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Detecting financial shenanigans: Applying Beneish M Score

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Abstract

Financial shenanigans are purposeful manipulation of financial data or following unethical practices by individuals or companies to cheat investors, regulators, or other stakeholders. The aim of financial shenanigans is to create wrong picture of financial health of company or its financial performance. Financial shenanigans are also referred as manipulations in market prices of company by doing insider trading. Financial Shenanigans affect reliability of financial statement which is most important qualitative feature of financial statements.

Due to increase in competition, nowadays many companies are involving in financial shenanigans to either increase their market value or maintain it. On the other hand, many techniques are available to check if company is involved in financial shenanigans or not. Few of them includes Beneish M score, Montier C score, Pustylnick P-Score, Dechow F- Score etc. Most frequently used and well-known technique is Benish M score.

The present paper is taken up with the objective to understand various kinds of financial fraud/ Shenigans s which are possible in different companies, also to learn reasons behind financial fraud/ Shenigans and to study financial shenanigans with Beneish M score [8 factor model]for selected sample companies for the period of 5 years i.e. from 2019-2020 to 2023-2024.For the purpose of study top five pharmaceutical companies on the basis of Market value in March 2024 were identified viz Sun Pharmaceutical Industries Ltd, Divis Laboratories Ltd, Cipla Ltd, Zydus Lifesciences Ltd, Dr Reddys Laboratories Ltd. Appropriate hypothesis are framed and tested for the purpose of study. Results shown that high Manipulations found in Divis laboratories as compared to other companies during the period of study.

Keywords: Financial shenanigans, Beneish M score, Market value, financial manipulations

1. Introduction

Financial shenanigans are deliberative manipulation of financial data or following unethical practices by individuals or companies to cheat investors, regulators, or other stakeholders. The aim of financial shenanigans is to create false picture of financial health of company or its financial performance.

Other way of financial shenanigans is to manipulate market prices of company by doing insider trading, pump and dump schemes etc.

All users of financial information like shareholders, creditors, employee, customers and prospective employees are using the financial information with trust but if such manipulations are done it will result not only into chaos but will suppress the economy of our country in long run. Reliability most important feature of financial reporting will be ruined. (5 Paise, 2023) ^[1].

2. Review of literature

1. Kezia Aviel Lumadi and Fransisca Hanita Rusgowanto studied on The Effects of Beneish's M-Score Model and Financial Ratio Analysis on Fraudulent Financial Statement Indications The research purpose was to collect empirical evidence on the effects of Beneish's M-Score Model that was calculated using the eight formulas that come with it and of financial ratio analysis based on the indicators financial leverage, profitability, asset composition, liquidity, and capital turnover on fraudulent financial statement indications in manufacturing companies in the consumer goods sector listed on the Indonesia Stock Exchange over the period from 2017–2020. The results depicted that the variable financial leverage had a significant effect on fraudulent financial statement indications. Beneish's M-Score Model did not have any significant effect on fraudulent financial statement indications. (Lumadi & Rusgowanto, 2023) ^[5].
2. S. Baranidharan and Amirdha Vasani Sankar has done research on Financial Misconduct at Ricoh India: A Case Study of Falsified Accounts and the Consequences of Corporate Governance Failure. The objectives of the study was to understand the results of incorrect financial statements and the significance of maintaining transparency and integrity in financial reporting. The response of regulators for financial misconduct, role of internal controls and financial reporting in ensuring the accuracy and reliability of a company's financial statements and impact that pressure from management can have on financial reporting and the importance of a strong corporate governance system. It was found that Ricoh India case serves as a reminder of the importance of proper financial reporting and internal controls within a company. The company's management had pressured employees to misstate the numbers to meet targets and increase the company's stock price, which ultimately led to the falsification of financial statements and the incurring of heavy loss of Rs 1,123 crore for the year ended March 31, 2016. This misconduct not only put the company's reputation at risk but also lost the trust of investors and regulators. (s & Sankar, 2022) ^[9].
3. Ms Yamuna Parikh and Dr.Kamini shah has conducted study on " Financial statement fraud detection models: an exploratory study" The objectives of study was discussion of various Financial Statement Frauds [FSF] detection models that highlighted on detection of fraud from the financial information provided by the corporate entity in their financial reports. The study is a descriptive in nature. The study tried for conceptual information about various fraud detection model available that gives detail insights into the model and their workings. (Parikh & Shah, 2022) ^[8].
4. Dr.Leyaket Hossain Mahmood and Dr.Prahallad Chandra Das studied on Detection of Corporate Fraud and Financial Distress: An Empirical study using Forensic Accounting Tools. The purpose of study was to investigate the corporate fraud and financial distress by using two forensic accounting tools using secondary sources of data of Titas Gas Transmission and Distribution Company Ltd. (TGTDCCL) Reseachers concluded that the TGTDCCL has not undertaken material fraudulent financial reporting during the study period. It was also seen that financial stability of the company was not consistent during the period of study. (Mahmood & Das, 2021)
5. Mousa Mohammad Abdullah Saleh, Mohammad Aladwan, Omar Alsinglawi and Haneen Mahmoud Ibrahim Saleh studied on Predicting fraudulent financial statements using fraud detection models. The objective of the research was to provide scientific data on the association between fraud causes and false financial statements. The paper gave further insight into the applicability of Altman's z-score and Dechow f-score to the exposure of false financial statements by Jordanian industrial owners. The findings of the analysis shown conclusive proof that Jordanian manufacturing firms were engaged in the conduct of false financial statements; while some of the triangle fraud variables were identified without any correlation with fraudulent financial reports; other factors were found to be strongly associated with fraud. The Accuracy of fraud models, the findings of the analysis confirmed the validity and specificity of the fraud detection models adopted in the study. (Saleh, Aladwan, Alsinglawi, & Saleh, 2021) ^[10].
6. Prof. Shimoli Dhama studied on Forensic Accounting: Signaling Practicing Accountants to Improve Skillset and Forming Regulatory Body for Forensic Accountants in India. The objectives of study was Highlighting the problems so as to develop future prospects of Forensic Accounting and its importance in India and determine the extent to which financial and economic crimes have impacted on the Indian economy and the efficacy of forensic accounting functions. It also dealt with understanding the historical perspective of forensic accounting in India. Researcher concluded that Forensic accounting is an interesting area and can be highly useful to both the society and the investigator. It is important to note that only persons of such skills and courage with an attitude to know the secrecy can be successful in the process of forensic investigation. (Dhama, 2015) ^[3].

3. Research Methodology

3.1 Research Gap

In past many studies are conducted to detect or check financial manipulations by applying different techniques of analysis but still it is needed to consider latest techniques to detect financial shenanigans in different companies for latest periods as financial shenanigans is ongoing process and it's important to keep check on the financial statements of the companies to decide its reliability.

Present study is undertaken with the object to keep check on financial statements of top companies in pharmaceutical sector as it is one of the fast-growing sector

3.2 Objectives of Study

1. Detecting reasons for financial fraud/ Shenigans
2. Analyzing various kinds of financial fraud/ Shenigans s which are possible in different companies
3. Studying Financial shenanigans with Beneish M score for selected sample companies for the period of 5 years i.e. from 2019-2020 to 2023-2024

3.3 Selection of Sample-

For present study top five pharmaceutical companies based on Market capitalisation on 31st March 2024 are selected which are as follows

1. Sun Pharmaceutical Industries Ltd,
2. Divis Laboratories ltd,
3. Cipla Ltd,
4. Zydus Lifesciences Ltd,
5. Dr Reddys Laboratories Ltd.

3.4 Period of Study

The period of study selected is five years commencing from 2019-2020 to 2023-2024.

3.5 Tools and techniques of study

For study financial tools and statistical tools are used. Beneish M Score [8 factor model] is calculated to check if companies involved in Manipulations or not during the period of study. 8 Factors includes [1] Days Sales in Receivables Index [2] Gross margin Index [3] Asset quality Index [4] Sales growth Index [5] Depreciation Index [6] Sales, General and Administrative expenses index [7] Leverage index [8] Total Accrual to Total assets. Statistical tools One sample T test and One way anova is also applied in study to test hypothesis framed.

3.6 Hypothesis

- H₀₁:** There is no significant difference in Beneish M Score during the period of study for selected sample company.
H₁₁: There is significant difference in Beneish M Score during the period of study for selected sample company.
- H₀₂:** There is no significant difference in Beneish M score of selected sample companies during the period of study.
H₁₂: There is significant difference in Beneish M score of selected sample companies during the period of study.

4. Reasons behind financial shenigans

- In many cases, the payment of corporate executives is directly related to the financial performance of the company. Thus they are prompted to draw a rosy picture of the company's financial condition to meet standard performance expectations and to achieve personal gains.
- It is a relatively easy thing as generally accepted accounting principles provides a significant amount of scope and interpretation in accounting provisions and methods. For better or worse, these allows a wider flexibility and making possible for corporate management to draw an expected positive or negative picture of the financial condition of the company according to their their Interest.
- Financial manipulation are less detected by investors due to the relationship among the independent auditor and the company. (Adkins, 2021) [2].

5. Financial frauds in respect to financial statements of companies

a) Recording False revenue and sales

One of the methods followed by companies were to show a rosy picture by showing more and more sales and thereby higher amount of profit.

b) Recording revenue for goods yet not sold and sent on consignment

This is other way for inflating profit and sales wherein goods though just sent on consignment are shown as sales against the principle of revenue recognition. As per principle once goods sent on consignment are sold by consignor than only revenue should be recognized.

c) Asset Manipulation

Asset could be manipulated by overstating or understating resulting manipulations in financial status of company.

d) Alteration of Accounting Records

Recording entries in wrong manner or doing posting error, recording false expenses, hiding liabilities, overstating revenue etc. are few ways of conducting financial frauds.

e) Inflated company valuation

Many times, Managers commit fraud by increasing value of companies. This helps them to show that they have performed their duties well. (Hubler, 2016) [4].

6. Beneish M Score

6.1 Introduction

It is a mathematical model predicting manipulation of earnings using different financial ratios and eight mentioned variables. It was developed by Professor Messod Beinish. In the present paper, 8 variable model (components) has been considered for the purpose of study.

6.2 The components of Beneish M score are as follows (Wallstreetmojo Team, 2024)

Component 1: Days Sales in Receivables Index [DSRI]

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

Component 2: Gross Margin Index [GMI]

$$GMI = [(\text{Sales}_{t-1} - \text{COGS}_{t-1}) / \text{Sales}_{t-1}] / [(\text{Sales}_t - \text{COGS}_t) / \text{Sales}_t]$$

Component 3: Asset Quality Index [AQI]

$$AQI = [1 - (\text{Current Assets}_t + \text{PP\&E}_t + \text{Securities}_t) / \text{Total Assets}_t] / [1 - ((\text{Current Assets}_{t-1} + \text{PP\&E}_{t-1} + \text{Securities}_{t-1}) / \text{Total Assets}_{t-1})]$$

Component 4: Sales Growth Index [SGI]

$$SGI = \text{Sales}_t / \text{Sales}_{t-1}$$

Component 5: Depreciation Index [DEPI]

$$DEPI = (\text{Depreciation}_{t-1} / (\text{PP\&E}_{t-1} + \text{Depreciation}_{t-1})) / (\text{Depreciation}_t / (\text{PP\&E}_t + \text{Depreciation}_t))$$

Component 6: Sales, General, and administrative expenses Index [SGAI]

$$SGAI = (\text{SG\&A Expense}_t / \text{Sales}_t) / (\text{SG\&A Expense}_{t-1} / \text{Sales}_{t-1})$$

Component 7: Leverage Index [LVGI]

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

Component 8: Total Accruals to Total Assets [TATA]

$$TATA = (\text{Income from the Continuing Operations}_t - \text{Cash Flows from the Operations}_t) / \text{Total Assets}_t$$

6.3 Formula

$$\text{Beneish M Score} = -4.84 + 0.92 * DSRI + 0.528 * GMI + 0.404 * AQI + 0.892 * SGI + 0.115 * DEPI - 0.172 * SGAI + 4.679 * TATA - 0.327 * LVGI$$

Rule of Thumb

If Beneish M score is less than -2.22, The Company is non-manipulator [NM] and if it is more than -2.22 the company can be manipulator [M].

6.4 Pros and cons of beneish m score

Benefits

1. Beneish M score helps to keep check on management if they are doing some manipulations in earnings or not and thus financial fraud can be detected.

Drawbacks

1. Beneish M score is just a probability based model thus gives only probability regarding financial manipulations.
2. This model is not applicable to financial firms. (Wallstreetmojo Team, 2024) ^[11].

7. Data analysis and interpretations

Table 1: Factors for calculating Beneish M score

Sun Pharmaceuticals Industries Ltd.							Divi'S Laboratories Ltd.				
	Weight	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
DSRI	0.92	0.912647	0.925904	0.656883	1.210776	1.305682	1.105296	0.8816	1.124207	0.888538	1.152149
GMI	0.528	0.803169	1.073619	1.177976	0.723465	1.049995	1.069114	0.864582	0.970959	1.288704	1.063012
AQI	0.404	0.969140	1.075216	1.052387	0.780741	1.097754	0.163277	6.396209	0.610699	0.57358	2.399845
SGI	0.892	0.804936	0.801716	1.460553	0.900592	1.156636	1.088307	1.284295	1.308389	0.860297	1.004429
DEPI	0.115	1.023909	0.508659	0.944496	0.845208	0.969467	1.192567	0.974586	0.960235	0.992869	0.910146
SGAI	0.172	1.443313	0.793844	0.822629	0.507241	1.145279	1.107667	0.881589	0.919281	1.384717	1.031019
TATA	4.679	0.046836	0.027170	-0.18116	0.027192	0.071591	0.01742	0.000675	0.071175	-0.04317	0.019553
LVGI	0.327	0.831039	1.087517	1.065535	1.039484	0.95931	2.026317	0.78433	1.107156	0.613773	1.068875
CIPLA LTD							Zydus Lifesciences Ltd.				
	Weight	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
DSRI	0.92	1.122101	0.941002	0.68086	1.004694	0.855065	1.107628	0.63362	1.18188	1.383925	1.093292
GMI	0.528	0.955076	0.973714	0.968918	0.996648	1.365193	1.055128	0.873222	1.176767	0.937479	0.803878
AQI	0.404	1.872721	0.938731	1.058378	0.877089	0.813812	1.086297	0.992283	0.807806	1.151456	1.090708
SGI	0.892	1.017761	0.893459	1.360009	1.026394	1.049028	1.049554	1.224798	1.012132	1.111038	1.241109
DEPI	0.115	0.934842	1.196363	0.958819	0.996684	0.977939	0.902203	0.955506	0.99654	0.950009	1.010453
SGAI	0.172	1.037632	0.914245	0.702876	1.314057	1.061365	1.141271	0.849806	0.996077	0.807415	0.94827
TATA	4.679	0.014415	-0.0608	0.004232	-0.02023	0.011286	0.009474	-0.0371	-0.02062	0.019416	0.052022
LVGI	0.327	1.048946	0.888617	0.891307	0.941968	0.916336	0.884884	0.955302	0.877519	1.344686	1.066929
Dr. Reddy's Laboratories Ltd											
DSRI	0.92	1.115508	0.781714	1.120742	0.737541	0.940358					
GMI	0.528	0.967971	1.0006	1.091419	0.874338	0.90909					
AQI	0.404	2.337025	1.309161	0.783608	0.467041	1.061021					
SGI	0.892	1.115279	1.126468	1.079114	1.177526	1.14864					
DEPI	0.115	0.953143	0.91513	1.123939	1.03204	1.017147					
SGAI	0.172	0.902167	1.00009	1.052528	0.951246	0.972516					
TATA	4.679	0.055503	-0.06032	0.011394	-0.09563	0.029319					
LVGI	0.327	1.020156	0.979009	1.163728	0.726519	1.04557					
DSRI	0.92	1.115508	0.781714	1.120742	0.737541	0.940358					

(Source: Prowess CMIE Database)

Table 2: Beneish M score computation for selected companies

Companies	2020	2021	2022	2023	2024
Sun Pharmaceutical Industries ltd	-2.64986	-2.57831	-3.11467	-2.42807	-1.67339
Divis Laboratories ltd	-2.85637	-0.13564	-1.95596	-2.86968	-1.68396
Cipla Ltd	-1.98549	-2.87866	-2.34359	-2.63365	-2.38493
Zydus Lifesciences Ltd	-2.22638	-2.82485	-2.34232	-1.99405	-2.01438
Dr Reddys Laboratories Ltd	-1.48311	-2.72796	-2.33251	-3.19072	-2.29665

(Source: Table 1)

Table 3: [M]/Non Manipulator [NM]

Companies	2020	2021	2022	2023	2024	Total Manipulators [M]
Sun Pharmaceutical Industries ltd	NM	NM	NM	NM	M	1
Divis Laboratories ltd	NM	M	M	NM	M	3
Cipla Ltd	M	NM	NM	NM	NM	1
Zydus Lifesciences Ltd	NM	NM	NM	M	M	2
Dr Reddys Laboratories Ltd	M	NM	NM	NM	NM	1
Total Manipulatio [M]	2	1	1	1	3	

(Source: Table 2)

7.1 Analysis and Interpretation:

From the above table it can be observed that less manipulations are revealed in sun pharmaceutical industries ltd, Cipla Ltd and Dr. Reddys Laboratories ltd in past 5 years as compared to other two companies viz Divis Laboratories ltd and Zydus Life science ltd.

Maximum manipulations are committed in Divis Laboratories ltd.

As far as the accounting period is concerned maximum manipulations is observed in the year 2024 where 3 companies are found manipulating financial records out of 5 companies.

7.2 Hypothesis Testing

In order to test **Hypothesis 1** one sample T test has been applied

Table 4: One sample T test results

Company	Probability Value For Normality Assumption[Shapiro wilk test]	Probability Value For one sample T test
Sun Pharmaceutical Industries ltd	0.63	0.996
Divis Laboratories ltd	0.305	0.999
Cipla Ltd	0.943	0.976
Zydus Lifesciences Ltd	0.284	0.998
Dr Reddys Laboratories Ltd	0.852	0.99

(Source: Table 2)

From the above Table it can be concluded that in all selected sample companies null hypothesis is accepted indicating no significant difference in Beneish M score during the period

of study for selected sample companies.

In order to test hypothesis 2 One way Anova test is applied.

Table 5: One Way Anova results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.140	4	0.285	0.663	0.625
Within Groups	8.605	20	0.430		
Total	9.746	24			

(Source: Table 2)

From the above results, Null hypothesis is accepted indicating no significant difference in Beneish M score of selected sample companies during the period of study.

8. Conclusion:

From the above analysis it can be concluded that Maximum manipulations seen in Divis Laboratories ltd during the period of study out of selected sample companies. As far as period is concerned maximum manipulations seen in 2024 where 3 companies are found manipulating financial records out of 5 companies. However no significant difference is seen in Beneish M score in selected sample companies during the period of study and no significant difference is seen in Beneish M score between the companies during period of study.

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