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The Accrual Anomaly in Norway and Sweden

Anna Emilie Endreson & Kristin Aspvik Johansen

Supervisor: Professor Thore Johnsen

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Abstract

This Master's thesis extends the existing literature on the accrual anomaly, first documented by Sloan (1996), by investigating its existence in the Norwegian and Swedish stock markets. First, we look at whether the persistence of earnings performance is decreasing in the magnitude of the accrual component of earnings and increasing in the cash flow component, where we find that accruals are a less persistent measure of future earnings than cash flow. Next, we investigate whether investors are aware of the lower persistence attributable to accruals or if they naïvely look to earnings without consideration of its components. Our findings here do not yield significant results, which means that we cannot conclude that the naïve investor hypothesis holds. Last, we test whether it is possible to gain abnormal return by taking a long position in the stock of firms with a relatively low level of accruals, and a short position in those with a relatively high level of accruals. We find that the long-short strategy yields an abnormal yearly return of 7.0%. Further, we test the hypotheses for the Norwegian and Swedish data separately, as well as base the trading strategy on different components of accruals. We find that a long-short strategy based on non-current operating accruals yields an abnormal yearly return of 12.4% for Norway, while for Sweden, the findings suggest that an investor could gain an abnormal yearly return of 9.7% when basing the long-short strategy on both current and non-current operating accrual. Next, we find a significant difference before and after 2005 in Norway, which marks the transition from GAAP to IFRS, where the results suggests that, after 2005, the accrual anomaly is not present at the Oslo stock exchange. In Sweden however, we do not find such a difference.

Preface

This Master's thesis has given us the opportunity to dig deep into the accrual anomaly. The work has proved to be very interesting, especially considering the little research available on the topic in Norway and Sweden. We have learned a lot during our semester of independent work, both on the accrual anomaly, as well as on how to research a new topic and write an informative research paper.

We would like to thank Finn-Øystein Bergh for first suggesting the accrual anomaly as a topic for our Master's thesis, as well as meeting with us to discuss the subject. Bergh's engagement and insights on the anomaly have been inspirational.

Next, we wish to express our sincere gratitude to our supervisor Thore Johnsen for his excellent guidance. In addition to serving as a valuable discussion partner, he has challenged us to perform at our best. Johnsen has supervised our Master's thesis in his spare time, for which we are very grateful. Last, Johnsen's success in the finance community makes us proud to have had him as our supervisor.

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Introduction

This Master's thesis investigates whether or not there is an accrual anomaly in Norway and Sweden. We follow the research design presented by Sloan (1996), who documented the accrual anomaly in the US stock market, concluding that stock prices act as if investors "fixate" on earnings, failing to reflect the information in the accrual and cash flow components adequately. Sloan's findings have been confirmed and extended by several subsequent research papers, among them Richardson, Sloan, Soliman, & Tuna (2005), which we use as one of our primary sources.

Finn Øystein Bergh's article in "Paretos Optimale" (2016) inspired us to research the accrual anomaly in Norway and Sweden for our Master's thesis. In his article, Bergh discusses Sloan's (1996) study of the accrual anomaly in conjunction with the increase in the price-to-earnings multiple at the Oslo Stock Exchange. Further, he states that a Google search on the accrual anomaly yields no results on Norwegian websites, indicating that there is little Norwegian research on this.

When Sloan (1996) discovered and presented the accrual anomaly, it was the most robust anomaly ever revealed (Dechow, Khimich, & Sloan, 2011), making it unique among asset pricing anomalies. Since then, his paper has become one of the most highly cited accounting research papers as it generated considerable interest among academics who still adhered to the efficient market hypothesis.

Although the accrual anomaly is thoroughly researched on a global level, there are few studies who have investigated whether the accrual anomaly is present in Norway and Sweden, and none to our knowledge with significant results. Additionally, research on the accrual anomaly outside the US yields different results and explanations for its persistence, making it unclear whether one should expect to find the mispricing in the Norwegian and Swedish stock markets. Thus, it is interesting to examine whether investors in firms listed in these countries also suffer from naïve expectations about earnings that comprise of high levels of accruals, creating a mispricing in the stock market. The purpose of this thesis is, therefore, to test the hypotheses presented by Sloan (1996) based on data from the Norwegian and Swedish stock markets. Additionally, we extend the methods used by Sloan by adding recommendations from subsequent studies on the accrual anomaly. For instance, we use a more comprehensive definition of accruals, following Richardson et al. (2005), as well as test if there is a difference before and after the introduction of the International Financial Reporting Standards (IFRS) in the two countries. Both of these extensions has, to our knowledge, not been included when researching the accrual anomaly in Norway and Sweden before.

We initially pool data from Norwegian and Swedish firms. We then analyse each country separately. First, we find that the accrual component of earnings is less persistent with future earnings than the cash flow component, which is consistent with previous findings. However, when testing the naïve investor hypothesis, we do not find significant results, which means that we do not have statistical evidence supporting that investors put too much weight on non-persistent accruals when they form their expectations of future earnings.

Despite our rejection of the naïve investor hypothesis, we find significant support for our third hypothesis of a profitable trading strategy based on buying firms with a relatively low level of accruals (the "Low" decile) and going short in those with a relatively high level of accruals (the "High" decile), yielding an abnormal yearly return of 7.0%. For our Norwegian sample, we find evidence of an accrual anomaly based on non-current operating accruals with an abnormal yearly return of 12.4%, while in Sweden, we find evidence of an accrual anomaly based on both current and non-current operating accruals, which yields an abnormal yearly return of 9.7%. Testing the accrual anomaly before and after the introduction of IFRS in 2005 and 2007 for Norway and Sweden respectively, we find that while there is no significant difference in Sweden, the results in Norway suggest that the accrual anomaly is no longer present after 2005.

We note that the firms in the low and high deciles based on total accruals are relatively risky compared to the other deciles, which could refrain an investor from taking advantage of a potential mispricing. First, we find that the firms in the low and high decile are less liquid compared to the other deciles, illustrating higher arbitrage risk. Second, these are also smaller, have lower book-to-market multiples, as well as higher systematic risk. However, the net exposure to size, book-to-market, and market risk is relatively low, although not eliminated, due to similar exposure to these risk factors in both the long and short position.

The structure of this paper is as follows. Section 1 develops our research design and hypotheses. Section 2 describes our data sample. Section 3 presents our findings. Section 4 outlines the trading strategy risk. Section 5 presents limitations and robustness tests and section 6 concludes the paper.

1. Research Design

We base our research on the design presented in the papers of Sloan (1996) and Richardson, Sloan, Soliman, & Tuna, (2005). First, we explain what accruals are, its role in accounting and the basic idea of the accrual anomaly introduced by Sloan. Second, we define our three hypotheses. Third, we present the extended definition of accruals outlined by Richardson et al., which we use in our analysis. Fourth, we look into the literature explaining its persistence. Fifth, we summarize some of the international research on the accrual anomaly. Last, we investigate some features of the accounting standards in Norway and Sweden.

1.1 Accruals and the Accrual Anomaly

Accrual accounting is an accounting method that aims to measure a firm's performance in a given period by recording economic events at the time a transaction occurs, rather than when the payment is made (Khan & Mayes, 2009). The income statement will, therefore, consist of a cash component and non-cash component, where the non-cash part is known as accruals. Accruals will arise due to periodization of incomes and expenses (Richardson et al., 2005). Further, due to the subjective considerations that go into making the income statement, accruals are likely to be less reliable than cash flow as the accountant has to make earnings estimations based on past, present and future cash flows, as well as the present value of the firm's assets.

First, let us present a simple example of what accruals are and why this component of the income statement is less reliable. Consider two firms that sell goods to customers for NOK 10. The first firm receives payment in cash, which results in a cash flow and net income of NOK 10. The second firm receives payment by credit, which implies that the sale will not generate any cash flow in the period the good is sold. However, the sale is registered on the firm's balance sheet under accounts receivable, which means that the accountant has to exercise judgment to decide how creditworthy the customer is. A confident accountant may report a net income and increase in accounts receivable of NOK 10, while a more pessimistic accountant may set this to NOK 6, where the increase in non-cash assets is the firm's accruals. Next, if the firm receives NOK 8 upon maturity, the error in net income is NOK 2 for the confident accountant and NOK -2 for the pessimistic accountant. According to Sloan

(1996), the first firm in this example will have a more reliable income statement, as the net income is equal to cash flow.

Accrual accounting can also be a means to manipulate the income statement to appear more profitable to shareholders. An example is the scandal of Kraft & Kultur AB, a subsidiary of the Norwegian firm Troms Kraft, who, in 2011, was uncovered to be reporting fictitious earnings over a period of 10 years, amounting to NOK 1.5 billion (Mogård, 2015). The example illustrates that earning may not always be the most reliable measure of a firm's profitability.

Further, one can think of the accrual component of earnings as a way to smooth out a firm's cash flow through periodization of income and expenses, which means that earnings will most likely differ from cash flow. However, over time, cash flow and earnings should even out, considering that periodization is just a shift of cash flow in time. Still, Sloan (1996) finds that earnings performance attributable to accruals shows lower persistence than earnings performance from cash flow. He also finds that investors fail to detect this, and thus overvalue firms with a high level of accruals. Based on these findings, Sloan constructs a trading strategy based on taking a long position in stocks with a relatively low level of accruals and a short position in stocks with a relatively high level of accruals. The trading strategy yields an abnormal yearly return of 10.4%, thus implying that investors fixate on earnings, creating a mispricing in the market.

1.2 Hypotheses

Based on Sloan's (1996) research, this paper investigates whether the accrual anomaly is present in the Norwegian and Swedish stock markets. We test the same hypotheses as Sloan, with a focus on Norway and Sweden rather than the United States. We also use data that is more recent and a more comprehensive definition of accruals, as well as investigate whether there is a difference before and after the introduction of IFRS in 2005 and 2007 in Norway and Sweden respectively. First, we look at whether accruals are a less persistent estimate of future earnings than cash flow:

Hypothesis I: The persistence of current earnings performance is decreasing in the magnitude of the accrual component of earnings and increasing in the magnitude of the cash flow component of earnings.

Second, we investigate whether stock prices act as though investors are aware of the lower persistence of accruals relative to cash flow, or whether investors in the Norwegian and Swedish stock markets, like investors in the US stock market, fixate on earnings. Thus, the second hypothesis is:

Hypothesis II: Stock prices fail to reflect fully the higher earnings persistence attributable to the cash flow component of earnings and the lower earnings persistence attributable to the accrual component of earnings.

Finally, we investigate whether the long-short strategy, developed and tested by Sloan, will yield an abnormal return in the Norwegian and Swedish stock markets. The third hypothesis is, therefore:

Hypothesis III: A trading strategy taking a long position in the stock of firms reporting relatively low levels of accruals and a short position in the stock of firms reporting relatively high levels of accruals generates positive abnormal stock returns.

1.3 Definition and Categorization of Accruals

Following the research of Richardson et al. (2005), we use a more comprehensive definition of accruals than Sloan (1996). Sloan, who follows Healy (1985), defines accruals as the change in non-cash working capital less depreciation expense. Richardson et al. argue that this definition omits accruals and deferrals relating to non-current operating assets, non-current operating liabilities, non-cash financial assets, and financial liabilities. The broader definition includes accountants' estimates of long-term future benefits, thus providing a complete measure of accruals and earnings persistence. Based on this reasoning, we use the extended definition of accruals by Richardson et al., which is the sum of the change in net current operating assets, in net non-current operating assets, and in net financial assets.

Additionally, Richardson et al. (2005) categorize accruals by their degree of reliability. Reliability arises from the amount of subjectivity attributed to each item, where a lower reliability indicates a higher probability of mispricing. The first category, current operating accruals, consists of current operating asset and liability accruals. The asset component comprises of items such as accounts receivable and inventory and has low reliability due to the difficulty of measuring its components objectively as the accountant has to estimate the creditworthiness of the customers. Additionally, the accountant has to make numerous cost flow assumptions when measuring inventory. Accruals from current operating liabilities, such as accounts payable, can be verified with suppliers, resulting in a high degree of reliability. Based on these arguments, Richardson et al. conclude that current operating accruals have medium reliability. The second class of accruals, non-current operating accruals, consists of assets, such as property, plant and equipment as well as intangibles, and liabilities, such as long-term accounts payables. On the one hand, the asset component of non-current operating accruals is characterized by low reliability due to the subjectivity involved in choices such as depreciation schedule and when, and by how much, an item ought to be impaired. The liability component, on the other hand, involves different degrees of reliabilities. Long-term accounts payable, for instance, has a high degree of reliability. Richardson et al. conclude that, due to the broad specter of reliabilities associated with these assets and liabilities, non-current operating accruals have low/medium reliability. The last category, financial accruals, has high reliability as the value of these items often can be measured in the marketplace.

1.4 Do We Have an Anomaly?

Research by Lev & Nissim (2006) finds that the accrual anomaly does not only persist, it has also not decreased in magnitude after its discovery by Sloan in 1996. Many researchers have therefore sought to provide alternative explanations for it, foremost related to risk.

Mashruwala, Rajgopal & Shevlin (2006) argue that the anomaly might be a result of the characteristics of extreme accrual firms, considering that these are relatively small with high volatility and low liquidity, which are characteristics often avoided by institutional investors. Further, the attributes associated with these firms (size, stock liquidity, price, risk, etc.) indicate high arbitrage risk, which can repel an investor from taking advantage of the anomaly. Still, Sloan (1996) tests the risk factors proven to predict future stock returns by Fama and French (1992) and finds that they do not explain the accrual anomaly. He also finds that the long-short strategy has a beta of only 0.02. Subsequent research by Hirshleifer, Lim, and Teoh (2011) concludes that the level of accruals predicts return irrespective of the risk factors tested, casting further doubt on the risk-based explanations of the accrual anomaly.

Another theory that may explain why the accrual anomaly persists relies on the psychological aspect of investor behavior. Previous research indicates that limited attention affects how both naïve and sophisticated individual investors, as well as financial professionals, interpret accounting data (Libby, Bloomfield, & Nelson, 2002). Based on these results, Hirshleifer et al. (2011) provide a model of stock market reactions to earnings-related information based on limited investor attention. They conclude that the accrual anomaly occurs when investors focus on earnings without consideration of its components and do not take into account that, for a given level of earnings, the correct expectations of future earnings is higher when accruals are relatively low than when they are high.

However, a more recent paper by Green et al. (2011) finds that the accrual anomaly has disappeared after 2000 as the trading strategy no longer yields significant positive return. Further, they conclude that this is attributable to, or at least partly due to, hedge funds taking advantage of the mispricing.

1.5 International Research on the Accrual Anomaly

Several papers have investigated whether the accrual anomaly is present in countries outside the United States, presenting mixed results. Pincus et al. (2007) find significant results of the accrual anomaly in only 4 out of the 20 countries tested, while LaFond (2005) finds the mispricing in 15 out of 17 countries. Further, Leippold and Lohre (2012) detect the anomaly in 10 out of 26 countries testing the hypotheses simultaneously, and in 4 out of the 26 countries using multiple testing procedures. In total, research regarding the accrual anomaly in countries other than the US yields conflicting results.

To this date, only two research papers, which we know of, have investigated the presence of the accrual anomaly in Norway, while three have included Sweden. According to LaFond (2005), Norway and Denmark are the only countries without significant results on the accrual anomaly. For Sweden, however, he finds a presence of the mispricing at a 10% level of significance. Further, Leippold and Lohre (2012) find significant evidence in neither Norway nor Sweden, which is in line with the lack of results in Sweden by Pincus et al. (2007).

There are several potential explanations for the lack of significant results in Norway and Sweden. First, the number of firm-year observations is quite low, especially compared to other countries with more established markets such as the US or the UK, which can make it difficult to draw statistical conclusions from the data. However, it is worth noting that Leippold and Lohre (2012) and Pincus et al. (2007) find significant evidence on the accrual anomaly in Denmark, indicating that lack of observations may not be the problem. Another potential explanation for the lack of significant results on the accrual anomaly in Norway could be the density of firms in the oil and offshore sector (Oslo Børs, 2017), implying that the degree of diversification among listed Norwegian companies is relatively low, possibly influencing the results.

Further investigating this matter, Pincus et al. (2007) identify several factors that make it more or less likely for the accrual anomaly to occur in a country. First, they find that the accrual anomaly is more likely to be present in countries with common law, such as the United States, rather than civil law, where a more extensive range of stakeholders has access to inside information. Leippold and Lohre (2012) classify Norway and Sweden as civil law countries, which, according to Pincus et al., could explain the lack of significant results as a more substantial portion of investors understands the real value of the accrual component of earnings. However, LaFond (2005) contradicts the evidence that the accrual anomaly is less likely to occur in a civil law country, indicating that a country's legal tradition cannot explain whether the accrual anomaly will occur. Second, Pincus et al. find that the mispricing is more likely to be present in countries with more extensive accrual accounting. According to Hung (2001), Norway scores high on the extent of accrual accounting permitted, while Sweden scores relatively low. Last, Pincus et al. find the anomaly in countries with a low concentration of shareholder ownership, which, according to Porta et al. (1998), there is in Norway and Sweden. In sum, it is unclear whether we should expect significant results on the accrual anomaly in Norway and Sweden.

1.6 Accounting Standards and Accruals

Kaserer and Klingler (2008) find that, in Germany, the accrual anomaly is likely to be driven by the transition to IFRS. IFRS relies on true and fair view accounting, which is straightforward for items that have a reliable market value, which is often not the case. Managers must, therefore, generally exercise judgment when deciding the current value of a balance sheet item. The authors supplement their findings by assessing how the degree of accounting standards' enforcement affects the quality of accounting information. According to Hope (2003), Germany has a low governance of accounting standards, implying that the probability of sanctions is low. Managers will, therefore, have a higher incentive to manipulate income statements, which entails that the persistence of earnings is likely to be lower under IFRS. These findings are similar to those of Kaserer and Klingler (2008).

Norway however, bundled the introduction of IFRS in 2005 with increased enforcement, illustrated by the fact that, in 2006, the Financial Supervisory Authority of Norway (FSAN) reviewed more than 10% of the companies listed on the Oslo stock exchange (Christensen, Hail, & Leuz, 2013). Sweden also initiated an increase in enforcement, admittedly after adopting IFRS in 2007. According to Hope (2003), managers will have lower incentives to manipulate income when the probability of sanctions is higher. Thus, it seems less likely that the introduction of IFRS could provoke a potential increase or resurrection of the accrual anomaly in either country, such as it did in Germany.

2. Data

Our research employs data from Datastream where we have downloaded financial statement data as well as stock returns for firms on the stock exchanges in Oslo and Stockholm. We have included both listed and delisted firms to avoid survivorship bias. Our final sample, after the screening process, consists of 9,364 firm-year observations and covers a period from 1989 to 2015. The statistics are presented in table 2-1.

Table 2-1 Sample Statistics

The number of firms and firm-year observations in our final pooled sample, and for the Norwegian and Swedish sample separately.

	Firms	Firm-years
Norway	394	3,333
Sweden	508	6,031
Total	902	9,364

Next, we will present the screening process describing which observations we have eliminated or set to zero, followed by definitions of the variables used in our analysis.

2.1 Screening

Following Richardson et al. (2005), we make several adjustments to our data sample. We exclude financial firms as these report accruals differently to other industries. We also remove firms where the industries in which they operate are missing, as we cannot know for sure whether they are financial firms or not. Next, we delete firm-year observations that lack the data necessary for calculating working capital and net non-current operating assets accruals, which are cash and short-term investments (WC02001), total assets (WC02999), total liabilities (WC03351), current assets (WC02201) and current liabilities (WC03101). However, for firm-year observations missing values for long-term debt (WC03251), other investments (WC02250), debt in current liabilities (WC03051), preferred stock (WC03451) or short-term investments (WC02001 - WC02003), we set the data item to zero instead of eliminating the firm-year observation, as not all balance sheet items are relevant for all firms. Further, we exclude firm-year observations without data on next year's stock return, which is necessary to test the second and third hypothesis.

Next, we make some additional adjustments to the data in our sample. Some of the firms in our sample have more than one kind of stock available to investors, creating a duplicate, as the financial statement figures will be identical. Consequently, we remove all observations that are equivalent to A-stocks as we wish to capture the effect of investor's perception of a firm's performance, displayed by changes in stock prices, and not of the demand for the additional rights attributed to the A-stock. Also, when regressing our pooled sample, we convert relevant data[1] to Norwegian Kroner, using data on the SEK/NOK and EUR/NOK currency crosses from Bloomberg. Last, we only include data after 1989 due to lack of data available before this year.

2.2 Building Variables

As presented in section 1.3, we use the extended definition of total accruals by Richardson et al. (2005), described as follows[2]:

$$TACC = \Delta WC + \Delta NCO + \Delta FIN \tag{1}$$

ΔWC represents the change in net working capital from time zero to time one, also known as current operating accruals, defined as:

$$\Delta WC = WC_t - WC_{t-1} =$$
$$\big(Current\ Assets(WC02201) - Cash\ and\ Short\ Term\ Investments(WC02001)\big) -$$
$$(Current\ Liabilities(WC03101) - Debt\ in\ Current\ Liabilities(WC03051)) \tag{2}$$

Next, ΔNCO is the second component of TACC and represents the change in net non-current operating assets. The definition of net non-current operating assets is as follows:

[1] The variables we convert to NOK are market value (MV), turnover (VA), and book value of equity (WC2999 - WC03351). Also, when computing the robustness test with the additional screenings described in section 5.2, we convert data for price (P) and sales (WC1001) to NOK.

[2] Datastream codes are in parantheses.

$$\Delta NCO = NCO_t - NCO_{t-1} = (Total\ Assets(WC02999) - Current\ Assets(WC02201) - Investments\ and\ Advances(WC02250) - (Total\ Liabilities(WC03351) - Current\ Liabilities(WC03101) - Long\ Term\ Debt(WC03251)) \quad (3)$$

Last, we have ΔFIN, which is the change in net financial assets. Net financial assets are the difference between financial assets and financial liabilities, more accurately defined as:

$$\Delta FIN = FIN_t - FIN_{t-1} = \Big(Short\ Term\ Investments(WC02001 - WC02003)^{3} + Long\ Term\ Investments(WC02250)\Big) - \big(Long\ Term\ Debt(WC03251) + Debt\ in\ Current\ Liabilities(WC03051) + Preferred\ Stocks(WC03451)\big) \quad (4)$$

In accordance with Sloan (1996) and Richardson et al. (2005), we calculate accruals, earnings, and cash flow as percentages of average total assets, which is the average of total assets at the beginning and end of the fiscal year. This approach is necessary to compare accruals and cash flows across firms, as a firm's size will affect the level of earnings, and hence the level of accruals and cash flow. Additionally, like Richardson et al., we construct a variable for all operating accruals (ΔNOA), which is the sum of ΔWC and ΔNCO.

Testing the hypotheses, we use operating income after depreciation (WC01250), as opposed to net income attributable to common, as a measure of a firm's earnings when calculating return on assets. We exclude non-recurring items considering that the purpose of this paper is to investigate the degree of persistence of accruals versus cash flow with future performance, where non-recurring items are by definition not persistent with future earnings as these items are considered a one-time event. Further, we calculate cash flow by subtracting total accruals from operating income after depreciation. The reason for calculating cash flow as a residual is that earnings are composed of two parts, one cash and one non-cash part, where accruals are the non-cash part.

[3] We have computed short term investments as cash and short term investments (WC02001) less cash (WC02003) due to lack of a variable for short term investments in Datastream.

Next, to calculate the abnormal stock return for the tests in the second and third hypotheses, we compute the buy-hold size-adjusted stock returns, where returns are measured for a 12-month period, starting the 1st of August after the end of the relevant fiscal year. We size-adjust the stock returns by first dividing the stocks in a given year into 10 deciles, based on size, where the first decile consists of the 10% of stocks with the lowest market value at the beginning of the return cumulating period. Second, we compute the average value-weighted return for each decile, where the return is weighted by market value, and subtract this from each firm-year return to get the abnormal return for each firm-year observation.

3. Findings

We begin this section by presenting descriptive statistics that we regard as relevant. Next, we present our results from testing each of the three hypothesis presented in section 1.2. We test the hypotheses for three samples: one pooled sample, one for Norway, and one for Sweden. The pooled sample consists of both Norwegian and Swedish data, totaling 9,364 firm-year observations from 1989 to 2015. The Norwegian sample consists of 3,333 firm-year observations from the Oslo Stock Exchange, and the Swedish sample consists of 6,031 firm-year observations from the stock exchange in Stockholm.

3.1 Descriptive Statistics

Table 3-1 panel A presents descriptive statistics for the observations in the pooled sample. The mean value of accruals (TACC) is 0.046, which means that accruals are, on average, 4.6% of a firm's total assets. Investigating the components of total accruals, we find that net non-current operating accruals (ΔNCO) have the highest mean value of 0.056, as well as the highest standard deviation of 0.231. Next, working capital accruals (ΔWC) have the second highest mean, with a value of 0.008, and the lowest standard deviation of 0.122. Financial assets (ΔFIN) have a negative mean value of 0.018, which indicates that the average firm reduces the value of its net financial assets. For TACC, ΔWC, and ΔNCO, the median values are lower than the mean values, indicating that extreme variables are more likely to be found on the positive side, rather than on the negative side. Like Richardson et al. (2005), we find that ΔWC and ΔNCO correlate significantly negatively with ΔFIN, which indicate that firms tend to finance growth in WC and NCO through reducing their financial assets or increasing their financial liabilities. These sample statistics are similar to Richardson et al. and different from Sloan (1996), as he use another definition of accruals.

Further, return on assets (ROA) has a negative mean value of 0.022. The low mean is attributable to some extreme observations affecting the mean negatively, which is illustrated by the positive median of 0.044. Next year's return on assets (FROA) also has a negative mean value, though somewhat less negative than ROA. Further, the average firm-year in our sample has a future abnormal return (FRET) of 0.012, measured as the buy-hold size-adjusted one-year return starting the 1st of August after fiscal year end. The median of -

0.064 is quite a lot lower, which illustrates that there are more observations with negative, rather than positive, abnormal return.

Table 3-1 Accounting Accruals

Descriptive statistics for the pooled sample. The sample consists of 9,634 firm-year observations from 1989 to 2015.

Panel A: Descriptive statistics for the pooled sample

	Mean	St. Dev.	25 %	Median	75 %
TACC	0.046	0.223	-0.031	0.030	0.106
ΔWC	0.008	0.122	-0.033	0.005	0.047
ΔNCO	0.056	0.231	-0.026	0.021	0.104
ΔFIN	-0.018	0.182	-0.069	0.000	0.039
ROA	-0.022	0.291	-0.045	0.044	0.101
FROA	-0.019	0.270	-0.043	0.043	0.099
FRET	0.012	0.712	-0.318	-0.064	0.209

Panel B: Descriptive statistics for each industry. Sample sizes are reported in the last row in the table.

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Health Care	Consumer Services	Telecomm-unications	Utilities	Tech-nology
TACC	0.070	0.042	0.039	0.042	0.055	0.038	0.064	0.048	0.049
ΔWC	0.006	0.007	0.012	0.017	0.010	-0.005	-0.011	0.000	0.002
ΔNCO	0.114	0.047	0.044	0.040	0.058	0.054	0.107	0.067	0.055
ΔFIN	-0.050	-0.012	-0.017	-0.016	-0.013	-0.012	-0.032	-0.020	-0.008
ROA	-0.001	-0.004	-0.001	0.023	-0.179	0.020	-0.047	0.033	-0.053
FROA	0.003	-0.007	-0.001	0.025	-0.170	0.016	-0.044	0.028	-0.041
FRET	-0.046	-0.009	0.016	0.015	0.044	-0.008	0.058	-0.043	0.045
N	955	690	3,232	952	874	974	108	90	1,489

Datastream codes are in parentheses.

Industry samples are formed on the FTSE Industry Classification Benchmark industry codes (ICBIC).

TACC is total accruals from the balance sheet approach. It is calculated as ΔWC + ΔNCO + ΔFIN. Total accruals and all of its components (described below) are calculated as percentages of average total assets (WC02999), which is the average of total assets at the beginning and end of the fiscal year.

ΔWC is the change in non-cash working capital, defined as $WC_t - WC_{t-1}$. *WC = (Current assets (WC02201) - Cash and Short Term Investments (WC02001)) - (Current Liabilities (WC03101) - Debt in Current Liabilities (WC03051)).*

ΔNCO is the change in non-current operating assets, defined as $NCO_t - NCO_{t-1}$. *NCO = (Total Assets (WC02999) - Current Assets (WC02201) – Other Investments (WC02250)) - (Total Liabilities (WC03351) - Current Liabilities (WC03101) - Long Term Debt (WC03251))*

ΔFIN is the change in financial assets, defined as $FIN_t - FIN_{t-1}$. *FIN = (Short Term Investments (WC02001 -*

WC02003) + Long Term Investments (WC02250)) - (Long Term Debt (WC03251) + Debt in Current Liabilities (WC03051) + Preferred Stock (WC03451)).

ROA is operating income after depreciation (WC01250) as a percentage of average total assets.

FROA is future operating income after depreciation computed as next year's ROA.

FRET is the annual buy-hold size-adjusted return. The size-adjusted return is computed by taking the raw buy-hold return on a size matched value-weighted portfolio of firms, where size is measured as market value (MV) at the beginning of the return cumulation period. The return cumulation period starts the 1st of August the year after the relevant fiscal year.

Comparing the descriptive statistics for the Norwegian and Swedish sample, we find relatively small deviations between the two countries. However, investigating the descriptive statistics across the industries presented in table 3-1 panel B, there are some differences worth noting. We find that all industries have positive mean values for TACC, with oil & gas having the highest mean of 0.07. Comparing ROA across industries, we find that health care stands out with the most negative earnings with a mean of -17.9%, while for FRET, oil & gas has the most negative return, with a mean of -4.6%. Next, we find that 34.5% of all firm-year observations in our sample are in the industrials industry, followed by 15.9% in technology. Consumer services, oil & gas, consumer goods, health care, and basic materials consist of between 10.4% and 7.4% of all firm-year observations. We have the least observations for the telecommunications and utility industry, with approximately 1% of total firm-year observations in each. The magnitude of each industry also differs between the two countries. In the Norwegian sample, 24% of all firm-year observations are in the oil & gas industry, while this is only 3% in the Swedish sample. Health care, however, accounts for only 4% of the observations in Norway and 13% in Sweden.

Next, we rank firm-year observations annually and assign them into deciles based on total accruals. Table 3-2 presents the accrual decile portfolios' mean and median values of TACC, cash flow (CF) and ROA. Consistent with Sloan (1996), we find that there is a negative relation between accruals and cash flow, considering that the mean value of TACC is increasing over accrual deciles while the mean values of cash flow is decreasing. We note that the extreme accrual deciles, the low and high deciles, have the lowest mean value of earnings, which is different from Sloan, who finds that the mean value of earnings is increasing over accrual deciles.

Table 3-2 Accounting Accruals across Accrual Deciles

Mean and median values of total accruals (TACC), cash flow (CF), and earnings (ROA), across decile portfolios formed on total accruals.

Portfolio rank		Low	Dec2	Dec3	Dec4	Dec5	Dec6	Dec7	Dec8	Dec9	High
Mean	TACC	-0.298	-0.085	-0.031	-0.002	0.021	0.043	0.069	0.109	0.182	0.464
	ROA	-0.225	-0.058	0.000	0.017	0.031	0.039	0.041	0.041	-0.016	-0.086
	CF	0.073	0.027	0.031	0.019	0.010	-0.003	-0.027	-0.068	-0.197	-0.550
Median	TACC	-0.230	-0.083	-0.032	-0.002	0.020	0.040	0.063	0.101	0.161	0.382
	ROA	-0.123	0.005	0.031	0.050	0.057	0.072	0.071	0.082	0.061	0.004
	CF	0.101	0.077	0.053	0.050	0.036	0.031	0.012	-0.022	-0.112	-0.423

Firm-year observations are, for each year, assigned into decile portfolios based on total accruals.
TACC is total accruals from the balance sheet approach. It is calculated as ΔWC + ΔNCO + ΔFIN. Total accruals and all of its components are calculated as percentages of average total assets.
ROA is operating income after depreciation (WC01250) as a percentage of average total assets.
CF is the difference between ROA and TACC (as defined above).
Otherwise, we refer to the definitions under table 3-1.

3.2 Hypothesis I: Persistence of Current Earnings

Testing the first hypothesis, we investigate whether the persistence of current earnings performance is affected by the relative size of the accrual and cash flow components of earnings. In particular, we investigate whether the persistence is decreasing in the size of the accrual component of earnings and increasing in the size of the cash flow component. The results are presented in table 3-3 where all regressions are executed using the Fama and Macbeth (1973) two-step procedure. In the first step, a cross-sectional regression is performed for each of the 27 years. In the second step, we obtain the final coefficients as the average of the first-step coefficients.

First, we regress FROA on ROA to see how this year's earnings affect earnings the following year. The result shows a significant positive relationship between the two variables. However, this regression is not sufficient for testing our first hypothesis, as it assumes that the coefficients of TACC and CF are equal. Thus, we replace ROA with CF (ROA - TACC) and TACC, resulting in the following regression:

$$FROA = y_0 + y_1(ROA - TACC) + y_2TACC + \varepsilon \quad (5)$$

The equation above can be rewritten to:

$$FROA = p_0 + p_1ROA + p_2TACC + \varepsilon \quad (6)$$

where $p_1 = y_1$ and $p_2 = (y_2 - y_1)$ and where y_1 and y_2 reflect the earnings persistence of cash flow and accruals respectively. The first hypothesis predicts that $(y_2 - y_1) < 0$, which is equivalent to p_2 being negative and shows that accruals are a less persistent measure of future earnings than cash flow. Thus, the lower y_2 compared to y_1, or the more negative p_2, the less persistent the accrual component of earnings relative to the cash flow component. We use the modified regression (function 6), considering that p_2 is a more direct measurement of persistence, as opposed to y_1 and y_2. The regression yields a negative p_2 of 0.064, which is significant at the 5% level. The adjusted R^2 is 49.3%, similar to Richardson et al. (2005). Based on these findings, we confirm our prediction that, for Norwegian and Swedish firms, the accrual component of earnings is a less persistent indicator of future earnings than the cash flow component.

Table 3-3 Test of hypothesis I

Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year's accounting rate of return (FROA) on this year's accounting rate of return (ROA) and accruals (TACC, ΔWC, ΔNCO, ΔFIN). The tests are performed for the pooled (Panel A), the Norwegian (Panel B), and the Swedish sample (Panel C). Each sample covers a period from 1989 to 2015.

$$FROA = \rho_0 + \rho_1 ROA + \rho_2 TACC + \rho_3\ \Delta WC + \rho_4\ \Delta NCO + \rho_5\ \Delta FIN + \varepsilon$$

Panel A: The pooled sample consisting of 9,364 firm-year observations.

	FROA	FROA	FROA
ROA	0.643	0.654	0.659
	(18.72)**	(18.84)**	(18.83)***
TACC		-0.064	
		(3.14)**	
ΔWC			-0.133
			(3.61)***
ΔNCO			-0.036
			(1.86)*
ΔFIN			-0.052
			(2.35)**
Intercept	0.001	0.004	0.004
	(0.28)	(0.94)	(0.72)
Adj R^2	0.482	0.493	0.504

Panel B: The Norwegian sample consisting of 3,333 firm-year observations.

	FROA	FROA	FROA
ROA	0.634	0.653	0.652
	(14.42)**	(14.52)**	(14.65)***
TACC		-0.043	
		(1.98)	
ΔWC			-0.101
			(3.16)***
ΔNCO			-0.018
			(0.80)
ΔFIN			-0.043
			(1.41)
Intercept	0.005	0.006	0.006
	(1.27)	(1.87)	(1.77)*
Adj R^2	0.497	0.505	0.508

Panel C: The Swedish sample consisting of 6,031 firm-year observations.

	FROA	FROA	FROA
ROA	0.723	0.739	0.743
	(25.44)**	(25.10)**	(25.36)***
TACC		-0.088	
		(3.61)**	
ΔWC			-0.164
			(3.68)***
ΔNCO			-0.058
			(2.68)**
ΔFIN			-0.067
			(2.67)**
Intercept	-0.003	0.001	-0.000
	(0.54)	(0.13)	(0.04)
Adj R^2	0.540	0.554	0.566

Regression are computed using the Fama and Macbeth (1973) two-step procedure.

** Denotes significance at the 10% level using a two-tailed t-test.*

*** Denotes significance at the 5% level using a two-tailed t-test.*

**** Denotes significance at the 1% level using a two-tailed t-test.*

Otherwise, we refer to the definitions under table 3-1.

Next, panel B and C in table 3-3 present the results from testing the first hypothesis for the Norwegian and Swedish samples separately. The regressions yield ROA-coefficients of 0.653 for Norway and 0.739 for Sweden. Further, we find that p_2 is only significantly negative for Sweden, which means that the first hypothesis holds for Sweden and not for Norway. Thus, for the Swedish sample, we can conclude that the accrual component of earnings is less persistent than the cash flow component on future earnings, while for the Norwegian sample we have no evidence supporting this prediction. Next, when studying differences between industries for the pooled sample, we find significant results for the first hypothesis at the 1% level for the technology industry, and at the 10% level for the consumer goods industry. However, it is worth noting that the number of firm-year observations in each industry is relatively low, which might yield lower test power.

Next, to investigate which component of TACC that is the least persistent with future earnings, we divide TACC into ΔWC, ΔNCO, and ΔFIN, resulting in the following regression:

$$FROA = y_0 + y_1(ROA - \Delta WC - \Delta NCO - \Delta FIN) + y_2\Delta WC + y_3\Delta NCO + y_4\Delta FIN + \varepsilon \quad (7)$$

which can be rearranged to:

$$FROA = y_0 + y_1 ROA + (y_2 - y_1)\Delta WC + (y_3 - y_1)\Delta NCO + (y_4 - y_1)\Delta FIN + \varepsilon \quad (8)$$

To estimate the persistence of each variable directly, we rewrite the formula to:

$$FROA = p_0 + p_1 ROA + p_2 \Delta WC + p_3 NCO + p_4 \Delta FIN + \varepsilon \quad (9)$$

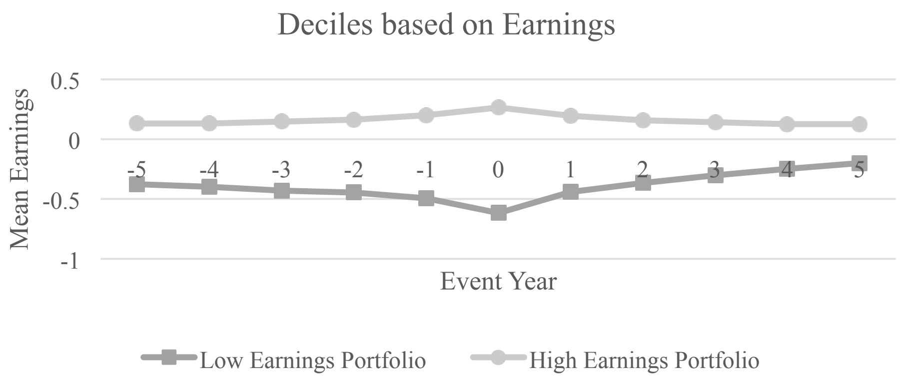
The rightmost column in table 3-3 illustrates the results from the multivariate regression. We find that, for the pooled sample, the negative coefficients for ΔWC and ΔFIN are significant at the 5% level, while the negative coefficient for ΔNCO is significant at the 10% level. Further, ΔWC has the lowest coefficient of -0.133, which is significantly different from the coefficients of ΔNCO and ΔFIN at the 5% and 10% level respectively when performing F-tests. These results indicate that ΔWC is the least persistent on future earnings performance. Our findings correspond with Richardson et al. (2005), who also found significantly negative coefficients for ΔWC and ΔFIN. However, their coefficient for ΔNCO is more significant. Next, our results differ from Richardson et al. on which components are the least persistent. While they conclude that both ΔNCO and ΔWC are less persistent than ΔFIN, we find this only for ΔWC. Further, testing the extended regression for each of the two countries, we find significant results for all accruals in Sweden, with ΔWC being the least persistent, while the result for Norway suggests that only ΔWC significantly affects future earnings.

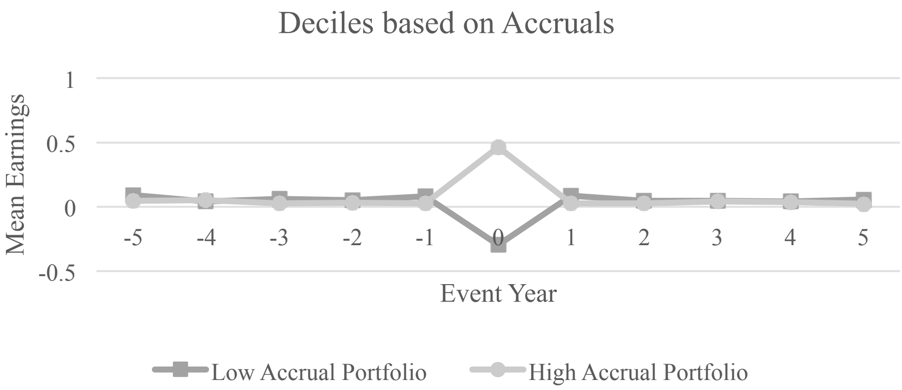
The difference in reliability for these items may explain the difference in their persistence with future earnings, as it seems likely that accruals that are less reliable also are less persistent. As we recall from section 1.3, Richardson et al. (2005) categorize each component of accruals with different reliability, where lower reliability means that the item is measured with a higher degree of subjectivity, thus implying a higher probability of mispricing. If the value of an item is associated with a low degree of subjectivity, the real value of the item will be more or less the same as the reported value. The item will, therefore, have similar attributes to cash flow when it comes to accuracy, and is thus likely to have similar persistency on future earnings performance. Richardson et al. classify ΔWC as an accrual component with medium reliability, while ΔNCO is classified as the component of accruals with the lowest reliability. Further, ΔFIN is classified as an accrual component with high reliability. They conclude that less reliable accruals lead to lower earnings persistence. Our results contradict this conclusion, as we find no evidence for ΔNCO being less persistent than ΔFIN, even though the levels of reliability associated with these components differ.

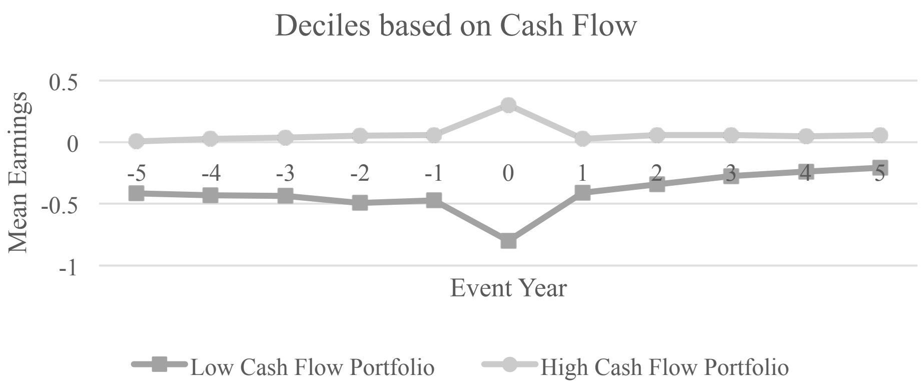
The time-series plots in figure 3-1 further confirm the findings from table 3-3. The plots exhibit earnings performance for firm-year observations that are in the extreme deciles in year zero, in which firms are ranked to deciles based on earnings, accruals or cash flow. Further, the plots document mean earnings performance for these firms five years before and after year zero. Consistent with Sloan (1996) and the regression results from hypothesis I, the mean reversion is more rapid when observations are assigned to deciles based on accruals rather than cash flows, which indicates that earnings attributable to accruals are less persistent than earnings attributable to cash flow.

Figure 3-1 Earnings Performance for Firms in Extreme Deciles

Time-series plots of earnings performance for firm-year observations in the low and high decile, when ranked by earnings, accruals, and cash flows respectively. Year zero is the year in which firms are ranked and assigned in equal numbers to 10 portfolios based on each of the three respective variables.







Earnings are operating income after depreciation (WC01250) as a percentage of average total assets.

Accruals are calculated as ΔWC + ΔNCO + ΔFIN, where all components are calculated as percentages of average total assets.

Cash Flow is the difference between earnings and accruals.

Last, we have tested the first hypothesis before and after the introduction of IFRS, which is in 2005 for Norway and 2007 for Sweden. The results show that, for Norway, ROA affects FROA significantly positive at the 5% level before and after 2005. Before 2005, we find significant negative coefficients at the 5% level for one component of accruals, which is ΔWC, while after 2005, we only observe a negative coefficient for ΔFIN, significant at the 10% level. Next, for Sweden, the results are similar before and after the introduction of IFRS in 2007. Decomposing TACC into ΔWC, ΔNCO and ΔFIN, we find that after 2007, only one accrual coefficient is significant at the 10% level, which is the coefficient for ΔWC. Before 2007 however, the coefficient for ΔWC is significant at the 1% level, and the coefficients for both ΔNCO and ΔFIN are significant at the 10% level. These findings suggest that accruals are a more persistent measure of future earnings performance before the introduction of IFRS for both countries as the significance of the coefficients seem to disappear after this event. However, it is worth noting that the number of observations is relatively low after 2005 and 2007, which could affect the test power.

Summing up, the results from the first hypothesis indicate that the accrual component of earnings is a less persistent indicator of future earnings than cash flow for Norwegian and Swedish firms. Next, we find that ΔWC is the accrual component that is the least persistent with future earnings performance and that it is less persistent than cash flow for all three samples, while TACC, as well as ΔNCO and ΔFIN, are significantly less persistent with future earnings only for the pooled and Swedish sample. Thus, we do not expect to find results of an accrual anomaly based on TACC, ΔNCO, or ΔFIN for the Norwegian sample, as we do not have evidence that these accruals have lower earnings persistence.

3.3 Hypothesis II: Earnings Expectations

Testing the second hypothesis, we investigate whether earnings expectations embedded in the stock prices fully reflect the higher earnings persistence attributable to the cash flow component of earnings and the lower earnings persistence attributable to the accrual component. We use the same explanatory variables as before, but the explained variable is future abnormal return (FRET) rather than future earnings (FROA). The results from the regressions show that none of the coefficients is significantly different from zero, which means that we cannot conclude that hypothesis II holds. Consistent with the previous research on the accrual anomaly in Norway and Sweden presented in section 1.5, the lack of results indicate that investors are aware of the lower persistence attributable to the accrual component of earnings.

Testing the hypothesis for the Norwegian- and Swedish sample separately, we find that the results for Norway coincide with the pooled sample. For Sweden however, we discover that earnings affect future abnormal return positively at the 10% level, while the coefficient representing the difference in persistence between accruals and cash flow is not significant. Comparing the results before and after the transition to IFRS in 2005 for Norway and 2007 for Sweden, we find that, for Norway, there is no difference before and after 2005. For Sweden however, the results show that ROA affects FRET significantly at the 10% level before 2007, while after 2007, none of the coefficients are significant.

3.4 Hypothesis III: Arbitraging the Accrual Anomaly

Testing the third hypothesis, we investigate whether one can gain positive abnormal return by taking a long position in the stock of firms reporting relatively low levels of accruals and a short position in the stock of firms reporting relatively high levels of accruals. For each year, we sort the firms into 10 deciles based on their level of accruals, where the first decile consists of the firms with the lowest level of accruals, the long-portfolio, and the last decile consists of the firms with the highest level of accruals, which is the short portfolio. If investors fail to understand the lower persistence attributable to accruals, one would expect that this strategy would yield positive abnormal return. However, due to lack of significant results in the second hypothesis, we do not expect to find any abnormal return from this trading strategy. Still, we test the third hypothesis for our pooled sample, as well as for Norway and Sweden separately.

Results Pooled Sample

The results from testing the third hypothesis for the pooled sample are presented in table 3-4 and figure 3-2, where figure 3-2 illustrates the abnormal return from the long-short strategy in each of the 27 years in our sample. We find that the mean values of next year's buy-hold size-adjusted return for the low and high accrual deciles are 2.4% and -4.6% respectively, which yield a long-short yearly return of 7.0%. In contrast to the lack of results in the second hypothesis, these results indicate that investors in the Norwegian and Swedish stock markets do not fully comprehend the lower persistence attributable to accruals found from testing the first hypothesis, creating a mispricing in the market.

Next, we sort the observations into deciles based on ΔWC, ΔNCO, ΔFIN, and ΔNOA. First, we find that the trading strategy based on ΔFIN yields a negative abnormal yearly return of 8.5%, which is significant at the 5% level. Second, we find a positive long-short yearly return for ΔNCO of 5.1%, significant at the 10% level, which is attributable to the negative return in the high accrual decile, that is, through the short position. Third, the portfolio formed on ΔNOA yields a significant positive long-short return of 8.4%, also mostly attributable to the short position with a return of -6.3%. Because the ΔNOA strategy yields the greatest return, an investor who wishes to take advantage of the accrual anomaly in the Norwegian and Swedish stock markets ought to base his/her long and short position on ΔNOA-deciles. These results coincide with the results for the US stock market, presented by Richardson et al. (2005).

We recall from the results of the first hypothesis that ΔWC and ΔFIN are the only variables that are significantly less persistent with future earnings performance than cash flow, with ΔWC being the least persistent. Still, we find that the trading strategy based on ΔNCO yields positive abnormal return while the trading strategy based on ΔWC does not. This result contradicts Richardson et al. (2005), who found that, in the US, a trading strategy based on a combination of the least reliable and least persistent accrual components (ΔNCO and ΔWC) yields an abnormal return even higher than that of the trading strategy based on total accruals. Following this, one would expect that our trading strategy based on ΔWC would yield the highest abnormal return due to this component of accruals being the least persistent with future earnings, thus creating a higher probability of mispricing, but as presented above, we do not find this.

Table 3-4 Test of Hypothesis III for the Pooled Sample

Next year's annual mean size-adjusted returns for each decile formed on total accruals and its components for the pooled (panel A), the Norwegian (panel B), and the Swedish sample (panel C). Each sample covers a period from 1989 to 2015.

Panel A: The pooled sample consisting of 9,364 firm-year observations.

Portfolio rank	TACC	ΔWC	ΔNCO	ΔFIN	ΔNOA
Low	0.024	0.025	-0.027	-0.072	0.022
2	-0.019	0.006	0.056	-0.015	0.063
3	-0.007	0.021	0.017	0.002	0.049
4	0.034	0.003	0.073	0.010	-0.015
5	0.035	-0.006	0.037	0.014	0.015
6	0.020	0.009	0.023	0.039	0.030
7	0.002	-0.023	0.010	0.009	0.024
8	0.020	0.075	0.021	0.079	0.028
9	0.060	0.033	-0.011	0.041	-0.030
High	-0.046	-0.023	-0.077	0.013	-0.063
Hedge	0.070	0.048	0.051	-0.085	0.084
t-statistic	1.678	0.836	1.429	-2.334	2.076
p-value	0.050	0.204	0.080	0.988	0.021
σ	0.218	0.207	0.176	0.160	0.207

Firm-year observations are, for each year, assigned into decile portfolios based on total accruals and its components. Hedge represents the net return generated by taking a long position in the "Low" portfolio (decile 1) and an equal sized short position in the "High" portfolio (decile 10). The t-statistic tests whether the hedge return is statistically different from zero and the p-value tests whether the hedge return is significantly positive. ΔNOA is defined as the sum of ΔWC and ΔNCO.
Otherwise, we refer to the definitions under table 3-1.

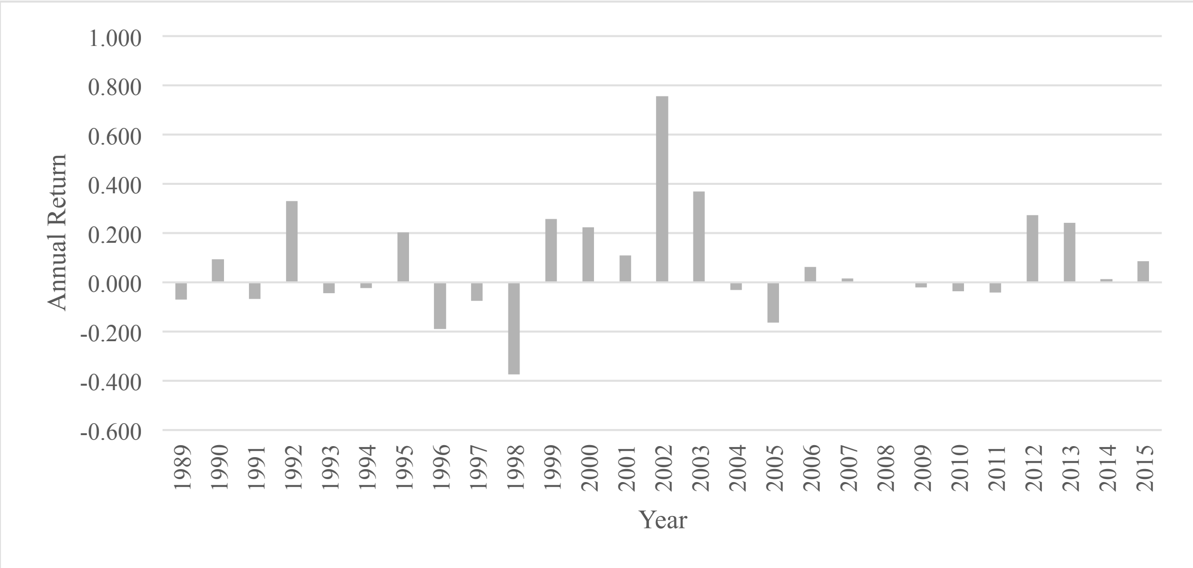
Long-Short Return over Time

Next, we find that the long-short strategy based on TACC is negative in 13 out of the 27 years in our sample, compared to the ΔNOA-strategy that yields a negative return in only 7 out of 27 years. These findings imply that a strategy based on ΔNOA is more robust, substantiated by the higher level of significance of the return for the ΔNOA-strategy. However, Sloan finds a negative return in only 2 out of 30 years. Next, investigating cumulative abnormal return over time, we find that the TACC-strategy yields a cumulative return of 189% over 27 years, which is equivalent to an annual compound rate of return of 4.0%. The cumulative return for the ΔNOA strategy is even higher, with a total return of 228% and an annual compound rate of return of 4.5%.

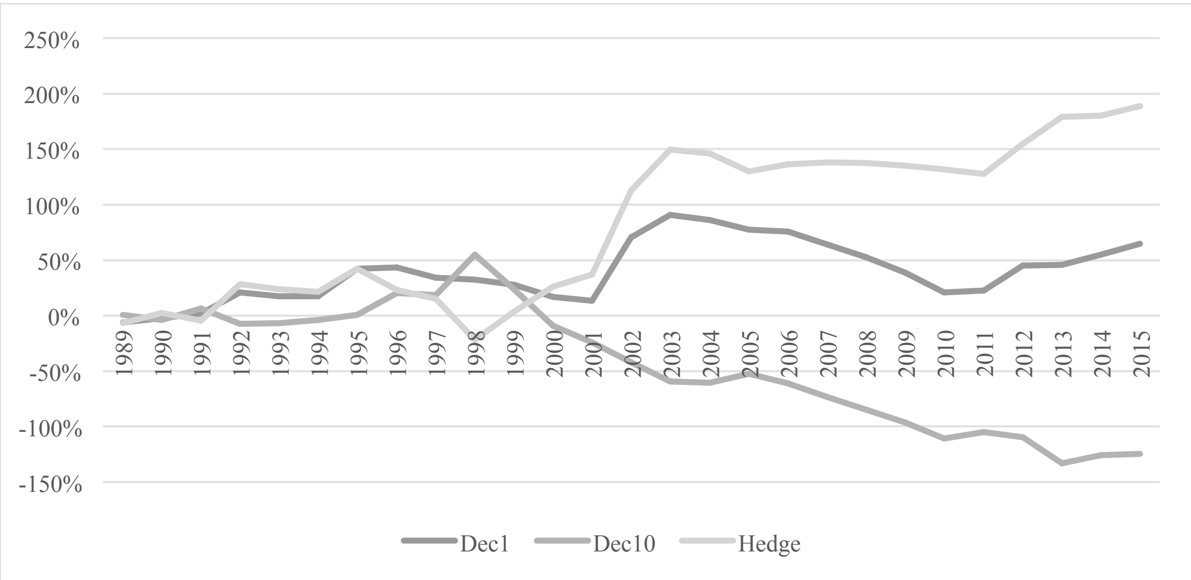
Figure 3-2 Long-Short Return over Time for the Pooled Sample

Yearly abnormal return generated by a hedge portfolio taking a long position in the stock of firms with a relatively low level of total accruals and a short position in the stock of firms with a relatively high level of total accruals. The sample covers a period from 1989 to 2015 and consists of 9,364 firm-year observations.

Panel A: Long-short return over time based on total accruals (TACC)



Panel B: Cumulative abnormal return over time for the low and high accrual portfolios and the long-short strategy based on total accruals.



Firm-year observations are, for each year, assigned into decile portfolios based on total accruals.

Hedge represents the net return generated by taking a long position in decile 1 and an equal sized short position in decile 10.

Otherwise, we refer to the definitions under table 3-1.

Next, table 3-5 presents the results from testing the third hypothesis for the Norwegian and the Swedish sample separately.

Norway

Consistent with previous research presented in section 1.5, we do not find significant results for the long-short strategy based on total accrual-deciles, which means that we cannot conclude that the accrual anomaly is present in Norwegian stock market. This is not surprising as neither hypothesis I nor hypothesis II yields significant results. However, the lack of results may be explained by the reduction in sample size when testing the Norwegian and Swedish sample separately. Further, when we construct portfolios on the components of accruals, we find significant results for the ΔNCO portfolio with an abnormal yearly return of 12.4%, which is even higher than the long-short return for the pooled sample. Investigating the abnormal return for each decile, we find that the excess return is foremost attributable to the short position in the high portfolio, with a negative return of 9.6%. Next, a hedge strategy based on ΔNOA yields an abnormal yearly return of 8.6%, significant at the 10% level. Comparing these results to the results from testing the first hypothesis, we note that we do not get significant results for ΔNCO being less persistent than cash flow with future earnings performance. Thus, we cannot conclude that the abnormal return from the trading strategy based on ΔNCO is attributable lower persistency with future earnings, which according to Sloan (1996), is the primary cause of the accrual anomaly. Further, we find that the ΔNCO-strategy yields a negative long-short return in 8 out of the 27 years in our sample, while this is nine years for the ΔNOA-strategy.

Sweden

For Sweden, we find that the trading strategy based on total accruals yields an abnormal yearly return of 9.4%, which is significant at the 10% level. This is consistent with the findings of previous research on the Swedish stock market, presented in section 1.5. Next, ΔFIN is the only component of TACC that yields significant results for a long-short strategy, although significantly negative with a mean return of -8.5%. We have also sorted the observations into deciles based on ΔNOA, where the hedge strategy yields a significant abnormal return of 9.8%, which is somewhat higher than the TACC-hedge return. These results are consistent with the findings from testing the first hypothesis, indicating that total accruals and all of its components are less persistent than cash flow on future earnings performance. Last, investigating the long-short return over time, we find that the long-short strategy based on TACC yields a negative return in 9 out of the 27 years in our sample, while for the strategy based on ΔNOA this is seven years.

Table 3-5 Test of Hypothesis III in Norway and Sweden separately

Panel A: The Norwegian sample consisting of 3,333 firm-year observations.

Portfolio rank	TACC	ΔWC	ΔNCO	ΔFIN	ΔNOA
Low	-0.004	0.025	0.028	-0.080	0.005
2	-0.051	0.010	-0.022	-0.024	0.044
3	0.029	-0.006	0.040	0.059	0.065
4	-0.007	-0.034	0.063	-0.012	0.000
5	0.036	0.015	0.071	0.030	-0.009
6	-0.002	-0.051	0.058	-0.026	0.088
7	0.046	-0.007	0.022	0.050	0.046
8	0.024	0.035	-0.043	0.106	0.011
9	0.098	0.137	-0.008	0.011	-0.045
High	-0.056	-0.010	-0.096	0.020	-0.081
Hedge	0.052	0.035	0.124	-0.101	0.086
t-statistic	0.770	0.491	2.395	-1.863	1.567
p-value	0.223	0.313	0.010	0.966	0.062
σ	0.338	0.387	0.026	-0.193	-0.028

Panel B: The Swedish sample consisting of 6,031 firm-year observations.

Portfolio rank	TACC	ΔWC	ΔNCO	ΔFIN	ΔNOA
Low	0.044	0.025	-0.029	-0.066	0.044
2	0.022	0.021	0.069	-0.056	0.057
3	-0.021	0.031	0.028	-0.004	0.038
4	0.020	-0.002	0.021	0.010	-0.002
5	0.042	-0.007	0.029	0.046	0.020
6	-0.016	0.016	-0.017	0.043	-0.018
7	0.012	0.007	-0.007	-0.009	-0.019
8	0.016	0.031	0.027	0.046	0.018
9	0.014	-0.038	0.006	0.041	-0.004
High	-0.050	-0.004	-0.052	0.019	-0.053
Hedge	0.094	0.030	0.024	-0.085	0.097
t-statistic	1.667	0.467	0.456	-2.303	1.972
p-value	0.051	0.321	0.325	0.987	0.027
σ	0.309	0.300	0.297	0.189	0.234

Otherwise, we refer to the definitions under table 3-1.

Table 3-6 provides the results from testing the third hypothesis before and after the transition to IFRS in 2005 in Norway and 2007 in Sweden.

Test of Hypothesis III before and after IFRS in Norway

For the Norwegian sample, we find that the mean annual long-short return for the ΔNCO-strategy is 20.6% before 2005, while this is 0.5% after 2005. A difference in means test (panel C) shows that the difference in returns is significant at the 5% level, which indicates that the introduction of IFRS in Norway could have contributed to a disappearance of the abnormal return from the trading strategy based on ΔNCO. However, we note that there may be other reasons explaining the difference before and after 2005. For instance, investors could have become more aware of the mispricing related to ΔNCO. Investigating returns across ΔNCO deciles, we find that before 2005, the first decile has a positive mean return of 9.13%, while the last decile has a negative return of 11.5%. After 2005 however, the mean returns for both the low and high decile portfolios are negative, with values of -6.3% and -6.8% in the first and last decile respectively. Further, we find that the standard deviation falls from 0.255 before 2005 to 0.193 after 2005. Overall, our results imply that the mispricing of ΔNCO is no longer present at the Oslo Stock Exchange. These findings contradict the findings of Kaserer and Klinger (2008), who found that the accrual anomaly is likely to be driven by the transition to IFRS. However, as presented in section 1.6, Norway bundled the introduction of IFRS with increased enforcement, which is likely to reduce managerial incentives to manipulate income and thus the probability of an accrual anomaly.

Test of Hypothesis III before and after IFRS in Sweden

Investigating the long-short return for the TACC-trading strategy before and after the introduction of IFRS in 2007 in Sweden, we cannot find significant results that a difference in means exists. The lack of significant results also applies when testing the difference between ΔNOA long-short returns before and after 2007. Consequently, we cannot conclude that there is a difference before and after the introduction of IFRS for the Swedish sample. Further, we find that when we test the third hypothesis on the two periods, only the trading strategy based on ΔNOA yields significant results before 2007, while after 2007, we cannot find significant results for the TACC or the ΔNOA trading strategies. However, it is worth mentioning that the number of observations is quite low after 2007, which could affect the results or lack thereof.

Table 3-6 Test of Hypothesis III before and after IFRS

Next year's annual mean size-adjusted returns for decile portfolios formed on total accruals and its components before and after the transition to IFRS in 2005 and 2007 for Norway and Sweden respectively.

Panel A: The Norwegian sample. The first two columns cover a period from 1989 to 2004 totaling 1,586 firm-years, while the last two columns cover a period from 2005 to 2015 totaling 1,747 firm-years.

	Before 2005		After 2005	
Portfolio rank	ΔNCO	ΔNOA	ΔNCO	ΔNOA
Low	0.091	0.048	-0.063	-0.058
2	0.052	0.042	-0.131	0.047
3	-0.008	0.113	0.111	-0.004
4	0.057	-0.037	0.072	0.053
5	0.043	-0.02	0.112	0.009
6	0.03	0.062	0.101	0.125
7	-0.002	0.056	0.057	0.031
8	-0.048	-0.002	-0.036	0.029
9	0.032	-0.017	-0.066	-0.087
High	-0.115	-0.101	-0.068	-0.052
Hedge	0.206	0.149	0.005	-0.006
t-statistic	2.911	1.994	0.074	-0.073
p-value	0.004	0.03	0.471	0.529

Panel B: The Swedish sample. The first two columns cover a period from 1989 to 2006 totaling 3,017 firm-years, while the last two columns cover a period from 2007 to 2015 totaling 3,014 firm-years.

	Before 2007		After 2007	
Portfolio rank	TACC	ΔNOA	TACC	ΔNOA
Low	0.055	0.064	0.022	0.003
2	0.027	0.074	0.011	0.023
3	-0.043	0.040	0.023	0.033
4	0.041	-0.009	-0.024	0.013
5	0.049	0.026	0.028	0.008
6	-0.031	-0.036	0.014	0.017
7	0.034	-0.028	-0.030	0.000
8	0.015	0.011	0.017	0.030
9	-0.010	-0.006	0.062	0.002
High	-0.049	-0.050	-0.052	-0.061
Hedge	0.104	0.114	0.074	0.064
t-statistic	1.334	1.711	1.041	0.948
p-value	0.096	0.049	0.157	0.179

Panel C: Tests of difference in mean returns before and after 2005 for the Norwegian sample, where returns are based on the ΔNCO and ΔNOA hedge strategies.

	ΔNCO		ΔNOA	
	Mean	Std. Dev.	Mean	Std. Dev.
Before 2005	0.206	0.255	0.149	0.303
After 2005	0.005	0.193	-0.006	0.249
Difference	0.201		0.155	
t-statistic	2.331		1.452	
p-value	0.028		0.159	

Panel D: Tests of difference in mean returns before and after 2007 for the Swedish sample, where returns are based on the TACC and ΔNOA hedge strategies.

	TACC		ΔNOA	
	Mean	Std. Dev.	Mean	Std. Dev.
Before2007	0.104	0.363	0.142	0.265
After 2007	0.074	0.169	0.033	0.171
Difference	0.030		0.109	
t-statistic	0.293		1.298	
p-value	0.772		0.206	

T-statisticks and p-values test whether the difference in means is significant different from zero. Otherwise, we refer to the definitions under table 3-1.

In sum, the results from testing the third hypothesis indicate that there is an accrual anomaly in the Swedish and Norwegian stock markets. For the pooled and the Swedish sample, the long-short strategy yields an abnormal yearly return when based on TACC, and on ΔNOA, while the Norwegian sample yields an abnormal return when deciles are formed on ΔNCO, as well as on ΔNOA. Further, we note that these long-short returns are mostly attributable to the short position, that is, the high accrual decile portfolio. Last, our findings indicate that the accrual anomaly in Norway disappears after the transition to IFRS in 2005, while we find no evidence for this when Sweden introduce IFRS in 2007.

4. Trading Strategy Risk

As presented in section 1.4, the risk associated with the accrual anomaly could potentially explain why investors refrain from exploiting the long-short strategy, as well as indicate that the abnormal return could be, or partly be, attributable to insufficient adjustment for risk. Table 4-1 and 4-2 report statistics on potential risk factors for each decile portfolio formed on total accruals and some of its components that yield significant results in hypothesis III.

First, from table 4-1 we find that, for the pooled sample, the stocks in the low and high decile formed on total accruals have relatively high betas compared to the other deciles. Beta is a measure of systematic risk, calculated as the covariance between the equal-weighted market return and the equal-weighted return for each accrual decile, divided by the equal-weighted market return. We find that the low and high accrual deciles have betas of 1.367 and 1.200 respectively. However, the hedge portfolio with a long position in the high accrual decile and an equal sized short position in the low accrual decile yields a net beta estimate of 0.168, which means that the long-short strategy has a relatively low level of systematic risk. Still, we note that Sloan (1996) finds a beta for the hedge portfolio of only 0.02, indicating that the long-short strategy is riskier in the Norwegian and Swedish stock market than in the US stock market. Further, the long-short portfolio formed on ΔNOA has a beta of only 0.04. When investigating the systematic risk for the Norwegian and Swedish sample separately, we find that the hedge portfolios that yield significant results in hypothesis III also have low systematic risk due to the relatively equal sized beta in both the long and short portfolio.

Table 4-1 Systematic Risk

The estimated betas for each decile portfolio based on TACC and ΔNOA for the pooled and Swedish sample, and for ΔNCO and ΔNOA for the Norwegian sample. The pooled sample consists of 9,364 firm-year observations. The Norwegian sample consists of 3,333 firm-year observations. The Swedish sample consists of 6,031 firm-year observations. All three samples cover a period from 1989 to 2015.

	Portfolio rank	Low	2	3	4	5	6	7	8	9	High	Hedge
Pooled sample	TACC	1.267	0.900	0.878	0.882	0.954	0.889	0.852	1.047	1.225	1.102	0.164
	ΔNOA	1.126	1.021	1.098	0.796	0.813	0.890	1.056	1.036	1.086	1.083	0.044
Norway	ΔNCO	1.026	1.092	0.830	1.133	0.992	1.042	0.656	1.021	1.219	0.979	0.047
	ΔNOA	1.079	0.807	1.126	1.027	0.792	1.146	1.087	0.918	1.044	1.001	0.077
Sweden	TACC	1.209	0.824	0.805	1.125	0.872	0.826	0.936	1.074	1.157	1.170	0.039
	ΔNOA	1.191	1.121	1.034	0.745	0.780	0.752	0.973	1.127	1.151	1.131	0.061

Beta is calculated as the covariance between the equal-weighted decile return and the equal-weighted market return over the 27 years in the sample, divided by the market variance.
Hedge represents the net return generated by taking a long position in the "Low" portfolio and an equal sized short position in the "High" portfolio.
Otherwise, we refer to definitions under table 3-1.

Second, table 4-2 panel A presents the liquidity risk attributable to each accrual decile, where lower liquidity, measured by the natural logarithm of turnover, implies higher arbitrage risk. We use the natural logarithm to reduce the effect of extreme observations. Consistent with Mashruwala et al. (2006), we find that the stocks in the first and last decile are the least liquid. Thus, the liquidity risk could repel an investor from taking advantage of the strategy considering that he/she may find it difficult to exit the long or short position. Comparing the statistics for the Norwegian and Swedish sample, we observe that the mean turnover pattern across deciles for Sweden is similar to that of the pooled sample, with the low and high deciles being the least liquid. However, for Norway, we do not find the same clear pattern. Further, it is worth noting that a significant portion of the firm-year observations in our sample lacks data for liquidity, potentially affecting our results. Still, considering that the firm-year observations lacking data on liquidity are more or less equally distributed across deciles and that our results are in line with previous research, we assume that our results are not measured with too much error, at least not sufficiently to change our conclusion.

Table 4-2 Equity Market Risk

Mean values of liquidity, size, and book-to-market for each decile portfolio based on TACC and ΔNOA for the pooled and Swedish sample, and on ΔNCO and ΔNOA for the Norwegian sample. The number of firm-year observations in each sample is reported in the rightmost column. All samples cover a period from 1989 to 2015.

Panel A: Liquidity

	Portfolio rank	Low	2	3	4	5	6	7	8	9	High	N
Pooled sample	TACC	11.5	12.1	12.5	12.9	12.9	13.1	13.0	12.8	12.3	11.8	5,303
	ΔNOA	11.6	12.0	12.5	12.9	13.2	13.0	12.9	12.6	12.2	12.0	5,303
Norway	ΔNCO	12.4	12.1	12.5	12.7	12.6	13.5	12.8	13.5	13.3	12.7	1,304
	ΔNOA	12.1	12.2	12.7	12.9	13.1	13.0	13.3	13.1	13.0	12.8	1,304
Sweden	TACC	11.4	12.1	12.6	13.1	13.0	13.3	13.1	12.8	12.1	11.7	3,999
	ΔNOA	11.4	11.9	12.7	13.1	13.3	13.2	12.8	12.6	12.1	11.9	3,999

Panel B: Size

	Portfolio rank	Low	2	3	4	5	6	7	8	9	High	N
Pooled sample	TACC	5.1	5.9	6.4	6.7	6.8	7.0	6.9	6.6	6.2	5.9	9,054
	ΔNOA	5.2	6.0	6.5	6.7	6.9	6.8	6.8	6.5	6.3	6.1	9,054
Norway	ΔNCO	5.8	6.2	6.5	6.8	6.8	7.1	6.9	7.1	7.1	6.8	3,217
	ΔNOA	5.7	6.3	6.8	6.8	7.0	7.0	6.9	7.0	6.9	6.7	3,217
Sweden	TACC	5.0	5.8	6.4	6.7	6.8	7.1	6.8	6.5	6.0	5.7	5,837
	ΔNOA	5.0	5.8	6.6	6.8	7.1	6.9	6.6	6.4	6.0	5.8	5,837

Panel C: Book-to-market

	Portfolio rank	Low	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	High	N
Pooled sample	TACC	-0.7	-0.4	-0.3	-0.4	-0.4	-0.5	-0.5	-0.6	-0.7	-0.8	8,940
	ΔNOA	-0.5	-0.5	-0.4	-0.5	-0.5	-0.5	-0.6	-0.6	-0.6	-0.6	8,940
Norway	ΔNCO	-0.3	-0.3	-0.4	-0.5	-0.5	-0.4	-0.4	-0.4	-0.5	-0.5	3,157
	ΔNOA	-0.5	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5	-0.6	3,157
Sweden	TACC	-0.7	-0.5	-0.3	-0.4	-0.5	-0.5	-0.6	-0.7	-0.8	-0.8	5,783
	ΔNOA	-0.6	-0.5	-0.5	-0.5	-0.5	-0.5	-0.7	-0.7	-0.7	-0.7	5,783

Datastream codes are in parentheses.

Liquidity is calculated as the natural logarithm of turnover (VA), which is the value of all trades for a stock, in a particular year.

Size is calculated as the natural logarithm of the market value (MV) at the fiscal year-end.

Book-to-Market is calculated as the natural logarithm of the book value of equity (WC02999 – WC03351) divided by the market value of equity (MV) at the fiscal year-end.

Otherwise, we refer to the definitions under table 3-1.

Third, from table 4-2 panel B, we find that the firms in the low and high deciles formed on TACC are smaller in terms of market value compared to the other deciles, implying higher risk as smaller companies are considered riskier (Fama & French, 1992). We have defined size as the natural logarithm of market value. Considering that the companies in both the long and short portfolios are smaller on average, the net effect is reduced, though not eliminated as the firms in the long portfolio are still smaller than the firms in the short portfolio. The size statistics for the Swedish sample are similar to that of the pooled sample, while for the Norwegian sample, the mean size values in the high accrual decile formed on ΔNCO and ΔNOA are similar to the other deciles. Compared to Sloan (1996), we note that these statistics display a more considerable difference in size between the low and high accrual deciles, indicating that an investor who aims to exploit a potential accrual anomaly in the Norwegian and Swedish stock markets will be exposed to size-risk through the long position.

Fourth, from table 4-2 panel C, we find that, for the pooled sample, the mean book-to-market is lowest for the average firm-year observation in the extreme accrual deciles formed on TACC. We calculate book-to-market as the natural logarithm of the book value of equity divided by the market value of equity at the fiscal year-end, where book value is calculated by subtracting total liabilities from total assets. According to Fama and French (1992), growth companies are considered riskier than value-companies, where growth companies are defined as companies with relatively low book-to-market, while value-companies have relatively high book-to-market. Thus, the statistics indicate that the extreme accrual deciles are riskier due to relatively low book-to-market means. However, considering that the multiple is relatively small for both the low and high decile portfolio formed on TACC, we regard the net return attributable to the growth risk factor as low. Next, we find that the pattern in book-to-market, where the low and high deciles have the lowest multiples, is less clear when deciles are formed on ΔNOA. Comparing book-to-market for the Norwegian and Swedish sample separately, we find that the pattern for ΔNOA in Norway is similar to the pooled sample. However, the multiple in the low decile is relatively high for the ΔNCO-strategy for Norway, thus implying lower risk attributable to the growth factor for these firm-year observations. Last, the results show that the book-to-market pattern across deciles is more or less the same for Sweden as for the pooled sample.

Last, arbitrage risk could also be measured by standard deviation. We find that the abnormal long-short return for the pooled sample based on TACC deciles has a standard deviation of

21.8%. For the ΔNOA long-short return, this is 20.7%. Comparing the pooled sample to the Norwegian and Swedish sample separately, we find that both the ΔNCO and ΔNOA long-short returns for Norway, as well as the TACC and ΔNOA returns for Sweden, have higher standard deviations than the returns for the pooled sample. These results imply that the arbitrage risk is somewhat higher when basing the trading strategy on only Norwegian or Swedish data.

In total, the findings suggest that although we find abnormal return when testing the trading strategy for the Norwegian and Swedish stock markets, there is risk associated with exploiting it.

5. Limitations and Robustness Tests

Following, we describe our assumptions and model limitations. Next, we present the additional tests we have employed to check the robustness of our results.

5.1 Limitations and Assumptions

We make several simplifying assumptions that may limit the use of the findings we present in this paper, as well as question our statistical results.

First, we assume an independently and identically distributed measurement error in accruals, uncorrelated with the components of earnings. In reality, this may not be the case as managers can smooth earnings (Richardson et al., 2005), potentially causing a negative correlation between the measurement error and both accruals and cash flows. Also, managers with limited tenure have a greater incentive to manipulate earnings to gain recognition and enhance shareholders' perception of the firm's performance, which would cause more significant positive errors (Watts, 2003). Another example that could violate this assumption is, for instance, when new managers manipulate poor earnings numbers to look even worse to make future performance look better (Richardson et al., 2005). Last, because of conservative accounting that is stricter on gains than on losses, our negative errors could be greater in magnitude and by that violate the assumption that the measurement error in accruals is an independent random variable (Watts, 2003).

Second, when pooling Norwegian and Swedish data, we assume that the accounting standards in Norway and Sweden are similar throughout our sample period. According to Agami and Monsen (1995), the Nordic council issued a Common Nordic Proposal for harmonization in 1969, which recommended the Nordic countries to harmonize their accounting standards. They conclude that the Nordic countries achieved this to a high degree. Still, it is important to note that Sweden became a member of the European Union (EU) in 1994, which meant that they had to comply with EU directives for accounting and financial reporting. Sweden was, however, not obliged to make substantial changes in their accounting policy, considering that the policy in Sweden, as well as in the rest of the Nordic countries, was mainly in accordance with, or exceeding, the accounting and financial reporting standards imposed by the EU. Today, both Norway and Sweden have adopted IFRS, albeit in 2005 and 2007 respectively (Christensen, Hail, & Leuz, 2013).

Next, we make a simplifying assumption that the 12-month stock return, starting the 1st of August after the end of the fiscal year, adequately reflect the information released in the financial statements. This assumption is due to the 31st of July being the deadline for firms with accounting obligations to submit their accounts according to the Norwegian Accounting Act (1999, § 8-2), and the Swedish Accounting Act (1995, § 8-6). In reality, we cannot know the exact filing date for the firms in our sample as the release date for annual reports differs. This simplification may weaken our analysis as many firms submit their annual reports long before this date, indicating that the time from which the return is calculated might not adequately reflect a firm's performance as some of the return may be from the succeeding period. For example, if a firm surprises investors positively in year two, the return attributable to the previous period (year one) may appear higher due to the effect of the succeeding year (year two). Further, we assume that all firms submit their annual reports in due time, which may not always be the case.

Another problematic aspect regarding our analysis is that it does not take into account the so-called "holding company discount," which means that the market value of a holding company can be significantly below its estimated net asset value (Rommens, Deloof, & Jegers, 2004). The discount may arise for several reasons. First, if a holding company wishes to sell a considerable portion of its shares, it may have a difficult time finding a buyer, or it may have to charge a lower price for the shares due to lack of liquidity, which investors have taken into account. Second, the discount may occur because of managerial entrenchment as the manager may abuse his/her power to benefit at the expense of the shareholders. For example, the controlling shareholder will have the incentive to extract value from any company in the holding structure, which could be harmful to the minority investors. However, a potential holding company-discount may not be problematic if the discount remains constant. Investigating the holding companies in our sample, such as Aker, we find that, according to Framstad (2017), that this is not the case. Thus, the existence of a holding company discount may weaken our analysis, as the return in a given period may not reflect investors' perception of the company, but rather a change in discount.

Next, our analysis does not consider that minority shares may also trade at a discount (Booth, 2001). These investors are given a discount due to the possibility that a majority shareholder exploits his/her power in a manner that is detrimental to minority shareholders. A majority shareholder may for example extract value from the firm that he/she is not entitled to, at the expense of the minority shareholders. The discount could be problematic for our analysis as return may be, or may partly be, attributable to a change in discount, such as in the case of the holding company discount, rather than a change in investors' perception of the firm. For instance, one would assume that the discount could change as a result of a shift in majority shareholder, considering that minority shareholders may demand a lower discount if the majority shareholder is more reliable and thereby less likely to take advantage of his/her position.

Last, we do not adjust our analysis for several firms in our sample having undergone substantial changes due to transactions such as mergers, acquisitions, and divestitures. Previous research suggests that firms that have experienced a merger, acquisition or IPO, typically have high levels of accruals and often underperform the following period (Zach, 2003). However, firms that have undergone a divestiture or restructuring typically have low levels of accruals and are more likely to overperform in the following period. These results indicate possible implications for our analysis as a potential accrual anomaly could be, or could partly be, a result of the number of transactions present in our sample. Zach illustrates that the abnormal return from the trading strategy falls by 25% when removing these corporate events, thus proving that the accrual anomaly is sensitive to corporate events.

5.2 Robustness Tests

We conduct several tests to check the robustness of our results. First, we compute our tests using a measure of accruals derived by using the statement of cash flow instead of the balance sheet[4], which means that we have calculated accruals as a residual from earnings and cash flow, which is known as the cash flow approach. Prior research differs in opinion to which method is the most accurate. We initially chose to calculate accruals by using the balance sheet approach, as this in line with both Sloan (1996) and Richardson et al. (2005), who are our primary sources for this research paper. Roychowdhurly (2004) substantiates

[4] This alternative measure of accruals is computed as the difference between net income before extraordinary items (WC01551) less net operating, investing and financing cash flow (WC04860, WC04870, WC04890), plus net proceeds from sale/issue of common and preferred stock (WC04251) less cash dividends (WC04551).

this choice through his findings that some managers may have the incentive to manipulate real activities, affecting both cash flow and accruals. The research suggests that firms reporting small positive profits often have unusually low cash flow from operations and abnormally high production costs. Some firms may also report lower expenses to make their margins appear higher, or to meet an earnings target, indicating that there could be measurement error in cash flow. Testing our hypotheses using the cash flow approach, the results for the first and second hypotheses are similar to that of the balance sheet approach, while for the third hypothesis, we do not find significant results. However, the lack of results could be attributable to a lower number of observations, and thus lower test power, considering that Datastream does not have sufficient data on cash flow items for Norwegian and Swedish firms before 1994.

Second, we use free float to weight return. Some research suggests that there might be a problem associated with weighting return by market value, as it does not take into account the degree of liquidity attributable to each stock (Norges Bank, 2014). Some stocks are not traded freely in the market, which means that an investor will not be able to add this particular stock to his/her portfolio. One may, therefore, argue that it is beneficial to use a free float weighing where each weight is proportional to the market value of the shares held by unrestricted investors. Still, according to Fama and French (2004), weighing return by market value is theoretically the correct method. Market value weights are also in line with a buy-hold strategy, which means that an investor does not always need to rebalance his/her portfolio, as well as being the approach primarily used in previous research on the accrual anomaly. However, when we use free float to weight return we do not find significant results for the second and the third hypothesis.

Third, following Sloan (1996), we test the first two hypotheses through decile rank regressions. The purpose of this robustness test is to ensure that our results are not attributable to outlying observations that are not representative of the entire population and possibly measured with error. These regressions use decile rankings of the financial statement variables instead of their actual values. This approach yields similar results, which exhibit our method's ability to test the desired outcome. The only exception is that the decile rank results report that ROA affects FRET significantly positively, while the results of our initial approach do not. Fourth, we test the robustness of our results in hypothesis I and II by using industry-specific regressions based on FTSE Industry Classification Benchmark industry codes (ICBIC). Sloan argues that this robustness test is necessary considering that the time-series properties of earnings differ as a function of industry characteristics, potentially causing a varying parameters problem with the pooled regression results. However, the industry-specific regressions provide similar results to that of the pooled regression, which means that our results are robust to this potential problem.

Fourth, we test our hypothesis with additional screenings suggested by various papers on the accrual anomaly, which reduces our sample to 7,899 firm-year observations. First, we follow Leippold and Lohre (2012) in eliminating small firms. Thus, we delete firm-year observations where revenue is below NOK 35 million and total assets are below NOK 70 million, which the Norwegian Accounting Act (1999, § 1-6) defines as small firms. In accordance to Leippold and Lohre, we also eliminate observations with a stock price less than NOK 1. Last, following Desai, Rajgopal, and Venkatachalam (2004), we delete firm-year observations with negative book-to-market. We get similar results regarding the first and second hypothesis, while for the third hypothesis, the long-short return is not significant. However, we note that the trading strategy based on ΔNOA still yields a significantly positive abnormal return.

Fifth, following Sloan (1996), we test the robustness of our abnormal return calculations by comparing the size-adjusted returns with Jensen's alpha (α_p), calculated by the following Capital Asset Pricing Model (CAPM) regression:

$$\left(R_{pt} - R_{ft}\right) = \alpha_p + \beta_p\left(R_{mt} - R_f\right) + \varepsilon_{pt} \tag{5}$$

where R_{pt} is the buy-hold return for portfolio p in year t, and $(R_{pt} - R_{ft})$ is the portfolio return in excess of the risk-free rate (R_f). We calculate the risk-free rate by first subtracting 0.25% from NIBOR and STIBOR, which are the interbank rates in Norway and Sweden respectively. Next, we weight the rates with the number of firms in the two countries, as opposed to market weights, which is due to the market return (R_{mt}) being equal weighted, leaving us with one risk-free rate for each year. Further, we estimate beta (β_p), which is the systematic risk attributable to portfolio p, as well as Jensen's alpha, for each decile. Testing the third hypothesis using CAPM regressions, we find significant results, which is in line with our initial findings.

Last, we test the third hypothesis using quartile rankings instead of decile ranking, which is motivated by the deviating results in hypothesis II and III. In our initial approach, the findings for hypothesis III revealed an abnormal yearly return from the trading strategy despite the lack of significant results for hypothesis II. These contradicting results may be due to the difference in samples utilized in the two tests, considering that while we test all observations for the second hypothesis, we only test the firm-year observations in the extreme accrual deciles for the third hypothesis. Investigating abnormal return across deciles, we do not find the same clear pattern as Richardson et al. (2005) and Sloan (1996), with the lower accrual deciles having the highest return and the upper accrual deciles having the lowest return. To illustrate, we find a negative return in the second and third accrual decile and a positive return in the eighth and ninth decile. Therefore, the lack of significant results in the second hypothesis could be, or could partly be, attributable to lack of consistency in return across deciles, which means that the regression cannot find any connection between accruals and future return. When we test the third hypothesis using quartile rankings, the abnormal return from the long-short strategy based on total accruals disappears. However, the trading strategy based on ΔNOA still yields a significant positive abnormal return.

In sum, we cannot conclude that our results are robust to all the potential problems presented above. However, it is worth noting that the reduced number of firm-year observations in some of the robustness tests could weaken their power.

6. Conclusions

Our research is based on the work of Sloan (1996), which documents the accrual anomaly in the US stock market, and on Richardson et al. (2005), which provides an extended definition of accruals. Later studies have investigated whether the accrual anomaly is present in other countries, although reporting mixed results and few mentioning the Nordic countries (Pincus et al. 2007, LaFond 2005, Leippold and Lohre 2012). Our contribution to the literature is to investigate the accrual anomaly in the Norwegian and Swedish stock markets, as well as to use an extended definition and decomposition of accruals, and test if there is a difference before and after the transition to IFRS in each country.

First, we look at whether the persistence of earnings performance is decreasing in the magnitude of the accrual component of earnings and increasing in the cash flow component. We find that accruals are less persistent than cash flow on future earnings and that working capital accruals are the component of accruals with the lowest persistence.

Second, we investigate whether investors are aware of the lower persistence attributable to accruals or if investors naïvely look to earnings without considerations of its components. Our findings do not yield significant results, which means that we cannot conclude that the naïve investor hypothesis holds.

Third, we test whether it is possible to gain abnormal return by exploiting a potential mispricing through taking a long position in the stock of firms with a relatively low level of accruals, and a short position in the stock of firms with a relatively high level of accruals. Considering the lack of significant results regarding the naïve investor hypothesis, we do not expect to find any abnormal return. However, this is not the case. We find that the trading strategy based on total accruals yields an abnormal yearly return of 7.0%. Investigating the Norwegian and Swedish sample separately, we find that a trading strategy based on non-current operating accruals yields an abnormal yearly return of 12.4% for Norway, while a strategy based on both current and non-current operating accruals yields an abnormal yearly return of 9.7% for Sweden. It is worth noting that these abnormal returns generally are mostly attributable to the return in the high accrual decile, which is the short position. We also find a significant difference in mean abnormal returns before and after 2005 in Norway, which marks the transition to IFRS, where the results suggested that, after 2005, the accrual anomaly is no longer present at the Oslo Stock Exchange. In Sweden, we could not find such a difference. Still, it is worth noting that the lack of significant result could be attributable to few observations.

Finally, it is worth noting that our trading strategy is associated with some arbitrage risk. First, the firms in the low and high accrual deciles have lower liquidity, as well as relatively high standard deviations, which implies higher arbitrage risk. Thus, an investor could refrain from employing the trading strategy due to fear of not being able to exit the long or short position. Second, the low and high accrual deciles have higher systematic and size risk, in addition to having relatively low book-to-market multiples. However, an investor's exposure to these risk factors is reduced, although not eliminated, due to the somewhat similar exposure in both the long and short position.

The reader ought to be aware of the limitations of our analysis. First, we assume an independently and identically distributed measurement error in accruals, uncorrelated with other components of earnings, which potentially causes a bias in our estimates. Second, the return cumulation period starts the 1st of August for all firm-year observations, which means that the return may not adequately reflect investors perception of the accounts in the given period, considering that some firms submit their reports long before this date. Third, discounts for holding companies and minority shares entail that the return in a given period could be attributable to a change in discount rather than investors' perception of the company (Rommens, Deloof & Jegers, 2004, Booth, 2001). Last, corporate events such as mergers, acquisitions, and divestitures could affect our results, as the accrual anomaly is sensitive to events such as these (Zach, 2003).

Next, we cannot conclude that our results are robust concerning all potential measurement issues we have introduced. More specifically, we do not find significant results on the trading strategy based on total accruals when we use the cash flow method as an alternative measure of accruals, or when we use free float to weigh return. However, the lack of significant results in some of our robustness tests could be attributable to the reduction in sample size, reducing the power of the tests. Further, when we perform our tests with additional screenings, suggested by Leippold and Lohre (2012) and Desai et al. (2004), or quartile rankings, the accrual anomaly based on total accruals disappears. However, the positive abnormal return of the trading strategy formed on all operating accruals persists.

Our findings raise additional issues for future research. First, future studies on the existence of the accrual anomaly in Norway and Sweden are needed to corroborate our results. Second, it would be interesting to examine whether accounting differences between generally accepted accounting principles (GAAP) and IFRS could explain the change in results before and after 2005 in Norway, or if this change is merely due to investors' awareness of the higher persistence of cash flow relative to accruals. Last, future research on the transition to IFRS in Sweden is needed to investigate if the accrual anomaly at the Stockholm Stock Exchange has disappeared.

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A. Appendix

A.1 Datastream Codes

List of variables and their respective Datastream code. Each variable is downloaded for all firms that are listed, or have been listed, on the stock exchanges in Norway and Sweden. The sample covers a period from 1989 til 2015.

Variable	Datastream code
Price	P
Market value	MV
Turnover	VA
Free float	NOSHFF
Earnings per share	WC05201
Operating income after depreciation	WC01250
Other investments	WC02250
Cash and short term investments	WC02001
Cash	WC02003
Preferred stock	WC03451
Total assets	WC02999
Total liabilities	WC03351
Long term debt	WC03251
Total current liabilities	WC03101
Total current assets	WC02201
Short term debt and current portion of long term debt	WC03051
Net cash flow from financing	WC04890
Net cash flow from investing	WC04870
Net cash flow from operating activities	WC04860
Net income before extra items/preferred divided	WC01551
Net proceeds from sale/issue of common & preferred	WC04251
Net sales or revenue	WC01001
Cash dividends paid total	WC04551
FTSE Industry Classification Benchmark industry code	ICBIC
FTSE Industry Classification Benchmark industry name	ICBIN

A.2 Descriptive Statistics

Descriptive statistics for the initial decomposition of total accruals (TACC) for the Norwegian and Swedish sample. Each sample covers a period from 1989 to 2015.

Panel A: The Norwegian sample consisting of 3,333 firm-year observations.

	Mean	St. Dev.	25 %	Median	75 %
TACC	0.050	0.220	-0.031	0.031	0.111
ΔWC	0.007	0.111	-0.035	0.003	0.042
ΔNCO	0.068	0.255	-0.030	0.029	0.132
ΔFIN	-0.025	0.216	-0.093	-0.003	0.048
ROA	-0.005	0.277	-0.020	0.040	0.090
FROA	-0.002	0.227	-0.023	0.038	0.086
FRET	0.010	0.738	-0.312	-0.057	0.193

Panel B: The Swedish sample consisting of 6,031 firm-year observations.

	Mean	St. Dev.	25 %	Median	75 %
TACC	0.044	0.224	-0.031	0.030	0.103
ΔWC	0.008	0.128	-0.032	0.007	0.049
ΔNCO	0.050	0.216	-0.024	0.017	0.089
ΔFIN	-0.013	0.160	-0.057	0.000	0.037
ROA	-0.031	0.298	-0.068	0.047	0.107
FROA	-0.028	0.290	-0.064	0.047	0.105
FRET	0.009	0.672	-0.307	-0.066	0.203

Datastream codes are in parentheses.

Industry samples are formed on the FTSE Industry Classification Benchmark industry codes (ICBIC).

TACC is total accruals from the balance sheet approach. It is calculated as ΔWC + ΔNCO + ΔFIN. Total accruals and all of its components (described below) are calculated as percentages of average total assets (WC02999), which is the average of total assets at the beginning and end of the fiscal year.

ΔWC is the change in non-cash working capital, defined as $WC_t - WC_{t-1}$. *WC = (Current assets (WC02201) - Cash and Short Term Investments (WC02001)) - (Current Liabilities (WC03101) - Debt in Current Liabilities (WC03051)).*

ΔNCO is the change in non-current operating assets, defined as $NCO_t - NCO_{t-1}$. *NCO = (Total Assets (WC02999) - Current Assets (WC02201) – Other Investments (WC02250)) - (Total Liabilities (WC03351) - Current Liabilities (WC03101) - Long Term Debt (WC03251))*

ΔFIN is the change in financial assets, defined as $FIN_t - FIN_{t-1}$. *FIN = (Short Term Investments (WC02001 - WC02003) + Long Term Investments (WC02250)) - (Long Term Debt (WC03251) + Debt in Current Liabilities (WC03051) + Preferred Stock (WC03451)).*

ROA is operating income after depreciation (WC01250) as a percent of average total assets.

FROA is future operating income after depreciation computed as next year's ROA.

FRET is the annual buy-hold size-adjusted return. The size-adjusted return is computed by taking the raw buy-hold return on a size matched value-weighted portfolio of firms, where size is measured as market value (MV) at the beginning of the return cumulation period. The return cumulation period starts the 1st of August the year after the relevant fiscal year.

A.3 Magnitude of industries

Descriptive statistics over the percentage of firm-year observations in each sector in Norway and Sweden.

Industry	Norway	Sweden
Oil & Gas	23,8 %	2,7 %
Basic Materials	5,5 %	8,4 %
Industrials	33,1 %	35,3 %
Consumer Goods	10,6 %	9,9 %
Health Care	3,5 %	12,6 %
Consumer Services	8,2 %	11,6 %
Telecommunications	0,7 %	1,4 %
Utilities	1,7 %	0,6 %
Technology	13,0 %	17,5 %

A.4 Correlation Matrix

Spearman (above diagonal) and Pearson (below diagonal). P-values are shown in parenthesis below correlations. * Denotes significance at the 5% level.

Panel A: Pooled Sample

	TACC	ΔWC	ΔNCO	ΔFIN	ROA	FROA	FRET
TACC		0.379*	0.511*	0.118*	0.214*	0.108*	0.001
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.973)
ΔWC	0.390*		0.021*	-0.213*	0.163*	0.078*	-0.006
	(0.000)		(0.042)	(0.000)	(0.000)	(0.000)	(0.568)
ΔNCO	0.593*	-0.055*		-0.499*	0.120*	0.043*	-0.024*
	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.020)
ΔFIN	0.218*	-0.135*	-0.508*		0.006	0.032*	0.043*
	(0.000)	(0.000)	(0.000)		(0.540)	(0.002)	(0.000)
ROA	0.101*	0.113*	0.0504*	-0.016		0.786*	0.164*
	(0.000)	(0.000)	(0.000)	(0.130)		(0.000)	(0.000)
FROA	0.0103	-0.006	0.030*	-0.022*	0.702*		0.268*
	(0.317)	(0.572)	(0.004)	(0.037)	(0.000)		(0.000)
FRET	-0.022*	-0.008	-0.036*	0.024*	0.028*	0.096*	
	(0.038)	(0.428)	(0.001)	(0.039)	(0.006)	(0.000)	

Panel B: Norway

	TACC	ΔWC	ΔNCO	ΔFIN	ROA	FROA	FRET
TACC		0.354*	0.515*	0.072*	0.228*	0.120*	0.028
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.111)
ΔWC	0.317*		0.022	-0.182*	0.122*	0.057*	-0.006
	(0.000)		(0.207)	(0.000)	(0.000)	(0.001)	(0.746)
ΔNCO	0.551*	-0.032		-0.583*	0.156*	0.076*	-0.005
	(0.000)	(0.069)		(0.000)	(0.000)	(0.000)	(0.790)
ΔFIN	0.208*	-0.151*	-0.602*		0.010	0.020	0.028
	(0.000)	(0.000)	(0.000)		(0.577)	(0.252)	(0.103)
ROA	0.073*	0.060*	0.063*	-0.037		0.726*	0.123*
	(0.000)	(0.001)	(0.000)	(0.078)		(0.000)	(0.000)
FROA	0.004	-0.023	0.051*	-0.044*	0.650*		0.227*
	(0.835)	(0.184)	(0.004)	(0.011)	(0.000)		(0.000)
FRET	0.002	-0.003	-0.018	0.026	-0.003	0.061*	
	(0.888)	(0.844)	(0.296)	(0.139)	(0.874)	(0.000)	

Panel C: Sweden

	TACC	ΔWC	ΔNCO	ΔFIN	ROA	FROA	FRET
TACC		0.395*	0.508*	0.147*	0.210*	0.105*	-0.015
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.243)
ΔWC	0.410*		0.024	-0.234*	0.181*	0.088*	-0.010
	(0.000)		(0.067)	(0.000)	(0.000)	(0.000)	(0.458)
ΔNCO	0.623*	-0.069*		-0.446*	0.105*	0.030*	-0.025
	(0.000)	(0.000)		(0.000)	(0.000)	(0.021)	(0.052)
ΔFIN	0.228*	-0.131*	-0.426*		0.003	0.036*	0.043*
	(0.000)	(0.000)	(0.000)		(0.829)	(0.005)	(0.001)
ROA	0.115*	0.137*	0.041*	-0.004		0.811*	0.164*
	(0.000)	(0.000)	(0.002)	(0.785)		(0.000)	(0.000)
FROA	0.013	0.001	0.018	-0.007	0.725*		0.266*
	(0.330)	(0.950)	(0.166)	(0.574)	(0.000)		(0.000)
FRET	-0.034*	-0.019	-0.039*	0.020	0.035*	0.094*	
	(0.009)	(0.148)	(0.003)	(0.114)	(0.006)	(0.000)	

We refer to the definitions under A-2.

A.5 F-Test Hypothesis I

Wald tests of simple and composite linear hypotheses about the parameters in the multivariate regression. P-values test if the differences in coefficient-values are different from zero.

Panel A: The pooled sample

	ΔWC = ΔFIN	ΔNCO = ΔFIN	ΔNCO = ΔWC	ΔNCO&ΔFIN=ΔWC
F-value	3.85	1.73	5.33	5.17
p-value	0.060	0.200	0.029	0.032

Panel B: The Swedish sample

	ΔWC = ΔFIN	ΔNCO = ΔFIN	ΔNCO = ΔWC	ΔNCO&ΔFIN=ΔWC
F-value	3.52	0.20	4.32	3.98
p-value	0.072	0.656	0.048	0.057

We refer to the definitions under A-2.

A.6 Industry Specific Regressions

Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year's return on assets (FROA) and this year's return on assets (ROA) and accruals (TACC, ΔWC, ΔNCO, ΔFIN) for the pooled sample across industries based on ICBIC codes. The sample covers a period from 1989 to 2015.

Panel A: FROA = $\rho_0 + \rho_1$ROA + ε

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Health Care	Consumer Services	Telecom-munications	Utilities	Technology
ROA	0.703	0.765	0.694	0.801	0.847	0.809	0.884	0.072	0.666
	(13.03)**	(14.85)**	(15.15)**	(10.95)**	(14.74)**	(16.46)**	(2.88)**	(0.14)	(7.17)***
Intercept	0.004	-0.003	0.006	0.005	-0.030	0.001	-0.011	0.042	-0.007
	(0.79)	(0.63)	(1.26)	(0.74)	(2.92)**	(0.16)	(0.45)	(2.46)*	(0.51)
R^2	0.52	0.58	0.57	0.61	0.67	0.62	0.75	0.86	0.46
N	955	690	3,232	952	874	974	108	90	1,489

Panel B: FROA = $\rho_0 + \rho_1$ROA + ρ_2TACC + ε

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Health Care	Consumer Services	Telecom-munications	Utilities	Technology
ROA	0.704	0.811	0.694	0.825	0.874	0.817	1.202	0.488	0.678
	(12.52)**	(13.43)**	(14.85)**	(11.92)**	(17.00)**	(18.41)**	(3.98)**	(3.21)**	(8.83)***
TACC	-0.004	-0.133	-0.031	-0.074	-0.096	-0.039	-0.641	0.025	-0.173
	(0.17)	(1.75)	(1.21)	(2.61)*	(2.03)	(0.66)	(1.45)	(0.21)	(2.88)***
Intercept	0.004	0.000	0.006	0.006	-0.021	0.003	0.025	0.014	0.001
	(0.68)	(0.03)	(1.45)	(1.00)	(2.51)*	(0.41)	(0.78)	(0.81)	(0.07)
R^2	0.55	0.63	0.58	0.64	0.70	0.65	0.88	0.97	0.52
N	955	690	3,232	952	874	974	108	90	1,489

Panel C: FROA = $\rho_0 + \rho_1 ROA + \rho_3 \Delta WC + \rho_4 \Delta NCO + \rho_5 \Delta FIN + \varepsilon$

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Health Care	Consumer Services	Telecom-munications	Utilities	Technology
ROA	0.692	0.750	0.692	0.802	0.786	0.768	0.780	0.073	0.700
	(10.73)**	(14.09)**	(14.99)**	(10.33)**	(9.34)**	(14.50)**	(3.23)**	(1.00)	(6.39)***
ΔWC	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000
	(0.98)	(2.22)*	(2.87)**	(0.84)	(1.68)	(2.78)**	(1.68)	(1.34)	(2.15)**
ΔNCO	-0.000	0.000	0.000	-0.000	0.000	0.000	-0.000	0.000	0.000
	(1.20)	(1.08)	(2.30)*	(0.28)	(0.30)	(2.01)	(0.58)	(1.49)	(1.01)
ΔFIN	-0.000	0.000	0.000	-0.000	0.000	0.000	-0.000	0.000	0.000
	(1.47)	(0.26)	(2.36)*	(0.60)	(0.91)	(1.83)	(1.00)	(1.44)	(0.03)
Intercept	0.002	-0.010	0.005	0.001	-0.036	-0.001	-0.036	-0.018	-0.012
	(0.32)	(1.64)	(0.94)	(0.19)	(2.93)**	(0.07)	(0.66)	(0.56)	(0.65)
R^2	0.59	0.61	0.57	0.64	0.70	0.65	0.93	1.00	0.53
N	955	690	3,232	952	874	974	108	90	1,489

Panel D: FRET = $\rho_0 + \rho_1 ROA + \varepsilon$

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Health Care	Consumer Services	Telecom-munications	Utilities	Technology
ROA	-0.024	-0.453	0.166	0.353	0.463	0.577	-1.237	0.902	-0.527
	(0.07)	(0.99)	(2.16)*	(1.41)	(1.59)	(3.03)**	(1.18)	(0.38)	(1.46)
Intercept	0.017	0.008	0.006	-0.003	0.019	-0.033	0.165	-0.021	0.158
	(0.22)	(0.19)	(0.32)	(0.12)	(0.42)	(1.68)	(1.17)	(0.18)	(2.22)**
R^2	0.09	0.10	0.02	0.07	0.12	0.07	0.42	0.56	0.08
N	955	690	3,232	952	874	974	108	90	1,489

Panel E: FRET = $\rho_0 + \rho_1$ROA + ρ_2TACC + ε

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Health Care	Consumer Services	Telecom-munications	Utilities	Technology
ROA	0.039	-0.379	0.204	0.395	0.770	0.456	-0.121	0.047	-0.390
	(0.14)	(0.77)	(1.92)	(1.97)	(2.57)*	(2.34)*	(0.09)	(0.03)	(1.04)
TACC	-0.102	0.051	-0.019	-0.112	-0.488	-0.148	0.114	-1.077	-0.088
	(0.52)	(0.20)	(0.13)	(0.64)	(0.99)	(0.60)	(0.08)	(1.40)	(0.37)
Intercept	0.021	0.001	-0.004	-0.005	0.034	-0.018	0.270	0.049	0.143
	(0.27)	(0.04)	(0.22)	(0.20)	(0.82)	(0.82)	(0.90)	(0.42)	(2.11)**
R^2	0.12	0.13	0.04	0.10	0.22	0.12	0.66	0.84	0.13
N	955	690	3,232	952	874	974	108	90	1,489

Panel F: FRET = $\rho_0 + \rho_1$ROA + ρ_3 ΔWC + ρ_4 ΔNCO + ρ_5 ΔFIN + ε

	Oil & Gas	Basic Materials	Industrials	Consumer Goods	Health Care	Consumer Services	Telecom-munications	Utilities	Technology
ROA	0.051	-0.574	0.157	0.264	0.923	0.451	-0.268	0.012	-0.369
	(0.12)	(1.19)	(2.00)	(0.82)	(1.81)	(2.25)*	(0.56)	(1.00)	(1.02)
ΔWC	-0.000	0.000	0.000	0.000	-0.000	-0.000	-0.000	-0.000	0.000
	(0.14)	(1.03)	(0.99)	(2.01)	(1.69)	(0.53)	(1.29)	(1.55)	(1.40)
ΔNCO	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000
	(1.26)	(0.66)	(0.21)	(1.50)	(0.19)	(0.93)	(0.06)	(1.63)	(1.19)
ΔFIN	-0.000	0.000	0.000	0.000	-0.000	0.000	0.000	-0.000	-0.000
	(0.98)	(0.72)	(1.09)	(1.46)	(2.47)*	(1.10)	(1.39)	(1.94)	(0.34)
Intercept	0.072	-0.004	0.008	-0.000	0.040	-0.019	0.230	0.003	0.139
	(0.73)	(0.08)	(0.43)	(0.01)	(0.54)	(0.68)	(1.15)	(0.03)	(1.88)*
R^2	0.24	0.18	0.03	0.15	0.27	0.19	0.80	1.00	0.18
N	955	690	3,232	952	874	974	108	90	1,489

Hypotheses I and II are tested individually for each FTSE Industry Classification Benchmark industry code (ICBIC).

Regression results are computed using the Fama and Macbeth (1973) two-step procedure.

** Denotes significance at the 10% level using a two-tailed t-test. ** Denotes significance at the 5% level using a two-tailed t-test. *** Denotes significance at the 1% level using a two-tailed t-test.*

Otherwise, we refer to the definitions under A-2.

A.7 Tests of Hypothesis I and II Before and After the Transition to IFRS in Norway

Panel A: Before 2005

	FROA	FROA	FROA	FRET	FRET	FRET
ROA	0.549	0.580	0.578	-0.389	-0.416	-0.552
	(9.20)**	(9.08)**	(9.18)***	(1.25)	(1.38)	(1.70)
TACC		-0.043			0.017	
		(1.27)			(0.21)	
ΔWC			-0.112			0.215
			(2.72)**			(1.26)
ΔNCO			-0.020			0.036
			(0.55)			(0.48)
ΔFIN			-0.018			0.293
			(0.40)			(1.83)*
Intercept	0.010	0.011	0.012	0.027	0.028	0.047
	(1.70)	(2.47)*	(2.51)**	(1.26)	(1.36)	(1.96)*
R^2	0.39	0.41	0.42	0.02	0.03	0.06
N	1,586	1,586	1,586	1,586	1,586	1,586

Panel B: After 2005.

	FROA	FROA	FROA	FRET	FRET	FRET
ROA	0.757	0.760	0.759	-0.013	-0.021	-0.006
	(16.90)**	(16.62)**	(16.83)***	(0.19)	(0.31)	(0.09)
TACC		-0.044			0.017	
		(1.78)			(0.19)	
ΔWC			-0.085			0.064
			(1.61)			(0.26)
ΔNCO			-0.015			0.026
			(0.79)			(0.31)
ΔFIN			-0.080			0.130
			(2.11)*			(0.74)
Intercept	-0.002	-0.001	-0.002	0.008	0.007	0.017
	(0.52)	(0.38)	(0.44)	(0.81)	(0.74)	(1.12)
R^2	0.67	0.67	0.68	0.01	0.02	0.05
N	1,747	1,747	1,747	1,747	1,747	1,747

We refer to the definitions under A-2 and A-6.

A.8 Tests of Hypothesis I and II Before and After the Transition to IFRS in Sweden

Panel A: Before 2007

	FROA	FROA	FROA	FRET	FRET	FRET
ROA	0.736	0.749	0.752	0.298	0.333	0.302
	(20.41)**	(18.90)**	(19.00)***	(2.57)*	(2.60)*	(2.33)**
TACC		-0.066			-0.034	
		(2.77)*			(0.23)	
ΔWC			-0.134			-0.115
			(3.01)***			(0.53)
ΔNCO			-0.054			0.006
			(1.94)*			(0.04)
ΔFIN			-0.053			0.141
			(1.89)*			(0.99)
Intercept	0.004	0.007	0.007	-0.005	-0.014	-0.006
	(0.54)	(1.03)	(1.03)	(0.39)	(1.01)	(0.45)
R^2	0.56	0.57	0.59	0.02	0.04	0.06
N	3,017	3,017	3,017	3,017	3,017	3,017

Panel B: After 2007

	FROA	FROA	FROA	FRET	FRET	FRET
ROA	0.698	0.718	0.725	0.042	0.059	0.058
	(14.79)**	(17.48)**	(17.86)***	(0.76)	(1.11)	(1.07)
TACC		-0.133			-0.084	
		(2.41)*			(1.09)	
ΔWC			-0.225			-0.144
			(2.22)*			(1.01)
ΔNCO			-0.067			-0.074
			(1.85)			(0.87)
ΔFIN			-0.094			0.141
			(1.84)			(0.90)
Intercept	-0.016	-0.011	-0.014	0.010	0.015	0.018
	(2.26)	(1.45)	(1.74)	(3.61)**	(2.66)*	(2.94)**
R^2	0.51	0.53	0.56	0.01	0.01	0.02
N	3,014	3,014	3,014	3,014	3,014	3,014

We refer to the definitions under A-2 and A-6.

A.9 Test of Hypothesis II

Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year's size adjusted stock return (FRET) on this year's accounting rate of return (ROA) and accruals (TACC, ΔWC, ΔNCO, ΔFIN) for the pooled (panel A), the Norwegian (panel B), and the Swedish sample (panel C). Each sample covers a period from 1989 to 2015.

$$FRET = \rho_0 + \rho_1 ROA + \rho_2 TACC + \rho_3 \Delta WC + \rho_4 \Delta NCO + \rho_5 \Delta FIN + \varepsilon$$

Panel A: The pooled sample consisting of 9,364 firm-year observations.

	FRET	FRET	FRET
ROA	0.042	0.041	0.031
	(0.73)	(0.74)	(0.55)
TACC		-0.014	
		(0.22)	
ΔWC			-0.031
			(0.28)
ΔNCO			-0.024
			(0.41)
ΔFIN			0.150
			(1.85)
Intercept	0.014	0.013	0.019
	(1.98)	(2.45)*	(3.35)**
Adj R^2	0.01	0.02	0.03

Panel B: The Norwegian sample consisting of 3,333 firm-year observations.

	FRET	FRET	FRET
ROA	-0.235	-0.255	-0.330
	(1.26)	(1.40)	(1.66)
TACC		0.017	
		(0.28)	
ΔWC			0.153
			(1.09)
ΔNCO			0.032
			(0.58)
ΔFIN			0.227
			(1.93)*
Intercept	0.019	0.020	0.035
	(1.45)	(1.53)	(2.25)**
Adj R^2	0.009	0.009	0.021

Panel C: The Swedish sample consisting of 6,031 firm-year observations.

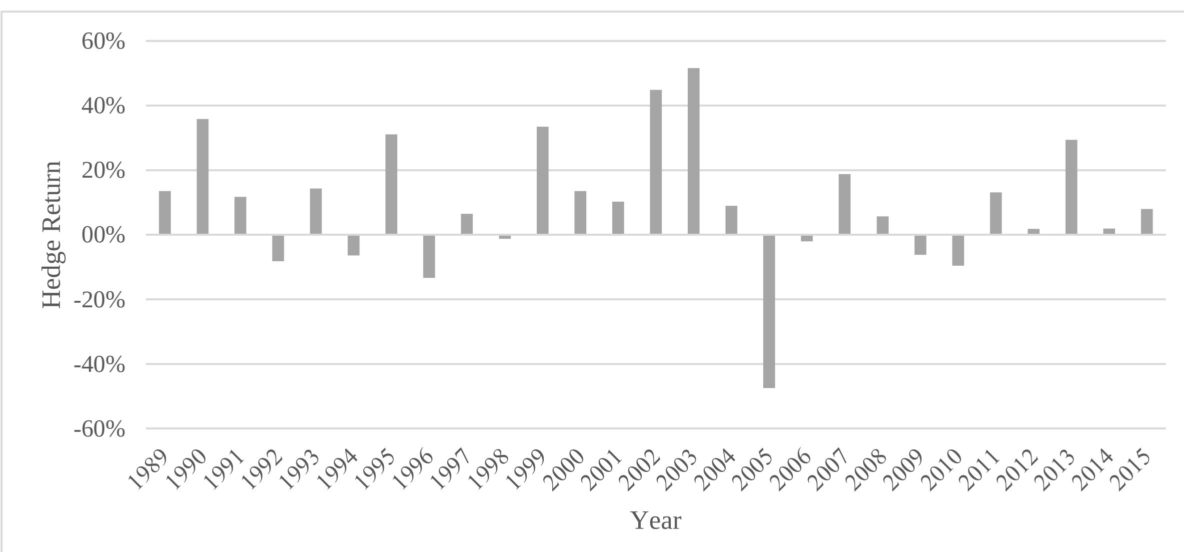
	FRET	FRET	FRET
ROA	0.213 (2.59)*	0.242 (2.69)*	0.220 (2.45)*
TACC		-0.050 (0.51)	
ΔWC			-0.125 (0.82)
ΔNCO			-0.020 (0.18)
ΔFIN			0.140 (1.31)
Intercept	0.000 (0.03)	-0.004 (0.44)	0.002 (0.19)
Adj R^2	0.007	0.017	0.025

We refer to the definitions under A-2 and A-6.

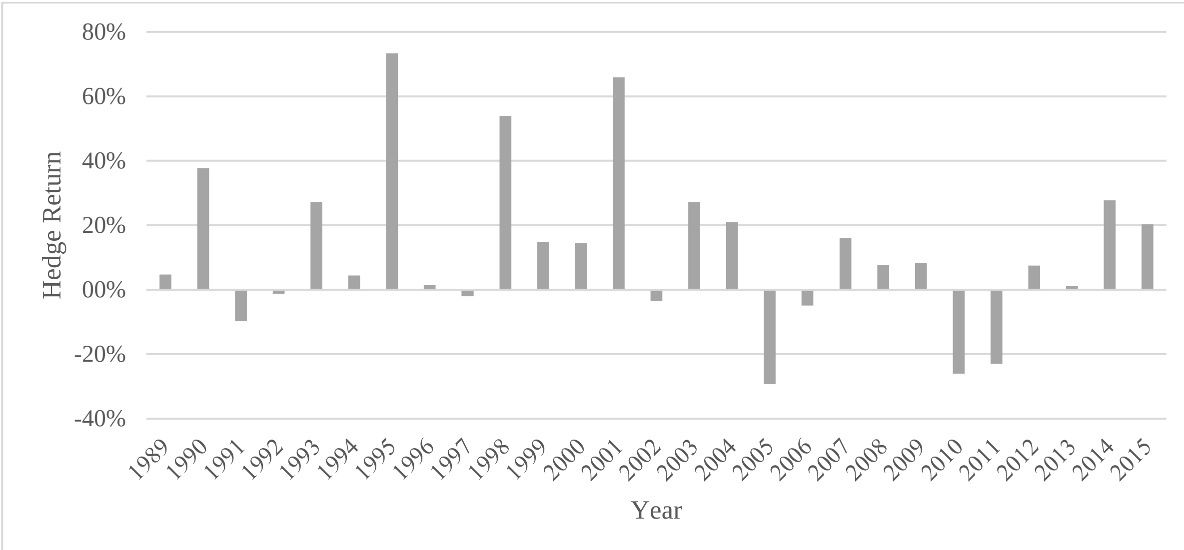
A.10 Hedge Return over Time

Yearly abnormal return generated by a trading strategy taking a long position in the stock of firms with relatively low level of accruals (decile 1) and a short position in the stock of firms with relatively high level of accruals (decile 10).

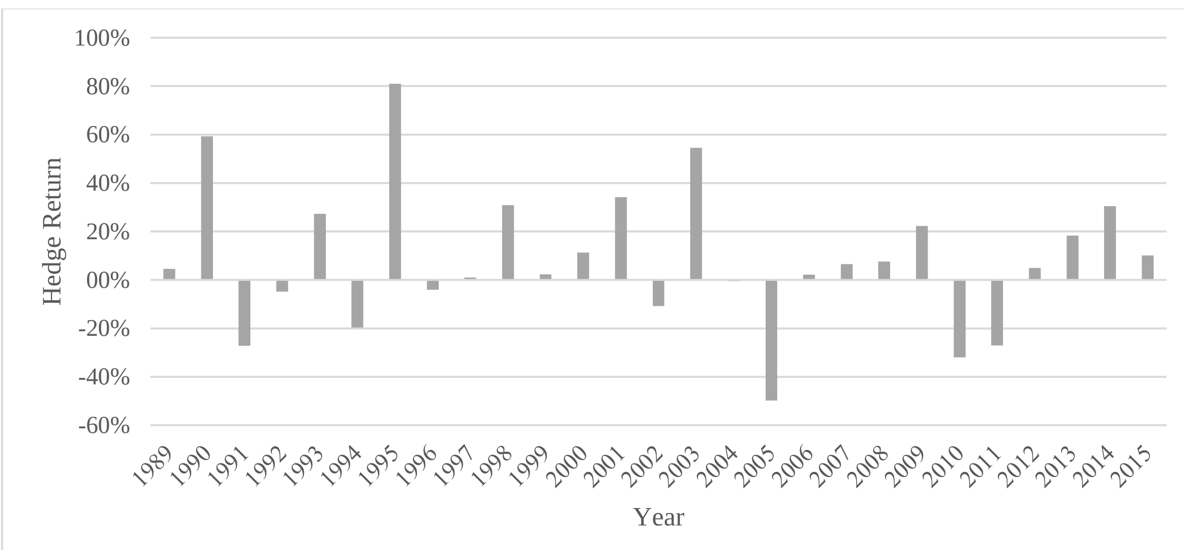
Panel A: Hedge return over time based on all operating accruals (NOA) for the pooled sample, covering a period from 1989 to 2015 and 9,364 firm year observations.



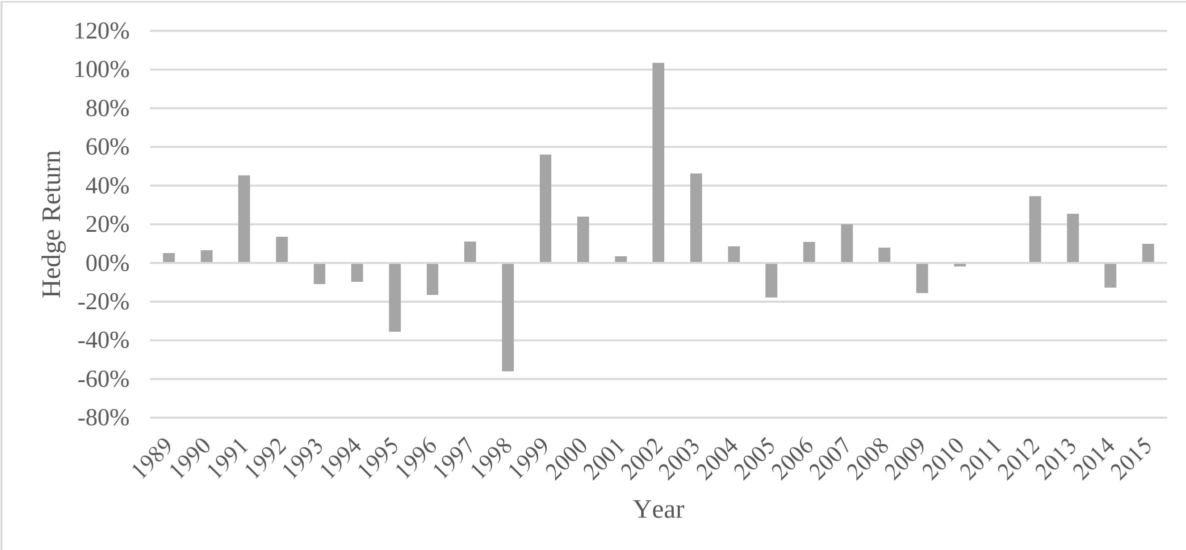
Panel B: Hedge return over time based on non-current operating accruals (ΔNCO) for the Norwegian sample, covering a period from 1989 to 2015 and 3,333 firm year observations.



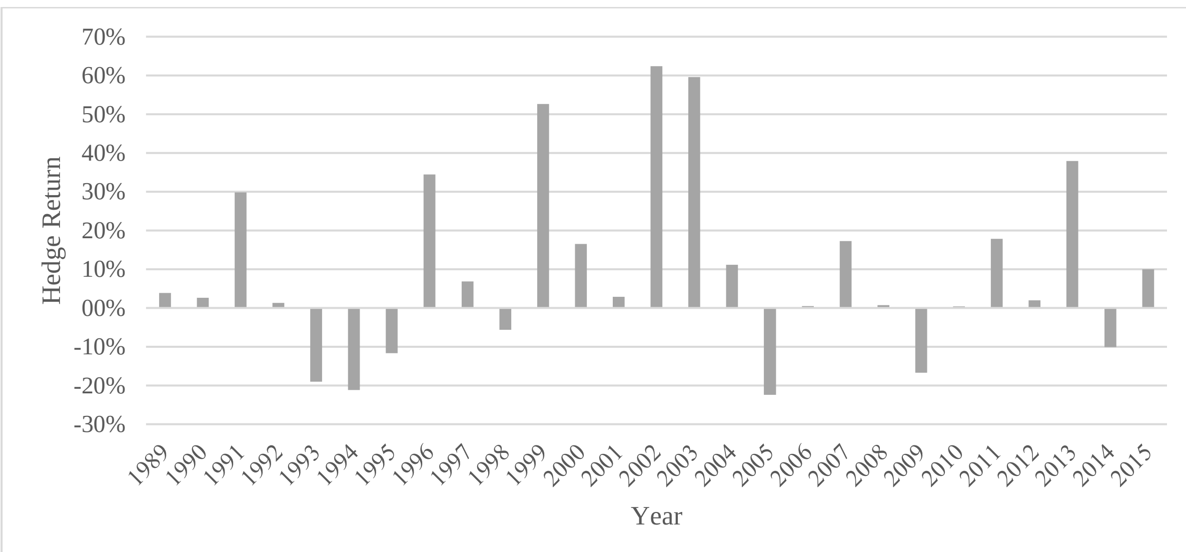
Panel C: Hedge return over time based on total operating accruals (ΔNOA) for the Norwegian sample, covering a period from 1989 to 2015 and 3,333 firm year observations.



Panel D: Hedge return over time based on total accruals (TACC) for the Swedish sample, covering a period from 1989 to 2015 and 6,031 firm year observations.



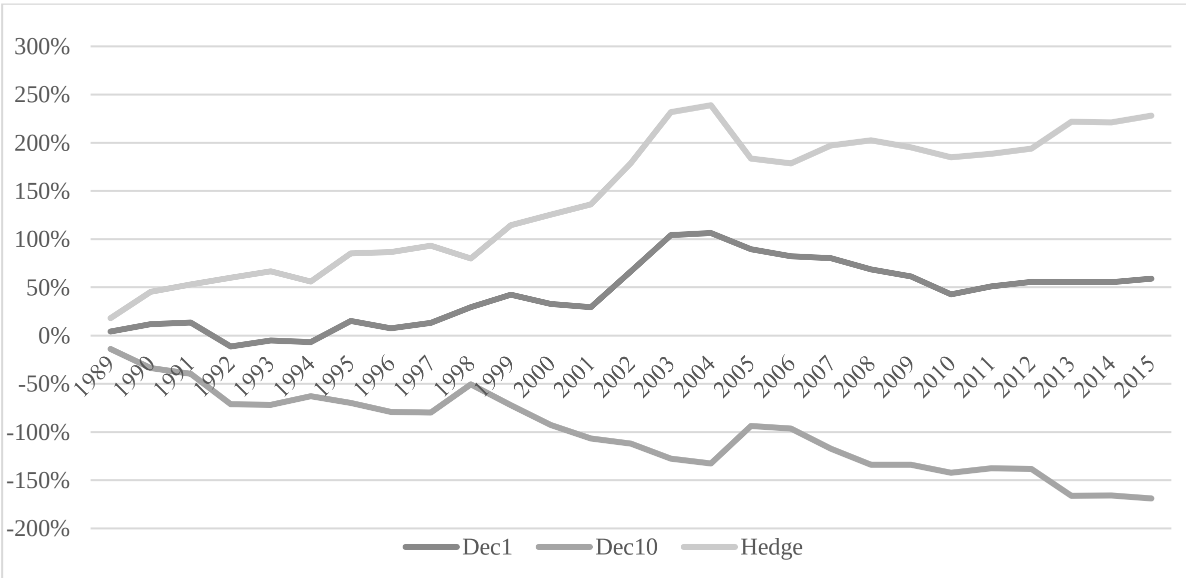
Panel E: Hedge return over time based on total operating accruals (ΔNOA) for the Swedish sample, covering a period from 1989 to 2015 and 6,031 firm year observations.



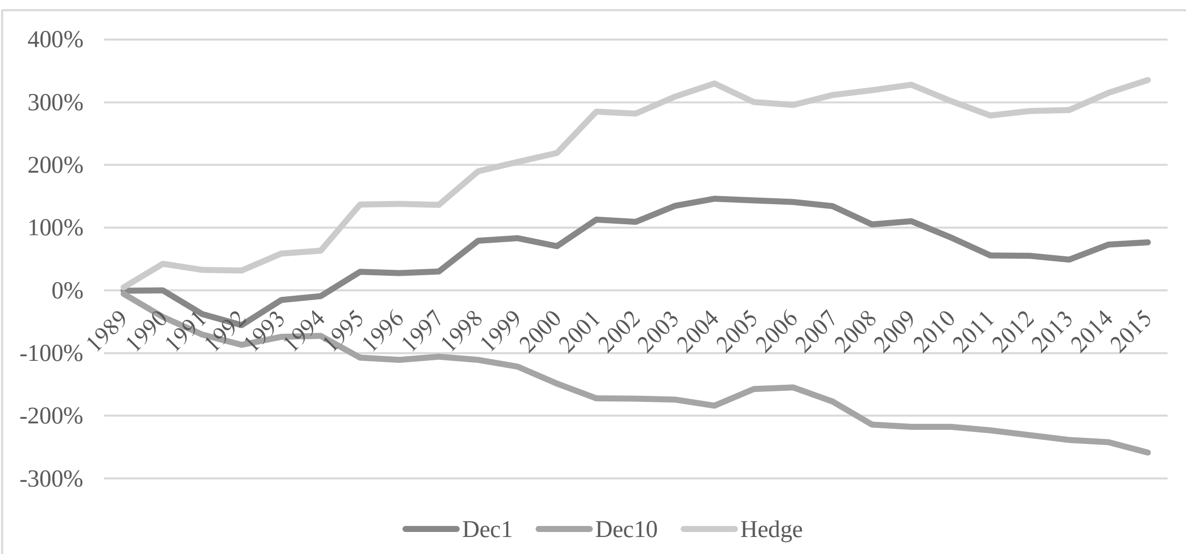
We refer to the definitions under A-2 and A-6.

Figure A-1 Cumulative Return over Time

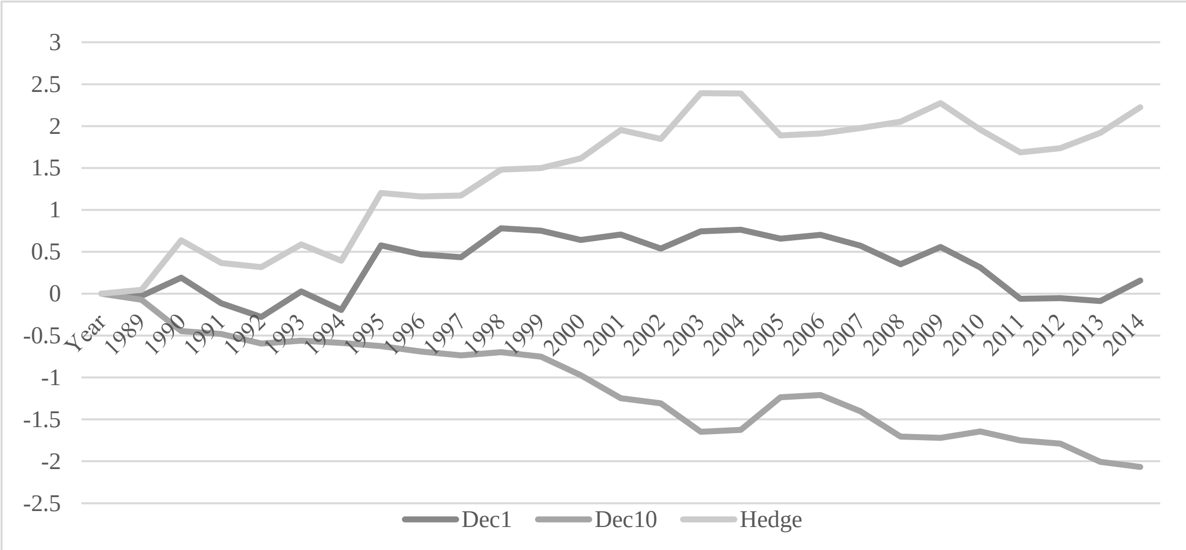
Panel A: Cumulative abnormal return for the trading strategy formed on ΔNOA for the pooled sample, covering 27 years.



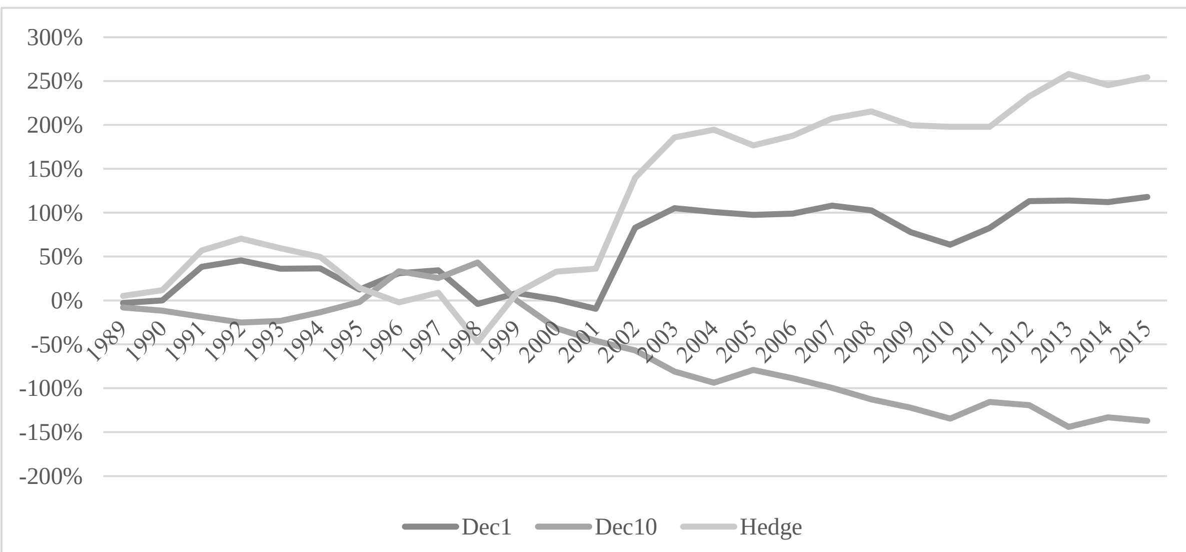
Panel B: Cumulative abnormal return for the trading strategy formed on ΔNCO for the Norwegian sample, covering 27 years.



Panel C: Cumulative abnormal return for the trading strategy formed on ΔNOA for the Norwegian sample, covering 27 years.



Panel D: Cumulative abnormal return for the trading strategy formed on TACC for the Swedish sample, covering 27 years.



We refer to the definitions under A-2.

A.11 Standard Deviations

Standard deviations for the buy-hold size-adjusted returns for each decile portfolio formed on total accruals and its components for the pooled sample, the Norwegian sample and the Swedish sample. Each sample covers a period from 1989 to 2015. Sample sizes are in the last row of the table.

	Pooled sample		*Norway*		*Sweden*	
Portfolio rank	TACC	ΔNOA	ΔNCO	ΔNOA	TACC	ΔNOA
Low	0.157	0.145	0.223	0.241	0.242	0.212
2	0.105	0.130	0.247	0.257	0.113	0.157
3	0.112	0.168	0.209	0.335	0.124	0.124
4	0.110	0.096	0.190	0.133	0.162	0.128
5	0.086	0.073	0.177	0.163	0.095	0.109
6	0.090	0.114	0.198	0.261	0.100	0.095
7	0.084	0.101	0.155	0.215	0.114	0.118
8	0.116	0.137	0.119	0.193	0.125	0.161
9	0.168	0.125	0.204	0.166	0.169	0.173
High	0.149	0.153	0.151	0.152	0.167	0.144
Hedge	0.218	0.207	0.249	0.288	0.309	0.234
N	9.364	9.364	3.333	3.333	6.031	6.031

Standard deviations are based on the mean values of buy-hold size-adjusted returns for each portfolio across the 27 years in the sample.

Otherwise, we refer to the definitions under A-2.

A.12 Cash Flow Method

Results from testing hypothesis I, II (panel A), and III (panel B) using the cash flow method on the pooled sample. The sample consists of 9,634 firm-year observations covering a period from 1989 to 2015.

Panel A: Time-series means and t-statistics for coefficients from annual cross-sectional regressions of next year's earnings (FROA) (left columns) and next year's return (FRET) (right columns).

	FROA	FROA	FRET	FRET
ROA	0.684 (19.45)**	0.713 (23.34)***	0.082 (1.00)	0.048 (0.54)
TACC[a]		-0.096 (2.72)**		0.033 (0.36)
Intercept	0.001 (0.15)	0.003 (0.86)	0.018 (1.98)	0.016 (1.59)
R^2	0.53	0.56	0.01	0.02
N	7,077	7,077	7,077	7,077

Panel B: Next year's annual mean size-adjusted returns for decile portfolios formed on total accruals.

Low	2	3	4	5	6	7	8	9	High	Hedge	*t*-statistic
0.000	0.017	0.007	0.001	0.024	0.019	0.027	0.010	0.092	0.028	-0.028	-0.506

TACC[a] is an alternative measure of accruals computed as the difference between net income before extraordinary items (WC01551) less net operating, investing and financing cash flow (WC04860, WC04870, WC04890), plus net proceeds from sale/issue of common and preferred stock (WC04251) less cash dividends (WC04551).

Portfolio ranks (Low – High) are computed for each year, assigning firm-year observations into decile portfolios based on TACC. Hedge represents the net return generated by taking a long position in the "Low" portfolio and an equal sized short position in the "High" portfolio. T-statistics tests whether the hedge return is statistically different from zero.

Otherwise, we refer to the definitions under A-2.

A.13 Free Float Weights

Results from testing hypothesis II (panel A) and III (panel B) using free float-weighted stock returns for the pooled sample. The sample consists of 9,364 firm-year observations, covering a period from 1989 to 2015.

Panel A: Hypothesis II

	FFRET	FFRET	FFRET
ROA	-0.032	-0.036	-0.046
	(0.42)	(0.50)	(0.68)
TACC		-0.010	
		(0.16)	
ΔWC			-0.034
			(0.34)
ΔNCO			-0.019
			(0.30)
ΔFIN			0.145
			(1.71)*
Intercept	0.082	0.082	0.088
	(1.80)	(1.87)	(2.04)*
R^2	0.01	0.02	0.03

Panel B: Hypothesis III

Portfolio rank	TACC	ΔNOA
Low	0.104	0.096
2	0.048	0.143
3	0.060	0.115
4	0.107	0.047
5	0.095	0.074
6	0.090	0.104
7	0.064	0.088
8	0.079	0.088
9	0.134	0.032
High	0.016	0.010
Hedge	0.088	0.086
t-statistic	1.000	1.071
p-value	0.161	0.145

T-statistics test whether the hedge return is statistically different from zero and the p-values test whether the hedge return is statistically positive.

FFRET is the free float-weighted annual buy-hold size-adjusted return. The size-adjusted returns are computed by taking the raw buy-hold return on a size matched, free float value-weighted portfolio of firms, where size is measured as market capitalizations multiplied by free float at the beginning of the return cumulation period.

Otherwise, we refer to the definitions under A-2 and A-6.

A.14 Decile Rank Regressions

Time series means and t-statistics for coefficients from annual cross-sectional regressions of next year's decile ranking numbers of accounting rate of return ($FROA^{dec}$) (left columns) and next year's buy-hold size-adjusted stock returns (FRET) (right columns) on this year's decile ranking numbers of accounting rate of return (ROA^{dec}) and accruals (AC^{dec}, ΔWC^{dec}, ΔNCO^{dec}, ΔFIN^{dec}). The pooled sample consists of 9,364 firm-year observations, covering a period from 1989 to 2015.

	$FROA^{dec}$	$FROA^{dec}$	$FROA^{dec}$	FRET	FRET	FRET
ROA^{dec}	0.749	0.760	0.762	0.010	0.010	0.010
	(54.70)**	(54.75)**	(58.22)***	(3.24)**	(3.21)**	(2.96)***
AC^{dec}		-0.049			-0.002	
		(5.14)**			(0.53)	
ΔWC^{dec}			-0.045			0.000
			(6.25)***			(0.04)
ΔNCO^{dec}			-0.054			-0.002
			(5.26)***			(0.64)
ΔFIN^{dec}			-0.023			0.008
			(2.32)**			(1.95)*
Intercept	1.374	1.586	1.973	-0.043	-0.034	-0.073
	(18.37)**	(20.81)**	(14.62)***	(2.09)*	(1.52)	(1.43)
R^2	0.57	0.57	0.57	0.01	0.02	0.03

We refer to the definitions under A-2 and A-6.

A.15 Pooled Statistics from Industry Specific Regressions

Panel A: Hypothesis I

$FROA = \rho_0 + \rho_1 ROA + \rho_2 TACC + \rho_3\, \Delta WC + \rho_4\, \Delta NCO + \rho_5\, \Delta FIN + \varepsilon$

	(1)				(2)				(3)			
	Mean	25th	Median	75th	Mean	25th	Median	75th	Mean	25th	Median	75th
ROA	0.729	0.694	0.694	0.004	0.748	0.704	0.704	0.704	0.720	0.692	0.692	0.692
TACC					-0.076	-0.004	-0.004	-0.004				
WC									0.000	0.000	0.000	0.000
NCO									0.000	0.000	0.000	0.000
FIN									0.000	0.000	0.000	0.000
Intercept	-0.001	0.004	0.004	0.004	0.002	0.004	0.004	0.004	-0.005	0.002	0.002	0.002

Panel B: Hypothesis II

$FRET = \rho_0 + \rho_1 ROA + \rho_2 TACC + \rho_3\, \Delta WC + \rho_4\, \Delta NCO + \rho_5\, \Delta FIN + \varepsilon$

	(1)				(2)				(3)			
	Mean	25th	Median	75th	Mean	25th	Median	75th	Mean	25th	Median	75th
ROA	0.071	-0.024	0.166	0.017	0.143	0.039	0.039	0.039	0.115	0.051	0.051	0.051
TACC					-0.109	-0.102	-0.102	-0.102				
WC									0.000	0.000	0.000	0.000
NCO									0.000	0.000	0.000	0.000
FIN									0.000	0.000	0.000	0.000
Intercept	0.029	0.017	0.017	0.017	0.028	0.021	0.021	0.021	0.036	0.072	0.072	0.072

The regressions are tested for each industry. Mean denotes the mean values of the coefficients for the industry regressions.

Otherwise, we refer to the definitions under A-2 and A-6.

A.16 Additional Screenings

Test of hypothesis I, II, and III with additional screenings. The additional screenings consist of eliminating small firms, firm-year observation with stock price less than NOK 1, and firm years with negative book value.

Panel A: Test of hypothesis I and II for the pooled sample with the additional screenings. The sample covers a period from 1989 to 2015 and consists of 7,899 firm-year observations.

	FROA	FROA	FROA	FRET	FRET	FRET
ROA	0.687	0.698	0.698	0.129	0.106	0.110
	(21.00)**	(21.31)**	(21.51)***	(1.58)	(1.23)	(1.34)
TACC		-0.054			0.041	
		(3.50)**			(0.60)	
chWC			-0.066			0.018
			(2.74)**			(0.14)
chNCO			-0.053			0.004
			(2.76)**			(0.06)
chFIN			-0.044			0.180
			(2.13)**			(2.19)**
_cons	0.007	0.010	0.010	0.003	0.002	0.007
	(1.87)	(2.89)**	(3.03)***	(0.37)	(0.29)	(0.92)
R^2	0.50	0.51	0.52	0.01	0.02	0.03

Panel B: Test of hypothesis I and II for the Norwegian sample with the additional screenings. The sample covers a period from 1989-2015 and consists of 2,995 firm years.

	FROA	FROA	FROA	FRET	FRET	FRET
ROA	0.680	0.695	0.695	-0.058	-0.098	-0.144
	(17.71)**	(18.14)**	(18.40)***	(0.40)	(0.70)	(0.90)
TACC		-0.052			0.032	
		(2.91)**			(0.28)	
chWC			-0.074			0.156
			(2.09)**			(0.69)
chNCO			-0.034			0.027
			(1.74)*			(0.23)
chFIN			-0.038			0.166
			(1.71)			(1.43)
_cons	0.006	0.008	0.007	0.021	0.023	0.032
	(1.69)	(2.56)*	(2.46)**	(1.71)	(1.76)	(2.13)**
R^2	0.52	0.53	0.55	0.01	0.03	0.06

Panel C: Test of hypothesis I and II for the Swedish sample with the additional screenings. The sample covers a period from 1989-2015 and consists of 4,904 firm year observations.

	FROA	FROA	FROA	FRET	FRET	FRET
ROA	0.743	0.761	0.762	0.295	0.329	0.309
	(21.32)**	(20.49)**	(20.55)***	(3.46)**	(3.56)**	(3.54)***
TACC		-0.071			-0.035	
		(3.54)**			(0.35)	
chWC			-0.094			-0.096
			(2.61)**			(0.60)
chNCO			-0.075			-0.036
			(3.57)***			(0.34)
chFIN			-0.055			0.124
			(1.91)*			(1.15)
_cons	0.007	0.009	0.010	-0.010	-0.016	-0.011
	(1.44)	(2.08)*	(2.28)**	(1.25)	(1.79)	(1.09)
R^2	0.54	0.55	0.56	0.02	0.03	0.05

Panel D: Hedge return for the pooled sample, the Norwegian sample, and the Swedish sample.

	Pooled sample		Norway		Sweden	
Portfolio rank	TACC	ΔNOA	ΔNCO	ΔNOA	TACC	ΔNOA
Low	-0.005	0.004	0.016	0.017	0.006	0.007
2	-0.024	0.068	0.007	0.047	0.009	0.067
3	-0.002	0.035	0.108	0.068	-0.030	0.023
4	0.027	-0.008	0.053	0.025	0.031	-0.006
5	0.041	0.005	0.027	-0.013	0.048	0.017
6	-0.001	0.034	0.036	0.070	-0.022	-0.016
7	0.029	0.005	0.026	0.042	0.027	0.005
8	0.005	0.038	-0.030	0.016	-0.002	0.014
9	0.042	-0.034	-0.010	-0.032	-0.007	-0.016
High	-0.027	-0.064	-0.056	-0.063	-0.020	-0.056
Hedge	0.022	0.068	0.072	0.080	0.027	0.063
t-statistic	0.670	2.098	1.466	1.391	0.593	1.565
p-value	0.253	0.020	0.075	0.086	0.278	0.062
N	7,899	7,899	2,995	2,995	4,904	4,904

Datastream codes are in parentheses.

Book value is calculated as total assets minus total liabilities. Further, price (P), revenue (WC01001), total assets (WC02999), and total liabilities (WC03351) are converted to Norwegian Kroner using the SEK/NOK and EUR/NOK currency crosses from Bloomberg.

Small companies are defined as observations where both sales are below NOK 35 million and total assets are below NOK 70 million, which is the definition used by the Norwegian Accounting Act (1999, § 1-6).

The additional screenings are based on various papers by authors such as Leippold and Lohre (2012) and Desai, Rajgopal and Venkatachalam (2004).

Otherwise, we refer to the definitions under A-2 and A-6.

A.17 Jensen's Alpha

Next year's annual mean abnormal stock returns, calculated by Jensen's alpha, for decile portfolios formed on total accruals and its components for the pooled (panel A), the Norwegian (panel B), and the Swedish sample (panel C). Each sample covers a period from 1989 to 2015.

	Pooled sample		Norway		Sweden	
Portfolio rank	TACC	ΔNOA	ΔNCO	ΔNOA	TACC	ΔNOA
Low	0.006	0.010	0.019	0.003	0.018	0.015
2	-0.021	0.063	-0.010	0.053	0.023	0.047
3	-0.012	0.030	0.040	0.054	-0.020	0.034
4	0.036	-0.019	0.050	-0.024	0.013	0.007
5	0.024	0.008	0.043	-0.001	0.048	0.016
6	0.015	0.030	0.054	0.068	-0.011	-0.002
7	-0.002	0.008	0.021	0.029	0.005	-0.023
8	-0.002	0.009	-0.066	-0.019	0.009	0.008
9	0.033	-0.050	-0.044	-0.054	-0.013	-0.026
High	-0.078	-0.090	-0.114	-0.106	-0.074	-0.078
Hedge	0.084	0.100	0.133	0.109	0.092	0.093
t-statistic	1.80	2.30	2.39	1.67	1.22	1.81
p-value	0.084	0.030	0.025	0.108	0.235	0.083

The abnormal stock returns are computed as Jensen's alpha, which is the estimated value of α_p from:

$(R_{pt} – R_{ft}) = \alpha_p + \beta_p (R_m - R_{ft}) + \varepsilon_{pt}$,

where R_{pt} is the buy-hold return for portfolio p in year t, and $(R_{pt} - R_{ft})$ is the portfolio return in excess of the risk free rate (R_f). The risk-free rate is calculated by weighting the risk-free rate in each country by the number of firms in each country each year. The risk-free rates in each country are computed as the interbank rates (NIBOR and STIBOR) less 0.25%. Beta (β_p) is the systematic risk attributable to portfolio p.

Otherwise, we refer to the definitions under A-2 and.

A.18 Portfolios Formed Using Quartile Ranking

Panel A: Pooled sample

Portfolio rank	TACC	ΔWC	ΔNCO	ΔFIN	ΔNOA
Low	0.005	0.019	0.011	-0.033	0.050
2	0.026	0.006	0.058	0.022	0.006
3	0.017	0.008	0.023	0.031	0.031
High	0.017	0.032	-0.027	0.047	-0.023
Hedge	-0.012	-0.014	0.038	-0.079	0.073
t-statistic	-0.404	-0.428	1.545	-2.927	2.774
p-value	0.656	0.665	0.065	0.998	0.004
Std dev	0.149	0.145	0.120	0.142	0.123

Panel B: Norway

Portfolio rank	TACC	ΔWC	ΔNCO	ΔFIN	ΔNOA
Low	-0.007	0.026	0.013	-0.016	0.027
2	0.024	0.008	0.067	0.021	0.028
3	0.021	-0.027	0.057	0.034	0.078
High	0.050	0.084	-0.052	0.051	-0.047
Hedge	-0.056	-0.058	0.065	-0.067	0.075
t-statistic	-1.227	-1.118	1.705	-1.832	1.790
p-value	0.887	0.866	0.047	0.964	0.040
Std. dev	0.236	0.265	0.218	0.189	0.216

Panel C: Sweden

Portfolio rank	TACC	ΔWC	ΔNCO	ΔFIN	ΔNOA
Low	0.022	0.039	0.021	-0.041	0.057
2	0.025	0.000	0.039	0.028	0.009
3	0.004	0.024	-0.001	0.036	0.000
High	-0.001	-0.014	-0.010	0.028	-0.019
Hedge	0.023	0.053	0.031	-0.069	0.076
t-statistic	0.650	1.813	0.997	-2.548	2.189
p-value	0.259	0.038	0.162	0.993	0.017
Std. dev	0.213	0.141	0.160	0.122	0.179

Firm-year observations are, for each year, assigned into quartile portfolios based on TACC, ΔWC, ΔNCO, ΔFIN or ΔNOA.

Otherwise, we refer to the definitions under A-2.