

Corporate Legal Responsibility and Longer Term Shareholder Value:

Evidence from Environmental and Social Fines

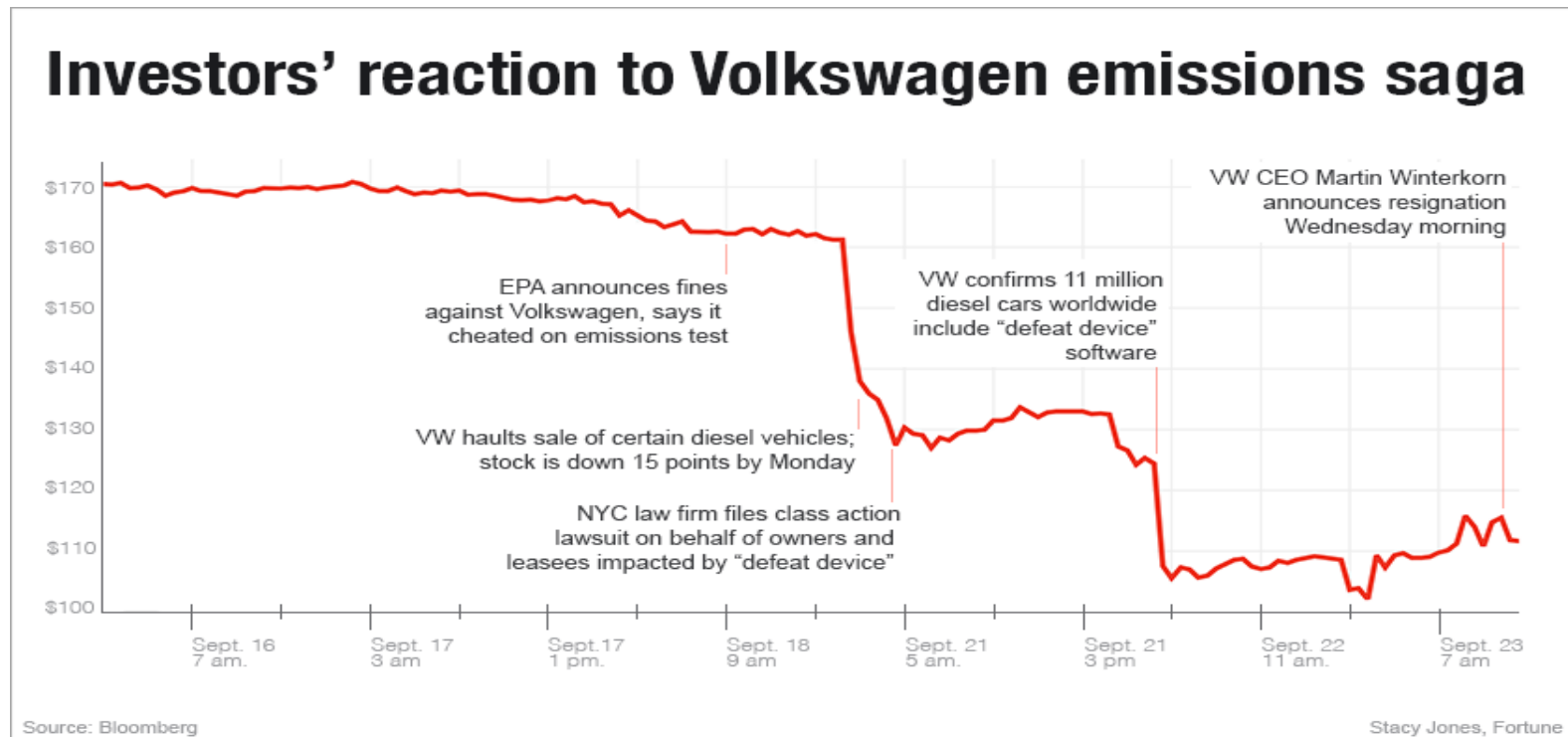
Rupini Deepa^a & Andreas G. F. Hoepner^b

^aICMA Centre, Henley Business School, University of Reading, Reading RG6 6BA, UK

^bMistra Financial Systems, Stockholm School of Economics, Box 6501, Stockholm SE-113 83, Sweden

Motivation

Volkswagen Emissions Saga



Here's a timeline of Volkswagen's tanking stock price
by Benjamin Snyder, Stacy Jones @WriterSnyder
September 23, 2015



Hypotheses Development

- **Hypothesis 1:** Stocks of firms that are being held for one year upon announcement of violations have *negative stock returns*
- **Hypothesis 2:** Firms with higher fines per market size would have a *larger negative stock return* in the long term compared to firms with lower fines per market size
- **Hypothesis 3:** Violations at the *initial allegation* legal stage would have larger negative stock returns compared to the confirmed but pending other matters, confirmed and overall stages of violations
- **Hypothesis 4:** Investors would react more to violations in the *extractions and usage of valuable minerals and natural resources industries* compared to other industries based on each stage of the legal process
- **Hypothesis 5:** Investors perceive *environmental violations* at every stage of the legal process to be more of a concern compared to social and long-term violations

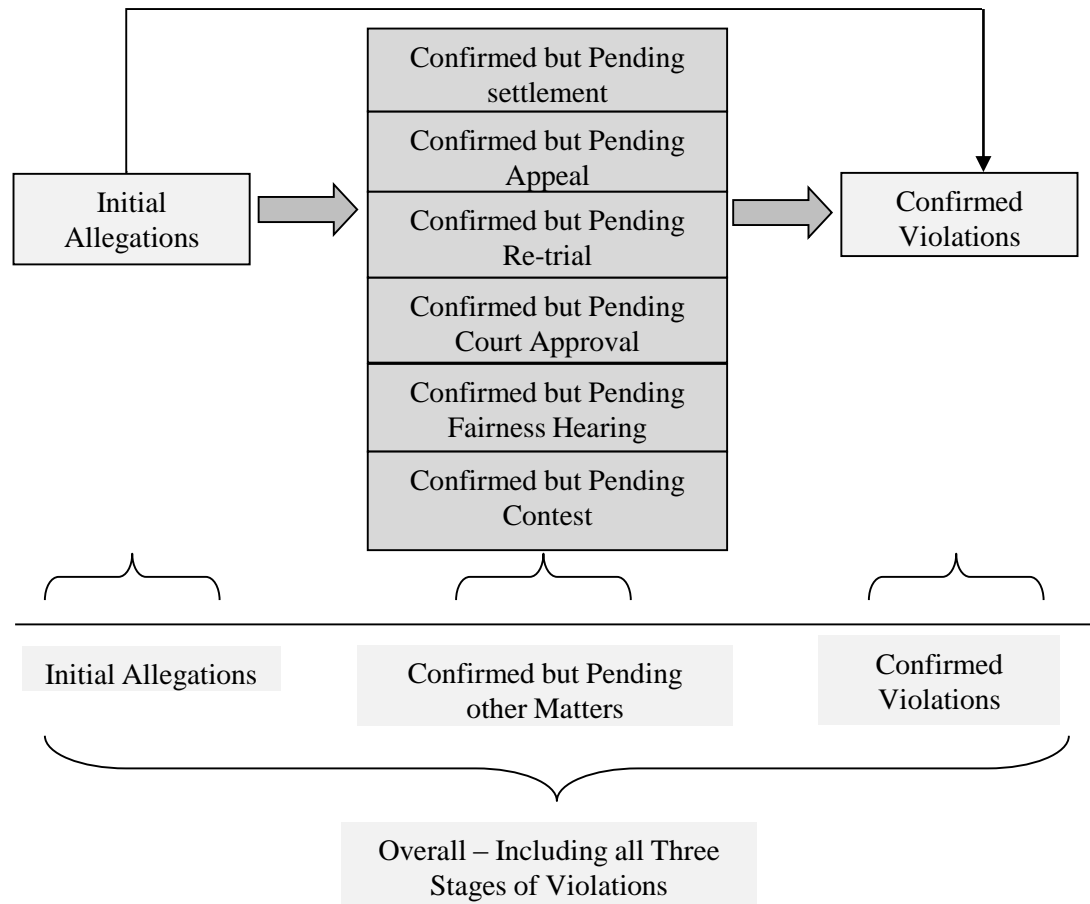


Data & Methodology

Data Sample

- The lists of US firms were taken from the MSCI World Large Cap Constituents over a *19-year period* from 1994 to 2012
- *Unique hand-collected data* via filings of 10-K reports from U.S Security and Exchange Commission (SEC)
- The overall sample consists of 394 unique firms and 1887 number of violations throughout the 19 years

Different Legal Stages of the Violations





Data & Methodology

EFFAS ESG KPIs

- The KPIs are defined by 114 subsectors following the Dow Jones Industry Classification Benchmark (ICB).
- We matched our list of firms to the ICB codes and then for each individual violation, matched it to the KPIs.
- In addition to the ESG factors, these KPIs have an additional factor “*Long Term Viability*” or “*Viability*”, herein “*Long Term*”.
- The LT issues are key to be added because firms usually pursue corporate sustainability with both an agenda to reduce ESG risk but also to increase their long term viability i.e. increase their profits.
- Hence, examining the LT separately from environmental and social issues would be crucial in understanding whether investors consider LT issues that affect firms as a concern.

Empirical Model and Benchmark Creation

- Time- series regressions were run using the single and multifactor models following the Capital Asset Pricing Model (CAPM), the three factor Fama-French model and the four factor Carhart model:

$$\text{CAPM: } R_{p,t} = \alpha_p + \beta_{\text{creat},p} \Gamma_{\text{creat},t} + \varepsilon_{p,t} \quad (1)$$

$$\text{Fama-French: } R_{p,t} = \alpha_1 + \beta_{\text{creat},p} \Gamma_{\text{creat},t} + \gamma_p \text{SMB}_t + \delta_p \text{HML}_t + \varepsilon_{p,t} \quad (2)$$

$$\text{Carhart: } R_{p,t} = \alpha_1 + \beta_{\text{creat},p} \Gamma_{\text{creat},t} + \gamma_p \text{SMB}_t + \delta_p \text{HML}_t + \theta_p \text{MOM}_t + \varepsilon_{p,t} \quad (3)$$

- Instead of using traditional market benchmarks, we constructed a specific market benchmark to match the set of firms in the created portfolios.

Empirical Results

Industry and Fines per Market Size Results

	All Industries				Mining			
Carhart Results	Alpha		R²	Adj R²	Alpha		R²	Adj R²
Initial allegations	-0.0022	(-1.3301)	0.7590	0.7549	-0.0029	(-1.1057)	0.6625	0.6567
Confirmed violations but still pending other matters	0.0004	(0.1978)	0.6380	0.6319	-0.0035	(-0.7591)	0.3452	0.3328
Confirmed violations	-0.0029 **	(-1.999)	0.7547	0.7506	-0.0063 *	(-1.9291)	0.6184	0.6118
Overall - Including all three stages of violations	-0.0028 **	(-1.9767)	0.7546	0.7505	-0.0042 *	(-1.6812)	0.7430	0.7386

	Manufacturing				Transportation and Public Utilities			
Carhart Results	Alpha		R²	Adj R²	Alpha		R²	Adj R²
Initial allegations	-0.0041 ***	(-2.6595)	0.7984	0.7949	-0.0024	(-0.8654)	0.5352	0.5272
Confirmed violations but still pending other matters	0.0039 **	(1.9885)	0.5214	0.5132	-0.0073 **	(-2.0302)	0.5505	0.5426
Confirmed violations	-0.0006	(-0.3727)	0.7394	0.7351	-0.0042 *	(-1.7875)	0.5007	0.4923
Overall - Including all three stages of violations	-0.0005	(-0.446)	0.8255	0.8226	-0.0026	(-1.2677)	0.6892	0.6840

	0 to 20th Percentile Level				80th to 100th Percentile Level			
Carhart Results	Alpha		R²	Adj R²	Alpha		R²	Adj R²
Initial allegations	-0.0050 *	(-1.9188)	0.5774	0.5701	-0.0064 ***	(-2.0177)	0.4307	0.4207
Confirmed violations but still pending other matters	-0.0058	(-1.6137)	0.4985	0.4899	0.0054	(0.9483)	0.3486	0.3371
Confirmed violations	-0.0033	(-1.2237)	0.5760	0.5686	-0.0028	(-0.9028)	0.3656	0.3547
Overall - Including all three stages of violations	-0.0035	(-1.6377)	0.6568	0.6510	-0.0026	(-1.5477)	0.5798	0.5726

The following table displays the Jensen's alpha's results from Carhart regressions with the specific overall created benchmark. Column one indicates the four different portfolios based on the stages of the violations, column two indicates the equal-weighted at the fine level. Each portfolio reports the r-squared and adjusted r-squared values. T-statistics are computed with Newey-West (1987) corrections for serial correlation. ***, **, * indicates statistical significance at the 1%, 5% and 10% levels respectively. The values in the parentheses represent the values of the t-statistics.



Empirical Results

Industry and Fines per Market Size Results

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Confirmed violations	-0.0029 **	(-1.999)	0.7547	0.7506	-0.0063 *	(-1.9291)	0.6184	0.6118
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Overall - Including all three stages of violations	-0.0035	(-1.6377)	0.6568	0.6510	-0.0026	(-1.5477)	0.5798	0.5726

The following table displays the Jensen's alpha's results from Carhart regressions with the specific overall created benchmark. Column one indicates the four different portfolios based on the stages of the violations, column two indicates the equal-weighted at the fine level. Each portfolio reports the r-squared and adjusted r-squared values. T-statistics are computed with Newey-West (1987) corrections for serial correlation. ***, **, * indicates statistical significance at the 1%, 5% and 10% levels respectively. The values in the parentheses represent the values of the t-statistics.

Empirical Results

Environment, Social and Long Term Results

	Environment					Social			
Carhart Results	Alpha			R²	Adj R²	Alpha		R²	Adj R²
Initial allegations	-0.0038	**	(-2.2462)	0.7241	0.7194	-0.0052	(-1.4624)	0.3157	0.3038
Confirmed violations but still pending other matters	-0.0127	***	(-2.669)	0.4441	0.4344	0.0041	(1.1553)	0.2952	0.2824
Confirmed violations	-0.0043	**	(-2.1442)	0.6631	0.6575	-0.0042	(-1.5176)	0.4504	0.4411
Overall - Including all three stages of violations	-0.0047	***	(-2.8633)	0.7565	0.7525	0.0003	(0.1224)	0.5453	0.5377

	Long- Term			
Carhart Results	Alpha		R²	Adj R²
Initial allegations	-0.0029		0.6223	0.6158
Confirmed violations but still pending other matters	-0.0017		0.6830	0.6775
Confirmed violations	-0.0022		0.7077	0.7027
Overall - Including all three stages of violations	-0.0027	*	(-1.6694)	0.8226

The following table displays the Jensen's alpha's results from CAPM, Fama-French and Carhart regressions with the specific overall created benchmark. Column one indicates the four different portfolios based on the stages of the violations, column two indicates the equal-weighted at the fine level Each portfolio reports the r-squared and adjusted r-squared values. T-statistics are computed with Newey-West (1987) corrections for serial correlation. ***,**,* indicates statistical significance at the 1%,5% and 10% levels respectively. The values in the parentheses represent the values of the t-statistics.

Empirical Results

Environment, Social and Long Term Results

	Environment				Social			
Carhart Results	Alpha		R^2	Adj R^2	Alpha		R^2	Adj R^2
Initial allegations	-0.0038 **	(-2.2462)	0.7241	0.7194	-0.0052	(-1.4624)	0.3157	0.3038
Confirmed violations but still pending other matters	-0.0127 ***	(-2.669)	0.4441	0.4344	0.0041	(1.1553)	0.2952	0.2824
Confirmed violations	-0.0043 **	(-2.1442)	0.6631	0.6575	-0.0042	(-1.5176)	0.4504	0.4411
Overall - Including all three stages of violations	-0.0047 ***	(-2.8633)	0.7565	0.7525	0.0003	(0.1224)	0.5453	0.5377

	Long- Term			
Carhart Results	Alpha		R^2	Adj R^2
Initial allegations	-0.0029	(-1.2777)	0.6223	0.6158
Confirmed violations but still pending other matters	-0.0017	(-0.7154)	0.6830	0.6775
Confirmed violations	-0.0022	(-1.0872)	0.7077	0.7027
Overall - Including all three stages of violations	-0.0027 *	(-1.6694)	0.8226	0.8196

The following table displays the Jensen's alpha's results from CAPM, Fama-French and Carhart regressions with the specific overall created benchmark. Column one indicates the four different portfolios based on the stages of the violations, column two indicates the equal-weighted at the fine level Each portfolio reports the r-squared and adjusted r-squared values. T-statistics are computed with Newey-West (1987) corrections for serial correlation. ***,**,* indicates statistical significance at the 1%,5% and 10% levels respectively. The values in the parentheses represent the values of the t-statistics.



Conclusion

- In the long term for one year, there is **significant underperformance** of these firms between 25 and 29 basis points per month based on Carhart alphas
- Firms with **higher fines have larger underperformances** indicating that the level of monetary value of fines do indeed impact stock performance
- **Initial announcements** of the violations have **larger negative returns**
- Investors react to violations only in the **manufacturing, mining and transportation and public utilities** industries compared to other industries.
- Investors perceive **environmental issues** on all different stages of violations to be a cause of concern and it has larger underperformances
- Advocate that firms should have **strong principles of corporate legal responsibility** as behaviours of violations would be detrimental for corporation's performances especially in the long run

Thank You and Q&A

Appendix

Motivation

Scandals / Disasters

- In 2015, Volkswagen paid **\$15 billion in fines** to settle their **emissions-cheating** scandal which is the largest paid fine by an auto-maker for negligence.
- Volkswagen's **share price** tumbled **nearly 30%** since the Environmental Protection Agency (EPA) announced that the automaker manipulated emissions software
- Volkswagen's CEO Martin Winterkorn announces **resignation** within one week of announcement of the fine
- In 2012, BP paid **\$4.5 billion** penalty over the Deepwater Horizon disaster
- BP's **share price** dropped a **13 year low** after the incident
- In 2015, BP paid an **additional environmental fine** of \$18.7 billion

Literature Review

Criminal Penalties

- Cohen (1996), Ulen (1996), Lott(1996), Karpoff, Lee & Martin (2007)

Illegalities and Firm Value

- Wallace & Worrell (1988), Bosch & Eckard (1991), Davidson, Worrell, & Lee (1994), Baucus & Near (1991), Baucus and Baucus (1997), Karpoff et al., (1999), Langus and Motta (2006), Arnold & Engelen (2007), Choi & Pritchard (2012), Zeidan (2013), Kouwenberg and Phunnarungsi (2013), Song & Han (2015)

Environmental and Social issues on Firm Value

- Konar and Cohen (2001), Thomas (2001), Jacobs et al., (2010), Karpoff et al.,(2005), Ziegler, Schröder, & Rennings (2007), Capelle-Blancard and Laguna (2010)

Literature Review

Definition of Illegality

- Baucus & Baucus (1997) define illegal corporate behaviour as “*unlawful activities of members or agents of a firm, engaged in primarily for the firm's benefit which includes intentional and unintentional illegal acts*”(p129).
- Song and Han (2015) adopted a comprehensive definition to corporate crime indicating that “*corporate crimes are illegal activities perpetrated by both corporate executives as individuals and corporations as organizations. Individual crimes may include white-collar crimes (e.g., fraud, embezzlement) and street crimes (e.g., assault, theft), while organizational crimes could incorporate operational crimes (e.g., price fixing, labor law violation) and financial crimes (e.g., accounting fraud)*”(p2).
- Becker (1968) introduced the optimal penalty theory where the penalty should equal the social harm divided by the probability of detention.

Data & Methodology

Data Preparation and Portfolio Creation

- Monthly returns were taken from Thomson Reuters Datastream under the Return Index (RI) category and converted into continuously compounded returns

$$r_{i,t} = \ln \left(\frac{P_{i,t}}{P_{i,t-1}} \right)$$

- Measuring the long term impact, holding periods of twelve month equal weighted portfolios were created both at a fine and firm level

$$r_{p,t} = \ln \left[\frac{1}{N} \left(\frac{P_{i1,t}}{P_{i1,t-1}} + \frac{P_{i2,t}}{P_{i2,t-1}} + \dots + \frac{P_{iN,t}}{P_{iN,t-1}} \right) \right]$$

- Twelve month value weighted portfolios were also created at firm level as robustness

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