. The two extremes, containing the firms with the lowest versus the highest level of asset-scaled accruals, will be the primary focus of this paper.

Table III contains summary statistics for these four quartiles. Quartile 4, defined as the high DCA quartile, has a mean DCA of 91.19%, implying that the level of asset-scaled accruals exceed the predicted value by 91.19% on average. Consistent with our expectations, the average growth in operating cash flow is lower than the growth in net income, and is in this case even negative.

Quartile 1, defined as the low DCA quartile, has a mean DCA of -177.07% and exhibits the by far highest cross-sectional variation (1086.59%). It also contains the best performing firms in terms of sales growth in the IPO year. Both quartile 2 and 3 have DCA levels close to zero and the cross-sectional variations are small. The firms in these quartiles are also larger on average (in terms of mean market value) as compared to the firms in quartile 1 and 4.

5. RESULTS

The presence and implications of earnings management in initial public offerings has been the focus of several academic papers, often with conflicting results. In this chapter, we aim to assess whether abnormal accruals in IPO companies reliably can predict long run stock performance of Nordic companies by addressing potential biases in research methodology discussed in recent empirical literature.

First, we relate the level of discretionary current accruals to long-run stock performance using different approaches and benchmarks. In most, but not all cases, we find a significant negative relationship between the level of discretionary current accruals and post-IPO returns. Second, we measure the incremental effect of discretionary current accruals on post-IPO underperformance through cross-sectional regression analysis. Even after controlling for other factors known to influence stock returns, as well as factors that might influence the level of accruals, we find that earnings management in the IPO year reliably predicts long-run post-IPO underperformance. Lastly, we split our sample of Nordic IPO firms into four subsamples based on nationality to conclude whether we observe any country-specific effects.

5.1 Abnormal Accruals and Subsequent Stock Performance

We begin by looking at the level of abnormal accruals in relation to post-IPO stock returns. Discretionary current accruals (DCA) represent the above-expected level of accruals and are used as our proxy for earnings management. The detailed approach for calculating DCA is outlined in chapter 4.2. The firms in our sample are divided into four quartiles based on their level of asset-scaled abnormal accruals, with portfolio 1 containing the lowest-level firms and portfolio 4 the highest-level firms.

We use two different approaches to measure post-IPO stock performance: cumulative average returns (CAR) and buy-and-hold returns (BH). In addition to raw performance measures, returns are also measured in excess over two different benchmarks: (1) a country-specific market index, and (2) a set of size- and industry-matched firms. The calculations and methodology of the different approaches are described in section 4.3.

Table IV
Mean Abnormal Long-term Returns by DCA Quartile

The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The return is measured over 36 months, with the first month of trading assigned as month 0. The firms are divided into four quartiles based on their level of discretionary current accruals (see section 4.2 for calculation of DCA). Quartile 1 contains firms with the lowest level of discretionary current accruals and quartile 4 the firms with the highest level of DCA. The results below show both buy-and-hold returns as well as cumulative average returns for the four quartiles. The computations of these measures are described in detail in Chapter 4.3.

	Buy-and-Hold Returns (BH)					**Cumulative Average Returns (CAR)**				
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	All firms	Quartile 1	Quartile 2	Quartile 3	Quartile 4	All firms
Raw Return	21,36%	20,93%	17,21%	-19,28%	9.99%	28,11%	38,56%	18,71%	2,15%	21.88%
(tstat)	*(1.49)*	*(2.00)*	*(1.39)*	*(-2.33)*	*(1.71)*	*(1.49)*	*(2.53)*	*(1.40)*	*(0.12)*	*(2.22)*
Index adjusted	17,56%	12,34%	11,77%	-20,49%	5.25%	26,83%	30,35%	13,36%	-2,33%	17.05%
(tstat)	*(1.37)*	*(1.44)*	*(1.15)*	*(-2.57)*	*(1.03)*	*(1.40)*	*(2.09)*	*(1.12)*	*(-0.14)*	*(1.96)*
Peer adjusted	-0,55%	10,75%	-11,07%	-18,13%	-4.78%	-12,92%	-4,20%	-34,26%	-36,93%	-22.08%
(tstat)	*(-0.04)*	*(1.02)*	*(1.00)*	*(-1.90)*	*(-0.86)*	*(-0.62)*	*(-0.25)*	*(-2.05)*	*(-2.15)*	*(-2.16)*

Due to the relatively small sample size, our results and estimated significance levels are highly susceptible to the influence of outliers and extreme observations. In order to facilitate statistical analysis but at the same time retain as much of the data as possible, we decided to bring the most extreme outliers closer to the normal distribution curve through winsorization.[6] Since the 5th percentile of our data caused more than 30% of the standard deviation, we settled on a 95% winsorization. This implies that the most extreme values at both sides of the distribution in every quartile were affected. The non-winsorized results are reported in Appendix A.

Table IV summarizes the abnormal returns over a 36-month holding period for the four DCA quartile portfolios after winsorization. On a BH measure, we see that the high-DCA portfolio (Portfolio 4) underperforms the low-DCA portfolio (Portfolio 1) by 40.64% in raw returns, 38.05% in index-adjusted returns and 17.57% in peer-adjusted returns. Comparing the results from the CAR-approach, the effect is slightly weaker; with high-DCA firms underperforming low-DCA firms by 25.97% in raw returns, 29.17% in index-adjusted returns and 24.01% in peer-adjusted returns. Overall, our full sample of IPO firms performs well on a

[6] To illustrate this point, consider the engineering company Sevan Marine AS included in quartile 1. With a first month closing price of 14.20 NKK and an initial market value just shy of one million NKK, Sevan has since its IPO in 2005 managed to increase its share price with about 1,133%. Given that we have 73 companies in one quartile portfolio, Sevan alone would increase average portfolio buy-and-hold return by 15.5%

raw and index-adjusted basis, but underperforms relative to their size and industry-matched peers; both on a BH as well as a CAR measure.

While all measures indicate long-term underperformance for firms with a high level of abnormal positive accruals, we also observe that the quantitative measurement of the long-run performance of IPOs is highly sensitive to the choice of benchmark. This is not unusual for long-term event studies, as shown by Dimson and Marsh (1986). For instance, we see that raw and index-adjusted returns follow a more uniform pattern, whereas peer-adjusted returns appear to be more volatile. This is not a very surprising find. Since our sample of IPO firms mainly consists of small, highly volatile companies, the size-and-industry-matched peers tend to exhibit similar return characteristics.[7]

Overall, the peer benchmark has produced the lowest returns across the quartile portfolios and the largest return differential as compared to raw returns. A potential explanation could be the effect of delistings during the holding period. While delistings due to bankruptcy are likely to have a negative impact on realized portfolio return, delistings due acquisitions by another firm are likely to increase return. The low peer-adjusted portfolio return may therefore reflect a greater probability of negative delistings of IPO firms than for their industry-and-size-matched non-issuing peers.

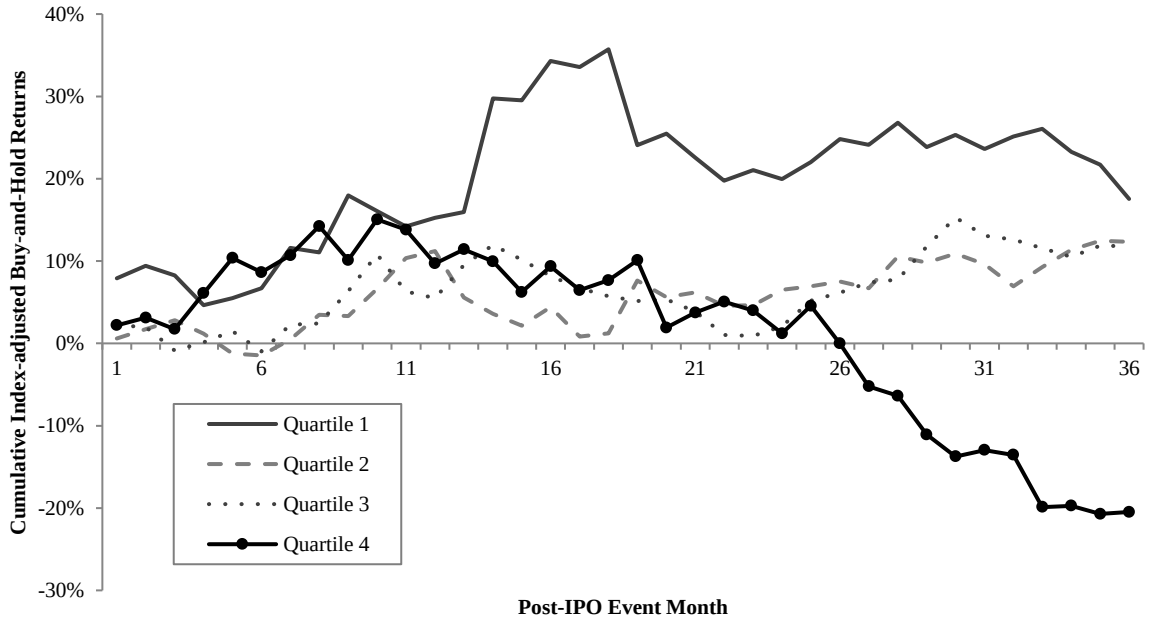
Figure I plots the time series of index-adjusted buy-and-hold returns for the four quartile portfolios. The figure shows that quartile 1, 2 and 3 outperform the market index by 12% to 18% over the 36-month holding period, whereas quartile 4, which is the high accrual portfolio, underperforms by 20%. The most conservative portfolio, quartile 1, exhibits the best performance, with cumulative buy-and hold returns ranging from 6% to 36% throughout the period. The graph also reveals an interesting return pattern for the high accruals portfolio. During the first year, quartile 4 performs well, with cumulative buy-and-hold returns peaking at 15% in month 10. The positive trend is reversed one year following the listing month, with index-adjusted buy-and-hold returns on a slow decline. Performance then deteriorates dramatically throughout the last twelve months. At the end of the holding period, in month 36, quartile 4 underperforms the market by 20% on a buy-and-hold basis.

[7] Since we measure returns in relative rather than absolute values, the often very low stock prices at the time of listing can help explain some of the extreme returns.

Figure I

Cumulative buy-and-hold returns net of the market index return

The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The firms are divided into four quartiles based on their level of discretionary current accruals (see section 4.2 for calculation). The index-adjusted cumulative Buy-and-Hold returns for the four quartiles are plotted below for the 36 months following the IPO-month.



This finding is consistent with the theory that managers are likely to continue engaging in earnings management during the months following the listing in order to maintain a high share price until after lock-up expiration. Reversing accounting entries or switching to more conservative accounting methods too soon after the IPO date could also raise suspicion of fraudulent behaviour.

It is however important to also address the potential limitations to this approach. The market indices are value-weighted and comprise all companies traded on either the Nasdaq Stockholm, Nasdaq Copenhagen, Oslo Børs or Nasdaq Helsinki exchanges. The majority of the IPO firms in our sample are small growth-firms that by nature exhibit different return characteristics (Fama and French, 1993). This implies that the return differential between the market index and the portfolio of IPO companies might also depend on size-related factors.

We observe somewhat different return patterns if an alternative return measure or benchmark is used (see Appendix A for graphed results over all return specifications for quartile 1 and 4). We however observe that quartile 4 underperforms irrespective of specification.

In sum, the results imply that firms with a high level of estimated discretionary current accruals in the IPO year are more likely to exhibit long-term underperformance. Our results are statistically significant for raw and index-adjusted buy-and-hold returns as well as peer-adjusted cumulative average returns, but due to our high cross-sectional variation and small sample size, the statistical power of our test is limited. In order to validate the accuracy of our findings, the following sections will address potential biases and shortcomings of our main approach.

5.2 Cross-Sectional Regressions

In order to measure the incremental explanatory power of accruals on post-IPO stock performance, we turn to event-time cross-sectional regression analysis. As our dependent variable, we consider the three-year post-issue buy-and-hold returns. Our main independent variable is the level of asset-scaled discretionary current accruals (DCA) in the IPO year. The details on how DCA is calculated can be found in section 4.2. In addition, we include a set of control variables that has been shown to influence stock performance: a contemporaneous three-year buy-and-hold return of the corresponding country-specific market index (Mkt); the IPO firm's logged capitalization measured at the first month of trading (MV); a dummy variable indication if the stock was listed during a "hot issue period", i.e. 2000; 2006-2007 or 2014 (HIP); and country dummies for Norway, Denmark and Finland.

The market value variable is intended to capture potential differences in return characteristics related to size. As has been demonstrated by Fama (1970) among others, small-cap stocks tend to outperform large-cap companies over time. The HIP variable is added to address the concern that the event-time approach may yield biased results in times when IPOs cluster around specific time periods, such as during the dot-com bubble (Schultz, 2001). Since prevailing industry conditions are indirectly controlled for through the calculation of DCA, no additional business sector controls were added.

In a second approach, we extend our analysis past firm characteristics to also include financial factors related to the level of accruals. We add two additional dependent variables: IPO-year cash flows from operations (CFO); and change in net income (ΔNI). The cash flow variable is included in order to address the concern that the relation between high accruals and negative long-run returns is driven by low cash flows generated by firms with high accruals (Armstrong et al., 2015). The variable is calculated as cash flows from operations in the IPO

Table V
Event-time Cross-sectional Regression Results

The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The sample has been winsorized at the 95% level in order to limit the impact of the most extreme observations (see full motivation in previous section). The full regression is specified as following:

$$R_i = \alpha_0 + \beta_1 DCA_i + \beta_2 Mkt_i + \beta_3 \log(MV)_t + \beta_4 CFO_t + \beta_5 \Delta NI_t + \beta_6 HIP_t + \sum_{c=3} \gamma_c Country_c + e_i$$

where R_i is the buy-and-hold return for firm *i*, measured from the first month of trading closing price and to the earlier of it's three-year anniversary or delisting date; DCA_i is the estimated level of discretionary current accruals, scaled by total assets; Mkt_i is the market buy-and-hold return for the same period as the dependent variable; $\log(MV)_t$ is the logged market capitalization measured at the end of the first month of trading and used as a proxy for size; CFO_t is the level of asset-scaled cash flows from operations in the IPO year; and ΔNI_t is the growth in asset-scaled net income in the IPO year.

Panel A: Parameter estimates

Intercept	DCA	Mkt	Log (MV)	HIP	NO	DK	FI
0.231	-0.021*	1.272***	-0.012	0.025	0.022	0.052	0.259
(0.41)	*(-2.35)*	*(8.31)*	*(-0.43)*	*(0.21)*	*(0.16)*	*(0.31)*	*(1.34)*

Panel B: Parameter estimates

Intercept	DCA	Mkt	Log (MV)	CFO	ΔNI	HIP	NO	DK	FI
0.054	-0.050*	1.336***	-0.004	-0.033	0.008	0.051	-0.029	0.051	0.284
(0.09)	*(-2.01)*	*(8.62)*	*(-0.14)*	*(-0.41)*	*(0.31)*	*(0.44)*	*(-0.22)*	*(0.30)*	*(1.47)*

Panel C: Summary statistics of variables

Variable	Mean	Median	Standard deviation
Return	0.109	-0.168	1.008
DCA	-0.214	0.007	5.864
Mkt	0.057	0.092	0.396
Log (MV)	19.78	19.79	1.902
CFO	-0.214	0.008	0.891
ΔNI	-0.296	-0.301	2.122

year divided by total assets. The change in net income equals the asset-scaled net income growth between year -1 and year 0.

The results from the regressions are reported in Table V. Three stars denote significance at the 0.1% level, and one star at the 5% level. Panel A displays the estimated factor loadings with their corresponding t-stats below in parenthesis for the first regression. The adjusted R-square is 23.43% and the F-statistic for regression fit is highly significant, indicating that our model is accurately specified. Our key explanatory variable, discretionary current accruals (DCA), has an estimated coefficient of -0.021, significant on the 5% level (p-value 0.020). This implies that a one-standard deviation increase in DCA yields a 2.1% return difference. The coefficient on the market return is 1.312 and can be interpreted as the average beta in our sample. This implies that the firms in our sample are more volatile than the

market, confirming the evidence presented by Clarkson and Thomson (1990) on beta risk of newly issued stocks.

Panel B reports the parameter estimates and corresponding t-stats for the extended regression. For this specification we obtain a slightly lower R-squared of 22.95%. The estimated coefficient for DCA is -0.050, still significant on the 5% level. This leads us to conclude that a higher level of estimated earnings management in the IPO year reliably predicts poorer long-term stock performance, even after controlling for the level of cash flows from operations. We find no significant relationship between long-run stock performance and logged market capitalization, hot issue periods, operational cash flows, net income growth or firm nationality. However, although we find no significant country-fixed effects, time-varying country-specific effects may have been captured by the market variable.

The Panel A and B regression results generally support the conclusions drawn in the preceding section, and are for the most part consistent with empirical literature. The coefficient on our main explanatory variable, DCA, is rather low at -2.1% or -5.0% as compared to the results in previous studies. Teoh et al. (1998a) estimates the incremental effect of DCA to -22.7%, and also find a significant relationship between post-IPO returns and logged market value as well as change in net income.

Panel C reports summary statistics of the regression variables. We observe that the average IPO firm exhibits negative long-run performance, but due to a few very successful issues the mean three-year raw buy-and-hold return is still positive at 10.9%. The reverse pattern can be inferred from the DCA variable, where we observe more extreme values for negative observations.

5.3 DCA Patterns

Our findings strongly indicate that there is a relationship between the level of asset-scaled discretionary current accruals in the IPO year and subsequent stock underperformance. We can however not infer with certainty that this proves that managers attempt to deceive investors in order to maximize their personal gains. In a scenario where issuers opportunistically advance accruals to improve reported earnings during the issue and lock-up period, we expect the level of abnormal accruals in the subsequent years to decline, since this strategy cannot be sustained in the long-run. As a result, reported net income has to be revised downwards in subsequent periods, which in turn is likely to have a negative impact on the price of equity.

Table VI
Time-series Pattern of DCA and Return on Sales by Quartile

The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The return is measured over 36 months, with the first month of trading assigned as month 0. The firms are divided into four quartiles based on their level of discretionary current accruals in year 0 (see section 4.2 for calculation of DCA). Quartile 1 contains firms with the lowest level of discretionary current accruals in year 0 and quartile 4 the firms with the highest level of DCA in year 0. ***, ** and * represent significance at the 0.1%, 1%, and 5% levels respectively, two-tailed, based on t-distribution for means and Wilcoxon for median. Panel A reports the time-series of asset-scaled DCA for quartile 1 and 4. Panel B displays the return on sales for quartile 1 and 4, defined as net income divided by sales.

Panel A: Discretionary Current Accruals

	Year 0			Year 1			Year 2			Year 3		
	n	**Mean**	**Median**	***n***	**Mean**	**Median**	***n***	**Mean**	**Median**	***n***	**Mean**	**Median**
Quartile 1	*73*	-1.771	-0.295***	*70*	0.008	-0.006	*66*	-0.031	-0.001	*55*	-0.049	-0.016
Quartile 4	*73*	0.912*	0.261***	*70*	-0.035	-0.024	*66*	-0.016	0.005	*49*	-0.043	0.009

Panel B: Return on Sales

	Year 0			Year 1			Year 2			Year 3		
	n	**Mean**	**Median**	***n***	**Mean**	**Median**	***n***	**Mean**	**Median**	***n***	**Mean**	**Median**
Quartile 1	*73*	-1.360***	-0.051***	*70*	-0.674***	-0.047**	*66*	-0.747***	-0.070***	*55*	-2.180**	-0.053***
Quartile 4	*73*	-0.377**	0.016	*70*	-0.889***	-0.079***	*66*	-0.500***	-0.019**	*49*	-0.043***	-0.063**

Table VI, Panel A, reports the time series of discretionary current accruals for quartile 1 and 4 from year 0 (issue year) to year 3. We observe that the level of current accruals normalizes already in year 1 for both quartile 1 and quartile 4, and approximates to the fitted value of the model. This also holds for the subsequent years for all quartiles (quartile 2 and 3 not reported), with mean and median levels of DCA remaining close to zero.

The fact that we only observe abnormal levels of accruals in the IPO year is an interesting finding in its own, and can potentially unify two seemingly contradictory discoveries. While the evidence for quartile 4 is consistent with the theory of managers attempting to inflate earnings to maximize equity values, as argued by Teoh et al. (1998a), the firms in quartile 1 appear to report more conservatively in connection with the issue; a theory advocated by Ball and Shivakumar (2008) and Venkatamaran, Weber and Willenborg (2008). Our results thus suggest that the event of an IPO leads to a polarisation of accounting practices, enticing some managers to take advantage of the information asymmetry and high capital inflows by inflating earnings, and others to adopt a more conservative approach due to the extensive scrutiny around the offering.

Panel B reports the mean and median return on sales for quartile 1 and 4 from year 0 to year 3. About 44% of the companies in our sample report a net loss in year 0, of which

many continue to make losses throughout the measurement period. Out of these companies, 56% ended up in either quartile 1 and 4, resulting in negative performance measures. Although the overall performance is rather poor, conclusions can be derived from the time series patterns. We observe that quartile 4 exhibits its highest mean and median return on sales in year 0, after which performance start to deteriorate. While about 40% of the portfolio companies report losses in the issue year, more than 60% do so in the subsequent year. The opposite is true for quartile 1, with performance improving slightly in year 1.

This finding is consistent with the time-series pattern of returns (see Figure I and Figure II). For quartile portfolio 4, equity value peaks during the first year, after which the positive trend is reversed and stock performance starts to decline. In sum, the evidence indicates that reported earnings of quartile 4 firms are higher in the IPO year because of high abnormal accruals. If these abnormal accruals reflected actual favourable long-term firm prospects, the reversal would not impact earnings. In fact, Subramanyam (1996) finds that high accruals reliably predict high future profitability in a sample of public firms (not just IPOs). Our evidence is therefore consistent with opportunistic earnings management by the issuer in the IPO year.

5.4 Country-Specific Results

We now split our sample into four subsamples based on firm nationality in order to examine potential country-specific differences in returns. Consistent with our main approach, the firms are divided into four quartiles based on their level of asset-scaled discretionary current accruals in the IPO year. We report the buy-and-hold return for each quartile over a 36-month holding period following the listing month.

In order to ensure comparability with our main results and reduce the impact from extreme outliers, returns have been winsorized at the 95% level. Through winsorization, the standard deviations of the samples were reduced by between 10.0% and 43.4%.

Table VII
Mean Buy-and-Hold Returns by Country and DCA Quartile

The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The return is measured over 36 months, with the first month of trading assigned as month 0. The firms are divided into four groups based on nationality, and thereafter into quartiles based on their level of discretionary current accruals (see section 4.2 for calculation of DCA). The buy-and-hold returns by quartile and country are reported below. The computations of the return measures are described in detail in Chapter 4.3.

	Sweden				**Denmark**			
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Quartile 1	Quartile 2	Quartile 3	Quartile 4
No. of firms	*40*	*40*	*40*	*40*	*10*	*9*	*9*	*9*
Raw Return	1.64%	28.98%	31.94%	-20.92%	54.20%	16.45%	21.61%	-47.06%
(tstat)	*(0.10)*	*(2.14)*	*(1.88)*	*(-2.07)*	*(0.84)*	*(0.77)*	*(0.42)*	*(-2.54)*
Index adjusted	-0.84%	12.75%	19.86%	-25.45%	68.07%	8.24%	16.64%	-40.21%
(tstat)	*(-0.06)*	*(1.05)*	*(1.33)*	*(-2.56)*	*(1.11)*	*(0.44)*	*(0.35)*	*(-2.76)*
Peer adjusted	-27.07%	-1.75%	-6.90%	-16.20%	65.20%	-42.38%	17.94%	-49.87%
(tstat)	*(-1.74)*	*(-0.12)*	*(-0.49)*	*(-1.33)*	*(1.13)*	*(-1.44)*	*(0.34)*	*(-3.81)*
	Norway				**Finland**			
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Quartile 1	Quartile 2	Quartile 3	Quartile 4
No. of firms	17	17	16	17	7	6	6	7
Raw Return	104.10%	15.96%	3.19%	-12.14%	-4.56%	-9.06%	-6.71%	-26.16%
(tstat)	*(1.95)*	*(0.62)*	*(0.15)*	*(-0.54)*	*(-0.15)*	*(-0.31)*	*(-0.15)*	*(-0.86)*
Index adjusted	77.71%	7.31%	-8.50%	-17.93%	17,42%	12.32%	13.29%	18.38%
(tstat)	*(1.53)*	*(0.39)*	*(-0.65)*	*(-0.85)*	*(0.65)*	*(0.70)*	*(0.39)*	*(0.77)*
Peer adjusted	71.13%	22.82%	-26.93%	-6.74%	-17.45%	4.46%	31.39%	2.37%
(tstat)	*(1.50)*	*(0.83)*	*(-1.09)*	*(-0.28)*	*(-0.68)*	*(0.20)*	*(1.15)*	*(0.07)*

Table VII reports the mean buy-and-hold returns by quartile for each of the four countries. We find that the return patters are very similar as compared to the pooled sample. On a raw buy-and-hold measure, quartile 4 underperforms quartile 1 regardless of nationality. For all countries but Finland, the underperformance of high DCA companies becomes even more significant after adjusting for index returns. We observe very non-uniform peer-adjusted buy-and-hold returns. The explanation for the volatility of the peer-return benchmark can be found in the size-matched peers which, alike the IPO companies, are predominantly small and exhibit extreme return characteristics.

In summary, even though the magnitude varies between countries, we observe that regardless of nationality, companies with a high level of discretionary current accruals have a tendency to underperform. Accordingly, we conclude that our findings should not be attributed to any country-specific characteristics.

6. ROBUSTNESS TESTS

In this section we introduce a series of robustness tests to further validate our results. We begin by employing an alternative approach to measure abnormal quartile portfolio returns, which allows us to control for both market and firm-related factors. In the second part, we introduce two additional methods of estimating the level of earnings manipulation in the IPO year. Throughout this section, only buy-and-hold returns will be reported, which is our main approach to measure stock performance.

6.1 Alternative Measures of Return

In response to the evidence of return anomalies of IPO companies presented in economic literature, advocates of the efficient market theory claim that correctly specified asset-pricing models could explain the abnormal performance. The Fama and French three factor model (1969) is one of the most renowned asset-pricing models, and considers three distinct risk factors in order to decompose returns: market exposure, size and value. The three factor model has been shown to explain up to 95% of returns in diversified stock portfolios.

If our high DCA portfolio truly underperforms on a risk-adjusted basis, it should consistently underperform relative to an explicit asset-pricing model (Brav and Gompers, 1997). For each firm in our sample, returns therefore are constrained to be:

$$R_{i,t} = \alpha_t + rf_t + \beta_1\left(M_{i,t} - rf_t\right) + \beta_2 SMB_t + \beta_3 HML_t$$

where t is an event month index, $R_{i,t}$ is the monthly raw return for firm i, rf_t is the risk-free rate, $M_{i,t}$ is the European stock market return, SMB_t is the return difference between a portfolio of small and a portfolio of large firms, and HML_t is the return difference between a portfolio of high book-to-market and a portfolio of low book-to-market firms.[8]

The alpha (α_t) captures the monthly abnormal return, which is zero under the null of no abnormal return given the model.[9]

[8] The Fama and French factors are retrieved from the Kenneth R. French website and include all stocks with available market equity data for 16 European countries. More information can be found on http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_3developed.html

[9] Worth noting is that this approach imposes a joint-test problem (Fama, 1970), stating that testing for market inefficiency inevitably will involve simultaneous testing of the assumed model of expected return. This implies that the alpha in our framework will capture the combined effects of abnormal stock performance and model misspecification if the model is unable to completely describe the cross-section of expected returns.

Table VIII

Fama French-adjusted Returns by DCA Quartile

The samples comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The return is measured over 36 months, with the first month of trading assigned as month 0. The firms are divided into four quartiles based on their level of discretionary current accruals (see section 4.2 for calculation of DCA). Quartile 1 contains firms with the lowest level of discretionary current accruals and quartile 4 the firms with the highest level of DCA. Abnormal returns are estimated from the Fama French three factor model: $R_{i,t} = \alpha_t + rf_t + \beta_1(M_{i,t} - rf_t) + \beta_2 SMB_t + \beta_3 HML_t$

	Buy-and-Hold Returns (BH)			
	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Fama French Adjusted returns	18,15%	13,13%	11,41%	-20,53%
(tstat)	*(1.40)*	*(1.41)*	*(0.99)*	*(-2.52)*

The betas from the regression are not reliable, when firms get delisted within the first year after their IPO. Following Teoh et al. (1998a), the abnormal return for firms with fewer than twelve monthly return observations is calculated as follows:

$$\alpha_t = R_{i,t} - M_{i,t}$$

To ensure comparability with our previous results and limit any distortive effects of extreme observations, the sample has been winsorized at the 95% level. This implies that the most extreme outliers at each side of the distribution have been normalized. Table VIII reports the mean abnormal returns for the four quartile portfolios. We observe that quartile 4 exhibits a Fama French-adjusted buy-and-hold return of -20.53%, and thus underperforms quartile 1 by 38.68%. The result is significant on the 5% level (t-stat of -2.52), allowing us to conclude that abnormal positive accruals in the IPO year are a reliable predictor of long-term underperformance also after controlling for market-, size- and value-related risk factors.

6.2 Alternative Measures of Accruals

Throughout the paper, we rely on an extension of the Jones (1991) model advocated by Teoh et al. (1998a) to estimate the level of abnormal accruals in the IPO year. Since different methods are subject to different kinds of errors and biases, we now consider two alternative benchmarks for abnormal accruals to assess how robust our findings are with respect to different specifications.

6.2.1 The Cash Flow Model

An important concern raised by among others Armstrong et al. (2015) is that long-run underperformance of high accrual firms might be explained by a negative correlation between accruals and cash flow. For this reason we extend our model for estimating the level of expected accruals by including asset-scaled operating cash flow among the regressors:

$$\frac{CA_{j,t}}{TA_{j,t-1}} = a_0\left(\frac{1}{TA_{j,t-1}}\right) + a_1\left(\frac{\Delta Sales_{j,t}}{TA_{j,t-1}}\right) + a_2\left(\frac{\Delta CFO_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t}$$

where $\Delta CFO_{j,t}$ is the change in cash flows from operating activities in year t and *j* refers to each firm j in the estimation sample. Using the average estimated intercept $\hat{a}_0$ and slope coefficient $\hat{a}_1$, nondiscretionary current accruals for every IPO firm *i* are calculated as:

$$NDCA_{i,t} \equiv \hat{a}_0\left(\frac{1}{TA_{i,t-1}}\right) + \hat{a}_1\left(\frac{\Delta Sales_{i,t} - \Delta AR_{i,t}}{TA_{i,t-1}}\right) + \hat{a}_2\left(\frac{\Delta CFO_{i,t}}{TA_{i,t-1}}\right)$$

The discretionary current accruals are as previously defined as the difference between actual accruals and the fitted value of accruals and will be used as our proxy for earnings management. Based on their level of discretionary current accruals, the firms are divided into four quartiles. We see that 71% of the firms remain in the same quartile as in our original approach. The mean level of accruals and the associated buy-and-hold returns for these four quartile portfolios is presented in section 6.2.3.

6.2.2 Beneish M-score

As our final proxy for earnings management, we use the Beneish (1999) M-score. This approach is very different from the Jones (1991) model, and uses eight different factors to calculate a score indicating the likelihood of a firm being a manipulator. Each factor loading has been estimated from a sample of known GAAP violators, yielding the following model:

$$\begin{aligned} M-score \;=\; & -4.84 \;+\; 0.92 \times DSRI \;+\; 0.528 \times GMI \;+\; 0.404 \times AQI \;+\; 0.892 \times SGI \\ & +\; 0.115 \times DEPI \;-\; 0.172 \times SGAI \;+\; 4.679 \times TATA \;-\; 0.327 \times LVGI \end{aligned}$$

where DSRI stands for Days Sales in Receivables Index, GMI is Gross Margin Index, AQI is Asset Quality Index, SGI is Sales Growth Index, DEPI is Depreciation Index, SGAI is Sales

General and Administrative Expenses Index, LVGI is Leverage Index and TATA is Total Accruals to Total Assets.[10] The threshold level for likely manipulators is estimated to be -2.22, but the higher the M-score, the higher the likelihood that the managers have tampered with the figures.

Our samples comprise several firms with very small balance sheet values in the post-IPO year. Since the explanatory variables in the model are primarily based on year-on-year changes, a too small denominator can yield very extreme results. In order to address this issue, the data have been winsorized at the 5% and 95% percentile for each variable.

The advantage of the Beneish (1999) M-score over the cross-sectional Jones (1991) model is that it captures several indicators of earnings quality and includes factors that have been proven to correlate with financial manipulation. One of the main shortcomings of using the Beneish M-score on our sample is that the model might fail to take into account potential differences in accounting frameworks or earnings manipulation techniques between American and Nordic firms. Furthermore, the model is estimated from a sample of firms facing charges of financial fraud, whereas IPO firms in general can be expected not to engage in earnings manipulation of this degree. To conclude, there is a risk that our results may be biased and the results in this section should therefore only be viewed as a robustness check.

It is also important to note that since the Beneish M-score takes a very different approach to measuring earnings management than we do in this paper, it does not necessarily correlate with the level of abnormal accruals. In our case, we find that 78% of the firms in DCA quartile 4 are considered to be likely manipulators (M-score above -2.22) according to the Beneish Model.

[10] For a given year t, the variables in the Beneish's M-score, with the Compustat data item names in brackets are:

$$\text{DSRI} = \frac{Receivables_t[RECT]}{Sales_t[SALE]} \Big/ \frac{Receivables_{t-1}}{Sales_{t-1}} \qquad \text{GMI} = \frac{(Sales_{t-1} - COGS_{t-1}[COGS])}{Sales_{t-1}} \Big/ \frac{Sales_t - COGS_t}{Sales_t}$$

$$\text{AQI} = \left[1 - \frac{(Current\ assets_t[ACT] + PPE_t[PPENT])}{Total\ assets_t[AT]}\right] \Big/ \left[1 - \frac{(Current\ assets_{t-1} + PPE_{t-1})}{Total\ assets_{t-1}}\right] \qquad \text{SGI} = Sales_t / Sales_{t-1}$$

$$\text{DEPI} = \frac{Depreciation_{t-1}[DP\ less\ AM]}{PPE_{t-1} + Depreciation_{t-1}} \Big/ \frac{Depreciation_t}{PPE_t + Depreciation_t} \qquad \text{SGAI} = \frac{SGA\ expense_t[XSGA]}{Sales_t} \Big/ \frac{SGA\ expense_{t-1}}{Sales_{t-1}}$$

$$\text{LVGI} = \frac{(LTD_t[DLTT] + Current\ liabilities_t[LCT])}{Total\ assets_t} \Big/ \frac{(LTD_{t-1} + Current\ liabilities_{t-1})}{Total\ assets_{t-1}}$$

$$\text{TATA} = \frac{Income\ from\ continuing\ operations_t[IB] - Cash\ flow\ from\ operations_t[OANCF]}{Total\ assets_t}$$

Table IX

Long-term Buy-and-Hold Returns by Quartile for Alternative Earnings Manipulation Proxies

The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The return is measured over 36 months, with the first month of trading assigned as month 0. The firms are divided into four quartiles based on their estimated level of earnings management (see section 6.2.1 and 6.2.2 for detailed calculations of the two different proxies). The buy-and-hold returns for the four quartiles are reported below. The computations of the different specifications are described in detail in Chapter 4.3.

	The Cash Flow Model				**Beneish M-score**			
(DCA / M-score)	Quartile 1 *(-61.1 to -0.1)*	Quartile 2 *(-0.1 to 0.0)*	Quartile 3 *(0.0 to 0.1)*	Quartile 4 *(0.1 to 3.1)*	Quartile 1 *(-6.0 to -2.7)*	Quartile 2 *(-2.7 to -2.1)*	Quartile 3 *(-2.1 to -1.1)*	Quartile 4 *(-1.1 to 33.8)*
Raw Return	27.84%	-2.39%	29.47%	-10.18%	9.51%	36.96%	-4.35%	-4.23%
(tstat)	*(1.62)*	*(-0.26)*	*(2.34)*	*(-0.97)*	*(0.78)*	*(3.35)*	*(-0.35)*	*(-0.35)*
Index adjusted	27.23%	-9.29%	22.11%	-13.11%	-2.55%	22.49%	0.76%	-7.43%
(tstat)	*(1.75)*	*(-1.20)*	*(2.17)*	*(-1.38)*	*(-0.23)*	*(2.73)*	*(0.07)*	*(-0.66)*
Peer adjusted	7.73%	-25.28%	6.70%	-9.85%	-30.04%	11.73%	-3.37%	-9.29%
(tstat)	*(0.55)*	*(-2.51)*	*(0.56)*	*(-0.91)*	*(-2.61)*	*(1.18)*	*(-0.29)*	*(-0.77)*

6.2.3 Results

To assess whether these alternative specifications for earnings management predict long-term stock underperformance, we relate the estimated values to long-term performance. Following the same methodology as in the previous section, we divide the firms into four quartiles based on the predictions of the cash flow model and the Beneish M-score, respectively. Quartile 1 contains the firms considered least likely to be manipulators, and quartile 4 contains the most likely manipulators. 39 firms had to be excluded from the Beneish M-score sample due to insufficient financial data available on Compustat, leaving 62 or 63 companies in each quartile portfolio. No firms had to be excluded from the original sample in the cash flow model.

Table IX reports the mean abnormal buy-and-hold returns by quartile ranked on discretionary current accruals (Cash flow model) or Beneish M-scores. The return data have been winsorized at the 95% level. In the cash flow model approach, we observe that quartile 4 underperforms quartile 1 by 38.02% in raw buy-and-hold returns, by 40.34% in index-adjusted buy-and-hold returns and by 17.58% in peer-adjusted buy-and-hold returns.

For the Beneish M-score, quartile 4 underperforms quartile 1 by 13.75% in raw buy-and-hold returns and by 4.87% in index-adjusted buy-and-hold returns, but actually outperforms quartile 1 in peer-adjusted returns. As previously mentioned, this approach to quantify the

likelihood of earnings management in the IPO year builds on factors estimated from known US GAAP violators and thus introduces several potential biases.

Overall, the results indicate that even for alternative proxies of earnings management, the most likely manipulators tend to exhibit negative long-term returns. We cannot claim with certainty that quartile 4 exhibits significant negative returns since the wide dispersion of returns across the different benchmarks results in low statistical power. Consequently, rather than ensuring robustness of our main results, we conclude with this test that alternative earnings management proxies do not lead to contradictory results.

7. Discussion

There is extensive literature documenting the relationship between firm characteristics and post-IPO returns, with several papers focusing on the role of accrual-based earnings management. Few studies, however, venture beyond examining the US market, and we have not been able to find a paper investigating if earnings management can predict the cross-section of future stock returns for Nordic IPO firms.

One restraining factor when using Nordic IPO data is the limited sample size. While we obtain a sample size of 290 IPO firms, studies performed on the US market commonly report samples well above 1000 issuers. This has two important implications for our analysis: (1) Even though we observe return patterns consistent with our hypothesis, the number of observations in relation to the cross-sectional sample variation are in some cases too small to achieve statistical significance. (2) In a small sample, extreme observations and outliers will have a stronger impact on the results and could potentially produce misleading means.

Furthermore, we note that a considerable share of our sample consists of small growth-firms traded on unregulated exchanges (e.g. Aktietorget or Nasdaq First North). For these firms, financial accounting requirements are less extensive than for firms at the main exchanges, and complete financial data could not always be retrieved from COMPUSTAT. The exclusion of firms with insufficient financial records could therefore potentially introduce a sample bias towards larger IPO firms traded on the regulated exchanges, which are exposed to a higher level of scrutiny. In order to address these limitations, we would suggest manually collecting financial data from prospectuses. This approach would have yielded a larger and more representative sample.

We have previously discussed that issuers engaging in earnings management during the issue period are likely to continue to do so until lock-up expiration. However, in order to

determine the exact point in time when managers are most incentivized to inflate reported earnings, the terms of the lock-up agreements, the expiration dates and the associated quarterly reports are of material importance. Since we were unable to obtain this information for our sample firms, we could not explore this subject in great detail.

Finally, we observed that the estimated abnormal returns are highly susceptible to the benchmark used. Few studies investigate the return properties of Nordic stocks, and there is still little consensus regarding how to accurately control for the risk aspects of an IPO firm.

Based on the findings as well as the limitations of our study, we have identified four major subfields of suggested future research. As a first subfield, we encourage additional attempts to disentangle the motives of earnings management in an IPO; in particular identification of firm or perhaps ownership characteristics that might increase the likelihood of the firm being a manipulator. As an extension, we believe it would be meaningful to go beyond earnings management and create a comprehensive framework of all drivers of managerial behaviour during the IPO period, by the inclusion of all fields allowing the manager to exercise discretion in this context. Portions of this topic were already investigated by Certo et al. (2003), Ertimur et al. (2017) and Li et al. (2016).

The second identified subfield involves the determinants of observed discretionary current accruals. One potential approach involves performing a case study for a small number of firms based on the DCA results yielded by the Jones (1991) model and conduct an in-depth analysis to determine how much of the computed DCA can be related to manager discretion and how much to other firm-, peer-, and manager-specific characteristics.

The third subfield concerns the validation of established return prediction models and benchmarks for the Nordic stock markets. Using the appropriate framework and controlling for the correct risk factors is crucial for measuring abnormal returns, especially in the context of IPOs. Since the amount of financial literature addressing this subject is very limited, we believe that additional studies are required in order to create a suitable benchmark for Nordic IPO firms.

As a final subfield, we suggest further research on how perceived earnings quality is reflected in the stock prices of Nordic companies. Since the foundation of the "accrual anomaly" by Sloan (1996), this field has been widely researched for the US market. Among others, Collins and Hribar (2000), Dechow and Ge as well as Wu, Zhang and Zhang (2009) have examined and isolated several core aspects of accruals in the context of future stock returns. Yet, we believe that researching the influence of accruals for the Nordic market is important to resident investors, corporations and authorities.

8. Conclusion

This study documents the relationship between discretionary current accruals in the IPO-year and long-run post-IPO performance for companies traded on the Nordic stock markets. Our first key finding is that a high level of positive discretionary current accruals reliably predicts stock underperformance over a 36-month window following the listing date. The pattern is persistent across a variety of specifications and benchmarks.

The results are robust after the inclusion of other explanatory variables known to affect stock returns. The predictive power of DCA on long-term stock performance stays significant also after controlling for cash flows to operations, and we therefore refute that negative long-run returns are caused by low cash flows generated by firms with high accruals (Armstrong et al., 2015).

Our second key finding suggests that firms opportunistically manage current accruals when going public in order to inflate reported earnings. The time-series pattern of accruals shows that abnormal positive discretionary current accruals in the IPO year are reversed in the subsequent year. If the IPO-year accruals would reflect actual advantageous firm prospects, we would expect accruals to reverse without impacting net income and be positively related to stock returns (Subramanyam, 1996). In contrast, we see that the decline in abnormal accruals is accompanied by a decline in return on sales as well as in stock performance. This evidence is consistent with opportunistic earnings management.

Our findings have implications for all stakeholders in the market, not least for investors. These results highlight the importance of assessing the quality of earnings as well as the underlying business when making investment decisions instead of blindly relying on reported net income as an indicator of firm prospects. Abnormal levels of discretionary current accruals should raise a red flag and might be an indication of future stock underperformance. Additionally, regulators may find this information relevant when evaluating how much discretion managers should be awarded in their accounting choices, especially in connection with an IPO, in order to ensure efficiency of capital markets.

9. APPENDICES

Appendix A: Additional Information on Post-IPO Performance

Figure II plots the time series of the cumulative buy-and-hold returns and cumulative average abnormal returns for quartile portfolio 1 and 4. Each graph displays the raw returns as well as the index- and peer-adjusted returns for the two portfolios. Quartile 1 outperforms quartile 4 across all specifications, but does not perform as well compared to the size-and-industry matched peers. The performance of quartile 4 starts to deteriorate after approximately one year and is predominantly negative throughout year 3 on all measures. On a raw cumulative abnormal average return-basis, quartile 4 recovers slightly during the last three months, recording a positive return of 2% by the end of the holding period.

Figure II
Mean Abnormal Cumulative Returns by DCA Quartile
The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The firms are divided into four quartiles based on their level of discretionary current accruals (see section 4.2 for calculation). The cumulative buy-and-hold returns as well as the cumulative abnormal returns for the four quartiles are plotted below for the 36 months following the IPO-month.

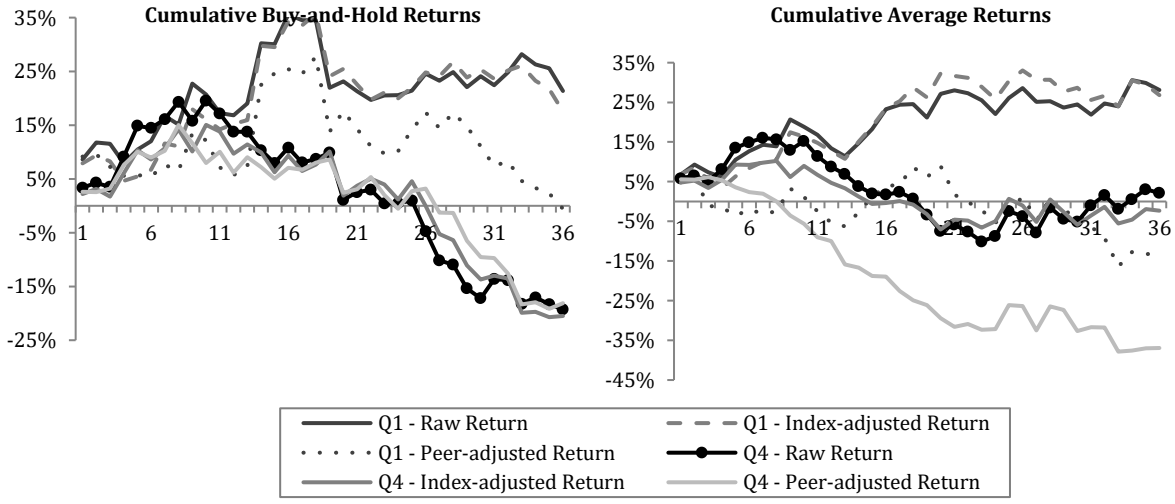


Table X reports the unwinsorized returns of the four quartiles. On the BH measure, the underperformance of quartile 4 as compared to quartile 1 is even more profound than in the winsorized dataset, with 53.80% in raw returns, 51.48% in index-adjusted and 28.53% in peer-adjusted returns. The underperformance on the CAR measure has only changed at a fractional amount. The reported unwinsorized and winsorized results are on average 10.13% different compared on the BH measures and 2.76% different on the CAR measures. The

Table X

Mean Abnormal Long-term Returns by DCA Quartile

The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The return is measured over 36 months, with the first month of trading assigned as month 0. The firms are divided into four quartiles based on their level of discretionary current accruals (see section 4.2 for calculation of DCA). Quartile 1 contains firms with the lowest level of discretionary current accruals and quartile 4 the firms with the highest level of DCA. The results below show both buy-and-hold returns as well as cumulative average returns for the four quartiles. The computations of these measures are described in detail in Chapter 4.3.

	Buy-and-Hold Returns (BH)				**Cumulative Average Returns (CAR)**			
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Raw Return	42,02%	32,41%	26,10%	-11,79%	31,13%	39,12%	19,28%	5,58%
(tstat)	*(1.83)*	*(2.14)*	*(1.66)*	*(-1.00)*	*(1.52)*	*(2.41)*	*(1.40)*	*(0.27)*
Index adjusted	37,52%	23,30%	18,94%	-13,96%	29,61%	30,38%	13,22%	2,72%
(tstat)	*(1.74)*	*(1.68)*	*(1.39)*	*(-1.18)*	*(1.45)*	*(2.04)*	*(1.03)*	*(0.14)*
Peer adjusted	13,87%	13,70%	-3,44%	-14,66%	-6,52%	-6,06%	-39,40%	-32,75%
(tstat)	*(0.68)*	*(0.89)*	*(-0.23)*	*(-1.07)*	*(-0.26)*	*(-0.32)*	*(-2.01)*	*(-1.63)*

discrepancy stems from the fact that for the CAR measure, returns are winsorized on a monthly level. This eliminates the compounding effect we observe for the BH returns, where exceptional returns are carried forward in subsequent months.

Appendix B: Value-Weighted Results

Throughout this paper we rely on a quartile portfolio division approach, with the equal-weighted portfolio returns as our performance indicators. In this section we report the value-weighted returns for the four quartiles, using initial market value as our proxy for size.

The weight of each firm is computed as its share of the total market value of the quartile in month 0 times the number of firms in the quartile:

$$w_i = \frac{V_i * n}{\sum_{i,t=0}^{n} V_i}$$

The reported value-weighted buy-and-hold returns after 36 months are computed as the product of a firm's 36-month BH return multiplied by its weight:

$$VBH_{i,t=0,T} = w_i * BH_{i,t=0,T}$$

Table XI
Mean Abnormal Value-weighted Long-term Returns by DCA Quartile

The sample comprises all initial public offerings on the Swedish, Danish, Norwegian and Finnish stock exchanges (with the exception of financial and real estate firms) going public between 1996 and 2014 with coverage on COMPUSTAT and FinBas. The return is measured over 36 months, with the first month of trading assigned as month 0. The firms are divided into four quartiles based on their level of discretionary current accruals (see section 4.2 for calculation of DCA). Quartile 1 contains firms with the lowest level of discretionary current accruals and quartile 4 the firms with the highest level of DCA. The results below show both buy-and-hold returns as well as cumulative abnormal returns for the four quartiles. The computations of these measures are described in detail in Chapter 4.3.

	Buy-and-Hold Returns (BH)				**Cumulative Abnormal Returns (CAR)**			
	Quartile 1	Quartile 2	Quartile 3	Quartile 4	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Raw Return	13.55%	60.42%	-32.11%	-17.66%	-6.45%	50.93%	-37.91%	-4.49%
(tstat)	*(0.39)*	*(2.40)*	*(-0.92)*	*(-0.97)*	*(-0.15)*	*(3.92)*	*(-0.78)*	*(-0.19)*
Index adjusted	28.42%	33.65%	-0.38%	-13.22%	2.26%	29.83%	12.87%	2.86%
(tstat)	*(0.95)*	*(1.68)*	*(-0.05)*	*(-0.84)*	*(0.07)*	*(2.32)*	*(0.24)*	*(0.13)*
Peer adjusted	16.65%	8.79%	3.88%	-49.07%	23.50%	9.62%	-37.58%	-57.08%
(tstat)	*(0.50)*	*(0.20)*	*(0.20)*	*(-1.96)*	*(0.49)*	*(0.60)*	*(-0.74)*	*(-2.04)*

The reported value-weighted CAR measures are the cumulative value-weighted monthly benchmark-adjusted returns:

$$CAR = \sum_{t=0}^{T} \frac{1}{n} \sum_{i=1}^{n} w_i * ar_{i,t}$$

Table XI reports the value-weighted returns for the four DCA quartiles. As compared to the equally-weighted returns, the BH and CAR value-weighted measures differ by on average 17.89% and 17.91%, respectively, on a full sample basis. The Compared on each individual measure, the value-weighted returns vary strongly from the equally-weighted returns. On a buy-and-hold measure, quartile 4 underperforms quartile 1 by 31.21% in raw returns, by 41.64% in index-adjusted returns and by 65.72% in peer-adjusted returns. On a CAR basis, the underperformance equals 80.58% in peer-adjusted returns. Conversely, the high-DCA portfolio actually outperforms the low-DCA portfolio by 1.95% in raw returns and by 0.60% in index-adjusted returns.

Appendix C: Illustration of DCA Calculation

For comprehension reasons, we now illustrate the calculation of the discretionary current accruals using heating equipment manufacturer Alfa Laval AB (ISIN: SE0000695876, SIC: 35) as an example. Alfa Laval went public on May 15, 2002.

There were 18 publicly listed Swedish firms (footnote) in the same industry as Alfa Laval in 2002. After calculating the asset-based current accruals (CA) for each of these firms, we use the Jones model to derive the fitted coefficients:

$$\frac{CA_{j,t}}{TA_{j,t-1}} = 1.576\left(\frac{1}{TA_{j,t-1}}\right) + 0.239\left(\frac{\Delta Sales_{j,t}}{TA_{j,t-1}}\right) + \varepsilon_{j,t}$$

Inserting the respective financial data items as depicted in Table XII yields the following discretionary current accruals for Alfa Laval:

$$\begin{aligned} DCA_{i,t} &\equiv \frac{CA_{i,t}}{TA_{i,t-1}} - \hat{a}_0\left(\frac{1}{TA_{i,t-1}}\right) + \hat{a}_1\left(\frac{\Delta Sales_{i,t} - \Delta AR_{i,t}}{TA_{i,t-1}}\right) \\ &= \frac{-915.3}{17{,}631.8} - \left(1.576\left(\frac{1}{17{,}631.8}\right) + 0.239\left(\frac{-1234.7 - (-1331{,}4)}{17{,}631.8}\right)\right) \\ &= -0.0533 \end{aligned}$$

Table XII
Calculation of Discretionary Current Accruals

MSEK	Year 2002 *t*=0	Year 2002 *t*=-1	Difference Δ
Accounts receivable	3478	4809	-1331
Inventory	2279	2624	-345
Other current assets	112	148	-36
Accounts payable	1028	1303	-275
Taxes payable	458	627	-170
Other current liabilities	2591	2943	-352
Current accruals (CA)			**-915**
Accounts receivable	3478	4809	-1331
Sales	14595	15830	-1235
Total assets	-	17632	-

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