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Non-cash investing: The accruals anomaly in the Norwegian market

An empirical analysis of the relation between non-cash earnings and return for the Norwegian stock market

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Abstract

Current investment strategies are highly reliant on cash flows and macro-factors, while non-cash earnings are, to some extent, ignored. We examine the relation between non-cash-based accruals and stock market return for the Norwegian market and evaluate the correlation between the two in light of established research on the subject. We find a strong correlation between accruals and future market returns for the Norwegian market. Moreover, we find results that are aligned with both efficient and inefficient market explanations for the accruals anomaly. Furthermore, we review the composition of the Norwegian stock market. Here, we find distinct characteristics such as few companies, skewness in company size and significant reliance on the oil sector. Based on these distinct characteristics, our findings might not be applicable to other markets.

1. Introduction

Stock market predictions are one of the most discussed and dividing subjects among financial institutions and researchers globally. There has been substantial research on stock price prediction, but there are still no compelling answers besides a few recognized theories, such as momentum effects and mean-reversion. The price anomalies and arbitrage opportunities that are found in markets are quickly exploited and not considered long-term prediction tools. Further, there has been a desire to utilize accounting information to forecast future market returns. However, there have been no major breakthroughs in current earnings as a predictor for future market returns.

On the other hand, Sloan (1996) found predictive ability when decomposing earnings into cash flows and non-cash earnings, namely accruals. Accruals consist of several different components. It includes non-cash assets, liabilities, revenues, expenses, gains, and losses. Therefore, accruals describe operations, transactions, events, and circumstances that affect cash receipts and outlays (SFAC no. 6, 2008). This definition from the financial accounting standard board shows the complexity and broad range of transactional and operational factors included in accruals. The complexity of accruals might be why investors are more reliant on earnings as a whole. Sloan (1996) suggests an earnings fixation hypothesis about investors being fixated on earnings and ignoring its composition of accruals and cash flow. Thus, he argues that accruals modeling can be used as an investment strategy.

The finding by Sloan has led to further research about the accruals anomaly and why it occurs. Hirshleifer et al. (2009) aggregated accruals for the whole market and tested whether this could predict future market returns. Interestingly, he found that aggregate accruals positively predict future market returns, which is the opposite of what Sloan (1996) found at a firm-level basis. Accordingly, aggregate accruals can predict future market returns one year ahead. Thus, the accruals anomaly on an aggregate level is that accruals positively predict future market returns, which can be used as an investment strategy for market-portfolio-based investors.

This paper aims to investigate the relationship between non-cash earnings and returns for the Norwegian stock market, and whether the accruals anomaly is present in the Norwegian stock market. We evaluate the objective following the approach of Hirshleifer et al. (2009), which investigate aggregated accounting effects on aggregated market returns. Thereby, we decompose earnings into a cash flow and an accruals component to study the Norwegian market between 1995 and 2020.

To study the relation between accruals and returns, we regress Norwegian accounting data on Norwegian market returns. In addition, we also regress US accounting data on US returns to control our approach, in alignment with Hirshleifer (2009). Also, we investigate if there is a transatlantic relation between US accounting data and Norwegian market returns. Thereby, we have three different approaches to examine in our empirical analysis.

Our empirical analysis consists of 3 main parts: review of our results, our findings in light of previous accruals anomaly explanations, and the validity of our analysis. When reviewing our results, we look into whether the earnings fixation hypothesis found by Sloan (1996) also holds for the Norwegian market. Therefore, we assert earnings effect on future returns and, thereafter, the effect of cash flow and accruals to examine their predictive ability.

When investigating accruals anomaly explanations, we evaluate whether efficient market and inefficient market explanations can justify our results. In light of efficient market theory, we review accruals and possible correlations with shifts in discount rates or expected future earnings. For inefficient market theories, we examine accruals' correlation with market-wide undervaluation and managemental earnings manipulation.

When evaluating the validity of our analysis, we address potential limitations and shortcomings of our analysis. When evaluating potential threats to internal validity, we review the risk of a small sample bias and measurement error risk related to accounting regulation change. Further, we discuss the limitations of the Norwegian stock market compared to the US market, and how this might affect the applicability of our findings in other markets. Specifically, we address the oil dependency and low concentration of listed firms in the Norwegian stock market, which might impose a threat to external validity.

Our thesis is structured in the following way: First, we review existing literature on accruals' predictive ability on market returns. Thereafter, we present our data sample of the Norwegian market, the US market, and macroeconomic variables used in the regression as controls. The next section gives an overview of our variable construction approaches. Then, we present the summary statistics and correlation matrix of our samples before presenting the methodology used in the empirical analysis. Next, we present our results together with the analysis as described above. Finally, we summarize our findings and conclude the thesis.

2. Theory and literature review

In this section, we provide an overview of literature related to the relation between earnings and stock returns, and the accrual variables' predictive power. Academic work on the relation between earnings and predictability of the stock market might have counterintuitive effects and explanations. Therefore, it will be essential to have an overview of the subject to understand our findings. In this literature review, we will try to address and highlight papers that offer different angles to our master thesis. In particular, we will first look at the relationship between earning components and stock prices at a firm-level, before addressing research on the link between aggregate earning components and their predictive power on market returns. Finally, we will examine the different approaches to measure accruals in research.

2.1 Earnings and stock return

Ball & Brown (1968) find that announcements of unexpectedly high earnings cause returns through stock price increases on a firm-level basis. Also, several studies have examined the effects of how predictable the relationship between earnings and market returns are for the aggregated market (S., Lewellen, & Warner, 2006); (Gallo, Hann, & Li, 2016). They find that there is no relation between aggregate earnings and future market returns. In addition, they find that aggregate earnings offer little new information to a well-diversified investor. Hence, aggregated earnings as an accounting measure do not seem to be a good predictor of future market returns.

Therefore, several studies have assessed earnings on a more granular level to find a component of it with predictive power. For firm-level, Sloan (1996) decomposed earnings with its low predictive power into accruals and cash flow. The accruals component consists of revenues where the cash has not yet been received and costs that have not yet been paid (Kingsman, 2004). Cash flow, on the other hand, is the cash part of the earnings and consists of cash-based transactions. Sloan (1996) finds that relatively high levels of accruals result in negative future abnormal market returns in the time period 1962 to 1991. Hence, a higher level of accruals will lead to lower annual stock market returns on a firm-level, and a trading strategy could be to go long in low-accruals firms and short high-level accruals firms.

2.2 The accruals anomaly

Sloan (1996) introduces an explanation for this anomaly where a higher level of accruals, which is an earnings component, results in lower abnormal returns. The earnings fixation hypothesis is that the anomaly in the accrual component comes from investors fixated on the reported earnings and fail to appreciate the lower persistence of accruals (Sloan, 1996); (Shi & Zhang, 2012). Hence, investors look at the earnings announcements and appreciate the cash-based earnings received in this period but fail to focus on cash inflows that come later, for instance, from accounts receivable.

Other explanations have also been developed to explain the relationship between high accruals and lower stock returns. Richardson et al. (2005) argue that measurement errors result in a lasting difference between cash flows and accruals. The accruals variable is therefore mispriced, and they find in a related paper that extreme values of accruals are often linked with earnings manipulation (Richardson, Sloan, Soliman, & Tuna, 2006).

Lev & Nissim (2004) investigated the persistence of the accruals anomaly in order to find out if the suggested market strategy has been exploited as an arbitrage by investors. They find that the accruals anomaly still persists, that the magnitude has not declined over time, and that institutional investors have exploited this strategy. Even though some large investors have detected and exploited this arbitrage opportunity, the persistence of the anomaly indicates that it is not exploited to its full extent. A possible explanation for why too few investors exploit the anomaly is, according to Lev & Nissim (2004) because high-level accrual firms often have low profitability and are of small size, which is associated with higher risk. Hence, they believe that the accruals anomaly persists and will endure. Thus, accounting information can help predict future market returns but will not be exploited.

To the extent that the accruals anomaly is persistent, LaFond (2005) investigates whether accruals anomaly is a global phenomenon. He finds that accrual anomaly is present in international equity markets, but the factors that drive the anomaly appear to vary significantly across different markets. The first factor is managerial discretion on accounting data, where managers tend to smoothen income, which leads to accrual mispricing. Second, analysts fail to understand the information conveyed by accruals, leading to mispricing. Third, the degree of institutional ownership, which leads to less mispricing of accruals. Thus, the accruals anomaly found by Sloan (1996) is present in international equity markets and not just in the

US. As a result, investigating other markets to see if the trading strategy based on accounting information could be exploited would be interesting.

2.3 Aggregated accruals

Further studies have examined the accrual anomaly on an aggregated level. An advantage of aggregation is that information and arbitrage costs are less significant on an aggregated level (Hirshleifer, Hou, & Toeh, 2009). In addition, aggregate market returns have a higher effect on future market profitability compared to when we look at stock returns at firm-level (Sadka & Sadka, 2009). Hirshleifer et al. (2009) and Heater et al. (2021) find that, on an aggregated level, accruals can predict future stock market returns in a positive manner. Hence, the papers find that higher levels of aggregated accruals will lead to higher market returns.

This finding is puzzling as the negative relation between accruals and returns on a firm-level basis becomes a positive relation when aggregating to a total stock market. Hirshleifer et al. (2009) explain this effect by high aggregate level of accruals and low aggregate level of cash flows being linked with higher levels of risk, which they believe imply higher expected stock returns. Further, they find that accruals' predictability is positive and more significant in some industries, like technologies, while accruals are negative and a weaker predictor in other industries, like oil and gas.

However, some effects are not mitigated after aggregation. First, Nelson & Kim (1993) find that aggregation does not improve the small sample bias risk, as the length of the time frame of observations determines this bias. Moreover, Baker & Wurgler (2000) finds that firm-level effects are not completely mitigated by aggregation.

2.4 Efficient versus inefficient markets

Hirshleifer's study led to numerous research papers on why accruals positively predict future market returns. Kang et al. (2010) examine if the accruals anomaly is driven by discretionary accruals and not normal accruals. Discretionary accruals are calculated as the change in revenues in year t and gross investments in year t (Kang, Liu, & Qi, 2010). They argue that discretionary accruals characterize managerial earnings decisions, while normal accruals reflect actual performance. The predictive power of accruals on aggregate market returns in year t+1 is higher with discretionary accruals. This indicates that managers are timing aggregate stock markets and overall business conditions when reporting their earnings as they "lean against the wind". Managers manipulate their accruals and, thereby, their earnings levels in response to undervaluation in the markets. Investors do not recognize this, which can explain the positive relation between aggregate accruals and future stock market returns. Kang et al. (2010) argue that investors failing to rationally price the market given the information is an indication of the market being inefficient. In addition, Jung & Shiller (2006) found evidence that markets might be efficient at a firm-level, but aggregation to a market level causes inefficiency. They argue that the reason for this inefficiency is due to arbitrage opportunities when using well-diversified portfolios.

Market efficiency is a fiercely debated subject in financial academia and is therefore by some viewed as a controversial topic. However, most of the studies we have found regarding the accrual anomaly are using market efficiency theory to explain the relation between market returns and aggregated accruals. Therefore, we need to include this topic in our thesis despite its controversy. The market efficient accruals anomaly explanation is based on accruals being correlated with determinants of market conditions, which rational investors should recognize and thereby increase stock prices. It builds on the theories from Campbell (1991) and Campbell & Shiller (1998), that changes in stock price are a result of changes in discount rates, expected future earnings, or both simultaneously. Hirshleifer et al. (2009) theorize that shifts in aggregate accruals are correlated with shifts in market discount rates, which their control variables do not account for. Hence, a higher level of accruals is linked to lower discount rates, which results in higher market returns.

Gou & Jiang (2011) examines the relationship between aggregate accruals and determinants of the conditional equity premium. The conditional equity premium is the premium of investing in stocks over risk-free rates, meaning the excess return. Gou & Jiang (2011) argue that aggregate accruals are a proxy for the conditional equity premium and is why aggregate accruals can forecast market returns. The paper also states that aggregate accruals can be a leading indicator for firm growth, as accruals and earnings contain information about the conditional equity premium. They find that aggregate accruals are closely linked to other measures of the conditional equity premium, such as earnings-to-price, dividend yield, book-to-market, default premium, and the term premium.

However, the aggregate accrual variable is still significant after controlling for these variables, and Gou & Jiang (2011) argue that these are poor proxies for the conditional equity premium.

They introduce variables for the conditional equity premium as CAPM-based idiosyncratic shocks across the 500 largest US firms, and the sum of squared daily excess market returns. By regressing these variables on future market returns, they give similar predictive power as aggregate accruals, indicating a close correlation between aggregate accruals and the conditional equity premium variables introduced. Hence, aggregate accruals forecast market returns due to correlation with components of the conditional equity premium.

At a firm-level, the accruals variable is decomposed into a part that correlates with determinants of the conditional equity premium and a residual part. The component correlated with the conditional equity premium is positively related to stock returns, while the residual part, which is not correlated with the equity premium, is negatively related to stock returns, as in Sloan (1996). Of the two components, the one correlated with the conditional equity premium, is the one that is not diversified away when aggregated. This indicates that aggregate accruals are a positive predictor due to the conditional equity premium and conveys information about expected future market returns, given that the market is efficient.

2.5 Accruals construction approaches

As the literature review shows, there are several different approaches to study accruals and market returns. Researchers also vary in the methodical approach of constructing the accruals variable. For instance, Hirshleifer et al. (2009), Kang et al. (2010), and Gou & Jiang (2011) uses the balance-sheet approach, while Heater et al. (2021) also introduce a cash flow-based approach. Therefore, decisions around accruals variable construction could be an important part of a research approach.

According to Richardson et al. (2005), accruals can be decomposed into three main categories: working capital accruals, noncurrent operating accruals, and financial accruals. Further, accruals can be calculated using the balance sheet method or the cash flow statement. Measuring by the cash flow statement is to take earnings and extract it by cash flows from operations before extraordinary items. This method might, in some cases, omit certain accrual components, and includes write-downs and depreciations that are not related to the operating accrual (Larson, Sloan, & Giedt, 2018). They also find evidence that the balance sheet approach on accruals contains important information about firm-specific economic activities and is therefore preferable as the method for calculating accruals. On the other side, Hribar & Collins (2002) finds potential measurement errors in the balance sheet method. For example, changes in assets and liabilities due to non-operating events in a company will show up on the balance sheet but not in the income statement. Hence, a portion of the changes in balance sheet working capital relates to the non-operating events, and they would wrongly be shown as accruals under the balance sheet approach. Thus, both methods have flaws to consider from a research perspective.

3. Data

In this section, we describe the sample selection for our dataset and evaluations around our selection of variables.

We collect annual US accounting data from the Compustat database for the period 1980 to 2021. This period is selected because macroeconomic data are limited outside this time frame. For Norwegian accounting data, we obtain annual accounting data for the period 1989 to 2021 from Compustat Global, which is the whole period with available data for Norwegian companies. Norwegian accounting data is in different currencies, so we obtain historical currency data from Norges Bank to align all Norwegian accounting data into NOK.

The US stock return data is retrieved from the Center for Research in Security Prices (CRSP) in the same period as the accounting data. The CRSP index is a value-weighted market index, weighted by companies' market capitalization at the end of the previous period, with all issued securities on the NYSE, the NASDAQ Stock Market, and the Arca Exchange. For Norwegian stock return data, we retrieved the Oslo Stock Exchange All Stocks Index (OSEAX) from Bloomberg. The index is value-weighted using market capitalization, following Hirshleifer et al. (2009). Annual return calculations are defined, for period t, as from May of the given year to April of year t+1. The returns are shifted to one year ahead for regression purposes as we want to determine if year t accounting data can explain returns in year t+1.

For Norwegian returns, we have singled out OSEAX as the most relevant stock index for several reasons. First, OSEAX includes all Norwegian stock exchange shares, whereas the commonly used OSEBX only includes around 70 stocks. OSEAX is therefore mostly equal to the US all share CRSP index that previous research on accruals uses, since both indices include all public companies in their respective markets. Hence, OSEAX will give us the most comparable results. Secondly, including more firm returns will decrease fluctuations due to single companies. Lastly, using all firms ensures that we regress accruals of the same firms we measure the returns of one year ahead.

Fama (1991) discusses that markets may have semi-strong efficiency, where market prices reflect all publicly available information. According to Norwegian ESMA (2022) compliance, all annual reports for listed companies have to be published before the end of April. For US data, we filter for companies with fiscal year end in December, which also will publish their annual report before end of April (Hirshleifer, Hou, & Toeh, 2009). As a result, we time all return and macroeconomic data to the beginning of May, when all annual reports have been published.

Due to OSEAX data starting in 1996 and being regressed on accounting data from the year before, our Norwegian company data is limited to the time frame of 1995-2020 and return from 1996 to 2021. Our US data is from 1980 to 2020 and return from 1981 to 2021. After restricting our sample and omitting NA observations, our sample of US data is left with 161 454 firm-level observations. The Norwegian data sample, after restricting the sample and omitting NA observations, is at 4039 firm-level observations. As seen in the Figure 1, when omitting missing data, there is a significant difference in the number of annual companies used in the analysis for our Norwegian and US company data. Therefore, each company might have more impact on the aggregated level for Norwegian firms than for US firms.

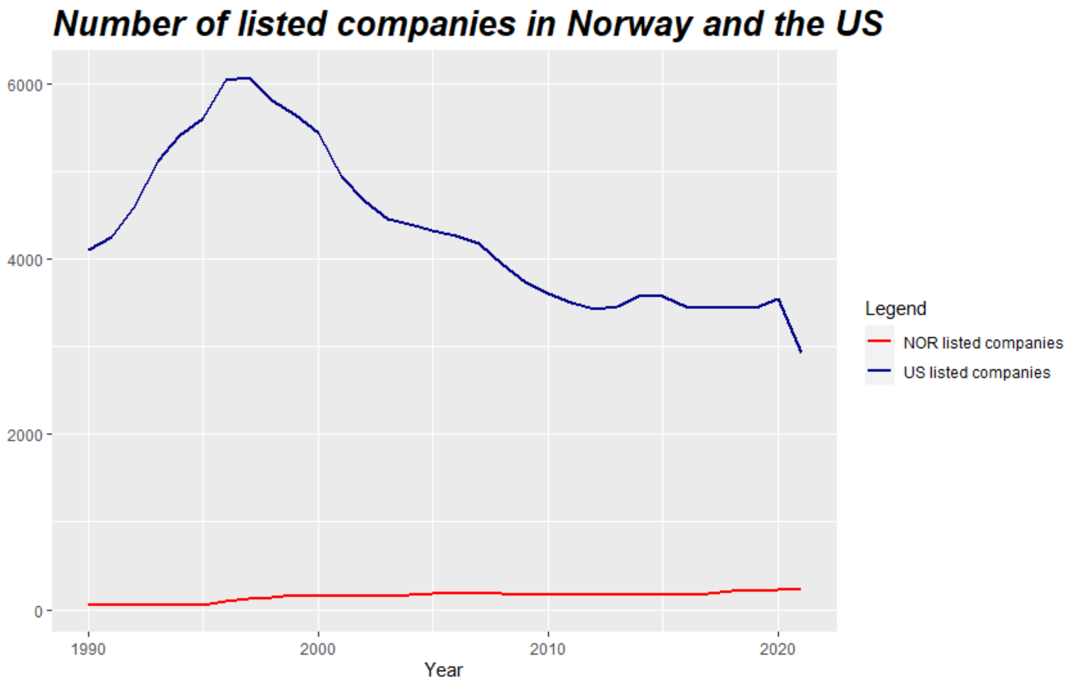

Figure 1: Number of listed companies included in our samples annually.

3.1 Macroeconomic control variables

Macroeconomic data is included for control variable purposes. The variables can show shifts in business cycles over the sample period and could therefore serve as proxies for discount rates in the market. Specifically, we obtain DYIELD, which is the value-weighted dividend yield for US companies, in the Center for Research in Security Prices (CRSP) database. From the Federal Reserve Bank of St. Louis (FRED) we obtain default spread (DEF), which is the difference between Moody's BAA bond yield and AAA bond yield, and term spread (TERM), which is constructed as the difference between 10- and 1-year treasury maturity rates. TBILL is the 30-day US treasury bill yield, retrieved from CRSP. These interest rate data are measured at the end of April in year t to the beginning of May in year t+1.

The variables are used as control variables on both Norwegian and US data to serve as proxies for market conditions. The reason is that we believe macroeconomic data is more universal, and since Norwegian macroeconomic data is limited and illiquid. Hence, we avoid Norwegian macroeconomic data since it lacks predictive power on aggregated stock returns (Evjen, Grønvold, & Gundersen, 2017). Fama & French (1989) found that the aggregate default spread, dividend yield, and long-term yield spread have stock return predictability for a market as a whole. Therefore, these variables can be viewed as useful control variables when controlling for macroeconomic trends.

New equity issued relative to total new debt and equity issued (ESHARE) is another variable used as control. Our methodology for ESHARE follows Baker and Wurgler (2000). Debt issues are US Corporate bond issues less bonds sold outside the US, and new equity issues only consist of public offerings. Both are retrieved from the *Federal Reserve Bulletin.* ESHARE from the US is also applied to Norwegian data, as the timeframe for Norwegian equity issues is severely limited.

Bremnes et al. (2000) found clear linkages of US treasury long-term bond yields on Norwegian long-term bond yields, and the effect not going the other way around. This could implicate a one-way effect between the US economy's macroeconomic well-being and Norwegian market conditions. Hence, it could indicate that the American macroeconomic variables used in the regression with US data also can be used on Norwegian stock return, which is included in our model.

In addition, we retrieve the Europe Brent Spot price FOB from EIA (US Energy Information administration) to serve as a control variable (EU Brent oil) for the Norwegian data. This variable is measured in USD and calculated from the beginning of May in year t to align its timing with our other macroeconomic variables.

We include the variable as we believe the Norwegian stock returns (OSEAX) can be partly determined by the oil price because of the industry distribution at the Oslo Stock Exchange. Firstly, this is because we see that the distribution of oil-related companies on the Oslo Stock Exchange is approximately 15 percent of our sample. This effect is even more prominent on a value-weighted basis with for example Equinor, which is the undisputed largest public Norwegian company. Second, St. Louis FRED (2015) finds a clear relationship between the Norwegian stock market and the oil price, which indicates that it should be used as a control in the regression on Norwegian returns. On the other hand, Johansen (2020) finds a less significant relationship between Norwegian stocks and the oil price. However, he also concludes that the oil sector stocks depend on the Brent Spot price, affecting the market as a whole. Third, Filis (2013) also finds a correlation between the stock market and the oil price. Hence, we conclude that adding the Brent Spot oil price (EU Brent oil) to the regression for Norwegian return data could avoid omitted variable bias for our regressions.

3.2 Variable selection and construction

In this section, we describe the construction of the variables used in our analysis. First, we construct market capitalization, which is used to value-weight other variables. We find the firm-specific annual market capitalization (MVE_{it}) in the US sample by multiplying closing stock price at fiscal year end ($PRCC\_F_{it}$) by common shares outstanding ($CSHO_{it}$). Both are retrieved from the Compustat database. For the Norwegian sample, we find the firm-specific annual market capitalization (MVE_{it}) by multipliying the closing stock price at the last day in the year ($PRCC\_D_{it}$) from the CRSP database with common shares outstanding issued ($CSHOi$), retrieved from the Compustat Global database for companies outside the US. Thereafter, we sum the total market capitalization of each year (MVE_TOT_t). Finally, we divide the market capitalization for firm i on the total market capitalization for each year t.

The then calculated number is the firms' value weight in our models for the specific year (VW_MVE_{it}).

$$VW\_MVE_{it} = \frac{MVE_{it}}{MVE\_TOT_t}$$

For the firm specific earnings, we use operating income after depreciation for each year ($OIADP_{it}$), for both Norwegian and US data. The reason for choosing this specific variable is because it excludes extraordinary items and non-operating income that are non-recurring and will not show a normalization of the earnings variable. The variable is scaled by the firm-specific total assets from the beginning of year (AT_{it-1}) retrieved from Compustat. As the empirical analysis uses cross-sectional comparisons of the relative degree of accruals and cash flows, we scale by lagged total assets to make it possible to facilitate such comparisons (Sloan, 1996). Thereafter the firm specific annual earnings are multiplied with the corresponding firm's annual value weight (VW_MVE_{it-1}). Finally, we construct our aggregated earnings ($EARNINGS_t$) by summarizing the value-weighted and scaled firm earnings for each year. We thereby value-weight following Hirshleifer et al. (2009).

$$EARNINGS_t = \sum \left(\frac{OIADP_{it}}{AT_{it-1}} \cdot VW\_MVE_{it-1} \right)$$

Accruals are first calculated on a firm-level basis for each year ($accruals_{it}$). It is calculated following Hirshleifer et al. (2009) and Sloan (1996), using the indirect balance-sheet method. We choose the balance-sheet approach, as recommended by Larson et al. (2018), since it includes important information about economic activities. We summarize changes in firm-specific current total assets (ΔACT_{it}) with changes in short term debt (ΔDLC_{it}) and taxes payable (ΔTXP_{it}), less changes in current liabilities (ΔLCT_{it}) and cash & short-term investments (ΔCHE_{it}). Finally, we subtract the annual firm-specific depreciation (DP_{it}). We thereafter scale firm-specific $accruals_{it}$ by AT_{it-1} and multiply with VW_MVE_{it-1} as done for EARNINGS. Finally, we summarize accruals each year to get the aggregated accruals ($ACCRUALS_t$). Thus, our accruals' construction is done accordingly to previous studies (Hirshleifer, Hou, & Toeh, 2009) (Heater, Nallareddy, & Venkatachalam, 2021), which will make our results the most comparable.

$$accruals_{it} = \Delta ACT_{it} - \Delta LCT_{it} - \Delta CHE_{it} + \Delta DLC_{it} + \Delta TXP_{it} - DP_{it}$$

$$ACCRUALS_t = \sum\left(\frac{accruals_{it}}{AT_{it-1}} \cdot VW\_MVE_{it-1}\right)$$

Cash flow (CF_t) is calculated as the difference between EARNINGS and ACCRUALS. This way, we split up the earnings variable into two components. CF is, like ACCRUALS and EARNINGS, scaled by lagged total assets and value-weighted using market capitalization at the beginning of the year as weights on a firm-level basis. Since both $ACCRUALS_t$ and $EARNINGS_t$ already are scaled and value-weighted, we can achieve this by simply subtracting accruals from earnings.

$$CF_t = EARNINGS_t - ACCRUALS_t$$

For Book-to-market, we use firm-level common equity (CEQ_{it}) from the firm's balance sheets for the book value of equity, retrieved from Compustat. This is summarized with $TXDB_{it}$, which is the annual firm-level deferred taxes. For the market value of equity, we use MVE_{it}, as used for the construction of VW_MVE_{it} explained above. For the Norwegian data, we do not have enough observations of the $TXDB_{it}$. Therefore, we only use CEQ_{it} for the book value of equity in the Norwegian sample. The firm-specific BM_{it} is thereafter multiplied with VW_MVE_{it-1} and summarized annually to get the value-weighted book-to-market (BM_t) in alignment with our other value-weighted variables.

$$BM_t = \sum\left(\frac{CEQ_{it} + TXDB_{it}}{MVE_{it}} \cdot VW\_MVE_{it-1}\right)$$

Our earnings-to-price ratio is the firm-level operating income after depreciation ($OIADP_{it}$) divided by market capitalization (MVE_{it}). Afterwards, it is value-weighted with the same approach as BM_t to obtain the earnings-to-price we use (EP_t)

$$EP_t = \sum\left(\frac{OIADP_{it}}{MVE_{it}} \cdot VW\_MVE_{it-1}\right)$$

3.3 Summary statistics

In Tables 1 & 2 we report the summary statistics of constructed variables and other aggregated return predictors for our firms' sample on an aggregated level. In Table 1, we see the summary statistics and macroeconomic variables of the US sample on an aggregated level and Table 2 includes the summary statistics of the Norwegian sample. We include the mean, median, standard deviations, percentiles, and the number of observations for all variables.

For US ACCRUALS, the mean and median values are negative at -0.046 and -0.044. The negative mean could be caused by the subtraction of depreciation and its larger size than the other accruals components, as shown in the formula. The mean and median lie closely together, indicating that the accrual variable is approximately normally distributed. BM has a mean of 0.5 and a median of 0.43, indicating some potential extreme values in the top end of the distribution of the variable. After aggregation, we are left with 40 observations for each variable, which is one for each year from 1980 to 2020.

We see that ACCRUALS for the Norwegian sample are negative, and even more negative than for US data. This could be caused by depreciation. Since the Norwegian sample is smaller, the aggregation will not smoothen out the high levels of the depreciations for some firms in the sample. The cash flow variable, CF, is also higher, with a median of 0.25 and a mean of 0.31, indicating that there could be some outliers created by some of the larger companies in the sample. The macroeconomic variables, which are used as control variables in our regressions, are the same for both the Norwegian and the US samples. After aggregation, we are left with 25 observations for each variable, one for each year from 1995 to 2020 for Norway.

Table 1: Descriptive statistics US sample

	N	Mean	Median	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
BM	40	0.501	0.437	0.193	0.280	0.372	0.578	0.998
EP	40	0.120	0.094	0.123	0.004	0.072	0.133	0.812
ACCRUALS	40	-0.046	-0.044	0.014	-0.114	-0.048	-0.040	-0.027
CF	40	0.183	0.184	0.013	0.150	0.175	0.190	0.212
EARNINGS	40	0.137	0.140	0.018	0.060	0.133	0.149	0.171
DEF	40	0.011	0.009	0.005	0.006	0.008	0.012	0.030
ESHARE	40	0.145	0.125	0.085	0.049	0.089	0.156	0.430
DYIELD	40	0.026	0.022	0.010	0.011	0.020	0.034	0.052
TERM	40	0.014	0.015	0.011	-0.012	0.005	0.021	0.033
TBILL	40	0.004	0.004	0.003	0.000	0.001	0.005	0.013
CRSP t+1	40	0.128	0.146	0.178	-0.352	0.008	0.201	0.512

The table presents the summary statistics of the sample of US listed firms. We report the number of observations, mean, median, standard deviation, min value, percentiles and max value for all variables included. The data is aggregated and consists of 40 aggregated observations for each year

Table 2: Descriptive statistics Norwegian sample

	N	Mean	Median	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
BM	25	0.572	0.603	0.192	0.230	0.427	0.662	0.953
EP	25	0.150	0.156	0.057	0.039	0.112	0.182	0.272
ACCRUALS	25	-0.131	0.093	0.119	-0.488	-0.127	-0.082	0.020
CF	25	0.316	0.260	0.270	-0.149	0.191	0.326	1.145
EARNINGS	25	0.184	0.156	0.163	-0.129	0.099	0.233	0.675
DEF	25	0.010	0.009	0.005	0.006	0.007	0.010	0.030
ESHARE	25	0.115	0.109	0.046	0.049	0.081	0.130	0.230
DYIELD	25	0.020	0.021	0.004	0.011	0.018	0.022	0.026
TERM	25	1.443	1.270	1.068	-0.260	0.710	2.560	3.280
TBILL	25	0.002	0.001	0.002	0.000	0.000	0.004	0.005
OSEAX t+1	25	0.131	0.152	0.272	-0.443	-0.049	0.280	0.771
EU Brent oil	25	56.993	50.890	35.377	14.600	24.730	74.850	126.640

The table presents the summary statistics of the sample of Norwegian listed firms. We report the number of observations, mean, median, standard deviation, min value, percentiles and max value for all variables included. The data is aggregated and consists of 25 aggregated observations for each year from 1995 to 2020.

3.4 Correlation matrix

3.4.1 US sample

The correlation matrix for the US data is shown in Table 3, which is the variables we use in the regression. Table 3 present significance levels at 10%, 5%, and 1%. The highest correlation in the matrix is between DYIELD and the BM variable at 94 percent, which we need to consider in the regression because of multicollinearity risk. The BM variable has a high correlation with several other variables as well. EP is also a variable that is highly correlated with several macroeconomic variables and will need to be considered in the regression analysis. The correlation between EARNINGS and ACCRUALS, and EARNINGS and CF are also high and significant, which is natural since earnings are split up into these two variables.

On the contrary, we see no correlation between ACCRUALS and CF. One explanation for this finding could be that the aggregation of firm-level data smoothens out different firm-specific shocks, and therefore the correlation is erased in the aggregate. Table 3 also shows that the correlation between ACCRUALS and CRSP t+1 is large and significant at 31%, while CF are negatively correlated with CRSP t+1, but this is not a significant correlation. The correlations in regard to CRSP t+1 indicate that ACCRUALS might have more predictive power. Since neither ACCRUALS nor CF are correlated with other aggregated return predictors like BM and EP, we will control for these variables in the analysis to test if ACCRUALS and CF can predict aggregated returns.

We also see that the OSEAX t+1 is not significantly correlated with any variables, except for CRSP t+1 where the correlation is significant at 0.76. A possible explanation could be that all stock markets are affected by worldwide risks that are idiosyncratic as the world is highly globalized.

3.4.2 Norwegian sample

The correlation matrix for the Norwegian data is shown in Table 4, and has significance levels at 10%, 5%, and 1%. The highest correlation in the matrix is between ACCRUALS and CF at -0.94, with a high level of significance level. On the other hand, the US sample has a negative correlation between the given variables at only -0.06, which is not significant. One possible explanation for this finding is that the sample is smaller for the Norwegian data, and there are some firms with a large value-weighted share in some of the years in the sample. Hence, the aggregation of the sample does not smoothen out the firm-specific shocks in the same way as in the US data, and the firm-level correlation is not smoothened out during aggregation. This is illustrated in Figure 2, where Equinor is likely to account for the outliers in the ACCRUALS variable in 2018.

Another interesting measure is that the BM variable is, on an aggregate basis, highly correlated with all other firm-specific variables. In contrast, EP is not correlated with any of the firm-specific variables, but many of the macro variables, that are not firm-specific. The main difference between these variables is that BM uses CEQ, while EP uses OIADP. One explanation for the difference in correlations could be that CEQ, which is the book value of equity, is more accounting based and not affected by market conditions. OIADP, on the other hand, could be more cyclical to market conditions and affected by macroeconomic trends. Hence, OIADP is more affected by market conditions, while CEQ is more correlated with accounting-based data.

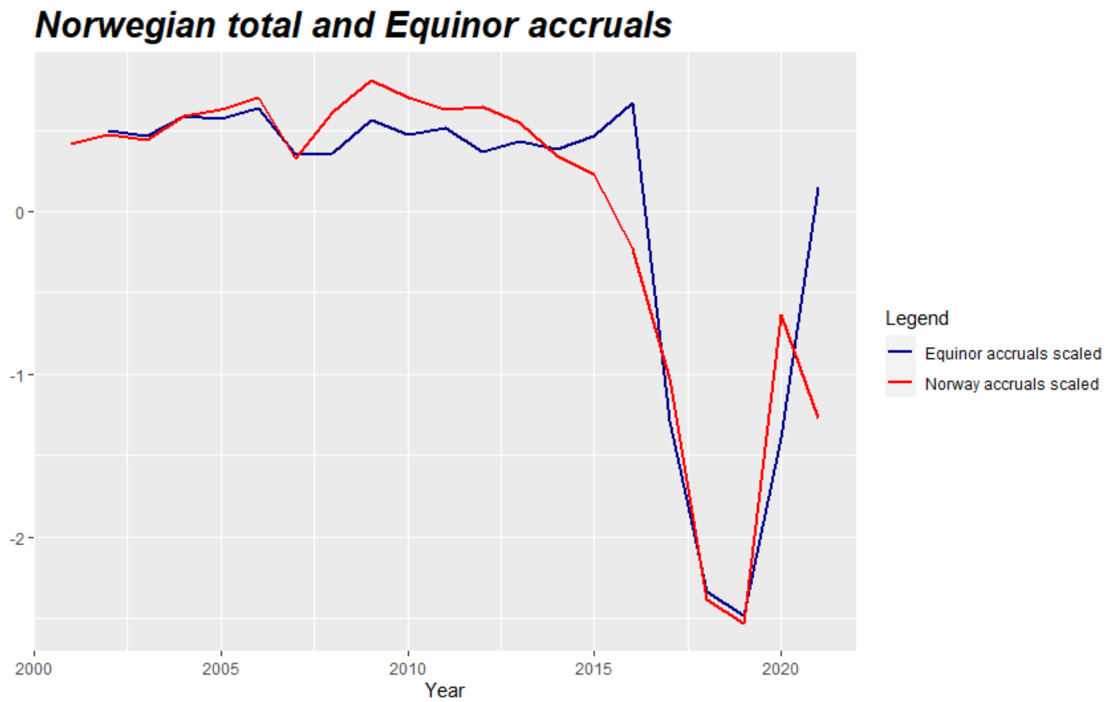

Figure 2: Accruals scaled on company assets t-1 and value-weighted using market capitalization t-1. Further, accruals are standardized to mean of zero and variance of 1. Red line shows accruals for the entire Norwegian market and the blue Equinor isolated. The lines follow each other closely.

Table 3: Correlation matrix US sample

	BM	EP	ACCRUALS	CF	EARNINGS	DEF	CRSP t+1	ESHARE	DYIELD	TERM	TBILL	OSEAX t+1
BM	1											
EP	0.68***	1										
ACCRUALS	0.19	0.25	1									
CF	0.12	0.23	-0.06	1								
EARNINGS	0.22	0.35**	0.71***	0.66***	1							
DEF	0.65***	0.37**	0.11	-0.01	0.08	1						
CRSP t+1	0.18	0.36	0.31**	-0.16	0.12	0.08	1					
ESHARE	0.77***	0.61***	-0.04	0.29*	0.18	0.68***	0.21	1				
DYIELD	0.94***	0.66***	0.36**	-0.04	0.24	0.57***	0.22	0.66***	1			
TERM	-0.21	-0.38**	0.14	-0.16	0	-0.04	0.12	-0.19	-0.22	1		
TBILL	0.79***	0.58***	-0.02	0.34**	0.23	0.39**	-0.03	0.61***	0.75***	-0.59***	1	
OSEAX t+1	-0.31	0.14	0.09	0.12	0.15	0.12	-0.04	-0.09	-0.09	0.03	-0.06	1

This table contains a pairwise correlation matrix of the variables of the sample for listed firms in the US for the period 1980 to 2020. The statistical significance at the 10%, 5% and 1% levels are indicated by *, ** and ***, respectively

Table 4: Correlation matrix Norwegian sample

	BM	EP	ACCRUALS	CF	EARNINGS	DEF	ESHARE	DYIELD	TERM	TBILL	EU Brent oil	OSEAX t+1
BM	1											
EP	0.45**	1										
ACCRUALS	0.63***	0.25	1									
CF	-0.61***	-0.01	-0.94***	1								
EARNINGS	-0.55***	0.17	-0.81***	0.96***	1							
DEF	-0.05	0.07	-0.01	-0.01	-0.03	1						
ESHARE	0.37*	0.1	0.32	-0.33	-0.31	0.49**	1					
DYIELD	0	0.59***	-0.21	0.35*	0.42**	0.23	0.17	1				
TERM	0.43**	0.52***	0.22	-0.18	-0.14	0.28	0.16	0.39*	1			
TBILL	0.13	-0.27	0.27	-0.27	-0.24	-0.42**	0	-0.6**	-0.67***	1		
EU Brent oil	0.07	0.49**	-0.14	0.28	0.36*	0.07	0.04	0.69***	0.35*	-0.57***	1	
OSEAX t+1	0.25	0.55***	0.02	-0.03	-0.03	0.18	0.09	0.31	0.42**	-0.32	-0.03	1

This table presents a pairwise correlation matrix of the variables of the sample for listed firms in Norway for the period 1995 to 2020. The statistical significance at the 10%, 5% and 1% levels are indicated by *, ** and ***, respectively

4. Empirical analysis

4.1 Methodology

To model the relationship between earnings components and future stock market returns, we use the ordinary least squares (OLS) method to estimate a multivariate regression, following Heater et al. (2021). Our dependent variable is a value-weighted market index return (CRSP t+1, OSEAX t+1) for the next period, as described in the data section. The OLS method is commonly used in finance to predict future outcomes of a time series for the dependent variable or as in our case, to analyze a relationship between two variables of interest (Gibbons, 1982). There are four different assumptions required to apply multivariate regression. First, there should not be correlations between the residual term that captures all variations in the model besides the variables included and the independent variables. If the conditional distribution of the residual term given the independent variables has a mean of zero, meaning no correlation, we can assume that the estimate made from the sample regression converges to the population. Second, regressions using OLS require random sampling. Third, there should be no outliers in the sample, which is solved by winsorizing the data variables. Finally, there should be no perfect multicollinearity, meaning that independent variables in the regression cannot be an exact linear function of the other independent variables.

For time series, there will always be a concern of autocorrelation over time. Autocorrelation leads to the error terms in the OLS model to be correlated, which is produced by the time aspect in a time series regression. This results in the standard errors in the model being biased and often too large t-statistics, such that we reject the null hypothesis too often, as found by Shapiro & Mankiw (1986).

After conducting a Durbin-Watson test, we find a level of autocorrelation in our analysis. To correct this problem, we report Newey-West heteroskedasticity and autocorrelation consistent standard errors for all parameters in the model. Following Newey and West (1987), we find that three lags are appropriate for correcting autocorrelation. We follow their approach using the formula $4 \cdot \left(\frac{T}{100}\right)^{\frac{2}{9}}$, where T is the number of observations in the regression model. For the Norwegian data, T is 25, while for the US data, T is 40. In both cases, the number of lags equals three, according to the model described.

For all the regressions, we standardize all independent variables with a mean of zero and a standard deviation of one. We standardize the independent variables in order to facilitate interpretability and comparability with Hirshleifer et al. (2009), as done by Heater et al. (2021). Standardization will also ease comparability in graphs for visual inspection of variables.

4.2 Results

4.2.1 Regression of US Earnings on US returns

In Table 5, we present the regression output of the US data sample, where compounding return from the CRSP market index in period t+1 is the dependent variable (CRSP t+1). Independent variables are firm-specific variables and macroeconomic control variables. All data is reported with significant levels of 10%, 5%, or 1%. The variables in the regression outputs are robust to heteroskedasticity and autocorrelation errors by using the Newey-West method and standardized to a mean of zero and standard deviation of one for comparison purposes.

In the first regression we see that EARNINGS are positive but not significant on CRSP t+1 and therefore not a measure to predict future market returns on an aggregate basis, as found in Hirshleifer et al. (2009) and Sloan (1996). Hence, aggregated earnings as an accounting measure do not seem to be a good predictor of future market returns and offer little new information to a well-diversified investor (S., Lewellen, & Warner, 2006) (Gallo, Hann, & Li, 2016).

In the next regression output (2), we decompose EARNINGS into CF and ACCRUALS, and see that ACCRUALS are positive and significant on a 1% level. On the other hand, CF is negatively related to CRSP t+1. However, CF is not significant in this regression output. Hence, when we decompose EARNINGS into ACCRUALS and CF, ACCRUALS positively predict future market returns in the US market, as found in Hirshleifer et al. (2009). The explanatory power is also higher for this model, as the adjusted R^2 is higher at 7.2%.

In order to avoid endogeneity problems and strengthen the results of our model, we include control variables in the regression. In regression output (3) we include ESHARE, BM, EP, DYIELD, DEF, and TERM as controls. We drop TBILL from the regressions due to multicollinearity issues with DYIELD, which we found by a Variance Inflation Factor (VIF) test. ACCRUALS are here positive and significant at a 1 percent level, but CF also becomes significant at a 5 percent level when including controls and is still negative. Hence, ACCRUALS positively predict future market returns on an aggregate level, and CF negatively. Again, this follows the results from Hirshleifer et al. (2009) and opposes Sloan (1996), who found that accruals negatively predict future market returns. The results could indicate an omitted variable bias in regression output (2) since CF is not significant, and ACCRUALS are still significant at a 1% level. In addition to CF and ACCRUALS being significant, EP, DYIELD, and DEF are also significant in the model. The explanatory power of the model increases with the control variables to an adjusted R^2 of 20.3 percent.

However, we are concerned about the correlation between EP and BM, as shown in the correlation matrix. The VIF test indicates that there could be some multicollinearity issues, and we therefore drop BM in regression output (4). The same variables are now significant as in regression output (3), but the robustness of the significance levels is now somewhat lower for most of the variables. However, the explanatory power of the model is now higher, with an adjusted R^2 of 22.6 percent.

Summarized for the US dataset, we see that the regressions follow the same results as in Hirshleifer et al. (2009), even though there are different time periods. Hence, the accruals anomaly is not exploited in the US and is still persistent, as described by Lev & Nissim (2004).

Table 5: Regression Results US sample

	Dependent variable:			
	CRSP t+1			
	(1)	(2)	(3)	(4)
EARNINGS	1.168			
	t = 0.940			
ACCRUALS		0.054***	0.064***	0.058***
		t = 5.034	t = 3.653	t = 3.503
CF		-0.028	-0.080**	-0.075**
		t = -1.006	t = -2.571	t = -2.414
ESHARE			0.091	0.091
			t = 1.378	t = 1.446
BM			0.035	
			t = 0.601	
EP			0.653***	0.678***
			t = 4.156	t = 4.028
DYIELD			-0.098**	-0.067*
			t = -1.964	t = -1.885
DEF			-0.051*	-0.047
			t = -1.683	t = -1.438
TERM			0.032	0.034
			t = 0.966	t = 1.080
Constant	-0.031	0.130***	0.054	0.051
	t = -0.183	t = 6.121	t = 1.568	t = 1.486
Observations	40	40	40	40
R^2	0.014	0.12	0.367	0.365
Adjusted R^2	-0.011	0.072	0.203	0.226

This table presents the regression estimates and t-statistics of one-year-ahead aggregate returns on current aggregate earnings, accruals, cash flows, and additional macroeconomic control variables. CRSP t+1 is the one-year-ahead CRSP value-weighted index returns. All independent variables are standardized to have a mean of zero and variance of one for interpretability purposes. T-statistics are calculated using the Newey-West approach for autocorreation and heteroskedasticity-consistent standard errors. We report the number of observations, r-squared and the adjusted r-squared The statistical sginificance is reported as *, **, and ***, for 10%, 5% and 1% levels, respectively.

4.2.2 Regression of Norwegian Earnings on Norwegian returns

In Table 6, we have eight models utilizing aggregated and value-weighted ACCRUALS, CF, DYIELD, BM, and macro variables. All models have autocorrelation and heteroscedasticity-adjusted standard errors following Newey & West (1987) and are standardized for comparison and interpretation purposes.

For our first model of Norwegian companies on Norwegian return (OSEAX t+1), we see that EARNINGS has no predictability on OSEAX t+1. This is underlined by both the very low R^2 and insignificant coefficient, as found for our US data and by Hirshleifer et al. (2009). In our second model, ACCRUALS and CF are regressed on OSEAX t+1. Here we also see a low model predictability, with adjusted R^2 below zero and both variables have insignificant coefficients, and thereby low predictability of future market returns.

In the third model, we see that including all the variables gives the highest R^2 of all our NOR-on-NOR models in Table 6. Here, we see that ACCRUALS is significant on a 1% level, along with BM, while the EU Brent oil is significant at a 10% level. In model 4, we see that excluding EU Brent oil reduces our adjusted R^2, indicating that the oil price has an impact on OSEAX t+1. Consequently, oil price inclusion could be important as a control variable for Norwegian return, mitigating a potential omitted variable bias in Norway's oil dependent economy.

The inclusion of both ACCRUALS and CF gives high VIF-test values for both variables, indicating multicollinearity that might weaken the validity of our models. Therefore, the CF variable is omitted in models 5-8. We see from the correlation matrix for Norwegian data that CF and ACCRUALS are highly correlated and significant, compared to US data with its lack of correlation between the variables. The difference in correlation between the samples can come from the fact that the US sample is much larger than the Norwegian sample. Thus, aggregation of the variables will in a larger scale diversify away firm-specific shocks and weights from larger firms in the samples.

Omitting the CF variable from the models decreases the VIF factor for ACCRUALS to 1.9 from 19.5 with CF in the model, which is within our acceptable levels. After omitting CF from the model, we see that ACCRUALS is still significant at a 1% level, but the t-statistics are more robust. Hence, omitting CF increases the robustness of the relationship between ACCRUALS and OSEAX t+1. However, TBILL still has a VIF factor slightly above 10. Therefore, TBILL is also excluded in model 7. In model 7, we see that the VIF factors for all variables are below 3.5, indicating no multicollinearity in our final model. However, it doesn't increase the significance of ACCRUALS or other variables but increases the explanatory power of the model with an adjusted R^2 of 58.2 percent.

We also evaluate OSEAX two years after (OSEAX t+2) the accounting data in model 8 to review if the effect of accruals can be persistent in the future beyond one year. The lack of significance of the variable here indicates that the effect is limited to returns one year ahead only, and the only significant variable is EU Brent oil.

Altogether, our models indicate that Norwegian companies' accruals have a significant and robust predictive ability on OSEAX t+1. Our results are thereby consistent with previous literature from LaFond (2005), who argue that the accruals anomaly is a global phenomenon, which we see from Norwegian data.

Table 6: Regression Results Norwegian sample

	Dependent variables:							
				OSEAX t+1				OSEAX t+2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EARNINGS	-0.048							
	t = -0.203							
ACCRUALS		0.147	0.347***	0.248***	0.171***	0.179***	0.177***	-0.066
		t = 1.198	t = 2.763	t = 3.163	t = 8.459	t = 6.471	t = 6.038	t = -1.184
ESHARE			0.021	0.021	0.021	0.022	0.013	0.003
			t = 0.755	t = 0.457	t = 0.481	t = 0.595	t = 0.480	t = 0.061
CF		0.115	0.184	0.085				
		t = 0.938	t = 1.412	t = 1.018				
DYIELD			-0.027	-0.098	-0.091	-0.025	-0.005	0.107
			t = -0.404	t = -1.034	t = -0.933	t = -0.288	t = -0.096	t = 1.135
DEF			-0.034	-0.008	-0.01	-0.034	-0.022	-0.01
			t = -1.324	t = -0.192	t = -0.257	t = -1.084	t = -1.094	t = -0.236
TERM			0.075	0.112*	0.113*	0.083	0.117***	0.065
			t = 1.168	t = 1.762	t = 1.912	t = 1.119	t = 5.327	t = 1.258
TBILL			-0.086	-0.024	-0.012	-0.052		
			t = -0.753	t = -0.282	t = -0.135	t = -0.515		
BM			-0.265***	-0.304***	-0.321***	-0.305***	-0.315***	0.026
			t = -6.839	t = -7.608	t = -10.462	t = -14.217	t = -16.889	t = 0.522
EP			0.027	0.04	0.065	0.079	0.066*	0.166**
			t = 0.575	t = 0.791	t = 1.526	t = 1.427	t = 1.856	t = 2.537
EU Brent oil			-0.126*			-0.107**	-0.097**	-0.214***
			t = -1.882			t = -2.446	t = -2.261	t = -4.553
Constant	0.140**	0.131***	0.131***	0.131***	0.131***	0.131***	0.131***	0.124***
	t = 2.201	t = 2.905	t = 5.722	t = 4.978	t = 5.511	t = 5.837	t = 5.018	t = 4.317
Observations	25	25	25	25	25	25	25	24
R^2	0.001	0.043	0.747	0.679	0.674	0.728	0.721	0.622
Adjusted R^2	-0.043	-0.044	0.566	0.486	0.512	0.564	0.582	0.42

This table presents the regression estimates and t-statistics of one-year-ahead aggregate returns on current aggregate earnings, accruals, cash flows, and additional macroeconomic control variables. OSEAX t+1 is the one-year-ahead value-weighted index returns for listed Norwegian firms. OSEAX t+2 is the two-year-ahead value weighted index returns. All independent variables are standardized to have a mean of zero and variance of one for interpretability purposes. T-statistics are calculated using the Newey-West approach for autocorreation and heteroskedasticity-consistent standard errors. We report the number of observations, the r-squared and the adjusted r-squared. The statistical sginificance is reported as *, **, and ***, for 10%, 5% and 1% levels, respectively

4.2.3 Regression of US Earnings on Norwegian returns

In Table 7, we regress US public company accounting data on the Norwegian OSEAX t+1. All models have autocorrelation and heteroscedasticity-adjusted standard errors following Newey & West (1987) and are standardized with a mean of zero and standard deviation of 1 for interpretation purposes.

For the first model, we see that EARNINGS coefficient has low R^2 and no significance when regressed alone on OSEAX t+1. For the second model, we see that ACCRUALS and CF don't have significant coefficients and a negative adjusted R^2, indicating low predictable power on Norwegian returns.

For the third model, CF is at its most significant at a 1% level and has a t-statistic at 2.7. However, the low R^2 at 2.2 percent indicates low explanatory power and thereby limited predictability. For the fourth model, we see that the adjusted R^2 increases to the highest for these models at 11.6 percent, when including the oil price. The CF coefficient is now significant at a 5% level. The significance reduction from model 3 could indicate that CF in the third model is affected by omitted variable bias when excluding EU Brent oil. This is backed by the difference of 9 percent in adjusted R^2 when including the oil price.

However, TBILL has a VIF factor above 10, which could implicate multicollinearity, affecting our results. Therefore, our fifth model excludes TBILL. However, this causes a sharp reduction in the models' predictability and explanatory power. The adjusted R^2 becomes negative, which implies a low predictability. Omitting TBILL also reduces the significance of the CF coefficient, implying that the predictability of CF from the US on OSEAX t+1 is lower after adjusting for potential flaws. Interestingly, we see that the macroeconomic variables DEF and TERM are significant for the models, which strengthens our belief that US data affects Norwegian returns. Finally, our 7th model uses OSEAX returns two-years-head (OSEAX t+2) to review effect longer than one year. Here, there is no significance for either ACCRUALS or CF, indicating no effect longer than one year.

Altogether for all the models, we see that US ACCRUALS has no predictive ability for OSEAX t+1. CF, on the other hand, has some predictive power, but the robustness of this variable is lower after adjusting the models. We also see a low adjusted R^2 for all models indicating that US companies' accounting data has a low predictability for Norwegian return.

Table 7: Regression Results US on Norwegian returns

	Dependent variables:						
	OSEAX t+1						OSEAX t+2
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EARNINGS	1.273						
	t = 0.773						
ACCRUALS		0.026	-0.124	-0.149	-0.124	-0.117	0.13
		t = 0.885	t = -1.304	t = -1.290	t = -1.430	t = -1.250	t = 1.182
CF		0.015	0.152***	0.237**	0.109*	0.100*	-0.073
		t = 0.598	t = 2.713	t = 2.517	t = 1.935	t = 1.673	t = -0.523
ESHARE			-0.107	-0.131	-0.122	-0.111	0.051
			t = -1.506	t = -1.261	t = -1.424	t = -1.349	t = 0.531
BM			-0.186*	-0.093	-0.198**	-0.218**	0.096
			t = -1.841	t = -0.649	t = -1.971	t = -2.519	t = 1.552
EP			0.108***	0.090**	0.102**	0.108***	-0.071
			t = 2.806	t = 2.332	t = 2.434	t = 2.798	t = -1.282
DYIELD			0.024	0.121	0.139	0.08	0.055
			t = 0.151	t = 0.810	t = 1.214	t = 0.565	t = 0.379
DEF			0.135**	0.082	0.144***	0.155***	-0.059
			t = 2.186	t = 0.976	t = 2.778	t = 3.055	t = -0.710
TERM			0.004	-0.111	0.084*	0.090**	0.088
			t = 0.058	t = -0.893	t = 1.882	t = 2.534	t = 1.520
TBILL			-0.152	-0.326**			
			t = -1.432	t = -2.276			
EU Brent oil				-0.187*	-0.068		-0.188***
				t = -1.957	t = -1.244		t = -3.316
Constant	-0.038	0.131***	0.119***	0.127**	0.131***	0.126***	0.135***
	t = -0.201	t = 2.999	t = 2.773	t = 2.301	t = 2.789	t = 2.705	t = 2.847
Observations	25	25	25	25	25	25	25
R^2	0.011	0.012	0.351	0.37	0.485	0.389	0.483
Adjusted R^2	-0.032	-0.078	0.027	-0.008	0.116	0.022	0.173

This table presents the regression estimates and t-statistics of one-year-ahead aggregate returns in the Norwegian market on current aggregate earnings, accruals, cash flows, and additional macroeconomic control variables for the US sample. OSEAX t+1 is the one-year-ahead value-weighted index returns for listed Norwegian firms. OSEAX t+2 is the two-year-ahead value weighted index returns. All independent variables are standardized to have a mean of zero and variance of one for interpretability purposes. T-statistics are calculated using the Newey-West approach for autocorreation and heteroskedasticity-consistent standard errors. We report the number of observations, the r-squared and the adjusted r-squared. The statistical sginificance is reported as *, **, and ***, for 10%, 5% and 1% levels, respectively.

4.3 Findings review

In this section, we first look further into our findings from the regression modeling to find out whether accounting information can help predict future market returns in Norway. Thereafter, we discuss result implications in light of inefficient versus efficient market hypotheses. Finally, we assert potential shortcomings and limitations of our results.

We find for all our regressions that EARNINGS do not predict future market returns on an aggregate level. ACCRUALS, on the other hand, are a strong positive predictor in both the US sample as well as in the Norwegian sample. However, ACCRUALS cannot predict future stock market returns more than one year ahead. Current assets and liabilities are often, by nature, measured as balance sheet components, which should be realized within one year and could explain our findings. Nevertheless, we see that the earnings fixation hypothesis documented by Sloan (1996) holds.

Also interesting is that cash flow is deviating in significance for our different models. The American CF is a positive predictor for both US and Norwegian returns, while Norwegian CF has no predictive ability. The positive covariation between US cashflow and US return is shown in Figure 4. A potential explanation for cash flows not being a significant predictor in the Norwegian sample could be because of its correlation with EARNINGS. CF is calculated as EARNINGS less ACCRUALS, and we see the patterns for accruals extracted from earnings in Figure 3. As found in our model's, earnings are not a good predictor of stock market returns. Therefore, we can see why cash flow, which follows similar patterns as earnings in Norway also has limited predictive ability.

A potential explanation for difference in cash flow significance could be the sample size in the Norwegian market. The firm-specific shocks from the largest companies could unlikely be diversified away when aggregating as the sample size is too small. In contrast, the US market seemingly has no correlation between earnings and cash flow, and their respective patterns can be seen in Figure 5. This could, in opposition to the Norwegian sample, be because the sample size is large enough to diversify away firm-specific shocks. Therefore, both accruals and cash flows cannot be a predictor for future market returns in our sample for Norwegian firms since the variables are correlated, which leads to multicollinearity issues in the regressions.

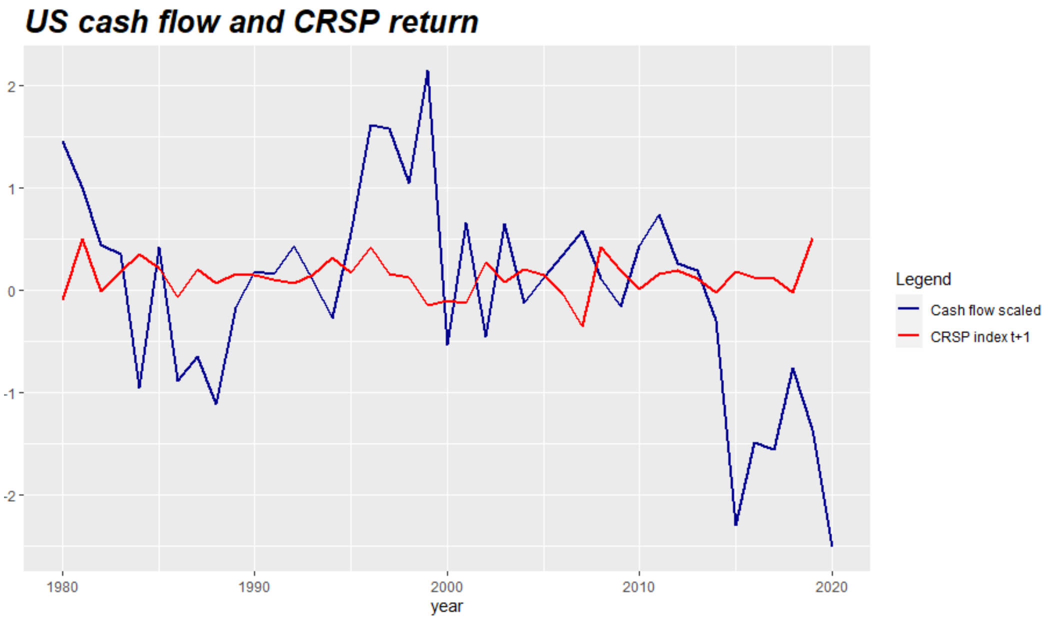

Figure 4: Earnings, cashflow and accruals scaled on company assets t-1 and value-weighted using market capitalization t-1. All variables are standardized to mean of zero and variance of 1. Cash flow closely following earnings while accruals follow a negative correlating t

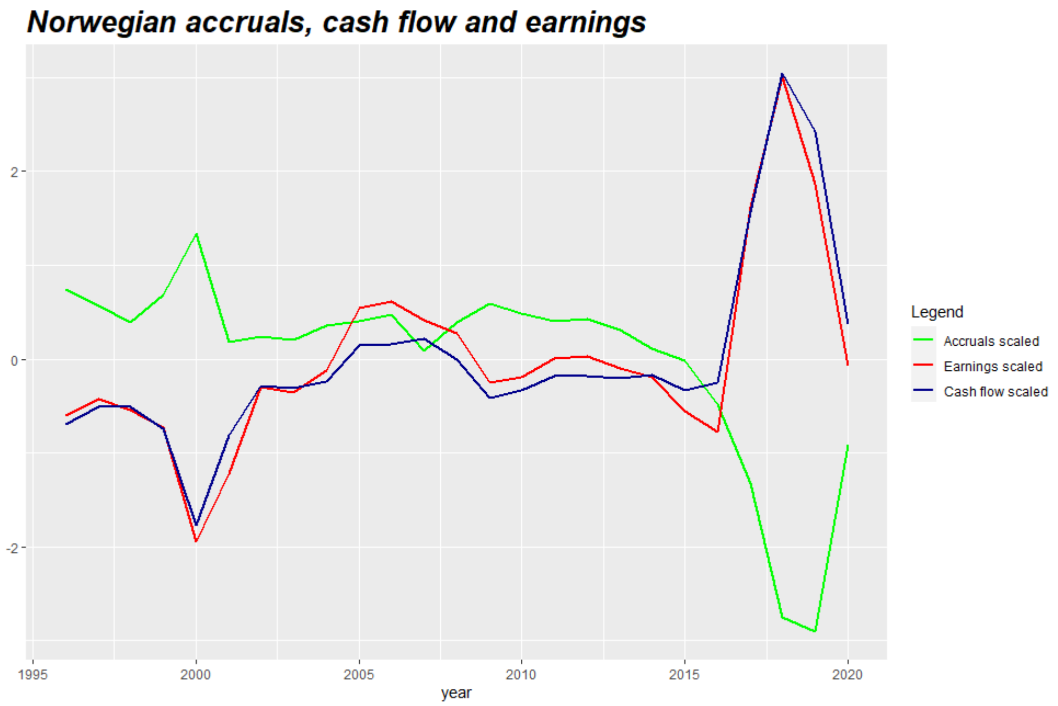

Figure 3: Cash flow are scaled on company assets t-1 and value-weighted using market capitalization t-1. Further, cash flow is standardized to mean of zero and variance of 1. CRSP t+1 return annualized are calculated from May in year t to end of April in year t+1

Somewhat interesting is also that US accounting data can predict Norwegian market returns. Hence, a higher level of CF in the US market will increase the market returns in the Norwegian market the following year. A possible explanation could be that since the US market is large, and Norway is a small open economy affected by worldwide market conditions, the overall market conditions in the US could affect the Norwegian market. However, the explanatory power is low for all the models of US accounting data on Norwegian market returns, such that the predictability of this relationship is low.

Summarized, we find that accruals are a strong positive predictor in both US and Norwegian markets, but not for US accounting data on Norwegian returns. Hence, the earnings fixation hypothesis holds in domestic markets. CF is not a significant predictor in the Norwegian market, but in the US market, and for US accounting data on the Norwegian market. The Norwegian sample is smaller, and aggregation does not smooth out all firm-specific shocks such that cash flow is still highly correlated with earnings. This might be the reason for why CF is not significant in the Norwegian sample.

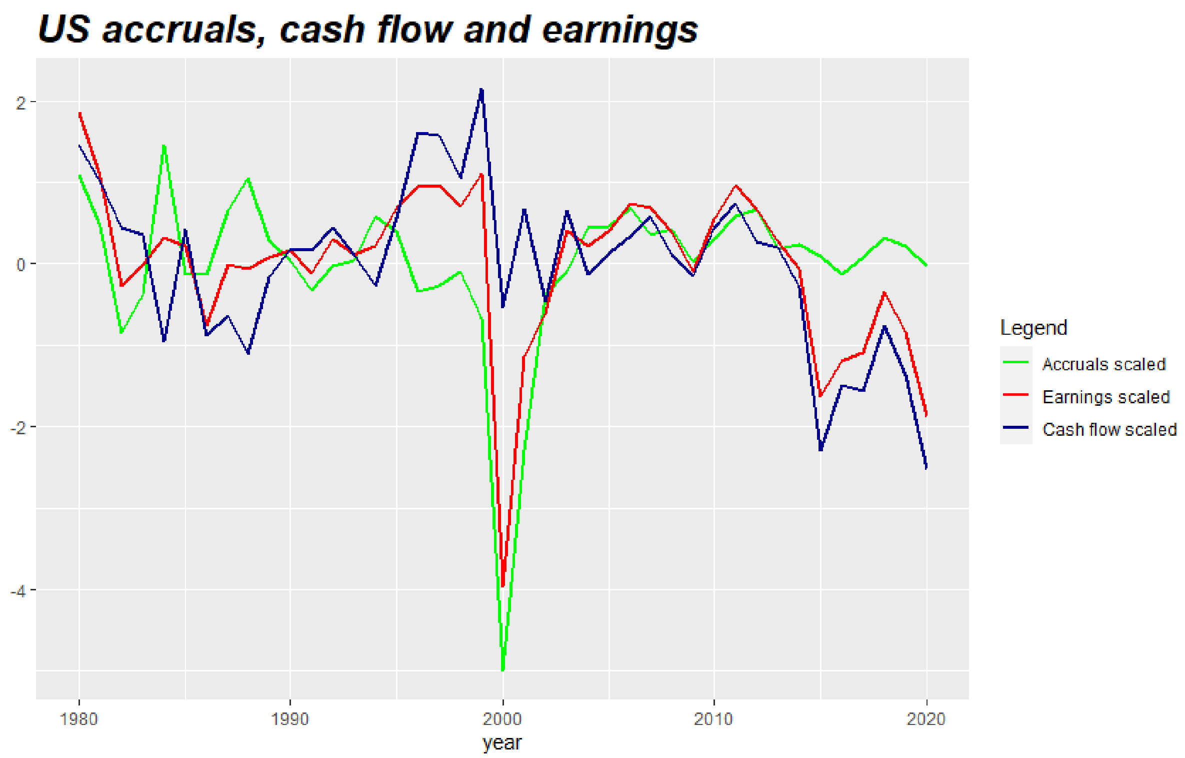

Figure 5: Cash flow, accruals and earnings in the US sample scaled on company assets t-1 and value-weighted using market capitalization t-1. All variables are standardized to mean zero and variance of 1.

4.4 Implication of results

In this section, we will look at the implication of our results and examine why accruals can be a positive predictor for future market returns in both the US and the Norwegian market. We will first look at efficient market explanations from previous research for why accruals are a positive predictor, before studying inefficient market perspectives for aggregate accruals' predictive ability on future market returns.

4.4.1 Efficient markets

Semi-strong market efficiency is when asset prices fully reflect all public information. Hence, only investors with additional inside information could have an advantage in the market. Any price anomalies are quickly found, and the stock market adjusts thereafter (Fama, 1991). The investors will rationally price assets correctly according to all public information, and the information given by the company truly reflects their performance. Given this theory, our findings could imply that accruals give some information about changes in the return of the market. Campbell & Shiller (1988) and Campbell (1991) find that changes in stock price are caused by either rational change in discount rates, expected future earnings, or both. In an efficient market, investors have to be rational when pricing assets. As the investors behave rationally, price changes will come from changes in the discount rate or changes to future expected earnings, given an efficient market. Therefore, changes in accruals must affect one or both of these two factors to obtain the results we found, if semi-strong efficient market assumptions hold.

Discount rate

First, we will assess if accruals could affect the discount rate in a semi-strong efficient market.

Hirshleifer et al. (2009) argue that accruals should be linked with shifts in market discount rates. In an efficient market, accruals should contain information on several factors that a rational investor should respond to, affecting the stock price. The relevant factors that accruals contain information about are shifts in demand, inventories, investment activities, and cash holdings. Therefore, we could argue that accruals are informative regarding business cycles and thereby also risk premiums. A reasonable assumption is that a company with a higher level of accruals is likely to receive gains from short-term assets during the following year. Higher levels of accruals give a more certain income within the next year, which makes the investment less risky. Since the investment is assumed to be less risky, this could reduce the risk premium for the investment.

Aggregation of the market should diversify away firm-specific risk as argued by Hirshleifer (2009). Therefore, aggregated accruals could be a proxy for the market risk premium. As the risk in most asset pricing models is included in the discount rate, we believe that Hirshleifer et al. (2009) findings could be a viable theory and that accruals covariates with discount rates. Discount rates' effect on stock pricing means that accruals, through covariation with discount rates, could also covariate with market return.

Further, as found by Hirshleifer et al. (2009) and in our results, accruals are a significant predictor of future market returns. The effect is still present after controlling for frequently used discount rate proxies, such as treasury bill rates and default spread. Therefore, the hypothesis about accruals being linked with discount rates is strengthened by our results.

Gou & Jiang (2011) supports this view and singles out the conditional equity premium as the discount rate component that correlates with accruals. Aggregated accruals are, according to Gou & Jiang (2011), closely correlated with conditional equity premium variables. As equity premium is a component of equity discount rates, its covariation with accruals means that an accruals increase will be a positive indicator of higher market return.

Overall, our results might imply that accruals could give an indication of the riskiness and thereby the discount rate of Norwegian stocks in light of efficient market theory. However, as this effect is insignificant for Norwegian return regressed on US accruals, the prediction of accruals being correlated with discount rates only holds within domestic markets and not by the US impacting the Norwegian market.

Changes in expected earnings

A different explanation given efficient markets is that accruals contain information on rational expected earnings changes.

Gou & Jiang (2011) argue that firm-level accruals are a leading indicator of firm growth. Accordingly, rational managers will increase their inventories when anticipating growth, which implies a future earnings increase. Inventory changes affect accruals and will thereby cause a positive covariation between the two. When a company builds up an inventory, its current assets increase, which increases accruals. As accruals are linked with anticipated firm growth, this could possibly lead to future earnings increase. Consequently, rational investors should respond to firm growth by increasing the stock price. As a result, accruals are, through expected earnings changes, linked with future market returns.

Since we find a positive relation of accruals on stock returns, accruals being a leading indicator might also hold on an aggregated level, given this theory. The positive relation could signify that aggregated accruals correlate with aggregated earnings growth anticipation, and therefore also aggregated returns in an efficient market.

Further, accruals from the US market are not a significant predictor of Norwegian stock market returns. According to this theory, the US accruals increase is caused by US companies' growth anticipation and not growth prospects for Norwegian companies. Therefore, rational investors should not, based on US accruals, expect earnings increase in Norway. As a result, Norwegian market returns should be unaffected. Based on the effect only being domestic, our results are aligned with Gou & Jiang's (2011) explanation for accruals being a firm growth predictor.

However, a weakness with Gou & Jiang's (2011) reasoning is that accruals are a complex measure, consisting of several components with differentiating effects. Accruals also includes short-term debt, deprecation, and income tax payable, which are factors that may have contradicting effects on market return than inventory changes isolated. Thus, one could argue that implying accruals' effect on firm growth is unreasonable as accruals includes several other factors. Therefore, it might be better to only use inventory increase to assess this firm-growth effect and not utilize it as an explanation for the accruals and market return relation.

4.4.2 Inefficient markets

However, other studies are more skeptical on whether accruals affecting market returns can hold in an efficient market. For instance, Kang et al. (2010) find that market discount rates through firm risk lack empirical support through their approach. The paper finds that the link between accruals and future returns might be caused by market-wide stock mispricing and earnings manipulation. According to their study, management responds to stock mispricing by manipulating accruals. Kang et al. (2010) explain this by management needing to adjust earnings as investors fail to price stocks correctly according to all publicly available information. Therefore, efficient market theory doesn't hold according to this reasoning, and an inefficient market explanation is needed.

Since investors fail to price stocks correctly, there will be times when the market is overvalued or undervalued. When undervalued, management is incentivized to manipulate their accounts to convey a more positive image of their performance to increase stock price to the correct one. As a result, the accruals anomaly could be explained by managemental response to undervaluation linked with market returns when the price increases towards the correct one (Heater, Nallareddy, & Venkatachalam, 2021). Hence, accruals are mispriced in the earnings announcements, which leads to inefficient markets.

Kang et al. (2010) & Richardson et al. (2006) found evidence for accruals being highly affected by manipulation through earnings management. This implies that the relationship between accruals and market valuation is opposite. Undervaluation leads to accruals being boosted and overvaluation leads to accruals reduction by manipulation. The market should shift upwards after an undervaluation and the opposite when overvalued. Therefore, the relationship between accruals and future market returns one year ahead should likely be positive, as shown in our regression results. On the other hand, contemporaneous returns should be negatively correlated with accruals as management will reduce accruals when market valuation is high and increase accruals when market valuation is low.

Looking at our correlation matrix, we see that earnings are significant and positively correlated with accruals for US data. However, for Norwegian data, we see a strongly significant and negative correlation between these two variables. For US data, one can argue that since accruals are a component of earnings, the two components should covariate positively when no accounting manipulation is present. For Norwegian data, on the other hand, the negative correlation could indicate that Norwegian managers manipulate their accruals to smoothen out their earning fluctuations. Thereby, they “lean against the wind” by increasing accruals when earnings are low, and decreasing accruals when earnings are high. The correlations could therefore indicate that earnings manipulation is present at a level that has an impact in Norway but not in the US.

Thus, the correlations could indicate that the inefficient market theory holds for Norway and not the US. Based on this, the Norwegian market as a whole could be affected by earnings manipulation when undervalued. As a result, earnings manipulation could cause a significant coefficient of accruals on OSEAX return for the next year. However, seeing a positive correlation in the US doesn’t imply widespread earnings manipulation in the US market.

Therefore, the result is rather puzzling if the inefficient market theory holds in both countries. For our results with US accruals and Norwegian return, the accruals coefficient has no significance. This can in light of inefficient market theory be explained by our lack of indication for accounting manipulation in response of undervaluation for the US sample. The other explanation is that US accounting manipulation shouldn't be related to Norwegian market undervaluation. A possible reason for only seeing accounting manipulation in Norway could be that Norway's low number of firms and skewed value-weight between them can cause fewer firms choosing manipulation to affect the aggregated accruals than for the US market.

Summarized, our findings can both be explained using the efficient market hypothesis and also by an inefficient market hypothesis. Given an efficient market, our findings are aligned with previous research, explaining the accruals anomaly by changes in the overall discount rates and expected future earnings in the market. However, such efficient market explanations contradict previous findings using other methods such as Kang et al. (2010). If the market is considered inefficient, our findings from the Norwegian sample can be explained by managers manipulating earnings during market undervaluations. However, this does not hold for our findings in the US sample as we don't find indications of earnings manipulation in this market.

4.5 Limitations and shortcomings

In this part of our thesis, we will discuss possible limitations of our data sample, biases, and sources of measurement errors that might inflict the implications of our results. We will address limitations such as small sample bias risks, change in accounting standards and the peculiarities of the Norwegian market.

4.5.1 Small sample bias

The first possible source of validity weakness is small sample bias. The bias could be an issue given that we only use annual observations aggregated for 25 years for the Norwegian sample, and 40 years for the US sample. Therefore, it is important to assess small sample bias for our models.

According to Stambaugh (1999), we are at risk of a small sample bias, where the t-statistics produced will be too large and give wrong statistical inference when regressing accounting data on return one year ahead. Nelson & Kim (1993) state that the small sample bias is present because standard errors are biased downwards and the predictors being endogenous. Hirshleifer et al. (2009) and Kang et al. (2010) solve this bias with a Monte-Carlo simulation approach. However, Kang et al. (2010) find small differences between Newey-West robust regressions and regressions using a Monte-Carlo simulation.

Also, similar papers to our state that the bias is caused by feedback from returns to future values the regressor and the regressor is persistent over time, for instance with dividend yield ((Nelson & Kim, 1993); (Stambaugh, 1999); (Mankiw & Shapiro, 1986); Gungor & Luger, 2020)). In our case, accruals are not considered to have feedback from returns, such that the endogeneity problem is not present in our analysis. Further, Gou & Jiang (2011) state that since the forecasting variables, such as accruals and cash flow are not persistent at the aggregate level, the bias is likely to be small. Therefore, we are aligned with more recent papers, such as Gou & Jiang (2011) and Heater et al. (2021), utilizing the Newey-West method to adjust for the small sample bias, and not a Monte-Carlo simulation approach.

Baker et al. (2006) find that small sample bias can be an issue when using scale price variables such as dividend yield and earnings price, as the level of these variables is negatively correlated with contemporaneous returns. Accruals and CF, which are our main variables of interest, are not scaled-price variables. On the other hand, some of our control variables are scaled by, which could be an issue as it increases small sample bias risk. However, these variables are vital to isolate the effect accruals have when disregarding other factors of the market conditions.

The small sample issue in the Norwegian market is also due to fewer firms on the stock market in Norway, and because the sample period is much shorter than for the US sample. The smaller Norwegian sample reduces the robustness of our results compared to the US data, where they have more observations both at the firm-level and on a yearly basis. For example, Norwegian aggregated figures might be more biased due to information and arbitrage costs, in contrast to the US aggregation advantage found by Hirshleifer et al. (2009). Future analysis should consider this issue when working with aggregation-level data for Norwegian firms. However, we limit the small sample bias by using empirical techniques mentioned above to mitigate this bias.

4.5.2 Change in accounting standards

An additional weakness of our study is the changes in accounting standards in Norway, which could affect the internal validity of our results. In 2002 the European Union decided that all listed companies should follow the IFRS standard by 2005 (IAS, n.d.). Norway, as a member of the European Economic Union (EEA), also had to comply with this new regulation. In addition, new regulation changes have followed, such as the implementation of IFRS 16 in 2019 (KPMG, n.d.). IFRS 16 requires that operational assets that are leased have to be included in the balance sheet and usage accounted as depreciation instead of financial costs. Therefore, change in accounting standards could have a significant impact on our accruals variable when depreciation is included in our methods.

Altogether, changes in accounting standards could therefore impact our levels of accruals and therefore our results. Measurement errors stemming from changes in accounting standards could exist both under the efficient and inefficient market assumption. For an efficient market where accruals accounted reflect "true" accruals, the correct way to measure accruals will change. For an inefficient market, new accounting regulation could affect the wiggle room for earnings manipulation. Therefore, changes in accounting standards should be taken into regard, independent of market efficiency, when reading our results.

4.5.3 Characteristics of Norwegian sample

Another source of validity limitations for our data is the Oslo Stock Exchanges' skewness in sector distribution, especially against the oil sector. Norway has since its first major exports in the 70s, been a country with high reliance on oil production in its economy (Norsk Petroleum, 2022). Norway's oil dependency has left a clear impact on the Norwegian Stock Exchange, as seen in Figure 6. On the Oslo Stock Exchange. there have been around 10 to 20 percent of companies within the oil sector since 1990 compared to 2-4 percent in the US. The difference is also calculated to be significant at a 95 percent confidence level. The Norwegian stock markets' value-weighted market cap is even more impacted by the oil sector, as shown in Figure 7. Therefore, our Norwegian results will, in a much higher regard, be dependent on the performance of a singular sector. Consequently, our Norwegian results will possibly have less validity for appliance on other sectors and broad sector portfolios than the US results.

Another puzzling factor is that our results contradict the sector-specific findings of Hirshleifer et al. (2009). They find a negative coefficient of accruals on return in the oil sector. He also finds that different sectors have different explanatory power and significance on sector returns. This could have two implications if applied to our results. One is that the composition of the market is a factor that affects market-level results. The second one is that sector-specific effects from the US are not applicable to the Norwegian market. Altogether our results' deviation from Hirshleifer et al. (2009) on oil sector effects shows potential implications for the external validity.

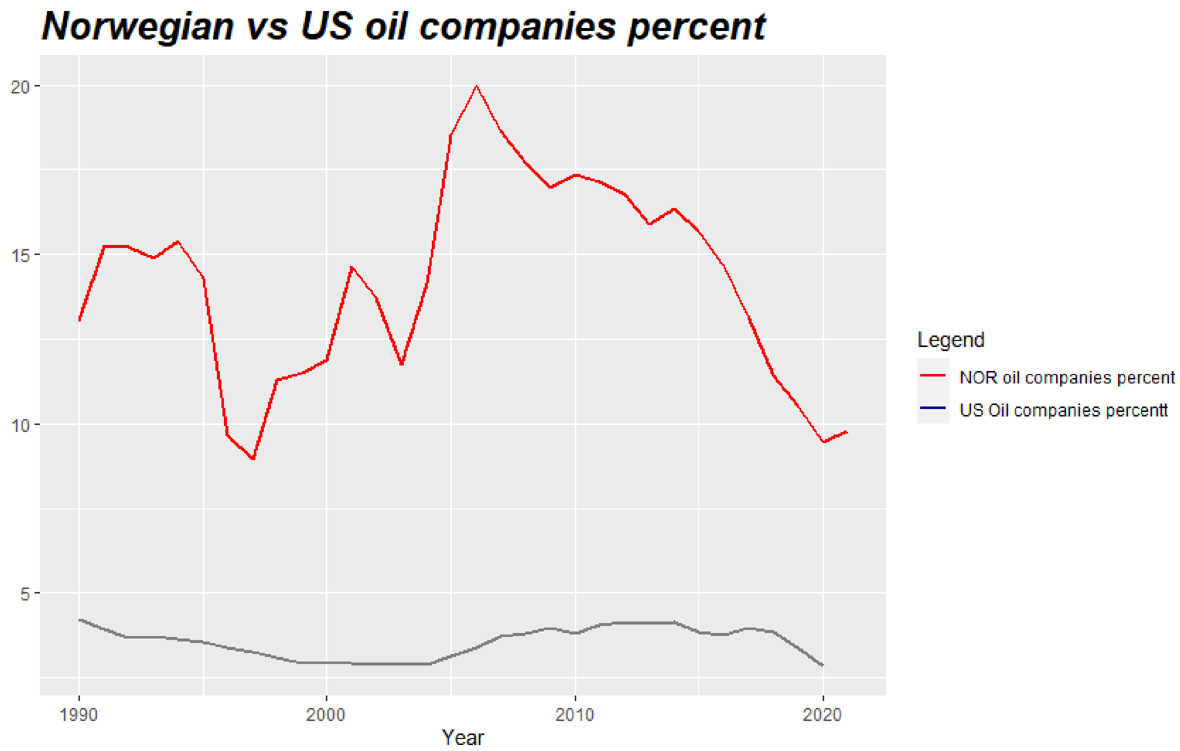

Figure 6: Percent of companies within the oil production or oil service industries in the US and in Norway

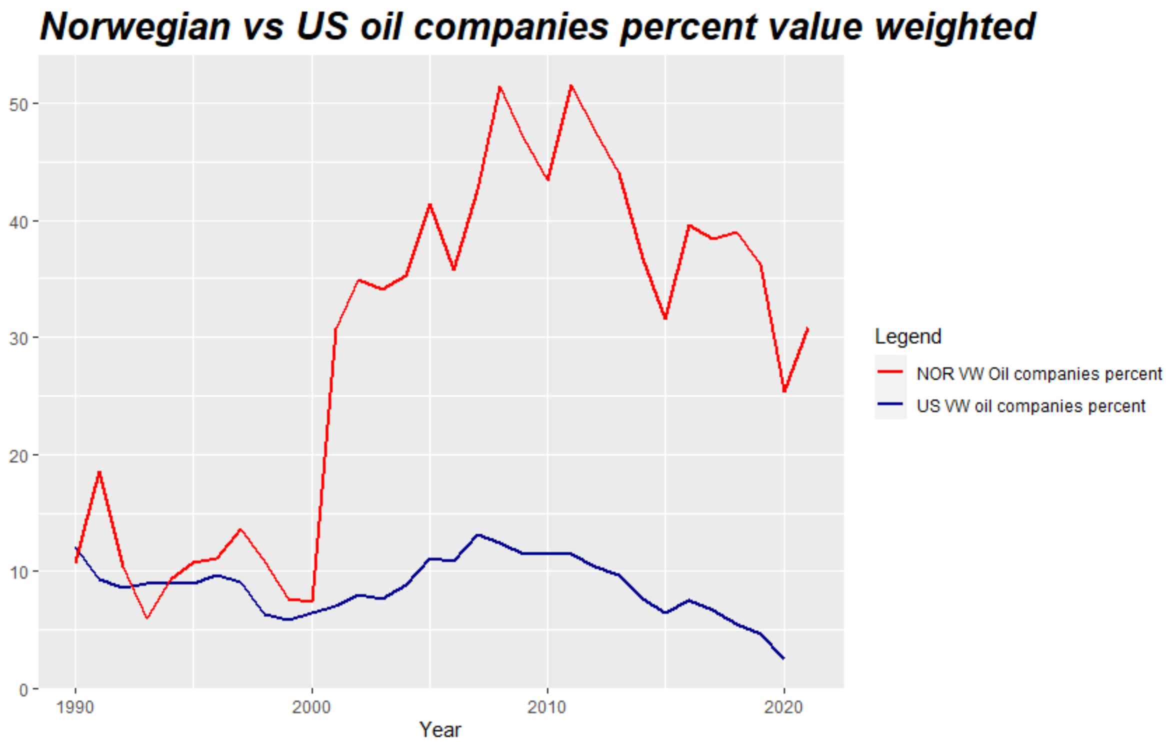

Figure 7: Percent of companies within the oil production or oil service industries in the US and in Norway. Value-weighted using market capitalization in year t.

Additionally, the proportion that singular companies have in weight when value-weighting the Oslo Stock Exchange could have a significant impact on our results. For instance, the spike in value-weighted percent of oil companies in Norway in 2001, which we see it Figure 7, was caused by Equinor going public on the Oslo Stock Exchange (Equinor, n.d), as seen in Figure 8. Afterward, the oil sector has been between 30 and 50 percent of the whole OSE market value. The weight of Equinor will in particular have a substantial impact on the results when using our methodology of value-weighting. Equinor reached up to 45% of our model weight at its peak in 2007. As shown in Figure 2, the Norwegian ACCRUALS are also closely follow that of Equinor. This is underlined by regressing the entire markets' accruals on Equinor's accruals. Therefore, the extreme values of ACCRUALS and CF, which are dependent on an equation of earnings and accruals in the late 2010s, are in major part caused by Equinor. Hence, Equinor will likely impact and be a strong driver for studies using aggregated figures from the Oslo Stock Exchange.

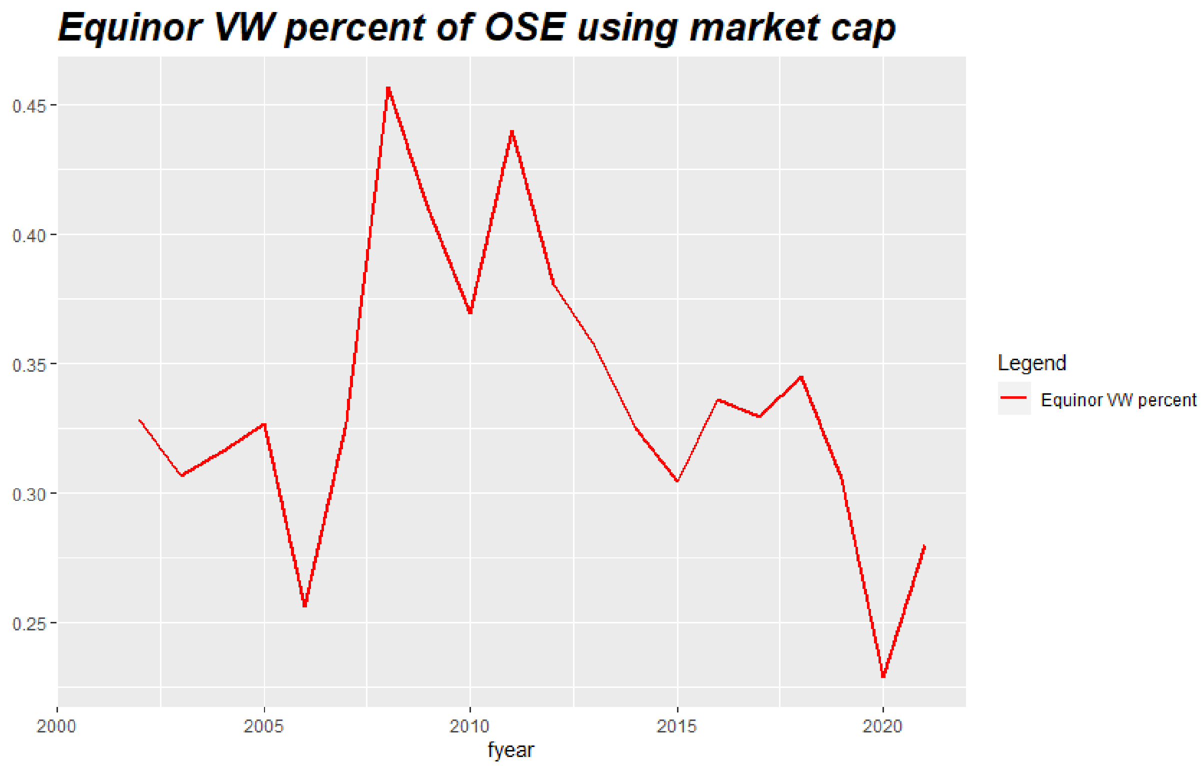

Figure 8: Equinor value-weighted percent of the Norwegian stock market using market capitalization. The percentage is calculated after excluding missing observations in our data sample.

Another limitation is the low concentration of listed firms in Norway. Norway is a market with a few hundred stocks and some disproportionate large ones will be a weakness of our approach. However, Equinor is highly present in the OSEAX index. Since it is calculated using market cap weights of all shares on the Oslo Stock Exchange, excluding the accruals and cash flows of this particular company might be the wrong approach to examine statistical inference. Equinor is also included in other broad weighted indices from the Oslo Stock Exchange, such as OBX and OSEBX, so we cannot change index to exclude Equinor from our models. These indices also exclude several other companies and might therefore be even more unfavourable when asserting the Norwegian market as a whole. As OSEAX is value-weighted, we cannot exclude Equinor from our independent aggregated variables. Therefore, our modelling is at risk of being too dependent on firm-specific shocks, which might lead to our results deviating from other findings where aggregated level reduces firm specific-level effects.

4.5.4 External validity

Even though our results are significant for the Norwegian market, there are factors that are important to take into consideration when using our findings on other markets. The external validity of our findings is strengthened by the fact that ACCRUALS are significant in the models for both US and Norwegian samples and for different time periods than previous findings (Hirshleifer, Hou, & Toeh, 2009). In addition, LaFond (2005) finds that the accruals anomaly is a global phenomenon, which implies other markets having similar results.

However, our finding on the cross-effect of US cash flow on Norwegian return could be dependent on Norwegian economic reliance on the US, and we don't find this effect to go the other way around. Therefore, using US data on less US-dependent markets could imply different results. Further, for the Norwegian sample regressed on Norwegian market returns, the results can be impacted by the nature of the Norwegian market composition, opposing threats to the external validity of our results. The Norwegian market is highly oil-dependent and based on a few companies where some of them hold a substantial portion of the value-weight. Therefore, markets with other compositions could lead to deviating results. Finally, the short time period used in the Norwegian sample could implicate period-specific effects that also could deviate from longer and other time periods. The difference in significance of the CF in the two markets also signifies the differences in the markets we have studied.

Altogether, these factors could threaten the external validity of our results and should be taken into regard when utilizing our findings on other markets.

5. Conclusion:

In this thesis, we have assessed whether the accruals anomaly is present in the Norwegian stock market. We have also studied the accruals anomaly in the US, and US accruals' impact on Norwegian return. By using aggregated accounting variables, we limit firm-specific noise that could affect our results. We use several macroeconomic measures as control variables to take into regard market trends outside earnings components effects, thereby controlling for potential omitted variable bias. By using Newey-West heteroskedasticity and autocorrelation robust standard errors, we limit the risk of autocorrelation and small sample bias affecting our results. Using our model on US data confirms that our approach is aligned with previous studies on the subject. Further, we assess the same effect for the Norwegian market, and test if US accounting information can impact Norwegian return.

Our findings indicate a strong effect of accruals on one-year-ahead stock market returns when controlling for macro variables in the Norwegian market. We find concurring results to previous papers when studying the US market with accruals having a strong effect. US accruals seem to have no effect on Norwegian returns, while US cash flows do. We find no effect of earnings on return, indicating that the decoupling of cash flow and accruals is essential for predicting future market returns.

Our results have further been asserted in light of efficient and inefficient market theory. We find indications for our findings being aligned with previous efficient market theory explanations for the accruals anomaly. Specifically, accruals could serve as a proxy for risk, and its correlation with the discount rate could explain our results given an efficient market. Also, we evaluate if accruals can be linked with changes in expected earnings. We find that accruals being a leading indicator for firm growth is a possible explanation for the accrual anomaly. Our results for US accruals and US return, and for Norwegian accruals on Norwegian return is in alignment with this explanation. However, we find potential flaws with this reasoning and are cautious about implying that our study aligns accruals with changes in expected earnings. Additionally, other studies find that the accruals and discount rate relation lack empirical support, which is also a weakness of efficient market explanations for the accruals anomaly.

Regarding inefficient market theory, our result from the Norwegian sample indicates that the accruals anomaly might be explained by earnings manipulation. Norwegian accruals are negatively aligned with Norwegian earnings indicating that management "leans against the wind". Our results of US accruals regressed on Norwegian return are also aligned with the inefficient market theory that US earnings manipulation doesn't signify Norwegian market undervaluation. The positive correlation between accruals and earnings in the US indicates low wide-spread earnings manipulation in response to undervaluation in the US. This signifies that our coefficient of US accruals on US returns cannot be explained through earnings manipulation and inefficient market theory.

Therefore, we find weaknesses in both the efficient and inefficient market explanations of our results. However, accruals strongly correlate with future returns in all our regressions for the Norwegian market. Thus, independent of the explanation, our findings indicate that the accruals anomaly is present in the Norwegian market. As a result, investors should take this investment approach into regard when investing in Norwegian market-based portfolios. However, we find specific characteristics of the Norwegian market that can affect our results' external validity. Therefore, we recommend a thorough assessment of market similarities before our findings can be applied to investment strategies in markets outside Norway's borders.

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