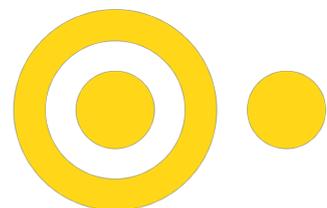


Unethical Conduct & Stock Prices

A case study on the wealth effects of unethical corporate behavior

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Abstract

In the last decade Corporate Social Responsibility (CSR) has become increasingly important and multiple corporations that have been exposed for unethical behavior have been harshly penalized by the market. This study aims at evaluating wealth effects of unethical corporate behavior by doing a case study, in which an in-depth analysis is conducted on four infamous corporate scandals; Wells Fargo, HSBC, Danske Bank, and Volkswagen. Share prices are compared to an approximation of what the prices could have been, had the scandals not been revealed, to give an indication on abnormal returns around the announcement of the corporate scandals. The approximation is based on the share's previous correlation with market returns. Results of the study are then contrasted to and analyzed with regard to findings of previously conducted event studies on the wealth loss suffered due to exposed unethical behavior. It is found that the corporate scandals resulted in substantial direct wealth losses in terms of market cap value and shareholder wealth for two of our cases, Wells Fargo and Volkswagen. The value decrease that Danske Bank suffered was also substantial, but had a lag in discernible market reactions in comparison to Wells Fargo and Volkswagen. HSBC has in recent years been lagging behind our price approximation, but any direct negative effect from the scandal announcement cannot be observed.

Key words: Corporate Social Responsibility, shareholder wealth, corporate scandals, unethical corporate behavior

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1. Introduction

In recent years Corporate Social Responsibility (CSR) has become increasingly important. It is not enough to earn profits for shareholders, to survive in a competitive corporate climate so called "soft goals" such as employment conditions, environmental consideration and social initiatives have to be taken into account when forming a corporate strategy. Studies have supported a positive relationship between corporate social performance and financial performance (Orlitzky, Schmidt & Rynes 2003). Today stakeholders expect a viable action plan to help improve, or at least not ruin, the world we live in. A trust bond is formed where investors expect corporations to pay heed to the social problems of our world. But what happens when a company breaks that trust, and how are they penalized for such a betrayal? Several studies conducted over the last few decades show that corporations that are exposed for conducting their business in an unethical manner are penalized by the market, not only for the possible monetary penalties in the form of fines, settlement fees, etc., but also for the loss of trust. A form of reputational penalty is exacted on those who are perceived to act outside the scope of ethical behavior. (Karpoff & Lott 1993)

By doing an in depth analysis of four infamous corporate scandals revealed in the last decade this paper aims to evaluate eventual wealth loss effects of unethical conduct. The results from previously conducted studies on the effect of unethical behavior on financial performance will be contrasted to the results of this study. The study also aims at investigating if there are unique factors for each case such that a thorough understanding of the impact of scandals warrants a case-by-case method.

2. Method

2.1. Event studies

The method of event studies was first introduced by Fama et al. (1969). They conducted a study that investigated abnormal returns to evaluate the effect that a specific event had on stock prices. Since then it is a commonly used methodology to quantify potential market reactions to corporate actions such as splits (Fama et al. 1969) and mergers (Tichy, 2001), as well as exposed unethical behavior (Rao & Hamilton, 1996). The method is based on the efficiency of capital markets, where stock prices rapidly adjust to new information. Most event studies use a single index model showing the return of a security with regard to index returns, as defined in *Equation 1*, to observe deviations from estimated returns.

Equation 1: Single Index Model

$$R_i = \alpha_i + \beta_i R_m + e_i$$

The alpha variable (α), which represents a security's expected excess return when market return is zero, should for a larger sample cluster around zero. This means that at stock price equilibrium α will be driven towards zero. The beta variable (β) represents the systematic risk of the individual security and indicates sensitivity to fluctuations in market returns. If the Beta is 1 it means that the stock return correlates perfectly with market returns, while a Beta of -1 indicates that the stock return has a perfect negative relationship with market returns. If market return increases with 1 percent this will lead to a 1 percent increase in return for a stock with a Beta value of 1, while the return of a stock with a Beta of -1 will decrease with 1 percent. The last part of the single index model is a residual component, commonly referred to as an error term (e), which catches all return fluctuations that cannot be explained by neither the alpha nor the beta term. The error term can be defined as the difference between estimated returns and actual returns on an investment. On average the error term should be zero and estimated returns should be equal to actual returns. If that is not the case it could be interpreted as a disruption by an externality, outside the scope of the index model. (Bodie et al., 2018)

In event studies this index model is calculated for a period preceding the announcement of the investigated event to get an "estimation window". This will give a beta coefficient which will allow to estimate expected returns with regard to previous relationship to index returns. After this abnormal returns are computed by comparing estimated returns according to the single index model against actual returns. The abnormal returns in the form of average residuals (AR) for the sample are used to observe a cumulative average residual (CAR) which will show the sample's abnormal returns for the time following the investigated event. If the CAR deviates from zero following the event in a statistically significant way this will indicate that the event has had an impact on stock returns.¹

2.2. Study

Previous event studies have mainly carried out quantitative analysis on large samples to find averages and estimates for the negative effects of corporate scandals. However, all corporate

¹ See event study by Fama et al. (1969)

scandals have different characteristics in the form of type of scandal, identity of plaintiff and corporate image. These factors may lead to industry and case unique reactions by market and stakeholders. Therefore an in-depth analysis of a smaller sample of scandals could give some insight into how well these findings correspond with actual effects on a case to case basis.

The scandals included in this study have frequently figured in international press² during the last decade and are connected to publicly traded large cap companies. Each scandal has had a great stakeholder impact and has been deemed highly unethical in the press coverage. All companies included are publicly traded, partly due to accessibility to data, but also because one category of stakeholders, the shareholder, is more easily identified, and their impact more easily measured as shareholder wealth. The cases chosen for this study are three banks, Wells Fargo, HSBC, and Danske Bank, and one car manufacturer, Volkswagen. This is because the high exposure industry of the banking sector could make banks more vulnerable to effects of exposed unethical behavior (Zeidan, 2013). Banks have also recently come into focus in Sweden and the Nordics when several has been involved in money laundering scandals (Bloomberg, 2019). Volkswagen, a mainly manufacturing company, has been included to act as a control for comparison to the results of the banks. This is to avoid only capturing reactions specific to the banking industry.

I will investigate four major corporate scandals step by step and evaluate market reactions and possible penalties, both monetary and reputational. The corporations act in different markets and their performance will be compared to market indices and industry competitors to discern deviations due to reactions on unethical behavior rather than market or industry fluctuations. Taking inspiration from the event study method, I will calculate an estimation window to find a beta coefficient indicating the stock return's correlation to index return before the occurrence of the scandal. Using the single index model I will use an estimation window of two years leading up to the investigated scandals which will allow to calculate an approximation of expected returns. We assume that the error term over time will have a mean value of zero which means that our regression will be run on *Equation 2*. Specification of the data used can be found in section 2.3 *Data Collection*.

Equation 2: Single Index Model without error term

$$R_i = \alpha_i + \beta_i R_m$$

² A simple Google search of the company name + scandal generates the following number of hits in international news; Wells Fargo: 346 000, HSBC: 59 000, Danske Bank: 17 400 & Volkswagen: 843 000.

The beta coefficient (β) from our regression will be used in *Equation 3* to calculate a price approximation with regard to the stock returns's previous relationship with index returns (R_m).

Equation 3: Price Approximation

$$P_t = P_{t-1} + P_{t-1}(\beta_i * R_{m,t-1})$$

This price approximation will give an indication on what the stock price could have been following the time of each scandal, if the scandal had not been revealed. Our estimated price will be compared to actual stock price levels to see if the time just after the scandal deviates from the stock return's previous correlation with index returns. The difference between our estimation and actual price levels will give an indication of abnormal returns and thereby stock price effects due to the scandal.

Both return and market cap value will be compared to levels 'pre-scandal' to give an understanding of the magnitude of the wealth effects. Trading volume changes will also be evaluated to see if this can give some indication of how strongly the market reacts to a specific event. If there is a spike in trading volume this can be interpreted as the market having a strong reaction to a recent or expected incident.

2.3. Data collection

All data for this study has been gathered from Yahoo Finance. The data set for each scandal includes observations from two year before the scandal was revealed until one month after the last event of the scandal described in this case study. For comparative index and industry competitors the same data span is used. The data sets in focus for this study are adjusted closing prices, trading volume and log returns. See specification of data collection in *Table 1*.

Table 1: Data Collection

	Adjusted closing price	Trading volume	Log return
Cases:			
Wells Fargo	Aug 8th 2016 - Feb 28th 2018	Jan 1st 2016 - Feb 28th 2018	Sep 8th 2014 - Feb 28th 2018
HSBC	Jan 1st 2012 - Feb 26th 2018	Oct 1st 2011 - Feb 26th 2018	Jan 1st 2010 - Feb 26th 2018
Danske Bank	Feb 20th 2017 - Dec 31st 2018	Jan 1st 2017 - Dec 31st 2018	Mar 20th 2015 - Dec 31st 2018
Volkswagen	Aug 18th 2015 - Feb 26th 2018	Sep 1st 2015 - Feb 26th 2018	Sep 18th 2013 - Feb 26th 2018

	Adjusted closing price	Trading volume	Log return
Indices:			
S&P 500	Jan 1st 2012 - Feb 28th 2018	-	Jan 1st 2010 - Feb 28th 2018
OMX	Feb 20th 2017 - Dec 31st 2018	-	Mar 20th 2015 - Dec 31st 2018
DAX	Aug 18th 2015 - Feb 26th 2018	-	Sep 18th 2013 - Feb 26th 2018
Industry competitors:			
Bank of America	Jan 1st 2012 - Feb 28th 2018	-	Jan 1st 2010 - Feb 28th 2018
SEB	Feb 20th 2017 - Dec 31st 2018	-	Feb 20th 2017 - Dec 31st 2018
Daimler	Aug 18th 2015 - Feb 26th 2018	-	Sep 18th 2013 - Feb 26th 2018

Data collected from Yahoo Finance.

For both Wells Fargo and HSBC, since they are traded in the U.S., S&P 500 has been used as a comparative index. Since they also act in the same industry, the banking sector, Bank of America, which is one of the largest commercial bank in S&P 500, has been used as a comparative industry competitor.

Ideally each company would be compared with their country specific index. However, such complete data sets are not available for all companies at Yahoo Finance, or an equally accessible source. Thus, I have used OMX Stockholm as a proxy index for Danske Bank. As a comparative industry competitor the Swedish bank SEB has been used. Partly due to its similar size, but also due to that SEB was not involved in the "Danske Bank scandal".

For Volkswagen the German index DAX has been used as a comparative index as the share is traded on the German market. As an industry competitor the German car manufacturer Daimler has been used.

3. Literature review

Several studies have, through quantitative event studies, tried to discern a correlation between social and financial performance. On the question of being rewarded for social initiatives the results of different studies vary. When looking at the negative side however, most studies have shown some form of market penalization, in addition to fines and legal fees, for those who have conducted their business in a perceived unethical manner.

To elaborate on the subject and give an introduction on previous findings I will summarize a few of the studies conducted on social and financial performance.

One of the earlier quantitative studies carried out on the effect of unethical conduct by corporations on their market value was done in an event study by Rao & Hamilton (1996). Their study covered 58 U.S. corporations involved in scandals reported by the Wall Street Journal between 1989 and 1993. The scandals covered a variety of categories, including white collar, environmental and employee discriminations. Rao & Hamilton tested for abnormal returns in relation to market returns 12 months prior to 6 months after the scandals were revealed by looking at a residual component of the stocks holding period return (HPR). The HPR is based on the single index model and can be defined as *Equation 3*.

Equation 4: HPR

$$r_{j,t} = \hat{\alpha}_j + \hat{\beta}_j r_{m,t} + e_t$$

Rao & Hamilton (1996) found that the cumulative average residual (CAR) of the stock sample on average was significantly different from 0. They concluded there was a statistically significant negative effect reflected in the CAR on stock prices around the time of the scandal announcements, which can be interpreted as a disruption in return due to the scandal. Abnormal returns earned on the announcement date was found to be -5.67% for the sample.

The results of the Rao and Hamilton study have been substantiated by multiple other quantitative studies, among them a meta-analysis by Frooman (1997). His study included the results of 27 event studies on the effect of socially irresponsible and illegal behavior on shareholder wealth. In classic

economic theory there is an assumption that all agents will act with rational self-interest, and if that holds true, then why would a corporation opt to do the socially responsible thing, assuming that it is more expensive than acting irresponsible? Theories on enlightened self-interest in CSR argues that there are positive long term effects from acting in a socially responsible manner, such as customer satisfaction, employee loyalty, possibly less regulation and a positive image for the corporation, which should incentivize corporations to stay away from unethical behavior. Frooman's (1997) meta analysis, which concluded a substantial negative effect on shareholder wealth from unethical behavior, gave empirical support of enlightened self-interest arguments. It shows that stakeholders can recognize and account for tangible and intangible downstream costs, and therefore it is in the firms best interest to act in a socially responsible and law-abiding manner.

In addition to losses that can be attributed to direct as well as tangible and intangible downstream cost Karpoff and Lott (1993) argued that a reputational penalty is exacted for corporate fraud. The study was conducted by making an estimate of the wealth loss that firms accused of corporate fraud suffered and compare that to an estimate of expected legal penalties incurred by the firms. Karpoff and Lott (1993) found that a very small portion of the loss of common stock market value can be traced to expected legal fees and fines, even under extremely unrealistic assumptions of those expected monetary effects. The conclusion they reached is that some of this wealth loss is due to a reputational penalty which captures a lower present value of output prices or higher input prices.

Another factor that has been found to have an impact on the wealth loss that firms suffer due to unethical conduct is the perceived severity and characteristics of the offense committed. This was investigated by Bhagat et al. (1998) who conducted a study on wealth effects of corporate lawsuits. The study included lawsuits filed between 1981 and 1983 where either the plaintiff, the defendant, or both were corporations. Bhagat et al., similarly to Rao and Hamilton, tested for abnormal cumulative returns (CAR) in relation to benchmark returns to see if the difference is statistically significant, and can thereby be interpreted as an effect of the announcement of a lawsuit. They found a statistically significant wealth loss for corporate defendants in a lawsuit. The effect was found to be significant regardless of the type of lawsuit and the identity of the plaintiff. They could however discern a variation in the wealth effect on a defendant due to the characteristics of the suit, such as type of legal issue, identity of the plaintiff, and profile of the corporate defendant. The study showed that government lawsuits resulted in a greater wealth loss (-1.73%) than both suits brought by private parties (-0.81%) and other corporations (-0.75%). A variation due to type of lawsuit could also be discerned, where environmental suits had the largest effect on shareholder wealth (-3.08%)

in comparison to product liability suits (-1.46%), violations of security laws (-2.71%), and other disputes.

Zeidan (2013), however, fails to replicate the results of the Bhagat et al. (1998) study for the US Banking sector. Zeidan's event study focused on the banking sector specifically and tried to find if previously conducted study on the effect of illegal behavior could be applied to banking institutions. Zeidan chose to look at the banking sector because of the special nature of the industry. Banking is a regulated high exposure industry as it plays a critical role in economic stability. Trust is also a crucial part of day to day operations for a bank why the negative impact from a corporate scandal could be more substantial than for other industries. His study included 128 publicly traded banks, all of which had been subject to enforcement actions by the US regulatory authorities. The study managed to substantiate previous results conducted on the effect of illegal behavior, and that these apply to the banking sector as well. Zeidan's results concluded a statistically significant abnormal return on the first few days following the announcement of a scandal. He found that the most significant effect could be observed on day two when average abnormal returns in his sample was -1.58%. He did however not find any evidence that the severity or repetitiveness of an offense has any additional effect on the firms wealth loss suffered by corporations following a scandal. In light of later rather large scandals concerning the banks Wells Fargo, HSBC and Danske Bank, we are especially concerned with contrasting the statistical methods used in Zeidan (2013) with a more narrative event study.

4. Cases

4.1. Wells Fargo

Wells Fargo, founded in 1852 and named after its two founders Henry Wells and William G. Fargo, still has its headquarter in San Francisco where their journey once began. The bank has strong local roots and are highly associated with the image of a six-horse stagecoach that during the early 20th century figured frequently in Hollywood westerns. (Wells Fargo, 2018) Today, with over 260 000 employees, Wells Fargo is one of the largest corporations in America ranked no.26 in Fortune's 2018 ranking Fortune 500 (Fortune, 2018). Found in 8050 locations the bank serves around one third of the United States population. (Wells Fargo, 2018)

Like most banks Wells Fargo has not been spared from the occasional scandal. Here we will study the effects of the 2016 "fake-accounts" scandal that was first exposed on the 8th of September. It

was found that employees of the bank had created millions of unauthorized bank and credit card accounts. (CNN, 2018) In the following months more illicit behavior at the bank was revealed which eventually led to an unprecedented move by the Federal Reserve to restrict the growth of the banking institution. (FED, 2018)

On the day before the infamous Wells Fargo scandal was revealed the bank's market cap value was just over \$234 billion. Average trading volume from 1st of January until 7th of September 2017 (the day before the scandal was revealed) was 19,300,000 shares, and in the two weeks leading up to the scandal average trading volume was 18,200,000 shares.

As a comparative index S&P 500, of which Wells Fargo constitutes around 1 percent, is used. Bank of America Corporation (BAC) is the bank which has the largest weight in S&P 500, why BAC is used as a comparative industry competitor.

When running a regression on Wells Fargo's return against S&P 500 index return for September 2014 to September 2016 the coefficient is 1.14³ with a constant very close to zero. This means that during the two years leading up to the scandal Wells Fargo's return tended to be 1.14 times the return of index S&P 500. This would mean that when S&P index return is 1 percent, Wells Fargo's return on average would be 1.14 percent.

The amount of outstanding shares used to calculate market cap value is that at recorded date for the annual meetings of 2016 (5,057,245,527 shares), 2017 (5,003,872,216 shares), and 2018 (4,876,092,912 shares). (Wells Fargo, 2019)

Scandal

On September 8th 2016 U.S. federal regulators publicly revealed that employees of one of the largest banks in America, Wells Fargo, had secretly created millions of unauthorized bank and credit card accounts for their customers. The news gained much attention and quickly spread in the international press. Subsequently thousands of employees had to leave their positions and the bank agreed to pay a fine of \$185 million. (CNN, 2018)

The fine did not stop an imminent investigation of the banks operations by regulatory authorities. Subpoenas were served to employees of Wells Fargo and by the end of the month more illicit behavior in the form of illegal repossessions of cars had been revealed. This resulted in refunds and

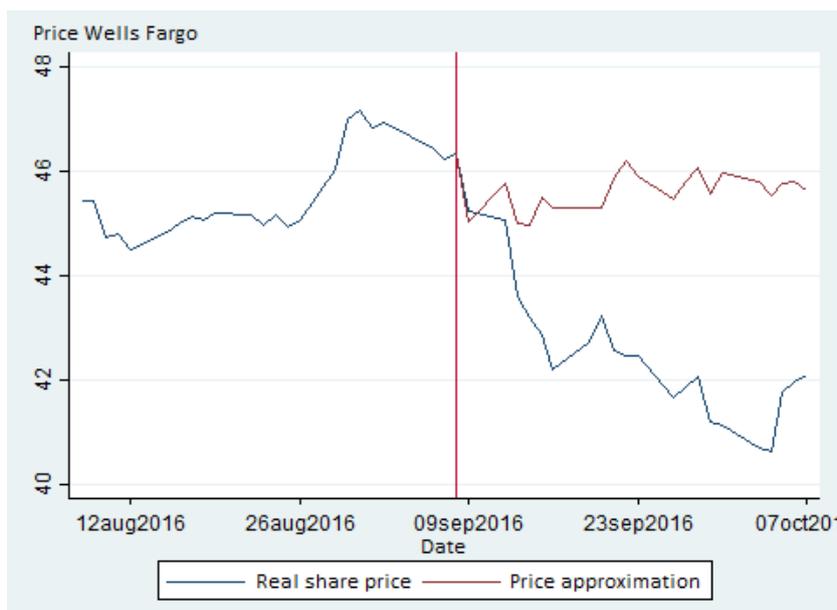
³ Statistically significant at a 1% significance level. Std. error 0.03.

sincere apologies from the bank. Employees blamed these issues on the unrealistic sales goals which effectively encouraged illicit behavior. (CNN, 2018)

During the first five days after the scandal broke the Wells Fargo stock price decreased around 7.5 percent, lagging behind index and industry equivalents. S&P 500 dropped just over 1.5 percent during the same time period and the share price of industry competitor Bank of America decreased around 1.2 percent. This price drop meant a market cap value decrease of \$17 billion for Wells Fargo, from \$234 billion to around \$217 billion. Simultaneously average trading volume in the two weeks following the scandal spiked and was around 44,000,000 which is over twice as much as in the two weeks leading up to the scandal. This could be interpreted as a substantial market reaction due to the exposed illicit behavior. Going into the following month Wells Fargo had dropped over 12 percent while market index was down less than 1 percent, and Bank of America less than 1.5 percent. The 12 percent stock price drop meant a decrease in market cap value of \$28 billion. The fine that Wells Fargo agreed to pay was only around 1 percent of the \$17 billion value decrease that the bank and its shareholder suffered in the first few days after the announcement of the scandal.

If we consider the average correlation with S&P 500 index returns we found for the two years leading up to the scandal, which was 1.14, compared to the time immediately after the scandal there is a distinct difference in market value. *Figure 1* illustrates the difference between the actual price development that Wells Fargo experienced (the blue line) and our estimated price development without the scandal (the red line), assuming the same correlation with market returns as in the two years before the scandal. In *Figure 1* we can see that the day after the scandal was revealed, which is when Zeidan (2013) found the most significant abnormal returns at -1,58 percent, our price approximation, represented by the red line, is actually lower than the real price. This indicates that our price approximation estimated a lower return than the share experienced and that abnormal returns were not negative as Zeidan's study concluded. Comparing our estimate to actual returns gives a positive abnormal return of 0.44 percent that day. Looking beyond the first two days *Figure 1* however illustrates a large discrepancy between the real and hypothetical price development, where the real price is far lower than our price approximation. The difference reaches its peak of around \$5 in the beginning of October, which means that the real price was about 11 percent lower than our approximation. A \$5 difference in stock price equals around \$25,3 billion in market cap value.

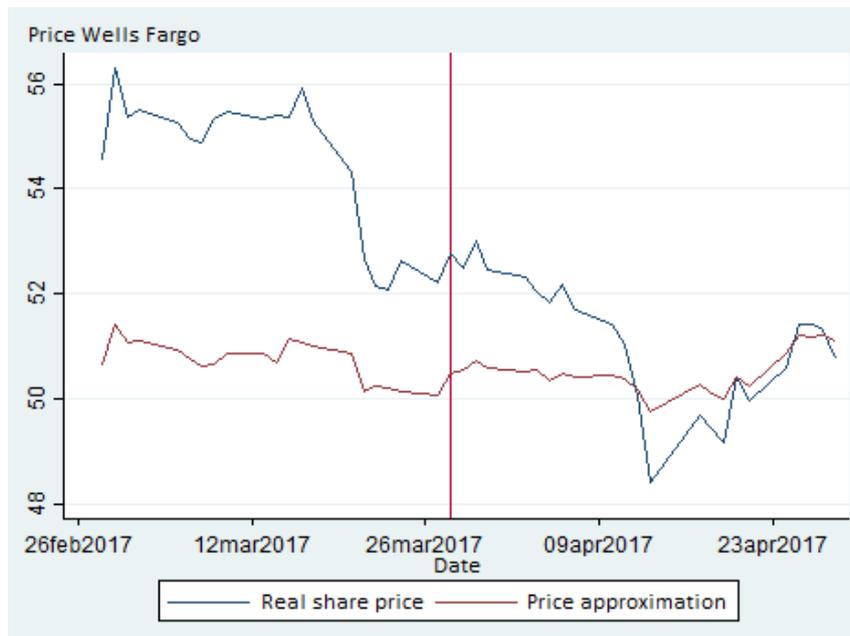
Figure 1: Price development around the announcement of the Wells Fargo scandal



In November 2016 the estimated number of fake account created was around 2.1 million, which was later revealed to be a large understatement. The fall crisis of 2016 led to the dismissal of four senior bank employees in early 2017 and in March a downgrade of Wells Fargo's community lending rating by top federal regulators. A class action suit also led to a settlement amount of \$142 million paid to customers who had suffered costs due to unauthorized bank and credit card accounts. (CNN, 2018) The first few days after the announcement of the class action settlement on the 28th of March 2017 led to a slight drop (1.75 percent) in share price for Wells Fargo, while S&P 500 index remained virtually unchanged and a less than 1 percent drop for Bank of America. By mid April the bank had dropped 8.24 percent while S&P was down 1.26 percent and Bank of America down 4.86 percent. The 8.24 percent share price drop meant a market cap value decrease of \$22 billion. This is a large decrease in shareholder wealth but since also Bank of America saw a value decrease during that same time period a part of the drop could be due to industry fluctuations, and not only reactions to the class action settlement.

Figure 2 shows that leading up to this announcement Wells Fargo had outperformed our approximation of the price development given its previous relationship to index returns. However, following the settlement the Wells Fargo share price started decreasing and had by mid April dropped to around \$1.5 below our estimation. After a quick bounce back the real price of the share caught up with our hypothetical price level.

Figure 2: Price development around the announcement of the class action settlement



On June 14th of 2017 new allegations of mortgage modifications surfaced, and less than two weeks later issuance of unnecessary auto insurances was revealed. This was followed by another law suit in August, and later that month a new estimate of the number of unauthorized accounts created showed about over one million more accounts than the first estimate. (CNN, 2018)

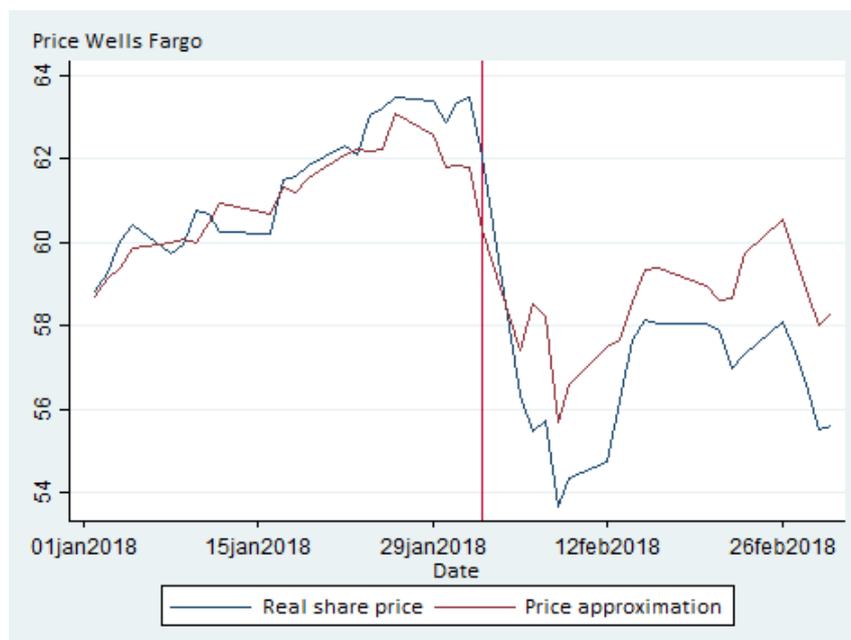
In response to the events of consumer abuse and compliance breakdowns the Federal Reserve made an unprecedented decision to restrict Wells Fargo's growth until they managed these issues. They were allowed to continue with day to day operations such as deposits and making consumer loans, but had to cease all forms of expansions that would increase their assets to a level greater than its total asset size as of the end of 2017. The bank was forced to improve their internal operations regarding governance and risk management as well as let a total of four board members go. This was published in a press release on the 2nd of February 2018. (FED, 2018)

In the first five days after the FED report was published the banks stock price dropped an astounding 13.53 percent, dragging the whole market down with it. Wells Fargo constitutes around one percent of the comparatively used index S&P 500, thus a large drop will affect not just the company itself but also the market as a whole. During those first days S&P 500 also decreased from 2762 to 2581 USD, a change of around minus 6.55 percent. If we compare Wells Fargo's price drop with the banking institution which carries the heaviest weight in the S&P 500 index Bank of

America, whose stock price decreased 6.92 percent during that same time period, it is a substantial decrease. Such a large drop in comparison to market index and a close competitor can likely be interpreted as a shareholder reaction to the news of the FED restrictions. The imposed restrictions meant no ability for the company to grow, which in turn means lower expectations of future return for shareholder. If shareholders expect a reduction in future returns that must be discounted in the share price to a level where buyers of free floating shares deem it reasonably priced given its expected outlook.

Figure 3 shows a large drop following the announcement of the FED restrictions. Since Wells Fargo constitutes a large part of S&P 500 such a large drop will inevitably drag index down with it. However, the decrease for Wells Fargo was substantial in comparison to our approximation of a price development without the scandal. The discrepancy between the actual price development and our approximation reached its peak around the 10th of February and was around \$2.

Figure 3: Price development around the announcement of FED restrictions



If we consider the whole timespan of the scandal, as seen in Figure 4 below, we can see direct negative reactions due to each mentioned stage of this scandal. Price drops can be observed in September 2016, late March 2017, and in the beginning of February 2018. We can also see that the bank has had little issue regaining its market value shortly after each drop. Some of that value has been regained virtually immediately since each drop has been followed by a quick bounce back,

presumably due to an overreaction by the market and shareholder tendency to sell in fear after a shock instead of regarding the shares underlying value and potential. The bounce back for the first stage of the scandal which was the exposure itself took longest, while the second drop due to the class action suit settlement was almost immediate. The FED restrictions imposed in the beginning of 2018 resulted in the largest price decrease, which as of yet has not been regained.

When comparing the actual price development for Wells Fargo to our approximation of a price development without the scandal as seen in *Figure 4* below, we can see that following the announcement of the scandal Wells Fargo fell under our estimation but that it quite quickly bounced back and outperformed our price approximation. Around the the announcement of the class action suit our price approximation started outperforming the real price development of the Wells Fargo share. It the beginning of 2018 Wells Fargo caught up to our approximation, but fell under again following the imposed FED restrictions.

Figure 4: Price development for the entire Wells Fargo scandal period



In accordance with Rao and Hamilton's (1996) results we can find indications that, in the following months after the scandal was revealed, Wells Fargo saw significant negative effects on share price and market cap value as well as a deviation from their 'before-scandal' correlation with market returns. A significant drop in shareholder wealth can be discerned which was out of proportion to the marginal drop in comparative index and industry competitors return.

Market cap value decrease due to the scandal was significantly greater than monetary penalties imposed on the bank which could be interpreted as being a combination of share-holders' ability to

account for downstream costs, and a reputational penalty as described in Karpoff and Lott's (1993) study. Karpoff and Lott argued that the loss in shareholder wealth because of these types of corporate scandals is too large to be attributed only to direct or indirect monetary consequences from the scandal. In this case the direct monetary penalty only constituted about 1 percent of the shareholder wealth loss observed in the first few days, and about 0,7 percent of the market cap decrease by the beginning of October 2016. Some of this is likely attributed to an expectation of lower shareholder returns due to indirect downstream costs. However, it seems unlikely to warrant such a significant market cap value decrease.

4.2. HSBC

HSBC was founded in Hong Kong in 1865 to facilitate trade between Europe and Asia. The name derives from its founding member 'The Hongkong and Shanghai Banking Corporation Limited' and was from start meant to serve an international market. Today the bank has operations in 66 different countries and territories all over the world and employ around 230,000 people worldwide. The bank's head office is now located in London, UK, and HSBC is one of the largest banking and financial services organizations in the world. (HSBC, 2018)

HSBC's Mexican branch was in 2012 exposed for laundering money for some of Latin and South America's most violent drug cartels. The bank was accused of insufficient AML controls and not having conducted adequate risk assessments of their Mexican affiliate. The Department of Justice concluded a violation of the Bank Secrecy Act (BSA) between 2006 and 2010 (Department of Justice, 2012), after which HSBC signed a Deferred Prosecution Agreement and agreed to pay a record settlement of \$1.92 billion. (New York Times, 2012)

HSBC's market cap before scandal, at the first of January 2012 was around \$464,5 billion, and average trading in the last three months of 2011 was 2,130,806.

HSBC is a British registered bank but traded on the New York Stock Exchange. Therefore, like with Wells Fargo, S&P 500 has been used as a comparative market index. Bank of America has also been used as an industry competitor here as well.

When running a regression on HSBC's return against S&P 500 return we get a coefficient of 1.14⁴ with a constant very close to zero. This indicates that when S&P 500 index gives a return of 1 percent, the HSBC share will on average give a return of 1.14 percent.

Number of outstanding ordinary shares used to calculate market cap value; 2011 (17,868,085,646), 2017 (20,320,716,258). (HSBC, 2019)

Scandal

In early 2012 U.S. law enforcement officials revealed a major money laundering scandal at the Mexican branch of the British registered bank giant HSBC. The officials told a story of a banking branch cooperating with two of Latin America's most violent drug cartels, laundering at least \$881 million. (Permanent Subcommittee on Investigations, 2012)

Regulation implemented in 2002 requires all U.S. banks to conduct due diligence on foreign financial institutions before opening a U.S. correspondent account, with no exceptions for foreign affiliates. Despite this HSBC in the U.S. (HBUS) failed to conduct adequate due diligence on their affiliate HSBC Mexico, known as HBMX. HSBC Group had a long-standing policy that instructed an assumption of all affiliates meeting the Group's AML standard and that certain services, such as correspondent accounts, could be opened without further investigation and due diligence. In addition to poor standards for due diligence HBUS classified HBMX as being located in a low risk country despite the apparent issues faced in Mexico at the time, such as drugs, violence, and corruption. This allowed for more lax requirements on monitoring of wire transfers and account activities. (Permanent Subcommittee on Investigations, 2012)

Large sums in U.S. dollars were being transferred from HBMX to HBUS which alerted both the U.S. and the Mexican authorities. It was believed that such large sums could only be reached if some of that money came from illegal drug activities. With strict AML regulation drug cartels faced issues with depositing large amounts of U.S. Dollars in U.S. banks, and there was a concern that the traffickers transported their earnings to Mexico to deposit it there and then with the help of Mexican banks route it to enter the U.S. financial system. (Permanent Subcommittee on Investigations, 2012)

⁴ Statistically significant at a 1% significance level. Std. error 0.03.

After investigation the Department of Justice concluded that HBUS, between the years of 2006 and 2010, was in violation of the Bank Secrecy Act (BSA) and its implementing regulations. The violation was due to failure to identify risks and monitor suspicious activity connected to their affiliation with HBMX. This resulted in the laundering of hundreds of millions of U.S. dollars for drug cartels such as the infamous Sinaloa Cartel in Mexico and the Colombian Norte del Valle. The bank management was aware of significant AML problems but failed to inform HBUS and implement adequate controls to handle these risks. (Department of Justice, 2012)

On October 6th 2010 Cease and Desist Orders were served to HSBC in the U.S. and HSBC North America (HNAH). The orders were issued by the OCC and the Board of Governors of the Federal Reserve with regard to the aforementioned AML issues and BSA violations. The banking institution was given instructions to conduct a thorough assessment of compliance risks and form an action plan to manage these risks. (FED, 2010)

In the beginning of 2012 when this scandal was first revealed no direct negative market reactions can be discerned. *Figure 5* shows that HSBC for the most part managed to outperform our approximation of the share's price development, based on its previous relationship with market returns, during the first two and a half months of 2012. This could indicate that the market did not have a very strong reaction to the news of the money laundering scandal. No spikes in trading volumes during this time can be observed, which further indicates a mild reaction by the stock market.

Figure 5: Price development around the announcement of the HSBC scandal



U.S. authorities decided not to indict HSBC in the money laundering case due to fear that criminal charges could endanger the stability of the global financial system as criminal charges could lead to a suspension of HSBC's banking license in the U.S.. HSBC, as one of the world's largest banks, hold a systemic importance in the stability of the global financial system and the loss of their banking license could have devastating effects. As today's banking institutions are so intertwined the fall of just one can severely cripple the stability of the whole financial system, as had been observed with Lehman Brothers just a few years earlier. In other words, HSBC was deemed 'too big to fail' and no criminal charges were brought against the bank. Instead, a Deferred Prosecution Agreement (DPA) was signed and HSBC announced on the 7th of December 2012 that they had agreed to a record settlement of \$1.92 billion. (New York Times, 2012) This was not met with strong reactions by the market. The record settlement had no discernible direct effects on shareholder wealth or market cap value for HSBC, nor any effects on trading volume.

On January 26th 2018 the streaming site Netflix released a documentary series called "Dirty Money" in which each episode focused on a specific company or industry scandal. Episode number 4 put the HSBC case under a microscope for the whole world to see. The series gained much attention and soon most people, regardless of interest in finance, had heard about the "cartel bank" and how they laundered hundreds of millions of dollars, and consequently facilitated operations for at least two of the worlds most violent and bloody drug cartels. Following the release of Dirty Money HSBC saw a price decrease of 6.9 percent in the first week. However, given that both S&P 500 and Bank of America also saw price drops during that time, 7,8 percent and 6 percent respectively, it is likely that other factors affected the market at that time. The wealth loss that HSBC experienced does not substantially deviate from our approximation of the price development that HSBC could have seen without the scandal.

Although no part of this scandal seems to have triggered a direct strong market reaction the financial press argues that HSBC are lagging behind its industry competitors, such as J.P. Morgan Chase, and HSBC's own target of 10 percent yearly returns. (Financial Times, 2018) Indications of this can be observed in *Figure 7*. Here we can see that the HSBC share (blue line) managed to outperform our approximation of its price development (red line) even after the scandal had been revealed. However, around the beginning of 2014 something seems to have occurred and the HSBC share dropped below our estimation. It has since then continued to underperform in relation to its previous correlation to index returns. The discrepancy peaked around mid 2016 at over \$15. Since

around mid 2017 HSBC has started catching up to our approximation, but as of February 2018 the difference is still substantial.

Figure 6: Price development for the whole HSBC scandal period



4.3. Danske Bank

Den Danske Bank was founded as Den Danske Landmandsbank in Copenhagen in 1871 and is after several mergers with other Nordic banks one of the biggest actors on the Nordic banking market. Danske Bank started in Denmark and still has strong local roots, with most of its core businesses in Denmark and neighboring Nordic countries. Today the bank has expanded with presence in 16 countries and have over 20 000 employees. One of the bank's core visions is to be recognized as the most trusted financial partner, as their website states, "We can only run a sound, competitive bank and create value for our customers, shareholders and the communities we serve if they trust us to do so. Their trust is something we must earn - every day." (Danske Bank, 2018)

In the last two years money laundering issues and insufficient AML protocols in multiple banks has come to light. The Danske Bank scandal gained much attention after its announcement on March 20th 2017. It was found that money has been funneled from countries like Russia to tax havens without adequate verification of its origin. (Berglingske. 2017)

On the day before the scandal was revealed on the 20th of March 2017, Danske Banks market cap value was just over 216 billion DKK (Equivalent to around \$32,7 billion). Average trading volume from January 1st 2017 leading up to the scandal was 1,675,408.

Since OMX Copenhagen did not contain enough data points for this analysis a proxy in the form of OMX Stockholm has been used as a comparative market index. As an industry competitor the bank SEB which is traded on the Swedish stock market has been chosen, partly because of its similar size, but mainly because SEB was not included in the list of banks outed for money laundering in this scandal.

When running a regression on Danske Banks return in relation to OMX Stockholm's return for the two years prior to the scandal was revealed this gives us a coefficient of about 0.78⁵ with a constant very close to zero. This tells us that a 1 percent return on the index OMX on average would mean a 0.78 percent return on Danske Banks share.

Number of outstanding shares used to calculate market cap value is that at the previous year end, for 2016 that equals 935,259,793, for 2017 894,050,822 and for 2018 854,795,388. (Danske Bank, 2019)

Scandal:

On the evening of the 20th of March 2017 Berlingske Business together with journalist organization Organized Crime and Corruption Reporting Project (OCCRP), Russian daily Novaya Gazeta, and other media outlets revealed a massive money laundering scandal involving Eastern European branches of two of the biggest banks in the Nordic countries, namely Danske Bank and Nordea. They had found indications that large sums had passed through the banks without any verification of its origin or its purpose, as is required by international anti-money laundering regulations. (Berlingske, 2017a)

An investigation was launched by authorities in countries like Moldavia and Latvia whom suspected that billions had been hidden by international criminal networks through among others

⁵ Statistically significant at a 1% significance level. Std. error 0.04.

Danske Bank Estonia. Data revealed by Berlingske, OCCRP and Novaya Gazeta shows that around 7 billion DKK was transferred to the Danish Banks between 2011 and 2014. (Berlingske, 2017a)

Most of the money was found to have come from Moldova or Latvia, and sent from accounts belonging to British shell companies. These shell companies were suspected of funnelling money from illegal activity in, among other countries, Russia, through the Danish banks to recipients in tax havens such as the Seychelles or Panama. Many other banks were involved in the scandal, but Danske Banks involvement probably received the most attention in northern European media as it hits closest to home as well as being one of the banks who has been accused of laundering the highest amount connected to this case. (Berlingske, 2017a)

In the first few days after the scandal broke in the press the market had a mild reaction to the news. Danske Bank dropped 2.36 percent in first three days, while OMX Stockholm decreased 1.28 percent and SEB 0.5 percent. No spikes in trading volume following the exposure of the scandal can be discerned. *Figure 7* shows price development for the Danske Bank share (blue line) in comparison to our approximation of a price development without the scandal (red line), based on its previous relationship to OMX return. The difference between the two scenarios is not very significant even though we can see a small drop in actual price at the time of the announcement. If we compare our estimate to the results of Zeidan's (2013) study, the price development for Danske Bank follows his conclusions very well. Zeidan found the most significant abnormal returns the day after a scandal announcement at -1.58 percent, when the difference between our estimate of the return for Danske Bank and actual returns for the share was -1.57 percent. The Danske Bank share was back to the same price level as before the 20th of March about two weeks after the scandal was announced, which can be observed in *Figure 7*. After that our approximation started outperforming the real price development of the Danske Bank share, which lasted until around mid June the same year.

Figure 7: Price development around the announcement of the Danske Bank scandal



Further investigations by journalists also found that the Azerbaijani regime had used the same branch of Danske Bank to channel money to tax havens and European politicians. A scheme that sent the entire country to the streets to protest their regime as well as severe repercussions for politicians and officials all over Europe. (The Guardian, 2017b) This was revealed in September 2017 to which the market did not seem to pay heed. No discernible direct market effects due to these news can be observed.

Danske Bank management admitted to their lack of controls and flawed monitoring of these types of transactions. The bank has since worked on closing down the customers in question and improving their internal system for transaction monitoring. Flemming Pristed, General Counsel at Danske Bank, also admitted that it took longer than anticipated to settle all concerned customer relationships after having become aware of these issues in 2015. (Berglingske, 2017a)

It was later found that a warning had been issued by a British law firm concerning these transactions in 2013 to Danish authorities who had disregarded the accusations without conducting an investigation, partly due to that the alleged violations were outdated. At Danske Bank internal auditors had also raised warning flags regarding suspicious transactions in the Estonian branch and the top level management had been informed of the potential risk as early as the beginning of 2014, which goes against their previous statements. Internal letters from auditors to the top management tells a story of branch employees knowingly hiding these shell companies and their suspicious

transactions from authorities while earning large sums on said clients. The operation continued for over a year which indicates a conscious choice to keep bearing that risk. (Berglingske, 2017b)

The exposure of the "Azerbaijani laundromat" in September 2017 prompted an investigation by the Danish Financial Supervisory Authority (FSA). Their report was published on May 3rd of 2018 and stated their findings on the money laundering allegations against Danske Bank. The report was devastating to the banking institution and told the story of a major bank collaborating with criminal organizations to launder money and hide it from authorities. It also stated that Danske Bank had inadequate responses to the alarm of suspicious activity at the Estonian branch raised by a whistleblower, and failed to conduct proper internal investigations. During the FSA investigation of the money laundering allegations Danske Bank was also accused of withholding documentation and failing to comply with regulations in a timely fashion. (FSA, 2018)

Looking at the first few weeks after the report was published Danske Banks share price saw a small decrease of just over 4 percent while OMX Stockholm remained virtually unchanged and SEB dropped about 2.6 percent. This might not be a very significant direct market effect but if we broaden the perspective and look at the whole year of 2018, Danske Bank lost a total of \$16 billion in market cap value. *Figure 8* illustrates that around the time of the FSA report the Danske Bank share started to deviate substantially from our approximation of price development based on the share's previous correlation with index returns.

The bank admitted that much of the around \$230 billion that went through the Estonian branch of the bank between 2007 and 2015 can be considered suspicious in origin. Since, Danske Bank has replaced much of its management and tried to mitigate the AML risks. (Bloomberg, 2018)

Since the money laundering scandal involving Danske Bank is still relatively new no criminal charges have been brought and no monetary penalties have so far been exacted on the banking institution. This means that all market reactions we can observe for this case will be due to expectations of monetary penalties both direct and indirect as well as reputational penalties.

Danske Bank revealed in late November 2018 that they had built reserves of \$2.7 billion to cover potential fines connected to the money laundering case. Estimates of possible fines have however been placed as high as \$8 billion by certain analysts which has been deemed unlikely by Jesper

Berg, the head of Danish Financial Supervisory Authority. Danske Banks share price rose 6 percent following Bergs published statement regarding the inflated fine estimates and their unlikelihood. (Bloomberg, 2018) This could be interpreted as the market having discounted for a larger potential fine and that the price needed to adjust to new expectations of lower monetary penalties.

Looking at the Danske Bank money laundering case the direct negative market reactions to each stage were not very strong. If we however step back and look at the entire time period Danske Bank has suffered greatly in terms of shareholder wealth and market cap value. The Danske Bank share has gone from a level of between 220 and 230 DKK before the scandal to closing the year of 2018 on 128.9 DKK, which is a decrease of approximately 42 percent. That means a market cap value decrease from 216 billion DKK to just under 102 billion DKK in just under two years (equivalent to about \$17 billion). It should be observed that the majority of that wealth loss was during the second half of 2018 when there was a general market decrease. During that same period OMX Stockholm saw a decrease of around 11 percent, and the industry competitor SEB decreased with around 9 percent. Although it was a generally "sour" market, the loss of shareholder wealth that Danske Bank suffered is astounding in comparison to both index and industry competitor.

Figure 8 shows that the actual price development of the Danske Bank share and our approximation of a price development without the scandal, assuming a continuance of its previous correlation with OMX returns, are very close until around spring 2018. Early summer 2018, around the publication of the FSA report, the discrepancy between the real price development and our approximation increases significantly. As previously mentioned OMX too saw a price decrease during the second half of 2018, but considering that Danske Bank previously have had a tendency to fluctuate less than index returns, as seen in our regression results since the coefficient was 0.78, we can see a substantial deviation from that relationship. *Figure 8* illustrates the significant wealth loss that Danske Bank and its shareholders suffered in comparison to our estimation of the price level, had the scandal not been revealed.

Figure 8: Price development for the whole Danske Bank scandal period



Although no substantial direct negative effects could be observed around the events described in this case study, the Danske Bank share has since spring 2018 substantially deviated from its previous relationship with index returns. A significant short-term direct effect cannot be discerned but looking at a longer perspective Danske Bank has clearly been lagging behind and suffered great wealth losses. This is in accordance with Rao & Brook Hamilton (1996) who found that unethical behavior by corporations has a statistically significant negative effect on shareholder wealth.

The 114 billion DKK market cap value decrease can in part be attributed to fear of potential monetary penalties both direct in the form of fines as well as other indirect downstream costs due to the scandal. It can however be concluded that the loss of shareholder wealth is far more substantial than any estimation of monetary penalties from fines. Even if we consider the very inflated estimates of potential fines only a portion of the 114 billion DKK wealth loss can be attributed to this. The additional wealth loss that Danske Bank suffered could be interpreted as a reputational effect due to the perceived unethical behavior. The wealth loss suffered by firms can according to the results of Karpoff and Lott's (1993) study in part be attributed to a reputational factor which captures lower future profits due to lower output or higher input prices.

4.4. Volkswagen

In the early 1900 the American mass production of cars inspired talks about a "Volkswagen", a people's car, that could be available for the masses instead of being considered a luxury item. The first Volkswagen design was commissioned to Ferdinand Porsche in 1934 but it was not until three years later that the company later to be called Volkswagen was founded in Berlin. Adolf Hitler coined the name "KdF-wagen"⁶ for the original model commissioned to Porsche and during World War II Volkswagen produced military equipment and vehicles. After the fall of the Third Reich the British Military Government took over administration in trusteeship. Since the British Military had an increasing demand for transportation the production plant again became an assembly line for commercial cars. (Volkswagen, 2019)

Fast-forwarding 75 years Volkswagen is one of the largest producers of commercial cars sold in most parts of the world. (Volkswagen, 2019) Volkswagen made a name for itself during the rise of diesel vehicles for having low levels of toxic NOx emissions, which has been a long-standing issue for all diesel motor manufacturers. Diesel engines became popular due to its low carbon dioxide (CO₂) emissions but emitted the far more toxic NOx and everyone wanted to find a way to burn NOx before it left the exhaust system, but it was expensive and difficult. It seemed as though Volkswagen had solved the technical enigma and had the whole automobile industry in awe of its success. (The Guardian, 2017a)

As it turned out, the reason for the low NOx emission levels was the fact that many diesel cars had so called "defeat devices" installed. These could alter its software when being tested to show lower emission levels. The defeat devices in Volkswagen diesel cars was revealed in 2015 after a group of researchers had found abnormal emission levels in some Volkswagen models. (EPA, 2015) This led to outraged customers and eventually Volkswagen had to spend up to \$14.7 billion on settlements, buybacks and lease terminations. (EPA, 2017)

The day before the infamous Volkswagen emissions scandal was revealed Volkswagen AG's market cap value was €76.7 billion (equivalent to approximately \$85 billion). Average trading volume in the two weeks leading up to the scandal was around 61,000 shares.

⁶ KdF stands for "Kraft durch Freude" which in English translates to "Strength through Joy"

Volkswagen AG is traded on the German market which is why the German index DAX is used as a comparative index. As a comparative industry competitor I have chosen the company Daimler who operate within the same industry and is also traded in Germany.

When running a regression to find an indication on the relationship between Volkswagen AG and its index comparison, DAX, for the two years leading up to the scandal we get a coefficient of 1.04⁷. This tells us that a 1 percent return for DAX index would on average mean a 1.04 percent return on Volkswagen common share.

Number of outstanding shares registered at annual general meetings of 2015 (475,731,296) and 2016 & 2017 (501,295,263) is used to calculate market cap value . (Volkswagen 2015, 2016 & 2017)

Scandal:

In September 2015 it was revealed that Volkswagen had installed devices to cheat emission testing, so called "defeat devices", in diesel cars sold in the United States. The Environmental Protection Agency (EPA) published a notice of violation on the 18th of September 2015 in which an ongoing investigation by the EPA of Volkswagen AG, Audi AG and Volkswagen Group of America was announced. The investigation concerned violations against the Clean Air Act (CAA) because of defeat devices installed in certain car models. Defeat devices aim to bypass or defeat emissions controls in accordance with CAA emissions standards. The device would be able to detect when being tested and switch to a software with testing calibration to alter its performance which would show CAA compliant emission levels. During actual driving the software would switch to a road calibration with far higher emission levels. (EPA, 2015)

The Volkswagen emission issues were brought to the EPA's and the California Air Resources Board's (CARB) attention when the West Virginia University's (WVU) Center for Alternative Fuels, Engines & Emissions published a study in May 2014. The study was commissioned by the International Council on Clean Transportation and found very high emission levels in two popular Volkswagen models. The research team at WVU found emission levels up to 40 times higher than certified levels. Volkswagen addressed the results of the study and attributed the high NO_x levels to

⁷ Statistically significant at a 1% significance level. Std. error 0.38.

various technical issues and unexpected in-use conditions. A voluntary recall by Volkswagen to mitigate the accusations and further investigations by CARB, in coordination with the EPA, were conducted to try to address the emission issues. CARB found that none of Volkswagens explanations of various technical issues could be the cause of the reported abnormally high NOx levels. Under the threat of no issued certificates of conformity for Volkswagens 2016 model year diesel vehicles until the issue was resolved, the car manufacturer finally admitted to installing so called defeat devices. (EPA, 2015)

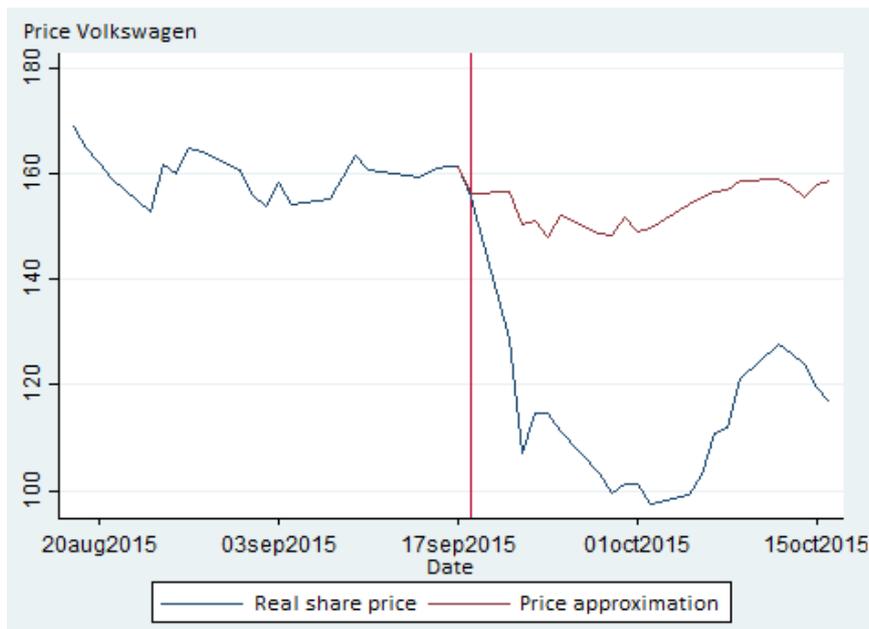
Volkswagen said the fraud was limited to a small group of employees and that management was unaware. It was however soon revealed that emails between members of management indicated some insight into these issues and neither Head of Volkswagen U.S. Michael Horn nor Volkswagen CEO Martin Winterkorn lasted much longer on their posts. (The New York Times & The Guardian, 2016)

The first week after the emissions scandal was exposed had devastating effects for the German car manufacturer, as can be observed in *Figure 9*. Volkswagen AG shares saw a drop of around 36 percent, decreasing their market cap value with around €27 billion (equivalent to around \$30.5 billion). A significant drop for a large company traded on a market like Frankfurt can have disastrous effects for the whole market, and both comparative index DAX as well as industry competitor Daimler took a hit during the first week. DAX was down 4.7 percent and Daimler 12.5 percent during Volkswagens dramatic decrease. If the company had continued its previous relationship with market returns the drop would have been far less, and as such the scandal has to have a large explanatory value in this scenario. The difference to its industry competitor, Daimler, is also palpable. In the two weeks following the exposure of the scandal trading volume in the Volkswagen share spiked and had an average of around 1,112,000 shares, over 18 times the average trading volume in the two weeks leading up to the scandal. In the beginning of October Volkswagen AG share price had decreased a total of almost 40 percent.

Looking at the real price development of Volkswagen AG share in comparison to our approximation of the price development, as shown in *Figure 9* below, we can see a substantial discrepancy between the two. In our approximation a slight drop can be discerned following the scandal as DAX also saw a decrease at that time. It is however minor in comparison to that of the actual price of Volkswagen AG. The day after the emissions scandal was revealed the difference between

Volkswagen's real return and our estimated return, based on index returns, was around -18.5 percent. This indicates significant abnormal negative returns for Volkswagen on the day after the announcement of the scandal. The difference between the real price level and our price approximation reaches its peak around two weeks after the exposure of the scandal at around €50.

Figure 9: Price development around the announcement of the Volkswagen scandal



The time following the exposure of the emissions scandal was a turbulent time for the German car manufacturer. After extensive investigations Volkswagen was required to spend up to \$14.7 billion on buybacks, lease terminations, customer compensations, actions to mitigate pollution, and investments to support green vehicle technology. The buybacks and lease termination include nearly 500,000 diesel cars of model year 2009-2015 sold or leased in the U.S. This vast amount was published by the EPA in the end of June 2016. (EPA , 2017) Looking at late June to beginning of July of 2016 Volkswagen AG share lost a bit over 12 percent and average trading volume more than doubled in comparison to the beginning of June. The market clearly reacted to something during this time but since but comparative index DAX and industry competitor Daimler also took a dive during that same time period it seems unfair to attribute it entirely to the news of the settlement amount. An interpretation of the relatively mild reaction to the large settlement amount could be that shareholder already had expected a large settlement amount and that it had already been accounted for in the share price. This would mean that no correction was needed when the estimated amount was published.

On the 26th of January 2018 the Volkswagen emissions scandal was brought into the light again through the release of Netflix's documentary series *Dirty Money*. As for HSBC, one of the episodes focused on the scandal involving the car manufacturer and its environmentally disastrous defeat devices. The Volkswagen episode told an incriminating story of a car manufacturer started to serve the average German citizen and who built some of its success on the technology that allegedly solved the long-standing issue of high NOx emission from diesel engines. This "environmentally progressive" corporation was one third into the episode turned into a company who tricked their customers and regulatory authorities for years for profits.

Following the release of the Netflix series Volkswagen AG share price decreased 7.16 percent in the first week and the average trading volume in the two weeks following January 26th increased over 35 percent compared to the two weeks leading up to the documentary release. Comparative index DAX also took a dive of about 4.89 percent and Daimler was down around 5.49 percent during the first week. Given that both Volkswagen AG as well as DAX and Daimler saw a quite large decrease it could indicate some other factors affecting the market at that time.

If we look at the entire time period from one month before the scandal broke until one month after the Netflix documentary series was released, as is illustrated in *Figure 10*, we can see a clear drop following the initial announcement of the EPA notice of violation. This was followed by a quick bounce back where Volkswagen regained some of its market cap value loss. The scandal had a clear direct negative market effect and it took Volkswagen AG a long time to reach the value it had before the emissions scandal was exposed. Around the other two events that have been brought up in this study we can also see a slight drop in Volkswagens share price, although considering the fact that both comparative index and industry competitor also saw large drops around those events it is likely that other market or industry factors have affected the share price as well. We can however discern a larger negative effect for Volkswagen in comparison to market index that deviates slightly from Volkswagens previous relationship to index returns. This could indicate that our events have had some effect on the Volkswagen AG share price around the announcement settlement amount and the release of the Netflix documentary series.

Looking at the entire time period of the scandal, as seen in *Figure 10* below, we can observe a substantial price decrease at the time of the exposure of the scandal (blue line), which had a clear

deviation from our approximation of Volkswagen AG's price development without the scandal (red line). This discrepancy was never regained and Volkswagen continued on a far lower price level than our approximation for the entirety of our observed scandal period.

Figure 10: Price development for the whole Volkswagen scandal period



In the wake of the Volkswagen emissions scandal we can see clear direct negative effects on share price and market cap value, which substantially deviated from the share return's previous correlation with index return according to our approximation. This could indicate abnormal returns for Volkswagen AG in accordance with the Rao & Hamilton (1996) study on wealth effects of unethical conduct by corporations. Rao & Hamilton found statistically significant negative effects on stock prices around the time of a scandal announcement and this seems to be the case for Volkswagen as well.

The wealth loss that Volkswagen suffered following the scandal was substantially greater than any fines incurred or costs of buybacks and lease terminations, and can be interpreted as a reputational effect indicating decreasing expectations of future profits. Karpoff & Lott's (1993) study found that a rather small portion of the wealth loss for a firm following a scandal can be attributed to an estimation of expected fines and legal fees incurred on the corporation. The rest could have its origin in a reputational penalty taking into account a lower present value of future output prices or higher input prices.

Volkswagen was founded to build cars for the masses and built some of its success on its environmentally progressive image which could also have an impact on the wealth loss the car manufacturer suffered due to the exposure of the emissions scandal. Bhagat et al. (1998) conducted a study to observe variations in wealth effects due to the characteristics of the suit brought against a firm. They found that several factors, such as identity of plaintiff and type of suit can have an effect on the wealth loss incurred on a corporation. They found that government lawsuits had a larger negative effect on wealth than suits where a private party or another corporation acted as plaintiff. The results of the study also concluded that environmental suits resulted in a more substantial wealth loss than other types of suits. The Volkswagen case is an environmental scandal investigated and revealed by the U.S. regulatory authorities which means that it belongs to both categories of suits that lead to the largest negative effect on shareholder wealth. This could give some explanation to the substantial wealth loss that Volkswagen AG suffered due to the scandal.

5. Discussion

Looking at each of the cases studied in this paper they all have unique characteristics regarding short term and long term market reactions as well as the magnitude of the wealth loss suffered. Following the Wells Fargo "fake-accounts scandal" and the Volkswagen emissions scandal large direct negative market reactions can be observed. In both cases the firms deviated substantially from our price approximation, based on previous relationship with index returns, in the time following the exposure of the scandals. On the day following the announcement of the Wells Fargo scandal, which is when Zeidan (2013) found the most significant abnormal returns for his sample, the difference between actual returns and our estimated return is minor. The difference indicates a positive abnormal return for the Wells Fargo share of 0.44 percent. However, in the days that followed, Wells Fargo dropped far below our price approximation which indicates a substantial wealth loss effect shortly after the scandal was revealed. If we conduct the same comparison for Volkswagen, between real and estimated returns for the day after the scandal announcement, we get a negative abnormal return of 18.5 percent. Both scandals led to large market cap value losses for the companies directly following the scandals and despite quick bounce backs they have seen some difficulty in catching up to our price approximation during the scandal period. Volkswagen has since the exposure of the emissions scandal not caught up to our approximation of the price development the share could have seen, had the scandal not been revealed. In Wells Fargo's case the

market cap value they had before the announcement of the FED restrictions in February 2018 had at the end of our observation period not been regained.

In contrast, for Danske Bank it was more difficult to observe a substantial direct effect that clearly deviated from comparative index or industry competitor returns due to the revelation of the money laundering scandal. None of the events of the Danske Bank scandal described in this study seems to have affected the share price in such a substantial direct way that it did for Wells Fargo and Volkswagen. However, when comparing our return estimation to the real price development we can discern a slight difference in return on the day following the announcement of the scandal of -1.57 percent, which was in accordance with the results of Zeidan's (2013) study. If we look at the entire timespan since the scandal was revealed Danske Bank has suffered great losses in terms of market cap value and shareholder wealth, as can be observed in *Figure 8*. There we can also see that there is a significant discrepancy between Danske Bank share price and our approximation starting around spring 2018 which clearly deviates from its previous relationship with OMX index returns.

Reactions to the HSBC money laundering scandal were also moderate in comparison to those for the Wells Fargo and Volkswagen scandals. No substantial direct negative effects due to any stages of the scandal can be discerned. Financial press has however reported that HSBC returns have been lagging behind its industry competitors, such as J.P. Morgan. A deviation from HSBC's previous relationship with S&P 500 can be discerned during the second half of 2015 as is shown by our comparison between actual price development and our price approximation in *Figure 6*. This could indicate a support for the theory that HSBC has been lagging behind the market during the last few years.

One interpretation of the direct negative effect seen for Wells Fargo and Volkswagen, in comparison to the other two cases in this study, is their relative direct impact on their customers. Both the Wells Fargo and the Volkswagen scandal included cheating a large number of their customers for profit in a far more direct way than Danske Bank or HSBC, which both concerned money laundering in foreign branches of the corporations. The direct effect that the Wells Fargo and Volkswagen scandals had on their domestic customer could be a factor when evaluating why this variation can be discerned.

In these case studies we can see indications that the results of Rao & Hamilton 1996 study, which concluded statistically significant negative effects for unethical conduct by corporations in the months following the announcement of a scandal, for at least three companies hold true. Such direct negative effects for HSBC cannot be substantiated given the chosen method of this case study as the discrepancy between our approximation and actual price development could not be discerned until a few years after the exposure of the money laundering scandal.

We can also see that for the three companies that saw substantial negative market reactions due to the exposure of a scandal suffered wealth losses far greater than any estimation of potential fines or legal fees. This is in agreement with the results of Karpoff and Lott's 1993 study which concluded a reputational component to the penalty exacted on firms acting in a fraudulent manner. For the two banks, Wells Fargo and Danske Bank, the reputational penalty could be connected to the nature of the banking industry as described by Zeidan (2013). He proposes that trust is an essential component of the function of their day to day operations. This could indicate that actors in the banking sector should be especially vulnerable to such scandals. The loss of trust in a banking institution could hinder the operations of the bank and in extent, due to the interconnectedness of banking institutions around the world, the stability of the global financial system. The reputational component of the wealth loss suffered by firms due to fraudulent behavior captures lower present values of output prices or higher input prices, which for the banks could mean lower demand for their financial services or higher input prices due to for example higher lending rates.

A reputational component is also indicated in the very large market cap value decrease for Volkswagen AG that far exceeded any possible fines. Here however, we also had a component of expectations of potential buybacks which could have influenced the price decrease. Although the total settlement amount for fines as well as buybacks and lease terminations was large no possible estimations could warrant such a substantial wealth loss that Volkswagen saw during the first week after the emissions scandal was revealed. The large value decrease could be connected to the characteristics of the scandal, as described by Bhagat et al. (1998). The emissions scandal was an environmental suit brought by the U.S. regulatory authority, which means it belongs to a combination of the two categories of suits which Bhagat et al. concluded resulted in the greatest wealth loss for a firm.

The choice that each of these firms made to prioritize short term profits over long term effects of socially responsible behavior is in contradiction to the conclusions of Frooman's (1997) study. He argued that the established negative effects of unethical behavior should deter from acting in a socially irresponsible manner. His study concluded that it is in a firm's best interest to act in a socially responsible way since CSR arguments of enlightened self-interest, where stakeholders can recognize and account for tangible and intangible downstream costs, was given empirical support by his meta study. In each of the cases in this study it seems a corporate culture had been created which did not deter from, but effectively encouraged unethical or even unlawful behavior. All corporations chose to prioritize short term profits over long term positive effect of socially responsible behavior.

6. Conclusions

In this case study we can observe negative effects for all corporations, where at least three can likely be directly connected to the scandals. For two companies, Wells Fargo and Volkswagen, we can see strong direct negative effects on their market cap values immediately after the announcement of their scandals. This wealth loss can likely be attributed both to potential fines and other monetary penalties as well as a reputational component. The wealth effects were substantial, which is in accordance with the results of both Rao & Hamilton's (1996) study, as well as the similarly conducted study by Zeidan (2013) specifically for the banking sector which found smaller, but still statistically significant, negative effects for banking institutions.

Regarding Danske Bank and HSBC, we can observe more long term negative effects that at least in Danske Bank's case likely can in part be attributed to the money laundering scandal. This means Danske Bank's wealth loss too is in accordance with the studies conducted by Rao & Hamilton as well as Zeidan (2013). Our method does not allow us to make a clear connection between the scandal and the wealth loss that HSBC suffered several years after the scandal was revealed.

Zeidan chose to study banks due to the special nature of the industry, hypothesizing that this would make banks especially vulnerable to the loss of trust following a corporate scandal involving unethical behavior. This is not something we can substantiate in this case study, where the wealth loss that the banks suffered varied substantially. It rather seems for our cases that the characteristics of the scandal had a greater impact on the effect on market cap value, which indicates support for

results from the Bhagat et al. (1998) study. The scandal among our cases that resulted in the greatest direct negative effect was the Volkswagen emissions scandal. This could give some support to the conclusion of Bhagat et al. (1998) that environmental suits result in the most substantial wealth loss.

The fact that the specific characteristic of the scandal seems have the highest explanatory value in our cases supports the additional value that a case-by-case method could give to gain a thorough understanding of the impact of a scandal. However, in most quantitative event studies on the wealth effects of unethical behavior the category of scandal is included and could thereby be controlled for. In conclusion I cannot find solid evidence that a case study on average would give a much deeper understanding of wealth loss effects due to a scandal than an event study with a larger sample. The quantitative studies give a good indication on the approximate negative effects of unethical corporate behavior.

A result of this study that could be subject for further investigation is the variation in time in takes for the market to react to the announcement of the scandal. For Wells Fargo and Volkswagen we saw clear direct market effects but for Danske Bank and HSBC the direct effects to the scandals were minor. If we however step back and look at a longer time period they have both suffered greatly in terms of market cap value. For HSBC I was not able to substantiate a direct connection to the scandal announcement but they have clearly been lagging behind for some reason. Looking at common traits for a larger sample could give some indication as to why this delayed effect for Danske Bank and HSBC was observed.

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