ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Bachelor Thesis: International Economics and Business Economics

Is there Justice in Financial Markets? The Effects of Corporate Scandals on Company's Stock Performance.

Abstract

Corporate governance has recently become an important factor of the investment decisions as the consequences of unethical management often affect stockholders. The following research examines the effect of corporate scandals on the stock performance of a firm in years 2014-2019. Implementing the empirical analysis of Cumulative Abnormal Returns (CARs), the paper concludes that firms involved in a corporate misbehaviour have experienced negative stock performance. Analysis of different scandal types of accounting, collusive, personal and bribery nature concluded that each type is likely to have a different influence over the stock. It is also documented that image effects and financial leverage have no effect on the magnitude of the experienced returns for the assessed sample.

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Introduction:

In September 2015, the United States Environmental Protection Agency (EPA) issued a Notice of Violation to Volkswagen AG for using a deceptive software that concealed the amount of nitrogen oxide released by the vehicles produced by Volkswagen (Mačaitytė & Virbašiūtė, 2018). One of the world's biggest automotive manufacturers had to pay a $18 billion fine the same year (Kabeyi, 2019); nevertheless, the firm suffered even more serious financial consequences in the stock market. Within a week, after the scandal went public, Volkswagen's stock price plunged by 39% from €161.35 to €101.15, which translated to a €29 billion loss in market capitalization (Jung & Sharon, 2019). Despite the large scale of the misconduct, with 11 million vehicles having installed the illusive software, and a mass media attention, the multinational recovered quickly and achieved the all-time-high operating profit of €19.3 billion in 2019 (Volkswagen Group, 2020). Less than a year later, Wells Fargo, the third-largest financial intermediary in the United States, was fined $185 million for fraud in sales practices (Cavico & Mujtaba, 2017). The bank was involved in a cross-selling scandal that set up 'ghost' bank products under customers' names, which was caused by unrealistic sales targets enforced by the high management. Despite opening millions of fake accounts, the company suffered very few legal consequences and though 5,300 employees were terminated, they were almost all lower-level employees. Additionally, the restructuring took place when the bank experienced record stock prices and paid millions to the senior management in performance bonuses (Grunewald, De Feis, & Atallo, 2018). Following the fine by the Consumer Financial Protection Bureau, the company's stock price dropped by 9% but rose again by 30% when the current CEO, John Stumpf had 'retired'.

Corporate scandals such as the ones involving Volkswagen and Wells Fargo are constantly present in the current financial markets. Nevertheless, despite large media attention and initial public indignation, it is very often that the owners and not the decision-makers have to bear the consequences. When in 2016, JPMorgan Chase & Co. was fined $264 million for its involvement in a scandal regarding bank's recruitment of sons and daughters of Chinese government officials, no representative of the senior management had faced disciplinary consequences (Pufpaff & McCann, 2021). Furthermore, no personal retribution took place in 2017, when Apple paid a $113 million in settlements for deliberately slowing down the performance of their devices to stimulate the demand for new models (Kelly, 2020). Whether the firm is involved in accounting fraud, bribery, insider trading or scandals of personal nature, the majority of the burden seems to be bared by the stockholders. According to the Stanford

Report on Corporate Governance (Larcker & Tayan, 2018) corporate scandals have become a more and more concerning issue over the years, with as many as 227 securities class action lawsuits being filed in 2016. In 2021, the number of settled cases has reached 87 with the total compensation aggregating to $1.8 billion (Cornerstone Research, 2021). Therefore, the following paper aims to provide the investors with adequate knowledge regarding the market's response to corporate mismanagement so that informed investment decisions can be made.

The issue of corporate scandals and their disturbance on the financial markets is being overlooked by the recent academia. Most of the scientific papers in this field focus on event studies on cases such as the Enron-Arthur Andersen scandal of 2001 (Christopher, 2010). Despite benefits in form of in-depth analysis of the market behaviour, the academia is lacking a systematic, large-N, panel-data analysis on the topic. This would allow to gain some case-independent insights into how corporate scandals influence the stock market and provide information to both the investors and firms' management. Furthermore, the current academic literature is out-dated and often focuses on accounting scandals, which does not provide sufficient information, especially in times where the impact of an investment starts to have a higher value for the investors than the return (Maurel & Viviani, 2019). There is also a shortage of appropriate databases including scandal firms and therefore a deficiency in papers with empirical focus.

Kaprof, Lee and Martin (2008), show that the penalties imposed by the market are up to 7.5 times larger than the fines imposed by the U.S Security and Exchange Commission (SEC) or Department of Justice (DOJ). Thus, the following research could be used as a framework for the purpose of policy implementation. A paper by Hail, Tahoun and Wang (2017), is concerned with the effects regulation has on the occurrence of corporate scandals. Their findings suggest that though the regulatory changes often follow a scandal that has attracted a large media attention, they do not curb corporate misconducts. The research concludes that the firms possess much larger knowledge and information about the industry than the legislators and deems it one of the consequences of ineffective regulation, which highlights the relevance of the following research.

Therefore, the following paper aims to examine how corporate scandals affect a firm's stock performance and what company's insights could change the magnitude of this effect. The following research question is aimed to be answered:

"To what extent do the corporate scandals affect the company's stock performance?"

To provide further insights into the researched topic, the analysis of the firm's characteristics and structure is incorporated. Prior literature confirms that a positive reputation of a business, which influences stockholders' investment decisions, has a positive effect on the stock returns (Raithel & Schwagier, 2014). Furthermore, those image effects are likely to increase in the upcoming years with the rise in 'financially illiterate' retail investors (Fisch & Wilkinson-Ryan, 2014). Hence, the first sub-question is formulated:

"What role does a firm's Governance pillar of the ESG rating play in the degree company's stock performance is affected by the corporate scandal?"

Additionally, to incorporate the effect firm's financial structure has on stock returns when a firm engages in unethical activity, the leverage component is added to the research. This is done to provide more relevant information to both the investors and the management, as well as, add onto the existing literature. The research by Nemlioglu and Mallick (2021) on the role of firm's solvency in times of crisis, shows that a well-managed firm can benefit from leverage effect. Therefore, the following sub-question is composed:

"What role does the financial leverage play in the degree company's stock performance is affected by the corporate scandal?"

Theoretical Framework:

The paper is based on the theory of the firm with a focus on the agency theory. The agency theory claims that the adequate functioning of a firm relies on the relationship between the principal (shareholders) and the agent (management) (Jensen & Meckling, 1976). The main proposition of the theory states that if both parties are utility maximisers, the agent will not always act in the best interests of the principal. Therefore, a corporate scandal is likely to negatively affect the trust of investors which will have an influence on the stock performance (Kulik, 2005). Furthermore, the research assumes a semi-strong market efficiency, in which the stock prices fully and fairly reflect all the publicly available information (Maloney & Mulherin, 2003). This assumption is necessary to attribute the changes in the company's stock performance to the disclosure of a scandal. Though some events such as the Challenger crash in 1986 see an immediate reaction, and others, like the Wells Fargo scandal, the market takes time to adjust (Cavico & Mujtaba, 2017), the prior research seems to confirm the semi-strong market efficiency.

The following section discusses existing scientific literature on the topic of corporate scandals and positions its analysis with respect to other papers. In their paper from 2019, Jeremiah and Kabeyi highlighted the importance of good corporate governance in the management of organisations. Through case studies of corporate unethical behaviour in the contexts of the Enron Corporation and the Volkswagen emission scandal, they show how bad governance can lead to value diminution. Using a variety of indicators, including poor operating performance, high staff turnover and deteriorating stakeholder relationships, the paper directly links unethical conduct to the poor performance of a company's stock. The theoretical research done by Kuhn and Aschcraft in 2003, on how to approach corporate scandals using the theory of the firm, identifies 3 different types of fraud: accounting fraud, options backdating and collusion. According to the paper, accounting fraud incorporates tax evasion, manipulation of financial statements or channelling corporate profits for individual use, as in the case of Adelphia or Tyco. Options backdating refers to issuing in-the-money stock options with the false assertion that they were issued at an earlier date (Bernile & Jarrell, 2009). Lastly, the paper categorizes collusion as cooperation with independent parties that implies a conflict of interest e.g., Enron's relations with auditors from Arthur Andersen in 2001. The recent empirical research by Hung, Wing and Zhang (2015), has found that the market tends to be most responsive to collusion, especially if a scandal has a political background.

The recent academia, as well as, the previously discussed examples of Volkswagen, Wells Fargo and JPMorgan, have found that the direct effects of the corporate scandal are experienced by the shareholders. The empirical study by Bernile & Jarell (2007), which investigated the effects option backdating scandals had on the company stock performance in the sample of 129 firms, has found that the companies involved in this type of misconduct experienced negative Cumulative Abnormal Returns (CARs). Using the market model and the event window of 41 days; 20 before and 21 after the grant date (the date the stock is reported to be issued), the paper concludes a price drop of -8.91% for the used sample. This accounts for an aggregated loss of $686 million for all the stockholders. Previous literature also suggests that the public is quick in forgetting corporate scandals (Mena, Rintamaki, Fleming, & Spicer, 2016). When in 2003, the CEO of HealthSouth was accused of inflating profits by $1.4 billion and the company was on the verge of bankruptcy, they implemented a number of brand recovery strategies to 'stay alive' (Armstrong & Balch, 2015). By removing all ties with the old CEO, heavy restructuring and refocusing on its core values, the company managed to get relisted on the New York Stock Exchange in 2007 under a new name: Encompass. The research by Mena et al. (2016) suggests collective memory effects have an influence on the short duration of corporate guilt.

In terms of moral theories regarding business ethics of corporate scandals, the prior academic literature is in dissensus. Some, such as the study on self-interest and business ethics by Thomas L. Carson (2003) argue that corporate misconduct is a product of the market, whereas others like the research by Knights and O'Leary (2005) propose that; it is the lack of ethical core and failure of the leadership that leads to scandals. The paper by Carson (2003) analyses corporate scandals of Enron in 2001 and WorldCom in 2002 and finds the stakeholder theory inapplicable in the modern corporate world. Furthermore, it argues that the presence of the principle-agent problem and a lack of mechanisms shareholders possess to control the management, leaves too much room for misbehaviour. Lastly, according to Carson, the intense market competition and peer effects put pressure on managers to behave unethically. On the other side, Knights & O'Leary (2005) argue that the biggest obstacle to ethical leadership is an individual's preoccupation with self and success. The paper claims that the management tends to disregard moral and legal boundaries to achieve a competitive advantage and gain personal benefit. They propose that intensification of business ethics courses in business schools would build a more resilient moral core for future entrepreneurs, which is likely to result in fewer scandals.

Jory, Ngo, Wang, & Saha (2015) analysed the market response to the CEO-related corporate scandals from 1993 to 2011. Their database is concerned with the American companies listed on NYSE, Amex and NASDAQ. Jory et al. use event study methodology to examine the effects on the stock market. Their computation of cumulative abnormal returns with forecasted daily returns is obtained through the market model formula. They then perform a linear regression analysis with control variables of size, operating income, volatility and market-to-book ratio. The findings suggest that companies that were involved in a CEO-related unethical behaviour have experienced negative CARs and those were more likely to happen in large firms. The study estimated that the sample of 80 companies aggregately generated a loss of $152 billion for the shareholders. Due to the high quality and appropriate statistical methodology, the study by Jory et al. is chosen as a core paper for the following research and parts of the analysis are based on their findings. This leads to the formulation of the first hypothesis:

H_1: *"Involvement in corporate scandals negatively affects the company's stock performance."*

Despite their thorough analysis, Jory et al. fail to incorporate how the effects may differ depending on the type of the scandal. Recent psychological studies suggest that there is a divergence in the public reaction to different kinds of corporate misbehaviours (Guckian, Chapman, Lickel, & Markowitz, 2020). Nevertheless, the study by Hung, Wong and Zhang (2015), which researched four different types of scandals and their effects on CARs of Chinese firms, has shown that each type yields similar results. Their analysis of bribery, state asset misappropriation, financial misrepresentation and firm asset misappropriation concludes that all types had a significant negative effect on a firm's stock. To provide more insights into the field with specific data for the US stock market, the type of corporate scandal is analysed and the following hypothesis is formulated:

H_2: *"Different types of scandals have the same effect on the company's stock performance."*

The paper by Janney and Gove (2010), examines the influence of corporate social responsibility (CSR) on the market reaction to US firms being involved in option backdating scandals. The research finds that CSR initiatives can decrease the negative impact firm's misconduct may have on stock returns. The more recent research of Suhadak, Kurniaty,

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Handayani and Rahayu (2018) on the effects that GCG rating (Indonesian index of good corporate governance) has on the financial performance of a company, argues that image effects have a large influence over a company's stock price. The study incorporated financial analysis of the 45 largest firms on the Indonesian Stock Exchange between 2010-2016 and has shown significantly higher returns for stocks of companies with higher GCG ratings. Therefore, the third hypothesis is composed:

H_3: "*Higher Governance pillar of ESG rating decreases the effect corporate scandals have on the firm's stock performance.*"

A study by Mohan and Chandramohan (2018), analysed the impact of a firm's financial structure on a firm's stock performance. This paper performed an empirical analysis of 30 companies listed on the Bombay Stock Exchange using the OLS regression of retrieved panel data. Their results reveal that higher leverage, as well as, higher asset turnover had a positive effect on a company's stock returns. Furthermore, the research by Bonini and Diana (2010), investigated whether companies involved in corporate misconduct possess different capital structures. Their examination of firms which received a security class action suit has shown that stockholders view firms with higher leverage as more likely to behave ethically, as they rely on an outside source of financing. Additionally, companies that expect to engage in misbehaviour, tend to lower their debt financing, which could be interpreted as a signal by the market. Thus, the fourth and last hypothesis is formulated:

H_4: "*Higher financial leverage decreases the effect corporate scandals have on the firm's stock performance*"

Data and Methodology

1. Data

Firstly, the data on corporate scandals for years 2014-2019 had to be obtained. Due to the unavailability of relevant databases regarding corporate misconducts in the United States and the failure to obtain access to the Lexis-Nexis database, it was decided to perform the data collection manually using the SEC Litigation Releases Archives (U.S Securities and Exchange Commission, 2022). As the field of finance is the focus area of the following research, the Accounting and Auditing Enforcement Releases are chosen, which concern financially related enforcement actions brought by the Commission in the federal court between years 2014 and 2019. SEC Litigation Release is a publishment of an investigation the Securities and Exchange Commission conducted concerning the wrongdoing of a company and includes its findings and imposition of remedial sanctions. The release date is therefore the legal date from which a business entity must perform the requested action. In the following paper, the release date is regarded as the scandal date as it includes the declaration of all information to the public.

Not all litigation releases were applicable for the following research, as some were with regard to OTC traded securities, limited liability entities or updates on previously published orders, and therefore from 585 analysed reports only 109 corporate scandals are obtained. To achieve more specific results and investigate the 2nd hypothesis of the research, a categorical variable of the scandal type is added. The variable includes 4 distinct types of scandals; 1 – accounting fraud, 2 − collusion, 3 – personal scandal involving senior management and 4 – bribery. Two initial types are incorporated form the typology of Kuhn and Aschcraft (2013), as discussed in the literature review. It was decided to disregard the option backdating scandals, as from the introduction of the Sarbanes-Oxley Act in 2002, all option grants have to be registered with the SEC and this type of misconduct has become much less popular (Hossain, Mitra, Rezaee, & Sarath, 2011). Accounting fraud involves all sorts of book misstatements, auditing mistakes and illegal alterations of company's financial statements. The second type of scandal, collusion, is concerned with corporate misconduct such as fraud, involvement in organised crime, price-fixing or misleading of investors. Additionally, to further investigate the effect unethical leadership has on the stock performance as discussed by the moral theory by Knights and O'Leary (2005), scandals of personal nature involving senior management are included. It is concerned with the personal usage of corporate funds, nepotism and personal perks for senior executives reporting directly to the CEO (Oakley, 2000). Only senior

management is taken into consideration, as past literature shows that such a scandal is more likely to affect stock performance (Jory et al., 2015). Lastly, due to the large quantity of observed events, bribery is added as the 4th type of scandal analysed in the following research. Previous research defines corporate bribery as the use of "illicit (financial) transactions/exchanges to win or maintain business contracts in foreign jurisdictions" (Lord & Levi, 2016, p. 365) and this definition is incorporated in the following research. The database can be summarized by the following descriptive statistic.

Table.1 - Descriptive statistics portraying distribution of corporate scandals database over years and types.

	Type				
Year	**Accounting**	**Collusion**	**Personal**	**Bribery**	**Total**
2014	10	4	3	1	18
2015	8	1	3	2	14
2016	15	7	1	3	26
2017	7	1	3	2	13
2018	12	5	4	0	21
2019	9	3	5	0	17
Total	61	21	19	8	109

Note: The table portrays descriptive statistics regarding the distribution of scandals by **Year** and **Type** in the database retrieved from SEC litigation releases. Variable **Year** indicates the year a scandal occurred in. Variable **Type** expresses a type of corporate misconduct.

Following the example of Jory et al., the research accounts for industry effects. Therefore, Global Industry Classification Standard (GICS) codes are retrieved from the Compustat IQ database (University of Pennsylvania, 2022) for each of the companies. Due to the small size of the used sample, only general sectors are used for categorization, which includes 11 areas of business. The sector distribution can be described in the following table.

Table.2 - Descriptive statistics portraying sector distribution.

Sector	Frequency	Percent
Communication Services	4	3.67
Consumer Discretionary	9	8.26
Consumer Staples	7	6.42
Energy	6	5.50
Financials	20	18.35
Health Care	15	13.76
Industrials	11	10.09
Information Technology	26	23.85
Materials	5	4.59
Real Estate	4	3.67
Utilities	2	1.83
Total	109	100.00

Note: The table portrays the distribution of scandal firms with respect to sectors they operate in for the database retrieved from the SEC litigation releases. The variable **Sector** is classified according to the GICS framework with division into 11 sectors.

To investigate the 3rd hypothesis of how a firm's reputation affects the price shocks caused by corporate scandals, the Governance pillar of the ESG framework is included in the research. As the data is retrieved from the Refinitiv Eikon, the Refinitiv ESG Methodology is used (Refinitiv, 2022). The governance pillar incorporates three distinct dimensions: CSR strategy, Management and Shareholders. Firstly, the sphere of CSR is measured through CSR goals and ESG reporting. A company's management is rated on the firm's structure, independence, diversity and management compensation. Lastly, the shareholder factor is measured through stockholder rights and takeover defences of a firm. The dimensions are summed to complete a 0-100 scale which indicates the quality of corporate governance of a firm. The measure is then added to the following model. To avoid posteriori changes in Governance scores once the scandal occurs, the ESG data is retrieved for the year prior to the scandal year.

Furthermore, financial ratios are drawn from the Financial Ratios Suite by Wharton Research Data Services (WRDS) (University of Pennsylvania, 2022). To assess the 4th hypothesis of the effect of the firms' financial structure on the change in CARs, the leverage ratio is retrieved. The Total-Debt-to-Total-Assets (TDTA) ratio is chosen as the appropriate leverage ratio for the following research. It allows for representation of the participation of debt

in the company's assets and has proven significant in the previous literature (Yahya & Hidayat, 2020). The leverage ratio is retrieved for the fiscal quarter prior to the scandal quarter.

The control variables are added to ensure the validity of the research and decrease the possible omitted variable bias. The firms' fundamentals are obtained from the Capital IQ database of Compustat North America Fundamentals Annual (2022). The fundamentals include; Total Dividend; Total Assets; and the firm's Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA). The research by Crutchley, Jensen, & Marshall (2007), provides an empirical analysis of 97 firms listed on NYSE and NASDAQ, and the role their financial characteristics played in the scandals. The paper argues that dividend payouts can substitute less effective monitoring devices and therefore they ought to be negatively associated with corporate fraud. Their findings suggest that the scandal firms had on average 50% smaller dividend payouts than the non-scandal peer firms. Therefore the total dividend in millions of USD is retrieved as a control variable for the following analysis. It is assumed that investors expect the dividend to remain constant over time, as it has been proven true by both the academia and the market in the past few decades (Chen, Da, & Priestley, 2012). Furthermore, a continuous variable Total Assets is retrieved to control for firm's size. The paper by Agrawal and Chadha (2005), has shown that size has a significant influence on the effect of corporate scandal. The variable is later transformed into 'Firm's size' as described in the results section. Lastly, the recent research by Cormier, Demaria and Magnan (2017) argues that disclosing EBITDA numbers reduces the asymmetry between managers and investors and increases market participation, and therefore should be positively associated with stock prices. Their empirical analysis of 233 firms on the Toronto Stock Exchange in 2012 and 2013 has shown that firms experience a very strong positive relation between earnings and stock prices. Furthermore, Jory et al. (2015) have found that changes in the operating performance increase firm's resilience to the shock their stock price experience due to corporate misbehaviour. Therefore EBITDA is included as a control variable in the following model. All fundamentals are recorded as of the fiscal year prior to the scandal year.

2. Methodology

To measure the effect corporate scandals have on the company's stock performance, Abnormal Returns are calculated using the Wharton Research Data Services (WRDS) event study tool (University of Pennsylvania, 2022). The Wharton algorithm calculates abnormal returns by comparing previously estimated stock returns with the observed returns at the determined event window. This is done for each of the companies in the database. The stock forecasts are obtained using the Capital Asset Pricing Model (CAPM) with an estimation window of (-250, -31) as reccommended by Jory et al. (2015). The length of the event window to measure stock reaction to corporate scandals is heavily debated in the current academia. Some papers, such as the analysis by Ge and Li (2021) use a one-day event window to prevent spurious time effects, whereas others like the research by Sulaeman, Bernile and Wang (2015) apply 40 days window to incorporate long-term effects. It is decided to use a short window of (-1, +3) to avoid the influence other factors may have on a company's stock (Gianetti & Wang, 2016) and avoid the issue of forgetting corporate responsibility as mentioned in Mena et al. (2016). All the windows are given in days with respect to the scandal date obtained through SEC litigation releases, so that day 0 is the event day and -31 is a day 31 days prior to the event day. Abnormal returns are displayed in percentages with respect to the estimated price. The method can be summarized by the following formula:

$$AR_{i,t} = R_{i,t} - (\alpha + \beta_i R_{mt})$$

Where; $AR_{i,t}$ is the abnormal return of company i at time t; $R_{i,t}$ is the observed returns and R_{mt} is the forecasted market return less the risk-free rate.

The daily distribution of calculated abnormal returns can be summarized by the following figure.
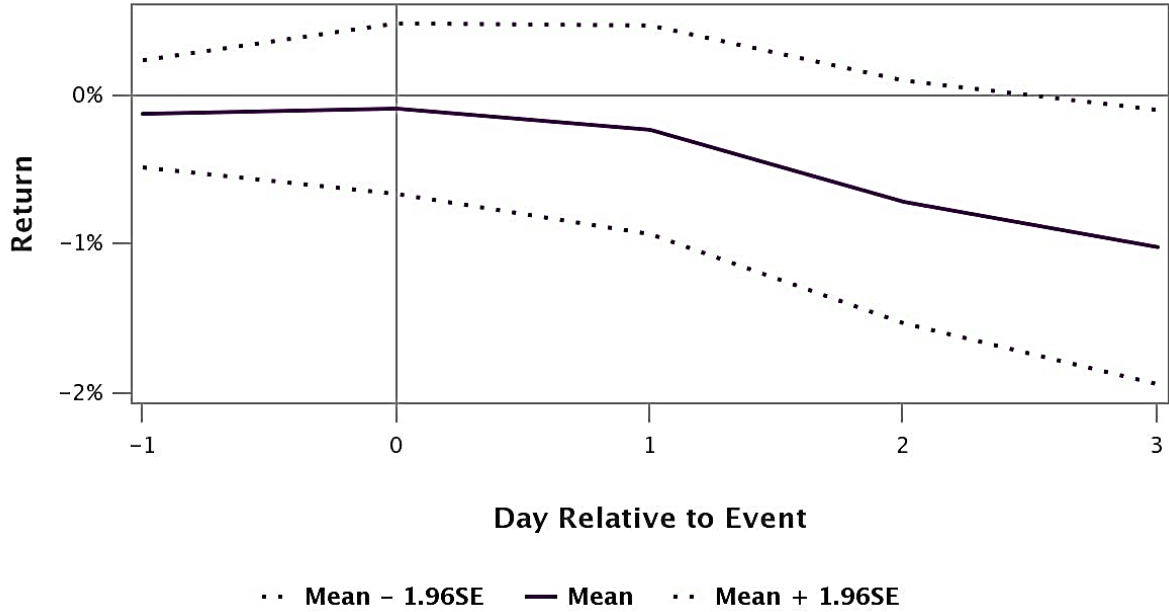
Fig. 1 Daily Abnormal Returns with mean and 95% confidence interval limits.

Note: The line chart above presents the average daily abnormal returns with respect to the day relative to the event for the data retrieved from the WRDS event study tool. The solid plot represents the mean and the dotted line shows the confidence interval.

To investigate hypotheses 2-4 and provide insights into the effects of corporate misbehaviour on stock performance, a statistical analysis is performed using the Ordinary Least Squares linear regression methodology. Abnormal returns are aggregated to find CARs and a multivariable model is applied. It can be summarized by the following equation:

$$CAR_i = \beta_0 + \beta_1 Scandaltype_i + \beta_2 Governance_i + \beta_3 Leverage_i + \beta_4 EBITDA_i$$
$$+ \beta_5 FirmSize_i + \beta_6 Dividend_i + \epsilon_i$$

The endogeneity assumption is believed to hold true by the rationale provided in the data section. To ensure that homoskedasticity holds for the following sample, a Breusch-Pegan test is performed. The produced χ^2 statistic is 7.41 with the p-value of 0.0065 and therefore, the null hypothesis can be rejected and it can be concluded that heteroscedasticity is present in the used data. To solve the issue and assure that correlation of error terms does not yield biased results, the standard errors are clustered. Clustering is done by the sector a firm operates in, as advised by the current econometric research (Stock & Watson, 2020, p. 374). Additionally, the problem of multicollinearity is addressed by performing a variance inflation factor (VIF) test. Nonetheless, the produced mean VIF is 1.61, with none of the individual factors exceeding 3 and therefore the issue does not threaten the validity of this research.

To investigate the research's reliability and expand on its resilience to changes in different measures of the dependent variable, two distinct robustness tests are performed.

Firstly, Cumulative Abnormal Returns are measured using the Fama and French Three-Factor Model. In their research from 2010, Fama and French have found that in addition to the market risk used in the CAPM model, two further factors play a role in determining market returns of a portfolio: size and value of a stock (Berk & DeMarzo, 2017). They have found that value stocks, as well as, small-cap stocks are likely to outperform the market and therefore decided to update the market model with measures for size and value risks. This method is used to retrieve new CARs values, and can be summarized by the following equation:

$$CAR^{FF}_{i,t} = \sum_{i=0}^{t} R_{i,t} - (\alpha + \beta_1 R_{mt} + \beta_2 (SMP) + \beta_3 (HML))$$

Where; SMP is the size premium (small – big), and HML is the value premium (high – low).

The recent research on the accuracy of the Three-Factor Model in predicting returns of the Indian and the US stock markets by Chaudhary (2017), has shown that for both locations Fama-French model has outperformed the market model. Therefore the measure is deemed a relevant robustness test for the following research and the CARs[FF] are retrieved from the WRDS event study tool (University of Pennsylvania, 2022).

Secondly, to compare the abnormal returns experienced by the firms involved in the scandals and the returns of similar portfolios, the buy-and-hold abnormal returns (BHARs) methodology is used. BHARs measure the average return using a strategy of investing in all the firms in the database and selling their securities at the end of the pre-specfified holding period, and compare the results with the same strategy applied to similar non-event firms (Mitchell & Stafford, 1999). The Wharton event study tool uses the characteristic-based method to find similar non-event firms (University of Pennsylvania, 2022). This methodology can be summarized by the following formula:

$$BHAR_{i,t} = \prod_{t=1}^{T} (1 + R_{i,t}) - \prod_{t=1}^{T} (1 + E(R_{i,t}))$$

Where; $R_{i,t}$ is the return on stock i at time t.

In the recent literature, Buy-and-Hold abnormal returns have become a very common robustness test for CARs-focused event studies, as seen in Jory et al. (2015). Furthermore, the research by Wu, Pandey and Lirely (2020), on the effect US presidential tweets have on the

global markets, also uses BHARs to test the resilience of their research. Therefore, the methodology is deemed appropriate and the retrieved BHARs with the holding period of (-250, -31) are then used as a dependent variable of the model.

Results

1. Abnormal Returns Analysis

To test the first hypothesis, the average abnormal returns for the respective days of the event window are retrieved and portrayed by the following table

Table.3 - Average Abnormal Returns for each day relative to the event date

Day	Number of negative returns	Mean Total Returns	Mean Abnormal Returns
-1	65	-0.00187	-0.00170 (-0.89)
0	49	-0.00169	-0.00055 (-0.31)
1	60	-0.00195	-0.00177 (-0.80)
2	63	-0.00427	-0.00404 (-2.56**)
3	57	-0.00261	-0.00285 (-2.24**)

Notes: The table presents the abnormal stock returns in response to corporate scandals in the (-1,3) event window for the data retrieved from the WRDS event study tool. The variable Day is presented relative to the event date. t-Statistics are presented in parentheses. *, ** and *** indicate the significance levels at 10%, 5% and 1%, respectively.

The table shows that for the 109 firms listed on NASDAQ and NYSE between 2014 and 2019, involvement in corporate scandals has resulted in negative stock returns. According to the performed cross-sectional t-tests, companies have experienced statistically significant negative abnormal returns for both the 2nd and the 3rd day after the scandal was reported by the SEC. Therefore, the hypothesis that corporate scandals negatively affect stock performance cannot be rejected. Stockholders have on average lost 0.004% and 0.003% respectively in the used sample. Furthermore, the high number of recorded negative returns on day -1, indicates that some traders were able to anticipate the price fall and try to minimize their losses, as suggested by Sulaeman et al. (2015). Nevertheless, no claims regarding the insider information nor strong market efficiency can be made as the mean abnormal returns are not statistically significant in the day prior to the event.

2. Model Analysis

The following descriptive statistics are obtained for the model discussed in the methodology section.

Table.4 - Descriptive statistics presenting the analysed model.

Variable	Obs	Mean	Std. Dev.	Min	Max
CARs	109	-0.01028	0.00923	-0.23161	0.14420
Type	109	1.76147	0.98975	1	4
Governance	109	57.49092	23.65923	2.54	98.32
Leverage	109	0.59765	0.24952	0	1.32698
EBITDA	109	4039.48	9112.543	-71.726	55684
Total Assets	109	113524.8	384844.9	24.9	2351698
Dividend	109	566.7954	1431.91	0	7999

Note: The table represents descriptive statistics for variables used in the analysed model. The dependent variable **CARs** represent cumulative abnormal returns as retrieved from the WRDS study tool. The categorical variable **Type** includes all types of scandals discussed in the data section. Variable **Governance** represents the governance pillar of company's ESG score and is given in a 0-100 scale. **Leverage** is a leverage ratio of total debt over total assets and is expressed in units. Continuous variables **EBITDA** and **Dividend** provide insights into the financial structure of the firm and are expressed in millions of USD. **Total Asset** portrays the firm's total assets in millions of USD.

To account for the large standard deviation of the variable Total Assets, a natural logarithm of the total assets is used as prescribed by Stock & Watson (2020). Therefore, a new variable 'Firm's size' is generated and included in the analysed model.

The results of the OLS regression can be summarized by the following table.

Table.5 - Linear regression to model the effect variables have on the CARs.

Variables	Model 1	Model 2	Model 3	Model 4
Intercept	-0.01712	-0.03070	-0.02681	-0.02953
	(-3.39***)	(-2.64**)	(-1.64)	(-1.13)
Type				
- Collusion	0.02848	0.02830	0.02773	0.02789
	(3.91***)	(3.97***)	(3.65***)	(3.18***)
- Personal	0.01491	0.01315	0.01255	0.01003
	(1.68)	(1.52)	(1.44)	(0.99)
- Bribery	-0.01708	-0.01527	-0.01566	-0.01842
	(-0.56)	(-0.48)	(-0.49)	(-0.56)
Governance		0.00024	0.00023	0.00021
		(1.42)	(1.39)	(1.16)
Leverage			-0.0056	-0.01408
			(-0.47)	(-0.99)
EBITDA				0.000001
				(1.54)
Firm's size				0.00118
				(0.55)
Dividend				-0.00001
				(-2.25**)
F-stat	8.93***	10.93***	8.18 ***	13.76***
R^2	0.0707	0.0837	0.0845	0.1245
N	109	109	109	109

Notes: This table presents results from the OLS regression of to what extent the discussed model explains variations of CARs (-1,+3). Categorical variable **Type** includes all types of scandals discussed in the data section. Variable **Governance** represents the governance pillar of company's ESG score and is given on a 0-100 scale. **Leverage** is a leverage ratio of total debt over total assets and is expressed in units. Continuous variables **EBITDA** and **Dividend** provide insights into the financial structure of the firm and are expressed in millions of USD. **Firm's size** is the natural logarithm of firm's total assets. Standard errors are clustered using variable **Sector**. t-Statistics are presented in parentheses. *, ** and *** indicate the significance levels at 10%, 5% and 1%, respectively.

The regression performed in Table 5 is done gradually to observe the effects each added variable has on the model. Firstly, Model 1 is run only with the effects each type of corporate scandals has on the Cumulative Abnormal Returns of the company's stock price. It can be concluded that companies involved in accounting fraud, which in the case of a categorical variable is incorporated within the intercept, can expect negative CARs. The coefficient is statistically significant at a 99% confidence interval and for this specific sample the average effect is around -0.02%, which though remarkably lower than the recent academia suggests, is in line with the research by Bernile & Jarell (2007). Furthermore, the performed analysis shows that the coefficient of collusive scandals is also statistically significant, yet, its effects are positive. It can be concluded that in the tested sample, firms which committed collusion are likely to experience 0.03% higher abnormal returns on their stocks, than those committing accounting fraud. This finding contrasts with the previous literature, including the research by Jory et al. and suggests that not all types of scandals are likely to negatively affect a firm's

CARs. Therefore, the 2nd hypothesis, that each scandal type has the same effects on the stock performance of a company, can be rejected. The last 2 types of scandals do not yield statistically significant results and therefore their effects on CARs remain unknown.

In the 2nd model, the measure of the Governance pillar of a firm's ESG rating is added to investigate the 3rd hypothesis. Nevertheless, the coefficient of governance is not statistically significant. Therefore, the hypothesis that better corporate governance decreases the negative effects corporate scandals have on a firm's stock performance cannot be rejected. The addition of a new variable has caused the intercept coefficient to decrease, which suggests an upward bias. As Governance is positively correlated with both CARs and the intercept, its coefficient is likely to be overstated (Moore, McCabe, Alwan, & Craig, 2016). The presence of positive bias, again suggests that the Governance pillar of the ESG score has no effect on the cumulative abnormal returns for the used sample. The inclusion of a new variable has also decreased the significance of the intercept. It can no longer serve as the interpretation of the base of the categorical variable Type and therefore it is not analysed in any of the following models.

Model 3 incorporates the measure of leverage using the total debt over total assets ratio. Its coefficient is however not statistically significant, suggesting that the 4th hypothesis that higher financial leverage is likely to decrease the negative effects corporate misconduct has on stock returns, cannot be rejected.

Lastly, the 4th regression portrays the complete model of the research, including the control variables of EBITDA, Firm's size and Dividend. The variable EBITDA does not yield statistically significant results at a 90% confidence interval, suggesting that the operating performance of a company has no effect on the reaction of its stock to corporate misbehaviour. Similarly, to the results presented by Jory et al. (2015), the coefficient of Firm's size is not statistically significant either. It can be concluded that the effects of corporate scandals are independent of firm's size for the used sample. Lastly, the variable Dividend representing the total dividends a firm has paid-out in the year prior to the scandal is included. The coefficient of Dividend is negative and significant at the 95% confidence interval which indicates that a higher dividend can be associated with more negative CARs. This is in line with current research by Bali (2003), in which the author argues for dividends as a good signal in times of economic prosperity, yet showing no positive effects on the stock performance during financial shocks. The inclusion of control variables had no further effects on the model, with the coefficient of collusion remaining unchanged and significant.

Additionally, to account for the fixed effects, the regression is repeated with inclusion of both seasonal and industry categorical variables. The methodology is in line with the past research of Gryglewicz, Hartman-Glaser and Zheng (2020) and involves yearly and sector dummies. The reults of the OLS regressions can be summarized by the following table.

Table.6 - Linear regression to model the effect variables have on the CARs, including the fixed effects.

Variables	Model 1	Model 2	Model 3	Model 4
Intercept	-4.00084	-3.10576	-3.1564	-2.36807
	(-0.95)	(-0.70)	(-0.74)	(-0.57)
Type				
- Collusion	0.02933	0.02915	0.02928	0.02792
	(3.76***)	(3.80***)	(3.71***)	(3.06**)
- Personal	0.01476	0.01331	0.01343	0.01111
	(1.54)	(1.41)	(1.39)	(1.02)
- Bribery	-0.01334	-0.01208	-0.01197	-0.01488
	(-0.56)	(-0.38)	(-0.37)	(-0.45)
Governance		0.00021	0.00022	0.00018
		(1.25)	(1.23)	(0.97)
Leverage			0.00116	-0.00838
			(0.09)	(-0.57)
EBITDA				0.000001
				(1.57)
Firm's size				0.00118
				(0.54)
Dividend				-0.00001
				(-1.86*)
Year effects	No	No	No	No
Sector effects	Yes	Yes	Yes	Yes
F-stat	6.68***	8.95***	8.65***	51844.72***
R^2	0.0958	0.1063	0.1064	0.1465
N	109	109	109	109

Notes: This table presents results from the OLS regression of to what extent the discussed model explains variations of CARs (-1,+3). Categorical variable **Type** includes all types of scandals discussed in the data section. Variable **Governance** represents the governance pillar of company's ESG score and is given on a 0-100 scale. **Leverage** is a leverage ratio of total debt over total assets and is expressed in units. Continuous variables **EBITDA** and **Dividend** provide insights into the financial structure of the firm and are expressed in millions of USD. **Firm's size** is the natural logarithm of firm's total assets. Variable **Year effects** represents the influence the year of the scandal had on the CARs. **Sector effects** represents how sector a firm operates in according to the GICS, might affect the regression. Standard errors are clustered using variable **Sector**. t-Statistics are presented in parentheses. *, ** and *** indicate the significance levels at 10%, 5% and 1%, respectively.

The results show that for the used sample of 109 firms listed on NASDAQ and NYSE, the statistical analysis is independent of the yearly fixed effects. The effect of the scandal year on the CARs was assumed to be insignificant, given the large estimation window (-250, -31). The methodology allowed for the incorporation of economic conditions and other relevant events in the estimation calculations and therefore no abnormal returns were recorded.

Companies involved in corporate scandals experienced different CARs on their stocks, depending on what sector they operate in. The Utilities sector which includes water, gas and electric utilities, experiences the least negative cumulative abnormal returns from all sectors present in the sample. The findings are in agreement with the paper by Bankraiem, Boubaker and Saeed (2021), which claims that utilities are heavily regulated and among the most price-inelastic industries, which causes their stocks to be relatively resilient to shocks. Furthermore, firms classified by GICS to belong to the Energy sector are likely to experience 0.082% less negative abnormal returns in comparison to different industries. This is in line with the research by Kim, Li and Li (2014), who claim that firms with lower CSR, though are more likely to experience stock price crashes, they tend to be of lesser magnitude. Since the energy industry already possesses a poor image, negative evnts such as corporate scandals are less likely to have severe magnitude.

Robustness

Both robustness tests, together with the main model of the research, are shown in the following table.

Table.7 - Robustness tests using Fama-French CARs and BHARs methodologies.

Variables	CARs	BHARs	Fama-French CARs
Intercept	-2.36807	-2.50869	-1.99077
	(-0.57)	(-0.62)	(-0.48)
Type			
- Collusion	0.02792	0.02761	0.02872
	(3.06**)	(3.06**)	(2.90*)
- Personal	0.01111	0.01080	0.01293
	(1.02)	(1.01)	(0.97)
- Bribery	-0.01488	-0.01232	-0.01394
	(-0.45)	(-0.41)	(-0.44)
Governance	0.00018	0.00017	0.00019
	(0.97)	(0.99)	(1.13)
Leverage	-0.00838	-0.01023	-0.03240
	(-0.57)	(-0.68)	(-1.82*)
EBITDA	0.000001	0.000001	0.000001
	(1.57)	(1.56)	(1.92*)
Firm's size	0.00118	0.00122	0.00003
	(0.54)	(0.56)	(0.01)
Dividend	-0.000009	-0.000009	-0.000009
	(-1.86*)	(-1.87*)	(-2.10*)
Year effects	No	No	No
Sector effects	Yes	Yes	Yes
F-stat	51844.72***	782.97***	1.89*
R^2	0.1465	0.1504	0.1616
N	109	109	109

Notes: This table presents the robustness test of results from the OLS regression of to what extent the discussed model explains variations of CARs (-1,+3) using 3 different methods. **CARs** model uses cumulative abnormal returns predicted by the market model. **BHARs** model uses buy-and-hold abnormal returns as a dependent variable, which is retrieved from the WRDS event study tool. **Fama-French CARs** use cumulative abnormal returns calculated with the **Fama-**French 3 factor model. All used variables remain unchanged as described per notes in Table.5

The model presented in this research has proven quite robust given the regressions performed on Buy-and-Hold abnormal returns, as the BHARs model yields almost identical results to the original regression. Despite small changes in coefficients, the investigation of abnormal returns with respect to the non-scandal peer firms maintains the statistical significance experienced in the CAR-based model and provides similar conclusions.

On the other side, the resilience test using the Fama-French model provides slightly divergent results. Under the new methodology, the control variable of EBITDA becomes significant at a 90% confidence interval. Its coefficient suggests that for the used sample, the

higher the firm's operating performance, the less negative the Fama-French CARs experienced by the firm. Furthermore, the coefficient of leverage has become statistically significant at a 90% confidence level. It can therefore be concluded, that under Three-Factor Model methodology for the following sample, firms with higher leverage are likely to suffer more negative abnormal returns, following their involvement in corporate misconduct. These results suggest that the 4th hypothesis should be revisited using a different methodology, as for the Fama-French CARs, the statement that higher financial leverage decreases the effect corporate scandals have on a firm's financial performance can be rejected. The coefficients for variables Type, Firm's size and Governance, with minor changes in magnitude, remain the same. The latter confirms the conclusion that the following research is unable to neither accept nor reject the second hypothesis, that businesses with higher corporate governance scores are more resilient to price shocks.

Discussion and Concluding Remarks

The research has investigated the effects corporate scandals have on the company's stock performance. The paper has added to the existing academic literature by empirically analysing a manually constructed database of 109 firms listed on NYSE and NASDAQ. All firms have been involved in corporate misconducts between 2014-2019. By applying the event-study methodology and the event window from 1 day prior to 3 days following the scandal, the cumulative abnormal returns of company's stock were calculated. The used model incorporated: the type of scandal a firm was involved in; financial characteristics of EBITDA, Dividend and Firm's size; a numerical score of the Governance pillar of the ESG framework, and a leverage ratio in form of total debt over total assets. Additionally, fixed effects were accounted for by controlling yearly and sector variations. Through the ordinary least squares linear regression, four distinct hypotheses were tested. The first hypothesis aimed to determine the nature of the relationship between a firm's involvement in a scandal and its stock returns. The second hypothesis was concerned with the effect different types of scandals have on this relationship. It was also tested how image effects, in form of governance score, affect the magnitude of obtained abnormal returns and lastly, how the financial leverage affects the analysis. The performed robustness tests using buy-and-hold abnormal returns, as well as, the Fama-French prediction model, showed that applied methodology yields reliable results with exception of EBITDA and Leverage ratio.

Despite producing statistically significant and robust results, the research had to overcome a large amount of academic and statistical difficulties. The measured effects were of marginal magnitude and therefore possess little economic relevance. This allows for little to no policy implementation. The used database was created manually, making the analysis more prone to measurement error. It is believed that the lack of a systematic and reliable dataset is the main obstacle in the production of appropriate scientific literature on the topic. Most of the studied papers such as Jory et al. (2015), Hail et al. (2017), Suhadak et al. (2018) and Bernile & Jarrell (2007) have all created their samples manually, which increases costs of the research and decreases its reliability. Future studies should aim to create a systematic multidisciplinary database, which incorporates social, legal and economic insights for firms involved in corporate scandals. Such research is likely to improve both the quantity and quality of the information about corporate misconducts and allow for more relevant regulatory changes as mentioned in Hail et al. (2017). Furthermore, the paper has treated all scandals as equals in terms of received

media attention. Stocks of the companies that receive more exposure are likely to be more prone to shocks, as it was the case for the research by Zhang et al. (2018). Therefore, it is advised that future research incorporates a measure of media coverage of a company such as the Share of Voice metric. The used measure of corporate governance as for the ESG framework has turned out to be statistically irrelevant. It is advised that future studies use a different measure of corporate governance such as the American Corporate Governance Index produced by the Institute of Internal Auditors. Though the research was concerned with the stock returns, a firm could potentially suffer different consequences. Except for the cumulative abnormal returns, future academia should look into how corporate scandals affect stock's volatility or shareholder distribution, as attempted by Agrawal and Chadha (2005).

In conclusion, involvement in corporate scandals has a negative effect on the company's stock performance. Firms in the analysed sample have experienced negative abnormal returns, that are statistically significant at 95% confidence interval. Furthermore, it was proven that different types of scandals yield different results. A clear distinction, both in magnitude and direction could be seen between accounting and collusive scandals. The effect a corporate image has on the abnormal returns remains unknown, as the Governance pillar of the ESG framework is not significant at any of the performed regressions. Lastly, the leverage ratio of the total debt over total assets is also not significant in the initial model and therefore no interpretations can be made about whether the financial structure of a firm plays a role. At the same time, the leverage coefficient becomes significant in the robustness test, which uses the Fama-French methodology to calculate a firm's CARs. Therefore, future research should revisit the proposed hypothesis using a different methodology. Despite a narrow sample of 109 firms, all GICS sectors are represented, and though the distribution is unequal, in the years 2014-2019 corporate scandals were present in all the industries. This could indicate that corporate misbehaviour is a product of the market, rather than a failure of personal ethical core and therefore suggest that the moral theory by Carson (2003) is more relevant in the current financial markets.

Through the examination of control variables, several additional conclusions can be drawn. The analysis of financial characteristics suggests that the firm's operating performance in form of EBITDA, and the Firm's size measured by Total Assets, have no influence on the cumulative abnormal returns. Analysis of the total dividend indicates that firms with higher dividend experience more negative returns.

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