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Stock Market Reactions to Corporate Misconduct

A study examining divergent outcomes following disclosure of corporate misconduct

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Abstract

This thesis examines how a set of outcomes succeeding corporate misconduct impact the abnormal return of the involved firms. Differentiating between receiving punitive fines and negative media attention the effects on stock returns are estimated. This study suggests that there is a negative effect on the abnormal returns associated with firms being subject to media scrutiny following misconduct. Further, if a scandal is followed by a fine, the return appears to remain at a lower level while if a fine is absent the return reverts to its prior state. It does not appear to be any adverse effects on abnormal returns upon obtaining a fine. The thesis also tests how these differences vary over different countries and types of misconduct and finds that the largest adverse effects on returns occur when firms have been involved in a scandal succeeding white-collar misconduct.

Keywords: Event Study, Corporate Misconduct, Market Efficiency, Media Effect

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1. INTRODUCTION

Firms have a long history of engaging in corporate misconduct and how severely a company is affected by its wrongdoings appears to vary largely. Noticeable examples of opposing outcomes include the infamous BP oil spill, causing the stock price to decrease by a relatively small 4%, contrasting to the healthcare company HealthSouth who lost 98% of its market value after their accounting fraud became public. Hereby, the consequences ensuing from misconduct appear to be ambiguous.

The purpose of this thesis is to investigate how the stock market reacts following the unveiling of corporate misconduct. This is considered to be of interest due to the large discrepancies between market responses but also in differences between how firms recover after their actions have been revealed. First, three divergent outcomes following the disclosure of corporate misconduct are identified. Companies are examined after either being subject to a media scandal; recipients of substantial fines; or subject to both of the former. The categorization is based on the distinction between reputational and regulatory penalties made in earlier literature (Karpoff and Lott, 1993; Murphy et al. 2009). Subsequently, the effects of the different outcomes on the firms' market returns are investigated. The findings suggest that media scrutiny as a result of misconduct can lead to lowered mean performance of firms while the imposition of a significant fine has little effect on stock returns. Further, the differences between the categories are explored to see if the effects of a scandal followed by a fine differ from an unpunished scandal, and if fines subsequent to scandals have larger impact than unnoticed fines. The results suggest a difference between the scandal cases. The outcomes are closely linked but when a fine is not issued, the returns revert to the previous level of return, while when a fine is issued the firm continues to perform at the lowered level. For fines no impactful differences surrounding the event are noticed.

Second, other factors that could provide explanatory value to the observed abnormal returns following the events are examined by utilizing cross-sectional analysis controlling for types of misconduct and countries of origin. The regressions are conducted using different subsets of the data, as there are presumably large differences between the firms depending on geographical location. This makes it difficult to find accurate predictors of market performance using all data at once. The main regressions concern Europe, the U.S. and white-collar misconduct and test for the effect of scandals on these subsets of data. The findings suggest that there are significant effects of scandals on firms in most of the subsamples. Further, the type of misconduct can provide some explanatory power in determining the extent of the market reaction of a scandal, as suggested by Karpoff et al. (2005, 2008).

As robustness test, the 'scandal' and 'fine' variables are tested through ANOVA to check how much of the variance of the returns that can be explained by those variables and how much is explained by other factors. Further, the cross-sectional tests are also conducted using all the available data at once to in order to see if the models specified for country and type of misconduct carries explanatory value when applied to another, more diverse, set of sample data.

Third, it is acknowledged that there are two polarizing views on the financial theory and that the results from the study either can be considered as consequences of rational or irrational investor behavior. The primary interpretation is that the market's reaction to new public information corresponds to rationally adjusted expectations and correct market prices (Fama, 1970). Contrarily, the reactions could also be steered by irrational investors trading on sentiment, lately described as media pessimism. This has been shown to cause a negative pressure on stock prices that later is reversed as the medial attention subsides (Tetlock, 2007). The negative abnormal returns in the case of an unpunished scandal could thus be interpreted as a consequence of media pessimism. The significant negative abnormal return in the case of a white-collar scandal is however considered to be a rational reaction as firms are forced to correct their financial misstatements, which will lead to a readjustment effect that lowers fundamental values (Karpoff et al, 2008).

The structure of the thesis is as follows: in section 2, the previous research that lays the foundation to the study is presented. In section 3, a conceptual framework is developed that provides the basis for a comparative analysis. Section 4 describes the collection of data and the final dataset. Section 5 presents the methodology used to generate the results that are presented in section 6. In Section 7, the conclusions of the study are presented. Lastly, section 8 contains suggestions for future research.

Finally, this thesis seeks to investigate

Hypothesis 1: Markets react negatively to the public disclosure of corporate misconduct

Although previous research implies that it is the nature of the misconduct that is the determining factor regarding how the markets ultimately will respond to the actions of the firm (Karpoff et al. 2005, 2008), a general negative reaction is expected. However, as other scholars suggest that investors underreact to news over shorter time horizons (Barberis et al. 1998) this could imply that lagging negative market responses will not be visible within the limits of this study.

Hypothesis 2a: Markets will demonstrate the largest and most sustaining value decrease when a corporate scandal is followed by a regulatory punishment (a fine)

The anticipated initial negative reaction caused by the scandal is assumed to be verified by the subsequent issuance of a fine, thus confirming the degraded expectations from the market. Therefore, the stock is not assumed to exhibit any reversal during the investigated period.

Hypothesis 2b: In the event of a large regulatory punishment following a case of corporate misconduct that not is acknowledged as a scandal, markets will not show any reaction

The hypothesis is based on a belief that the market continuously incorporates new information in stock prices. As the issuance of a fine often is a prolonged process where information is disclosed gradually, the expectations on the fundamental value of the stock should already have altered at the date of the issuance. No decrease in share price should thus be observed.

2. PREVIOUS LITERATURE

The literature review commences with a brief comment on the relation between business and ethics and how it is supposed to affect company profits. As the thesis is concentrated on the issue of how stock markets react to corporate misconduct, findings of earlier studies within this field are described more thoroughly. An interesting distinction is made in several of the articles, dividing an identified punitive effect in two components: a regulatory penalty and a reputational penalty. Since the dataset in this study is a manually assembled collection of news articles, it is also of interest to examine perceptions of the relation between media and the stock market. Studies investigating stock market reactions to different kinds of announcements have been a popular area of research when examining market efficiency. The literature review is therefore concluded by a short summary of the efficient market hypothesis as well as earlier studies of similar events. The aim is to provide a literary background that lays a solid foundation for discussion of the obtained results. This will be further concretized in the conceptual framework developed in section three.

Business and ethics

The relation between ethics and law is a debated topic in the context of business. The actions of a company can be seen as unethical or scandalous without necessarily being illegal. Miles (1993) investigates the relation between ethics and profits and concludes that a company can act morally correct in the daily operations while still pursuing an unethical strategy. Nonetheless, in a study by Zetlin (1991) it is found that profits for companies ascribing to ethical principles grow twice as fast over a thirty-year period. Reidenbach and Robin (1991) develop a five stage model for the moral development of corporations, where the stages is defined depending on how well ethical values are integrated in the corporate culture. Stage two is defined as 'the legalistic organization', where companies are still operating in grey areas and playing with the legal rules. It can be discussed on which stage the companies investigated in this study are located, however, a distinction will be made between legally punished and unpunished behavior.

Corporate misconduct and associated penalties

Earlier studies of corporate misconduct have shown that a significant decrease in the market value of equity of a company is to expect following the disclosure of misconduct. Karpoff and Lott (1993) make a distinction between two effects categorized as regulatory penalties and reputational penalties that seemingly generate the aggregate wealth loss. Regulatory penalties are defined as court-imposed fines or settlements, while the reputational penalties are considered to

be triggered by deteriorated relations to related parties by both Karpoff and Lott (1993) and Murphy et al. (2009).

Regulatory penalties

Karpoff and Lott's (1993, 2005, 2008) extensive research on penalties enforced on firms committing to misconduct show that court-imposed punishments often constitute a small part of the actual decrease in the firm's market value of equity. However, if a fine is substantial enough it can on its own force the firm to file for bankruptcy. Schilit and Perler (2010) write that since legal fees are non-recurring items, investors are less likely to place significant weight to them when considering their investments. Their findings suggest that the effect of a fine alone would not change the expected future earnings of the corporation and thereby not alter investors' preference for the company.

Reputational penalties

Following the argument made by both Klein and Leffler (1981) and Jarrell and Peltzman (1985), reputational penalties are assumed to be imposed by related parties rather than third parties. Murphy et al. (2009) define related parties as 'customers, suppliers, providers of financial capital and other related parties' that are presumed to change their terms of trade towards the firm when the firm's proneness to crime is revealed. Further, Murphy et al. (2009) state that this can be realized either as reduced corporate profits or as an increase in the cost of capital of the firm. When calculating the size of the penalties, Karpoff and Lott (1993, 2005, 2008) assume that investors are rational when forming expectations. Thus, the initial decrease of the company's market value is assumed to reflect the size of the regulatory penalty that investors expect will be imposed on the company. If the wealth loss exceeds the regulatory penalty that is issued, the unexplained amount is defined as a reputational penalty reflecting investors' rational expectations of the associated losses.

The effect of media on the market

Reports of corporate misconduct are often featured in the media, described as scandals and framing the company and its actions as highly inappropriate. As one of the purposes with the thesis is to investigate how media scrutiny impacts the stock performance of a company, it is interesting to review earlier research discussing the potential effects that media and journalism might have on the stock market.

Niederhoffer (1971) writes about the strong impact of world events on stock prices, investigating the relation between headlines in the New York Times and the stock market. Although he acknowledges that markets often quickly and correctly incorporate new information

into asset prices, he also states that investment decisions often are made after receiving information from news outlets. Mitchell and Mulherin (1994) find a direct relation between the daily number of news announcements reported by Dow Jones & Company and market activity, including market returns. More recently, Tetlock (2007) finds that 'news media content can predict movements in broad indicators of stock market activity'. His findings conclude that strong media pessimism predicts a downward pressure on stock prices, which is followed by a reversal that lessens the disparity between market values and the fundamental values. Developing on the subject, Dougal et al. (2011) find that financial journalists are able to affect market returns but only in association with an underlying event, thus, journalist reporting either amplifies or attenuates the returns. Consequently, news media is said to have a potential influence on the behavior of investors over short time horizons and it is in periods with high volatility that their 'rhetoric power' has the greatest impact on investors. Further confirmation of media's influence on pricing and trading of individual securities can be found in the work conducted by Huberman and Regev (2001) and Engelberg and Parsons (2010).

Traditional financial theory and market efficiency

The traditional view on financial theory is built on assumptions of rational investors, absence of arbitrage and security prices that reflect fundamental value. The determination of the fundamental value, i.e. the sum of the discounted values of their expected future cash flows, is dependent on investors' expectations. The expectations are further assumed to be correctly based on all available information regarding a security. Fama (1965b) summarizes this view in the formulation of the efficient market hypothesis. The issue of what should be included in the term 'all available information' has led to various versions of the EMH, ranging from weak to strong. In the weak version, the information set is considered as the historical prices of the stock; in the semi-strong version stock prices should reflect all information that is publicly available. The strong version lastly states that asset prices should reflect both public and private information (Fama, 1970).

Tests of market efficiency

Critique against the EMH has been raised and it has been empirically tested to see if securities are accurately priced or if investors are able to develop trading strategies to earn excess returns. Fama and French (1988) and Poterba and Summers (1988) have performed weak-form tests to investigate patterns in stock returns over a long horizon. Their results imply a negative long-term serial correlation in the returns of the overall market, which also is found in the work by de Bondt and Thaler (1985) but for individual stocks. This implies that the stock market has a

tendency to overreact to relevant news and that historical negative performances are followed by above-average performances in terms of future returns.

Tests of the semi-strong version of the EMH challenge the statement of that when new information becomes publicly available, prices of securities should adjust according to the nature of the information. Earlier scholars such as Bernard and Thomas (1989) investigate surprises related to earnings announcements, Michaely et al. (1995) study dividend initiating and omissions, Ikenberry et al. (1995) examine announcements of stock repurchases and Loughran and Ritter (1995) look at firms undertaking primary and secondary offerings. Most closely related to this study, Rao and Hamilton III (1996) investigate how reports of unethical conduct effect stock prices and conclude that it causes the market value of the firm to decrease for a considerable period of time.

3. CONCEPTUAL FRAMEWORK

When conducting the study, a conceptual framework is applied in order to define the different events following misconduct and illustrate how these are categorized, enabling a comparative analysis.

Definition of events

Definition of a 'scandal'

The event of a 'scandal' is defined as

> *A loss of or damage to reputation caused by actual or apparent violation of morality or propriety* or *a circumstance or action that offends propriety or established moral conceptions or disgraces those associated with it*
>
> Merriam-Webster Dictionary

Additionally, to be further investigated, the 'scandal' has to be mentioned at least one time in one reputable news outlet. The assessment of whether the actions of the company are to be classified as a scandal or not is made by examining the media coverage when the information about the event became public and if the reports are written in pessimistic terms. An event is labeled 'no scandal' if it can be described according to the definition above but is not featured in the media.

Definition of a 'fine'

The enforcement of regulatory penalties on firms following misconduct is one of the events investigated. As regulatory penalties tend to be small, a necessary limitation is which fines or settlements that are to be considered as large enough to have a potential negative impact on the value of the company. In order to make this distinction, the metric *fine/revenue* is used, making comparisons between large and small firms feasible. This method of comparison is based on Becker's (1974) framework used to establish the cost of a crime. When examining punished cartels over different countries and crimes, Conner and Helmer (2007) find that the median penalties ranged from 0.76% to 4.87% measured in fine/affected sales. Since the sample data has common traits with that of this thesis, it is considered appropriate to place the fine/revenue criteria in this range, setting the lower limit for a high fine to 5%. Henceforth, the definition of a 'high fine' (or settlement) will be denominated solely as a 'fine'.

Anticipated effects of corporate misconduct

Following the definition of the events above, the investigated firms are divided into three separate groups.

	High Fine	Low/No Fine
Scandal	I	II
No Scandal	III	IV

Box I: Corporate misconduct leading to a scandal that is followed by a fine

The companies included in this category are involved in two different events: initially a scandal and subsequently being recipients of a fine. It is therefore necessary to distinguish these two and analyze the effects separately. Relating this category to the research conducted by Karpoff and Lott (1993), firms included are subjects for both a regulatory and a reputational penalty. Since the scandal is assumed to surface first and the enforcement of the fine second, the initial market reaction should be caused by a reputational penalty, the anticipation of a regulatory penalty or irrational decision-making by investors.

Reputational penalties caused by deteriorated relations to related parties are expected to arise but the extension of them has earlier been seen to vary depending on the type of misconduct. Rao and Hamilton III (1996) divide unethical conduct into five categories, of which two are further investigated in the work by Karpoff et al. (2005, 2008). Remarkable divisions can be seen between the regulatory and reputational penalties for white-collar crimes and environmental violations. While white-collar crimes often are punished with small regulatory penalties and experience large reputational losses, the opposite seems to be true for firms whose actions cause harm to the environment. A possible explanation is believed to be that the related parties who have the largest influence over reputational penalties are rarely directly affected by crimes concerning the environment. Furthermore, the reputational penalty following white-collar crime includes a readjustment effect that captures the value loss associated with the correction of the financial misstatements.

Contrariwise, market reactions might not only be caused by rationally adjusted expectations on future earnings. Reasoning grounded in irrational investor behavior such as media influence also hold explanatory power regarding the immediate stock movements. The findings of Douglas et al. (2011) suggest that journalists are able to amplify the market's reaction to an underlying event during short time periods.

Due to the nature of regulatory penalties, a plausible fine is not expected to have an impact on the firm's stock return. In this category however, the existence of a regulatory penalty might have a validating effect on the initial market reaction caused by the scandal and the media attention. If investors are assumed to trade on the new information provided in connection to the scandal, a subsequent fine might confirm that the market's opinion on the event is correct and that the decrease in fundamental value of the company stock is justified.

Regardless of it is investor rationality or irrationality that causes the reputational penalty, the alignment of public opinion and judgment of legislative authorities is expected to cause the largest accumulated wealth loss for companies engaging in misconduct.

Box II: Corporate misconduct leading to a scandal that is not followed by a fine

In the event where a company engages in misconduct that solely leads to a scandal, they are attributed to box II. The market reaction in this setting is assumed to follow the pattern of the firms in box I, with the difference that the confirmative characteristic of the regulatory penalty is absent. However, since this is not known at the time of disclosure of the misconduct, the immediate market reaction will be based on the same information set as for the scandal firms that later will be punished. Thus, no larger differences between these groups should be identified initially.

A reputational penalty affecting underlying economic conditions through changed terms of trade from related parties can impact the stock price of the firm. A scandal leading to weakened bargaining power against customers and suppliers will decrease profitability and by extension, the intrinsic value of the stock. Consequently, the wealth loss is caused by rationally adjusted expectations of future earnings. Murphy et al. (2009) recognizes this aspect and also suggest that a scandal can increase idiosyncratic risk, thereby raising the discount rate applied to the firm's cash flows. Adjusted risk estimation can thus also lower the fundamental value of the firm.

Conversely, it is uncertain if investors can make such accurate predictions at the event date based on the publicly available information. Media reports often gradually disclose new information surrounding a scandal and expectations and stock prices should be adjusted progressively. The view of behavioral financial scholars has an even stronger explanatory power in this case. Following the argument made by Tetlock (2007), the downward pressure on a scandal stock is often later eased and followed by a reversal. This finding implies that the terms of trade not necessarily are worsened by the scandal and that the reversal is an adjustment from a temporary undervaluation by the market towards the fundamental value of the stock.

Box III: Corporate misconduct leading to a fine

A firm will be attributed to box III if it is subjected to a fine following misconduct. Further, the event leading up to the fine must not have been recognized in media to any substantial extent, that is, the event does not fulfill the criteria stated for a scandal. Further, Box III is the only category that could contain data that is subject to a survivorship bias. As firms included in this category could go bankrupt without it being noticed or considered a scandal, this allows for a potential bias in the sample as noted by Brown et al. (1992)

As already discussed, regulatory penalties are not expected to have any significant impact on the market value of a firm considering that they often are of trivial size. Even though the companies in this category are recipients of substantial fines, they are not assumed to affect the stock returns. Considering the statements made by Schilit and Perler (2010) regarding how fines should not impact investors' expectations on a company's future earnings, it is consequently presumed that investors will not act on this information. Moreover, as the legal process often is lengthy and information is disclosed gradually, it is also probable that investors already have adjusted their expectations at the time of conviction. Thus, a fine in isolation should not alter the fundamental value of the stock.

4. DATA

The primary sources of data that are used in this thesis are Thomson Reuters Datastream, government agencies disclosing regulatory outcomes of misconduct and the online publications of various reputable newspapers. The Kenneth French Data Library is used in order to collect the Fama-French factors applied to the U.S. firms in the dataset.

Scandal data

The collection of the dataset is initialized through a process where companies that have engaged in operations that have resulted in a scandal are identified. The collected information includes the name and origin of the company, type of misconduct and where the event is reported. The news outlets are chosen with consideration to their range of readers and reputability. Media archives such as Factiva was considered as a collected source to enable comparisons of the amount of published articles after a scandal. However, due to the geographical spread of the companies and the varying availability of publications, no such comparisons were possible. Consequently, only larger sources such as New York Times, Wall Street Journal and Reuters were selected as it is assumed that their publications will reach a sufficient amount of readers to have an potential impact on the value of the company stock, following Tetlock (2007).

Fine data

The second part of the dataset contains information about firms that are punished with a fine or who has reached a settlement with authorities. This data is mainly fetched from U.S. official government agency websites. The information contains brief information about the case, such as information regarding primary offense, size and date of the issuance of the penalty. The predominant plaintiffs are the Department of Justice, the Securities and Exchange Commission and the Environmental Protection Agency.

Stock data

The dataset is complemented with financial data fetched from Thomson Reuters Datastream. Stock return data for the selected firms as well as return data for the related indices are assembled one year prior to and one year post the event date. Following indices are used: for the U.S., NASDAQ and S&P500; for Europe, DAX30 and FTSE100; for Sweden, OMX30. Regarding companies in other countries, the main national index is chosen. Only companies who are publicly listed on the event date will be included in the dataset. The final dataset consists of 95 firms and a total of 110 outcomes of their associated misconduct. 82 events are categorized as scandals and 28 events are judicial punishments. Pursuant to the topic of the thesis, the same company and case of misconduct can be subject to both a scandal and a regulatory penalty.

5. METHODOLOGY

The following section presents the methodology and discusses the empirical framework used in order to examine the stock market reactions following the unveiling of corporate misconduct. First, a description of the methods that are employed when estimating the normal returns and calculating the abnormal returns of the firms after an event is presented. Second, comparisons between the categories are done via Student's T-test and Wilcoxon Rank-Sum test and when testing if categories are different from zero, Student's T-test is employed. OLS regression methods are used in cross-sectional testing to examine if firm specific factors such as country of origin and nature of misconduct provide explanatory value in understanding the relationship between the abnormal returns and previously mentioned factors.

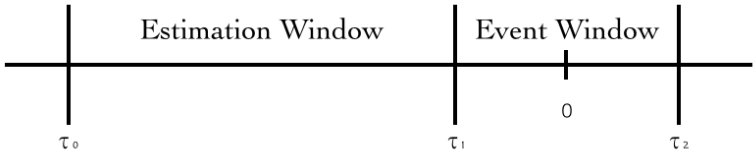
Event study

The fundamental method used is an event study. For U.S. firms both, the market model and the Fama-French three-factor model will be applied to determine normal returns, otherwise only the market model is applied. As the results show only minor differences between the methods, the results of the three-factor model applied to the U.S. firms are assumed to be comparable with the results of the single factor model applied to firms with other countries of origin.

Timeline

The timeline consists of an estimation window and an event window where the event date is labeled '0'. The event date for a fine corresponds to the date of the first report of the issuance of a fine. This can be conveyed either in the previously mentioned news outlets or through announcements from government agencies. As for scandals, the event date is when the most prominent information regarding the scandal is disclosed and thereby assumed to have the largest potential impact on investor decisions.

Figure 1. Event timeline



Determination of estimation window

The estimation window is used to estimate the normal returns of the share in order to contrast them to the abnormal returns, which are observed during the event-window. The normal returns are calculated based on an estimation window defined as 250 to 5 trading days prior the event, in accordance with the example given by MacKinlay (1996). An important feature is that the estimation window and the event window are not overlapping and are treated as two separate data samples to keep the estimated normal returns from being affected by the event.

The Market Model

In order to measure the abnormal return following an event the expected normal return of the stock needs to be estimated. MacKinlay (1996) proposes some methods that can be used in order to assess normal performance, however classifying the market model as the model of preference. Consequently, it will be applied in this thesis to determine normal returns. The market model is defined as

$$\mathrm{E}(\mathrm{r_{it}}) = \alpha_\mathrm{i} + \beta_\mathrm{i}\mathrm{R_{mt}} + \varepsilon_\mathrm{it}$$

Where r_{it} is the return of the firm at day t. β_i captures how well the stock$_i$ follows its corresponding market measuring systematic risk. α_i is the firm specific deviation in return from the market performance measured over the estimation period. R_{mt} is the market return at day t, measured by estimating the return of the appropriate index for each firm, as specified in data section.

Fama-French Three Factor Model

The Fama-French three-factor model is an alternative method for estimating normal stock performance, taking two additional systematic factors into consideration in order to give a more precise estimate than the market model. In addition to the single factor models, multifactor models can favorably be used to explain a greater part of the variance of the normal return of a security and thus reducing the variance of the abnormal return.

The model is extended to

$$E(r_{it}) = r_f + \alpha_i + \beta_{m,i}(r_{mt} - r_f) + \beta_{HML,i}HML + \beta_{SMB,i}SMB + \varepsilon_{it}$$

The SMB factor measures the return of a portfolio constructed as such that it is long firms with a small market capitalization and a short firms with a large market capitalization. The $\beta_{SMB,i}$ is the

estimated correlation between the firm of interest and the SMB factor. The HML factor represents the return of a portfolio that takes a long position in firms with the highest book-to-market ratio and a short position in firms with the lowest book-to-market ratios. The $\beta_{HML,i}$ is the estimated correlation between the firm of interest and the HML factor. All Fama-French factors (risk-free rate, market risk premium, HML and SMB) are fetched from the Kenneth French Data Library. As the library is limited to American data, only the firms listed in the U.S. in our dataset are tested with the Fama-French factors. However, all American firms are not included in the Fama-French estimations due to hinders in availability.

Measurement of abnormal return and cumulative abnormal returns

Examining the returns during the event period contrasted to the previously estimated normal returns measures the abnormal returns. The expected value of AR and CAR is zero if the abnormal returns are the same as expected returns. For the market model this renders abnormal returns as

$$AR_{it} = R_{it} - [\hat{\alpha}_i + \hat{\beta}_i R_{mt}]$$

For the Fama-French three-factor model this results in abnormal returns as

$$AR_{it} = r_{it} - [r_f + \hat{\alpha}_i + \hat{\beta}_{m,i}(r_{mt} - r_f) + \hat{\beta}_{HML,i} HML + \hat{\beta}_{SMB,i} SMB]$$

Where AR_{it} is the difference between r_{it}, return during event period, and the $E(r_{it})$, as defined above. Further, the abnormal performance of the share is measured on an aggregate level as cumulative abnormal return

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{it}$$

When conducting cross-sectional tests and difference testing over several separate time intervals the average cumulative abnormal return is computed with the event window set at the indicated time interval.

$$ACAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} \overline{AR}_t$$

where $\sum_{\tau=\tau_1}^{\tau_2} \overline{AR}_t$ is the sum of the average abnormal return for all firms at each day over the time interval.

Difference testing and cross-sectional analysis

Tests for differences from zero and between groups

The Student's T-test is applied when testing for differences from zero. The test is conducted separately for each category and over different time intervals with the purpose to examine if the categories are different from zero. This tests the alternative hypothesis that the abnormal returns are lower than zero, following the defined events. The test is interpreted through a lower tail p-value.

When testing for difference between the groups the following notation is used: a scandal followed by fine = 'scandal, fine'. A scandal not followed by fine = 'scandal'. A fine following a scandal = 'fine, scandal'. A fine without the presence of a scandal = 'fine'.

The groups tested are 'scandal, fine' against 'scandal' as well as 'fine, scandal' against 'fine'. In order to test for differences between the groups a Wilcoxon Rank-Sum test is employed, as the observations are independent from each other and this also accounts for the presence of non-normality within the groups. This is to test the alternative hypothesis that one of the groups is different from the comparison group. Further the unpaired Student's T-test is used to compare the groups' means over various time intervals. The test used assumes equal variance of the abnormal returns, which appears to be a reasonable assumption. The time intervals are selected to convey a complete image of how the abnormal returns are affected by the different phases of the event. This takes the issue regarding when the information actually reaches the market into account, as the determination of event date might not be entirely precise.

Cross-Sectional analysis

To gain further insights in how the observed abnormal return is affected by the specific characteristics of the event, cross-sectional analysis is employed as suggested by MacKinlay (1996). The cross-sectional analysis is conducted over an ACAR of 5 days prior and 5 days after the event date to cope with the problem of timing arising from manually assembling the data. By including more days in relation to the event the effect of an incorrect event date is reduced. The tradeoff being a less precise estimation of the results, therefore a 5-day window is considered appropriate. The general model has the following characteristics

$$AR_i = \beta_0 + \beta_1 x_{1_i} + \beta_2 x_{2_i} \dots \beta_m x_{m_i} + \varepsilon_i$$

Where AR_i is the abnormal return of observation i, x_{m_i} where $m = 1 \dots M$ are m characteristics of observation i. The error term, ε_i, is uncorrelated with the independent variable and has $E(\varepsilon_i) = 0$

and the β_m where $m = 1 \dots M$ are different coefficients in the regression. Further, since there is uncertainty regarding the distribution of the residuals, heteroskedasticity-consistent, robust, standard errors will be employed in statistical testing.

The specification of models occurs over four different subsamples of the data as there could be general differences between the countries and between different types of misconduct in the sample. The model specification is conducted for EU-based firms, U.S.-based firms, U.S.-based firms using the Fama-French three factor model and for white-collar misconduct. White-collar misconduct is selected as it is the category of misconduct that has the most observations. The regressions used are specified in multiple steps to facilitate the distinction between the effects of the different characteristics.

Standard regression

$$ACAR_{(-5,5),i} = \beta_0 + \beta_1 Scandal_i + \beta_1 Scandal_{fine_i} + \varepsilon_i$$

Where $Scandal_i$ is scandal data not followed by a fine for firm *i*, $Scandal_{fine_i}$ is scandal followed by a fine for firm *i*. This regression is used when specifying which model is going to be employed for all the subsets of explored data. The regression seeks to investigate if there are differences between the fine cases and the scandal cases.

Regression accounting for country of origin

$$ACAR_{(-5,5),i} = \beta_0 + \beta_1 Scandal_i + \beta_2 Scandal_{followingfine_i} + \beta_3 \left(\frac{Fine}{Rev}\right)_i + \beta_4 Scandal \left(\frac{Fine}{Rev}\right)_i + \sum \beta_i \, CountryOfOrigin + \varepsilon_i$$

This regression is used when specifying models using CAR looking only at the observations in the category of misconduct. $\sum \beta_i \, CountryOfOrigin$ contains dummy variables for country of origin and $\left(\frac{Fine}{Rev}\right)_i$ is a continuous variable ranging from the minimum fine to the maximum fine in the data sample.

Regression accounting for nature of misconduct

$$ACAR_{(-5,5),i} = \beta_0 + \beta_1 Scandal_i + \beta_2 Scandal_{followingfine_i} + \beta_3 \left(\frac{Fine}{Rev}\right)_i + \beta_4 Scandal \left(\frac{Fine}{Rev}\right)_i + \sum \beta_i \, NatureOfMisconduct + \varepsilon_i$$

This regression is used when specifying models using CAR looking only at the observations in the sample depending on different origin of firms. $\sum \beta_i \, NatureOfMisconduct$ contains dummy

variables for the different types of misconduct, as well as interaction terms to investigate if there are distinguishable effects of the nature of misconduct in the presence of a scandal.

Cleaning the data

The sample contained some extreme outliers that skewed the results substantially. In order to deal with this, the abnormal returns have been winsorized at a one percent level. Since the scandals and fines have the potential to cause large adverse effect on firms, reducing the extreme outliers causes the information carried by the outliers to also be reduced. The benefits of winsorizing is that the rest of the observations get larger weight compared to the pre-winsorized results, making it possible to examine the general trend rather than the extreme cases. Trimming of the dataset was also considered as a method but winsorizing appeared more appropriate as it still left some influence to more extreme outcomes following the examined event.

Robustness-test

An analysis of variance test is conducted to establish whether or not the variance of the sample can be explained by the different categories. The ANOVA test used is a one-way test between all four categories at the same time, which produces an F-statistic. The cross-sectional model specified above is applied to the full sample of the data to explore how well it performs in explaining a more diverse data sample.

Regression accounting for all control variables for robust test

$$ACAR_{(-5,15),i} = \beta_0 + \beta_1 Scandal_i + \beta_2 Scandal_{followingfine_i} + \beta_3 \left(\frac{Fine}{Rev}\right)_i + \beta_4 Scandal \left(\frac{Fine}{Rev}\right)_i + \sum \beta_i \, FirmSpecificVariable_i + \varepsilon_i$$

The $\sum \beta_i \, FirmSpecificVariable_i$ includes controls for the origin of the firms involved in the misconduct as well as the nature of the misconduct. Furthermore, it involves variations of interaction terms to examine whether the presence of a fine has any influence in combination with other factors.

6. RESULTS

This section contains descriptive statistics on the different categories of data followed by difference testing, comparison between the groups and lastly cross-sectional OLS testing. The descriptive statistics contain graphs highlighting different events of interest and reveal the initial differences between scandals, fines and scandals followed by fines. The difference testing is partly to determine if there is a statistically or economically significant difference from zero and partly to test for difference between groups. The tests between groups are conducted with the related groups, which are the 'scandal, fine' and the 'scandal' as well the difference between 'fine, scandal' and 'fine'. Lastly cross-sectional testing of average CAR over 5 days in relation to the event is done to investigate if there are specified characteristics that are influential in explaining the CAR.

Descriptive statistics

The dataset exhibits features such as the country of origin of firms involved in the misconduct as well as the nature of the committed misconduct. The distribution of observations is presented in Table 1.

Table 1. This table provides a brief summary of the distribution of observations. The section Not Used contains firms receiving fines that were not above the 5% fine/revenue threshold.

Sample Distribution					
	Fine & Scandal	Scandal	Fine	Not Used	Total
Country					
Sweden		9			9
Europe	11	8	2		21
US	23	32	9	5	69
World	1	14	2	1	18
Crime					
Employee Discrimination		12			12
White Collar	16	35	4		55
Environment	7	5	2	3	17
Insider trading		2	7		9
Business ethics	12	9		3	24
Total	35	63	13	6	117

Distribution of abnormal returns (AR) surrounding the event

The abnormal returns have been winsorized at 1% level. In order to reach an understanding of how the presence of the event affects the abnormal returns of the different categories the AR over the days (-5,15) are plotted in figure 2.1-2.4. The AR(-5,15) appear to be normally distributed centered on zero with larger tails for the scandal cases. In both fine cases the lowest

spread is 6%, where the lowest point for 'fine' is 3%. For 'scandal' the AR exhibits a positive as well as a negative tail. For 'scandal, fine' the tail is skewed negatively downwards, reaching -15%. However, figure 3 shows that the immediate CAR are likely normally distributed. Corresponding figures are included in the appendix.

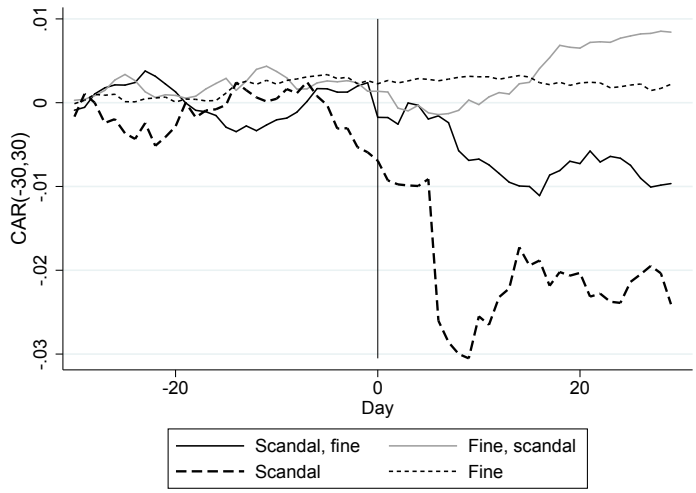
Stock market reaction to the events

Figure 4 shows that it appears to be a difference between how the market reacts to the fine cases contrasted to the scandal cases. 'Scandal' shows the largest reaction to the event with a drop of 3% in average returns while 'scandal, fine' also decreases in CAR however to a lesser extent. Figure 5 shows that over a longer perspective the 'scandal' will recover at a much greater rate than 'scandal, fine'.

Figure 6 shows the effects for the U.S. based firms where AR are computed using Fama-French three factor model. The effect of the event is noticeable here as well and the categories including scandals seem to be exhibiting the largest decline. As the results appear to be quite similar, most of the testing will be conducted using the market model, rather than the three-factor model, due to greater data availability.

The observed difference between the scandal cases around 50 days after the event, as seen in figure 5, could be due to the market reacting to the fact that the 'scandal' lacks sufficient economic impact on the involved firm's actual value. As suggested by Tetlock (2007) the reaction could be an example of observed media pessimism. The anticipation of a fine reaffirms the lower value. This would also explain why there is no noticeable effect of the fines since the information could already be incorporated when the 'scandal' deviates from the 'scandal, fine'.

Figure 4. The average cumulative abnormal return for 30 days before and after the event, ACAR(-30,30), separated for the categories. The graph shows the ACAR for the four categories. Day 0 is either the unveiling by media of a case of corporate misconduct, or the issuance of a fine by a governing agency.



Difference testing

To investigate if there is any significant effect of the events on the firms, t-tests are conducted to examine the deviation from zero over different time intervals. Results related to this are displayed in table 2 and show the largest decrease in abnormal return for the 'scandal', followed by 'scandal, fine' while the fine cases show little divergence from zero. The decline in abnormal return of the 'scandal' is also statistically significant at a 5% level for days (1, 10) and at a 10% level for days (-5, 15). The results of 'scandal, fine', while not statistically significant, might be interpreted as economically significant as all 'scandal, fine' cases exhibit negative mean abnormal return over all time intervals measured post event, and becomes statistically significant at a 10% significance level at the longest time interval. Neither of the fine cases show any substantial divergence from zero in relation to the event.

Furthermore, in table 3 the difference between the corresponding categories is examined. To test differences between groups the Wilcoxon Ranked- sum test and Students T-test are employed. The tests are conducted between 'scandal, fine' and 'scandal' and also between 'fine, scandal' and 'fine'. In the scandal cases the findings suggest that there are large similarities before and closely following the event but the categories diverge in the tests over longer horizon. Ultimately there is a statistically significant difference, on a 10% significance level, over the longest time interval, (0, 75). In the fine case, tests suggest that there are very small differences between the two cases. However, over a long period of time 'fine, scandal' seem to perform better than 'fine'.

Table 2. Test for difference from zero in all categories during various time intervals

This table shows the different intervals where the ACAR has been measured as well as the mean, standard deviation, p-values for one sided (low), and p-values two-sided and the t-statistic and standard error.

Interval	Obs	Mean	Std.Dev	One-Sided p-value (low)	Two-Sided p-value	T-Statistic	Std. Error
Scandal, fine							
CAR(-10-1)	20	1,88%	3,67%	0,98	0,03**	2,29	0,82%
CAR(-1,1)	20	-0,28%	3,57%	0,36	0,73	-0,36	0,80%
AR(0)	20	-0,93%	3,21%	0,11	0,21	-1,29	0,72%
AR(1)	20	1,15%	13,18%	0,65	0,70	0,39	2,95%
CAR(-1,5)	20	-0,67%	5,83%	0,31	0,61	-0,51	1,30%
CAR(1,10)	20	-0,92%	5,96%	0,25	0,50	-0,69	1,33%
CAR(-5,15)	20	-1,50%	7,92%	0,20	0,41	-0,85	1,77%
CAR(-30,30)	20	0,26%	12,13%	0,54	0,93	0,09	2,71%
CAR(-1,30)	20	-2,95%	13,94%	0,18	0,36	-0,95	3,12%
CAR(15,45)	20	0,40%	5,82%	0,62	0,76	0,31	1,30%
CAR(0,75)	20	-5,09%	16,87%	0,10*	0,19	-1,35	3,77%
Fine, Scandal							
CAR(-10-1)	20	-0,96%	4,22%	0,20	0,39	-0,88	1,09%
CAR(-1,1)	20	0,02%	2,73%	0,51	0,98	0,03	0,61%
AR(0)	20	-0,56%	2,22%	0,14	0,28	-1,12	0,50%
AR(1)	20	0,08%	2,70%	0,55	0,91	0,12	0,70%
CAR(-1,5)	20	-0,11%	15,55%	0,49	0,98	-0,03	4,02%
CAR(1,10)	20	-0,68%	16,84%	0,44	0,88	-0,16	4,35%
CAR(-5,15)	20	0,34%	15,76%	0,53	0,93	0,08	4,07%
CAR(-30,30)	20	1,59%	10,19%	0,72	0,56	0,60	2,63%
CAR(-1,30)	20	0,19%	4,22%	0,57	0,86	0,18	1,09%
CAR(15,45)	20	2,10%	7,12%	0,86	0,27	1,14	1,84%
CAR(0,75)	20	2,03%	4,76%	0,94	0,12	1,65	1,23%
Scandal							
CAR(-10-1)	62	-0,40%	6,21%	0,30	0,61	-0,51	0,79%
CAR(-1,1)	62	-1,01%	7,41%	0,14	0,29	-1,08	0,94%
AR(0)	62	-0,98%	7,18%	0,14	0,29	-1,07	0,91%
AR(1)	62	-1,20%	8,40%	0,13	0,26	-1,13	1,07%
CAR(-1,5)	62	-1,13%	8,02%	0,14	0,27	-1,11	1,02%
CAR(1,10)	62	-2,08%	10,58%	0,06*	0,13	-1,55	1,34%
CAR(-5,15)	62	-1,64%	6,53%	0,03**	0,05*	-1,98	0,83%
CAR(-30,30)	62	-0,74%	5,97%	0,17	0,34	-0,97	0,76%
CAR(-1,30)	62	-1,08%	8,38%	0,16	0,32	-1,01	1,06%
CAR(15,45)	62	-0,74%	10,16%	0,28	0,57	-0,58	1,29%
CAR(0,75)	62	-0,15%	11,30%	0,46	0,92	-0,10	1,44%
Fine							
CAR(-10-1)	13	0,06%	2,21%	0,54	0,92	0,10	0,61%
CAR(-1,1)	13	0,22%	0,93%	0,79	0,42	0,84	0,26%
AR(0)	13	-0,30%	0,36%	0,01***	0,01**	-2,98	0,10%
AR(1)	13	0,34%	1,22%	0,83	0,33	1,01	0,34%
CAR(-1,5)	13	0,27%	1,40%	0,75	0,50	0,70	0,39%
CAR(1,10)	13	0,39%	1,75%	0,78	0,43	0,81	0,48%
CAR(-5,15)	13	-0,37%	2,11%	0,27	0,54	-0,63	0,58%
CAR(-30,30)	13	1,23%	5,45%	0,78	0,43	0,81	1,51%
CAR(-1,30)	13	0,00%	2,82%	0,50	1,00	-0,01	0,78%
CAR(15,45)	13	-1,07%	4,26%	0,19	0,39	-0,90	1,18%
CAR(0,75)	13	-0,64%	4,58%	0,31	0,62	-0,51	1,27%

Significance levels *** p<0.01, ** p<0.05, * p<0.1

Table 3. Difference test of Average Cumulative Abnormal Returns ACAR during various time intervals

The table shows difference test between the groups 'Scandal, fine' and 'Scandal' as well as a comparison between 'Fine, scandal' and 'Fine'. The test used are Wilcoxon rank-sum test and student's t-test for examining the differences in mean. The table includes P-Value and Z-statistic for Rank-Sum test. The T-test includes mean values, standard-deviations, t-statistics, standard error, two-sided p-values and one-sided p-value (low).

							Student's T-test			Rank Sum Test	
	Obs	Obs	Mean (Scandal, fine)	Mean (Scandal)	Std,dev (Scandal, fine)	Std,dev (Scandal)	P-Value One-Sided, Low	P-Value Two-Sided	t-stat	Std.Error	Z-statistic	P-value
CAR(-10,-1)	20	62	1,88%	-0,40%	3,67%	6,21%	0,94	0,12	1,55	1,47%	-2,74	0,01
CAR(-1,1)	20	62	-0,28%	-1,01%	3,57%	7,41%	0,66	0,67	0,42	1,72%	-0,63	0,53
AR(0)	20	62	-0,93%	-0,98%	3,21%	7,18%	0,51	0,98	0,03	1,66%	-0,16	0,87
AR(1)	20	62	0,37%	-1,20%	3,23%	8,40%	0,79	0,42	0,81	1,93%	-1,59	0,11
CAR(-1,5)	20	62	-0,67%	-1,13%	5,83%	8,02%	0,59	0,81	0,24	1,94%	-1,18	0,24
CAR(1,10)	20	62	-0,92%	-1,36%	5,96%	8,39%	0,59	0,83	0,22	2,03%	-1,36	0,17
CAR(-1,30)	20	62	-0,70%	-0,74%	9,37%	5,97%	0,51	0,98	0,02	1,78%	-1,26	0,21
CAR(-30,30)	20	62	-2,95%	-1,08%	13,94%	8,38%	0,23	0,47	-0,73	2,57%	-1,14	0,26
CAR(15,45)	20	62	0,40%	-0,74%	5,82%	10,16%	0,68	0,63	0,48	2,39%	-1,24	0,22
CAR(0,75)	20	62	-5,09%	-0,15%	16,87%	11,30%	0,07*	0,14	-1,49	3,30%	-0,12	0,90
	Obs	Obs	Mean (Fine, scandal)	Mean (Fine)	Std,dev (Fine, scandal)	Std,dev (Fine)	P-value low	p-value two	t-stat	std,error	Z-stat	P-value
CAR(-10,-1)	20	13	-0,96%	0,06%	4,22%	2,21%	0,22	0,44	-0,79	1,31%	-0,45	0,65
CAR(-1,1)	20	13	-0,56%	0,22%	2,29%	0,93%	0,13	0,26	-1,14	0,68%	0,99	0,32
AR(0)	20	13	-0,24%	-0,30%	2,21%	0,36%	0,54	0,92	0,10	0,62%	1,40	0,16
AR(1)	20	13	0,08%	0,34%	2,70%	1,22%	0,38	0,75	-0,32	0,81%	-0,21	0,84
CAR(-1,5)	20	13	-0,11%	0,27%	15,55%	1,40%	0,47	0,93	-0,09	4,34%	1,87	0,06
CAR(1,10)	20	13	-0,68%	0,39%	16,84%	1,75%	0,41	0,82	-0,23	4,70%	1,22	0,22
CAR(-1,30)	20	13	1,59%	1,23%	10,19%	5,45%	0,55	0,91	0,11	3,16%	0,35	0,73
CAR(-30,30)	20	13	0,19%	0,00%	4,22%	2,82%	0,56	0,89	0,14	1,38%	-0,67	0,50
CAR(15,45)	20	13	2,10%	-1,07%	7,12%	4,26%	0,91	0,17	1,40	2,26%	-0,99	0,32
CAR(0,75)	20	13	2,03%	-0,64%	4,76%	4,58%	0,93	0,14	1,51	1,77%	-1,13	0,26

Significance levels *** p<0.01, ** p<0.05, * p<0.1

Cross-sectional regressions

Cross-sectional tests are done for subsets of the data. The subsets consist of EU-based firms (including the Swedish firms), 30 observations, U.S.-based firms, 64 observations, U.S.-using Fama, 43 observations, and lastly for firms involved in misconduct relating to white-collar, 55 observations.

The results differ depending on which subset of the data that is examined. White-collar Model 4 in table 5, displaying the subset of white-collar misconduct, shows a 6.96% decrease in CAR for firms involved in scandals, when controlling for size of fine and origin of firm. This effect is statistically significant at a 5% significance level. Interpretation of EU model 2, in table 4, suggests that firms being involved in scandals see an increase in CAR of 4.24% compared to firms that are recipients of fines, on a 1% statistically significant level. This suggests that the scandal information is disregarded while the introduction of a fine has a substantial effect. The U.S. model 3, in table 6, being the best fit of the U.S. models, shows a decrease in CAR of 2.05% in case of 'scandal, fine' however not statistically significant. U.S.-Fama model 5, in table 6 shows results in line with EU model 2 but not statistically significant or as large in magnitude of the effect.

As all cross-sectional testing only take the following trading week into account, the confirmative effect of the fine following the scandals is not noticeable. This could explain why the decline in CAR appears to be more strongly liked to scandals than scandals followed by fines.

Table 4. Average cumulative abnormal return during event window while controlling for a group of variables. The table shows the explanatory value of a group of variables containing nature of the misconduct as well as a variable capturing the effect of the fine size. The model shows a window of ACAR(-5, 5). Only observations based in Europe are included.

VARIABLES	EU Model 1	EU Model 2	EU Model 3	EU Model 4	EU Model 5	EU Model 6
Scandal	0.0424***	0.0471***	0.0472***	0.0469***	0.0362***	0.0627***
	(0.0150)	(0.0129)	(0.0131)	(0.0165)	(0.0107)	(0.0199)
Scandal, fine	0.0248	0.00928	0.00278	0.00946	0.00949	0.0167
	(0.0149)	(0.0162)	(0.0188)	(0.0184)	(0.0173)	(0.0212)
Fine/Rev		-0.00120*	-0.00126*	-0.00119	-0.00117*	-0.000888
		(0.000674)	(0.000697)	(0.000783)	(0.000629)	(0.000718)
White-Collar Crime		0.0265	0.0208	0.0265	0.0272	0.0268
		(0.0238)	(0.0259)	(0.0244)	(0.0244)	(0.0244)
Environment		-0.00247	-0.00848	-0.00230	-0.0103	-0.00615
		(0.0276)	(0.0293)	(0.0301)	(0.0322)	(0.0293)
Business Ethics		0.0219	0.0167	0.0220	0.0259	0.0317
		(0.0270)	(0.0289)	(0.0280)	(0.0279)	(0.0290)
Scandal, fine*(Fine/Rev)			0.0230			
			(0.0184)			
Scandal, fine* White-Collar Crime				0.000861		
				(0.0225)		
Scandal, fine* Environment					0.0303	
					(0.0256)	
Scandal, fine* Business Ethics						-0.0373
						(0.0241)
Constant	-0.0261**	-0.0274	-0.0209	-0.0276	-0.0276	-0.0348
	(0.0115)	(0.0264)	(0.0283)	(0.0281)	(0.0274)	(0.0300)
Observations	30	30	30	30	30	30
R-squared	0. 2322	0.2423	0.2616	0.2497	0.2534	0.2713
R-squared - ajdust	0.0904	0.0991	0.0940	0.0581	0.0815	0.0902

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5. White-collar misconduct. Average cumulative abnormal return during event window while controlling for a group of variables. The table shows the explanatory value of a group of variables containing origin of the firm well as a variable capturing the effect of the fine size. The model shows a window of ACAR(-5, 5). Only observations that are categorized as White-Collar crime are included.

VARIABLES	White-Collar Model 1	White-Collar Model 2	White-Collar Model 3	White-Collar Model 4
Scandal	-0.0344	-0.0551*	-0.0315	-0.0696**
	(0.0288)	(0.0318)	(0.0275)	(0.0311)
Scandal, fine	-0.0141	-0.0166	-0.00671	-0.00984
	(0.0258)	(0.0254)	(0.0252)	(0.0240)
Fine/Rev	-0.00250	-0.00314	-0.00238	-0.00321
	(0.00227)	(0.00225)	(0.00225)	(0.00212)
Sweden			0.0183	0.0290
			(0.0374)	(0.0378)
Europe			0.0269	0.0142
			(0.0353)	(0.0339)
US			-0.00248	-0.0237
			(0.0351)	(0.0342)
Scandal, fine*(Fine/Rev)		0.0166**		0.0266***
		(0.00760)		(0.00913)
Constant	0.0224	0.0295	0.0138	0.0413
	(0.0293)	(0.0291)	(0.0458)	(0.0447)
Observations	54	54	54	54
R-squared	0.051	0.129	0.101	0.253
R-squared-adjusted	0.0	0.0575	0.0	0.1391

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Robustness tests

There is a large discrepancy between the cross-sectional test containing all data and the ones containing subsets of specific countries and sorts of misconducts. The results show that the variation of CAR explained by the all data models in table 4 is very low. This is likely due to the large differences attributed to the broad geographic location of the firms, making it difficult to find accurate predictors of market performance. The ANOVA reveals large within variance and low between variance suggesting that the categorization of scandals and fines carries little explanatory value when applied for all the data.

7. CONCLUSION

The purpose of this study was to examine different stock market reactions following the unveiling of corporate misconduct contingent on the medial attention brought to the case and whether or not a punitive fine was issued. This thesis tests the hypotheses of whether or not; the stock market reacts negatively to corporate misconduct; a firm will demonstrate a larger and more sustaining value loss when a scandal is followed by a fine; the expectation that a large fine should not effect the market value of a firm, is correct.

Firstly, the findings suggest that the market reacts negatively to the news of a scandal. Negative abnormal returns in the cases purely related to scandals of -1.64% were recorded over 5 days prior to 15 days after the event. This reaction is statistically significant at a 5% level. For scandals followed by a fine there is no statistically significant reaction surrounding the event date, yet all mean abnormal returns are negative. This suggests that the reaction is economically significant but with lower p-values in the range 0.1-0.3. The results resemble those achieved by Rao and Hamilton III (1996) and Murphy et al. (2009). The findings provide support for the first hypothesis, stating that markets react negatively to the public disclosure of corporate misconduct. Comparing scandals with scandals followed by fines show that there is initially no difference between the two, but as time progresses the unpunished scandal firms revert to zero abnormal return while the cases followed by fines stay at the new, lower level of return. This difference is statistically significant at a 10% significance level, which provides support for the second hypothesis.

Second, the fines following unnoticed events show essentially no divergence from zero, indicating that the market has already adjusted to the information prior to the issuance of the fine. This result is in accordance with hypothesis 2b. An alternative interpretation of the finding is that investors are unaware, or indifferent, of the firms being convicted. Also, a survivorship bias could impact this subcategory since firms that go bankrupt as a consequence of a fine will be undetectable when collecting data. This distorts the results by leaving them less affected by the potential downsides of a significant fine.

Finally, the cross-sectional regression showed very different results depending on which subsection of data that was being analyzed. Most interestingly, when analyzing the effect of white-collar crime the results reveal that there is a statistically significant effect, at 5% significance level, that a scandal corresponds with a 6.96% lower abnormal return when controlling for size of fine and country of origin. This finding is in accordance with the studies of Karpoff and Lott (2008) that show that white-collar crimes are known to lead to remarkably large reputational losses compared to other types of misconduct.

Cross-sectional tests on EU firms show that scandals instead have a positive effect of 4.24%, which is statistically significant at a 1% level. This result might seem counter intuitive, that a scandal would benefit a firm, but considering that the test is between ACAR of a fixed amount of time the results propose that investors do not take the scandals into consideration while the fines have a large negative impact. This would suggest that the news of a scandal is disregarded in this subset of the data while there is evidence for a negative impact following a fine, which contradict the second hypothesis. In the subset using U.S. firms the results suggest a decline in abnormal return following a scandal, although the effect is not statistically significant.

Much of the results in the difference testing are not significant at a statistical level, which could depend on several factors. It could be a consequence of there being too few observations when dividing the sample data into several categories. Difficulties in determining a correct event date might also add noise to the data, which could lead to a larger spread of abnormal returns contributing to lower levels of significance. Other possible reasons include overestimating investors' access to information about scandals, or the suggestion that investors underreact to news over short time horizons, put forward by Barberis et al. (1998). Moreover, investors might not emphasize scandals as much as anticipated. The finding that firms associated with scandals appear to be worse off when also subjected to subsequent fines could be explained by the fact that when comparing two portfolios of randomly selected firms over a long enough time interval the two portfolios are expected to diverge.

Robustness tests, such as ANOVA and the cross-sectional test applied to all the sample data simultaneously, suggest that the explanatory value of the chosen test variables is low when describing CAR. ANOVA reveals relatively low F-values signaling that most of the variation in the sample is explained by large with-in variance, resulting in difficulties in distinguishing if the test variables are responsible for explaining the abnormal returns in the dataset, or if they are driven by other factors. When applying the test variables to the entire dataset the explanatory value of the models becomes small, expressed by low R^2 and R^2-adjusted. This problem could be explained by the large geographical spread of the firms in the dataset, leading to difficulties in identifying determining factors of stock performance.

Based on the previous discussion, the results appear too ambiguous to confidently reject any of the hypotheses. The results are volatile which makes it difficult to determine what can be accredited to the models and what is caused by chance or circumstances beyond the scope of the examined variables.

8. FURTHER RESEARCH

The chosen method and process of the data collection is associated with some limitations that complicated the selection. Only a small number of firms met the criteria of being recipients of a fine whose size managed to surpass the selected threshold. Consequently, the sample size of the subcategories in boxes I and III could preferably be increased. An alternative approach would be to calculate the threshold using the relation *fine/profit*, which can have other implications while still contributing to a larger sample and as satisfactory results. In order to detect abnormal returns generated by the fines, a more detailed time line for the event of a fine could be applied. Dividing the event window into an enforcement period and a regulatory period with several event dates, it might be easier to detect the potential decrease in share price (Karpoff and Lott, 2008).

The large spread in CAR for the observations surrounding the event date reveals that there likely is a large part of the observations that are not affected by the scandal. By incorporating trading volume of the firms during the event this could reveal for which firms this problem could potentially be reduced. An increase in trading volume is assumed to imply that investors notice and react to the newly disclosed information. In excluding the firms that do not show any change in the volume traded in their stock and only retaining the most frequently traded firms in the dataset, the tests could be run again in order to examine if those firms exhibit more noticeable abnormal returns. Further, this would result in a more consistent sample, reducing the spread in with-in variance and improve the ANOVA test.

To facilitate the collection of data a modification would be to use the dataset of similar studies, although they commonly are restricted to U.S. firms. This approach would allow for an increased number of firms in the dataset (although many firms already are included) as well as for robustness tests, comparing the results obtained by the dataset used in this thesis with the results obtained using the data of earlier researchers.

Another improvement could be made by taking the time fixed effects into account. This could reduce the effects that different states of the economy could have on the results. This could be interesting as Veronesi (1999), states that the market tends to react more to bad news in good times.

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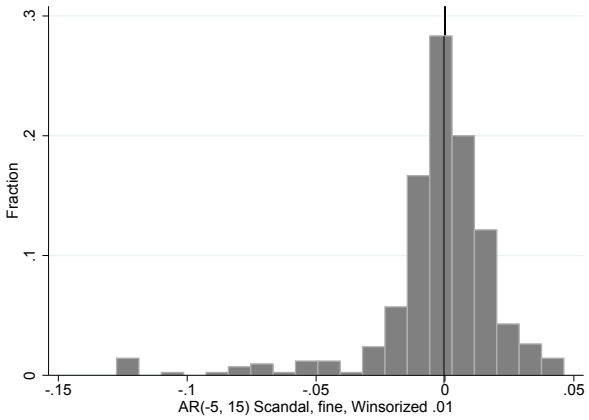
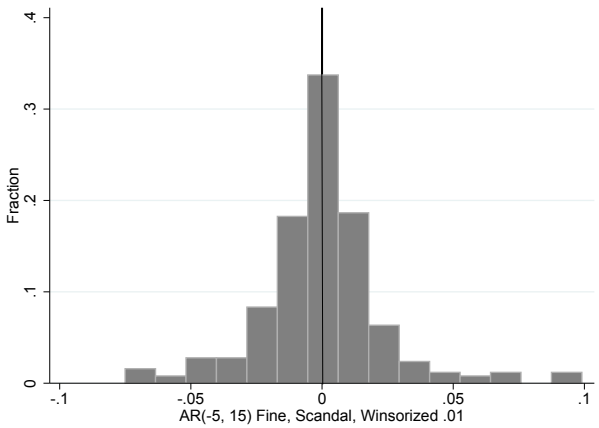
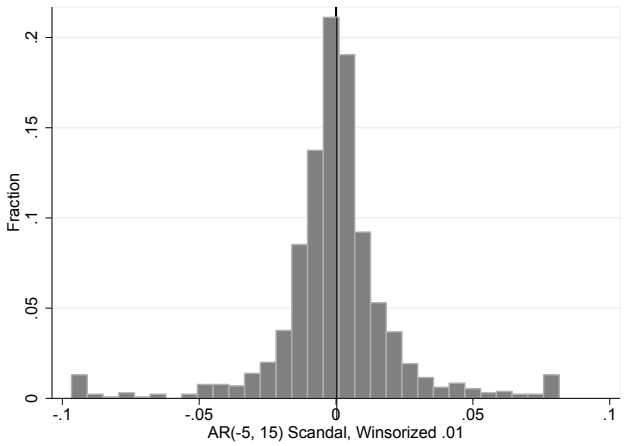
APPENDIX

Figure 2.1-2.4. Graph showing the distribution of Abnormal Returns 5days prior event to 15day post event.
The histograms show the distribution of abnormal returns during a 20day period circling the event. The graphs each contain a sample of roughly 25 observations and the variable AR has been winsorized at a 1%-level.







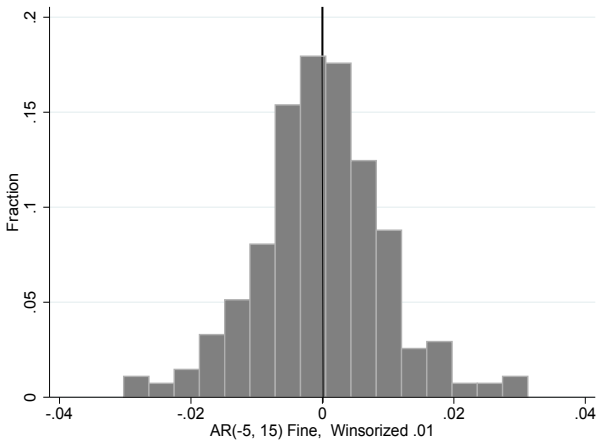


Figure 3.1-3.4. Graph showing the distribution of Cumulative Abnormal Returns 5days prior event to 5day post event. The histograms show the distribution of abnormal returns during a 10-day period circling the event. The graphs each contain a sample of roughly 25 observations and the variable AR has been winsorized at a 1%-level.

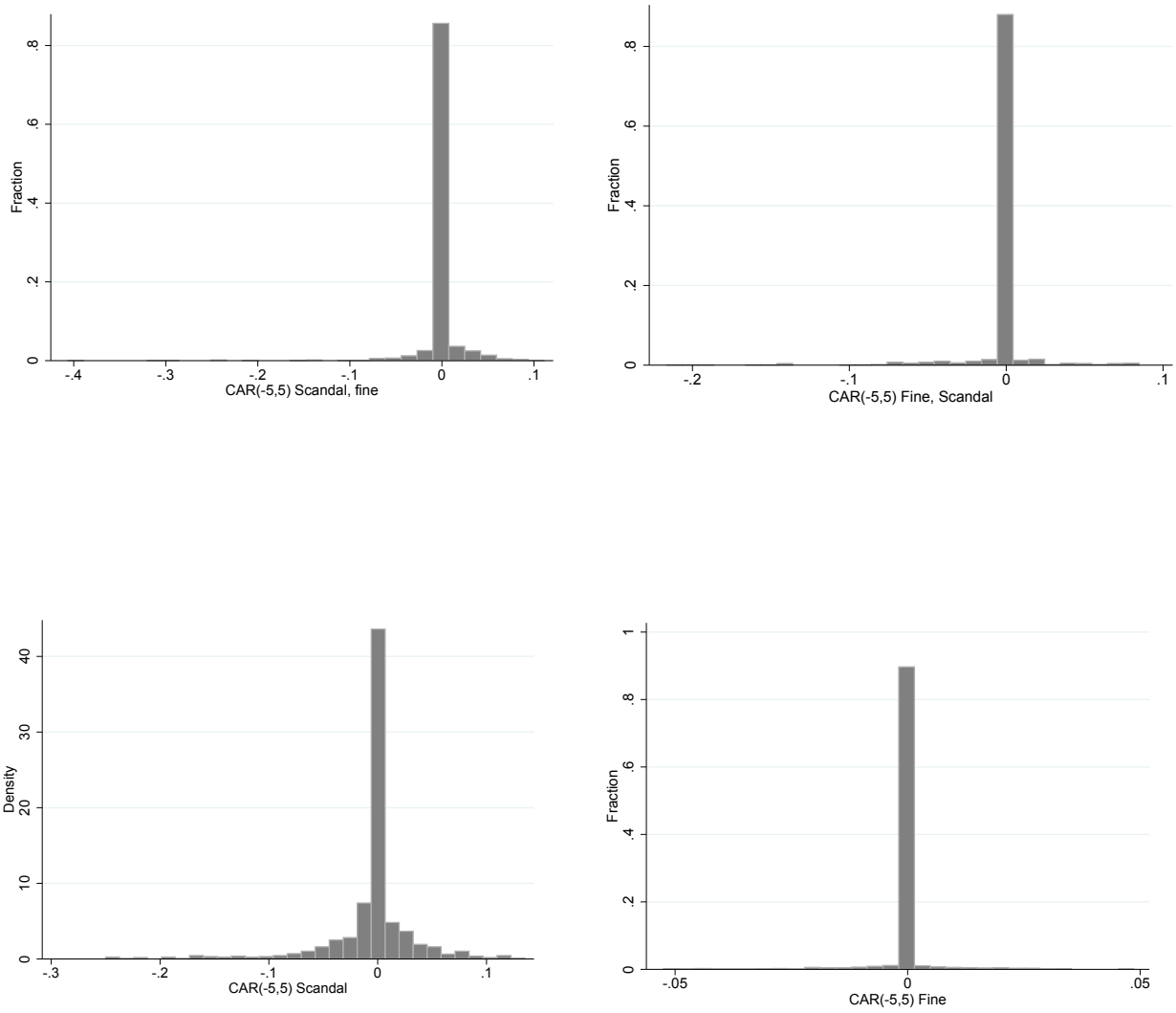


Figure 5. The average cumulative abnormal return for 5 days before and 75 days after the event, ACAR(-5,75), separated for the categories. The graph shows the ACAR for the four categories. Day 0 is either unveiling of corporate misconduct, or the issuance of a fine by a government agency.

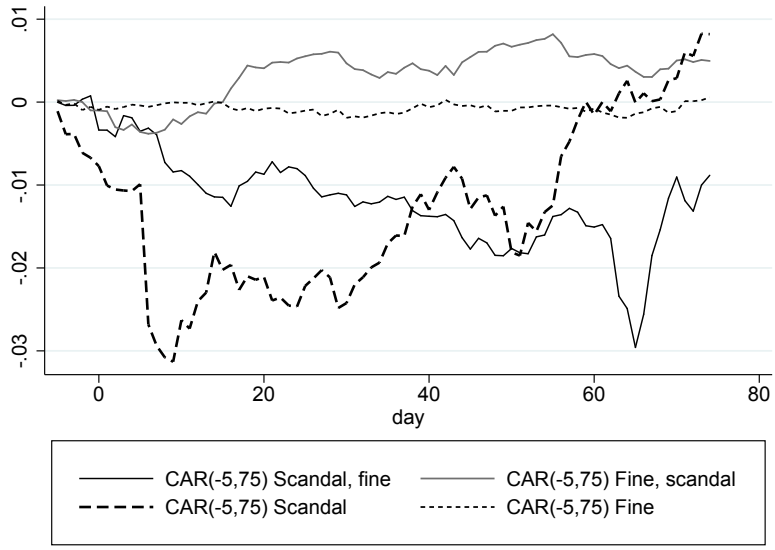


Figure 6. The average cumulative abnormal return for 30 days before and after the event, ACAR(-30,30), for US-firms computed using the Fama-French three factor model, separated for the categories. The graph shows the ACAR for the four categories. Day 0 is either the unveiling by media of a case of corporate misconduct, or the issuance of a fine by a governing agency.

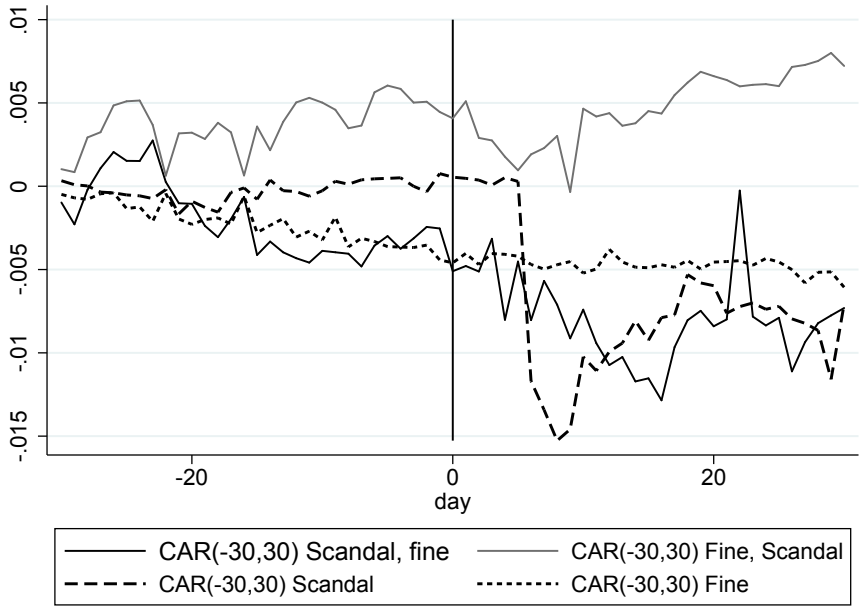


Table 6. Average Cumulative Abnormal Return during event window while controlling for a group of variables. Table shows the explanatory value of a group of variables containing nature of the misconduct as well as a variable capturing the effect of the fine size. Model shows a window of ACAR(-5, 5). Only observations based in the US are included. Table also includes Abnormal return of US-firms computed using the Fama-French three factor model.

VARIABLES	US Model 1	US Model 2	US Model 3	US Model 4	US Model 5	US Model 6	US FAMA Model 1	US FAMA Model 2	US FAMA Model 3	US FAMA Model 4	US FAMA Model 5	US FAMA Model 6
Scandal	-0.0119	-0.00910	-0.00693	-0.0230	-0.0102	-0.00188	0.00126	0.00462	0.00404	0.0215	-0.00810	0.00925
	(0.0158)	(0.0158)	(0.0164)	(0.0268)	(0.0189)	(0.0177)	(0.0213)	(0.0189)	(0.0191)	(0.0324)	(0.0229)	(0.0238)
Scandal, fine	-0.00865	-0.00579	-0.0205	-0.00193	-0.00694	-0.00454	0.0235**	0.0279*	0.0401***	0.0232	0.0152	0.0285*
	(0.0122)	(0.0148)	(0.0188)	(0.0164)	(0.0165)	(0.0149)	(0.0103)	(0.0149)	(0.0143)	(0.0184)	(0.0174)	(0.0154)
Fine/Rev		-0.000135	-0.000291	8.01e-05	-0.000218	-0.000118		-0.000350	-0.000316	-0.000614	-0.00127	-0.000346
		(0.000626)	(0.000650)	(0.000889)	(0.000853)	(0.000645)		(0.00106)	(0.00108)	(0.00136)	(0.00141)	(0.00108)
White-Collar Crime		-0.0141	-0.0299	-0.0157	-0.0139	-0.0155		-0.00727	0.00561	-0.00359	-0.00472	-0.00891
		(0.0159)	(0.0209)	(0.0165)	(0.0161)	(0.0162)		(0.00968)	(0.00985)	(0.0112)	(0.00962)	(0.0102)
Environment		0.0187	0.00950	0.0204	0.0173	0.0165		0.0491	0.0604	0.0473	0.0334	0.0477
		(0.0264)	(0.0284)	(0.0260)	(0.0236)	(0.0276)		(0.0436)	(0.0421)	(0.0417)	(0.0350)	(0.0452)
Business Ethics		-0.00904	-0.0200	-0.00558	-0.00914	-0.00521		-0.00508	0.00636	-0.0104	-0.00629	-0.00237
		(0.0151)	(0.0170)	(0.0148)	(0.0152)	(0.0146)		(0.0120)	(0.00962)	(0.0122)	(0.0118)	(0.0111)
Scandal, fine*(Fine/Rev)			0.0138*						-0.0101			
			(0.00787)						(0.00726)			
Scandal, fine* White-Collar Crime				0.0227						-0.0288		
				(0.0397)						(0.0530)		
Scandal, fine* Environment					0.00933						0.104	
					(0.0515)						(0.0737)	
Scandal, fine* Business Ethics						-0.0271						-0.0158
						(0.0343)						(0.0394)
Constant	-0.00326	0.00433	0.0184	0.000467	0.00549	0.00308	-0.0285***	-0.0279*	-0.0401***	-0.0232	-0.0152	-0.0285*
	(0.00825)	(0.0176)	(0.0207)	(0.0190)	(0.0191)	(0.0177)	(0.00903)	(0.0149)	(0.0143)	(0.0184)	(0.0174)	(0.0154)
Observations	64	64	64	64	64	64	43	43	43	43	43	43
R-squared	0.010	0.041	0.1652	0.0738	0.0778	0.051	0.0571	0.137	0.147	0.152	0.1469	0.141
R-squared - ajdust	0.0	0.0	0.0609	0.0	0.0	0.0	0.0262	0.0	0.0	0.0	0.0617	0.0

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7. Average Cumulative Abnormal Return during event window while controlling for a group of variables. Table shows the explanatory value of a group of variables containing either country of origin or nature of the misconduct as well as a variable capturing the effect of the fine size. Model shows a window of ACAR(-5, 5). All sampled data is included in table.

VARIABLES	All data Model 1	All data Model 2	All data Model 3	All data Model 4	All data Model 5	All data Model 6	All data Model 7	All data Model 8	All data Model 9
Scandal	0.00334	0.0152	0.00231	0.00985	0.0138	0.0158	0.0108	-0.0151	0.0112
	(0.0113)	(0.0300)	(0.0118)	(0.0159)	(0.0331)	(0.0345)	(0.0187)	(0.0253)	(0.0167)
Scandal, fine	-0.00796	-0.00724	-0.00790	-0.00574	-0.00735	-0.00300	-0.00811	-0.00531	-0.00195
	(0.0227)	(0.0274)	(0.0227)	(0.0224)	(0.0281)	(0.0292)	(0.0260)	(0.0294)	(0.0296)
Fine/Rev		0.000391		0.000111	0.000334	0.000244	0.000137	-5.01e-05	0.000124
		(0.000886)		(0.000615)	(0.000948)	(0.000965)	(0.000813)	(0.000858)	(0.000646)
Sweden			-0.00205	-0.0286	0.00240	-0.0373	-0.0282	-0.0494*	-0.0286
			(0.0224)	(0.0194)	(0.102)	(0.141)	(0.0210)	(0.0275)	(0.0195)
Europe			-0.00508	-0.00730	-0.00293	-0.00385	-0.00637	-0.0184	-0.00633
			(0.0141)	(0.0192)	(0.0398)	(0.0403)	(0.0222)	(0.0246)	(0.0193)
US			-0.00424	-0.00217	-0.00146	-0.00344	-0.00172	-0.0228	-0.00210
			(0.0133)	(0.0194)	(0.0359)	(0.0365)	(0.0209)	(0.0274)	(0.0194)
White-Collar Crime				-0.0362**		-0.0450	-0.0365***	-0.0693**	-0.0368***
				(0.0138)		(0.1000)	(0.0138)	(0.0280)	(0.0137)
Environment				-0.0277	0.00629	-0.0309	-0.0268	-0.0541*	-0.0285
				(0.0185)	(0.0312)	(0.104)	(0.0176)	(0.0279)	(0.0199)
Business Ethics				-0.0257		-0.0275	-0.0248*	-0.0473**	-0.0233*
				(0.0156)		(0.102)	(0.0134)	(0.0237)	(0.0137)
Scandal, fine*(Fine/Rev)		-0.0299**			-0.0293*	-0.0271			
		(0.0149)			(0.0164)	(0.0168)			
Scandal, fine* White-Collar Crime							0.00479		
							(0.0549)		
Scandal, fine* Environment								0.0211	
								(0.0617)	
Scandal, fine* Business Ethics									-0.0121
									(0.0441)
Constant	-0.0130	-0.0175	-0.00880	0.0184	-0.0161	0.0215	0.0170	0.0641	0.0170
	(0.00900)	(0.0215)	(0.0137)	(0.0276)	(0.0410)	(0.111)	(0.0330)	(0.0466)	(0.0283)
Observations	110	110	110	110	110	110	110	110	110
R-squared	0.005	0.057	0.005	0.018	0.057	0.065	0.018	0.033	0.019

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8. ANOVA Test using all the available data. The table shows the F-statistic generated through a one-way ANOVA test between the tested variables and CAR. The means for all categories is also displayed.

ANOVA Test

All data	CAR	CAR	Source				
	Mean	Std, Dev	Freq,		SS	Degrees of freedom	F	Prob > F
Fine, scandal	-1,78%	5,38%	20					
Scandal, fine	-0,98%	6,79%	20	Between groups:	0,0010	3	0,13	0,94
Scandal	-1,05%	4,91%	62	Within groups:	0,2812	106		
Fine	-0,59%	2,27%	13					

Table of assembled data

Firm name	Fine date	Scandal date	Fine/Revenue
Aarons	6-11-2011		5,14%
Abbott Laboratories Inc.	5-7-2012	10-22-2011	3,76%
Anadarko Petroleum	1-23-2015	4-3-2014	54,30%
Anheuser-Busch InBev	9-28-2016	9-28-2016	0,00%
AOL Time Warner	7-21-2110	8-1-2002	6,90%
BAE Systems	3-1-2010	3-1-2010	1,20%
Bank of America	8-21-2014		19,56%
Bilfinger		3-22-2015	0,00%
BNP Paribas	5-1-2015	6-1-2014	20,98%
Boeing		11-24-2003	1,00%
Boliden		9-16-2012	0,00%
BP		4-20-2010	11,01%
Braskem	12-14-2016	12-14-2016	5,60%
Bristol-Myers Squibb	8-4-2004	7-11-2002	0,80%
Cabot			2,45%
Carnival		2-1-2013	
Cephalon (Parent Teva Pharmaceutical Industries)	5-28-2015	5-28-2015	6,10%
ConAgra Grocery Products LLC (Parent ConAgra Brands)	5-20-2015	5-20-2015	0,10%
Credit Suisse	5-8-2131		34,57%
Daimler	4-1-2010	3-1-2010	0,10%
Deutsche bank	1-17-2017	11-18-2132	24,00%
Diageo PLC	7-27-2011	7-28-2011	0,10%
Dynegy	4-16-2005	4-26-2002	23,20%
Eli Lilly		15-01-2009	6,41%
Embraer	10-24-2016	10-24-2016	0,90%
Enbridge	7-20-2016	7-20-2016	0,70%
Eniro		8-18-2014	0,00%
Ericsson		6-17-2016	0,00%
Fannie Mae	5-23-2006	12-16-2004	5,90%
Fingerprint Cards		6-2-2016	0,00%
Foxconn		6-9-2010	0,00%
Freddie Mac	12-10-2003	11-21-2003	1,30%
Freeport-McMoRan		12-27-2005	0,00%
Gap		8-8-2010	0,00%
Gazprom		9-19-2013	0,00%
General Motors	9-17-2015	9-17-2015	0,60%
Glaxo-Smith-Kline	4-7-2012		6,36%
Halliburton		9-2-2004	3,95%
Handelsbanken		1-30-2015	0,00%
Healthsouth	6-9-2005	3-19-2003	3,10%
Herbalife	7-15-2016	4-12-2014	4,50%
Hexagon		10-31-2016	0,00%
HP		1-1-2016	
HSBC	12-11-2012	12-11-2012	2,20%
Hundai	11-3-2014	11-3-2014	0,20%
Infosys Limited	10-31-2013	10-31-2013	0,50%
Intel		6-25-2008	4,13%
JGC Corporation	4-6-2011		5,24%
Joe Fresh (Parent Loblaw Inc)	4-30-2015	4-25-2015	
Johnson & Johnson			
Johnson & Johnson	11-4-2013	11-4-2013	3,10%
Johnson Controls (Parent Tyco International)	10-7-2013		7,49%
JPMorgan	11-19-2013	11-19-2013	13,50%
Kia Motors	11-3-2014	11-3-2014	0,40%
L'Occitaine		7-30-2012	
La Senza		4-1-2005	0,00%
Lions Gate	3-13-2014	3-13-2014	0,30%
Louisiana Generating (Parent NRG Energy)	11-20-2012		3,13%
Marks and Spencer		8-11-2010	
Mead Johnson Nutrition Company	7-28-2015	7-28-2015	0,30%
Mengniu Dairy		7-16-2008	
Merck	11-1-2007	9-1-2004	20,00%

Firm name	Fine date	Scandal date	Fine/Revenue
Minebea	2-2-2015	2-2-2015	0,30%
MoneyGram	11-9-2012	11-9-2011	7,50%
Mosaic Fertilizer, LLC (Parent Mosaic)	10-1-2015	10-1-2015	9,10%
Mylan	12-20-2010	9-2-2016	5,14%
Nestlé		6-29-2012	
Nestle		7-7-1977	
Nordea		4-3-2016	0,00%
Northern Indiana Public Service Co. (Parent NiSource)	01-13-2011		13,66%
NSK	9-26-2013	9-23-2013	1,10%
Olympus	3-1-2016	3-1-2016	8,80%
Pfizer	9-2-2009		5,11%
Philip Morris		7-14-2010	
Potash Corporation	6-11-2014	6-11-2014	0,70%
Ralph Lauren	4-22-2013	4-22-2013	0,00%
RELX Group	1-17-2017	1-17-2017	0,00%
Rolls Royce	1-17-2017	1-17-2017	1,00%
Saint-Gobain Containers Inc.	1-21-2010	1-21-2010	0,30%
Samsung		9-5-2012	0,00%
SCA		1-30-2015	0,00%
Securitas		3-21-2011	0,00%
Serono Laboratories		12-16-2004	27,20%
Skanska		11-28-2014	0,00%
Skechers USA	5-16-2012	5-16-2012	2,60%
SSAB		1-30-2015	0,00%
Standard Chartered	8-7-2012	8-7-2012	1,90%
Swedbank		2-9-2016	0,00%
Telia		2-1-2013	0,00%
Toshiba	12-25-2015	7-20-2015	0,10%
Toyota Motors	3-19-2014	3-19-2014	0,50%
UBS		6-20-2008	3,47%
Verizon	8-23-2010		5,79%
Victoria's Secret (Parent Limited Brands)		11-26-2007	0,00%
Volkswagen		9-11-2015	6,10%
Volvo		4-9-2012	0,00%
W.R. Grace & Co		02-05-2014	1,94%
Walmart		4-24-2013	0,00%
Walt Disney		1-3-1996	0,00%
Wells Fargo	4-8-2016		5,68%
Westar Energy		01-25-2010	24,76%
Wisconsin Power and Light Company (Parent Alliant)	4-13-2013		30,85%
Wisconsin Public Service Corporation (Parent WEC Energy Group)		01-04-2013	6,14%
Xerox	4-11-2002	5-31-2001	0,10%
Yahoo		3-3-2012	0,00%
Zara (Parent Inditex)	5-12-2015	8-18-2011	