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Thesis

«Do financial celebrities affect stock prices?»

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Abstract

Through the media, there seems to be general consensus that financial celebrities affect stock prices. We investigate this issue by studying the mandatory notifications of trade and the corresponding stock returns on OSE in the period from 1992 to 2008. We find that stocks that are bought and sold by these investors earn abnormal return in the short term. The immediate effect of a buy is larger than the effect of a sell, however, through the full short term event window the total effect of a sell is larger than the effect of a buy. In both cases there is an underreaction to the announcement, increasing the trading possibilities for other investors. Our findings imply that there exists a celebrity premium and that the celebrity trading, through herding in the market, affects the stock prices. The herding itself may be caused by the celebrities' stock picking ability related to superior private information, the value of having an experienced investor as shareholder and other investors' overconfidence in the celebrity investors. Either way, our study indicates that herding is individually rational in the shorter term, but not on an aggregate level. In the longer term we observe an incomplete reversion concerning a buy, while stocks sold by the celebrity investors continue its downward slope in terms of abnormal return.

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1. Introduction

There are frequent headliners in the Norwegian financial newspapers reporting that a stock sky rocketed after being bought by a financial celebrity and vice versa if the stock instead was sold. The media is constantly concerned with this, rationalizing and explaining the development in the markets as reactions to these trades. The trades are not only given their own headlines, but are also included in stock comments describing today's or this week's activity. In other words, these trades are given great attention in the financial news press and the celebrity investors are presented as herd leaders, which is what we will study in this thesis. The media is either correct in general, that the celebrities really affect stock prices, or the media is carefully picking a combination of celebrity trades and abnormal stock performance in order to present a good story. The latter would not be surprising, while the former would be interesting from an economic point of view. If these investors affect stock prices through trading alone, an analysis of this mechanism is interesting both in terms of theoretical finance as well as in terms of actual trading possibilities.

If the financial celebrities really affect stock prices, we should document a celebrity premium. We define "celebrity premium" as the excess return on stocks traded by the celebrity investors, exceeding the return implied by the market model. As shorting stocks is possible, the term is also valid for a stock price decline. Our analysis reveals that stocks bought by the celebrity investors earn an immediate cumulative abnormal return of 5.11% in the three days around the event day[1], with a continued drift of 2.77% from day 2 to day 15. This implies that there is in fact a significant celebrity premium. Similarly, stocks sold by the celebrity investors earn an immediate cumulative abnormal return of -4.43% in the event window around the transaction, with a continued drift of -7.13% in the following 13 days. These returns are both statistically and economically significant for both purchases and sales. This implies that the celebrity investor have the most immediate impact on the market when revealing a positive view on a company. However, the most overall impact on the market when revealing a negative view on a company throughout the full short term event window. In

[1] When considering days in this thesis, it should be understood as trading days relative to the announcement day.

addition, the premium indicates that there is herding in the market. The development of abnormal returns in the 21-day event window implies that there is an underreaction following the event, and rather than reversion we observe that the abnormal return is increasing in the entire short term window with the same sign as the immediate effect. This implies that the market participants are herding in a rational sense, as they are part of the rise in stock prices. In the longer term, the impression of underreaction is more uncertain. In the case of a buy, we observe that the stocks yield positive abnormal returns in the first 6 months, followed by a partial reversion with negative abnormal returns in the following 6 months. In the case of a sell, the stocks continue their downward slope, with negative abnormal returns, throughout our whole event period, however flattening out towards the end of our one year event window after the announcement.

A study of financial celebrities' separate impact on the stock market has, to our knowledge, never before been conducted in Norway. However, a closely related study of the American investor Warren Buffett and his company Berkshire Hathaway, have been conducted by Hughes, Liu and Zhang (2010), revealing that investors should be able to earn similar returns as Buffett simply by following his investments decisions. This however, is seldom the case and the authors attribute this to underreaction caused by investors' overconfidence[2] in her or his own abilities, neglecting the possibility of Buffett's superior private information. Our study is also closely related to studies of herd behaviour, rationality and the role of media. In addition, studies of insider trading are relevant, due to the fact that many celebrity traders are insiders. Regarding herd behaviour, a growing body of literature is devoted to the aspect, however taking different paths.

In the simplest form, financial herding is defined as a group of investors trading in the same direction over a period of time (Nofsinger and Sias 1999). Imitation and mimicry are perhaps one of our most basic human instincts and it is a prominent belief that investors are influenced by the decision of other investors (Welch 1996). A further definition of herding may be difficult to state, however Welch has stated that herding is clearly related to behavioural patterns. The two polar

[2] Note the twofold use of "overconfidence" throughout this study as a result of the twofold use by several authors of financial studies. Overconfidence is either understood as overconfidence in others or as overconfidence in yourself, as in self-confidence.

views of herding in the literature are the non-rational and the rational view of the mechanisms driving herd behaviour. The non-rational view focus on investor psychology and claims that investors follow one another blindly and foregoing rational analysis, while the rational view focus on externalities and claims that optimal decision-making is being distorted by information difficulties or incentive issues (Welch 1996).

Also related to herding, Shiller (2000) has stated that aspects of overconfidence imply trusting experts. While focusing on the irrationality of herding he also states that herding may also be individually rational, but irrational as group behaviour, arising from information cascade defined as theories of "the failure of information about true fundamental value to be disseminated and evaluated". Scharfstein and Stein (1990) have suggested that managers simply mimic the investment decisions of others to avoid the risk of being "lone fools" and also "sharing the blame", and that herding could provide a partial explanation for excessive stock market volatility. Relating herding to the media, Tetlock (2007) have found that high media pessimism predicts a downward pressure on prices and the findings suggest that media content serve as a proxy for investor sentiment or non-informational trading.

The financial celebrities involved in our sample represent a small group of wealthy investors well known for their business activities, either through entrepreneurship, pure investments or both. The small group of people of course implies that the same people have been observed buying todays and tomorrow's winners over and over again and the general public may very well perceive them to make good decisions and a substantial return in the stock market. Their good performance in the past, affecting the media coverage and their status as celebrities constitutes a selection bias. This bias has however been avoided in this study, as we have only included observations occurring after their status as celebrities already have been acknowledged.

What we have studied in our thesis is whether investors defined as financial celebrities are affecting the stock market, by studying the mandatory notifications of trade in the period 1992 to 2008. We add to the literature by studying three issues; first, we aim to study what we have defined as a celebrity premium. That

is, whether these investors earn an abnormal return without any other obvious explanation. Second, we would like to study whether the investors in fact function as herd leaders that are being followed by the other investors. Third, we would link the results to the aspects of market reaction, market efficiency, confidence and rationality.

Due to lack of data, our study is not conclusive on all topics, but instead suggesting possible explanations. For instance, traded volume is only available for a limited number of observations and therefore excluded. In addition, the model of normal returns should have included a variable for analyst recommendations in order to remove the effect of possible correlated information arrival in independently acting investors (Welch 1996). Historical analyst recommendations is however also unavailable for most of our observations. Another challenge is that the investors are often trading in companies where they are insiders. Insider trading however is regulated through the Norwegian Securities Trading Act, and trading on undisclosed information is prohibited. A study by Eckbo and Smith (1998) confirms that insiders, in general, do not earn abnormal return. Einarsen (2009) on the other hand concludes in the opposite direction and finds that insiders earn, on average 1.3% abnormal return in the three days around the day of announcement. These studies are not consistent with each other, and the documentation of abnormal returns is not of the same magnitude as our results. Therefore, the implication of abnormal returns accruing from insider information is disregarded in this study. However, for drawing inferences from this study of the Norwegian market to an aggregate international market, this implication should be reconsidered based on insider studies in other countries.

Having these implications in mind, this study implies that the celebrity investors are herd leaders in the Norwegian market, that there is a celebrity premium, and that it is possible to earn an abnormal return by trading the same stocks which our sample of celebrities trade, due to the underreaction and lack of reversion in the short term. In the longer term the argument for stocks sold by the celebrities follow the same pattern, while the picture is not so decisive when it comes to stocks being bought due to a partial reversion of the abnormal returns.

2. Literature review

Up to this point, little research has been conducted on the specific topic of financial celebrities and whether they affect stock prices. Although the literature considering financial professionals trading is growing, the exact field of financial celebrities is not as well studied. The exception is the American study of Warren Buffett (Hughes, Liu, and Zhang 2010) as previously mentioned. However, there is important literature to consider in closely related fields of finance. The literature is divided into three main categories; the first part of this review focuses on financial professionals. The second on herding in the financial markets, while the third part reviews research regarding media's role in the financial markets.

2.1 Financial professionals

Although the study of Warren Buffett is the only one we have found conducted on the specific topic of financial celebrities, there are several studies of the performance of financial professionals' performance in the stock market. Financial experts are a vaguely defined group, ranging from financial analysts, brokers, portfolio managers, journalists in financial newspapers, and others who are considered a professional for some reason, and it is reasonable to believe that the financial celebrities also fit in to this group. One study by Womack (1996) shows that the recommendations of financial analysts affect stock prices, and induce initial abnormal returns as well as a drift in the following period. This is attributed to the analysts' stock picking ability, and the drift indicates that the analysts are gathering relevant information. Further, Coval et al. (2005) finds that some individuals also are able to outperform the market. The authors divided their sample of traders into two, and measured if the top 10% traders the first period continued to be the best in the next period. Their conclusion is indeed that the best traders continued to outperform the worst 10% with about 8% per year, and that if other investors mimicked these 10% best, they would earn an abnormal return of 5 basis points each day. Another relevant study for our paper is Hughes, Lui and Zhang (2010), where the authors have analysed the market reactions of the trading by the famous American investor Warren Buffett. Their findings are that the market underreacts to news about changes in the portfolio of Berkshire Hathaway. If market participants had actually mimicked this portfolio by buying and selling the same stocks immediately after they are made public, they would have earned

approximately the same abnormal return as Buffett himself. The authors attribute this to overconfident investors, who are put too much weight on their own information, disregarding the information revealed by the portfolio announcements of Berkshire Hathaway.

2.2 Herding

The literature on financial professionals indicates herding, either implicitly or explicitly. Therefore a thorough explanation of this phenomenon is relevant. Herding is a well-known phenomenon in financial markets, and has been given a lot of attention in recent studies. The main idea behind the concept of herding is that investors tend to follow each other, mimicking the trading performed by others rather than to follow their own intuition and beliefs. This may lead to exaggerated movements in stock prices, which is the subject of our analysis. Further, the literature is divided into the two polar views of herding; the irrational and the rational view.

A discussion on irrational herding is found in the book Irrational Exuberance by Robert Shiller (2000). Here, Shiller describes the phenomena of herding in the financial markets. In order to explain herding, several experiments are cited, saying that when someone's actions are considered "cannot be wrong", then one would act in the same manner. Shiller also cites another experiment and states that "people have learned that when experts tell them something is all right, it probably is, even if it does not seem so" (159). These issues are all related to the aspect of overconfidence. Shiller continues with that even completely rational people can participate in herd behaviour when they take into account the judgements of others, and even if they know that everyone else is behaving in a "herd-like" manner. Although individually rational, the group behaviour would be irrational, arising from information cascade, defined as "theories of the failure of information about true fundamental value to be disseminated and evaluated" (152).

While Shiller argues that herding is irrational, Devenow and Welch (1996) reviews models of rational herding. The prevailing model in modern research is the model of information cascade. This theory explains that although one investor has negative information, it will be overshadowed if there are indications that

other investors have positive information. This reaction will continue, as investor will bid up the price of the company based on other investors implied information.

Further, Scharfstein and Stein (1990) presented an article on herd behaviour and investment, and how managers simply mimic the investment decisions of other managers. Although such decisions may be inefficient, they take place because managers are concerned with their reputation and the risk of being "lone fools". As with all unpredictable components, prediction errors occur. However by mimicking they will also be "sharing the blame". Several effects may therefore drive herd behaviour, many of them psychological. The authors, more relevantly, also relates the same basic insight to the stock market, where herd behaviour could provide a partial explanation for excessive stock market volatility and the amplification of exogenous shocks. Related to our topic, the psychological aspects provided in this study may explain why investors mimic other, well-known investors in order to compensate for the unpredictability in the market.

So far we have focused on literature concerning individual psychological patterns. In order to be able to significantly move prices in a certain way, we find it reasonable to believe that institutional investors also represent a part of the herd of investors at Oslo Stock Exchange. Nofsinger and Sias (1999) document strong positive correlation between changes in institutional ownership and returns. They claim that these results suggest that either institutional investors positive-feedback trade more than individual investors or institutional herding impacts prices more than herding by individual investors. In addition they find that stocks purchased by institutional investors subsequently outperform those they sell in the following year, revealing no evidence of irrationality. The authors further argue that price momentum after herding is consistent with herding moving prices towards equilibrium and is thus stabilizing. If momentum traders drive the prices too high, the concern is that this would ultimately cause a price bubble. Further, Kim and Nofsinger (2005) have investigated herding and feedback trading by institutional and individual investor in Japan, a country known for its long-term business relationships. These relationships allow for the institutions to have better private information than outsiders. Herding based on this superior information is referred to as investigative herding. Different types of firms, during different economic regimes were analysed, concluding that herding affected current-, prior- and

subsequent year's return. This may be directly related to our research in the way that the financial celebrities may have, or are believed to have, private information, even though Norway has a different business culture.

2.3 Media

In the process of gathering data, our starting point was the Atekst-database of the largest Norwegian newspapers. The reason for this is that a search in newspapers is an efficient way to identify celebrities. An implication of this method of celebrity identification is that we cannot exclude the possibility that the media coverage actually plays a role in itself, in addition to the celebrity effect. If the media play a role in changing stock prices it would be related to our thesis, because our sample of financial celebrities have a large exposure in the media. The media also act as a messenger, providing an informational connection between the herd leaders and the rest of the market.

Tetlock (2007) have investigated the role of media in the stock market. The author found that high media pessimism predicts a downward pressure on prices, followed by a reversion to fundamentals. In addition, high or low pessimism usually also predicts high trading volume. The findings suggest that measures of media content serve as a proxy for investor sentiment or non-informational trading. The author's motivation has been to provide theories of abnormal movements in the stock market that are seemingly unjustified by fundamentals, as we might observe in our study.

Fang and Peress (2009) have investigated the relation between media coverage and expected stock returns. Mass media has a broad reach and the hypothesis is that security pricing is affected, even if the media does not supply genuine news. However, as one might expect this effect, the study shows that stocks with no media coverage earn higher returns than stock with high media coverage. It seems to be, what the authors name, a "no-media premium". The authors provide two main explanations, namely that it is a liquidity phenomenon or a compensation for imperfect diversification. The study further on indicates that the media effect is stronger the more incomplete the information is to begin with, as with small firms, with low analyst coverage and high fraction of individual ownership. The authors also provide an important implication of media content, that due to publication

delays, it is unlikely that the information provided is actual news. In our own thinking, this may also be the case for non-printed media, as there still are sources of delay present. This is in fact one of the reasons why we have chosen to only use Newsweb data.

Although the literature on our specific topic is limited, the literature in closely related fields is comprehensive, and what we would utilize further on in this study is how financial professionals operate in the market and the phenomena of herding. Most importantly, the evidence that the best traders continue to outperform the market based on their stock picking abilities and how other investors may earn abnormal returns by mimicking these trades. However, in order to explain our results and offer explanations to the induced phenomena of financial celebrities affecting stock prices, behaviour finance offers highly relevant psychological aspects to consider. Most importantly is the aspect of herding and whether or not this action is rational.

3. Research question

The purpose of this paper is to investigate if financial celebrities affect stock prices. By focusing mainly on the short term, we will try to find if there is a celebrity premium as defined in the introduction. Such a premium would imply that the celebrity investors constitute positive or negative news to the market and hence work as herd leaders that are being followed by the other investors.

The main research question is hence if financial celebrities affect stock prices. In order to test this hypothesis we have focused on other sub-questions in order to capture the different effects, and their economic implications. First of all we aim to document the celebrity premium in the short and longer term, and why there is such a premium. Second we aim to document whether these celebrities are herd leaders in the market, and whether or not this herding is rational. We also want to analyse if there are different results in the case of a sell or a buy, because it provides insight regarding the reactions on perceived positive versus negative news.

The main hypothesis is that financial celebrities affect stock prices, and do this through inducing positive or negative news to other investors, encouraging them to herd and hereby induce an abnormal return, i.e. the celebrity premium. We also expect that the herding is irrational in the longer term, so that the abnormal returns occurring is later reversed. Intuitively there should not necessarily be a fundamental reason for a company's value to increase (decrease) significantly with several percentage points because a certain person buys (sells) stocks. However if the abnormal returns continue in the following months, it would be an indication of that the celebrities reveal relevant value enhancing information. This would further imply that the herding is rational. We also believe that the sign of the returns are dependent upon whether it is a purchase or sale. In other words, the celebrity investors work as herd leaders, leading other investors to bid the price up (down).

4. Data

The observations in this study were found using three databases; the Atekst-database, the Newsweb database provided by Professor Øyvind Norli and Thomson Datastream. Atekst is a search engine within the Retriever database, and is the leading provider of historic news media content. The Newsweb database is the official database of the Oslo Stock Exchange (OSE) where, among other, data on mandatory notifications of trade and disclosures of large shareholdings are announced in real time. The Thomson Datastream is a comprehensive database of stock market data, where the returns are gathered.

4.1 Identifying the events

In order to identify the events we must first identify the financial celebrities. To identify the most prominent financial celebrities, we used the Norwegian newspaper database Atekst[3]. We have defined a "financial celebrity" as a person who has been described as either "bjellesau", "profilert investor" or "kjendisinvestor" in the major newspapers. The newspapers which we searched within were Dagens Næringsliv and Aftenposten in addition to the online news providers E24 and iMarkedet. This procedure however, instantly raises the

[3] https://web.retriever-info.com

question of a selection bias. This bias occurs when the persons recognized as a financial celebrity in the news achieved this recognition on the basis of the lucrative trades we later on include in our sample. To avoid this type of selection bias we therefore note the date and year when the investor first was recognized as a financial celebrity by the media. The trades prior to this date would suffer from selection bias and therefore be excluded, while the trades after this date would be unproblematic, as the investor is already perceived to be a celebrity, but not on the basis of the included observations. Our search returned in a list of 28 investors in the period 1992 to 2008, listed in Appendix 1.

Second, as most financial celebrities are known to trade through their companies rather than in their own name, these companies were found using the same newspapers, as well as the Brønnøysund Register Centre (Brønnøysund Register Centre)[4]. The Brønnøysund Register Centre also includes the NACE industry code required for all companies, enabling us to distinguish between operational and pure investment and holding companies. This procedure of collecting the celebrities trading companies may not capture every company, and we might lose some observations by the fact that we have not identified the company. However, our experience from gathering data in Newsweb is that the name of the celebrity usually is mentioned together with the name of the company in the announcements.

Third, the Newsweb database was used to gather information on mandatory notifications of trade. Mandatory notification of trade is regulated by the Norwegian Securities Act (Norwegian Securities Act 1997)[5]. Mandatory notifications of trade occurs, in short, when primary insiders perform trading, or with changes in ownership that hits, exceeds or falls below 5%, 10%, 15%, 20%, 25%, 1/3, 50%, 2/3 and 90% of the shares or voting rights. The law also regulates the required information to be included in the mandatory notification, most importantly, the name of the trader suspect to the mandatory notification (person or company), why the trading is subject to the notification as well as the time of the trade.

[4] http://www.brreg.no
[5] Norwegian Securities Act §4

As described, the Newsweb database provides real time data, enabling us to identify exactly when the market was informed about the transaction. This is a feature which would not present if the data was gathered from for example newspaper articles, where the information is delayed for an unknown period of time. Note that since we would like to study the announcement effects, as well as the effect in the longer term, we use the date of the notification, not the date related to the actual trade which is typically one day prior to the notification.

In Newsweb, we searched for both the name of the investors, as well as their companies. At this stage, the sample of 28 investors was reduced to 18, as ten of the investors lacked observations. The reason for this may be that these investors trade through unidentified companies, or that their trading is not subject to a mandatory notification of trade as described by the Norwegian Securities Act. Prior to filtering this returned 287 observations, related to the 18 investors.

As earlier mentioned we used the Brønnøysund Register Centre in order to distinguish between operational and pure investment and holding companies. Observations involving an operative trader rather than a pure investment- or holding company were deleted, in order to avoid effects of synergies and strategic trading that could affect stock prices for other reasons than the celebrity effect that we analyse. Removing these observations constitutes of removing 86 observations from the sample. Further filtering involved removing observations related to mergers, equity issuing and acquisitions involving voluntary and mandatory offers, based on information enclosed in the mandatory notification. Removing these observations constitutes of removing 24 observations from the sample. Both these filtering operations help ensure that observations that typically involve large fluctuations in stock prices, due to other reasons than what we would like to study, does not impact our results by creating a bias.

Final filtering involved removing overlapping observations, caused by the investors trading in the same stock for consecutive days. This causes problems in the event windows, because one observation may be included as a separate event, while it is also included in the post-, or pre-event windows of other observations and thereby bias the results drawn from these windows. Our solution to this problem was to only include the very first of the overlapping transaction, and

delete the rest from our sample, in order to increase the power of our inferences. Removing the overlapping observations constitutes of removing 26 observations from the sample. Finally, due to missing stock market data 38 observations was removed. Although the filtering has been comprehensive, reducing our sample from 287 to 113 observations, we believe that these operations have been necessary in order to isolate the celebrity effect.

After this filtering we were left with 113 observations related to 13 investors, and the final sample is distributed as in table 4.1. One obvious observation is that the sample consists of only men. A reason for this may be that there are not very many women who have status as a celebrity in the financial markets, and that those who are, do not trade enough to be captured by the media. Another aspect of our sample is that it consists of 76% purchases and only 24% sales, which may cause the results of our analysis to be more powerful for shares bought than shares sold. Another potential problem with the distribution of our sample is that John Fredriksen constitutes a very large part of the total number of observations.

Table 4.1

List of the sample of the celebrity investors, based on mandatory notification of trades after final filtering and removing observations related to missing stock market data.

	Purchases	Sales	Total
John Fredriksen	31	2	33
Kjell Inge Røkke	3	0	3
Trygve Hegnar	2	1	3
Øystein Stray Spetalen	4	7	11
Jan Haudemann Andersen	6	5	11
Jens Ulltveit Moe	14	1	15
Christen Sveaas	5	1	6
Arne Blystad	7	5	12
Tore Aksel Voldberg	1	2	3
Idar Vollvik	4	1	6
Edwin Austbø	1	0	1
Bjørn Rune Gjelsten	6	1	7
Dagfinn Sundal	2	1	3
Total	86	27	113

We have investigated the possibility of any specific firm characteristics in terms of market to book-ratio and past return. The descriptive statistics are presented in table 4.2, however, we have found no evidence of any specific firm characteristics of the companies being traded by the celebrity investors.

Table 4.2

Average market to book ratio and average past 12-months return for the firms in the sample.

	Firm characteristics				
	Min	Max	Mean	Median	Std.dev
Market to book	0.24	35.05	2.55	1.99	3.76
Past 12-months return	-84.81 %	469.25 %	41.58 %	17.30 %	1.00

4.2 Stock market data

We had to match our sample of companies with historical stock price data. These data were gathered in Thomson Datastream for the period -125 to + 252 trading days around the observations. The data gathered were "return index", which assumes that dividends are reinvested in the company. This approach will smoothen out the effect of the sudden movements in the pure stock price that occurs e.g. in the event of stock-splits and after ex-dividend day.

We have chosen to use the market model, based on the OSE return index including all companies except the 10% smallest. This index was provided by Professor Øyvind Norli and covers our estimation- and event windows.

4.3 Weaknesses in the data

The data in this study may suffer from some drawbacks. It would have been beneficial to match our observations with analyst recommendations to see if our sample of financial celebrities follows these to some extent, and therefore is a partial explanation of our results. The problem we encountered was that some of the stocks in our sample are small and have little or no analyst coverage dating back to 1992. Another drawback in the data is that our sample of trades is mostly inside trades, which could induce a bias in the results. This is a result of the Norwegian Securities Act much stricter regulations towards insiders rather than share of ownership. However, the literature on insider trading gives no consensus

as to whether insiders actually do earn abnormal return in the Norwegian market. Eckbo and Smith (1998) reports that insiders do not earn any abnormal returns, while Einarsen (2009) present evidence that insiders earn an immediate average abnormal return of 1.3% in the three days following the trade.

5. Methodology

In the analysis, we have applied an event study approach outlined by Brown and Warner (1985), and further developed by several other authors. This methodology is designed in order to analyse a well-defined event, and its impact on stock prices. In our case, the event itself is the mandatory notification of a transaction reported on Newsweb and thereby reaches the public. In an event study, there is an estimation window, and an event window. The event window we analyse is further divided into three; one pre-event window which spans from five to two days prior to the event, an event window which spans from one day before and after the event, and a pre-event window which spans from two to 15 days after the event. This approach allows us to isolate any movements before the event, the event itself, and whether or not there is a positive or negative drift in the days following the event.

In order to decide whether or not the observed returns are abnormal in any direction, we need to define normal returns, using an estimation window spanning from 125 to 6 days prior to the event. The literature provides several examples of such methods such as the Capital Asset Pricing Model, Arbitrage Pricing Model, the market model, and the constant return model. Although the constant return model, using a daily normal return of 0.05%, is considered sufficient in a short term event study (Kothari and Warner 2007), we have followed a market model approach in our study. This is done because we want to reduce the variance from the market, and because we could draw more precise inferences when we compare the results from the short and the longer term analysis. The abnormal returns follow the formula given by equation 5.1 in all the models.

$$AR_{it} = R_{i\tau} - E(R_{i\tau}) \qquad [5.1]$$

It is the $E(R_{i\tau})$ which separate the models, and in the market model the expected return is found using equation 5.2, where the individual stock prices are regressed as the independent variable with the market returns as the dependent variable. The estimation period used is 125 to 6 days prior to the event.

$$E(R_{i\tau}) = \alpha_i + \beta_i R_{m\tau} \quad [5.2]$$

The market model assumes that the expected returns on firm *i* and the market return follow a linear relationship. This eliminates the variance of the market movements in the period, and results in a smaller variance in the results. The coefficients in equation 5.2 are calculated using the OLS estimator.

In the short term analysis, we have found it reasonable to include five days prior to the event and 15 days after the event. The reason for this is that we want to be able to measure if there is any drift before the trade is publicly known, in order to see if it could be any information leakage in the market. Other reasons for this drift is also that the celebrity himself often trades in the preceding days, hence there is a possibility that he might bid up or down the price before he reports the transaction to the market. We have also included 15 days after the event, in order to measure any possible drift in the price in the days following the transaction. We have divided the analysis into tree windows; the pre-event window, the event window and the post-event window. To illustrate more formally, a transaction is reported at t=0. The pre-event window (L_1) stretches from t= -5 to t= -2, the event window (L_2) is from t= -1 to t=1 and the post-event window (L_3) stretches from t=2 to t=15.

Our longer term analysis is designed to analyse the drift in a longer horizon after the transaction, in order to detect any reversion or underreaction not captured in the short term study. The longer term event window is divided into four periods; the first spans from month 0 to 3, the second from 3 to 6, the third from 6 to 9, and the fourth window covers the period from 9 to 12 months. The estimation period for the longer term analysis is the same period as used in the short term.

In order to be able to draw inferences from our study, we need to aggregate our observations of individual abnormal returns. We start by finding the average

abnormal returns ($\overline{AR}$) across securities for each trading day, using formula 5.3. We then find the average cumulative abnormal returns ($\overline{CAR}$) for each window that we analyse, using formula 5.4.

$$\overline{AR}_\tau = \frac{1}{N}\sum_{i=1}^{N} AR_{i\tau} \quad [5.3]$$

$$\overline{CAR_i}(\tau_1, \tau_2) = \sum_{t=\tau_1}^{\tau_2} \overline{AR_{it}} \quad [5.4]$$

These operations yield three CARs in the short term and four in the longer term analysis; one for each period. In order to test the hypothesis that the cumulative abnormal returns are significantly abnormal (i.e. significantly different from zero), we have to find a measure for the variance in order to calculate standard errors. This approach is similar to the one applied by MacKinlay (1997), and the following t-distributed test statistic is used:

$$t = \frac{\overline{CAR}}{SE(\overline{CAR})} \sim N(0,1) \quad [5.5]$$

The standard error of the average CAR is found by formula 5.6.

$$SE(\overline{CAR}(\tau_1, \tau_2)) = \sqrt{\frac{1}{N^2}\sum_{t=\tau_1}^{\tau_2} \sigma_{\varepsilon_i}^2 (\tau_1, \tau_2)} \quad [5.6]$$

The variances in 5.6 are the variance from the residuals of the regression.

For comparison reasons we have also applied the constant return model for normal returns in the short term study, however our analysis is conducted and the empirical results presented on the basis of the methodology using the market model, as described above.

6. Empirical results and discussion

The results are organized as follows; first we present the main results from our short term analysis before we perform sensitivity analysis of the data in order to detect bias in any way. The results are then linked to herding through the issues of

market reaction, market efficiency, confidence and rationality. The short term analysis is followed by a longer term analysis in order to capture post event effects in a longer perspective. After presenting the results, a discussion on the celebrity premium is presented together with the trading possibilities arising from the results.

6.1 Short term celebrity investor performance

We have estimated abnormal returns using an ordinary event study approach as described in section 5. Table 6.1 contains the estimates of abnormal and cumulative abnormal returns for the days -5 until 15. Considering the event of a buy we observe a sudden increase in abnormal return to 1.77% at day -1 and an even further jump to 2.79% at day 0. The cumulative abnormal return moves correspondingly. The abnormal return from day -5 is cumulating to 8.15% for a buy, through day 15. The abnormal returns are cumulated in order to observe the total effect, illustrating that the cumulative abnormal return is more of less increasing in size throughout the full event window. The small abnormal returns prior to the events imply that the celebrity trading is unpredictable for other investors, however they might observe abnormal trading and increased demand prior to the actual notification. This might explain the abnormal return at day -1.

In the event of a sell, the (negative) cumulated abnormal return is larger. After first observing small abnormal returns, we observe consistent negative abnormal returns from day -2, cumulating to -12.77% through day 15. Note that unlike in the case of a buy, the results from using the market model with sell results in larger negative abnormal returns compared to using the constant return model as found in Appendix 2 and 3. This is most likely to be caused by the market itself going up, increasing the gap of returns.

Table 6.1

Average abnormal return and average cumulative abnormal return at the different event days. 86 and 27 observations.

	Market model			
	Buy		Sell	
Event day	AR	CAR	AR	CAR
-5	-0.32 %	-0.32 %	-0.67 %	-0.67 %
-4	0.26 %	-0.06 %	0.55 %	-0.12 %
-3	-0.10 %	-0.16 %	0.43 %	0.31 %
-2	0.43 %	0.27 %	-1.53 %	-1.22 %
-1	1.77 %	2.03 %	-1.22 %	-2.44 %
0	2.79 %	4.82 %	-2.70 %	-5.14 %
1	0.55 %	5.38 %	-0.51 %	-5.64 %
2	0.20 %	5.58 %	-0.97 %	-6.62 %
3	0.42 %	6.00 %	0.48 %	-6.14 %
4	0.34 %	6.34 %	-0.56 %	-6.70 %
5	-0.67 %	5.67 %	-0.41 %	-7.11 %
6	0.40 %	6.07 %	-1.07 %	-8.18 %
7	-0.20 %	5.86 %	-0.58 %	-8.76 %
8	*1.15 %	7.01 %	-0.41 %	-9.17 %
9	-0.09 %	6.93 %	-0.05 %	-9.21 %
10	0.11 %	7.04 %	-0.53 %	-9.74 %
11	0.66 %	7.70 %	-0.88 %	-10.63 %
12	0.16 %	7.86 %	-1.05 %	-11.68 %
13	0.43 %	8.29 %	-0.90 %	-12.58 %
14	0.02 %	8.31 %	-0.20 %	-12.79 %
15	-0.16 %	8.15 %	0.01 %	-12.77 %

* The observation is caused by activity in the Altinex stock.

These results confirm our hypothesis, clearly indicating that there is a celebrity premium related to the trades performed by the celebrity investors. In other words, holding the stocks traded by the celebrity investors will on average result in a celebrity premium of 8.15% for a buy and -12.77% for a sell, also confirming our hypothesis regarding the sign of the abnormal returns. We also observe that trading in the stocks after the celebrity transaction is known to the rest of the market would still result in abnormal returns due to drift. These observations indicates that there is herding in the Norwegian stock market, most possibly lead

by the celebrity investors. These findings are also illustrated in Figure 6.1, clearly indicating that there is underreaction, with a positive drift with stocks bought and a negative drift, with stocks sold.

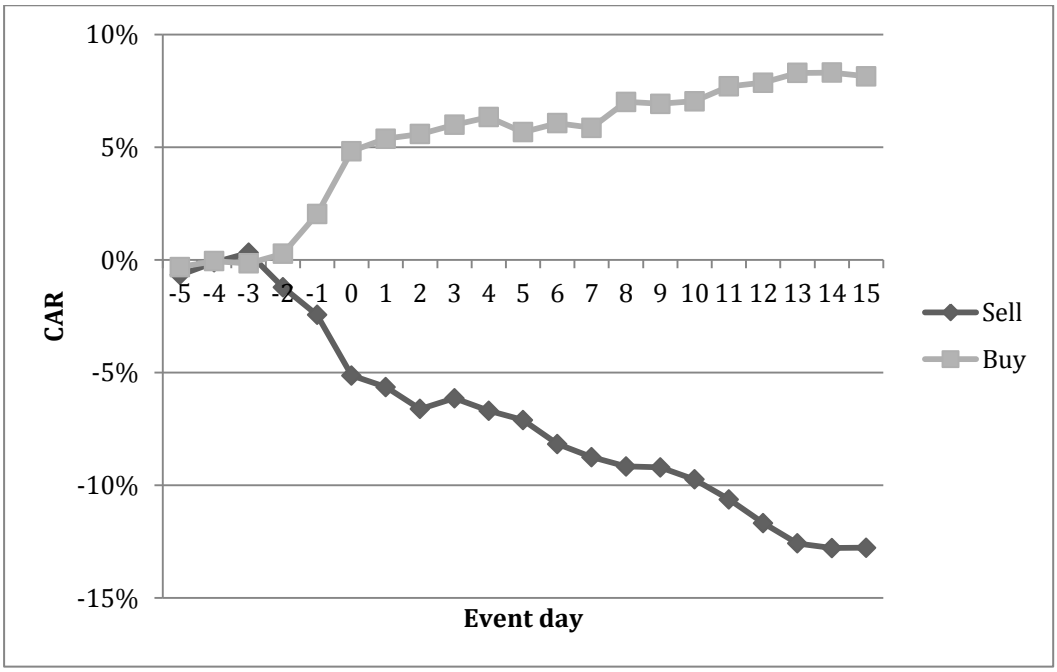

Figure 6.1: a plot of the average cumulative return in the days around the transactions.

In the rest of the short term analysis, we have divided the event window into three smaller windows, in order to be able to (1); measure if there is any drift prior to the transaction, (2); isolate the effect of the transaction itself and (3); to see if there is any drift in the days after the event. If there is any significant abnormal return prior to the event, this might indicate that the rumour spread among the broker community. Another possible explanation for this is that the celebrities are forced to bid up the price in order to be able to purchase the stocks in the market, as some of our trades are actually transactions that have been made in the preceding days, before they were reported to the market through Newsweb. If we find any drift in the price in the following days, this could potentially have several reasons that we will discuss later on.

Table 6.2 contains the abnormal returns for the event period from day -5 until day 15, divided into these smaller event windows. For a buy, these event windows reveal a small abnormal return of 0.26% prior to the event, an abnormal return of 5.11% around the day of the event and then a smaller abnormal return of 2.77%

thereafter. For a sell, there is an abnormal return of -1.22% prior to the event, a larger abnormal return of -4.43% around the day of the event, increasing to an abnormal return of -7.13% thereafter. This indicates that although much of the new information is incorporated in the prices around the event, the information is still not completely captured in the price as we still observe a positive drift for a buy and a negative drift for a sell in the third window. For the first window, the observed movement may occur as the abnormal trading is observed in the market, although with an unknown investor, because the mandatory notification of trade is arriving later. The results are both statistically as well as economically significant, although more powerful in the case of a buy due to the relatively small sample size in the case of a sell.

Table 6.2

Cumulative abnormal returns in the tree different event windows. 86 and 27 observations.

	Market model					
	Buy			Sell		
Event window	CAR	t		CAR	t	
-5 until -2	0.26 %	0.72		-1.22 %	-1.20	
-1 until 1	5.11 %	8.89	*	-4.43 %	-3.19	*
2 until 15	2.77 %	6.97	*	-7.13 %	-13.58	*

* Significant at a 1% level, ** Significant at a 5% level, *** Significant at a 10% level

6.2 Sensitivity analysis

One problem with our sample is that there is one person with nearly 30% of the observations. In order to avoid the risk of making a biased generalized conclusion about the celebrity investors' performance, the abnormal returns have also been calculated without the single largest investor as well as solely with the single largest investor. This reduces the sample size to a large degree, but an event study approach is still possible to conduct. In doing this, extraordinary performance by one single investor will not bias the results as a whole. Referring to table 4.1 in the Data section, John Fredriksen, who contributes the most to the sample, have both been removed and studied separately, resulting in returns as seen in table 6.3.

The tests have only been conducted on buy, as the same analysis for sold stocks would suffer from small sample size and hence have low power.

Table 6.3

Cumulative abnormal returns for a buy in the tree different event windows. Estimated for the single investor and all others separately. 31 and 55 observations.

	Market model					
	Buy, Single investor			Buy, All other investors		
Event window	CAR	t		CAR	t	
-5 until -2	-0.39 %	-0.81		1.01 %	1.95	**
-1 until 1	2.18 %	4.04	*	7.21 %	8.87	*
2 until 15	4.10 %	8.08	*	1.28 %	2.08	*

* Significant at a 1% level, ** Significant at a 5% level, *** Significant at a 10% level

We observe some differences in the estimates for the single investor and all other investors, however the single investor John Fredriksen does not bias the result. With the single investor we first observe a small negative cumulative abnormal return of 0.39% prior to the event, a positive abnormal return of 2.18% around the day of the event then increasing to 4.10% in the last event window. For all other investors there is a positive abnormal return of 1.01% prior to the event, a large positive abnormal return of 7.21% around the day of the event, and a smaller positive abnormal return of 1.28% in the last event window. The results are both statistically, as well as economically significant.

In order to help explain the findings of our study, we will now link the results to herding through the issues of market reaction, market efficiency, confidence and rationality.

6.3 Market underreaction

Figure 6.1, as previously presented, clearly indicates that there is an underreaction in the short term event window. From table 6.2 this observation is further documented, stating that although much of the abnormal returns occur in the days around the event, 5.11% and -4.43%, there is still a drift occurring in the following days, in the amount of 2.77% and -7.13%. There is no sign of reversion

in the short term. This implies that the market does not completely price in the new public information immediately and this result leads to question the efficient markets theory in the way that new information, namely the trading done by the celebrity investors, is neither immediately nor completely reflected in the prices. These findings also indicate that the market is inefficient.

6.4 Investor overconfidence

The underreaction documented by the short term analysis indicates that the market is not fully efficient. This is because the news, if it is considered good or bad, should be captured immediately in the stock price, and that no drift should be present. One possible explanation for this underreaction is part of the twofold subject of investor overconfidence.

The abnormal returns evolve as the stock prices increase and decrease. This is a result of increased and decreased demand for the stock suddenly created by the information of a buy and a sell from a celebrity investor. This sudden demand is closely related to investor overconfidence in the celebrity investor. Assuming no other news, the fact that one celebrity investor have bought (sold) stock in itself is considered positive (negative) news. This may only occur as other investors believe in and have confidence in the celebrity investors. However, when this new information in the markets is incorporated over time by the investors, this reveals that they initially tend to put too much weight on their own private information before realizing the value of the new information. This reaction fits our data well in the short term, due to the significant underreaction as well as the immediate increase in abnormal returns.

Investor overconfidence is therefore twofold, as it can occur in two opposite ways. Either the investors have overconfidence in the celebrity investors or they have overconfidence in themselves, as in self-confidence. Odean (1998) also confirms this link between overconfidence and market underreaction. Hypothesis is that the investors are neglecting recent news, overweighting one's private information hence creating the underreaction, as the one we observe in our study.

While investors' overconfidence in their own private information is an explanation for the underreaction, it still does not explain the significant

immediate reaction. This may be due to the other fold of overconfidence, namely overconfidence in perceived expert traders. Shiller (2000) has contributed to the literature by describing investor overconfidence as "trust in experts". Overconfidence in the celebrity investors represents a large part of Shiller's herding literature, where the author states that this issue is what causes prices to increase (decrease) and hence creating the positive (negative) abnormal return, as we also observe in our study. The issue of overconfidence, Shiller claims, is also closely related to herding, in the way that when someone's actions are considered "cannot be wrong", one would act in the same manner. In other words, investor overconfidence may explain the observation of both the abnormal returns as well as the underreaction.

6.5 Rationality in the short term

The issue of rationality is twofold and widely studied by authors like Shiller (2000) and Welch (2000). As there is no sign of reversion in our short time study, but rather underreaction, and trading on such news may be rational and a way for investors to follow the celebrity and earn the percentage points created by the drift. Although rational on an individual level, the same cannot be said at the aggregate level, as that would imply that the stock would continue to grow and hence create an irrational bubble that is doomed to burst sooner or later. This theory can again be linked to Odean (1998), stating that the overconfident investors can cause markets to underreact to the information of rational traders. Based on this study, mimicking the trades performed by the celebrity investors could be individually rational.

6.6 Longer term celebrity investor performance

In section 6.1 we documented a strong reaction, as well as an underreaction, to celebrity trading in the short term. We also want to analyse this in the longer term, in order to see if there are any significant patterns after the short term. The longer term analysis is conducted in the period from the announcement day to day 252 and provides insights into the rationality aspect of our thesis. If there is a significant positive drift after a purchase, which last several months, this indicates that it is rational to follow the celebrities in the short term, in order to be a part of the expected longer term abnormal returns. Figure 6.2 illustrates rather different results between a buy and a sell. In the case of a buy, there is a clear reversion,

although not complete, but in the case of a sell the downward sloping trend continues, however flattens out, towards the end of our event period. These findings confirm the hypothesis of a celebrity premium in the longer term, however only partly confirm our hypothesis of reversion.

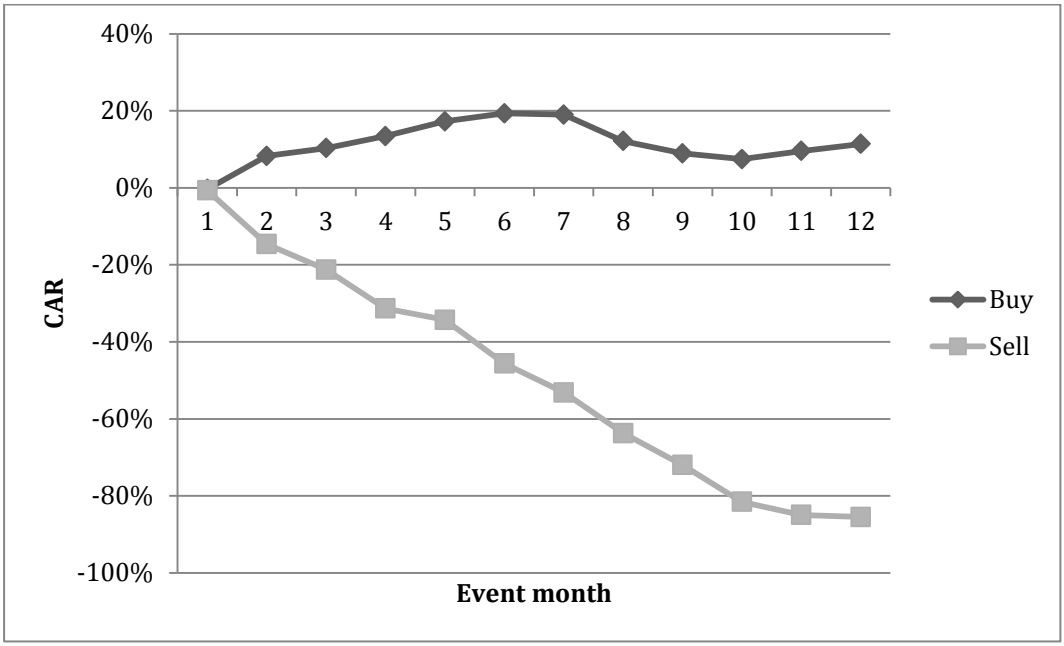

Figure 6.2: a plot of the average cumulative abnormal return of the months following the transactions.

As figure 6.2 illustrates, reversion is present from the months following month 6 concerning a buy. This challenges the findings of rational herding from the short term analysis. As Shiller claims, although individually rational, herding would be irrational on a collective level, because it will induce bubbles. However the abnormal returns are not completely reversed. This implies that although there seem to be an overreaction to the announcement of celebrity trades, the initial short term reaction is still justified.

A closer look at the abnormal returns in each event window confirms the reversion observed in the figure. In table 6.4 we have used the same procedure as in the short term analysis, and it clearly show the reversion in the case of a buy.

Table 6.4

Cumulative abnormal returns in the four different event windows, denoted in months. 86 and 27 observations.

	Market model					
	Buy			Sell		
Event window	CAR	t		CAR	t	
0 until 3	11.12%	31.93	*	-33.52	-52.15	*
3 until 6	6.5%	19.91	*	-15.42	-25.04	*
6 until 9	-8.01%	-23.28	*	-15.75	-25.25	*
9 until 12	-0.23%	-0.52		-20.82	-33.2	*

* Significant at a 1% level, ** Significant at a 5% level, *** Significant at a 10% level

In table 6.4 we have divided the longer term event window in four windows of three months that describe the development in abnormal returns. With a buy we observe that the positive abnormal returns are continuing in their existence the first six months. However, from month 3 until month 6 the abnormal return is decreasing in size. From month 6 until month 12 this trend is partly reversed, with a significant negative abnormal return, mainly accruing in the period from 6 to 9 months after the event. In the event of a sell, the negative abnormal return is present throughout the full 12-month period.

In conducting longer term event studies there are several methodical challenges that might bias the results. This is because there are several factors which is important in the evolution of the stock price, other than the celebrity effect we are looking to capture. Kothari and Warner (2007) discuss for example risk adjustment and modelling of normal returns. As a result of these issues we would not be discussing the actual results, in terms of magnitude from the longer term study, but rather conclude that we find evidence of an incomplete reversion in the abnormal returns in the longer term for a buy, and not for a sell. The continued drift followed by an incomplete reversion implies both an underreaction in the first months, as well as a subsequent overreaction to the news of the celebrity trading. In the event of a sell, the negative returns continue to exist.

While the issue of rationality have already been discussed for the short term observations, these findings also imply that mimicking the celebrity trading,

which imply herding in the market, is still individually rational up to the point of the overreaction, as defined by Shiller (2000). At the point where the overreaction occurs, herding becomes irrational.

6.7 The Celebrity premium and trading possibilities

There are several possible reasons for the celebrity premium, implied by the abnormal returns in this study. First, the investors may possess extraordinary stock picking abilities. The celebrity investor's private information would then be superior to other investors' private information. If this is the case then herding would be rational, up to the point of the overreaction which is later on reversed. This is because the uninformed traders would trade in the same manner as the informed, rational traders. Second, having an experienced celebrity investor on board in a company, holding the amount of shares necessary to trigger the mandatory notification, may in itself create value and increase expectations of the company's future value. If this is the case, and the value of the company rationally increases, then herding would also be rational. Third, as already discussed, the celebrity premium may be caused by overconfidence in the celebrity investors, either rational or irrational. The exact reason for the celebrity premium is hard to establish, however this study indicates the existence of such a premium and the possibility of mimicking the celebrities' trades is present as of underreaction and drift in the short term event window. The longer term study reveals sign of an incomplete reversion. In other words, the underreaction has subsequently been followed by an overreaction. Both these issues are related to overconfidence in the same manner as earlier described. However, most importantly, the incomplete reversion in the longer term strengthens the hypothesis of the celebrity investors extraordinary stock picking abilities as well as their ability to create value within a company.

Our research documents significant abnormal returns both in the case of a buy and a sell. The question for practitioners should hence be whether or not this can be used to earn risk-adjusted abnormal returns. Our analysis reveals that if investors for some reason are able to forecast which stock a celebrity will buy, this investor would make an abnormal return of 8.15% on average (table 6.1). This is substantial, considering that it is earned in just 21 days. In the more likely scenario, where investors are not able to forecast which stocks celebrities will

buy, this information is still valuable. If investors mimic the transaction two days after the mandatory notification, they will still earn an abnormal return of 2.77% on average, in 13 days. In the case of a sell, the results also indicate that following the financial celebrities is profitable. If the celebrity sells a stock, other investors should follow by shorting the stock. This would result in, on average, an abnormal return of 12.77% if the investors somehow are able to forecast the transaction and 7.13% if the stock is shorted two days following the announcement.

7. Conclusion

This paper studies the impact of celebrity investors' trading on Oslo Stock Exchange, based on the mandatory notifications of trade and the corresponding development in stock prices. Through our study we have succeeded in confirming our main hypothesis, namely that celebrity investors affect stock prices. Focusing mainly on the short term we have documented what we have defines as a celebrity premium, based on the abnormal returns. These abnormal returns are created by herding in the market, where the celebrity investors represent the implied herd leaders. The results are valid for investors included in the sample, and the performance of the investor with the most observations is compared to the rest, in order to avoid making biased generalizations. In the short term the herding is rational, implied by the underreaction to the news and the corresponding drift in abnormal returns. In other words, the effect is both immediate and continuing. We also observe that the abnormal returns are larger in the case of a sell than in the case of a buy, although both are statistically and economically significant. In the longer term we find that there is an incomplete reversion in the abnormal returns concerning stocks bought, while stocks sold continue its downward drift. This partly confirms our hypothesis on this matter. Based on this study there exist trading possibilities for other investors by mimicking the celebrity investors trading, mainly due to the underreaction in the short term. Three possible reasons for the celebrity premium have been presented. The celebrity investors may possess superior stock picking ability due to private information, having an experienced investor on board in a company may create value and hence increase future expectations and other investors overconfidence in the celebrity investors may induce them to herd.

Further research

The celebrity premium and the inferences drawn in this study are based on announcements reported in Newsweb and the corresponding development in stock prices, analysed within the event study framework. Further research should aim to narrow down the reasons for the celebrity premium, by adjusting for more variables in the model of normal returns. Examples of such variables are if the story has been covered in the media or if analyst recommendations are changing around the time of the announcement. Another important input is the traded volume around the event, in order to get a deeper understanding of the market reactions to such news.

The event study methodology is limited in its scope, especially in the longer term. One alternative could be to utilize the buy-and-hold return approach, and form portfolios of the stocks.

Acknowledgements

We acknowledge the support of our supervisor, Professor Øyvind Norli at BI Norwegian Business School. Our discussions have been helpful in our research and we truly value his advice and interest throughout this project.

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Appendices

Appendix 1: Initial investors

The 28 initial celebrity investors, prior to filtering.

Name	Name	Name
Alexander Vik	Jan H. Andersen	Ola Mæle
Arne Blystad	Jan Petter Sissener	Petter Stordalen
Arne Fredly	Jens Gundersen	Petter Sundt
Bjørn Rune Gjeldsten	Jens Ulltveit Moe	Ronny Åsland
Christen Sveaas	John Fredriksen	Terje Mikalsen
Christian Rytter	Kenneth Sandvold	Tore Aksel Voldberg
Dagfinn Sundal	Kjell Inge Røkke	Trygve Hegnar
Edvin Austbø	Kristian Siem	Øystein S. Spetalen
Einar Nagell Erichsen	Marius Skaugen	
Idar Vollvik	Morten Christian Mo	

Appendix 2: Event day, constant return model

Average abnormal return and average cumulative abnormal return at the different event days. 86 and 27 observations.

	Constant return model			
	Buy		Sell	
Event day	AR	CAR	AR	CAR
-5	-0,27 %	-0,27 %	1,13 %	1,13 %
-4	0,53 %	0,26 %	0,28 %	1,41 %
-3	-0,11 %	0,15 %	0,73 %	2,14 %
-2	0,35 %	0,50 %	-0,82 %	1,31 %
-1	1,71 %	2,21 %	-0,82 %	0,49 %
0	3,60 %	5,81 %	-1,23 %	-0,74 %
1	0,09 %	5,90 %	-0,99 %	-1,73 %
2	0,23 %	6,14 %	-0,35 %	-2,08 %
3	0,47 %	6,61 %	1,12 %	-0,95 %
4	0,34 %	6,95 %	-0,70 %	-1,65 %
5	-0,60 %	6,35 %	-0,01 %	-1,67 %
6	0,18 %	6,53 %	-0,58 %	-2,25 %
7	-0,54 %	5,99 %	0,40 %	-1,85 %
8	*1,18 %	7,17 %	0,24 %	-1,60 %
9	-0,19 %	6,99 %	-0,12 %	-1,72 %

10	-0,12 %	6,87 %	-0,29 %	-2,01 %
11	0,86 %	7,73 %	-0,31 %	-2,32 %
12	0,14 %	7,88 %	-0,91 %	-3,24 %
13	0,66 %	8,54 %	-0,31 %	-3,55 %
14	-0,22 %	8,32 %	0,55 %	-3,00 %
15	-0,12 %	8,20 %	0,34 %	-2,66 %

* The observation is caused by activity in the Altinex stock.

Appendix 3: Event windows, constant return model

Cumulative abnormal returns in the tree different event windows. 86 and 27 observations.

	Constant return model					
	Buy			Sell		
Event window	CAR	t		CAR	t	
-5 until -2	0,50 %	1,35	***	1,31 %	1,76	**
-1 until 1	5,40 %	9,72	*	-3,03 %	-4,04	*
2 until 15	2,30 %	5,28	*	-0,93 %	-2,03	**

* Significant at a 1% level, ** Significant at a 5% level, *** Significant at a 10% level

Table of Contents

Introduction

In our preliminary thesis report we will line out our motivation and the economic problem we have chosen to investigate. In order to increase our knowledge on relevant and similar studies, a thorough literature review has been conducted. We have further on outlined the methodology we would like to use in our study, on the basis of earlier work done by well-known financial researchers. In addition we have provided a data section explaining what data we will use, where we will find it and important implications we need to consider. Although we find this preliminary thesis to be covering most aspects of our study, changes may occur as we precede our work.

1. Motivation and economic problem

1.1 Motivation

There are weekly headliners in the Norwegian business newspapers telling the reader that a stock sky rocketed after some famous person bought shares, or that it plummeted after another person sold the stock. The persons related to these articles are mentioned because they are seen as celebrity investors or "leaders of the herd", and that they implicitly are causing the sudden movement in price. These claims are either true, or they are used as explanations when there is no other obvious reason for the sudden abnormal change in price. Our analysis will hopefully give an answer to this. If the claims are true, we should expect an economically significant average abnormal movement in the stock price when these trades occur.

1.2 Economic problem

We will investigate the stock markets immediate reactions to trades done by people we have defined to be celebrities in the financial markets, and investigate whether they induce abnormal activity. There are indications of herd behaviour in the markets, and we want to see if these people are leaders of the herd, and if so, to what extent.

Our main research question is "Do financial celebrities affect stock prices?" In order to answer this question, and capturing different effects we would like to investigate a number of sub questions. Interesting examples of such sub questions could be to see if there is a difference between a sale and a purchase, if the trades affect the total volume in the stock around the event days and whether or not the change in price is reverting towards its' previous level.

The questions above are interesting as they could reveal relevant information about the mechanisms in the market, i.e. if there is a difference between positive and negative news regarding the magnitude of the effect, if the effect is gone within short time or whether the effect stays and so on. This is important information that can be used further in explaining and understanding the effects and their corresponding implications with respect to psychology and rationality. Such implications are broadly investigated by others, and included in the literature

review. It could also be interesting to divide our sample into different categories, dependent upon what causes the report on Newsweb (inside trading, size of the transaction etc.), before and after the financial crisis of 2008, or other types of sub periods.

Our results will also have implications regarding the efficient market hypothesis, assuming that these people do not reveal any new information about the stocks. This should hold reasonably well due to the fact that it is not allowed to trade based on unrevealed information. If this is the case, the trading activity done by our sample of celebrity investors should not affect stock prices. If however it does show abnormal activity, it indicating increased trading by "ordinary" investors mimicking the famous investors trading, which in turn drives up the prices, and we are back to the question of psychology and rationality in the market. This we will try to detect in our analysis. An interesting feature of this part of the study is to see if there is a reversion back to normal returns (or even abnormal returns with an opposite sign) in the following period, as investors realize that the abnormal price change is not driven by fundamentals. Some of these people however are known to be good business leaders, and it may be considered positive news in itself, if they buy a share of a company. In that case we would expect the effect to be permanent and not reverting. This should however be taken care of one way or the other, and we have a proposal to a possible solution in the data section.

There are also practical implications, as if our results show that there are significant abnormal returns following trades, this could be used in developing algorithms for trading based on this information.

2. Literature review

Up to this point, there has been no research done on this particular topic, as far as we know. Hence, we have to find literature in closely related fields of finance. The relevant literature is divided into two main categories; the first category is related to the efficient market hypothesis and the critique from behavioural finance with particular emphasis on herding and media coverage. The second category is the event study methodology with its possibilities and restrictions. The focus has been on these topics, because we find them relevant to our research

problem. We have also included some articles regarding investor psychology, as this is also important to be aware of.

All the literature reviewed has been obtained from EBSCO, ISI Web of Science or otherwise at the BI Library. The articles reviewed are all well-cited, and mostly published in prestigious journals.

An important paper in the modern theory regarding the efficient market hypothesis is the review article written by Eugene Fama (1970), where he summarizes the research done on the field up to then. This paper describes efficiency in the capital markets as "prices fully reflect all available information". This however is impossible to test, and a further definition of what is meant by "available information" is needed. Therefore, the paper describes three forms of efficiency; weak-, semi-strong-, and strong form efficiency. A weak form of efficiency describes the state in which the information about historical prices is immediately incorporated into the current price. Hence, technical analysis of the stock market is meaningless. Empirical results seem to support this type of efficiency. Next, if the markets are semi-strong efficient, all public information available, other than the stock price (earnings announcements, information about the business cycles etc.) itself, is incorporated immediately, and that fundamental analysis is useless. Strong form efficiency means that all information (public and private) is incorporated into the prices of the securities. This implies that e.g. insider information is useless. The strong form efficiency is weakly supported by research. In a more recent paper, Fama (1991) has refined these statements, by including information about dividend yields, interest rates and so on, in testing for weak form efficiency. The two last types of tests of efficiency (semi-strong and strong), is now called "event studies" and "tests for private information" respectively.

A problem in the tests for market efficiency is the problem of the joint hypothesis (Campbell, Lo, and MacKinlay 1997). This problem is caused by the fact that a model of equilibrium prices, investors' risk preferences etc. is assumed, and then tested on the data. Hence, these efficiency tests are always a test of whether the market is efficient or not, or if the assumed model of expected returns is correct, or both.

A later review article (Fama 1998) discusses the large body of event studies which seem to reject the efficient market hypothesis. The articles reviewed by the author shows that there are both over-, and under reactions in the stock market, and this suggests that the market is not fully efficient (i.e. does not incorporate new information immediately). However, as Fama points out; the evidence of both over-, and under reactions are split into two roughly equal parts, hence these results may be attributed to chance.

There is an extensive literature criticizing the EMH, and we will now proceed with a deeper analysis of the research done on herd behavior and media's influence on the stock market. These are both mechanisms analyzed in the field of behavioral finance, and which are related to our research question.

Several studies of herd behaviour have been performed. Shiller (2000) investigates herd behaviour in his book Irrational Exuberance. Here, the author describes the phenomena of herding in the financial markets, which is the part reviewed here. In order to explain herding, Shiller cites experiments, saying that when someone's actions are considered "cannot be wrong", then one would act in the same manner. Shiller also cites another experiment and states "that people have learned that when experts tell them something is all right, it probably is, even if it does not seem so". These issues are all related to the aspect of overconfidence. Shiller continues with that even completely rational people can participate in herd behaviour when they take into account the judgements of others, and even if they know that everyone else is behaving in a herdlike manner. Although individually rational, the group behaviour would be irrational, arising from information cascade, defined as theories of "the failure of information about true fundamental value to be disseminated and evaluated".

Further, Scharfstein and Stein (1990) presented an article on herd behaviour and investment, how managers simply mimic the investment decisions of other managers. Although such decisions may be inefficient, they take place because managers are concerned with their reputation and the risk of being "lone fools". As with all unpredictable components, prediction errors occur. However by mimicking they will also be "sharing the blame". Several effects may therefore

drive herd behaviour, many of them psychological. The authors, more relevantly, also relates the same basic insight to the stock market, where herd behaviour could provide a partial explanation for excessive stock market volatility and the amplification of exogenous shocks. Related to our topic, the psychological aspects provided in this study may explain why investors mimic other, well-known investors in order to compensate for the unpredictability in the market.

Nofsinger have written two articles on herding and institutional investors, with Sias (Nofsinger and Sias 1999) and with Kim (Kim and Nofsinger 2005). Nofsinger and Sias document strong positive correlation between changes in institutional ownership and returns. These results, they claim, suggest either institutional investors' positive-feedback trade more than individual investors or institutional herding impacts prices more than herding by individual investors. In addition they find that stocks purchased by institutional investors subsequently outperform those they sell in the following year, revealing no evidence of irrationality. The authors further argue that price momentum after herding is consistent with the herding moving prices towards equilibrium and is thus stabilizing. If momentum traders drive the prices too high, the concern is that this would ultimately cause a price bubble.

In the second article, Kim and Nofsinger have investigated herding and feedback trading by institutional and individual investor in Japan, a country known for its long-term business relationships. These relationships allow for the institutions to have better private information than outsiders. Herding based on this superior information is referred to as investigative herding. Different types of firms, during different economic regimes were analysed, concluding that herding affected current-, prior- and subsequent year's return. This may be directly related to our research in the way that the financial celebrities may have, or are believed to have, private information, even though Norway has a different business culture.

Shiller (1984) has written an article on stock prices and social dynamics. Unlike Nofsinger, Shiller has focused on herding by individual investors. He states that, as "investing in speculative assets is a social activity (…) it is plausible that investors' behaviour (and hence prices of speculative assets) would be influenced by social movements". Shiller presents evidence that social movements, fashions,

or fads are likely to be important, or even the dominant cause of speculative asset price movements.

So far we have reviewed several influential articles regarding herd behaviour in the market. The researchers have all found evidence of different aspects of herd behaviour, as well as possible explanations. These results should be useful in our thesis, drawing the parallel to herding in the Norwegian stock market, possible led by the financial celebrities. Further on we would like to review studies regarding the role of media in the stock market. If the media play a role in changing stock prices, this would be strongly related to our thesis.

Tetlock (2007) have investigated the role of media in the stock market. The author found that high media pessimism predicts a downward pressure on prices, followed by a reversion to fundamentals. In addition, high or low pessimism usually also predicts high trading volume. The findings suggest that measures of media content serve as a proxy for investor sentiment or non-informational trading. The author's motivation has been to provide theories of abnormal movements in the stock market that are seemingly unjustified by fundamentals, as we might observe in our study.

Fang and Peress (2009) have investigated the relation between media coverage and expected stock returns. Mass media has a broad reach and the hypothesis is that security pricing is affected, even if the media does not supply genuine news. However, as one might expect this effect, the study shows that stocks with no media coverage earn higher returns than stock with high media coverage. It seems to be, what the authors name, a "no-media premium". The authors provide two main explanations, namely that it is a liquidity phenomenon or a compensation for imperfect diversification. The study further on shows that the media effect is stronger the more incomplete the information is to begin with, as with small firms, with low analyst coverage and high fraction of individual ownership. The authors also provide an important implication of the media, that due to publication delays, it is unlikely that the information provided is actual news. In our own thinking, this may also be the case for non-printed media, as there still are sources of delay present. This is in fact one of the reasons why we have chosen to only use Newsweb data.

As we have not found studies directly related to the one we would perform, we have also chosen to include two studies directly related to different psychological aspect, in addition to an insider study at OSE, the same arena as in our study.

Edmans, García and Norli (2007) have presented a study on sports sentiment and stock returns. By introducing a mood variable, international sports results, the authors have found that losses have a negative effect on the losing country's stock market. In other words claiming that the loss effect in caused by a change in investor mood. Although our study does not involve investors' mood, this study shows that there are diversified psychological aspects of the stock market, and that investors may behave irrationally.

More importantly Hirshleifer (2001) have written an article on investor psychology and asset pricing based on psychological pricing theories. Instead of using the basic paradigms of asset pricing, the author discusses a broader approach based on the psychology of investors, determined by both risk and misevaluation. This is a much less understood model than risk premium in a purely rational dynamic model. An extensive amount of psychological effects is discussed in order to capture the reality, and some of them may be at our interest.

Eckbo and Smith (1998) have written an article on insider trading at Oslo stock exchange. The authors have investigated the conditional performance of insider trades on OSE and found zero or negative abnormal performance during 1985 through 1992, a period with relatively lax insider regulations and enforcement. The result differs from the result of studies performed in US and UK markets, presented by other scientists, however using a different approach. Instead of the traditional event study approach, Eckbo and Smith have developed a new empirical methodology, a construction of a portfolio that tracks all movements of insiders in and out of the OSE firms. Possible explanations for the result are that insiders may only rarely possess inside information or that the value of maintaining corporate control benefits offset the value of trading on such information.

Our thesis will utilize an event study approach, and therefore a thorough review of this literature is required. In the literature review, the Kothari and Warner (2007) will be reviewed while MacKinlay (1997), which provides a more organized setup of how to conduct the study, is reviewed in the methodology chapter. These are both relatively recent articles, and they both review previous influential articles on this subject, like Brown and Warner (1980) and (1985). However, all these articles emphasize much of the same aspects in the implementation of an event study methodology in finance.

The event study literature has become more and more extensive during the last decades, and continues to draw attention. This type of methodology is mostly utilized in the analysis of corporate actions like stock splits, earnings announcements etc., and to test for market efficiency in capital markets. Methodically, such event studies can be divided into two main types, depending upon the length of the event window; long-term and short-term studies. Long-term studies use an event window of one year or more. We will utilize a short-term methodology, and we will not discuss the issues to be considered in conducting a long-term event study.

Event studies have proved to be a powerful tool to analyze specific events within or outside the firm, and to see if these events have any impact. If the period where the event occurs is known with absolute certainty, a sample size of only six observations will be sufficient to detect the effects 100% of the time. However, this percentage is dramatically reduced in the case where the event is not known. In other words; the power of the methodology is high when the time of the event is known with certainty and low if it is not. The article also points out strength and weaknesses regarding sensitivity of the test statistic with respect to the expected return, the variance of the abnormal return and so on.

3. Methodology

We will use an event study approach in our analysis, because it is the immediate effect of the trades that is interesting for us. Craig MacKinlay's article from 1997 outlines an organized setup on how to conduct an event study, which will now be summarized. The methodology is divided into steps, in order to get a clearer view.

Step 1. Define the event of interest and identify the event period. In our case, the event is the trades done by financial celebrities, and the event period is the day it is known and reported to the market. We assume that the market is informed by the Newsweb database.

Step 2. Identify the requirements for the observations to be included in the dataset. In our case, this will be trades on OSE which is reported in Newsweb.

Step 3. Deciding what normal returns are, in order to compare the normal with the actual, and the difference between is defined as the abnormal return (AR) as shown in equation 3.1. The stock returns are gathered from Datastream. The article outlines two different approaches to measure expected returns; the constant mean return model and the market model. In the model of constant mean returns, shown in equation 3.2, the expected return of firm *i* at time τ is equal to the mean return.

$$AR_{it} = R_{i\tau} - E(R_{i\tau}) \quad [3.1]$$

$$E(R_{it}) = \overline{R_{\iota}} \quad [3.2]$$

The market model assumes that the expected returns on firm *i* and the market return follow a linear relationship. This eliminates the variance of the market movements in the period, and results in a smaller variance in the results. The coefficients in equation 3.3 are calculated by using the OLS procedure and are therefore the OLS estimators.

$$E(R_{i\tau}) = \alpha + \beta R_{m\tau} + \epsilon_{\tau} \quad [3.3]$$

To generalize, both models measures abnormal returns as in equation 3.4, and X_t is constant in the constant return model, and it is a linear relationship to the market as shown in equation 3.3 in the market model.

$$AR = R_{i\tau} - E(R_{i\tau}|X_{\tau}) \quad [3.4]$$

There are several other models to model normal returns. These include utilizing the Capital Asset Pricing model (CAPM) (Sharpe 1964) (Lintner 1965), the

Arbitrage Pricing model (APT) (Ross 1976) with Fama-French three factor model (Fama and French 1993) or other multifactor models. However, there are problems with these models; in recent years, the errors and the deviations in the CAPM model have been emphasized, hence utilizing it might reduce the validity of our study. This model was used in the event studies of the seventies, but have nearly ceased. When it comes to the APT, it does not give guidelines as to which factors to include, and studies by Brown and Weinsten (1985) indicate that the most significant variable in the APT is the market factor. Based on these arguments, a market model of normal returns should be utilized. However, Kothari and Warner (2007) argue that if the event window is relatively small, as it is in our case, the model of expected returns is not very relevant. Hence they argue that a normal return of about 0.05% daily (about 13% annually) is sufficient, and the errors induced by this approach will be economically insignificant because a typical observation in the event window is a return of around 1%. Therefore, there is not much information lost in the simple approach and this model of expected returns is likely to be used in the thesis.

Step 4. Define the estimation window, event window and the post event window, as outlined in the figure 3.1. MacKinlay suggests an estimation window of approximately 120 days prior to the event and the event window should optimally be the day the event occurs. This may be problematic because there is uncertainty surrounding when the market processes the new information, depending on when the market close that particular day and when the information is published on Newsweb. To solve this, we extend the event window to some days before and after the event is reported, in order to be sure to capture the event. This is relatively unproblematic, and the power of the test is still high (Campbell, Lo, and MacKinlay 1997). The post-event window is optional and is included to give the calculated normal returns increased validity, by also including this period in the estimation of normal returns. An important issue to be aware of at this stage of the process is that the event window and the estimation window must not overlap. This may cause the observations in the event window to heavily influence the estimation results.

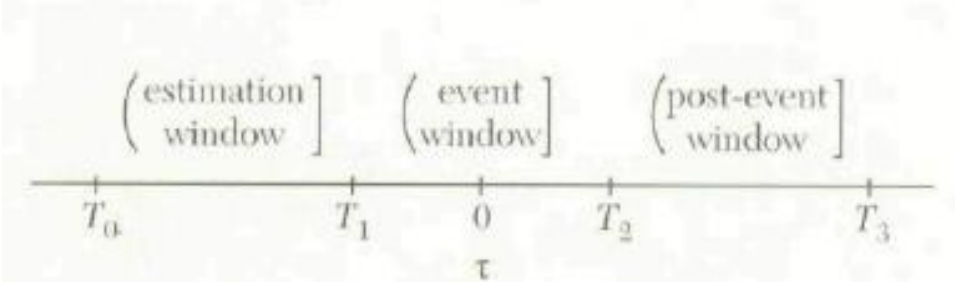

Figure 3.1: Time line for event studies (MacKinlay 1997)

A more formal description of these windows is to define $\tau = 0$ as the day the trade occurs, $\tau = T_1+1$ to T_2 is the event window and $\tau = T_0$ to T_1 as the estimation window. Further, let $L_1 = T_1-T_0$ be the length of the estimation window and $L_2 = T_2-T_1$ be the length of the event window. This notation on the two windows is used in the estimators shown in the next step. Note that we will not include the post-event window in the thesis.

Step 5. Design the testing framework. At this stage we want to obtain the abnormal returns, conditional upon the most suitable model of normal returns. The abnormal returns are found by equation 3.4.

The null hypothesis is that the trades in the event window have no impact on the returns (i.e. abnormal returns are zero). In order to draw valid overall inferences of the abnormal returns, they are aggregated both across securities and time. When the numbers are aggregated, we find the cumulative abnormal return (CAR) in the event window, shown in 3.5:

$$CAR_i(\tau_1, \tau_2) = \sum_{t=\tau_1}^{\tau_2} AR_{it} \qquad [3.5]$$

The CAR measures the first moment (i.e. the mean) only, as this is most relevant for our thesis, as this is a measure of change in shareholders wealth. Note that the event window may further be divided into two or more sub periods but this will not be explained in any detail at this point, although it might be interesting for the thesis.

The next thing to do now is to find the average abnormal return, across securities, which is found by equation 3.6.

$$\overline{AR}_\tau = \frac{1}{N}\sum_{i=1}^{N} AR_{i\tau} \quad [3.6]$$

To test for abnormal returns, we must find the average CAR across securities using equation 3.7.

$$\overline{CAR} = \sum_{i=1}^{n} \overline{AR_i} \quad [3.7]$$

Then we will use the test statistic shown in equation 3.8 provided by MacKinlay (1997). This test is Student-t distributed, with L_1-2 degrees of freedom, and E(θ)=0.

$$\theta = \frac{\overline{CAR}}{SE(\overline{CAR})} \sim N(0,1) \quad [3.8]$$

Step 6. At this stage, we have obtained results, and now we should be able to draw inferences, discuss strengths and weaknesses and so on. For example if the sample size is small, one should discuss extreme observations. A presentation of the diagnostics is also necessary at this point.

4. Data

We use data on trading announcements from Newsweb, and combine these with a database of stock returns from some other database (Datastream etc.) to obtain a dataset. Optimally we should have known every trade these persons have done, but we do not have this kind of information and it is assumed that this is unknown for the rest of the market as well.

To identify the persons assumed to be followed by the market, we have made a list of people identified as "bjellesauer" or "profilert investor" in Norway's largest newspapers since 1992 using the Atekst database. The list of persons is as follows:

John Fredriksen	Øystein Stray Spetalen
Kjell Inge Røkke	Jan Haudemann Andersen
Trygve Hegnar	Jens Ulltveit Moe
Petter Stordalen	Arne Fredly

Christen Sveaas	Jan Petter Sissener
Arne Blystad	Ola Mæle
Tore Aksel Voldberg	Petter Sundt
Idar Vollvik	Jens Gundersen
Edvin Austbø	Christian Rytter
Alexander Vik	Terje Mikalsen
Kenneth Sandvold	Morten Christian Mo
Kristian Siem	Ronny Åsland
Bjørn Rune Gjeldsten	Einar Christopher Nagell Erichsen
Dagfinn Sundal	Marius Skaugen

To avoid selection bias, that the events we include later becomes the reason why we included the persons in the first place, we have to make sure only to use the events after the investor have already been identified as a celebrity by the media. On the other hand, if we detect over- or under reaction it still violates the efficient market hypothesis as the market fails to properly price the firms.

Another problem with our approach is that some of these investors are known for their entrepreneurial skills, and an abnormal movement in the stock price should be perfectly consistent with the efficient market hypothesis. A solution may be to include only their personal trading, and not their companies' acquisitions etc. (i.e. for Fredriksen we will include trades originating from Hemen and Geveran and not Seadrill and Frontline). Another possible weakness with the sample is that some of the celebrity investors in the Norwegian market are left out. It is nearly impossible to include all, but we assume that the search criterion used in Atekst provides a representative sample.

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