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Reputational Loss Associated with Regulatory Sanctions in Scandinavia

Empirical evidence of the market reaction to Scandinavian regulatory sanctions

by

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Abstract

The purpose of this thesis is to determine if there is reputational harm as a consequence to a regulatory sanction. The focus of the thesis is the Scandinavian countries after the global financial crisis. To confirm if there is reputational losses associated with regulatory violations, an event study of abnormal returns was employed. The regulator, as well as the company in violation of regulation, has a need to understand the total financial loss following a regulatory enforcement action. The total loss for a publicly listed entity is twofold, one part being the administrative penalty given by the regulator, and the other being the penalty posed on the share price by the market reacting to the bad news of a regulatory violation. In Scandinavia the legal penalty constitutes of, on average, one eighth of the total financial loss which consequently imply reputational losses following the affirmation of corporate wrongdoings in Scandinavia.

Keywords: Regulatory Sanctions, Financial Supervisory Authority (FSA), Shareholder Value Loss, Reputational Loss, Abnormal Returns, Legal Penalty, Market Penalty, Efficient Markets, Financial Market Reaction.

Contents

1. Introduction

The financial crisis of 2007-2008 was a global financial crisis primarily created by banks in the United States. A stronger focus on the regulatory requirements of the financial markets followed the global crisis because the financial institutions created such a big negative ripple effect through the global economy (Xavier, 2010). A company in violation of a regulation may face two types of penalties. One comes from the regulator who may impose a legal penalty, while the other comes from the market which may in addition punish the shareholders of the publicly listed companies in violation of regulatory requirements (Karpoff and Lott, 1993). There is evidence, put forward by Armour, Mayer, and Polo (2017), showing a more severe market punishment of the financial companies' in violation of regulations post the financial crisis. The more substantial market punishment could be an affirmation that regulatory sanctions have increased in importance to people since the market crash (Armour, Mayer, and Polo, 2017). Karpoff and Lott (1993) stress how the reputational loss is an important factor in discouraging corporate crimes as the total loss could be more than 15 times the loss incurred from a regulatory sanction.

The Scandinavian regulatory environment is largely similar to those of other developed western countries since both Sweden and Denmark are a part of the EU, while Norway aspire to keep the same high regulatory standards as the EU member states (Finanstilsynet, 2016). The Scandinavian regulatory sanction is the legal penalty dealt from the regulator once an infringement has been confirmed. A legal penalty is often in the form of an administrative penalty, a financial fine, to be paid (Finansinspektionen, 2018b; Finanstilsynet, 2018, 2019). The administrative penalties may be perceived as very small when the legal penalty in Scandinavia is on average less than 0.5 percent of the companies' market values (see Table 4.1), and at times as little as $6.5 \cdot 10^{-6}$ percent of the market value (see Table A.1, observation No. 15, in Appendix A). Perhaps the legal fine is rightfully very small, as Alexander (1999) points out, if the market aids the regulator in punishing the companies in violation of the laws and regulations. The implication of a large market penalty is that the legal penalty might not be the major disincentive of misconduct (Alexander, 1999).

Fama (1970) identified how the stock price of a publicly listed company reflects informa-

tion available to the market to different extents. The market penalty reflects the efficient market hypothesis in the sense that the market penalty is merely the market reacting to the bad news of a company being in violation of laws and regulations. Karpoff and Lott (1993) states that if the market penalizes the company, and its shareholders, to a larger extent than the regulator does, then the company is also experiencing reputational losses from the regulatory breach. The loss of shareholder wealth exceeding the amount of the administrative penalty is the reputational loss (Karpoff and Lott, 1993).

Alexander (1999) affirms the understanding of the total cost, of violating laws and regulations, being of interest to both the companies who might face regulatory sanctions, and also to the regulatory authority in charge of enforcement actions. It should be of interest for the Financial Supervisory Authority itself as the regulator presents suggestions on regulations as well as being the deciding authority on the size of the administrative penalty punishment. If the Financial Supervisory Authority wants to match the size of the enforcement penalty to the damage the regulatory violation is deemed to have cost the society, which the authority ideally should, then the match should be to the total loss that the company experience subsequent to the enforcement (Alexander, 1999). The importance to practitioners, under the Scandinavian Financial Supervisory Authorities' supervision, is understanding the total financial loss at risk in order to fully comprehend the consequences of violating regulatory requirements.

The hypothesis in this thesis stems from the efficient market hypothesis combined with the regulatory sanction announcements confirming a specific company's violation of a law. My hypothesis is that negative news, in terms of a regulatory violation, should be reflected in a negative stock price reaction of the misbehaving Scandinavian company. The results, of this event study into abnormal returns, show that the market does punish the reputation of the Scandinavian companies in violation of regulatory requirements. The size of the market penalty result in a total loss that is about 7.7 times larger than the legal penalty. The result, in terms of the size of the market penalty in Scandinavia, is smaller than the previously researched by Karpoff and Lott (1993), Alexander (1999), Murphy, Shrieves, and Tibbs (2009), and Armour, Mayer, and Polo (2017) on the US and UK market penalties from before the financial crisis. However, the market penalties of Scandinavian corporate misconduct is of a higher statistical significance.

This introductory section is followed by a description of previous research and its results in Section 2. Section 3 presents economic theories of the Single-Index-Model and the Efficient Market Hypothesis, followed by the responsibilities of the financial supervisory authorities in

Scandinavia, and finally concludes with my hypothesis. The description of methodology and detailed characterization of the data used in this thesis is found in Section 4. Section 5 presents my results along with an analysis. Finally, Section 6, concludes the thesis.

2. Earlier Research

Earlier research is reviewed with a focus on legal fines and settlements after companies' breach the laws and regulations. Studies into the legal penalties and reputational loss, in terms of market penalties, of corporate misconduct are few, far apart, and with various different areas of focus. The research looking into corporate misconduct primarily focus on the initial press announcements of potential wrongdoing. There is also a concentration towards the US market in the event studies examining corporate wrongdoings. The research conducted on the US market is largely concentrated to misconduct that occurred before the year 2000. The two event studies conducted on data from European companies' misconducts; Sturm (2013) on the German banking sector, and Armour, Mayer, and Polo (2017) on the financial market in the UK, are conducted on data starting after the most recent millennium.

Reputational loss is commonly defined as the market reaction that is in excess of the size of the legal penalty imposed by an authority (Karpoff and Lott, 1993). The total financial loss is the market reaction to the negative news of corporate misconduct in addition to the size of the legal penalty as a percentage of the market value before the release of negative news (Armour, Mayer, and Polo, 2017). Alexander (1999) confirms the connection between the legal penalty and the market penalty, as well as the importance of regulators awareness of the link between the legal and market penalty in order to fully understand the consequences of an enforcement action. There also needs to be an understanding of total financial loss for the company in violations of laws and regulations in order for the regulators to find the optimal size of a legal fine (Alexander, 1999). Karpoff and Lott (1993) states the fact that optimization of the size of an administrative penalty should ideally correspond to the negative externality that the wrongdoing caused. If the market does *not* punish the shareholders' value of the company, then the legal fine should correspond proportionally to the violation. If, however, the market does further penalize the company by decreasing the shareholders' value to a larger extent than the size of the legal fine, then the total loss for the company should be proportionally matched to the negative externality

the company caused. Both of the alternatives will result in an internalization of the societal cost the regulatory violation causes. The regulator has to be aware of the market reaction to different types of offences in order to draw conclusions on what the optimum size of the legal penalty is in each case (Karpoff and Lott, 1993).

In regards to examining reputational loss of entities involved in corporate misconduct, it is common to regard the entire sample at first, and also sometimes to divide the sample into two classification groups of 2^{nd} and 3^{rd} party wrongdoings. Alexander (1999) defines the 2^{nd} party wrongdoings as the misconduct being against the companies costumers, investors, or suppliers, i.e. any party in direct contractual relation to the company. The 3^{rd} party misconduct rather regards any misconduct towards the government, environmental regulatory violations, reporting failure, or money laundering offences to give a few examples (Alexander, 1999; Karpoff, Lott, and Wehrly, 2005; Armour, Mayer, and Polo, 2017). Karpoff and Lott (1993) conducted some of the earlier research with regards to companies in the US committing criminal fraud in the late 70s to the late 80s. The loss of market value around two days of the initial press announcement is found to be 1.58 percent. Karpoff, Lott, and Wehrly (2005) researched violations against environmental regulations, i.e. only one type of 3^{rd} party wrongdoing, and found a loss of market value being 1 percent around the announcement of the violation. However, the results also show that this loss of market value is about the same size as the legal penalty. The size of the market reaction means that the market does not harshly penalize corporations in the US that violates the environmental regulations and therefore there is no reputational loss for this type of 3^{rd} party misconduct. Also, the results show no statistically significant losses of market value around the settlement day. An important conclusion from these results is that the size of the legal penalty is actually the only deterrent from violating environmental laws because the market does not aid in internalization of the cost incurred by breaching the law (Karpoff, Lott, and Wehrly, 2005).

Alexander (1999) applies the same method on the same sample as Karpoff and Lott (1993), but divides the sample into 2^{nd} and 3^{rd} party wrongdoings. Alexander (1999) finds the contract related wrongdoings resulting in a 3.06 percent loss of market value while the 3^{rd} party wrongdoings result in +0.44 percent change of market value, however without significance. Murphy, Shrieves, and Tibbs (2009) examines the US corporate misconduct from the early 80s to the mid-90s. The empirical examination show the market value loss for the whole sample being 1.4%, and after dividing the sample into 2^{nd} and 3^{rd} party misconduct the market loss was 2.3

percent and 0.8 percent respectively for the two days around the initial press announcement of misconduct (Murphy, Shrieves, and Tibbs, 2009).

In the two European event studies, Sturm (2013) examines the loss of market value in relation to announcement of operational loss in German banks while Armour, Mayer, and Polo (2017) examines the market value loss of companies in the financial market in the UK. Sturm (2013) finds statistically significant losses of between 0.63 percent and 0.95 percent around the settlement date. Armour, Mayer, and Polo (2017) examines the announcement publicized directly from the regulatory authority, as opposed to the press announcement that all earlier event studies examines, and find market penalties of between 1.26 percent and 1.68 percent around the regulators announcements. The sample of only 2^{nd} party misconduct show a larger loss of 2.62 percent while the sample of 3^{rd} party misconduct (only 14 events) does not show statistically significant losses. Where there is statistical significance, the reputational loss defined as loss of shareholder value is on average about 9 times as large as the legal fine (Armour, Mayer, and Polo, 2017).

3. Theory and Hypothesis

3.1 Single-Index-Model and the Efficient Market Hypothesis

Bodie, Kane, and Marcus (2014) describe the systematic risk as the risk all market participants face. The systematic risk cannot be removed with diversification and the business cycle is a typical example of an economic factor that affects the systematic risk. A firm specific return varies with two components; the first being unexpected return of the specific stock – a firm specific surprise, and the second being the unexpected return of the market – the macroeconomic surprises that affects all stocks. Different stocks react differently to the unexpected market returns in the sense that the stocks are differently sensitive to e.g. the business cycles in the economy (Bodie, Kane, and Marcus, 2014).

Sharpe (1963) introduces an index model where a wide market index can be considered a good approximation of the market and the macroeconomic variable that affect the stocks' returns. It is important that the market index well represents the relevant macroeconomic variables which affect the stocks considered for the model, in order to detach the systematic risk,

and highlight the firm specific risks (Sharpe, 1963). A stock's return can therefore be expressed with Eq. (3.1), and estimated with a single variable linear regression. The sensitivity to the market return, over period t for the specific stock, is captured through the β-value of the single variable linear regression. The stocks expected return over period t, if the market return were to be zero, is captured with the α-value (Bodie, Kane, and Marcus, 2014). Finally, there is the error term, $\varepsilon_{i,t}$, which captures the residual return for the specific stock during period t. The residual returns are assumed independently and identically distributed (IID), which in turn means that the residual returns are normally distributed with an average residual return of zero according to the central limit theorem (Bhagat and Romano, 2002).

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + \varepsilon_{i,t} \tag{3.1}$$

The excess return of a single stock is similarly defined as the returns of the stock and the market without the risk-free rate of return, r_f, as in Eq. (3.2).

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \tag{3.2}$$

where

$$R_{i,t} = r_{i,t} - r_f$$
$$R_{m,t} = r_{m,t} - r_f$$

Bodie, Kane, and Marcus (2014) highlight the possibility of constructing a portfolio so the combination of positive and negative β-values does result in a virtually nonexistent systematic risk, but for a single stock or a portfolio with many stocks the systematic risk is considered non-diversifiable. This theory of the systemic risk being non-diversifiable risk also holds empirically (Bodie, Kane, and Marcus, 2014). Further, Fama (1970) introduces that stock prices on the capital market reflect information available to the market through the efficient market hypothesis. The three levels of market efficiency is introduced with the hypothesis. The strongest level is where the price of a stock always fully reflects all information – including e.g. insider information, and this is the level at which the market is considered efficient. The semi-strong level of efficiency is where the stock price quickly adjusts to any new information that become publicly available. Finally, a weakly efficient market is where the stock price only contains historical information on the stock price and return (Fama, 1970). Malkiel (2003), simply describe

the central concept of the efficient markets theories called the *random walk*. The random walk in this context is when the change in price from yesterday to today, the return, is unpredictable throughout a series of prices. New information emerges randomly, and therefore a price of a stock that reflects all available information at each point in time in accordance with the efficient market hypothesis, will also move randomly from one day to the next (Malkiel, 2003). New information on regulatory sanctions emerges to the market through announcements from the financial supervisory authorities in Scandinavia (Finansinspektionen, 2018a; Finanstilsynet, 2015, 2016). Subsection 3.2 provides background into which types of companies are the potential subjects of the regulatory announcements.

3.2 Financial Supervisory Authorities of Scandinavia

Finansinspektionen (2018a), the Financial Supervisory Authority in Sweden, has multiple legal obligations. The overall responsibility of the authority is to maintain stability in the financial system. Areas of responsibility for the authority includes; banks, insurance companies, applicable IT companies, and financial markets. Obligations include everything from developing the legal system to being the authority that carries out the statutory audits to ensure legal compliance. Finansinspektionen (2018b) will ensure that both obliged entities under the authority's supervision and any entity outside of the authority's supervision follows the laws and regulations that the authority is in charge of. This means that *if* a legal entity, not under the supervision of the Financial Supervisory Authority, supplies financial products to the market, that company will also be subject to any regulatory consequences. A board member or chief executive officer can in exceptional circumstances also be subject to enforcement actions of the Financial Supervisory Authority. The authority has the mandate to intervene with an enforcement action if the Financial Supervisory Authority find entities conducting activities in violation of laws and regulations. An enforcement action could be a formal written warning, a warning along with an administrative penalty (financial fine), a withdrawal of authorization to continue business, or a withdrawal of authorization along with an administrative penalty. Any intervention is always preceded by a formal investigation by the Financial Supervisory Authority, but not all formal investigations will result in an intervention. Some formal investigations will result in a formal statement of termination of investigation without further enforcement actions (Finansinspektionen, 2018b). Companies under supervision are those active on the Swedish

financial market. Examples of topics the Financial Supervisory Authority is involved in are; a high level of consumer protection with regards to products provided by financial institutions, and ensuring that financial institutions conduct preventative measures against money laundering and terrorist financing correctly in accordance with the laws and regulations. Examples of a non-financial entity that the Swedish Financial Supervisory Authority has the authority to pose financial penalties on are those who fail to report a holding of a certain percentage in a publicly listed entity (Finansinspektionen, 2018a).

Finanstilsynet (2015), the Danish Financial Supervisory Authority, is responsible for three major areas; the financial system stability, the securities market, and market abuse. The first, financial system stability, includes legislative work, authorizations of firms, and supervision to ensure compliance with the country's laws and regulations that the Financial Supervisory Authority is in charge of. One example of the regulatory requirements that the banks and other financial institutions follow are capital and liquidity requirements. The second regards the securities market, where the Financial Supervisory Authority ensures companies provide information to the market in time, such as providing quarterly and annual reports on time. In addition, the supervision of the securities market also includes a responsibility to ensure that the companies meet all legal requirements upon an initial public offering of the companies' stocks. Finally, the authority's responsibility to follow up on market abuse includes punishing actions such as firms manipulating prices, or conducting insider trading (Finanstilsynet, 2015). Finanstilsynet (2019) has several enforcement actions to assign an entity for the violation of laws and regulations. The Danish Financial Supervisory Authority has the authority to issue a prohibition of activity onto an entity that has violated laws and regulations in order to hinder further wrongdoings. If the infringement has been of a criminal magnitude the authority will also ensure a legal proceeding through relevant law-enforcement agencies. Prosecution may also be an enforcement action from the Financial Supervisory Authority even when the violation regards a violation of a law or regulation that has ceased, in the terms that the entity is no longer conducting the activity in violation of the laws and regulations. The Financial Supervisory Authority will also determine which financial institutions are authorized to provide financial services. When entities under the Danish Financial Supervisory Authority's supervision or regulatory responsibilities, have been found in violation, the Financial Supervisory Authority may use administrative penalties as an enforcement action. Finally, the Financial Supervisory Authority will provide guidance, such as clarifications on appropriate statutory interpretation,

to entities operating in Denmark, in order to achieve a high compliance with the Danish laws and regulations (Finanstilsynet, 2019).

Finanstilsynet (2016), the Financial Supervisory Authority in Norway, aims to ensure financial stability as well as a fair and reliable market. Financial stability is achieved through authorization of firms whose business requires it. Stability is also reached through the development of the laws and regulations to be in line with EU- and international standards. Subsequently, through supervision, the Financial Supervisory Authority ensures compliance from obliged entities. Some examples of obliged entities are; banks and credit institutions, insurance companies, pension funds, the securities market participants, accountants, real estate agencies, and payment providers. Ensuring a reliable and well-functioning market entails ensuring statutory requirements being met by all market participants, for example participants are to both supply information correctly and within correct timing to the market (Finanstilsynet, 2016). Finanstilsynet (2018) states that the Norwegian stock exchange (Oslo Børs) and National Authority for Investigation and Prosecution of Economic and Environmental Crime (ØKOKRIM) are in cooperation with Norway's Financial Supervisory Authority in regards to regulatory enforcement actions and information thereof. The Financial Supervisory Authority is the authority conducting investigations. Administrative fines are being dealt to those entities identified to be in violations of regulatory requirements (Finanstilsynet, 2018). The Financial Supervisory Authority may also retract authorization if the breach is considered to be a particularly serious infringement (Finanstilsynet, 2016).

3.3 Hypothesis

The expectation is that once negative information has been declared confirmed the stock price should drop. The confirmation of negative news is determined through the official decision of imposing an administrative penalty from one of the three Financial Supervisory Authorities in Scandinavia. Combining the negative information of a regulatory violation with the fact that all available information is reflected in the stock price at all times according to the efficient market hypothesis, the newly released negative news should result in negative stock returns. The drop in the stock price might very well vary in size since leakages of information are quite likely. An example, of such a leakage, is if the information of an ongoing investigations could have become publicly known. In accordance with the efficient market hypothesis, if the fact that a company is

under investigation for wrongdoings is considered negative information, then it has already been incorporated in the price at the time of the confirmation of wrongdoing. The expectation is that the stock price would drop further upon confirmation of wrongdoings, as once the information is no longer speculative with regards to the size of the administrative penalty. The loss of shareholder value following an administrative penalty announcement from the regulator will be considered the reputational loss the entity face. My hypothesis on reputational loss is therefore: **H1.** *The stock price decreases, causing negative returns to the shareholders' wealth, in connection with a confirmation of wrongdoings through announcement of imposed administrative penalty from the regulator.*

4. Data and Method

4.1 Choice of Data

The data used in this thesis was concentrated to the Scandinavian countries; Sweden, Denmark and Norway, both in terms of geographical location of where the companies are fined as well as where the companies are publicly listed. Each of the countries' Financial Supervisory Authority made administrative penalties publicly available on the day of the enforcement action, with a short description of which entity under supervision has failed to comply with what regulation, and in addition how large the administrative penalty imposed was for the infringement. The penalized companies were retrieved manually with regards to 1) the time of the imposed administrative penalty, 2) name of the entity, 3) size of the financial penalty, and 4) a short description of the infringement for each event, after which a broad categorization of the infringements was made (the 5 categories are available in the Appendix A Table A.1). The Swedish entities, notified with a violation of regulation, were retrieved from the Swedish Financial Supervisory Authority "Finansinspektionen". The Danish entities, notified with a violation of regulation, were retrieved from the Danish Financial Supervisory Authority "Finanstilsynet". The Norwegian entities, notified with a violation of regulation, were retrieved from the stock exchange "Oslo Børs" news feed of statement releases from the Norwegian Financial Supervisory Authority "Finanstilsynet".

Further, a requirement in this thesis has been that entities imposed with an administrative

penalty needs to be publicly traded, and in addition, sufficiently traded in terms of frequency of trade in each stock. Stocks which displayed zero frequency of trade during prolonged periods of time during -2 to -261 days relative to the announcement were removed. Brown and Warner (1985) declares that such a removal decrease the bias in the single variable regression estimators (the α- and β-values), thereby the bias decreased in abnormal daily returns of the stocks. The majority of the daily stock prices were collected from Bloomberg and some from Thomson Reuters DataStream. All daily market values were collected from Thomson Reuters DataStream along with daily exchange rates from SEK, NOK, and DKK to EUR. The Nasdaq OMX Nordic 120 (NOMXN120) was used as the reference index to approximate the market returns since the geographical concentration concerns the Scandinavian countries. NOMXN120 includes the 120 largest of the 150 most traded stocks on the Copenhagen, Helsinki, Stockholm, and Oslo stock exchanges (NASDAQ, 2019). The index prices were collected from Thomson Reuters DataStream. The risk-free rate of return was represented by the interbank rate in each of the countries over the same period as the stock and index returns. The data on the interbank rates were collected from OECD's database.

Armour, Mayer, and Polo (2017) found that the companies in the UK were more severely punished after an administrative penalty was publicized after the 2007-2008 financial crisis, compared to before, indicating that the reputational damage of regulatory infringements has grown post the global financial crisis. Assuming this also holds for Scandinavia, the period researched in this thesis was post the financial crisis. The period, with regards to administrative penalties, covered all penalties imposed from the beginning of 2010 to the end of 2018, while the period for the daily stock prices regarded the same period and additionally 2009 for the estimated abnormal returns of the companies penalized during 2010. During the period from 2010 to 2018, there were a total of 75 Swedish, 80 Danish, and 91 Norwegian formal notifications of violations of various regulations. The times when the entities were imposed with an administrative penalty has been of interest for the research of this thesis. The requirement of the companies being publicly traded drastically decreased the sample to 5 Swedish entities, 17 Danish entities, and 7 Norwegian entities, totaling 29 companies and 49 events in the sample (see Appendix A, Table A.1, for details on each event). Table 4.1 summarize the statistics of the events.

Table 4.1: Descriptive statistics, 49 events.

	Denmark	**Norway**	**Sweden**	**Total**
Violations announcements	80	91	75	246
Applicable violations announcements	28	8	13	49
Applicable legal entities	17	7	5	29
	Mean	**Median**	**Minimum**	**Maximum**
Market value (€ millions)	11 406.13	1 010.18	7.18	69 965.43
Penalty (€ millions)	0.44	0.02	0.00	5.30

Note: Violations announcements from 2010 to 2018. Applicable violations announcements are the events that regard the announcements, from the applicable Financial Supervisory Authority, of administrative penalty to publicly traded entities from 2010 to 2018. Market value and penalty statistics regard the 49 applicable events.

4.2 Methodology

To test the hypothesis the event study methodology was used. Bodie, Kane, and Marcus (2014) state that in order to estimate an unexpected return, as a result of a specific event, both the average rate of return of the stock if there were no returns from the market (the α), and the stock's sensitivity to the market returns (the β), should be estimated through linear regression analysis. Also that a simple market model of total returns of each stock against the total market return is employed rather than the same regressions on excess returns of the stocks against the excess return of the market. The daily Treasury bill rate, if used as proxy for the risk-free rate, is typically a negligible contributory factor to the unexpected return in relation to the additional effort needed when deviating from the simple market model according to Bodie, Kane, and Marcus (2014).

Instead of the conventional and simple market model for the event study, the single-index-model, as introduced by Sharpe (1963), was used in this event study. The reason for using the single-index-model, instead of the simpler market model, was because the sample contained firms of similar characteristics due to financial institutions made up 74 percent of the sample. MacKinlay (1997) acknowledges how the use of a more advanced model than the market model in an event study, with a random sample, normally does not decrease the variance of the abnormal returns enough to return any major improvements. However, when the sample

is comprised of entities of similar nature, the benefit of a decreased variance of the abnormal returns from using the single-index-model was found larger than if the sample of events was random (MacKinlay, 1997). Another reason for why the single-index-model was employed to estimate the abnormal returns stems from Bhagat and Romano (2002) where the the statistical models, such as the single-index-model, returns consistent results as opposed to the economic models, e.g. the capital asset pricing model (CAPM) or the arbitrage pricing theory (APT), in event studies.

The impact, in terms of the share price movement post a regulatory breach, was measured by estimating α- and β-values for each of the events with an estimation window (t = -2 to t = -261 days) in relation to the event (t = 0) with ordinary least squares (OLS) regressions. The estimated individual α and β for each of the events was used to calculate the abnormal returns (from t = -261 to t = -2),

$$AR_{i,t} = R_{i,t} - \alpha_i - \beta_i R_{m,t}. \tag{4.1}$$

Three event windows (t = 0), (t = -1, to t = 0) and (t = -1, to t = 1) of one, two and three days respectively, were used to examine the abnormal returns in connection to the administrative penalties. The choice of few days, around the event of an administrative penalty announcement from one of the Scandinavian Financial Supervisory Authorities, increased the power of utilizing the event study method. The smaller the window around the event is and the larger the sample is, the stronger the statistical power of the event study will be according to MacKinlay (1997). A small event window is also of particular importance when assessing the market reaction to regulatory sanctions (Bhagat and Romano, 2002).

The abnormal returns were averaged over each of the days in the event windows,

$$AR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{i,t}. \tag{4.2}$$

The average abnormal events over the event windows were cumulated,

$$CAR(t_1, t_2) = \sum_{t_1}^{t_2} AR_t. \tag{4.3}$$

Before testing the significance, a winsorizing of the abnormal returns was done in order to decrease bias of outliers in the results, in accordance with earlier research from Armour, Mayer, and Polo (2017). Winsorizing the sample's abnormal returns put the observations outside of the

5^{th} and 95^{th} percentile to the 5^{th} percentile and the 95^{th} percentile respectively depending on if the outlier was below the 5^{th} percentile or above the 95^{th} percentile.

To test the significance of the cumulative abnormal returns during the event window, a student's t-test was used with the null hypothesis being that abnormal returns, after negative news has been released to the market, are zero (Brown and Warner, 1985). The standard deviations of the abnormal returns during the estimation window was used as the proxy for the sample standard deviation in the student's t-test (MacKinlay, 1997).

5. Results and Analysis

Table 5.1 show that the market penalizes firms that conclusively do not comply with laws and regulations in Scandinavia in agreement with the theory of an efficient market. The winsorized cumulative abnormal returns around the announcement of an administrative penalty, being dealt from a Scandinavian Financial Supervisory Authority to a firm originating in Scandinavia, are found negative and statistically significant. I have also tested significance of the non-winsorized cumulative abnormal returns and found the same level of statistical significance, indicating robustness of the winsorized sample results. Significant and negative abnormal returns are consistent with both theoretical expectations and previous research. The negative abnormal returns are small in comparison to research conducted on the US and UK markets, but consistent with the previous research conducted on the German financial market.

The three day event window show larger loss of wealth for the shareholders which could indicate an information leakage before the Financial Supervisory Authority announcement took place. A small market reaction, relative to most of the earlier research, could be an indication that the negative information of a company misbehaving is already to some extent incorporated in the stock price. The information, that the Financial Supervisory Authority is conducting a formal investigation, could likely have leaked and would according to the efficient market hypothesis already be incorporated as a potential negative factor in the stock price since perhaps several weeks or months. The results show that once the announcement of an administrative penalty has been publicized, and final legal penalty is being revealed, the market does further penalize the firms who affirmatively violated the laws and regulations. An indication of potential leakages, closer to the announcement date, of the legal penalty is also visible already two

days before the announcement, see Fig. 5.1.

Table 5.1: Winsorized Cumulative Abnormal Returns.

Announcement window	**(0)**	**(0,1)**	**(-1, 1)**
Market reaction (%)	-0.40	-0.58	-0.95
t-Statistic	**-5.99*** **	**-6.08*** **	**-8.12*** **

Note: The *, **, *** denotes significance at the 10%, 5% and 1% levels respectively. All t-Statistic with p-values below 0.05 are in bold.

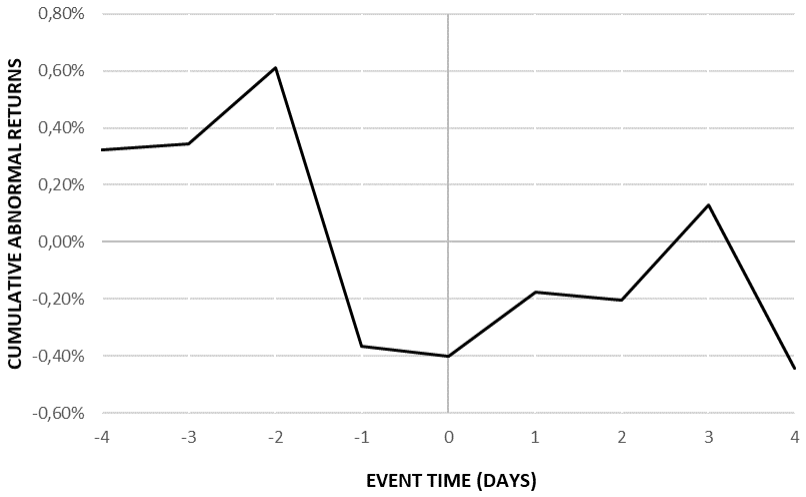

Figure 5.1: Cumulative Abnormal Returns (-4, 4).

Table 5.2 show total loss, i.e. the legal- and market penalty combined. The legal penalty is expressed as a percentage of the market value of each company a couple of days before the announcement of misconduct, in order to add the legal penalty to the market reaction. The total loss is the larger financial loss in which the regulatory enforcement action actually results. The combined reaction of the Scandinavian regulatory authority and the market is statistically significant and negative for the Scandinavian companies inflicted with an administrative penalty. By adding the loss incurred by the regulator as a financial fine to the loss of shareholder value incurred by the market, the t-statistic is substantially increased.

Table 5.2: Total Financial Loss.

Announcement window	**(0)**	**(0,1)**	**(-1, 1)**
Market reaction (%)	-0.78	-0.96	-1.33
t-Statistic	**-11.65*** **	**-10.09*** **	**-11.39*** **

Note: Total financial loss is the legal fine as a percentage of the market value on the last day of the estimation window, at t = -2, added to the winsorized cumulative abnormal returns for each event, at t = 0, as also done by Armour, Mayer, and Polo (2017) among others. The *, **, *** denote significance at the 10%, 5% and 1% levels respectively. All t-Statistic with p-values below 0.05 are in bold.

Table 5.3 show how the difference in size of market penalty and the administrative penalty result in the fact Scandinavian companies on average does experience reputational damages following regulatory violations. If the market penalty was as big as the legal penalty, the result would merely indicate that the market includes the information of the now known cost of the wrongdoing. The legal penalty is on average 13 percent of the total loss while the loss of market value, or shareholder value loss, represents 87 percent of the total loss. Table 5.3 show the loss of shareholder wealth in Scandinavian companies, after the corporate wrongdoings has been confirmed through administrative penalty, on average *not* being equally large as the fine. Because the market penalty on average represents 87 percent of the total loss, there is a large part of the total loss being represented by reputational loss for the firms in Scandinavia after wrongdoing has been confirmed. Total loss is about 7.7 times as big as the legal fine. Or differently put, the legal fine only represents about one eighth of the total loss. The conclusions to be drawn from this is that the fine itself does, on average, not constitute the major deterrent from breaking the laws and regulations. However, as the loss of share value is considerably larger than the fine, the reputational loss will help the three Financial Supervisory Authorities in Scandinavia to enforce and deter companies from violating the laws and regulations. The administrative penalties, that on an initial glance might seem *very* small, might actually be appropriate in magnitude since the market penalty will help the enforcement of Scandinavian laws and regulations.

Table 5.3: Average Nominal Loss and Breakdown of Origin.

Announcement window	**(0)**	**(0,1)**	**(-1, 1)**
Average Total Nominal Loss (€millions)	-14.94	-22.22	-23.58
Origin: Legal Penalty (%)	13	5	23
Origin: Market Penalty (%)	87	95	77

Note: Total financial loss comprises of both the loss in terms of the legal fine to be paid and the reputational loss. The average total nominal loss is the total nominal loss of market value (the market penalty) combined with the legal penalty for each event. The table expresses an average of nominal total loss for the whole sample of 49 events and how much the legal- and market penalty respectively contribute to the total loss on average.

There are many possible reasons as to why the Scandinavian market does not punish the Scandinavian companies' reputations to the same magnitude as the US and UK markets punish their companies' reputations. One reason could be that the enforcement actions, see Appendix A Table A.1, largely regard 3^{rd} party infringements, such as reporting failure of bank transactions, and very few (only 9 out of 49) observations regard 2^{nd} party infringements. Perhaps the Scandinavian market does care more about the 3^{rd} party regulatory violations than the US and UK market seem to do. One main reason for this interpretation being that research on the 3^{rd} party sub-samples in those markets did not consistently result in statistically significant shareholder losses. Another possible explanation to the statistical significance of negative abnormal returns of this Scandinavian sample is the time frame of data being concentrated to violations post the global financial crisis of 2007-2008. The few samples that occurred after the financial crisis in the Armour, Mayer, and Polo (2017) research shows an increased intensity of the market penalty. The stronger statistical significance of negative abnormal returns, if the same holds for Scandinavian enforcement actions, could be explained by the fact that the sample is post the financial crisis. Further tests, or other similar studies post the financial crisis, should confirm this theory.

Another likely explanation, to the result of a lower market penalty in Scandinavia, is that the US and UK studies regard the initial information release of possible or confirmed corporate misconduct from either the media or the regulator, while I have researched particularly the consequence to the confirmation of wrongdoing from the regulators' announcements. In order

to fully understand the reputational damage that a firm in Scandinavia carries, for a breach of regulatory requirement, a further examination into information leakages is needed. However, I deem it likely that speculative information of potential violations have already been incorporated in the market value of the Scandinavian companies. If information, such as there being a formal investigation into an entity, leaks before the Financial Supervisory Authority declares a legal fine, the shareholders have likely already experienced a wealth loss. The affect information, that is being gradually released or leaked, has on the abnormal returns of a stock should ideally be incorporated in order to conclude if the reputational loss is still significant and to what size of market reaction. In short, the stronger statistical significance, relative to earlier research, could derive from this study focusing on the confirmation of wrongdoing, but the lower market penalty could be due to the initial reputational harm of speculative news already being accounted for by the market.

Ensuring the optimal size of the legal penalty should be of interest to the Scandinavian Financial Supervisory Authorities in order to achieve deterrence of corporate crimes in Scandinavia. Ideally, the Scandinavian regulatory authorities should match the total loss incurred by the enforcement action to the negative externality, the cost of the regulatory violations, the Scandinavian companies cause. The differences, in whether or not the damage of the crime is internalized, then obviously differs between the private and public entities operating in Scandinavia. The public entities lose, on average, 7.7 times as much as the private entity because the private entity cannot be penalized by the market in an equal manner. Privately owned entities committing crimes in Scandinavia will only bear the legal fine as cost for the infringement, while the public entities will experience a loss of shareholder wealth in addition to the legal fine.

6. Conclusion

My hypothesis, that the stock price should react negatively to news of a confirmed regulatory enforcement action, has been proven with a high level of statistical significance. I find negative and statistically significant abnormal returns following a regulatory sanction given to a Scandinavian company in violation of laws and regulations under the local Financial Supervisory Authority. My findings are of interest to the practitioners under the supervision of the Scandi-

navian Financial Supervisory Authorities and the Scandinavian countries' respective authorities alike. The practitioners have a need to understand the total loss at risk when in violation of the statutory requirements, while the authorities should ideally also understand the total penalty imposed following an administrative penalty. The legal penalty is about 13 percent of the entire financial loss for the average company, which means that in Scandinavia the average total loss is about 7.7 times larger than the administrative penalty. The research in this thesis is restricted to shed light on the consequences to the shareholder value once a company has been confirmed to be in violation of laws and regulations. In order to capture *if* the initial speculative announcement also results in reputational harm, another study with this alternative focus should be conducted.

Important further research would be to examine if the size of the legal penalty would matter for the size of the market penalty. The size of the total losses, incurred post legal penalty, could confirm that the perceived small administrative penalties are actually appropriate, or to prove otherwise, and rather provide guidelines for the regulator to determine the rightful size of legal penalties. A larger sample of events could also enable an analysis of *if* there are differences between the size of the market penalty between the 2^{nd} and 3^{rd} party wrongdoings in Scandinavia. In addition, an examination into how earnings are affected could enlighten the Scandinavian regulators to a more comprehensive dimension of the affect a regulatory sanction has on the privately and publicly owned companies alike. A potential issue with studies on how earnings are affected would be the bias of the sample created by the surviving firms. Any firm that goes bankrupt, as a consequence of a Scandinavian regulatory sanction, will not be included in the research as the earnings of such a firm would cease to exist. Bankruptcy of enforced entities is not entirely unlikely as an enforcement action in Scandinavia could include a withdrawal of authorization which would prevent the company from continuing to conduct business.

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A. Appendix

Table A.1: Table A1. Description of the 49 events.
Categories; T = timing of information to market, RM = risk management, R = transaction reporting, ML = money laundering, CI = client information.
2^{nd} party infringements = T and CI (18% of the sample).
3^{rd} party infringements = RM, R, and ML (82 % of the sample).

No.	Country	Listed Parent Entity Name	Date	Penalty	Category
1	SWE	Skandinaviska Enskilda Banken AB	2010-05-25	2 500 000 SEK	R
2	SWE	Swedbank AB	2011-01-20	2 500 000 SEK	RM
3	SWE	Svenska Handelsbanken AB	2011-01-20	3 500 000 SEK	RM
4	SWE	Skandinaviska Enskilda Banken AB	2011-05-20	2 000 000 SEK	RM
5	SWE	Nordea Bank AB	2011-12-07	6 000 000 SEK	RM
6*	DEN	Jyske Bank A/S	2012-03-19	10 000 DKK	R
7	NOR	North Energy Corp. ASA	2012-06-12	140 000 NOK	T
8	NOR	Morpol ASA	2012-07-02	140 000 NOK	T
9	NOR	Norse Energy Corp ASA	2012-07-02	140 000 NOK	T
10	NOR	Sparebank 1 Ringerike Hadeland	2012-08-31	140 000 NOK	T
11	SWE	Nordea Bank AB	2013-04-16	30 000 000 SEK	ML
12	NOR	Norse Energy Corp. ASA	2013-06-21	144 200 NOK	T
13	DEN	Jyske Bank A/S	2013-07-10	25 000 DKK	CI
14	DEN	Danske Andelskassers Bank A/S	2014-01-31	500 000 DKK	RM
15*	SWE	Nordea Bank AB	2014-02-14	20 000 DKK	R
16	DEN	Danske Bank A/S	2014-02-19	20 000 DKK	R
17	DEN	Danske Bank A/S	2014-05-02	20 000 DKK	R
18*	SWE	Nordea Bank AB	2014-05-19	20 000 DKK	R
19	DEN	Spar Nord Bank A/S	2014-05-20	20 000 DKK	R
20	DEN	Novo Nordisk A/S	2014-08-18	500 000 DKK	R
21	DEN	Spar Nord Bank A/S	2014-08-21	25 000 DKK	R
22*	SWE	SkiStar AB	2014-10-07	750 000SEK	RM
23	DEN	Pandora A/S	2014-12-03	2 000 000 DKK	R
24	DEN	Vestjysk Bank A/S	2015-05-05	1 000 000 DKK	RM
25	SWE	Nordea Bank AB	2015-05-19	50 000 000 SEK	ML
26	SWE	Svenska Handelsbanken AB	2015-05-19	35 000 000 SEK	ML

continues on next page

No.	Country	Listed Parent Entity Name	Date	Penalty	Category
27	NOR	Hofseth Biocare ASA	2015-07-14	160 000 NOK	T
28*	SWE	Nordea Bank AB	2015-07-24	20 000 DKK	R
29	DEN	Danske Bank A/S	2015-08-11	15 000 DKK	R
30	DEN	Alm Brand Bank A/S	2015-08-18	20 000 DKK	R
31	DEN	Djurslands Bank A/S	2015-08-18	20 000 DKK	R
32	DEN	Fynske Bank A/S	2015-08-18	20 000 DKK	R
33	DEN	Jyske Bank A/S	2015-08-18	20 000 DKK	R
34	DEN	Nordfyns Bank A/S	2015-08-18	20 000 DKK	R
35	DEN	Ringkjøbing Landbobank A/S	2015-08-18	20 000 DKK	R
36	DEN	Skjern Bank A/S	2015-08-18	20 000 DKK	R
37	DEN	Sydbank A/S	2015-08-18	20 000 DKK	R
38	DEN	Parken Sport & Entertainment A/S	2015-09-22	1 000 000 DKK	RM
39	DEN	NeuroSearch A/S	2015-10-27	5 000 000 DKK	RM
40	DEN	Danske Bank A/S	2016-05-25	30 000 DKK	R
41	DEN	Vestjysk Bank A/S	2016-06-27	2 500 000 DKK	RM
42	NOR	I.M. Skaugen SE	2016-08-30	164 600 NOK	T
43	DEN	NeuroSearch A/S	2016-11-17	5 000 000 DKK	RM
44	DEN	Jyske Bank A/S	2016-12-07	40 000 DKK	R
45	DEN	Parken Sport & Entertainment A/S	2017-03-24	13 000 000 DKK	RM
46	SWE	Skandinaviska Enskilda Banken AB	2017-06-20	12 000 000 SEK	R
47	NOR	Oceanteam ASA	2017-08-17	170 800 NOK	T
48	DEN	Danske Bank A/S	2018-02-19	12 500 000 DKK	ML
49	DEN	Aalborg Boldspilklub A/S	2018-08-07	30 000 DKK	RM

Note: The * denotes where a subsidiary within the same corporate group was been fined. The subsidiaries for 6*, 15*, 18*, 22* and 28* are; BRFkredit A/S, Nordea Bank Danmark A/S, Nordea Bank Danmark A/S, Fjällförsäkringar AB, and Nordea Investment Management AB respectively.