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Detection of Financial Statement Frauds Using Beneish Model: Empirical Evidence from Listed Pharmaceutical Companies in Bangladesh

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Abstract

Financial statement fraud had the most significant financial impact on companies when compared to the other categories of occupational fraud as per ACFE Report to the Nations 2014. This study aims to determine the value of Beneish M-Score and to identify whether selected pharmaceutical companies were manipulating there earnings or not. Financial information of 14 pharmaceutical companies was collected from their annual reports of 2014-18. This study finds that pharmaceutical companies of Bangladesh are engaged in Earnings Manipulation and they are doing it on a continuous basis. The results of our study show a deteriorating financial condition of pharmaceutical industry which should make the auditors and regulators more cautious in detecting financial statement frauds.

Keywords: Financial Statement Fraud, Occupational fraud, Beneish M-Score, Earnings Manipulation.

Introduction

ACFE Report to the Nations, 2014 provided insight on recent condition of occupational fraud where only 9% of cases involved financial statement frauds constitute

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9%. But these cases had the greatest financial impact having a median loss of $1 million. (Association of Certified Fraud Examiners, 2014). Financial statement fraud is deliberately misrepresenting of the financial condition of an organization which is accomplished by intentionally performing misstatement or omission of amounts or disclosures in the financial statements for deceiving users of financial statements. (Association of Certified Fraud Examiners, 2003).

In some ways, financial statement fraud is similar to other occupational frauds. The perpetrators have motivation and opportunity and they have the ability to rationalize their actions. Cressey (1954) developed the fraud triangle where the analysis of financial statement frauds falls into the three points of the fraud triangle. (Cressey, 1954). Motivation, opportunity and rationalization in the fraud triangle show up like:

1. situational pressures motivating management to commit fraud;
2. perceived opportunity to commit the dishonest act and conceal it; and
3. some way to rationalize that act as justifiable.

Researchers have been trying to detect financial statement fraud using different methods. There are several models for detecting manipulation of earnings-

- Accrual models (1988)
- The aggregated accruals Jones model (1991)
- The modified Jones Model (1995)
- Beneish M-Score model (1999)

From all these models Beneish M-Score model (1999) is the most appropriate and accepted tool for detecting earnings manipulation. It is the most appropriate tool for the auditors to support detecting earnings manipulation (Khan & Akter, 2017) . The findings of this research will help the regulators to make policy and regulations to protect the rights of the investors and the shareholders. The investors will also be helped by this research as it will help them to take investing decision. They can know the indications about the actual condition of a company from pharmaceuticals industry by this research. Beneish M-Score model can help us for early indication (red flags) for detecting earnings manipulation practices in a company. Beneish M-Score is one of the most used methods to identify financial frauds by researchers all over the world. But there is a dearth of research of earnings manipulation practices in pharmaceutical industry of our country.

Objectives of this study

Pharmaceutical industry is a growing industry and has a great contribution in the economy of Bangladesh. There might be practices of earnings manipulation in this sector .There are some studies on Earnings Manipulation in other sector in Bangladesh like (Razzaque, Rahman, & Salat, 2006), (Ali, 2018), (Khan & Akter, 2017) , (Muttakin, Khan, & Mihret, 2017), (Rahman, Moniruzzaman, & Sharif, 2013) which motivated me

to conduct my research and to examine if there is any existence of Earnings Manipulation in the Pharmaceuticals Industry of Bangladesh .the main objectives of this study is to -

- Finding indications about earnings manipulation practice in Pharmaceuticals Industry of Bangladesh.
- Ascertainment of whether companies are continuously involved in earnings manipulation practice.
- Ascertainment of companies which are likely manipulating earnings and which are not.

Limitations and Motivations for Future Research

This paper mainly concentrates on probable cases of earnings manipulation in publicly listed pharmaceutical companies. The sample size is relatively small as many companies have been listed in recent years and there is a lacking in the availability of financial statements of existing companies. Because of the availability of annual reports of 14 out of 15 pharmaceutical companies, we have selected this industry for our study. And also as Beneish M-Score is a probabilistic model, it is very difficult to comment on earnings manipulation at national level with this small number of data . Further researches can be done to identify its relation with relevant variables.

Review of Literature

In 1976, Jensen and Meckling provided agency theory to explain motivations behind managing earnings (Jensen & Meckling, 1976). Sometimes management exploits the quest of shareholders to achieve higher return on equity by taking advantage of flexibilities accounting rules or violating them. (Curtis & Thalassinos, 2005). M. D. Beneish's research can be considered as fundamental in the field of fraud detection models (Beneish, 1999) . The accuracy level of Beneish model is 89.5% (Beneish, 1999), whereas the accuracy level of Person model is 71.5% (Pearosn, 1995), the accuracy level of Summers and Dechow models is 59.8% (Summer & Sweeney, 1998) and 63.7% (Dechow, Larson, & Sloan, 2011) respectively. This study will focus on Beneish M-Score and will try to detect earnings manipulation in pharmaceutical companies of Bangladesh.

In 1976, Jenson and Meckling described agency theory as the principal-agent relationship between shareholders and the management team in a firm (Jensen & Meckling, 1976). There are two types of agency problems: conflict between shareholders and managers which is Type I agency problem and conflict between controlling shareholders and non-controlling interests which is Type II agency problem (Salvato & Moores, 2010). This paper will be mainly focused on Type I agency problem. Mangers manipulate earnings due to agency conflict. Thiruvadi and Huang (Thiruvadi & Huang, 2011) and Beneish (Beneish, 1999) also tried to explain the motivations behind managing earnings with agency theory. Positive accounting theory and financial accounting theory states that manager are rational economic person. They will take decisions for their own interest no matter how much this decision costs the company. Their remuneration can be

fixed when the contract is done between a manager and the company or there can be remuneration based on their performance. If their bonus or other incentives are tied with their performance they will try to show better performance. If they can no perform well, they will create a false impression of better performance by managing the earnings.

M.D. Beneish stated earnings manipulation as an instance where management violates Generally Accepted Accounting Principles so that they can show favorable representation of the organization's financial performance (Beneish, 1999) Flexibilities in accounting standards are given for the accountants to cope up with the changing circumstances. But flexibility in accounting is sometimes used to manipulate data for personal economic interest. In his speech, Arthur Levitt, former Chairman, U.S. Securities & Exchange Commission reflects on the importance of flexibility in accounting treatment in 1998. It is known to accountants that they cannot anticipate every business structure, or every new and innovative transaction and so principles are developed that allow them flexibility to adapt to changing situations which helps accounting to keep pace with business innovations (Levitt, 1998).

In 2015, Fung discussed about manipulation as the financial reporting of a firm to the public being performed in a fraudulent manner in order to improve the financial condition of the firm being risky which had been revealed in Enron Corp., U.S. bankruptcy (Fung, 2015). In 2014, Jung et al. (2014) described about the reasons behind manipulation discussing about the loopholes in financial reporting standards worldwide which are used in fraudulent financial reporting. And so it had raised concerns about the quality of the financial reporting standards, the auditors' role and the financial market regulators (Jung, Lee , & Weber, 2014) There are some red flags to identify earnings manipulation practices by companies. Beneish's evidence indicated the probability of manipulations which increases with- unusual increase of receivables, deterioration of gross margins, decrease of asset quality, growth of sales, and increase of accruals (Beneish, 1999).

So earnings manipulation practices should be checked otherwise it might be the reason behind bad reputation for the whole industry. Eng et al.(2014) also provides insights on frauds in organizational financial reporting which cause many organizations business to collapse and negatively impact the reputations, brands and image of many existing organizations (Eng, Sun, & Vichitsarawong, 2014). Earnings manipulation was explained by another research of Mulford and Comiskey in 2002 as the active manipulation of earnings to reach a predetermined target, which may be set by management , may be an analyst's forecast or may be an amount being consistent with a smoother, more sustainable earnings stream (Mulford & Comiskey, 2002)

Earnings Manipulation and Beneish M-Score

To identify fraudulent financial statement detection in particular firms, one of the most commonly used methods has been the M-Score mode. In this segment, Wiedman (1999) wrote a case for detecting earnings manipulation by using financial statement analysis for instructional purposes (Wiedman, 1999). Khan et al. (2017) examined the presence of Earnings Management in Food and Allied Industry of Bangladesh (Khan & Akter, 2017). In another study, Ali (2018) analyzed the presence of Earnings management in Cement and Power industry in Bangladesh (Ali, 2018). Ahmed and Azim found that the

companies from Cement Industry of Bangladesh were Engaged in Earnings Management to cover bad financial performance (Ahmed & Azim, 2015). All these research were conducted on other industries or other countries. That's why there is a research lacking in the field of detecting the presence of Earnings Management in Bangladesh and especially in Pharmaceutical Industry. The common thing is that all of theese studies used the Beneish M-score model in addition to other types of analysis to detect earnings manipulation. Thereby, it is evident about M-score being one of the most commonly used models to detect fraudulent behavior.

Beneish (1997) designed a model for detecting earnings manipulation among firms which experienced extreme financial performance. (Beneish M. D., 1997) While developing his model, he examined 64 firms that violated GAAP (Violators of GAAP) and compared them with 1989 that had supposedly did not violate GAAP (*control firms*), during the period 1987-1993. Although GAAP violators were identified well enough, as they had been exposed as manipulators in the media or SEC subjected them to accounting enforcement (Wiedman, 1999), this was not the same for control firms. The fact was that the control sample might also have GAAP violators within them that had not been detected before, which biased the Beneish model to detect GAAP violators and making his tests more conservative (Barsky, Catanach, & Rhoades-Catanach, 2003). Beneish again presented a model to detect manipulation in 1999. This model (Beneish M. D., 1999) differed from Beneish's 1997 paper in the following characteristics. Firstly, it was estimated using 74 companies, instead of the 64 companies that were used in the previous model. Secondly, it used Compustat companies in the same industry, instead of using Compustat companies having the largest unexpected accruals. Thirdly, the set of explanatory variables used in 1999 provided a more parsimonious model than the previous model. Beneish concluded arguing the proposed model will allow researchers and investment professionals for detecting manipulation (Beneish M. D., The Detection of Earnings Manipulation, 1999). He also assured that the model being cost-effectively related to a naive strategy treating all businesses as not being manipulators.

Although Beneish M-Score is the most acceptable method for the detection of Earnings Management, Beneish informed that there can be two types of error present. When a company is found non manipulator of earnings but the company is actually a manipulator, this is called Type I error. And when a company is considered as manipulator but actually the company turns out to be non-manipulator, this type of error is called Type II error. There also had been many other studies to detect earnings manipulation practices worldwide using Beneish M-Score. That's why we used Beneish M-Score in this paper to detect manipulation of earnings. Our study tries to find out the presence of Earnings Manipulation over the time period and show the trend of Earnings Management. If the M-Score is greater than -2.22 then, the company may have manipulated their financial statements whilst when M-Score is less than

-2.22 it suggests that the company did not manipulate its financial statements (Nwoye, Obiorah, & Chukwunonso, 2015).

Based on this statement we have developed our hypothesis as-

H_0: Firms in the Pharmaceutical Industry of Bangladesh are not engaged in Earnings Manipulation.

H_1: Firms in the Pharmaceuticals Industry of Bangladesh are engaged in EM and are likely to continue the trend of manipulating earnings.

Methodology

Sample Size

This study is conducted based on only the pharmaceuticals Industry of Bangladesh. This industry basically consists of the companies which are engaged in production of medicines, and other medical equipment. There are e 15 leading companies in Pharmaceuticals Industry in Bangladesh. Out of them 14 companies are taken as sample and one company is excluded due to unavailability of data. That means sample size represents 93.33% of the leading companies of Bangladesh Pharmaceutical Industry.

Data Collection

All the required data is collected from secondary source. All the required data is collected from the annual reports of the companies. Necessary data for calculating M-Score is Present in the annual reports of the companies. Annual reports of the companies either collected from the company website or from DSE website. Since the main purpose of the study is to determine whether the companies are engaged in Earnings Management or not and if there is any trend in the Earnings Management process, data is collected for consecutive 4 years (2015-2018). For calculation purpose data for the year of 2014 is also collected and used.

Data Analysis: Beneish Model

This study is the real life application of the M-Score Model developed by Messod D. Beneish .In his paper (Placeholder3) he introduced a method for detecting Earnings Management using 8 variables giving the scope of detecting Earnings Management and Statistical Analysis . Using 8 variables and Multiplying the with their weight we get a score called M-Score. From this score we can determine whether the company is possible manipulator or not using 8 financial ratios Beneish Developed the equation for detecting Earnings Manipulation.

Days Sales in Receivables Index (DSRI)

Days sales in receivable index determines the changes in receivables comparing to increase of sales.it is calculated comparing sales and receivables data of consecutive two years.A large increase in DSRI signals a higher possibility of revenues and earnings being overstated.

$$DSRI = (\text{Net Receivables}_t - \text{Sales}_t) / (\text{Net Receivables}_{t-1} / \text{Sales}_{t-1})$$

Gross Margin Index (GMI)

Gross margin index shows the growth rate of gross margin comparing with previous year gross margin. If the value is greater than 1, then there is an indication that gross margin has dropped and there will be a pressure from the shareholders to make it profitable again thus the management can manage the earnings to show better performance. (Lev & Thiagarajan, 1993) suggested gross margin deterioration as being negative signal about firms' situation.

$GMI = ((Sales_{t-1}-COGS_{t-1})/Sales_{t-1}) / ((Sales_t-COGS_t)/Sales_t)$

Asset Quality Index (AQI)

In 1991, Siegel suggested that the change in the analysis of asset realization risk is measured by AQI (Siegel, 1991). Asset Quality Index is calculated by dividing current asset other than non-current asset by total asset. if there is increase in AQI, it indicates that the company using properties to capitalize the costs(Cost Deferral) to show better performance and low cost.

$AQI=(1-(Current\ Assets_t + PPT_t + Securities_t)/Total\ Assets_t) / (1- Current\ Assets_{t-1} + PPT_{t-1} + Securities_{t-1})/Total\ Assets_{t-1})$

Sales Growth Index (SGI)

A ratio of sales in the year of manipulation comparing with the previous year, this ratio doesn't exactly indicate manipulation but growth firms might be more likely to engage in financial frauds because of their financial position and capital needs. It is calculated by dividing current year sales by previous year sale. If the ratio is more than 1, then there is an indication that there can be a pressure from the investors and the shareholder to maintain the growth and thus the management can manipulate the earnings to show better performance. Companies try to dispel the impression of their decelerating growth, as this perception can be costly (Fridson, 1993).
So, there is a positive relation between SGI and the probability of earnings manipulation.

$SGI = Sales_t/Sales_{t-1}$

Depreciation Index (DEPI)

Depreciation index shows the ratio of depreciation in consecutive two years. If this value is below 1, that means the assets' depreciation rate has slowed down which increases the possibility that the firm is revising the estimates of assets' useful lives upwards or has adopted a new technique to increase revenue.

$DEPI=(Depreciation_{t-1}/(PPE_{t-1}+Depreciation_{t-1}))/ (Depreciation_t/(PPE_t+Depreciation_t))$

Sales General and Administrative Expenses Index (SGAI)

Selling general and administrative expense index is calculated by current year's selling and general expense ratio to sales by the previous year's selling and general expense to sales ratio. If there is a non-proportionate increase in the SGAI, it can be an indicator of Earnings Management.

SGAI= (SGA Expenses$_t$/Sales$_t$) / (SGA Expenses$_{t-1}$/Sales$_{t-1}$)

Leverage Index (LVGI)

Leverage Index is calculated by total asset to total liability ratio of current year by the total asset to total liability ratio of previous year. if there is an increase (LVGI>1) in LVGI then it indicates that there is a rise in leverage to buy more asset. This ratio is used to identify debt covenant incentives for earnings manipulation. Beneish and Press suggested the changes in leverage positions being associated with the stock market effect of default (Beneish & Press, 1993).

LVGI= (Current Liabilities$_t$+ Long Term Liabilities$_t$)/Total Assets$_t$) / (Current Liabilities$_{t-1}$+ Long Term Liabilities$_{t-1}$)/Total Assets$_{t-1}$)

Total Accruals to Total Assets (TATA)

Total Asset to Total Accruals is calculated by dividing changes in working capital without cash less depreciation by dividing total asset. TATA is taken as a proxy for the extent to which cash represents reported earnings and higher positive accruals is expected (less cash) to be associated with a higher probability of earnings manipulation (Beneish M. D., 1999)

TATA= (Income from Operations$_t$- Cash Flow from Operations$_t$) /Total Assets$_t$

Empirical Results

For detecting Earnings Management, we have calculated Beneish M-Score for 14 Firms using data from their annual reports. We have used data from the year of 2015-2018 for the calculation and data of the year of 2014 was used for calculation purpose. According to Beneish, if the M-Score is less than -2.22 or has less negative or positive value is a likely Manipulator. As Beneish M-Score model is a probabilistic model, a company with higher M-Score can also turn into a non-manipulator.

Table 1. Summary of M-Score of Pharmaceuticals companies of Bangladesh

Company Name	2014-15	2015-16	2016-17	2017-18
Advanced Chemical Industry Limited(ACI)	-1.55	-1.58	-1.15	-1.56
The ACME laboratories ltd.(ACME)	-1.60	-1.71	-0.79	-1.73
Beximco Pharmaceuticals limited(BEXIMCO)	-2.01	-1.61	-1.64	-1.27
GlaxoSmithKline Bangladesh ltd.(GSK)	-1.97	-1.62	-2.00	-6.52
SQUARE Pharmaceuticals ltd.(SQUARE)	-0.05	-0.70	-1.35	-1.74
Renata Limited (RENATA)	-1.45	-1.52	-1.74	-0.24
BECON Pharmaceuticals ltd. (BECON)	-2.27	-2.97	7.022	-1.26

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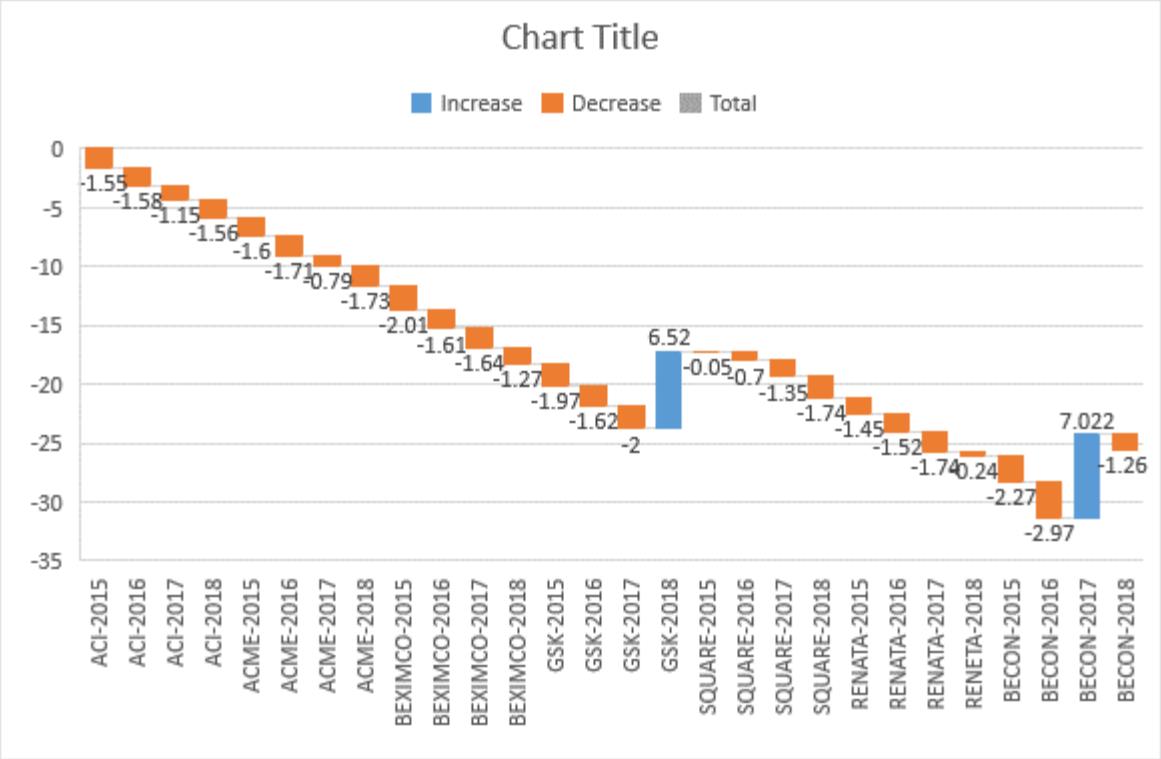
The IBN SINA Pharmaceuticals Ltd.(IBNSINA)	-1.48	-2.16	-0.77	-0.97
AMBEE Pharmaceuticals ltd. (AMBEE)	-1.81	-1.88	-1.96	-2.00
Active Fine Chemicals Ltd. (ACTIVE FINE)	-1.63	-1.92	-2.18	-2.01
Delta Pharma limited(DELTA)	-1.80	-2.01	-2.36	-3.31
Central Pharmaceuticals Ltd.(CENTRAL)	-1.72	-1.41	-0.73	-1.48
ORION Pharma ltd.(ORION)	0.14	0.31	2.39	-1.67
Pharma AIDS ltd.	-2.77	-1.10	-1.03	-1.28

Figure 1. Depicts the graphical representation of the empirical results from the study.



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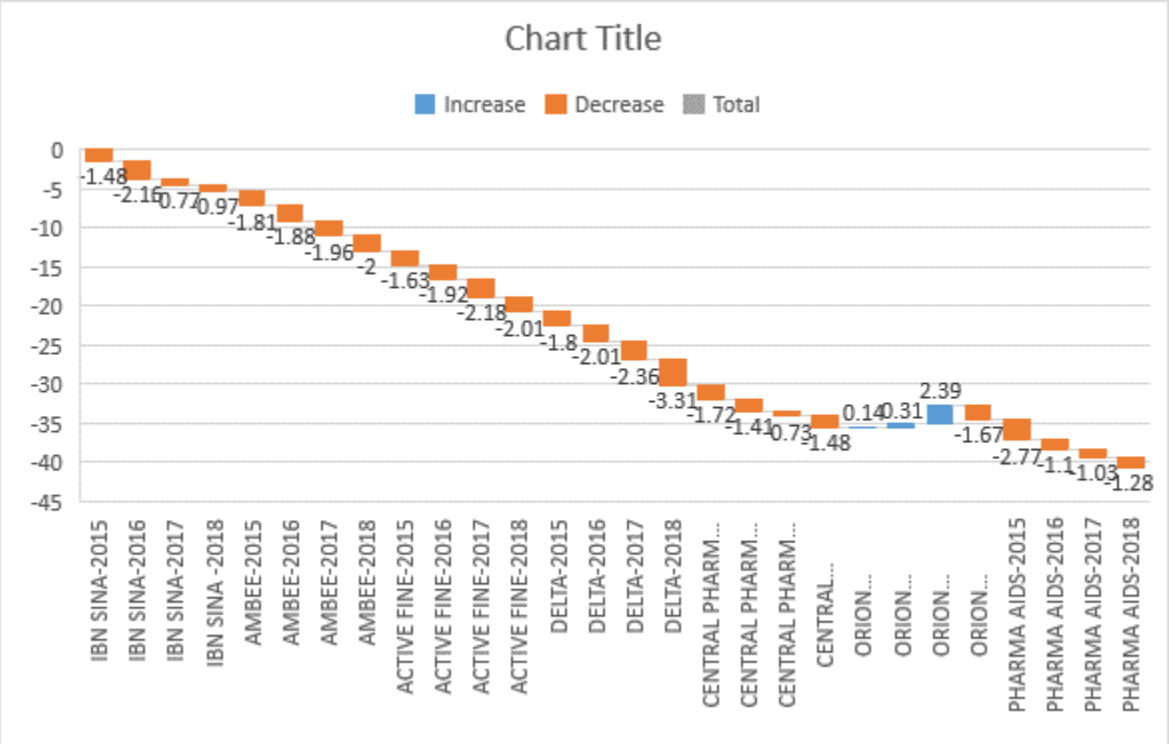

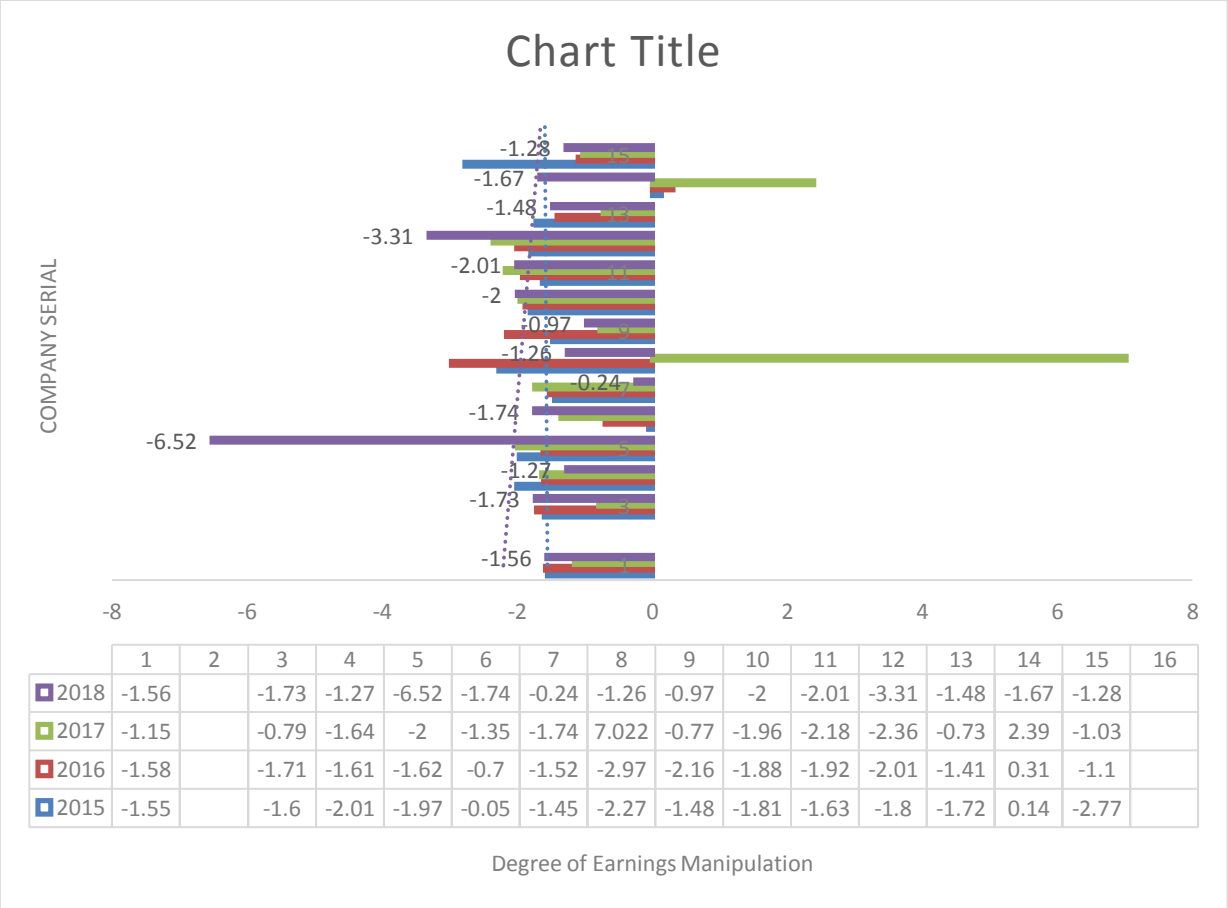

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2018	-1.56		-1.73	-1.27	-6.52	-1.74	-0.24	-1.26	-0.97	-2	-2.01	-3.31	-1.48	-1.67	-1.28	
2017	-1.15		-0.79	-1.64	-2	-1.35	-1.74	7.022	-0.77	-1.96	-2.18	-2.36	-0.73	2.39	-1.03	
2016	-1.58		-1.71	-1.61	-1.62	-0.7	-1.52	-2.97	-2.16	-1.88	-1.92	-2.01	-1.41	0.31	-1.1	
2015	-1.55		-1.6	-2.01	-1.97	-0.05	-1.45	-2.27	-1.48	-1.81	-1.63	-1.8	-1.72	0.14	-2.77	

The table shows the companies with the M-Scores of their respective financial years indicating the companies being engaged in manipulation. Almost all the companies are seen too be engaged in earnings manipulation on a continuous basis. Some companies didn't engage in manipulation for some years. But 10 out of 14 companies have been engaged in earnings manipulation all the 4 financial years. They are doing it on a continuous basis. To depict the picture year wise, suppose for financial year 2014-15 around 12 out of 14 companies probably engaged themselves in earnings manipulation. So, only 2 companies didn't commit financial frauds in that year. In 2016 we can see almost the same result. In 2016 all the companies are engaged in Earnings Management except one. As the number of companies engaged in earnings manipulation changes over the year, so we cannot accept the H_0. From the data presented above it is clear that the companies from pharmaceuticals industry of Bangladesh are engaged in Earnings Management. So we should accept the alternative hypothesis-H_1.

To see the trend of Earnings Management we can take idea from the Table 2.

Manipulation Status	2014-15	2015-16	2016-17	2017-18
Possible manipulator	85.72%	92.85%	92.85%	85.72%
Possible non-manipulator	14.28%	7.14%	7.14%	14.28%

The percentage of manipulators show increasing trend whereas non-manipulators are decreasing only exception is the year 2017-18 where manipulators decrease from 92.85%% to 85.72%. Thus manipulation practices in this country seem to be in an increasing status but Ahmed and Naima (2016) found it to be in a decreasing status. (Ahmed & Naima, 2016) That study was based on 2010-2013 financial data. So as per our study based on recent data it can be said that manipulation status is now on an increasing state. This result is consistent with Sakib (2019) (Sakib, 2019) and Khan et al. (Khan & Akter, 2017).

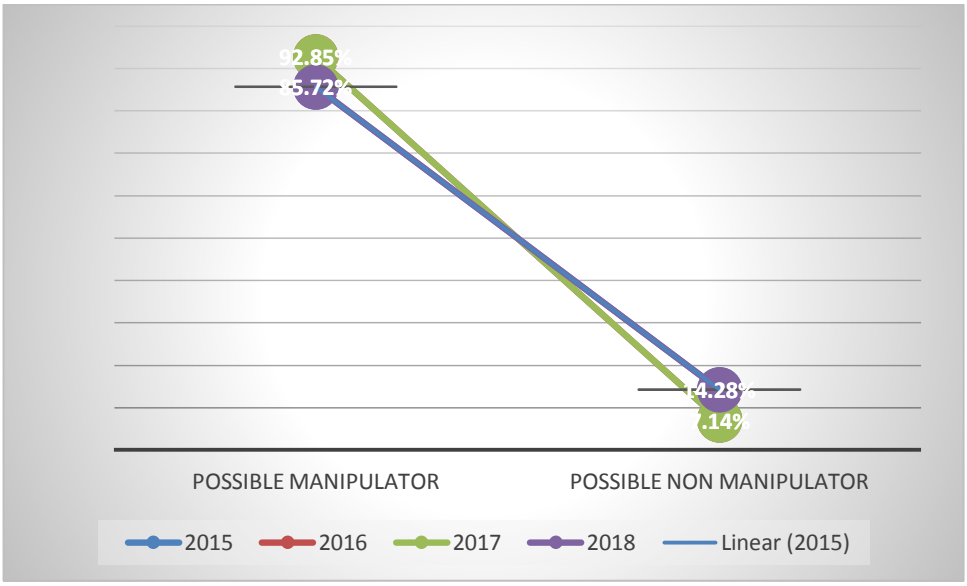

Figure 2. Trend of EM in Pharmaceuticals Industry of Bangladesh

Analyzing the trend of Earnings Management in The Pharmaceutical Industry of Bangladesh, we can see that the companies are engaged in EM on a continuous basis. This result is consistent with the findings of Sakib (2019) (Sakib, 2019). One company which is engaged in Earnings Management is likely to continue the trend to cover up the previous EM. So H_1 cannot be rejected. And so our null hypothesis which depicts that companies are engaged in Earnings Management on a continuous basis is true and accepted.

Conclusion

Our study is done on selected companies of Pharmaceutical Industry of Bangladesh. Main purpose of the study was to examine the presence of Earnings Management in the Pharmaceutical Industry of Bangladesh. We have found that companies from Pharmaceutical Industry of Bangladesh are engaged in Earnings Management and they are doing on a continuous basis. Since Beneish M-Score Model is a probabilistic model is does not give absolute confirmation that the companies are truly engaged in Earnings Management. Even if they have not manipulated earnings, it still raises a question because the volatility of reported numbers as shown in the index ratios. Hence, the auditors and regulators should be cautious the discrepancies and volatilities in the financial statements and the probable reasons behind those. As our research suggests, the firms are actively engaged in manipulation of reported earnings. If this goes unchecked, the developing trend in pharmaceutical sector will somehow face a serious trouble in the years ahead. The share market collapse of Dhaka Stock Exchange in July 2019 lost almost Tk.27500 crore. So if this practice of manipulation goes on like this, there might be another collapse in the pharmaceutical industry as well. This paper also finds that majority of the firms are manipulating earnings on a continuous basis which is consistent with the findings of Sakib (2019) (Sakib, 2019) and Khan et al. (Khan & Akter, 2017). Khan et al. (2017) found that most of the companies are likely to manipulate earning for more than one year. (Khan & Akter, 2017) Stakeholders and regulators must be cautious about the discrepancies in the financial statements and they should put more emphasis on the transparency of the statements.

We believe in the spirit of accounting principles and we would like to conclude our study saying the famous quote by Diane Garnick, "Accounting does not make corporate earnings volatile. Accounting just increases the transparency of volatility in earnings."

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