

Volkswagen - The Failure of Perfection and Moral Hazard: What Price Victory?

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Abstract

In the year 2015, it became publically known that Volkswagen employees created and deployed software designed to thwart emissions testing equipment, and in this paper, we use moral hazard theory to explain the causes of employees' motivation. Volkswagen employees' high internal locus of control and high elasticities of behavior to rewards were united with executives' low expectations of disclosure and high expectation of rewards to create strong incentives to use deceitful emissions systems. Employees' engaging in utilitarian, moral hazard based behaviors succeeded in increasing revenue for many years. Subsequent to disclosure of the deceit, Volkswagen's short-term and long-term financial performance were negatively impacted. Volkswagen's goal to be the largest automobile supplier in the United States was unattainable by ethical means, but employees' nevertheless pursued that goal which ultimately led to a significant decrease in company performance as measured by stock price and market capitalization.

Keywords: Volkswagen, moral hazard, market capitalization, stock price, emissions

1. Introduction

On September 3, 2015, Volkswagen admitted to United States' Federal Regulators that some of its diesel vehicles contained software that was designed to mislead admissions tests (Storbeck, 2015). Since then, a great deal of information has emerged regarding the scandal, and a Google search on the term "Volkswagen emissions" yields more than 14 million references.

Research on Volkswagen and on moral hazard has focused on single aspects of the inputs (i.e., the psychological reasons for the behavior) and occasionally on the broad outcomes of the behavior, such as a company bankruptcy. In the current paper, we focus on multiple psychological causes of the behavior, from employee egos to corporate culture, and we examine longitudinal financial outcomes including share price, market capitalization, and trading volume.

We first begin the paper with a detailed description of aspects of moral hazard theory (e.g., Ingroup, locus of control, disclosure), and, second, explain how the theory applies to Volkswagen employee behaviors. Third, we examine Volkswagen financial performance for the three years prior to and one year subsequent to the disclosure of the emissions cheating. We conclude the paper with recommendations for managers and suggestions for future research.

2. Moral Hazard

The theory of moral hazard posits that eliminating or reducing the negative consequences of behavior (or having the costs of the behavior be borne by others) either encourages actors to engage in that behavior or reduces actors' efforts to eliminate that behavior (Baker, 1996; Braynen, 2014; Ehrenberg & Smith, 2000; Rowell & Connelly, 2012).

Some researchers posit that using moral hazard to make decisions is not necessarily due to a lack of morality or a moral failing, but rather is due to a utility calculation (Rowell & Connelly, 2012). For example, moral hazard theory is used regularly in calculating experience-rating of insurance premiums (e.g., auto, fire, flood, health, unemployment, retirement) as a means to embed negative consequences for consumers into the premium price in order to decrease consumers' moral hazard (Rowell & Connelly, 2012). Other researchers posit that using moral hazard is based on morality because it requires redistribution of positive and negative outcomes, and the redistribution requires moral justification (Braynen, 2014).

2.1 Moral Hazard in Practice

While it is well known that insurance companies use moral hazard theory in setting premiums and that it is considered ethical for them to do so, companies in other industries have engaged in moral hazard behaviors in ways designed to harm their customers. For example, from 1976 to 1992, General Electric knowingly sold coffee makers that could cause fires (Brown, 1991). For a second example, from the 1930's to the 1980's, manufacturers sold asbestos-containing products, and from 1970 onward, the Asbestos Information Association promoted the safety of asbestos despite the existence of extensive research proving exposure to asbestos causes fatalities (Markowitz & Rosner, 2016). A third example is the 2007 to 2012 difficulties faced by "too big to fail" financial firms which engaged in risky behavior because they expected to be rescued by the United States federal government (Grunwald, 2009).

2.2 Components of Moral Hazard

There are many components of moral hazard that impact the extent to which an actor is likely to engage in risky behavior. We begin with a discussion of these components then apply these components to the behavior of Volkswagen employees.

Ingroup, Respect for Authority, and Purity (IAP)

The conservative norms of Ingroup, Respect for Authority, and Purity (IAP) drive people to engage in behaviors that promote welfare (Quigley, 2015). At Volkswagen, Ingroup and Respect for Authority values underpinned the moral hazard behavior of the Volkswagen employees. Although engaging in moral hazard behaviors is not necessarily an indication of immorality, in the case of Volkswagen, it can be argued that moral failings, combined with high ambition, led to the moral hazard behaviors. For example, numerous Volkswagen employees indicated the Volkswagen culture became tolerant of rule-breaking (Ewing & Bowley, 2015; Ewing, 2015). This rule-breaking culture was supported by employees due to their desire to be Ingroup and due to their Respect for Authority. Further, it can be argued that employees saw nothing improper in rule-breaking because sometimes people believe human beings are inherently immoral, and they consequently limit the moral demands they are willing to accept, thus making rule-breaking an acceptable behavior (Smilansky, 2010). It is possible that Volkswagen employees were engaging in utilitarian behaviors, defined as being willing to engage in any behaviors, even dishonest behaviors, if that leads to the best outcomes (Jamieson, 2007).

After disclosure of the emissions cheating, Volkswagen showed a propensity to refuse to accept responsibility, first by denying there was a problem (Ewing & Bowley, 2015) and later by challenging United States jurisdiction over the issue (Tabuchi, 2016). The Volkswagen denial was indicative of employees' desire for the company to have a reputation of Purity. Volkswagen's refusal to accept the findings of wrongdoing mirrors its refusal to accept findings of wrongdoing in the earlier airbag recall problem (Krisher, 2016).

Self-Efficacy and Internal Locus of Control

Engaging in moral hazard behaviors requires actors to have self-efficacy and an internal locus of control. Actors must have self-efficacy to believe they can control their behavior so they can act in their own best interest (Baker, 1996). Actors also must have an internal locus of control to believe their actions will impact outcomes (Colquitt, LePine, & Wesson, 2015).

At Volkswagen, in 2005, engineers believed they had the ability to circumvent United States emissions testing, and they began to plan how to circumvent United States emission laws because they knew they were unable to manufacture vehicles that would both abide by the emissions guidelines and also have the high gas-mileage that Volkswagen desired (Ewing & Bowley, 2015). For this reason, in 2007, Volkswagen abandoned its use of Mercedes-Benz and Bosch emissions technology due to its size and weight so that Volkswagen could design a smaller and more lightweight technology (Hakim, Kessler, & Ewing, 2015). Volkswagen engineers were successful in creating their own technology, and all post-2008 model years containing the 3.0-liter diesel engines also contained the deceptive software (Russell, Gates, Keller, & Watkins, 2016).

Elasticities

In regard to moral hazard, elasticity refers to the strength of the motivation to engage in moral hazard behaviors in response to an expected reward. For example, high elasticity indicates an increase in expected reward would induce behaviors that would generate greater-than-expected reward, which was found to be the case with workers' compensation insurance (Guo & Burton, 2010). Specifically, when potential payment amounts increased, workers' injury rates increased to a greater extent than expected so that payments received were higher than expected.

At Volkswagen, executives had an increasing desire to excel, and in 2011, they set the goal of being the largest global car manufacturer by 2018 (Hakim, Kessler, & Ewing, 2015). Their goal was to triple sales in the United States and to overtake Toyota in sales. Volkswagen executives' goal to increase sales exponentially served as the impetus to engage in moral hazard behaviors. The investigation of the fraud committed by Volkswagen reached upper management, including the ex-CFO and chairperson of the advisory board, Hans Dieter Pötsch. Under investigation for the orchestration of this case, Mr. Pötsch faced intensifying criticism from investors seeking answers. The addition of Mr. Pötsch to the investigation helped uncover the elements of a corporate culture that potentially created the idea of committing the fraud (Ewing, 2016a).

Volkswagen engineers engaged in moral hazard behaviors to gain rewards for themselves such as approval and promotions (Ewing & Bowley, 2015). Volkswagen engineers also understood that the success of Volkswagen directly impacted the German economy because approximately 14% of German workers were directly or indirectly employed in the automobile industry (Hakim, Kessler, & Ewing, 2015). Further, the Volkswagen culture was tolerant of rule-breaking (Ewing, 2015).

A study of corporate deviance that was committed by commercial banks in India found that high-status companies do whatever they can to remain high-status, and companies that have the most to lose do so, as well (Krishnan, 2015). "The research posits that the sense of security enjoyed by elite organizations has been greatly overestimated. Many are so eager to maintain their reputations that

they will engage in deviant behaviors – even acts of illegality – out of fear that they may not be able to meet the expectations of associates and shareholders” (Hansen, 2016). The study of India-based banks compared its findings to the Volkswagen scandal and noted there is the potential that the Volkswagen scandal stemmed from the actions of a few immoral employees who were driven by self-interest. Therefore, companies should remove motivation and emotion from decision making, and instead “employ specific management practices ... designed to put a stop to the undesired behaviour, such as investing time and effort in multilevel goal-setting, frequent goal achievement reviews, inter-unit communication and higher ‘visibility’ of top management” (Hansen, 2016).

Disclosure

Motivation to engage in moral hazard behaviors is increased if knowledge of one’s self-protective motivations and actions is undisclosed to others (Castillo & Leo, 2010). Within the business ethics field, this concept is known as The Disclosure Rule (Steiner & Steiner, 2012).

The extent of risk of disclosure is impacted by the extent of monitoring of outcomes of actors’ behavior. Specifically, if there is minimal or random monitoring, or if the timing and amount of monitoring is known, then actors can alter their behavior during monitoring to prevent detection, which would increase moral hazard behaviors. Monitoring is not cost-free, however, and buyers may not be willing to pay extra costs to increase monitoring to discourage moral hazard behaviors to ensure a pure product (Starbird, 2005).

Volkswagen evidently believed its deception would not be disclosed to the public based on its experiences in Europe, where government officials knew that Volkswagen’s and other manufacturers’ diesel engines exceeded pollution limits but took no action against Volkswagen (Hakim, 2016). In Europe, when random testing was done with portable testing devices on the road, emissions levels were found to be higher than when testing was done in a laboratory (Hakim, 2016). In the United States, automobile emissions are tested by states at a single, known time, either annually or biannually, which allowed Volkswagen to design software that could be used intermittently to deceive the emissions tests. Further, after the United States Environmental Protection Agency filed claims against Volkswagen, Volkswagen employees spent at least three days deleting documents related to emissions tests in an effort to decrease the risk of disclosure (Pleasance, 2016).

2.3 Causes of Moral Hazard at Volkswagen

The upper management of Volkswagen would have had to know of and approve of such a large-scale manipulation of software and its potential rewards and or consequences in order for the manipulation to have been conducted successfully. Volkswagen was driven to be the largest automaker, once the realm of General Motors and, more recently, Toyota. Volkswagen has always been known for, and embraced, its German heritage and engineering prowess, a proud and enduring selling point, and Volkswagen’s desire to maintain this reputation for quality could have been a motivation to engage in moral hazard behaviors.

2.4 Executive Compensation and Risk Taking Propensity

Senior executive pay packages are incentive based, using several metrics ranging from profit margin per unit, stock price, overall units sold and surpassing established benchmarks in all metrics. Executive compensation is frequently ephemeral and mercurial because the majority of the package is based upon the achievement of the company-wide goals that are sometimes difficult to control, such as profit and stock price. Increases in sales that are translated into rising stock prices have a multiplier effect on executives’ compensation because compensation from previously-awarded stock options increases in value with subsequent stock price appreciation. It is advantageous for

executive compensation for company sales to be progressively higher year over year, and executives will do everything within their power to push inventory movement to achieve sales growth.

Another aspect of moral hazard is the impact of executive bonuses on the level of risk taking. Most senior executives can benefit from bonuses if they reach certain predetermined goals. Typically, the goals are based on increases of the stock value and are paid in stock options. The objective of using stock options as bonuses is to incentivize executives to produce improved stock performance. There is usually no decrease in compensation if the goal of higher stock price is not achieved, so the opportunity to obtain the bonus will cause executives to take greater risks to achieve the goal than they would if negative consequences were attached to decreases in stock price. Therefore, when compensation is in the form of stock options, there is a strong incentive to meet the goal and there is no financial loss if the stock options expire worthless.

Yu (2014) stated CEO'S might have a high or excessive level of confidence in themselves, and CEO overconfidence explains some CEO behavior. For example, former Enron President Jeffrey Skilling was so confident in his own intelligence that he believed he could systematically manipulate reports without detection. Hannes and Tabbach (2013) showed that in, the United States, taking excess risk would be more attractive to an executive than even manipulating the stock price.

In some cases, CEO's who fail to meet goals would not only fail to receive the bonus, but would also be fired. In many cases, however, contractual termination benefits mitigate the loss to an executive who loses her job, thus decreasing the negative consequences of risk-taking behaviors.

At Volkswagen, Chief Executive Martin Winterkorn was the driving force behind the ambition of Volkswagen to become the world's largest carmaker, surpassing Toyota. Winterkorn was a demanding boss who didn't like failure; indeed five former Volkswagen executives described Winterkorn's style as fostering a climate of fear and authoritarianism that went unchallenged partly due to the company structure (Cremer & Bergin, 2015). As Volkswagen grew in size, largely due to sales in China, Winterkorn's compensation also grew rapidly and, in 2011, his compensation nearly doubled to €21 (\$23 million USD), making him the highest paid CEO among 30 companies in the German DAX index (Reuters, 2012).

When the emissions scandal was uncovered in September, 2015, Winterkorn resigned, but denied knowledge of the scandal. He remained, however, eligible for €5.9 million (\$7.1 million USD) in performance pay for a year in which the stock price fell by 30% (Snyder & Jones, 2015). That is, Winterkorn received significant rewards, and little negative consequences, due to the emissions scandal. There was a subsequent examination of Winterkorn's bonus, with €3.4 million (\$3.8 million USD) of outstanding bonus having been "frozen" in 2017 (Campbell & McGee, 2016). Nevertheless, Winterkorn became a retiree of Volkswagen and was entitled to annual pension payments of €1.1 million (\$1.2 million USD), (Murphy 2017).

The controversy over payments to Winterkorn has had a sobering influence on Volkswagen (Reuters 2017), and subsequently Volkswagen has capped pay to its CEO at €10 million (\$12 million USD). Further, eligibility for bonuses will be tightened under the new system, which will allow for up to 30% increase in fixed salary. Managers will lose annual bonuses if the operating profit is below €9 million (\$10 million USD), which is increased from the current threshold of €5 million (\$6 million USD). Long-term bonuses will track share price performance in line with Germany's corporate governance code. Thus, Volkswagen has recognized that incentive compensation programs which reward excess risk taking while mitigating failure with contractual "golden handshakes" present a clear moral hazard and Volkswagen has changed executive compensation programs accordingly.

Quality Management

Part of Volkswagen quality management is a very mindful thought process of how to manage profit margins (Volkswagen *Board of Management, 2016*). Volkswagen most likely used very strict and overriding manufacturing benchmarks and checkpoints all along the assembly process to identify and eliminate errors, thereby reducing rework. The focus on quality drives the operating profit margin, currently 2% up from a recent 1.5%, due in part to a very concentrated effort that began when the scandal became public, as Volkswagen began the struggle to reclaim its longer-term historical profit margin of 6% (Hetzner, 2016).

Industry Commonalities

Mitsubishi also was under scrutiny in April 2016 when it was discovered it had been manipulating fuel-economy data in multiple vehicle lines. Although the Mitsubishi scandal was revealed after the Volkswagen scandal, both companies were seeking the same goal: presenting their cars as being better than they were (Smith, 2016). Both Mitsubishi and Volkswagen also have histories of poor corporate governance, where employees could easily have engaged in utilitarianism due to the perception that a “bit of rule-bending would be tolerated as long as the results were OK” (Smith, 2016). Another commonality between Mitsubishi and Volkswagen is the length of time that these companies produced sub-par products. Mitsubishi was not caught until 20 years after it started manipulating gas mileage data, while Volkswagen was not caught until nine years after it started installing faulty emission systems. It is unknown whether the length of time indicates the companies hid it well or that people looked past the defects until an emerging pattern started to be noticed.

Chevrolet, General Motors, and Buick were also accused of falsely advertising fuel economy ratings that were higher than how the cars functioned. GM claimed the problem was due to improper calculations, but GM lost approximately €89.5 million (\$100 million USD) as a consequence of the false advertising (Sorokanich, 2016). Since the Volkswagen scandal was uncovered, Audi also has come under scrutiny by German authorities for some of its sport utility vehicles behaving “differently during tests than they did on the road” (Ewing, 2016b).

Cost – Benefit Analysis

Many companies engage in moral hazard behaviors to stay or get ahead when they see a high reward-low risk opportunity, with the reward usually being financial gains. Often, it takes great effort to devise a plan to cheat without getting caught (DuBois, 2012). At Volkswagen, engineers had to write and install the code into the software, as well as design and manufacture the engine components to implement the code, while managers had to approve these parts and installations, and upper management had to believe there was a positive result of cost-benefit analysis of not correcting the problem.

When any new, major initiative or project is being considered, there are many things to consider, including why, how, and the amount of financial resources that must be employed. Almost every large division or entity will employ a Monte Carlo-type simulation to create accurate predictions of all possible outcomes under varying conditions. For Volkswagen, the questions would have covered costs and benefits, including the following questions:

Benefits

- Will the software to create false emissions readings work?
- Will the software result in increased sales and, if so, by how much?
- What is the profit margin per unit and will it be affected by increased software development costs?
- How much will the increased unit sales add to company profit and is the increase sufficient to make a difference in the share price of the company stock?
- How much could the results affect executive compensation?
- How much could the results affect stock option amounts as part of compensation?

Costs

- Is the software detectable by outside monitors?
- How much and for how long will sales be hurt if the software is detected?
- How much and for how long will the shareholders bear the burden of declining stock prices?
- Taking all into account, what will be the total cost of lost revenue, punitive damages, repercussions, cost of fixing the software, including buying back affected vehicles?
- How much will consumer confidence be affected?

3. Volkswagen's Financial Performance

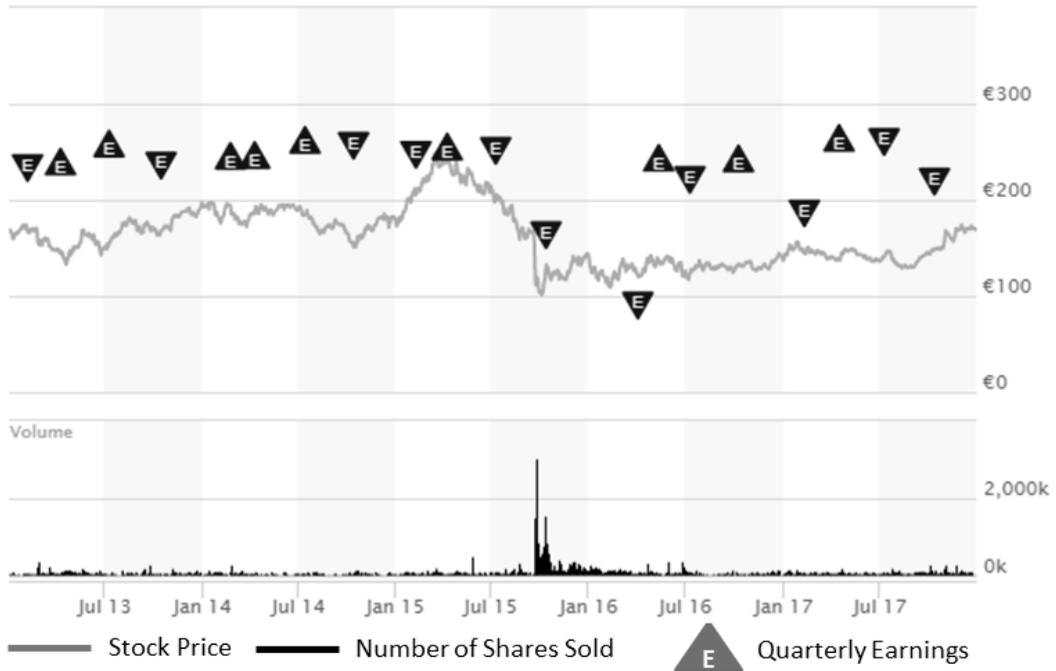
Volkswagen, being a publicly-traded company, faced significant negative financial consequences from its owners (i.e., shareholders) when the scandal became public. Immediately following the story becoming public, millions of shares were sold, leading to a precipitous decline in share price and market capitalization.

Stock Prices

From a purely financial perspective, it can be surmised that Volkswagen management did not believe the negative consequences would be significant, if indeed the software were discovered, which is what ultimately came to pass. The brand has suffered, but the following statistics and charts indicate that the initial decline that occurred to the company's stock price was short lived because after the initial free fall, the stock price rose slightly and stabilized somewhat, such that it was beneficial to management to permit the faulty software to be installed. After the slow and steady increase in stock price, however, the stock still remains more than 20% lower than prior to the scandal, and has a long way to go to achieve past levels.

Chart 1 shows Volkswagen stock price, trading volume, and quarterly earnings from January 2013 to December 2017 (Marketwatch, 2017). The high point of the stock price occurred on April 10, 2015 at €244.80 (\$293.72). Over the next five months, the stock price slowly declined 32% to €167.40 (\$200.85) on September 17, 2015, an amount closer to its usual average of the past few years, and daily trading volume was low, between 40,000 and 100,000 shares per day. Over the next week, directly after the emissions cheating became public, to October 2, 2015, the stock price declined 39% to €102.80 (\$123.34), and trading volume was extraordinarily high, with 2.38 million shares being traded on September 23, 2015 alone. After July, 2016, the stock price increased slightly and stabilized, at a new, lower average, around €130.00 (\$155.98). Company earnings were negative in the period directly following the uncovering of the emissions cheating, and remained negative for the following six months. Clearly, disclosure of the scandal caused significant negative consequences for Volkswagen and its shareholders in the short term.

Chart 1: Volkswagen Stock Price in Euro, Trading Volume, and Quarterly Earnings, January 2013 to December 2017



(MarketWatch, 2017).

Market Capitalization

Chart 2 shows data on market capitalization (i.e., total market value of outstanding shares) from January 2013 to December 2017 (YCharts, 2017). On September 15, 2015, prior to the emissions cheating becoming public knowledge, market capitalization was €80.5 billion (\$91.01 billion USD) but within four days, to Sept 29, 2015, market capitalization had declined 50.2% to €45.7 billion (\$51.07 billion USD). Compared to Toyota’s Market capitalization of €168 billion (\$187 billion USD) on September 30, 2015, one can easily see the crippling results that Volkswagen shareholders had to absorb.

Chart 2: Volkswagen Market Capitalization from January 2013 to December 2017, in Euros



(YCharts, 2017).

Volkswagen could have decreased the negative consequences of moral hazard behavior on the stock price by working to slow the decline in stock price by entering a short-put strategy to increase cash flow while buying back its own stock at increasingly lower levels. First, using this somewhat bullish

strategy, Volkswagen would slow the decline in the stock price somewhat, decreasing the probability of an outright rout, which could have, in turn, resulted in ever-growing class action suits by betrayed stockholders (Morgan & Morgan, 2016). Second, the company would be buying back stock more cheaply than otherwise would be possible and would reap substantial rewards upon a stock price rebound after the furor subsided. This ill-gained profit could help defer some of the legal costs incurred by the emissions cheating scandal, thus further reducing the negative consequences of moral hazard behaviors.

Long-Term Financial Outcomes

In the two years after the scandal was uncovered, Volkswagen stock price remained approximately 20% lower than it was prior to the scandal. There is a significant financial cost to Volkswagen, including a minimum of €12.5 billion (\$14 billion USD) of an emergency fund (Volkswagen, 2016) set by Volkswagen to pay to correct the problem, buy back defective cars, punitive fines levied on the conglomerate by foreign governments, such as the United States, possible class action suits by stakeholders, and the possible costs of the approximately 60 deaths that are being attributed to the increased emissions (Tutt, 2015). The total financial cost is difficult to quantify, but surely there will be years of litigation.

4. Conclusion and Implications

The theory of moral hazard and its components could explain the long-term, moral hazard behavior of Volkswagen engineers and executives in planning and executing the development of emissions systems containing software designed to thwart emissions tests. The company set the unattainable goal of becoming the largest automobile seller in the United States, which combined with the corporate culture emphasizing Ingroup importance, respect for authority, preservation of the purity of company reputation, and executive compensation packages, led employees to believe they would receive significant positive outcomes of cheating and very little, if any, negative outcomes. That the faulty software was used for nine years prior to being discovered is indicative of employees' belief that there would be no disclosure of the problem, thus giving further impetus to their engaging in moral hazard behaviors.

There were significant negative consequences for the company due to the precipitous decline in stock price and market capitalization, but the consequences were somewhat short-lived, as these values stabilized and did not reach zero. Several executives faced negative consequences such as termination of employment, but remained eligible for very lucrative retirement packages. Overall, it does not seem the short-run negative consequences for the company or the executives were as significant as the benefits to the company and the executives.

More often than not, large corporations prefer to put strife behind them rather than face unending negative publicity. The executives at Volkswagen must be some of the most intelligent and driven professionals in the world, so one must wonder what was the ultimate driving force behind such an egregious act. We will only know from future "whistle blower" books that will emerge.

Implications for Industry and Managers

We can only speculate regarding why the leaders of one of the world's top automakers would allow or facilitate this fraud. Recent findings have demonstrated that the amount of carbon dioxide emitted by all (not just Volkswagen) diesel engines far exceeds that which standard testing indicates, and this pollution is linked to more than 38,000 premature deaths globally (Anenberg, et al., 2017; Weston, 2017) indicating that other automakers may be engaging in behavior similar to that in which Volkswagen engaged. Indeed, the BMW German headquarters was raided recently by police who were investigating faked exhaust emission tests (Reuters, 2018). Companies in other industries also

have recently been investigated for moral hazard behaviors (i.e., partnerships with data brokers at Facebook and other firms (Ghosh 2018); use of a mystery partner in energy contracts in South Africa by McKinsey & Company (Bogdanich and Forsythe, 2018), indicating the practice is ongoing across the global economy.

Given that the unethical behavior has occurred across many industries, managers should take steps to ensure their subordinates do not also succumb to these behaviors. First, managers should create a safe space for employees to question authority without fear of retribution and without fear of losing status as ingroup members. Second, compensation should be structured to reward the process of producing work, not just company revenue or company profit, because a focus on profit might encourage Machiavellian behaviors. Third, decision making should be transparent, and detailed meeting minutes should be shared company-wide to the extent possible.

Limitations and Future Research

The primary limitation of this study is the secondary nature of the data on Volkswagen employees. While it is doubtful Volkswagen employees would agree to be interviewed or would complete surveys regarding the corporate culture or emissions systems due to fear of legal repercussions, future research could make use of trial transcripts and other legal documents to discern the underlying cause of the emissions system cheating.

Future research also can examine the long-term financial outcomes of organizations that engage in wrongdoing and compare it to the long-term financial outcomes of organizations that do not engage in wrongdoing. This analysis could demonstrate the extent to which wrongdoing affects shareholders and provide a further incentive for managers to behave ethically.

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