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The Impact of "Bad Media Attention" on Stock Price

An Exploratory Study regarding The Impact of "Bad Media Attention" on Stock Price on The OMX Stockholm 30 Stock Exchange

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ABSTRACT

Technology has evolved the last 20 years, making both the stock market and *media* operate in *real time*. The advancement of technology has increased trading activity and the number of investors who enter the stock market. Alongside, *media* has expanded itself into the internet and can, due to the advancement, provide information faster and in higher volumes through their channels. Being that, a limited number of follow-ups have been made regarding the impact of *media* on stock price and no studies have been made to investigate how stock price correlates with negative *media*. This generated the aim of this study to investigate and analyze the impact of "Bad Media Attention" on stock price. The thesis was conducted as an exploratory research study that collected secondary data from Avanza. Furthermore, the methodology in this study was structured and performed to best answer the research question (RQ1): Does "Bad Media Attention" have an impact on stock price?" The results showed that the majority of *news* defined as "Bad Media Attention" had no statistically significant impact on stock price. Also, the study found no consistent statistically significant correlation between "Bad Media Attention" and stock price. However, the small number of significant variables tends to have a negative correlation between "Bad Media Attention" and stock price. Therefore, this research contributed to the stock market field in a number of ways. First, by showing a majority of *news* events, defined as "Bad Media Attention", had no statistically significant impact on stock price for large cap companies on the OMX Stockholm 30 Stock Exchange. Second, the results and analysis may help to better grasp the impact of "Bad Media Attention". Third, this study provided more insight in the research area and raised awareness of this particular phenomenon, and will for this reason be a valuable discovery for future research.

Keywords: Bad Media Attention, Stock Price, media, news

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TERMS AND DEFINITIONS

For the purpose of this study, *media* refers to the various channels, especially newspapers (on paper and online) and magazines, by which information and news are given to large numbers of people. *Non-economical*, as opposed to Dalin's (1920) economical, is referred to as the information published that is not directly linked to financial reports, results or any other legal money related outcomes given by the company. *Unethical*, as used in this study, is a definition of lacking moral principles on the stock market and unwillingness to adapt to proper rules of conduct (Svenska Akademiens Ordbok, 1949; Svenska Akademiens Ordbok, 1950). Moreover, it is not in line with the standards of business. Also, *unethical* does not correspond with accepted standards of professional behavior, in other words, unethical business practice. "Bad Media Attention", also known as BMA, is the *non-economical* and *unethical* information that potentially produces a negative alteration to a company's present and future expectations. Furthermore, BMA affects the company's present and future expectations (through published non-economical and unethical information) which indicates the stock price in this study. Therefore, BMA produces undesirable information towards a company that has a negative impact of a company's present and future expectations. The stock market and *media* work in *real time*, the changes in stock price or information flow that describe a pace of information is nearly instantaneous. The *news* collected for this research will fit the criteria of BMA and will be gathered through online newspapers and trustworthy sources that the general population find reliable. *News* which is considered to have the potential of affecting the stock price. To further understand this study, it is crucial to interpret the definition of *risk*. Risk is often translated into probability of undesirable outcome, which makes it a definite term; risk is something negative (Baker and Nofsinger, 2010; Sjöberg, 2016). In the study, the term *risk* on the stock market is something profound, explaining the condition as either an opportunity or a threat. This is strengthened by the fact that riskier stocks can yield higher returns, but the contingency of losing is also higher, which is defined as Risk-Return Tradeoff (Nyberg, 2012; Koutmos, 2015). Baker and Nofsinger (2010) use two different terms of risk; *pure risk* and *speculative risk*. *Pure risk* is the occurrence of catastrophic events, which is the usual description of risk. *Speculative risk* is the explanatory definition of risk in the stock market and the one used in the study, where there are potential gains and losses in financial matters, referred to as upside risk and downside risk. Alternative risk assessments will be used throughout the study

(portfolio risk ~ *unsystematic risk* and market risk ~ *systematic risk*) and these are defined as *pure risk* within their context (Baker and Nofsinger, 2010; Wilke, 2003). *Unsystematic risk* is the controllable risk, the risk an investor can avoid through *diversification* (hold a larger number of stocks), whereas *systematic risk* (market risk) cannot be prevented (Wilke, 2003).

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Abbreviations

BMA	"Bad Media Attention"
CSR	Corporate Social Responsibility
EMH	Efficient Market Hypothesis
IPO	Initial Public Offering
H&M	Hennes & Mauritz
HFTs	High-Frequency Traders
OMX30S	OMX Stockholm 30 Stock Exchange

1. INTRODUCTION

The stock market has fascinated investors and been an interesting topic throughout the 20th century, with the most captivating feature that it has always been considered fast paced. However, the development in technology has evolved these last 20 years, growing at an exponential rate, and it has made the market more open to the public, which has allowed for easier and faster transactions (The Emerging Future, 2012). In other words, the technology has made the stock market work in *real time*. The advancement of the stock market and availability to necessary tools; software, subscriptions and *media*, have made it attractive not only to big investors with the potential to affect a market index, but also to small private investors sitting in a basement to invest their savings and earnings in the stock market. The stock market has therefore become a *real time* job, with stock price variation every second, which is confirmed by Yılmaz, Erdem, Eraslan and Arik's (2015) study; the technological advancement has increased the trading activity on stock markets all over world. The study also showed that implementing a more sophisticated platform as a more developed stock exchange tool contributes to the increased overall liquidity of the market. Furthermore, technology has not only increased trading activity, but allowed for high-frequency traders (HFTs) to enter the market and facilitate price efficiency (Brogaard et al, 2013). Also, according to Yılmaz, Erdem, Eraslan and Arik (2015), the technological upgrade has decreased the bid-ask spread of stocks.

Then, alongside the stock market's advancement have numerous public instruments evolved simultaneously due to technology. One of the instruments being *media* that has expanded itself into the internet and become widespread, operating 24 hours a day, seven days a week. *Media* coverage is, due to the advancement, providing information faster and in higher volumes, as well as everything else that relies on technology as a source of increasing efficiency. Therefore, the time when stocks were primarily traded by traders shouting on the floor in the exchange hall has now been replaced by electronic transactions and made stocks more sensitive to *real time* information with instantaneous changes in stock prices. Thus, given *media* coverage a lot more impact and is to be considered a relevant part of the changes in stock prices. A research study by Jeong-Bon,

Zhongbo & Hao (2016) showed that media exposure of a firm makes its stock price synchronicity decrease and the probability of informed trading of its stock increase. This shows that technology development and extensive commercialization of the market made media take a bigger role in the information flow and changes on the market.

Even though, a study by Mitchell and Mulherin (1994) regarding announcements and market activity on Dow Jones stock market revealed that market activity was not significantly influenced by macro news announcements. This research was made prior to the "universal internet era" and the market's technological development, thus the validity of such a study should be questioned. Later studies have negated the research and show that technology made the stock market grow and especially that intensive commercialization of the market made media coverage have a bigger part in the changes on the stock market. This is strengthen by Walker (2016), who stated that media plays an important role of a stock´s perception, and that technology has made prices more fair to investors and also faster moving (The Emerging Future, 2012). Thus, in line with Veronesi (1999) and De Bondt and Thaler's (1985), which suggest that people tend to overreact to unexpected or negative news, forcing investors to analyze the information flow of media more carefully when trading stocks all over the world. Considering the market condition these technology changes have made possible; volume increase of *media* coverage, the availability of tools providing all investors with essential information and the stock market's evolution, the stock market and *media* have the precondition to flawlessly cooperate.

With this in mind, a problem that was revealed regarding previous research and the connection between stock prices and *media* is the coverage of anticipated impact of a negative *media* event (BMA). Those familiar with stocks know what should be expected when atrocious and misguided information is exposed, but no one seems to understand the actual impact nor the extent it would have, just that it would have an impact. There has been an assumption that stock prices fall after BMA, but this has not been confirmed. However, Fang and Peress (2009) found that company stocks with no media coverage outperform covered stocks with 0,20 percent per month when accounting for other risk factors. This confirmed that overall media coverage and stock prices

correlate. It was further confirmed in a study by Engelberg and A.Parsons (2011) that the volume of local trading heavily depended on local media coverage.

With the support of these previous findings, a study regarding the real impact of BMA was needed to (1) better understand how stock price react after it was exposed to BMA and (2) investigate if there existed a consistent correlation between BMA and stock price. A hypothesis was formed, based on these factors, that BMA will have an impact on stock price. In the short term, the hypothesis was, that BMA will have a larger impact on stock price the day after the *news* was released. There was also a reason to believe that the attention would have an impact on the stock price and it should only cause minor changes due to abrupt uncertainty for the stock rather than a real reliability issue that affects future expectations. This led to the following hypothesis that BMA would have an impact on stock price only for a short number of days and then return to its initial point short after the *news* was published. Another hypothesis was that there exists a negative correlation between BMA and stock price. In other words, the stock price would decrease due to BMA.

1.1 PURPOSE & RESEARCH QUESTION

The purpose of this study was to investigate the relevance of BMA´s impact on stock price. As such, the principal question this thesis aims to answer is:

- *(RQ1): Does BMA have an impact on stock price?*

The goal of this research question was to consider if the potential impact of BMA on stock price followed a certain pattern. Furthermore, if this potential pattern creates a consistent correlation between BMA and stock price. The study, through answering the research question, also aimed to support future studies by providing essential information, which could be interpreted and then developed into new research about this topic. The research question was important to answer in

order to understand what to expect after *media* channels revealed unexpected information to the public and its impact on the stock price.

1.2 DELIMITATIONS

In order to minimize the scope of the thesis, three delimitations were made. First, only large cap companies on the OMX Stockholm 30 Stock Exchange were investigated to observe a general reaction or patterns within large companies that are perceived as well-established.
Huge volatile and mid-cap companies were considered harder to investigate because of the constant uncertainty in stock price and present and future expectations. Second, only large cap companies with a history of stable financial results were investigated in order to receive a more trustworthy conclusion based on the research question, and not investigate large cap companies with a recent IPO or those with large fluctuations in stock price. This decision was based on the reasoning that large cap companies with a history of financially stable results would allow the authors to investigate the real impact of BMA. Contrastingly, the results of the company with a period of either a steep rise or decline due to new investments or findings that are affecting the stock price, disregarding other information from *media*, were not considered. Third, this thesis has been limited to the OMX Stockholm 30 Stock Exchange to set boundaries to not investigate different markets. The boundaries set to only investigate the Swedish market would also allow the authors to investigate a market with expertise and knowledge from an everyday presence.

1.3 PREVIOUS RESEARCH

Acknowledging the connection between the stock market and media, prior research has found that news and media coverage had an impact on the stock market (Veronesi 1999; C. Tetlock 2007; Engelberg and Parsons 2011; Neuhierl, Scherbina, Schlusche 2013; Li , Wang et al, 2014; B.Walker 2016; Caporale, F. Spagnolo, N. Spagnolo 2016). However, previous research studied different perspectives and areas regarding how media affects the stock price and the market.

Engelberg and Parsons (2011) proved that local news is influencing the market activity from a local perspective. It was confirmed by the study that days when no mail was received the market activity in the area was insignificant. The volume of stocks traded and the activity was connected to pessimism and its interaction with media. In other words, the tendency to see, anticipate, or emphasize only bad or undesirable outcomes was studied and showed to be connected with media and its effects on the activity of a stock. Pessimism that was a result of media predicts that high volumes were traded on the market, which influenced the activity and therefore the stock price (C. Tetlock 2007). Li, Wang et al (2014) proved that not only news affected volatility, other decisive variables were also the content of the article and firm characteristics. News could then affect a company's stock activity differently depending on the information uncovered, since stock owners reactions were related to their respective company. The correlation between these two factors was strengthened by Walker's (2016) article in the Journal of Behavioral and Experimental Finance, as media content had an essential role in the perception of a stock. It was then proven that media plays an informative and behavioral role for stock owners and that stock owners were affected a lot by the surroundings of a company exposed in media. This aligns with Fang and Peress' (2009) discovery that companies with no media coverage outperform media covered companies, which verify a relationship between media and stock returns when accounting for other risk factors. Neuhierl et al. (2013), with the awareness that stock prices are actively influenced by financial news, examined how the stock market reacted after financial statements. The research showed a negative connection between the market and corporate releases, and that the volatility of stocks increased after these releases. A study by Caporale et al. (2016) could yet again prove the correlation of the two when they studied 8 countries (Belgium, France, Germany, Greece, Ireland, Italy, Portugal and Spain) in the European market, after the release of financial news. However, the study went further in its research and found that positive news yields positive returns, but that stock returns were more responsive to bad news, due to its fragile nature. This could be connected to the fact that stock prices tend to overreact to bad news in good times (Veronesi 1999), which was consistent with De Bondt and Thaler's (1985) research in experimental psychology confirming that most people tend to "overreact" to unexpected and dramatic news events.

1.4 DISPOSITION

In the first chapter, the introduction is presented in order to comprehend how *media* and stock price are compatible, and with the support of previous findings the RQ1 was then formulated. The section also presents the research problem, hypothesis and purpose with the study and explains the delimitations of this research. The theoretical frame of reference in chapter two is presented and explained, in order to base the research on different stock market theories and theoretical frameworks. The theoretical frameworks are also presented to understand what has been investigated and what questions and areas still remain to be uncovered within this research topic. Chapter two is therefore structured to introduce basic key concepts to further support and explain the results of the relationship between *media* and stock market. In chapter three, the methodology is presented and it explains how the study was structured and it also contains criticism to the the approach and methodological choices to prove its relevancy for this specific study. In chapter four, results are presented and includes the results tested in Eviews to support the analysis. All data tested was beneficial to answer the RQ1 in the analysis and create a relevant discussion, with the support of theories, theoretical frameworks and previous findings. Therefore, in chapter five, the analysis is presented and explains how the results connects with theories and previous findings, as well as to discuss whether the results correspond to the hypothesis. In chapter six, a conclusion is given to state the findings in this study. This section aims to answer the RQ1. Chapter seven assists with limitations to the study and potential future research.

2. THEORETICAL FRAME OF REFERENCE

The stock market, with the support of Veronesi (1999); C. Tetlock (2007); Engelberg and Parsons (2011); Neuhierl, Scherbina, Schlusche (2013); Li , Wang et al, (2014); B.Walker (2016); Caporale, F. Spagnolo, N. Spagnolo (2016), is influenced by information given from different public sources, which has resulted in changes in the stock market and on individual stock prices. To effectively analyze the impact of BMA on stock price, theories and frameworks connected to the stock market and its players were needed. These theories and frameworks on *media* and its impact on stock price were essential to grasp previous studies and the results and analysis presented in the study. A basic understanding of economics is required to comprehend stock price behavior. Key concepts related to stock activity; volatility and volume, which explain the movements on an individual stock, will provide necessary insight on the simple stock market function. Also, as stock market and stock prices reflect actions on the market; buy/sell activities are presumably acted upon the information obtained. The "Efficient Market Hypothesis" (EMH) will explain the controversial connection between the market and investor information. Since standard economics assume full rationality among its operators, but the market is determined by human decisions, suggesting that emotions have an impact on the stock market, rationality of individuals has to be questioned. To embody this aspect; the human mind, a psychology section as well as behavioral finance theories will be included in the theoretical framework. Behavioral finance and its fundamental concepts will provide enlightening information on features surrounding stock prices in order to clarify this complex activity and to provide support for the analysis.

2.1 STOCK ACTIVITY - VOLATILITY AND VOLUME

One main theory to describe the volatility of stock is The Random Walk Theory. Shortened, Random Walk Theory says that stocks take a random and unpredictable path (Malkiel, 1999). The theory explains that the potential for the stock price to go up is the same as it is going down (Malkiel, 1999). Theorists adopting the concept assume it to be impossible to outperform the stock

market without a certain risk added to the process (Malkiel, 1999). In addition, the theory declares that "future steps or directions cannot be predicted on the basis of past actions" (Malkiel, 1999). Grossman and Shiller (1980) used prior interpretation that the large and unpredictable swings that characterize the common stock; is that the changes in stock price represent the efficient discounting of "new information". Furthermore, Du and Dong (2016) investigated how price volatility and trading volume respond to market information. The research showed that both price variability and trading volume increase with traders´ responses to market information and therefore are positively associated. In the article, The Dark Side of Trading, Dichev et al. (2014) investigated the effect of high trading volume on observed stock volatility. The research found that there was a positive relation between trading volume and stock volatility. The research revealed that the relationship was even stronger when trading volume was high. The main findings were the positive relation between trading volume and stock price and that stock trading had an effect on volatility above and beyond the relation based on fundamental information. Bansal et al. (2014) demonstrated in one part of their study that volatility is important for understanding expected returns. In addition to this discovery, the research showed that volatility carries a sizeable positive risk premium and helps account for the cross section of expected returns. The findings of research by Xi et al. (2016) revealed that excess returns are more likely driven by market mispricing connected with volatility as a stock characteristic, which is supported by Chan's (2003) discovery that stocks have a higher drift after bad news, but that investors tend to react slowly after information is announced.

2.2 EFFICIENT MARKET HYPOTHESIS

The efficient market hypothesis developed by Eugene Fama (1970), is a heavily questioned theory arguing that markets are efficient, where an efficient market is when investors can earn returns on their capital invested. The existence of market efficiency is disputed due to its assumption that prices are fully reflected by all the information available. It would therefore mean that outperforming the market would be impossible, however investors have confirmed market inefficiency. The hypothesis is represented by three categories: weak-form, semi-strong-form and strong-form (Eugene Fama, 1970). All forms assume full investor rationality, implying that

investors respond identically to changes. The weak form indicates that the price is reflected by all market information; rates of return have no connection to past returns, suggesting that patterns (technical analysis - charting) or "Momentum Effect" should be precluded as investment strategies (Eugene Fama, 1970; Soros, 1994). Malhotra et al. (2015) could in their article, within Journal of Applied Finance, confirm that the Asia-Pacific stock market is not an efficient market on a daily and weekly basis according to weak-form. However, monthly returns showed traces of "Random Walk", but not all tests supported this hypothesis, making the results inconclusive, and the argument of existing "Random Walk" becomes even more unconvincing seeing as other studies have shown absence of this occurrence (Dsouza and Mallikarjunappa, 2015; Palamalai and Kalaivani 2015). The inconsistency of a weak-form efficient market was also verified in the "Journal of Financial Risk Management" when observing the Karachi stock market, as investors could capitalize on inefficiency and yield higher than expected returns using past data (Naseer and Tariq, 2015). The semi-strong-form suggest that the price observed in the stock market considers all public information (including weak-form), signifying a fast-paced and volatile market, where the individual investor cannot outperform other investors due to fast changes in price (Eugene Fama, 1970; Soros, 1994). Accordingly, the information provided is sufficient for a fundamental analysis of the stock price in order to potentially earn excess returns. Previous results regarding semi-strong market efficiency have been puzzling, as some markets (Malaysian and Indian) display semi-strong market efficiency (Hussin et al, 2010; Mandal and Rao, 2010), whereas others are not (Greek and Indian) and abnormal returns can be earned (Alexakis et al, 2010; Mallikarjunappa and Dsouza, 2013). The last form, strong-form, indicates that the price demonstrated includes all information (public and private), which means that if all investors had this information, outperforming is always inaccessible (Eugene Fama, 1970). The market is acknowledged as; not strong-form efficient, which is evident since companies will not share all private information, and the only people accessing this information legally are insiders (Young, 2015). EMH is generally accepted among economists and is used in contrast to what is and what should be. However, a problem found within EMH is the actual construction since it relies on price efficiency, meaning that there is no reason to invest if no one suspects market inefficiency. If market efficiency actually existed, there would be no investors (Campos Dias de Sousa and Howden, 2015).

2.3 STOCK MARKET PSYCHOLOGY

The stock market is determined by factors that are not rational; one of these are the psychology aspect. Since the market displays the trades made from investors, their decisions that are based on expectations and emotions affect the stock market and cannot be elucidated, just illustrated as a result (Dhaoui, 2015). This is the psychology of the stock market. It was discovered by Fan, Ying, Wang and Wei (2009) that the connection between the psychology aspect and market behavior is an explanation to market complexity. The complexity refers to the unexplainable about the stock market, which is a consequence of the traders' decisions. If all investors were entirely rational, this would not be an issue and the stock market could be defined in absolute terms considering all investors would act identically (homogeneity) and make the same decision every time when presented in a corresponding situation. Dhaoui (2015) could in his research disclose that the assumption of full rationality, the economic and financial literature perspective, was flawed and that investors tend to act on human psychological factors. It proved that investors are irrational and that other detrimental factors had a part in their trading decisions. One of these factors was investor expectation and its connection to risk aversion, where the meaning of risk aversion being different options of risk and the investor chooses the option with lower risk. Higher risk meant lower market expectation, which obstructed individuals' investments (Lee et al, 2015). In an earlier study regarding the financial crisis in China 2007-2008, it was discovered that the stock market bubble was a reaction to the psychological factors; greed, envy and speculation. Expectations in the market were not met, which led to disappointment fear and decreased confidence in the market among the investors. This caused the financial setback since investors were not willing to invest in a risky market. However, the research argued that investors will be more aware of potential risk factors in the future and the market will be less volatile, thus no creation of a bubble (Yao and Luo, 2009). In a study by Beilis et al. (2014), it was suggested that psychological aspects should be included in financial models. Their analysis on impact of emotions on trading demonstrated that anxiety and fear of making poor decisions, resulting in regret, caused investors to sell their stock more quickly.

2.3.1 BEHAVIORAL FINANCE

A profoundly rooted topic in stock market psychology is behavioral finance. The existence of this subject is to explain the behavior behind decision making in financial situations (Baker and Nofsinger, 2010). The significance of this subject has increased in importance as previous research has not been able to find sufficient evidence of rational decision making from investors in the financial department. Studies thus far have shown that the absolute "logical answer", the rational answer according to standard finance, seems unachievable for humans due to factors outside of the standard model (Baker and Nofsinger, 2010; Burns and Roszkowska, 2016). In order to investigate these other factors, researchers have included the psychology aspect; behavioral finance, as a representation of what has been unexplained deviations in standard financial models. The field behavioral finance instead puts focus on aspects outside of raw calculations and unquestionable economic/financial rationality, which is assumed in standard finance and tries to comprehend the relation between the human mind and financial decisions. This resolves the issue of why humans behave in a particular way (irrationally) when taking financial decisions rather than condemning humans as irrational and unteachable (Baker and Nofsinger, 2010).

2.3.1.1 THE REWARD SYSTEM AND LOSS AVOIDANCE

Baker and Nofsinger (2010) introduces two key aspects in their book "Behavioral Finance: Investors, Corporations and Markets"; *The reward system* and *Loss avoidance*. A *reward system* refers to the potential benefit arising from an opportunity in the surroundings and the response of well-being when task is accomplished. In contrast, *loss avoidance* is a potential threat that emerges in the environment (Baker and Nofsinger, 2010). As explained earlier, the concern regarding investing was based on the occurrence of anxiety and fear, which derives from the *loss avoidance system*. The existence of a stock market will present potential rewards for individuals and generate actions for these to achieve self-fulfillment through investing and earning returns. However, investing will also present a threat, activating the *loss avoidance system*, thus creating feelings; regret, fear and anxiety. The stock market can be explained as an opportunity and a threat, which is why the term *risk* is essential since it covers both perspectives (Baker and Nofsinger, 2010).

The concept of loss aversion is compatible with the *loss avoidance system*, signifying an individual's behavior of avoiding losses rather than employing risk-seeking to gain when subjected to uncertain outcomes. It further indicates that individual's consistently weigh losses more than gains, ceteris paribus (Baker and Nofsinger, 2010). There are cases when risk-seeking is the preference among individuals, but those are either small gambles or hinge on specific circumstances when there is a change in reference point, provoking a disparity between expected situation and the reference point. A situation causing risk-seeking behavior could be a sudden loss experienced, which would shift an individual's state of mind, leading to the overruling of risk aversion (Kahneman and Tversky, 1979). The "Expected Utility Hypothesis" initiated by Daniel Bernoulli in 1738 and developed by Neumann and Morgenstern (1944) exercise risk aversion in terms of gamble; mathematical calculations used to obtain expected outcome, motivating the individual to always pick the most profitable choice based on weighted average value. Thus, opting an individual to base their decision on rationality.

2.3.1.2 PROSPECT THEORY

In 1979, the Prospect Theory connected to Behavioral Finance was introduced by Kahneman and Tversky when investigating risk attitudes. The Allais paradox; A theory established through empirical results which has invalidated the absolute acceptance of the "Expected Utility Hypothesis" and demonstrates individuals' inconsistency in gamble situations of choosing a riskier and less profitable choice rather than the preferred, was used to justify the implementation of a new theory. The *Prospect theory*'s main objective is to explain how an individual evaluates risk, resulting in risky choice behavior (Baker and Nofsinger, 2010). Decisions in the stock market are risky and the judgment of taking one decision rather than another is a fundamental factor that needs to be understood when evaluating risks, since no individual has the ability to completely forecast the outcome. From Prospect Theory derived an improved version of the theory; the Cumulative Prospect Theory, which focused on the expected relative outcome to a reference point, instead of final outcome (Tversky and Kahneman, 1992). Then, disregarding the fact that nothing is ever

certain, there are ways to project possible outcomes using these alleged reference points; previous results within the same area consistent with the method used. As discovered in Phillip and Pohl's (2014) study; potential lone wolf terrorists using higher reference points evaluate prior results to expected outcome of an attack, and if the inflicted damage is above average, but not reasonable to expect with an identical attack, another method is used. If the reference point is lower, an attack method with less deviation is expected and coherent considering copycat behavior, reinforcing the conception of lower risk equals lower deviation, but also less potential (Nyberg, 2012; Koutmos, 2015). This employed the assumption of risk avoidance and is consistent with the concept risk aversion. According to Baker and Nofsinger (2010), there is a perspective claiming that prospect theory has the possibility to "better" illustrate "the puzzles of human behavior in a world of uncertainty" and specify these puzzles as; "certain outcomes (the Allais paradox); the unexpected (from a conventional theoretical perspective) high average rates of returns of stocks relative to bonds, referred to as the equity premium puzzle; overpaying for insurance and engaging in low expected value lotteries; individuals tending to weigh losses more than gains (referred to as loss aversion); the apparent overweighting of small errors (related to regret theory)". With the information provided, it can according to Baker and Nofsinger (2010) justify an individual's poor financial decision making in the stock market, such as waiting for better times and refusing to sell low-rate return stocks due to fear of loss. This might presume that individuals are irrational when taking decisions in a financial market. However, the theory dispute that an individual's behavior is rational with the information that is provided (Tversky and Kahneman, 1979). The "irrationality" discussed can be explained by insufficient information and other inadequate factors (Baker and Nofsinger, 2010).

2.3.1.3 INVESTOR TRADING

Market Psychology and the different theories in Behavioral Finance is disputing the prediction on how investors trade stocks on the market. Investors in a competitive market are considered to have homogenous beliefs, indicating identical decision making and adopting standard finance, thus the existence of rationality (Baker and Nofsinger, 2010). With earlier evidence and acknowledging that rationality is heavily opposed, tendencies of homogeneity is not sufficient enough to

completely neglect existence of heterogeneity, creating a competitive market and the reason to trade (Campos Dias de Sousa and Howden, 2015). The main reason to invest is to earn return on their investments, preferably excess return. It was argued in the study "On the Impossibility of Informationally Efficient Markets" by Grossman and Stiglitz (1980) that the EMH needs to be redefined as the incentive for investing would dissolve during acceptance of EMH. The decision to invest is based on the expectation of "grass always greener on the other side"; investors expect a preferred position relative to other investors when investing; anticipating additional returns. As explained earlier, no investors would exist on an efficient market; non-competitive market, considering access to information would not grant excess returns (Grossman and Stiglitz, 1980; Campos Dias de Sousa and Howden, 2015). There are however other reasons to trade; investors on the stock market can, according to Baker and Nofsinger (2010), trade stocks in order to rebalance their portfolios after some stocks significantly rise or fall. When trading stocks to rebalance it allows the investors to keep their preferred stock portfolio, thus the forming biases. On the other hand, it may need the investors to liquidate part of their investments in order to raise needed cash for future purchases. Rebalancing a portfolio also corresponds to the financial term *diversification*, which is a commonly used trading method to reduce *portfolio risk* and solely depend on *systematic risk* (Wilke, 2003; Willenbrock, 2011). According to Wilke (2003) and Young (2015), a general rule of thumb is to hold at least 10-20 stocks in a portfolio for it to be considered diversified, but the estimation behind this number is based on empirical studies, which is why there are different opinions regarding the validity of *diversification*, both the amount of stocks needed and if full *diversification* actually exists. Willenbrock's (2011) study supports the existence of *diversification*, addressing it as "free lunch", through rebalancing of portfolio and earning returns. However, Chance, Shynkevich and Yang (2011) could in their research, analyzing students which are assumed to invest exclusively for the purpose of *diversification*, point to the pattern of *diversification*, but also that adding securities could decrease *diversification*.

2.4 LINKS BETWEEN THEORIES AND THEORETICAL FRAMEWORKS

Welding these theories and theoretical frameworks together were chosen to describe the changes in stock price but from different perspectives. Furthermore, they are selected to support in answering the RQ1.

First, the volatility is explained by The Random Walk Theory and it is further presented by Eugene Fama (1970) when presenting the EMH concept. The Random Walk Theory states that stocks take random and unpredictable paths (Malkiel, 1999). Additionally, market psychology is presented to investigate the different aspects of how stock price is explained by factors that are not unpredictable. Since the stock price shows trades made from investors, the psychology part explained by Dhaoui (2015) and Fan, Ying, Wang and Wei (2009) was therefore important to clarify this aspect. Behavioral finance, a rooted topic in stock market psychology, that is the existence to explain the behavior behind decision making in financial situations was also needed to comprehend the study (Baker and Nofsinger, 2010).

Altogether, even if all theories and theoretical frameworks are describing different fields within the stock market they are relevant approaches in order to explain the stock price. Ideally, to explain and connect BMA with stock price.

3. METHODOLOGY

3.1 SCIENTIFIC APPROACH & RESEARCH DESIGN

According to Bryman & Bell (2011) a deductive theory explains how the hypothesis was formed through the collection of data using existing research and theories as a template. Considering the hypothesis and RQ1, a deductive theory approach was used in line with Bryman & Bell (2011). An exploratory research study was conducted using secondary data from Avanza. Avanza is a Swedish niche bank for savings that provides financial *news* and data of the OMX Stockholm 30 Stock Exchange. A comparison of financial data between Avanza and Nordnet (a similar option for collecting secondary data) was made to increase the reliability of the source used. Since both alternatives displayed similar financial data, Avanza (the more familiar option to the authors) was considered a trustworthy source (Avanza, 2015; Nordnet, 2015). A quantitative research with the use of secondary data appeared to be the most suitable for the purpose of this study. Seeing as it enables for a more in-depth understanding and in line with Bryman & Bell (2011) that the use of secondary data both saves time and costs. Furthermore, according to Bryman & Bell (2011), because it saves time, it allows to focus more on analyze the data tested and make it even better. The methodology in this study was also structured and performed in order to best answer the research question (RQ1): "Does BMA have an impact on stock price?"

The data collected for this study was used for the regression model tested in the statistical program Eviews. The data tested measured the impact of BMA on stock price before, during and after each *news*, defined as BMA, was published. The secondary data was also collected in line with Bryman & Bell (2011) to analyze and draw conclusions about how the data relates to the world of business, in this research how it related to the stock market and stock prices on the OMX Stockholm 30 Stock Exchange. To further study and analyze the actual impact of BMA on stock price, it required several collections of secondary data on the stock price and explanatory variables after each *news* was published. According to Bryman & Bell (2011), datasets that are employed most frequently for secondary data are of extremely high quality and is one reason this study was based on secondary data instead of calculating and creating data only specified for this particular study. The

amount of secondary data collected had to be at several different times before, during and after the occurrence of the *news*. The *news* collected fitted the criteria of BMA and was gathered through online newspapers and trustworthy sources that the general population find reliable. *News* which had the potential of affecting the stock price. Thus, sources that were not found to be reliable, but still with the potential of influencing the stock price, were not considered in the research. The analysis of secondary data from Avanza may entail the analysis of quantitative data (Dale, Arber, and Proctor 1988) through Bryman & Bell (2011).

The purpose of this research methodology was to test and further understand the way in which BMA, following several explanatory variables in the regressions, had an impact on the dependent variable, *stock price*. Other relevant explanatory variables, such as OMX Stockholm 30 Stock Exchange index and Volume, that explained the daily changes in stock price were added to each regression to better comprehend the impact of BMA on stock price, and used to analyze and answer the RQ1.

The process of the research methodology was as follows: (1) decide the relevant explanatory variables for each regression to explain the dependent variable *stock price* on a daily basis, (2) collect data (Valuation Date, OMX Stockholm 30 Stock Exchange index, Volume & Stock Price) from Avanza, (3) test the regression models with OLS and create a correlation matrix, and (4) analyze the data tested in Eviews.

3.2 MEASUREMENT

For this study to measure the impact of BMA on stock price the statistical program Eviews was chosen to be the most suitable tool for the outcome of the results, allowing for secondary data to be tested and analyzed in a regression model. The aim of the measurement was to figure out the impact BMA had on stock price. Furthermore, if it existed a certain correlation between BMA and stock price. Eviews allowed the study to both test the significance of variables, as well as test the correlation between variables when put into a regression model and tested. The secondary data

collected was to be considered relevant for the regression model and was in line with Bryman & Bell (2011) that secondary data may be collected by a company (in this case Avanza) for its own purposes. Although, it was used in this study to receive trustworthy results about the impact that BMA had on stock prices associated with large cap companies operating in the large cap section of the OMX Stockholm 30 Stock Exchange. The tested regression model for each *news* event also gave the opportunity to analyze the collected secondary data in more depth and further to test if explanatory variables were exposed to multicollinearity. Conclusively, the tested regression model in Eviews gave results and indications for this study to answer the RQ1.

3.3 STOCK SELECTION

The stocks were selected to be established on the OMX Stockholm 30 Stock Exchange. Listed in APPENDIX 1 are all stocks investigated and tested in this study. The stocks used were specifically chosen to have been exposed to *news* that fitted the definition of BMA. In other words, the companies were chosen from *news* found from credible sources that fitted the definition BMA and affected companies established on the large cap section on the OMX Stockholm 30 Stock Exchange. Furthermore, the specific chosen companies were well-established on the large cap section on the OMX Stockholm 30 Stock Exchange. The selected companies operate in the industries; automotive industry, clothing, metal refining, pharmaceuticals and telecommunication. Solidity, cash flow, size and industry (Appendix 4) were the factors inspected when choosing suitable companies for the study, both to fit the *news* of BMA and at the same time study large cap companies that are financially stable. Explicit companies on the large cap section with high instability and possible big everyday changes in stock price, when considering sudden expose to new information, were not investigated. The financial data regarding companies' solidity, cash flow, size, age and industry was collected from annual reports, presented by the companies, on Business Retriever via Linköping University access.

3.4 DATA COLLECTION

The financial data regarding selected stocks at the OMX Stockholm 30 Stock Exchange was collected from Avanza and contained various financial data about stock price and the market at the OMX Stockholm 30 Stock Exchange. Also, the data was collected with the support of Bryman & Bell (2011) that secondary data offers the prospect of having access to good-quality data. The data included financial data and valuation date and was put into an excel document used for tests in Eviews. The data regarding explanatory variables was considered to have an everyday impact on stock price. The explanatory variables, excluding the BMA variable, were also to assist in obtaining insight regarding how big of an impact BMA had on stock price. The choice of collecting secondary financial data was with the support of Bryman & Bell (2011) that the study is freed from having to collect fresh data and the approach to the data analysis can be more considered than it might have been otherwise.

3.5 LINEAR REGRESSION ANALYSIS WITH DUMMY VARIABLES

In order to investigate the impact of BMA on stock price the period of investigation was decided to be 10 days. The time interval tested was 2 days before, during and until 7 days after the *news* was released. The BMA variable was tested to have an impact on 2 days and 6 days.

All data regarding the regression model was put into Excel and transferred into Eviews. The regression model, containing data regarding the dependent variable and explanatory variables, were then tested and used in order to investigate the impact of the BMA on stock price. The test used stock price as the dependent variable. The explanatory variables OMX Stockholm 30 Stock Exchange index and Volume were chosen to have a relevant impact on the day-to-day changes on stock price and were considered to be relevant variables to assist the BMA variable. The tests were tested with OLS in Eviews in order to test the significance of variables and examine the impact on the dependent variable. To investigate the correlation even further, a correlation matrix model were created with the help of the tests in Eviews. The correlation model showed the correlation between

dependent variable and explanatory variables, as well as the correlation between the explanatory variables. The correlation model was presented in the results to see the correlation between variables, and also to investigate whether the regression model was potentially exposed to multicollinearity.

3.5.1 THE REGRESSION MODEL

The model 3.10 presented below is the linear regression model tested with OLS in Eviews, containing the dependent variable, *stock price* and the explanatory variables BMA, OMX Stockholm 30 Stock Exchange index and Volume. BMA is a dummy variable, meaning that the data was put either as 1 or 0, 1 if selected BMA period, 0 otherwise. OMX Stockholm 30 Stock Exchange index is an index that includes the 30 most traded stocks on the OMX Stockholm 30 Stock Exchange and Volume is the volume traded for a stock each day. The assumption was that there were changes in market index and volume from day-to-day and the variables were therefore to be considered as relevant explanatory variables to the regression model.

$$X_{\text{stock price}} = \beta 0 + \beta 1 BMA + \beta OMX30S + \beta V + \epsilon \qquad \text{model (3.10)}$$

Stock price = Stock Price for Stock X, X = the investigated stock

$\beta 0$ = intercept

BMA = 1 if "Bad Media Attention" period, 0 otherwise.

OMX30S = OMX Stockholm 30 Stock Exchange index

V = Trading Volume

ϵ = Error Term

3.5.2 HYPOTHESIS TEST FOR VARIABLES

To further determine whether a correlation between BMA and stock price existed, two hypotheses were tested against each other, a null hypothesis and an alternative hypothesis. The tests were based on a confidence interval of 95 percent.

Hypothesis 1 - Correlation between stock price and BMA

H0: There is no correlation between BMA and stock price

Ha: There is a correlation between BMA and stock price

H1; a correlation between BMA and stock price, would be confirmed if the OLS-estimation of the formula present significance on the BMA-variable, which would be a p-value below 0.05 (significance level), indicating that the null hypothesis would only be incorrectly rejected five percent of the times. The rejection of the null hypothesis and acceptance of the alternative hypothesis would be accurate at a rate of 95 percent.

Hypothesis 2 - Negative correlation between stock price and BMA

H0: There is no negative correlation between BMA and stock price

Ha: There is a negative correlation between BMA and stock price

The confirmation of H2; a negative correlation between BMA and stock price, would require a p-value below 0.05 (significance level) to fit the criteria of a 95 percent confidence interval. It would also require a negative coefficient on the BMA-variable in the OLS-estimation, indicating a decrease in stock price after the appearance of BMA. If presented with a significant BMA-variable in the OLS-estimation, a correlation could be supported with 95 percent certainty.

The hypothesis tests were based on the reasoning that BMA had an impact on stock price. Furthermore, that the BMA had a negative impact on stock price.

3.6 DATA ANALYSIS

Results presented in Eviews were used to provide answers to RQ1. According to Bryman & Bell (2011) secondary data analysis offers students the opportunity to examine data of far higher quality than the study itself could collect, meaning the analysis of data collected from Avanza was preferred. Therefore, the data collected and analyzed to investigate if a certain correlation between stock price and BMA existed, could be considered trustworthy. Moreover, the secondary data was used and analyzed in line with Bryman & Bell (2011); that in most cases the analysis of secondary data resulted in samples that are as close to being representative as one is likely to achieve.

The data analysis worked as useful information to answer the research RQ1, as well as to recognize potential correlations between stocks and how those specific stock prices potentially moved after each company was exposed to BMA. The data analysis was discussed with the support of theories and previous findings.

3.7 QUALITY OF RESEARCH DESIGN

There were several risks with the use of secondary data for a quantitative study that could have affected the reliability and validity of the research. According to Bryman & Bell (2011), for a study to be considered reliable, it is required that the authors carefully evaluate the reliability in the study. Bryman & Bell (2011) state that the authors should discuss if the outcome of the study would be repeatable and if the outcome was affected by random or reliable conditions. Meaning that, according to Bryman & Bell (2011) that the secondary data collected from Avanza has to be available for further research to reach the same results as in this study. Given these points, the collection of secondary data could mean miscalculations or general mistakes when collecting the

data, and for the reliability to be weakened. All data has therefore been carefully examined and gradually checked in order to minimize errors. Furthermore, the reliability of data has to be repeatable as a necessary factor for deciding the overall validity of this study and enhance the strength of the results. The choice of secondary data from Avanza was therefore to minimize author interpretations regarding the collected data and to be considered to strengthen the reliability of the research.

Then, according to Bryman & Bell (2011), a validity issue is if the study truly measures what was it was intended to measure. Bryman & Bell (2011) also argue that an important research criterion is the need for an assessment of whether the conclusions in the study were related or not. Essentially, *measurement validity* according to Bryman & Bell (2011) has to do with the question of whether or not a measure (in this study the secondary data from Avanza) was devised of data really did reflect the data that it was supposed to be denoting, thus the results in this research. As for the selected variables in this study, clear descriptions about the definitions and the measurements were used, and carefully described approaches for the research. Also, the selected variables were chosen to have an everyday impact in stock price and to work as relevant explanatory variable in combination with the BMA variable in the regression model. The chosen explanatory variables were considered to be commonly used in financial theory, used in previous studies and accepted by Inger Asp, Professor in Econometrics at Linköping University. Furthermore, all financial data regarding companies was collected from Business Retriever via Linköping University access, which contained annual reports released by each company, and therefore was considered validated and reliable in line with Bryman & Bell´s (2011) definition of validity and reliability.

3.8 ETHICAL ASPECTS

Bryman & Bell (2011) state that collection of data can be used for research purposes that may not be in line with the original reason for collecting the data in the first case. Although, Bryman & Bell (2011) explain that the collection of data not used for the original purpose raise an issue focused

on who owns the data and under what circumstances a study is entitled to use it. This study was based on secondary data collected from Avanza and the data was obtained on market prices and data showed by Avanza. The ethical aspect has been taken seriously into account and therefore all data tested in the regression models was exclusively collected from Avanza in order to assure the study used data that is legally collected and only used for an academical purpose. The authors each had an account at Avanza and the use of data in this study was only to test the impact of BMA on stock price and not used to give advice on trading on the stock market. The purpose of the collection of secondary data was therefore solely for academic reasons in order to answer the RQ1. The financial data from Business Retriever regarding companies was obtained in order to investigate the financial situation and only used to choose companies to fit the criteria within this study.

3.9 SOURCE CRITICISM

In the study, only secondary sources were used. However, to increase the credibility, the study had different types of sources of information, such as previous research in the form of academic articles, literature, lectures and electronic sources, as well as data collected by a considerably well-known internet bank (Avanza) in Sweden. Research articles used in the study were taken from respected economic journals via the Linköping University database and other academic databases. Articles published in academic journals has therefore been critically examined by experts in the field, which increased the credibility. The literature and sources used throughout the study have been consistently well referenced. The literature used has been textbooks and were published by well-known publishers and recognized professors, and lectures were done by respected professors in the finance department with several years of experience. Thus, these sources were considered fully trustworthy. However, the reliability regarding the newspaper articles could be debatable seeing as some were within the public sector (unbiased, non-profit), whereas others were private sector, implying profit-seeking and the possibility of peculiar agendas (political, financial).

3.10 METHOD CRITICISM

In the study, only secondary data was used. According to Bryman & Bell (2011), the use of secondary data could cause a lack of familiarity with data, meaning the study needs to get to grips with the range of variables, the ways in which it has been coded and various aspects of the organization of the data. The use of secondary data also means that the data is not primarily retrieved for this particular study, only collected from one source to be used in this study. It is according to Bryman & Bell (2011) that the use of secondary data analysis potentially has an effect of absence on key variables, meaning the analysis of data collected by others may cause that one or more key variables may not be presented in the method of analyzing data for the particular study. Therefore, companies that were investigated in this study were included in the OMX Stockholm 30 Stock Exchange and confirmed through the Swedish Tax Agency. Respectively, the stocks were chosen to have been exposed to *news* defined as BMA and the companies were also examined to be considered financially stable, thus these were not chosen randomly. Criticism to the use of the regression model in the study was that it can occur "omitted variable bias", meaning that there was a risk that the coefficients in front of each explanatory variable can catch up the impact on some other omitted variable. Being that, these omitted variables had the potential to correlate with the variables included in the model. Also, the study used regression models with dummy variables, which means that the test can only put a period with BMA against a period with no BMA but was to be considered the only suitable way in order to receive an answer to the RQ1.

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4. RESULTS

The first section starts with presenting the results from Eviews as descriptive data taken from APPENDIX 2 and APPENDIX 3. The results were presented to investigate how big of an impact BMA had on stock price and whether there was a correlation between stock price and BMA. Section two is focused to determine whether the correlation was negative, neutral or positive and therefore presents correlations models for when BMA was a significant variable.

4.1 DESCRIPTIVE DATA (2 DAYS OF BMA)

When tested if BMA had an impact on stock price 2 days of BMA, 5 out of 15 *news* had a positive impact on stock price and 10 out of 15 *news* had a negative impact on stock price. Although, 13 out of 15 tests showed that the BMA variable was insignificant, and 2 out of 15 were significant with a 95 percent confidence interval.

4.2 DESCRIPTIVE DATA (6 DAYS OF BMA)

When tested if "bad media attention" had an impact on stock price 6 days of BMA, 7 out of 15 *news* had a positive impact on stock price and 8 out of 15 *news* had a negative impact on stock price. Although, 12 out of 15 tests showed that the BMA variable was insignificant, and 3 out of 15 were significant with a 95 percent confidence interval.

4.3 BMA´S IMPACT ON STOCK PRICE (2 DAYS OF BMA)

The results showed that were 2 BMA variables that were significant when testing for 2 days of BMA; Ericsson2 (Bribery in Oman) showed that the BMA had a positive impact on stock price. Telia Company1 (Dictatorship) showed that the impact of BMA on stock price was negative.

According to the 15 *news* that fit the definition BMA there were 2 *news* when the variable BMA could reject the null hypothesis and with 95 percent certainty say that BMA had an impact on stock price. 13 out of the 15 *news* tested for 2 days of BMA could not reject the null hypothesis and therefore had no impact on stock price.

4.4 BMA´S IMPACT ON STOCK PRICE (6 DAYS OF BMA)

The results when testing for 6 days of BMA showed that there were 3 significant BMA variables, 2 that had a negative impact on stock price and 1 that had a positive impact on stock price. Among the significant variables, H&M2 (Factory Collapse) and H&M5 (Factory Still Bad) had a negative impact on stock price. Ericsson2 (Bribery in Oman) had a positive impact on stock price. There were 3 out of 15 *news* testing if the variable BMA had an impact on stock price that could reject the null hypothesis and with 95 percent certainty confirm that specific *news* had an impact on stock price, both positive and negative. 12 out of 15 *news* could not reject the null hypothesis and therefore had no impact on stock price.

4.5 CORRELATION FOR SIGNIFICANT BMA VARIABLE (2 DAYS OF BMA)

Telia Company1 (Dictatorship)

	STOCK_PRICE	BMA	OMX30S	VOLUME
STOCK_PRICE	1.000000	*-0.415147*	0.838465	0.353767
BMA	*-0.415147*	1.000000	-0.000267	-0.371201
OMX30S	0.838465	-0.000267	1.000000	0.263449
VOLUME	0.353767	-0.371201	0.263449	1.000000

In the correlation model above the results for Telia Company1 (Dictatorship) showed that the correlation between BMA and stock price was -0.415147 which indicated a negative correlation between the dependent variable *stock price* and the explanatory BMA variable. The results therefore indicated a correlation and no sign of multicollinearity thus the effect did not exceed -0.7 - 0.7.

Ericsson2 (Bribery Oman)

	STOCK_PRICE	BMA	OMX30S	VOLUME
STOCK_PRICE	1.000000	*0.622137*	0.652542	-0.374592
BMA	*0.622137*	1.000000	0.154934	0.088087
OMX30S	0.652542	0.154934	1.000000	-0.381047
VOLUME	-0.374592	0.088087	-0.381047	1.000000

In the correlation model above the results tested in Eviews for Ericsson2 (Bribery Oman) showed a positive correlation between BMA and stock price. The correlation between the BMA variable and the dependent variable *stock price* was 0.622137 and therefore positive. The correlation between explanatory variables did not exceed -0.7 - 0.7 and therefore no indication of multicollinearity in the regression model.

4.6 CORRELATION FOR SIGNIFICANT BMA VARIABLE (6 DAYS OF BMA)

H&M2 (Factory Collapse)

	STOCK_PRICE	BMA	OMX30S	VOLUME
STOCK_PRICE	1.000000	*-0.761364*	0.142388	-0.487293

BMA	*-0.761364*	1.000000	0.322413	0.211818
OMX30S	0.142388	0.322413	1.000000	-0.443783
VOLUME	-0.487293	0.211818	-0.443783	1.000000

The results of the correlation model above tested for H&M2 (Factory Collapse) in Eviews showed a negative correlation between the BMA variable and the dependent variable, *stock price*. The negative correlation was -0.761364. The correlation between explanatory variables did not exceed -0.7 - 0.7 and therefore no sign of multicollinearity in the tested regression model.

H&M5 (Factory Still Bad)

	STOCK_PRICE	BMA	OMX30S	VOLUME
STOCK_PRICE	1.000000	*-0.126391*	0.865906	-0.570841
BMA	*-0.126391*	1.000000	0.254335	-0.135336
OMX30S	0.865906	0.254335	1.000000	-0.740257
VOLUME	-0.570841	-0.135336	-0.740257	1.000000

The correlation model above showed results for H&M5 (Factory Still Bad) tested in Eviews. The results indicated that there was a negative correlation between the BMA variable and the dependent variable, *stock price*. There was a sign of multicollinearity thus the correlation between OMX30S and VOLUME was -0.740257 and therefore exceeded -0.7 - 0.7. The remaining explanatory variables had no sign of multicollinearity thus they did not exceed a correlation of -0.7 - 0.7.

Ericsson2 (Bribery Oman)

	STOCK_PRICE	BMA	OMX30S	VOLUME
STOCK_PRICE	1.000000	*-0.248282*	0.675164	-0.099706
BMA	*-0.248282*	1.000000	-0.704774	0.088268
OMX30S	0.675164	-0.704774	1.000000	-0.423626
VOLUME	-0.099706	0.088268	-0.423626	1.000000

The correlation model above showed results tested for Ericsson2 (Bribery Oman). The results showed a negative correlation between BMA and stock price and it was -0.248282. There was no indication of multicollinearity as no correlation between explanatory variables exceeded -0.7 - 0.7.

The overall results tested for the correlation between the BMA variable and stock price showed that there was 1 *news* that had a negative correlation for 2 days of BMA and 1 *news* that had a positive correlation for 2 days of BMA. The correlation between the BMA variable and stock price for 6 days of BMA showed a negative correlation for all 3 significant BMA variables. One regression indicated that there was multicollinearity between explanatory variables. The variables were OMX30S and VOLUME when tested for H&M5 (Factory Still Bad).

5. ANALYSIS

The research showed that a few *news* defined as BMA had an impact on stock price on established companies, on the OMX Stockholm 30 Stock Exchange. Though, the majority of *news* investigated in this study had no statistically significant impact on stock price. However, this research was the first research to study if BMA as an explanatory variable had an impact on the dependent variable, *stock price,* on companies on the OMX Stockholm 30 Stock Exchange.

The results showed that the majority of *news* had no statistically significant impact on stock price and a few specific *news* had either a positive or negative impact, suggesting an inconsistent correlation and that the market potentially work in a partly semi-strong-form (Fama, 1970; Soros, 1994). However, when considering BMA as a consistently insignificant variable, one could argue that the stock price is strong-form efficient at that particular period of time (Fama, 1970). The insignificant variables could also signal that the *news* was not information that affects an investor's present and future expectation of a stock, or that the present stock price already had discounted the information before its release in media. In other words, the stock price for a company on OMX Stockholm 30 Stock Exchange that suffered from BMA might already include the information regarding the *news*, verifying that individual investors cannot outperform other investors, which was seen in Malaysian and Indian markets when receiving the *news* (Hussin, Ahmed and Ying, 2010; Mandal and Rao, 2010). It could be that major players or other investors had access to *news* before it had been published in media, ensuring possibility of excess return for these particular individuals and that the stock price after the *news* already was discounted for the event, or that the event itself was insignificant for investors' expectations, resulting in no impact on the stock price. If the *news* was received to some operators before it was actually released in *media*, the market stock price tended to be strong-form in some cases, indicating insiders, with the support of Young (2015). These would act on the information regarding BMA before everybody else and would in this case mean the BMA variable would be insignificant due to market insufficiency, providing more evidence to the EMH (Fama, 1970). In other words, the BMA variable was insignificant after

the *news* had been released due to activity related to the event, but before the actual release. In reality, in lined with Grossman and Stiglitz's (1980) opposition to EMH's impact on the competitive market, and E. Campos Dias de Sousa and Howden's (2015) article that the construction of EMH was flawed, indicating that no investors would exist on an efficient market, the BMA variable on stock price endorsed this when demonstrating insignificance as no stock price changes could be certified as an outcome tied to the event. However, if the event of BMA itself was insignificant to investor expectation, the utilization of risk aversion was ambiguous. The investors either chose to keep the stock as no threat to the stock price was presented, implying no *risk aversion* was needed and no usage of *loss avoidance system*, or kept it due to *risk aversion* where keeping the stock demonstrated less risk. The later would be consistent with *loss aversion* and the confirmation of "Expected Utility Hypothesis" (Neumann and Morgenstern, 1944).

5.1 CORRELATION BETWEEN BMA AND STOCK PRICE

The results showed that BMA, in most cases, was an insignificant variable to impact the stock price, but when the variable was significant, it tended to have a negative correlation to stock price, arguing that BMA yielded negative returns, as a counterpart to F. Spagnolo and N. Spagnolo (2016) that was claiming positive news yield positive returns. Notably, in most cases when tested for 6 days of BMA the majority of significant variables had a negative impact on stock price and partially supported the hypothesis of a certain correlation of negative impact on stock price when suffering from BMA. Although, since the statistical evidence showed insignificance on most BMA-variables, no accurate correlation could be confirmed. In some cases, there were specific *news* when the correlation between the BMA variable and stock price was positive, further resulting in that the study could not claim that there was a consistent negative correlation between *news* events defined as BMA and stock price changes.

Furthermore, the results rejected the hypothesis that the impact of BMA had a larger impact the day after the *news* had been released. It also partially rejected the hypothesis; that the correlation between BMA was negative, with the fact that the significant variables tended to be negative, but

were not exclusively negative, meaning no consistent negative correlation could be concluded. With the support of results, the study considerably contradicted Caporale, F. Spagnolo and N. Spagnolo (2016); that stock returns were more responsive to bad news, meaning the bad news defined as BMA in this research, was not a statistically significant variable affecting the stock price. The results also partly contradicted Veronesi (1999) claiming that stock prices overreacted to bad news in good times, meaning this study did not define or involve good or bad times, but the bad *news* defined as BMA in this study could not be seen as a repeatable factor causing overreaction due to the majority of statistically insignificant variables. Even though, BMA was a specific defined *news* event that possibly only cause a change in stock price for very specific events, the BMA was according to the results not a significant factor to change the present and future expectations on a large cap company on the OMX Stockholm 30 Stock Exchange.

5.2 CONNECTION WITH BEHAVIORAL FINANCE

In line with the Prospect Theory, the results of this study showed a majority of insignificant BMA variables that potentially explains how investors evaluated risk, but using relative reference points from the Cumulative Prospect Theory (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992). This resulted in the majority of *news*' insignificance to affect the present or future expectations of stock price. The reference points would indicate past experiences ~ results on the stock market when presented in an identical situation. This would prompt investors to act similarly to that of their respective desired and expected outcome, which would be comparable to Phillip and Pohl's (2014) study concerning lone wolf terrorists. In addition, with the support of Baker and Nofsinger (2010) regarding an individual's poor financial decision, the insignificant BMA variables would demonstrate investors' unwillingness to sell low-rate return stocks or waiting for better times. This would imply that the BMA was only a short-term impact and did not affect an investor's action when trying to obtain expected return on a stock. The investors therefore acted rational according to the *news* of the BMA received and it worked as an inadequate factor for the stock price (Kahneman and Tversky, 1979).

Furthermore, the hypothesis in this study could be connected to the *loss avoidance system* Baker and Nofsinger (2010) acknowledged when BMA acted as a potential threat that emerged in the environment for a specific company. In contrast, the study showed that the BMA variable did not emerge as a potential threat to investors, since majority of tests had an insignificant BMA variable when *news* referring to BMA had been published. This created the complex situation of *risk aversion* explained above. Therefore, the *risk* as a potential loss in financial matters was according to the results only the consequence for a small number of *news* when the impact of BMA was statistically significant and had a negative impact on stock price. Also, when investors might find a potential threat of owning the stock, indicating the concept of Risk-Return Tradeoff (Nyberg, 2012; Koutmos, 2015). The majority of *news* investigated in the study showed that investors potentially find no *risk* (a financial loss) when a stock suffered from BMA.

The BMA variable would also be insignificant due to the theory from Baker and Nofsinger (2010) if investors rebalance their portfolio by trading another stock when expecting a negative trend caused by BMA. This would imply keeping a preferred stock, a bias, which suffered from BMA and allow them to not act on the *news*, making the BMA variable insignificant to stock price. This reaction would not show up in any of the variables examined and strengthen the argument for stock portfolio *diversification*; adding number of different stocks to eliminate *unsystematic risk*, thus completely following the market (Wilke, 2003; Willenbrock, 2011; Young, 2015). Nevertheless, since *diversification* is a debatable theory, the reasoning behind the insignificant statistical values, and the inconsistent correlation between the significant BMA variables and stock price remained unconvincing (Willenbrock, 2011; Chance, Shynkevich and Yang, 2011).

5.3 TEST FOR 2 DAYS OF BMA VERSUS TEST FOR 6 DAYS OF BMA

The results showed that there were more significant variables when testing for 6 days of BMA instead of 2 days. Therefore, indicating that the BMA variable either had an impact on stock price after 3 days or more, or that the event continued to have an impact on stock price for more than 2 days after the *news*. Thus, the results rejected the hypothesis that BMA would have a greater impact

the first days and then return to its initial point. One particular company, H&M, was tested for 5 *news* events and all 5 were insignificant when tested for 2 days of BMA, but had 2 significant BMA variables when tested for 6 days of BMA. It was therefore a random factor not included in this study or that the BMA variable had an impact during a longer period of time after the release of the *news* event defined as BMA. It could also suggest that the actual impact on stock price happened more than 2 days after the release. The results supported Chan's (2003) research that investors tend to react slowly after information has been released, meaning that the BMA would have an impact several days after the event and not the following 2 days. Anyhow, the study was made 13 years ago and considering the exponential growth in technology, the prior argument of a random factor seemed more prone and also support the Random Walk Theory; that the stock price has taken an unpredictable path that investors could not predict, causing the impossibility to outperform the market (Malkiel, 1999). This was also a possible result of a *risk* evaluation of the event made by investors that potentially evaluated if the *news* event, defined as BMA, was either an opportunity or a threat that should have affected the stock price. This resulted in a *risk* evaluation that made the BMA variable significant (Baker and Nofsinger, 2010). Also, the results showed that all statistically significant BMA variables when testing for 6 days in H&M had a negative correlation between the BMA variable and stock price. The results were of *news* events specifically tied to the company's employee's death or bad working conditions, meanwhile 1 of the 2 *news* events with insignificant BMA variables were tied to specific kind of labor force (child labor) in H&M. This is supporting Li, Wang et al's (2014) study that specific news might affect companies' stock prices differently depending on the information uncovered.

5.4 CLOSING ANALYSIS

As can be seen, the study showed that the majority of BMA variables were statistically insignificant when testing for *news* defined as BMA. Although, 5 BMA variables in all tests were found to be statistically significant, 2 when tested for 2 days of BMA and 3 when tested for 6 days of BMA. 2 of the statistically insignificant variables were close to be significant and would have been significant with a confidence interval of 90 percent, which implies that the results of this study

would have indicated a more strong significance and correlation if tested with a lower confidence interval. However, that would have made the results less trustworthy when analyzing the tested data. The results only showed one test to be exposed to multicollinearity and only between the explanatory variables OMX30S and VOLUME, not affecting the BMA variable. For this reason, the results showed that all tests indicated that the BMA variable did not suffer from multicollinearity when tested with the explanatory variables OMX30S and VOLUME. The BMA variable would therefore be a considerably respectable variable to explain the dependent variable *stock price*. It would accordingly be reasonable to assume that the BMA variable, OMX30S and VOLUME did not correlate strongly and thoroughly implied when investigating the pairwise correlation in the correlation model. Consequently, variance of the random terms could be assumed not to affect t-quotas, indicating that the results of this study were more reliable.

6. CONCLUSION

The aim of this thesis has been to investigate the impact of BMA on stock price. Thus, the principal question was asked:

- *(RQ1): Does BMA have an impact on stock price?*

The majority of BMA variables were found to be statistically insignificant and had no impact on stock price. However, the study found that a few *news*, defined as BMA, had a statistically significant impact on stock price. Also, that the correlation between BMA and stock price tended to be negative, but still remained inconsistent due to the small number of statistically significant variables. Considering no multicollinearity in the correlation matrix, BMA should be a valid factor and strengthen the fact that the BMA variable is insignificant. Furthermore, since there were so few significant variables, it supported the fact for a random factor rather than actual significance, thus BMA has no impact on stock price.

The results showed that there were more significant BMA variables when testing for 6 days instead of 2 days of BMA. This allowed for the analysis that the *news*, defined as BMA, had an impact on stock price several days after the event or during a longer period of time than 2 days. However, the conclusion was that these tests were inconclusive due to inconsistency and expected randomness.

Earlier research showed that media had an impact on stock price. Although, this study found that *news*, defined as BMA, is a statistically insignificant factor for the large cap section on the OMX Stockholm 30 Stock Exchange when testing for impact on stock price.

7. DISCUSSION

7.1 CONTRIBUTIONS, POTENTIAL IMPACT OR SIGNIFICANCE

This thesis contributed to the stock market field in a number of ways. First, by showing that in most cases that *news* events defined as BMA had no statistically significant impact on stock price for large cap companies on the OMX Stockholm 30 Stock Exchange. Second, this study may help to understand what affects the stock market, meaning *news* defined as BMA had no statistically significant impact on stock price, which could raise awareness on this particular topic. It could furthermore help to better grasp the impact of BMA. Last, it would help future studies on how certain stocks react to specific events tied to a specific area.

7.2 LIMITATIONS

When acknowledging the findings in the study as insignificant, there were certain limitations that inhibited further potential conclusions. The first limitation was the focus on BMA variable in the OLS-estimation as the definitive variable that would verify a connection between BMA and stock price. Additional explanatory variables in the estimation could have indicated which variables that are relevant for an investor, providing a rank system among the variables' significance. If none of the other explanatory variables would have shown significance, it would imply that a "human" factor rather than expectations matter. Such a "human" factor would certify that the perception of a company, thus the stock price, is not tied to a company's goodwill, suggesting that investor psychology and ethical aspects should be further investigated. Another limitation was the diverse range of industries as some according to results were more responsive to BMA (telecommunication and clothing). The final limitation was the use of large cap companies, which could be too big and well-established to be upset by the BMA variable.

7.3 FUTURE RESEARCH POTENTIAL

This thesis generated valuable insights regarding the impact of BMA on stock price. However, more work is needed in several areas in order to understand the whole impact regarding BMA. Future research using BMA as an explanatory variable could use additional variables to verify if other variables would have a significant impact on stock price. It could also use the discovery of BMA as insignificant to pursue the seeking to find if unethical information regarding a large cap company would have an effect on the value of the company. Furthermore, unethical *news* events, such as BMA, did not have a consistent correlation with stock prices for big and established companies. In addition, future research to could tie CSR, stock prices and the value of a company together. Further investigation regarding the use of CSR is significant and to understand the impact on large cap companies.

Overall, because this research showed that a majority of *news* defined as BMA did not have a statistically significant impact on stock price, future research within the area would narrow the impact of BMA on stock price down to specific companies or industries, since the only significant variables were in the clothing and telecommunication industry (Ericsson, H&M & Telia Company). Furthermore, in relative numbers, the majority of significant variables in this study were in the telecommunication industry (note that the company with the *news* was investigated in this industry; Ericsson and Telia Company), thus future research could investigate whether a specific industry is especially sensitive to BMA or if it is a specific event in itself that provokes this particular anomaly and therefore has an impact on stock price. Ultimately, a study regarding the BMA variable occurring to less established companies, preferably mid cap or fast developing small cap companies on OMX Stockholm 30 Stock Exchange, would be suggested to confirm the impact of BMA on stock prices.

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9. APPENDICES

9.1 APPENDIX 1. LIST OF INVESTIGATED STOCKS

AstraZeneca

Boliden

Ericsson B

H&M B

Saab B

Telia Company

Volvo B

9.2 APPENDIX 2. RESULTS PRESENTED IN EVIEWS (2 DAYS OF BMA)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:54
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	51.66654	22.11548	2.336216	0.0581
BMA	0.313449	1.274478	0.245943	0.8139
OMX30S	0.174349	0.022597	7.715516	0.0002
VOLUME	-3.40E-07	8.00E-07	-0.425156	0.6855

R-squared	0.918721	Mean dependent var	220.5650
Adjusted R-squared	0.878081	S.D. dependent var	4.271225
S.E. of regression	1.491377	Akaike info criterion	3.926451
Sum squared resid	13.34523	Schwarz criterion	4.047485
Log likelihood	-15.63225	Hannan-Quinn criter.	3.793677
F-statistic	22.60659	Durbin-Watson stat	0.789861
Prob(F-statistic)	0.001138		

H&M1 (Fire)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:56
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	228.4880	52.86908	4.321770	0.0050
BMA	-2.350069	2.151045	-1.092525	0.3165
OMX30S	0.001902	0.043368	0.043869	0.9664
VOLUME	-4.77E-07	1.01E-06	-0.470623	0.6545

R-squared	0.369648	Mean dependent var	228.9600
Adjusted R-squared	0.054471	S.D. dependent var	2.193019
S.E. of regression	2.132454	Akaike info criterion	4.641599
Sum squared resid	27.28417	Schwarz criterion	4.762633
Log likelihood	-19.20799	Hannan-Quinn criter.	4.508825
F-statistic	1.172829	Durbin-Watson stat	2.457674
Prob(F-statistic)	0.395324		

H&M2 (Factory Collapse)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:58
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	280.0800	113.8199	2.460729	0.0491
BMA	-8.624954	3.643186	-2.367421	0.0557
OMX30S	0.044343	0.066513	0.666683	0.5298
VOLUME	-1.72E-06	9.83E-07	-1.746114	0.1314

R-squared	0.681907	Mean dependent var	346.6300
Adjusted R-squared	0.522860	S.D. dependent var	5.620607
S.E. of regression	3.882450	Akaike info criterion	5.839984
Sum squared resid	90.44052	Schwarz criterion	5.961018
Log likelihood	-25.19992	Hannan-Quinn criter.	5.707210
F-statistic	4.287469	Durbin-Watson stat	2.695705
Prob(F-statistic)	0.061388		

H&M3 (Child Labor)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:00
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	77.14073	48.97728	1.575031	0.1663
BMA	1.624491	1.278213	1.270908	0.2508
OMX30S	0.155750	0.037904	4.109060	0.0063
VOLUME	-5.83E-07	2.12E-06	-0.274520	0.7929

R-squared	0.763313	Mean dependent var	272.6100
Adjusted R-squared	0.644969	S.D. dependent var	2.374143
S.E. of regression	1.414621	Akaike info criterion	3.820775
Sum squared resid	12.00692	Schwarz criterion	3.941809
Log likelihood	-15.10387	Hannan-Quinn criter.	3.688001
F-statistic	6.449963	Durbin-Watson stat	1.666421
Prob(F-statistic)	0.026295		

H&M4 (Factory Fire)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:02
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.893116	75.16510	-0.011882	0.9909
BMA	-4.284542	2.644167	-1.620375	0.1563
OMX30S	0.208153	0.048999	4.248134	0.0054
VOLUME	3.09E-06	2.17E-06	1.426895	0.2035

R-squared	0.833529	Mean dependent var	307.9900
Adjusted R-squared	0.750293	S.D. dependent var	5.345497
S.E. of regression	2.671180	Akaike info criterion	5.092092
Sum squared resid	42.81121	Schwarz criterion	5.213126
Log likelihood	-21.46046	Hannan-Quinn criter.	4.959318
F-statistic	10.01410	Durbin-Watson stat	1.658157
Prob(F-statistic)	0.009439		

H&M5 (Factory Still Bad)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:11
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-59.86857	31.14413	-1.922307	0.1029
BMA	0.297982	1.014364	0.293763	0.7788
OMX30S	0.098800	0.021688	4.555434	0.0039
VOLUME	4.10E-08	1.74E-07	0.235973	0.8213

R-squared	0.849187	Mean dependent var	85.61500
Adjusted R-squared	0.773780	S.D. dependent var	2.473195
S.E. of regression	1.176316	Akaike info criterion	3.451826
Sum squared resid	8.302313	Schwarz criterion	3.572860
Log likelihood	-13.25913	Hannan-Quinn criter.	3.319052
F-statistic	11.26142	Durbin-Watson stat	1.089105
Prob(F-statistic)	0.007066		

Volvo1 (Diesel Scandal)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:13
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.78710	78.93704	0.212664	0.8386
BMA	-0.189493	1.249504	-0.151654	0.8844
OMX30S	0.046140	0.053336	0.865083	0.4202
VOLUME	2.21E-07	2.55E-07	0.868448	0.4185

R-squared	0.138218	Mean dependent var	85.45000
Adjusted R-squared	-0.292673	S.D. dependent var	1.063798
S.E. of regression	1.209494	Akaike info criterion	3.507455
Sum squared resid	8.777252	Schwarz criterion	3.628489
Log likelihood	-13.53728	Hannan-Quinn criter.	3.374681
F-statistic	0.320772	Durbin-Watson stat	0.899760
Prob(F-statistic)	0.810633		

Volvo2 (Cartel)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:16
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-53.23702	17.52849	-3.037170	0.0229
BMA	-1.207458	0.443140	-2.724776	0.0344
OMX30S	0.073433	0.013036	5.633245	0.0013
VOLUME	-9.05E-09	5.49E-08	-0.164795	0.8745

R-squared	0.875747	Mean dependent var	45.97900
Adjusted R-squared	0.813620	S.D. dependent var	1.198448
S.E. of regression	0.517390	Akaike info criterion	1.809136
Sum squared resid	1.606156	Schwarz criterion	1.930170
Log likelihood	-5.045680	Hannan-Quinn criter.	1.676362
F-statistic	14.09618	Durbin-Watson stat	2.274428
Prob(F-statistic)	0.003996		

Telia Company1 (Dictatorship)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:18
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.442911	14.97985	-0.496861	0.6370
BMA	-0.024695	0.228032	-0.108298	0.9173
OMX30S	0.046187	0.012006	3.847037	0.0085
VOLUME	-2.25E-08	6.26E-08	-0.358939	0.7319

R-squared	0.818748	Mean dependent var	50.98500
Adjusted R-squared	0.728121	S.D. dependent var	0.440990
S.E. of regression	0.229941	Akaike info criterion	0.187186
Sum squared resid	0.317237	Schwarz criterion	0.308220
Log likelihood	3.064072	Hannan-Quinn criter.	0.054412
F-statistic	9.034340	Durbin-Watson stat	1.001451
Prob(F-statistic)	0.012106		

Telia Company2 (Bribery)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:19
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-212.7868	151.1993	-1.407327	0.2090
BMA	0.633089	1.045412	0.605588	0.5670
OMX30S	0.217706	0.112656	1.932493	0.1015
VOLUME	1.99E-07	2.19E-07	0.907731	0.3990

R-squared	0.527058	Mean dependent var	78.00000
Adjusted R-squared	0.290587	S.D. dependent var	0.779957
S.E. of regression	0.656932	Akaike info criterion	2.286702
Sum squared resid	2.589357	Schwarz criterion	2.407736
Log likelihood	-7.433509	Hannan-Quinn criter.	2.153928
F-statistic	2.228848	Durbin-Watson stat	1.254595
Prob(F-statistic)	0.185440		

Ericsson1 (Bribery Greece)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:25
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.27537	29.49376	0.551824	0.6010
BMA	4.524907	1.645444	2.749962	0.0333
OMX30S	0.061881	0.029415	2.103704	0.0801
VOLUME	-1.11E-07	1.00E-07	-1.107154	0.3106

R-squared	0.754186	Mean dependent var	73.10500
Adjusted R-squared	0.631279	S.D. dependent var	3.342026
S.E. of regression	2.029358	Akaike info criterion	4.542490
Sum squared resid	24.70976	Schwarz criterion	4.663524
Log likelihood	-18.71245	Hannan-Quinn criter.	4.409716
F-statistic	6.136238	Durbin-Watson stat	1.192043
Prob(F-statistic)	0.029332		

Ericsson2 (Bribery Oman)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:27
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	729.1638	357.5325	2.039433	0.0875
BMA	15.33993	10.53881	1.455565	0.1958
OMX30S	-0.403590	0.371699	-1.085798	0.3193
VOLUME	-7.96E-07	3.05E-06	-0.260540	0.8032

R-squared	0.494698	Mean dependent var	345.4400
Adjusted R-squared	0.242047	S.D. dependent var	13.58947
S.E. of regression	11.83106	Akaike info criterion	8.068508
Sum squared resid	839.8443	Schwarz criterion	8.189543
Log likelihood	-36.34254	Hannan-Quinn criter.	7.935734
F-statistic	1.958029	Durbin-Watson stat	0.558117
Prob(F-statistic)	0.221753		

AstraZeneca (“Suppressed” Drug Test)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:29
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	79.51489	76.25253	1.042784	0.3372
BMA	1.472524	1.117304	1.317927	0.2356
OMX30S	0.016254	0.059694	0.272286	0.7945
VOLUME	1.08E-06	1.01E-06	1.072740	0.3246

R-squared	0.286151	Mean dependent var	102.4000
Adjusted R-squared	-0.070773	S.D. dependent var	1.324135
S.E. of regression	1.370191	Akaike info criterion	3.756951
Sum squared resid	11.26454	Schwarz criterion	3.877985
Log likelihood	-14.78476	Hannan-Quinn criter.	3.624177
F-statistic	0.801713	Durbin-Watson stat	1.422775
Prob(F-statistic)	0.536771		

Boliden (Poison Scandal)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:31
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	119.4875	53.99666	2.212868	0.0689
BMA	-3.655215	3.638397	-1.004622	0.3539
OMX30S	0.011935	0.056676	0.210580	0.8402
VOLUME	1.28E-06	1.11E-05	0.115514	0.9118

R-squared	0.174444	Mean dependent var	130.7000
Adjusted R-squared	-0.238334	S.D. dependent var	3.818449
S.E. of regression	4.249188	Akaike info criterion	6.020507
Sum squared resid	108.3336	Schwarz criterion	6.141541
Log likelihood	-26.10254	Hannan-Quinn criter.	5.887733
F-statistic	0.422610	Durbin-Watson stat	0.927449
Prob(F-statistic)	0.743811		

Saab1 (Bribery in Hungary & Czech Republic)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 15:33
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-46.90212	24.47611	-1.916240	0.1038
BMA	-0.330498	1.130072	-0.292457	0.7798
OMX30S	0.139884	0.023548	5.940392	0.0010
VOLUME	-2.23E-06	6.42E-06	-0.346776	0.7406

R-squared	0.894530	Mean dependent var	96.90000
Adjusted R-squared	0.841795	S.D. dependent var	3.004626
S.E. of regression	1.195090	Akaike info criterion	3.483494
Sum squared resid	8.569438	Schwarz criterion	3.604528
Log likelihood	-13.41747	Hannan-Quinn criter.	3.350720
F-statistic	16.96274	Durbin-Watson stat	1.740232
Prob(F-statistic)	0.002463		

Saab2 (Bribery in South Africa)

9.3 APPENDIX 3. RESULTS PRESENTED IN EVIEWS (6 DAYS OF BMA)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/24/16 Time: 14:26
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	52.00191	15.04874	3.455565	0.0135
BMA	-1.664135	0.727587	-2.287197	0.0622
OMX30S	0.174164	0.015400	11.30908	0.0000
VOLUME	-1.25E-08	6.02E-07	-0.020726	0.9841

R-squared	0.956141	Mean dependent var	220.5650
Adjusted R-squared	0.934212	S.D. dependent var	4.271225
S.E. of regression	1.095536	Akaike info criterion	3.309539
Sum squared resid	7.201197	Schwarz criterion	3.430573
Log likelihood	-12.54770	Hannan-Quinn criter.	3.176765
F-statistic	43.60082	Durbin-Watson stat	1.565462
Prob(F-statistic)	0.000181		

H&M1 (Fire)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:06
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	184.9528	35.12876	5.264997	0.0019
BMA	-3.561025	0.979603	-3.635173	0.0109
OMX30S	0.039640	0.029088	1.362776	0.2219
VOLUME	-3.47E-07	5.37E-07	-0.646545	0.5419

R-squared	0.764006	Mean dependent var	228.9600
Adjusted R-squared	0.646008	S.D. dependent var	2.193019
S.E. of regression	1.304785	Akaike info criterion	3.659128
Sum squared resid	10.21478	Schwarz criterion	3.780162
Log likelihood	-14.29564	Hannan-Quinn criter.	3.526354
F-statistic	6.474779	Durbin-Watson stat	2.817307
Prob(F-statistic)	0.026073		

H&M2 (Factory Collapse)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:09
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	136.3500	124.7763	1.092755	0.3164
BMA	-3.442232	3.290198	-1.046208	0.3358
OMX30S	0.128593	0.073492	1.749747	0.1307
VOLUME	-1.07E-06	1.18E-06	-0.902079	0.4018

R-squared	0.479690	Mean dependent var	346.6300
Adjusted R-squared	0.219535	S.D. dependent var	5.620607
S.E. of regression	4.965466	Akaike info criterion	6.332066
Sum squared resid	147.9351	Schwarz criterion	6.453100
Log likelihood	-27.66033	Hannan-Quinn criter.	6.199292
F-statistic	1.843861	Durbin-Watson stat	2.211589
Prob(F-statistic)	0.239831		

H&M3 (Child Labor)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:13
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	106.4792	48.77915	2.182884	0.0718
BMA	0.042116	1.041463	0.040439	0.9691
OMX30S	0.133647	0.037978	3.519022	0.0125
VOLUME	-1.31E-06	2.33E-06	-0.560550	0.5954

R-squared	0.699678	Mean dependent var	272.6100
Adjusted R-squared	0.549517	S.D. dependent var	2.374143
S.E. of regression	1.593478	Akaike info criterion	4.058890
Sum squared resid	15.23504	Schwarz criterion	4.179924
Log likelihood	-16.29445	Hannan-Quinn criter.	3.926116
F-statistic	4.659517	Durbin-Watson stat	1.541091
Prob(F-statistic)	0.052119		

H&M4 (Fire)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:15
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.208152	58.14964	-0.003580	0.9973
BMA	-3.953332	1.412540	-2.798740	0.0312
OMX30S	0.211707	0.038319	5.524883	0.0015
VOLUME	1.45E-06	1.42E-06	1.018517	0.3477

R-squared	0.896196	Mean dependent var	307.9900
Adjusted R-squared	0.844294	S.D. dependent var	5.345497
S.E. of regression	2.109312	Akaike info criterion	4.619775
Sum squared resid	26.69518	Schwarz criterion	4.740809
Log likelihood	-19.09888	Hannan-Quinn criter.	4.487001
F-statistic	17.26707	Durbin-Watson stat	1.457038
Prob(F-statistic)	0.002349		

H&M5 (Factory Still Bad)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:18
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-37.62488	23.81013	-1.580205	0.1651
BMA	-1.309332	0.640176	-2.045269	0.0868
OMX30S	0.084128	0.016477	5.105802	0.0022
VOLUME	5.75E-08	1.31E-07	0.437447	0.6771

R-squared	0.909861	Mean dependent var	85.61500
Adjusted R-squared	0.864792	S.D. dependent var	2.473195
S.E. of regression	0.909411	Akaike info criterion	2.937134
Sum squared resid	4.962165	Schwarz criterion	3.058168
Log likelihood	-10.68567	Hannan-Quinn criter.	2.804360
F-statistic	20.18800	Durbin-Watson stat	1.748528
Prob(F-statistic)	0.001547		

Volvo1 (Diesel Scandal)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:20
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	36.44370	58.55693	0.622364	0.5566
BMA	-0.921399	0.748601	-1.230828	0.2644
OMX30S	0.033471	0.039286	0.851981	0.4269
VOLUME	1.19E-07	2.29E-07	0.519559	0.6220

R-squared	0.309307	Mean dependent var	85.45000
Adjusted R-squared	-0.036039	S.D. dependent var	1.063798
S.E. of regression	1.082798	Akaike info criterion	3.286148
Sum squared resid	7.034707	Schwarz criterion	3.407182
Log likelihood	-12.43074	Hannan-Quinn criter.	3.153374
F-statistic	0.895643	Durbin-Watson stat	0.827103
Prob(F-statistic)	0.495885		

Volvo2 (Cartel)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:27
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-53.20371	25.55345	-2.082056	0.0825
BMA	-0.378887	0.490631	-0.772245	0.4693
OMX30S	0.073050	0.019029	3.838989	0.0086
VOLUME	4.33E-08	7.26E-08	0.596711	0.5725

R-squared	0.747130	Mean dependent var	45.97900
Adjusted R-squared	0.620695	S.D. dependent var	1.198448
S.E. of regression	0.738097	Akaike info criterion	2.519692
Sum squared resid	3.268725	Schwarz criterion	2.640726
Log likelihood	-8.598460	Hannan-Quinn criter.	2.386918
F-statistic	5.909194	Durbin-Watson stat	1.654398
Prob(F-statistic)	0.031826		

Telia Company1 (Working with Dictatorship)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:31
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.778949	11.19197	-0.426998	0.6843
BMA	-0.150976	0.136764	-1.103922	0.3119
OMX30S	0.044140	0.008975	4.917836	0.0027
VOLUME	-1.98E-08	5.64E-08	-0.351714	0.7371

R-squared	0.849052	Mean dependent var	50.98500
Adjusted R-squared	0.773578	S.D. dependent var	0.440990
S.E. of regression	0.209840	Akaike info criterion	0.004231
Sum squared resid	0.264197	Schwarz criterion	0.125265
Log likelihood	3.978846	Hannan-Quinn criter.	-0.128543
F-statistic	11.24959	Durbin-Watson stat	1.288679
Prob(F-statistic)	0.007084		

Telia Company2 (Bribery)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:34
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-277.8477	108.4876	-2.561101	0.0428
BMA	0.925271	0.530939	1.742709	0.1320
OMX30S	0.266694	0.081199	3.284446	0.0167
VOLUME	1.48E-07	1.06E-07	1.395027	0.2125

R-squared	0.666805	Mean dependent var	78.00000
Adjusted R-squared	0.500207	S.D. dependent var	0.779957
S.E. of regression	0.551399	Akaike info criterion	1.936458
Sum squared resid	1.824244	Schwarz criterion	2.057492
Log likelihood	-5.682288	Hannan-Quinn criter.	1.803684
F-statistic	4.002487	Durbin-Watson stat	2.109436
Prob(F-statistic)	0.070019		

Ericsson1 (Bribery Greece)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:37
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-40.88705	29.87561	-1.368576	0.2202
BMA	4.993449	1.602733	3.115585	0.0207
OMX30S	0.121849	0.030166	4.039320	0.0068
VOLUME	-1.89E-07	9.98E-08	-1.896760	0.1066

R-squared	0.787749	Mean dependent var	73.10500
Adjusted R-squared	0.681623	S.D. dependent var	3.342026
S.E. of regression	1.885734	Akaike info criterion	4.395685
Sum squared resid	21.33595	Schwarz criterion	4.516719
Log likelihood	-17.97843	Hannan-Quinn criter.	4.262911
F-statistic	7.422806	Durbin-Watson stat	2.068262
Prob(F-statistic)	0.019174		

Ericsson2 (Bribery Oman)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:39
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	997.4983	321.0009	3.107463	0.0209
BMA	13.58865	9.291253	1.462521	0.1939
OMX30S	-0.680007	0.335166	-2.028865	0.0888
VOLUME	-4.96E-06	3.58E-06	-1.384102	0.2156

R-squared	0.495958	Mean dependent var	345.4400
Adjusted R-squared	0.243937	S.D. dependent var	13.58947
S.E. of regression	11.81630	Akaike info criterion	8.066012
Sum squared resid	837.7499	Schwarz criterion	8.187046
Log likelihood	-36.33006	Hannan-Quinn criter.	7.933238
F-statistic	1.967924	Durbin-Watson stat	0.695514
Prob(F-statistic)	0.220271		

AstraZeneca (“Suppressed” Drug Test)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:45
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	89.68266	106.3741	0.843087	0.4315
BMA	0.220395	1.239237	0.177847	0.8647
OMX30S	0.008852	0.083624	0.105859	0.9191
VOLUME	7.51E-07	1.10E-06	0.680168	0.5218

R-squared	0.084327	Mean dependent var	102.4000
Adjusted R-squared	-0.373509	S.D. dependent var	1.324135
S.E. of regression	1.551844	Akaike info criterion	4.005939
Sum squared resid	14.44932	Schwarz criterion	4.126973
Log likelihood	-16.02970	Hannan-Quinn criter.	3.873165
F-statistic	0.184186	Durbin-Watson stat	1.191758
Prob(F-statistic)	0.903380		

Boliden (Poison Scandal)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:48
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	178.9827	62.75437	2.852115	0.0291
BMA	-4.596652	3.312029	-1.387866	0.2145
OMX30S	-0.051630	0.065062	-0.793544	0.4577
VOLUME	1.01E-05	1.03E-05	0.973019	0.3681

R-squared	0.269945	Mean dependent var	130.7000
Adjusted R-squared	-0.095083	S.D. dependent var	3.818449
S.E. of regression	3.995862	Akaike info criterion	5.897570
Sum squared resid	95.80147	Schwarz criterion	6.018604
Log likelihood	-25.48785	Hannan-Quinn criter.	5.764796
F-statistic	0.739520	Durbin-Watson stat	1.218135
Prob(F-statistic)	0.565997		

Saab1 (Bribery in Hungary and Czech Republic)

Dependent Variable: STOCK_PRICE
Method: Least Squares
Date: 05/16/16 Time: 14:50
Sample: 1 10
Included observations: 10

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-62.38956	24.74880	-2.520912	0.0452
BMA	-1.145424	0.962879	-1.189582	0.2791
OMX30S	0.155009	0.023904	6.484688	0.0006
VOLUME	7.73E-07	6.37E-06	0.121339	0.9074

R-squared	0.913441	Mean dependent var	96.90000
Adjusted R-squared	0.870162	S.D. dependent var	3.004626
S.E. of regression	1.082658	Akaike info criterion	3.285889
Sum squared resid	7.032885	Schwarz criterion	3.406923
Log likelihood	-12.42944	Hannan-Quinn criter.	3.153115
F-statistic	21.10574	Durbin-Watson stat	1.940565
Prob(F-statistic)	0.001372		

Saab2 (Bribery in South Africa)

9.4 APPENDIX 4. COMPANY INFORMATION THE YEAR BEFORE BMA (NUMBERS AVAILABLE TO INVESTORS)

	Solidity	Cash Flow	Size
AstraZeneca (Pharmaceuticals, 1999)			
2009:	91,84%	-503 000 000 SEK	65 938 000 000 SEK
Boliden (Metal refining, 1924)			
2012:	57,32%	659 000 000 SEK	40 081 000 000 SEK
Ericsson B (Telecommunication, 1876)			
2007:	54,71%	-2 065 000 000 SEK	196 746 000 000 SEK
2013:	52,08%	-3 228 000 000 SEK	227 489 000 000 SEK
H&M (Clothing, 1947)			
2009:	74,71%	-3 607 000 000 SEK	101 393 000 000 SEK
2012:	72,85%	276 000 000 SEK	120 799 000 000 SEK
2014:	68,20%	-275 000 000 SEK	151 419 000 000 SEK
Saab B (Automotive industry, 1947)			
2007:	32,49%	-526 000 000 SEK	23 858 000 000 SEK
2009:	34,64%	600 000 000 SEK	24 796 000 000 SEK

Telia Company (Telecommunication, 2003 - but Telia in 1853)

2011:	45,96%	-2 978 000 000 SEK	112 514 000 000 SEK
2012:	44,58%	17 746 000 000 SEK	119 773 000 000 SEK

Volvo (Automotive industry, 1927)

2013:	22,05%	2 221 000 000 SEK	272 718 000 000 SEK
2014:	20,91%	-1 769 000 000 SEK	283 045 000 000 SEK