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1.0 Introduction

Insider trading is broadly defined as a trade in a security done by an individual with access to information about the security that is not publicly known. A primary insider or a secondary insider can execute insider trades. This study will focus on news oriented primary insider trades notified on the Norwegian Stock Exchange (OSLO). Primary and secondary insiders is separated by how you obtain your information, where a primary insider is an individual who possesses inside information by the state of his position, employment or responsibilities, a secondary insider is someone who knew or ought to have known that his information was insider information. Section 3-2 of the Securities Trading Act define inside information as precise information relating to a financial instrument which still is not available to the public and is likely to have a significant effect on the price of a financial instrument. More specifically primary insiders on OSLO is according to section 3-6 any member of the board, senior employee, member of the control committee and auditor associated with the issuing undertaking. And according to section 4-2 they are obliged to immediately give notification of any purchase, sale, exchange or subscription of shares issued, including if the company are to trade in its own shares.

Throughout the time of respectively the SEC (Securities Exchange Commission) in the US and Finanstilsynet in Norway, insider trading has been regulated. Such regulations have and still are heavily debated. Proponents list up three factors of why insider regulations are harmful; i) loss of liquidity in the market, (ii) perverse managerial incentives, and (iii) perception of unfairness and loss of faith in capital markets. Those who might be affected by insider trading are among others, market professionals, investors and liquidity traders. For instance market professionals receive competition from informed investors that sits on information the market has difficulties to get a hold on. Naturally there are people both for and against insider trading regulations, and lawmakers are currently trying to create a regulatory environment that accommodates information efficiency benefits of insider trading while minimizing the negative effects on investor confidence.

“Insiders might sell their shares for a number of reasons, but they only buy them for one; they think the price will rise.” - Peter Lynch

Previous studies suggest that insiders can, and do earn abnormal returns by conducting an insider trade. However, our method is designed to estimate the return that focuses on the informativeness of insider trades for other investors. All over the return on the stocks depends on many things, the nature of the investment, the kind of insider investing, and other characteristics unique to each firm.

We will also investigate the effect of investors' reaction and abnormal returns surrounding forecasts and news from celebrity-analysts and -investors to examine if media coverage is positively related to investor reaction. In this paper we define celebrity as a person who is famous or well publicized, known for his performance-related qualities (Boorstin 1987). Our prediction is that celebrity status will have an effect on investors not only because of their superior performance, but also because of the familiarity these names represent. People tend to aspire and mimic successful people; thus, they hold much sway over which stocks that is considered to be a good bet. The respect given to these celebrities based on individual skill and past success is sometimes so strong that they can affect the movement of the market by investing or suggesting that developments might occur. Past research has found clear evidence that media can influence people's beliefs or behaviour in general. Over the years, media has devoted more attention to the stock market and its key players. Recent research shows that the media plays an important role in the stock price formation process, however, with primarily focus on firms and not analysts and investors. We have handpicked three analysts and four investors, which has received a high amount of media attention over our chosen time period. We will investigate the influence of the analysts Stig Myrseth, Albert Collett and Peter Hermanrud, and the investors' Øystein Spetalen, Arne Fredly, Olav Trøim and Blystad.

This study will examine the short term effects of following insider trades. We will also compare this to following celebrity-analysts, and -investors known by investors on the Oslo Stock Exchange. These will be compared in a way of opportunities to exploit the lack of the strong-form efficiency in the market. We will use the most recent second hand data available from the OBI website. We

have chosen a time period of five years. Lasting from 2012-2016, it will reflect price behaviour in a time were among others the oil price cracked.

2: Literature review

Since our research is threefold, involving the efficient market hypothesis, insider trading and celebrity-analyst/investors, no previous research has considered them all together. Thus, we need to focus our literature review on each subject individually. While the efficient market hypothesis and insider trading has been subject to extensive research over the past decades, following celebrity-analysts/investors however, is more uncharted territory. Most of the recent research and at least the most cited research have covered the US stock markets, and although we are to use the Oslo Stock Exchange for our research, we will collect theory and inspiration from articles and research on the US stock market. We assume the rules around insider trading is quite similar for the Norwegian Finanstilsynet and the SEC, hence the theory and literature used is valid for the Oslo Stock Exchange. Researching the field around following insiders or famous analyst/investors can prove to be of significant importance, as if it violates the efficient market hypothesis and whether each strategy can be better than following the market index. Furthermore it can provide better understanding around how information can give you an advantage in the market. In our case, investors could potentially have a strategy that will earn them abnormal returns.

2.1 Efficient market hypothesis

The efficient market hypothesis, also known as the random walk theory, is a hypothesis stating that current stock prices fully reflect available information about the value of a firm, and that it is impossible to earn abnormal returns compared to the overall market, by using known information. It's a hypothesis that has been subject to massive research, respectively been supported and rejected countless times. The efficient market hypothesis can be said to be an illusion of how a market would look like in a perfect world. The term "efficient market" was first used in a paper from 1965 by E.F.Fama who said that: "in an efficient market, on the average, competition will cause the full effects of new information on intrinsic values to be reflected instantaneously in actual prices."

There are three forms of market efficiency, weak, semi-strong and strong form efficiency. The weak form is said to incorporate past prices and information, the semi-strong form suggests that the market fully incorporates all publicly available information and the strong form incorporates all information both public and private. Financial markets such as the Oslo Stock Exchange is said to be more of the semi-strong form of efficiency. When studying the semi-strong form, it is possible to earn abnormal returns for an insider, but not for an outsider following these signals, as the information is already reflected in the price. However, if the trade is done illegally, i.e. the market expects insiders to have more knowledge, or if trading is done on non-public information, there could be a possibility to earn abnormal returns. Generally the EMH questions the ability of financial analysts and investors to find mispriced securities. We will in this paper compare two strategies against the EMH, both short and long term, to test validity of the hypothesis.

2.2 Insider trading

Glass (1966) presented some of the first acknowledges research on insider trading. In his study, he examined the possibility to earn abnormal returns using insider information, by comparing a portfolio containing insider stocks to the market. This was the start of closer studies of insider trading as it gave evidence of abnormal returns. Insider trading has since been heavily discussed and debated both on a corporate level as well as on the theoretical concept of market efficiency. While opponents of insider trading argue that insider trading decreases market liquidity, proponents suggest that insider trading fosters efficient capital markets by improving the accuracy of stock prices (Muelbroek 1992). Previous research has focused on two of the primary issues we will address in this paper: i) the performance of following insiders, and ii) the timing of insider trading.

2.2.1 The performance of following insider trading

What are the returns to following insider trading? This is a question that has scientific implications for the study of market efficiency. The performance of following insider trades is typically measured by examining the abnormal returns

generated within a given period of time. Prior research indicates that insider buying (selling) activity precedes positive (negative) abnormal returns that persist over relatively long time horizons. Meaning, investors may benefit from the knowledge of previous insider trades, which is consistent with the fact that the financial press and investment advisors frequently provide information on insider trading activity (Sivakumar & Waymire 1994).

Seyhun (1998) concludes that several different trading rules lead to profits. He examined the aggregate level of insider trading within firms in the US, on a month-by-month basis, classifying each month as a “buy” or “sell” month based on the type of transactions that had the highest quantity of traded shares. According to his research “buy” -months yielded returns of 4.5%, while “sell” -months yielded -2.7% in the following 12 months.

Research by (Eckbo and Smith 1998) of insider trading on the Oslo Stock Exchange, finds that the abnormal performance disappears when insiders actual value-weighted portfolio returns are used or when a multifactor market model allowing for time-varying expected returns is applied. Neither the conditional Jensen's alpha or the conditional portfolio weight performance measure indicates abnormal returns by insiders. The results are in stark contrast to most of the other literature, by questioning if insider trading can generate abnormal returns. Their research also highlights the shortfalls of using event-studies, as used by Seyhun and other researchers, on studying long-term financial relationships.

2.2.2 The Timing of Insider Trading

Research on the timing of insider trades analyses the connection between when the insider trade is conducted and the announcement of firm-specific events. Seyhun (1992) defines a “timely” trade as one that profitably predicts the earnings news. In other words, sales prior to negative news and purchases prior to positive news would be considered “timely”. Informed trading prior to the disclosure of price sensitive sends a signal of mispricing to the market. Thus, insiders appear to avoid trade before forthcoming news events, takeover announcements, management forecasts of earnings, and earnings announcements. An insiders ability to trade is somewhat limited by the environment and regulations within the

market they operate, which has resulted in different results from past studies performed on the topic.

Increased insider trade regulations have been found to be associated with shifts in insider trade activity from periods that precede earnings announcements to periods that follow earnings announcements. Which is consistent to prior research that insiders appear to avoid trade before pending news events because of heightened litigation risk that surrounds these events (Jagolinzer & Roulstone 2007).

2.3 Celebrity analyst/investors

Following celebrity analysts and/or investors is a theme that is not much covered in financial theory. According to research done by Bonner, Hugon and Walther (2005) the level of media coverage can affect the initial market reaction to the celebrity analysts forecast revisions.

Fang and Yasuda (2013) find evidence that skill differences do exist and that they tend to consistently beat the market, and other analysts/investors. However, due to timing disadvantages, following these celebrity analysts gives more limited returns. In our study we are to examine more on the side of the followers and effects of the potential returns on following such media covered analysts and investors.

3. Main Theory and Hypothesis

Insider trading has been a popular topic for discussion amongst academics, the media and the financial environment for decades. Both researchers and investors have tried to challenge the market efficiency theory. The attention towards the topic is of great importance when considering the fact if CEOs, CFOs and other primary insiders uses their superior information to gain an advantage over non-informed investors to obtain abnormal profits.

3.1.1 Insider trading

Insider trading is a theory of law and information, and Finanstilsynet supervises related trading. Hence, it's highly relevant to carefully follow the laws of insider trading as earlier mentioned in the introduction.

3.1.2 Efficient Market Hypothesis (EMH)

According to the efficient market hypothesis (EMH), all new information should be fully reflected in the price of an asset. As a consequence, one should not be able to earn consistent abnormal returns on a trading strategy based on corporate events. However, numerous studies on insider trading have documented two claims. First, corporate insiders earn abnormal returns on their stock transactions. Second, outsiders can also earn abnormal returns by using the publicly available information concerning insider trades (Rozeff & Zaman 1988).

3.1.3 Asymmetric Information

The potential for one to have private information about the value of the security that is not known to the trading partner is referred to as asymmetric information. To understand why asymmetry can affect the market, one can use the example of buying a used car. As the seller knows more about the car than the buyer, the buyer will naturally wonder if the seller is trying to get rid of the car because it is a "lemon". In extreme cases of information asymmetry, trading may cease altogether (Bodie, Kane & Marcus 2011).

3.2 Hypotheses

We will in our preliminary introduce our thoughts and approach to whether it is possible to obtain abnormal returns by following celebrity-investors/analysts and/or transactions made by insiders trading. To investigate this we have formulated the following hypothesis and sub-hypotheses that we will test by using data from the Oslo Stock Exchange.

Main hypothesis:

Will a strategy consisting of following celebrity investors/analysts outperform a strategy that follows informed investors (insiders).

The main object of this event study is to compare two strategies up against each other. If there are to be any point in comparing these strategies we must first test them against a benchmark portfolio, in this case a calculated expected return if the stock receives no news concerning insider/celebrity trades, to see whether any of them are superior to choosing a more simple and less time-consuming strategy, like investing in the market index. Our hypothesis will be tested on a number of short-term strategies from 1 day to half a year. In order to test our main hypothesis we must create two sub-hypotheses. Further and more detailed explanation is provided in the methodology section.

Sub-hypothesis 1:

Following insider trades earns abnormal returns.

Sub-hypothesis 2:

Following celebrity-investors/analysts earns abnormal returns.

4. Methodology

4.1 Event Study

To test for abnormal returns and its relationship with insider trading, we will adapt an event study methodology. The main weakness compared to our model is the fact that it holds the level of risk constant, which again could bias long run testing, thus also affect the measure of risk adjusted abnormal returns (Kothari and Warner 1997). More recent research has found approaches, which takes this effect under consideration. Eckbo and Smith (1998) and Zeckhauser (2003) used respectively an approach with different weighting algorithms and equally weighting, constructing monthly portfolios adjusting for risk to achieve a more reliable result, while Zeckhauser used a tracking portfolio. This approach consists of a replicating portfolio where the higher volume traded firms have a greater weighting than the less. While we are looking for short-term effects we believe an event study is the method that serves us best. An event study describes a technique of empirical financial research that enables an observer to assess the impact of a particular event on a firm's stock price. This technique is similar to earlier studies on the topic. The general approach starts with a proxy for what the stock's return would have been in the absence of the event. Abnormal return is estimated as the difference between the stock's actual return and the chosen benchmarks return. If the changes are to be notable we need to assume rational and efficient markets (McWilliams and Siegel 1997). The same model will be used for both investigating the effects of following “celebrities” and insiders.

4.2 Abnormal Returns

In order to look for abnormal returns we need a way of finding the expected return to compare what would have happened to the stock should not the studied event occur. Either using the CAPM or the market model can do this. Another option is to use the market index, and assume the asset follows the market at a regular basis. Current theory states that no particular benchmark is superior to another. However, the capital asset pricing model (CAPM) is the most applied model when simulating event studies. Even though the model is widely used it contains restrictions as it only allows for one parameter to explain the return. Therefore we choose to apply both CAPM and Fama and French's three-factor model. The main

difference is that the latter one allows for three parameters to explain the return. The extra variables is price/book ratio(HML) and the relationship between small and big firms (SMB). We use daily data, hence the abnormal return on an asset (i) for a given day (t) is calculated by:

$$AR_{i,t} = R_{i,t} - E(R_{i,t})$$

Where R(i,t) is the given return that exact day, and E(R(i,t)) is the expected return without any specific trading news connected to the stock. Respectively CAPM and our three-factor model will look like;

$$R_{i,t} = \alpha_i + \beta_{i,t}R_{m,t} + u_{i,t}$$

$$R_{i,t} = \alpha_i + \beta_{i,t}R_{m,t} + \gamma_{i,t}SMB_{i,t} + \delta_{i,t}HML_{i,t} + u_{i,t}$$

An important assumption to such a statistical framework is that the standard errors are independently distributed, where the error term are the difference between the actual return and the normal return in the given estimation window, hence:

$$E(u_{i,t} = 0)$$

$$var(u_{i,t} = \sigma_{u_i}^2)$$

We then run an OLS (ordinary least squares) regression to collect estimates for each variable.

In order to achieve returns over a given time period we will use cumulative returns of each asset. And finally we will use cumulative returns on average to get our full portfolio analysed. This gives us the following calculations for each stock:

$$CAR_{i,(t_1,t_2)} = \sum_{t=t_1}^{t_2} AR_{i,t}$$

$$CAAR_{i,t} = \frac{1}{n} \sum_{t=0}^n CAR_{i,(t_1,t_2)}$$

To test the significance of our results we will use standard t-statistics.

$$T = \frac{CAAR_{i,t}}{SE(CAAR_{i,t})}$$

In order to be sure that we get all the volatility of the stock in our regression we need to choose a long enough estimation window. Prior theory on the subject suggests that a period of 100-300 days should be used. MacKinlay (1997) argues

between 180-250 days, and accordingly we choose to use a window of 250 days. We want to see the effects in an event window of (-1,1)(0,1)(0,5)(0,20)(0,60) and (0,120) trading days.

By choosing such event windows we get scenarios over six different time periods and therefore also immediate effects and up to half a year. This helps us to see how the trades move compared to the EMH. Such information can help attain different types of trading strategies.

In order to test our models we need the normality assumption to hold, and accordingly with Henderson (1990) geometric returns give stronger normality returns. Hence, we choose to use a logarithmically approach in calculating our returns. A second reason for this is due to the fact that they are calculated as continuously compounded returns. This makes it easier accumulate returns across time periods, and we get our calculations as time-additive. Hence, our calculations will be obtained from the following equation:

$$R_{i,t} = \ln\left(\frac{p_{i,t}}{P_{i,t-1}}\right)$$

5. Data collection

The next step will be to collect data from selected databases. This includes familiarizing ourselves further with servers and systems that will be able to retrieve the data needed. In order to manage that task, we will have to further investigate the manner in which the various financial database process and output our requested data. As of this moment, we are still in a planning-stage of this process, thus, we have only taken a few assumptions and choices regarding our data: this paper will be limited to only focus on the Norwegian stock market. Our time horizon will be between 2012 and 2016 to capture the most recent observations. We will also exclude actions which is associated with other corporate actions, i.e. options, bonus shares, since they are not initiated by insiders, hence, generally not driven by private information.

6. Future progress

Plan	Deadline
Collect and clean data	February-March 2017
Structure and test hypotheses	March 2017
Interpret and comment on results	March-April 2017
Further structuring	May 2017
Deliver first draft	End of May 2017
Review, add and finish thesis	June-September 2017
Deadline	September 1st 2017

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