

Forensic Accounting: Impact of Fraud on Stock Price

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ABSTRACT: *The business world is growing tremendously and the competition is therefore increasing proportionately. Unfortunately, excessive competition nowadays implies that the number of fraudulent activities which includes manipulation of accounting data, insider-trading, etc. are sky-rocketing. Due to this, recently the concept of forensic accounting has been gaining wide scale popularity in the field of finance. This paper attempts to analyze the impact of fraud announcements resulting from prudent forensic accounting investigations on the criminal company's share price. This paper by the usage of multiple statistical tools, tries to compare the difference of this impact on the selected company's which are belonging to different industries. For this purpose, 3 companies have been picked including Volkswagen (Automobile industry), Valeant Pharmaceuticals, which is now Bausch Health Companies Inc. (Pharmaceutical industries) and Toshiba (mainly Electrical and Electronics industry). A study is also made in this research to understand the effect of new privacy legislations on forensic accounting investigations. The findings in this paper can be used in predicting the possible downfall that a company could face due to illicit activities committed by it.*

KEYWORDS- *Forensic accounting, share prices, privacy legislation*

Date of Submission: 04-01-2019

Date of acceptance: 19-01-2019

I. INTRODUCTION

In the 1930s, an accountant with the Internal Revenue Service, Elmer Irey, was the brain behind ensuring the conviction of Al Capone for tax evasion. It was one of the first widely publicized uses of forensic accounting. This was not the first time forensic accounting was brought into the picture to uncover frauds. In the year 1817 in the case of Meyer v Sefton for the first time in history an accountant acted as an expert witness. But forensic accounting did not gain popularity and importance until years later in the 20th century when the Enron scandal was discovered. It brought out a lot of gaps in the legislation that was currently existing to prevent such accounting frauds. In the aftermath of the Enron scandal the Sarbanes Oxley act was introduced in 2002 which offered considerable amount of protection to whistleblowers which increased the demand for forensic accountants. Ever since then forensic accounting has been gaining popularity. In the following years there has been many advancements in the field of forensic accounting.

II. REVIEW OF LITERATURE

1. Forensic accounting has seen much evolution over time. Many factors including societal, economic and technological impacts have caused it to alter and transition into its current state. It was named as a profession in the early 1900s and it has transformed a great deal on how frauds are approached and treated. It was revealed in 1990s by the FBI that white-collar frauds comprised a negligible amount of 5% of the total frauds committed but the impact of this was still rather huge. These white-collar frauds is the cause of 95% of the financial losses adhered by the sufferer. Therefore, forensic accounting has become very relevant in the recent years in order to alleviate the losses and recuperate them if viable. (Manning, 2005)
2. In a study conducted by Zabihollah Rezaee and Larry Crumbley, the concept of an expectation gap has been talked about. The expectation gap mentioned, is about the expectation by the users of financial information on the auditors and its variance from what they actually take responsibility for. To minimize this gap, auditors are expected to conducted 'forensic-type' functions to ensure that all frauds are detected and ensure reliability of financial statements. These measures were taken so that the name and culture of the accounting and auditing function would be revived by the utilization of powerful fraud detection techniques and efficient reporting. (Rezaee & Crumbley, 2007)
3. A research by James A. Ohlson 1995, it talks about how the stock prices of a company are influenced by the financial statements and financial information published by a company. Elements such as earnings, dividends and book values of various assets are taken into consideration while doing an equity valuation. This paper acts as a benchmark in analyzing how accounting data influences the market price of a company's share. (Ohlson, 1995)

4. A research conducted by Rodiel C. Ferrer and Alger Tang told about how financial ratios namely return on asset, asset turnover, dividend payout ratios and price- earnings were seen to have significant on the stock prices of listed companies shares but corporate restructuring's like mergers, acquisitions, takeovers, etc are not perceived to be relevant to the change of stock prices over the years.(Tang & Ferrer, 2016)
5. Branka Mraovic introduced data mining as a new efficient tool that would prove to be largely effective for the purpose of accounting and forensic kind of works. Information can be analyzed in the most systematic manner in order to provide results which are proactive. But the major issue that arises while doing so is concerns with legalities, ethics and personal privacy. This limits the functions of data mining from being used in a way that crosses a particular limit.(Mraovic, 2008)

III. RESEARCH DESIGN

The paper has taken into consideration the prices of 3 publically traded fraudulent companies which are present on the stock exchange which include:

NAME OF COMPANIES	INDUSTRY
Volkswagen	Automobile
Toshiba	Conglomerate Mainly Electrical and Electronics
Valeant Pharmaceuticals	Pharmaceuticals

1. Statement of a Problem

- Forensic accounting is one of the most recent addition to the field of finance which help detecting the discrepancies and irregularities in financial data. These frauds have a rather significant impact prices of publically traded companies on the stock exchange they in turn influence the investors wealth
- It is understood that fraud announcements are likely to impact the stock prices but no previous studies have really studied how these prices are effected and the extent of their influence.
- Due to recent outburst of internet usage, personal information and data are easily accessible and they are increasingly susceptible to misuse. Many laws and acts have been introduced for this purpose in order to safeguard the victims. But forensic accounting implies usage of information of a person not necessarily with their consent, for the purpose of investigations. The issue occurs when both of these overlaps.

2. Objectives of Study

- i) To analyze the impact of fraud announcement on the stock price of the company and compare them on the basis of industry
- ii) To study the impact of privacy legislations on forensic accounting investigations in workplace

3. Sources of Data

Secondary sources of data were utilized for the purpose of this research. The sources include websites such as:

- <http://www.nasdaq.com>
- <http://www.bloomberg.com>
- <https://mfacc.utoronto.ca/program-0/research-projects>
- <https://financials.morningstar.com/>

4. Limitations of the Study

- This study is limited to companies that are listed on NASDAQ and only those prices that are quoted on the exchange.
- It is limited to companies that are still in existence even after the announcement of the corporate fraud.
- The study is limited to the cases of 3 companies
- The study uses only secondary sources of data for analysis
- The impact of the fraud announcement on other companies belonging to the same industry have not been studies
- The other factors influencing stock prices have not been taken into consideration
- Only a 5 year period has been taken for the purpose of this research

5. Hypothesis

H₀: There is no significant impact of fraud announcements on a company's stock prices

H₁: There is a significant impact of fraud announcements on a company's stock prices

6. Data Analysis Tools

Anova is a statistical tool which is the short form for analysis of variances. It is used to test if two or more differ significantly from each other on the basis of different characteristics and features. One way Anova is one where only one such factor or characteristic is considered.

The assumptions of one way Anova include:

- Each sample has been taken from a normally distributed population
- Each has been taken independently of the other samples
- The variance of each group is equal.

Another key statistical tool used in T-test. A t test is a kind of test that tests if there is a significant difference in the means of two different groups. A t-test finds the t-statistic, the t-distribution values and the degrees of freedom to find the probability of difference between the two different groups of data.

Assumptions of t test are:

- That the dependent data is normally distributed.
- That the variances of the two groups are equal.

Ratio analysis are other key tools commonly used for the purpose of analyzing a company's financials. The ratios used for our study include:

- **Net profit margin**

It is the ratio of the net profit or net income to the revenue of the company. It is a measure of how much of the revenue of the company is being converted into profit for the company.

$$\text{Net Profit Margin} = \frac{\text{Revenue} - \text{Cost of Goods Sold} - \text{Operating expenses} - \text{Other expenses} - \text{Interest} - \text{Taxes}}{\text{Revenue}} \times 100$$

- **Return on equity**

It represents the return that the shareholders of the company earn on their equity. If the return on equity is high it means that the company's is using the shareholders' funds efficiently. The formula for calculating return on equity is:

$$\text{Return on equity} = \frac{\text{Net income} \times 100}{\text{Owners equity}}$$

IV. DATA ANALYSIS

1) Analyzing the impact fraud announcements on stock prices of a share (industry wise)

The companies that are used for this paper include 3 publically listed companies who grabbed the headlines due to the alarming scandals committed by them. These 3 companies include:

- Volkswagen (Automobile industry)- They had committed the infamous Emission scandal. The fraud was announced on 21st September, 2015. They were asked to pay \$2.8 billion as a criminal fine.
- Toshiba (Conglomerate but mainly involved in Electrical and Electronics)-They were involved in an accounting scandal by using irrelevant techniques of accounting and inflating the profits by \$4.1 billion. This scandal was announced on 21st July, 2015.
- Valeant Pharmaceuticals (Pharmaceutical industry)- This scam involved hiking the prices of the medicines tremendously. This scam was disclosed on 28th September, 2015. The impact of the fraud was extremely huge on the company that they recently changed its name to Bausch Health Companies Inc., is hope of redemption.

A) Hypothesis testing :

i) ANOVA:

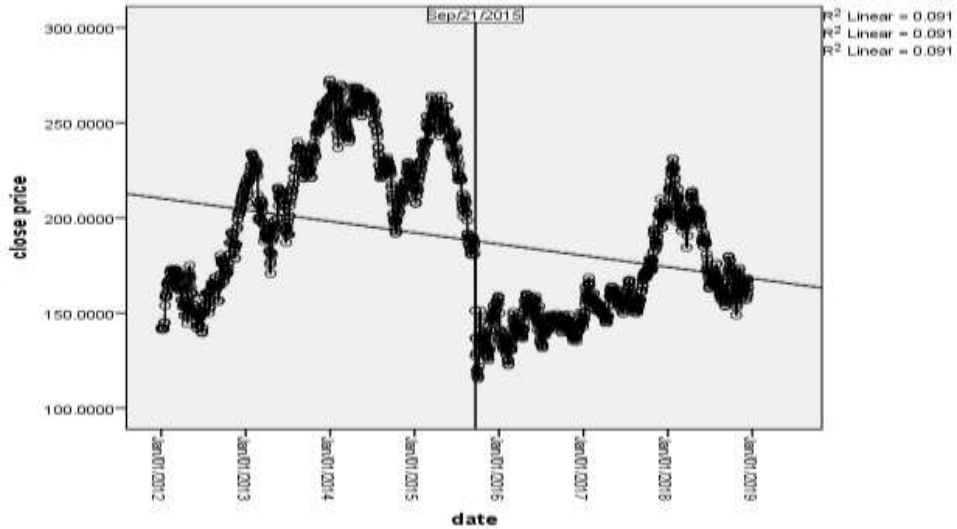
VOLKSWAGEN

close price

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1175383.197	1	1175383.197	1261.367	.000
Within Groups	1628843.207	1748	931.832		
Total	2804226.404	1749			

H₀: There is no significant impact of fraud announcements on a company's stock prices
 H₁: There is a significant impact of fraud announcements on a company's stock prices

As the p-value is less than 0.05, we reject the null hypothesis; this implies that stock prices of Volkswagen are impacted by the announcement of fraud.

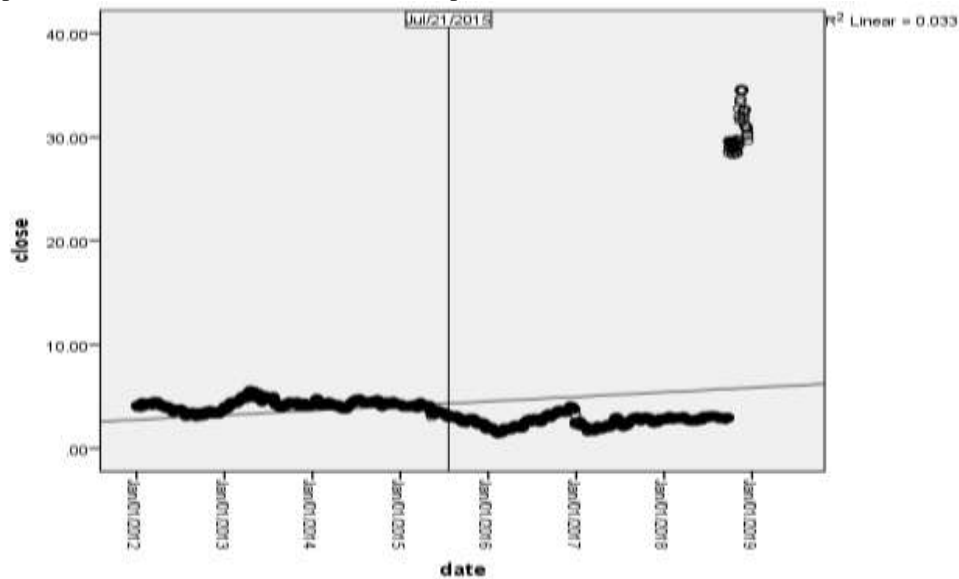


TOSHIBA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	43.610	1	43.610	1.834	.176
Within Groups	41574.109	1748	23.784		
Total	41617.719	1749			

H₀: There is no significant impact of fraud announcements on a company's stock prices
 H₁: There is a significant impact of fraud announcements on a company's stock prices

As the p-value is more than 0.05, we accept the null hypothesis; this means that there is no significant relationship between fraud announcement and stock prices.



VALEANT PHARMACEUTICALS

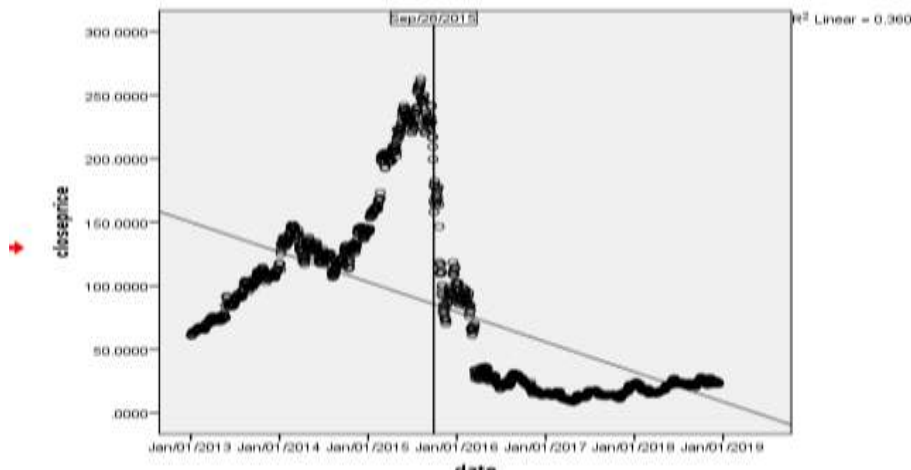
closeprice

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4117390.250	1	4117390.250	2275.050	.000
Within Groups	2709273.213	1497	1809.802		
Total	6826663.462	1498			

H₀: There is no significant impact of fraud announcements on a company's stock prices

H₁: There is a significant impact of fraud announcements on a company's stock prices

As the p-value is less than 0.05, we reject the null hypothesis; this implies that stock prices of Valeant Pharmaceuticals was impacted by the announcement of fraud.



ii) T TEST ANALYSIS

VOLKSWAGEN

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
close price	Equal variances assumed	217.851	.000	35.516	1748	.000	51.9546177	1.4628619	49.0854743	54.8237611
	Equal variances not assumed			36.512	1624.284	.000	51.9546177	1.4229539	49.1635996	54.7456358

As the t calculated value is more than the tabular value of two tailed with 95% confidence interval the null hypothesis is rejected.

TOSHIBA

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
close	Equal variances assumed	224.466	.000	-1.354	1748	.176	-.31578	.23320	-.77317	.14160
	Equal variances not assumed			-1.328	866.232	.184	-.31578	.23774	-.78239	.15082

As the t calculated value is less than the tabular value of two tailed with 95% confidence interval the null hypothesis is accepted.

VALEANT PHARMACEUTICALS

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
closeprice	Equal variances assumed	208.313	.000	47.697	1497	.000	105.1737081	2.2050156	100.8484599	109.4989563
	Equal variances not assumed			45.898	1087.012	.000	105.1737081	2.2914814	100.6774806	109.6699356

As the t calculated value is more than the tabular value of two tailed with 95% confidence interval the null hypothesis is rejected.

B) Ratio Analysis :

i) Net Profit Margin

COMPANY	2013	2014	2015	2016	2017
Volkswagen	4.60	5.36	-0.74	2.37	4.92
Toshiba	1.34	0.78	-0.57	-8.12	-19.83
Valeant Pharmaceuticals	-15.01	11.05	-2.79	-24.90	27.56

The fraud announcement resulted in a loss making year for Volkswagen but it was able to earn profits from the next year onwards. Toshiba which was profitable before the announcement continued to make increasing losses in the 2 years following the fraud announcement. Valeant suffered the highest losses among the three companies of 24.90 % in the year following the fraud announcement but was again profitable in the year after that.

ii) Return on equity

COMPANY	2013	2014	2015	2016	2017
Volkswagen	10.97	12.21	-1.78	5.69	11.27
Toshiba	8.15	4.49	-3.27	-65.12	0
Valeant Pharmaceuticals	-19.60	17.52	-5.20	-53.16	53.42

The shareholders of Volkswagen lost the least among the three companies studied. The shareholders of the other two companies suffered losses of equity to the tune of 50-60% in the years following the fraud announcement. Although two years after the incident all the companies were able to not have a negative return on shareholders' equity.

2) Studying the impact of the privacy legislations on forensic accounting investigations in the workplace

Plenty of new acts have come about recently due to the issues that the increased usage of internet causes which includes problems relating to identity theft, hacking, vulnerability of data to improper use, etc.

One such act that gained much popularity is PIPEDA (Personal Information Protection and Electronic Documents Act). Any organization has a fundamental obligation to protect the interest and safeguard an individual's privacy. But unfortunately, the conflict arises when the organization has to overrule this privacy legislation for the purpose of investigations relating to forensic accounting.

It is very that as individuals, we know what our rights for privacy are and when we can exercise it. The acts introduced for the purpose of privacy protection have some loopholes which are in the form of exceptions. As a result of this, the court has (Tang & Ferrer, 2016)declared that any organization can break the privacy barrier if the company has substantial evidence and a proper reason. They should also be able to illustrate this otherwise the right of the organization to be invasive in such scenarios will be denied.

The organization is also demanded to fulfill another very key requirement. This is that data gathered, utilized and disclosed are all relevant to the particular situation at hand.

The field of information technology is evolving rapidly. The courts and the acts are trying to keep up with the pace of these innovation to ensure that all possible issues can be addressed and taken care of by it.

V. FINDINGS & INTERPRETATIONS

In this paper we have studied how the stock prices of a publically listed company would be impacted after the announcement of a major scam in that company. Various statistical tools were used for the purpose of analysis which are namely Anova, T Test and Ratio analysis. From the tests we were able to conclude that all

the companies were impacted differently by the scandal announcement. The stock price of Volkswagen fell but it is seen that its stock prices have now been restored. Toshiba barely saw any change in price. Its price pretty much remained the same and currently its prices are seeing an unbelievable hike. Finally Valeant Pharmaceuticals saw its share prices plunging towards the bottom. The fall was devastating making it very hard for Valeant to cope due to which they changed their name to Bausch Health Companies Inc., hoping that that would help them restore their position. Valeant Pharmaceuticals recorded the highest net loss margin in the consecutive periods and Volkswagen had the least impact among the 3 when it came to the ROE ratio. Another major element that was analyzed in the paper was how the introduction of new acts relating to privacy is making forensic accounting investigations in companies more difficult. Exceptions are studied under these privacy legislation acts to see how investigative forensic accounting can be carried on subsequently without illegally breaching any individual rights.

VI. CONCLUSION

Forensic accounting is currently in its budding stage and is gaining unbelievable popularity especially among the large scale auditing firms due to the snowballing of frauds and scandals. Constant attempts are taken to ensure that these risks can be mitigated and the burden of loss on victims can be minimized, hopefully completely eliminated. For this purpose, studies are now being constantly conducted to analyze and gain greater understanding in this field. Forensic accounting has seen a huge shift to a whole new professional line due to its increased demand in recent times. This is all done to ensure that field of finance and accounting retains its sanctity and that the players and investors are exposed to true and honest market conditions so that trading, investing and wealth generation can all be conducted in a harmonious manner.

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Rebekah Susan Mammen" *Forensic Accounting: Impact of Fraud on Stock Price*" *International Journal of Business and Management Invention (IJBMI)*, vol. 08, no. 01, 2019, pp 89-95