

## **DETECTING MANIPULATIONS IN FINANCIAL STATEMENTS OF INDIAN COMPANIES**

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DOI: <https://doi.org/10.58426/cgi.v5.i1.2023.70-81>

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### **Abstract**

The purpose of this paper is to identify the likely manipulations in the financial statements of companies listed in India. It aims to examine the statistical differences among the manipulator and non-manipulator companies along with determining the ratios that may be significant predictors of financial statement fraud. The sample for the study comprises top 200 companies listed on BSE for the period 2018-2022. M-Scores of the companies were calculated using the Beneish model and ratio analysis with twenty ratios was conducted. Logistic Regression was carried out to find out the significant predictors of possible manipulations in the financial statement. The findings reflect that manipulations exist in the financial statements of companies. Some of the profitability, liquidity, leverage, and efficiency ratios are found to statistically differ between two sets of companies. Profitability ratio acts as a likely predictor of fraud in financial statements. The paper is one of the few studies carried out in the Indian context to predict fraudulent financial reporting by non-financial companies using the Beneish model and Ratio analysis. The paper offers relevant insights to the stakeholders for carefully analyzing specific ratios in the financial statements for detecting possible manipulations. The knowledge drawn from this academic research may help auditors, regulators and policy makers to put rigorous processes in place for early identification of fraud.

**Keywords:** Beneish M-Score, Ratio Analysis, Financial Statement Fraud, Earnings Manipulation.

**JEL Classification:** M41, M42, G33

### **1. Introduction**

Financial statement fraud is one of the rapidly growing financial frauds in the corporate world. Even after two decades of Enron scam in US and consequent regulatory measures such as enactment of Sarbanes-Oxley Act and establishment of Public Companies Accounting Oversight Board (PCAOB), financial statement misreporting and manipulations are rampant. India witnessed a similar incident in the Satyam scandal in 2007. A recent survey of over 35 countries (including India) claims that the financial statement fraud market was valued at USD

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20.8 billion in 2021. Further, it is anticipated that this figure may touch USD 82.53 billion by 2029, with a CAGR of 18.80% during the period 2022-2029 (Data Bridge Market Research, 2022)[7]. Financial statement fraud is a white-collar crime by management to misrepresent an enterprise's financial position by exaggeration, concealment, understatement, omission, or commission in financial accounts to present a positive outlook for the companies. The underlying objectives include profit linked compensation, performance pressure, personal growth, fighting competition etc. The Fraud Triangle Theory, propounded by Donald R. Cressey, specifies the existence of three factors for fraud perpetration - opportunity, incentive, and rationalization. Opportunity means circumstances enabling fraud such as absence of or weak internal control system, insufficient auditing procedures, poor tone at the top, weak accounting policies etc. Incentives or Pressures include profit linked compensation, need to consistently perform better than the peers, personal financial exigencies, meeting investors' expectations, among others. Rationalization is the justification provided by a fraudster for committing fraud. Since the amount involved in financial statement frauds is generally huge, it is imperative to prevent and detect its likelihood as early as possible. The Association of Certified Fraud Examiners (ACFE) defines financial statement fraud as "the deliberate misrepresentation of the financial condition of an enterprise accomplished through the intentional misstatement or omission of amounts or disclosures in the financial statements to deceive financial statement users" (ACFE 2018)[2]. The Association has further predicted an increase in financial statement fraud is anticipated in the post COVID-19 pandemic period. Beneish (1999)[3] defines earnings manipulation as the deliberate violation of accounting rules by management through the adoption of illegal and fraudulent schemes to present positive financial performance of the company. It is generally achieved through an overstatement of assets, a documented increase in sales, or an upward change in profits figures. Another way includes understatement of liabilities, expenses, or losses (Spathis, 2002)[23]. For a corporate fraud to thrive, management's malafide intentions coupled with a weak regulatory system and non-existent fraud reporting guidelines are prerequisites. An ineffective board that lacks oversight in auditing and accounting practices of the companies can give further push to the rise of such frauds (Gupta and Gupta, 2015)[8]. In their study on bank frauds in India, Bhasin (2015)[4] emphasized that a low level of compliance, weak internal control system, inaccurate employment procedures, less training programme and excessive work pressure are some significant factors responsible for fraud. Further, upholding the fraud triangle theory Huang et al. (2017)[10] claimed that financial statement frauds are driven by severe corporate pressures

and a desire for incentives. Inadequate business performance, need for external financing, inefficient board, financial anguish and competition provoke fraud. However, such fraudulent financial reports adversely affect the market sentiments and lead to incorrect decision making by the investors and others users of such statements (Kizil and Kasbasi, 2018)[14]. India has seen a series of accounting frauds in the recent past with Satyam, Reebok, Kingfisher Airlines, PNB scams to name a few. Occupational fraud is the most serious concern for auditors and is believed to be spreading rapidly across all industries and sectors. (Fraud Examination in India, n.d.)[6]. In its latest report, Hindenburg Research specializing in forensic financial research, has made serious fraud allegations against one of the largest conglomerates in India. However, there are only a few studies in India that focus on financial statement fraud identification in the corporate sector. This paper seeks to fill the gap and attempts to contribute towards the predictors of financial reporting fraud for early detection to mitigate economic losses to the investors and other stakeholders. It is sought to be done by applying the fraud triangle theory as explained above. The *pressure* aspect of the fraud triangle is generally exhibited by revenues & income inflation and an understatement of liabilities (quantified by profitability, leverage and efficiency ratios in the paper). The second element of the fraud triangle i.e. the *opportunity* exists when the internal controls are weak, supervisions are inadequate and thus providing sufficient scope for adopting alternate policies in order to influence figures in accounts (captured by ratios on liquidity, efficiency and measurement of assets). The final angle *rationalization* is the justification and reasoning given by the management for committing fraud. Since it relates to the personality and attitude of a person (Skousen et.al., 2009)[24], its measurement is outside the scope of this paper. By testing the fraud triangle theory for Indian companies, the paper has significant insights to offer to the investors, policy makers and corporates. The succeeding parts of the paper discuss the research methodology adopted, results obtained, and conclusions drawn followed by the limitations of study.

## **2. Research Methodology**

This section outlines the research questions, the sample used, data collection, research methods and techniques adopted to understand fraud in financial statements of Indian companies.

### **Research Questions**

The paper seeks to find answers to the following questions traced from the existing literature on the subject. The studies on financial statement fraud are scant and definitely thin on the ground in the Indian context. Thus, with a view to bridge the notable gap in literature, following questions are attempted to be addressed under the present study:

RQ1. How to measure the likelihood of financial statement fraud in listed companies in India?

RQ2. What are the characteristics differences among entities likely to engage in financial manipulation and those not likely to be a manipulator?

RQ3. What can be the early signs of predicting financial statement manipulation in India?

### **Research Methods and Data Collection**

To detect fraudulent reporting in India, companies listed on BSE (S&P BSE-200) have been selected. Out of which, only manufacturing and trading companies constitute the sample for this study since the Beneish Model did not include financial companies at the time of estimating the model for differences in their business models and applicable rules. The five-year period under study ranges from 2018 to 2022. The secondary data has been sourced from ProwessIQ CMIE database and annual financial statements of the companies. M-Score under Beneish Model and several financial ratios were calculated in correspondence to the first two research objectives of the study and logistic regression was carried out to identify the predictors of manipulations in the reported financial results of the company.

### **Beneish Model**

The Beneish Model was developed by Professor M. Daniel Beneish in 1999. It is a statistical model that uses financial ratios and variables obtained from the accounting results of the company to identify if they have been manipulated. This model is one of the most widely used probabilistic models to assess the probability of earnings manipulation and to categorize companies as ‘manipulators’ or ‘non-manipulators’. The model makes use of eight variables to measure ratios in three broad areas namely- the future performance of a company, cash flows and accruals, and management's incentives to manipulate financial data. The eight variables include:

- i. Days’ Sales in Receivables Index (DSRI)- measured as the ratio of receivables to sales rate in the current period versus previous period. A large increase in receivable days may indicate accelerated revenue recognition to inflate profits.
- ii. Gross Margin Index (GMI): Calculated as the ratio of gross margin of current year to previous year, a deteriorating gross margin may signal poor growth prospects and hence an incentive to manipulate profits.
- iii. Asset Quality Index (AQI): A ratio of non-current assets other than property, plant and equipment to total assets of time period t to time period t-1, may reflect on the propensity to capitalize cost and cost deferral to inflate profits.
- iv. Sales Growth Index (SGI): The ratio of current period sales to previous period sales, a high SGI may not necessarily mean manipulation. However, prior literature establishes that high growth companies are more likely to manipulate their earnings in order to

keep up with their performance consistently, especially when there is reversal in the situations. It pushes managers to achieve high earnings targets.

- v. Depreciation (DEPI): Calculated as the ratio of depreciation rate in the previous period ( $t - 1$ ) vis a vis depreciation rate in the current period ( $t$ ), a value greater than 1 indicates a reducing depreciation rate. There is either a revision in the estimate of useful life of assets or adoption of a more earnings friendly method of charging depreciation.
- vi. Sales, General and Administrative Expenses (SGAI): A ratio of these expenses to sales of current period vis a vis its rate in previous period enables identifying a manipulation motive if there is a disproportionate increase in it.
- vii. Leverage Index (LVGI): Measured as ratio of total debt relative to total assets of current period to preceding period, an increase in leverage may suggest motivation to manipulate earnings to cover debt covenants.
- viii. Total Accruals to Total Assets (TATA): A measure of adopting discretionary accounting policies to manage earnings, these variable estimates change in working capital (other than cash) minus depreciation relative to total assets. A higher level of accruals means more likelihood of earnings manipulation.

The eight variables are then weighted together according to the following formula:

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

Beneish (1999) concluded that if a company scores greater than -2.22, there is a likely probability of profit manipulation and vice versa for a score less than -2.22.

### **Financial Ratios**

Ratio analysis is one of the first techniques adopted to uncover manipulations in financial statements and to assess companies' financial health. Several researchers have used this technique to identify red flags for fraud examination and to classify companies as manipulators or non-manipulators. Ratio analysis entails measuring the relationship between the figures of two different financial statements. Ratios may be calculated using current year numbers and those of previous years, or may be compared with peers, the industry average, or even the economy to comment on the performance of the company. Anomalies in ratios could point directly to the existence of fraudulent actions in reports. Kaminski et al. (2004)[11] compared fraud versus non-fraud companies for a two-year period and conducted univariate analysis on 21 financial ratios. The results show that out of 21 ratios, 16 were found to be significant. Ratio

analysis is one of the most popular and widely used tools for financial statement analysis (Spathis, 2002, & Persons, 1995)[23,20].

The present study uses 20 financial ratios to establish the accounting measures that are more likely to be manipulated by the management motivated by malafide intentions. Table 1 lists down the ratios used for this purpose. These have been selected from prior literature on ratio analysis for manipulation detection (Kirkos et al., 2007; Lenard & Alam, 2009; Ravisankar et al., 2011; Dalnial et al., 2014 etc)[13,15,22,5]. The ratios have been grouped into four categories namely profitability, leverage, liquidity, and efficiency. Profitability ratios assess a company's ability to earn profits from its operations and its efficiency to create value for its shareholders. To determine the usage of debt by a company to finance its operations, leverage ratios play a significant role. They help in evaluating the financial soundness and repaying capacity of a company. Extending to short-term liabilities and margin of safety, liquidity ratios help in understanding the cash richness of the company. Efficiency ratios measure the effectiveness of a company in employing its resources and managing its liabilities to generate sales and income.

**Table 1 Financial Ratios Used**

Category	Ratio	Formula
Profitability	GPTA	Gross Profit/ Total Assets
	NITA	Net Income / Total Assets
	RETA	Retained Earnings/ Total Assets
	EBITTA	Earnings before Interest and Tax/ Total Assets
Leverage	TLTA	Total Liabilities / Total Assets
	TLTE	Total Liabilities / Total Equity
	LTDTA	Long-Term Debt / Total Assets
	D/E	Debt/Total Equity
Liquidity	WCTA	Working Capital / Total Assets
	CATA	Current Assets / Total Assets
	CACL	Current Assets / Current Liabilities
	TCNI	Total Cash / Net Income
	CFOPNI	Cash Flow from Operations / Net Income
Efficiency	ARTS	Accounts Receivable / Total Sales
	ARTA	Accounts Receivable / Total Assets
	INVTs	Inventory / Total Sales
	INVTA	Inventory / Total Assets
	APCOGS	Accounts Payable / Cost of Goods Sold
	TSTA	Total Sales / Total Assets

	TSTE	Total Sales / Total Equity
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Source: Author's Computation

### Logistic Regression

The study develops a logistic regression model to identify ratios that are more likely to predict the likelihood of fraudulent reporting in financial statements of Indian companies. Logistic regression is appropriate regression analysis to obtain odds ratio in the presence of one or more explanatory variables when the dependent variable is of binary nature. Beneish score enabled grouping of companies into those likely to commit financial statement fraud and those not likely to commit such fraud. The former category was coded as 1 and the latter was codified as 0 for the purposes of this study. Two financial ratios namely, Net Income to Total Assets and Long-term Debt to Total Assets have been used as independent variables for the model as only these two were found to be significant for both the periods. Thus, the regression model developed is as follows:

$$\text{Log} (p/1-p) = \beta_0 + \beta_1 * NITA + \beta_2 * LTDTA, \text{ where } p \text{ is the probability of manipulation}$$

### 3. Results and Discussion

#### Identifying likely manipulator and non-manipulator companies

Table 2 presents the results of the Beneish model. 69 out of 155 companies i.e. 44.5 % of the companies are likely to engage in financial manipulation in the year 2019. The rates for the year 2020 and 2021 are relatively low at 22.58% and 25.8% respectively. This implies that managers of a lesser number of companies were pushed to manipulate accounts during this period. The plausible explanation may be the fact it was the period of pandemic hence less competitive and peer pressure (one of the three important factors under fraud triangle theory) along with an implied support from a notification issued by the Government on March 24, 2020 to withhold bankruptcy filings during the pandemic. It is further evident from the below table that in the year 2022 the percentage of likely manipulators has again increased to 50.97 when the effect of pandemic had subsided. The results suggest that nearly half of the listed companies in India are likely to be engaged in financial statement manipulation.

**Table 2 Number of Manipulators and Non-manipulators Companies Using Beneish Model**

	2018-19	2019-20	2020-21	2021-22
Manipulators	69	35	40	79
Non-manipulators	86	120	115	76

Source: Author's Computation

**Ascertaining characteristic differences between probable manipulator companies and non-manipulator companies**

Table 3 below shows the results of the t-statistics analysis of the financial ratios of likely manipulators and non-manipulator companies. Six ratios are found to have statistical significant differences between the two groups of companies. Three profitability ratios NI/TA, RE/TA and EBIT/TA, one leverage ratio LTD/TA, one liquidity ratio CA/CL and one efficiency ratio TS/TA are found to be significant. It implies that manipulating and non-manipulating companies can be differentiated on the basis of these ratios. Similar results were obtained in (Kaminski et al.,2004; Kanapickiene, 2015 and Adjei et. al., 2020)[11,12,1]. Further, an analysis of the mean statistics of these ratios indicates interesting results. Profitability ratios i.e. NI/TA, RE/TA and EBIT/TA, liquidity ratio i.e. CA/CL and efficiency ratio i.e. TS/TA are discovered to be higher for those involved in manipulating their records. As is established, manipulators typically blow up their earnings and downplay their liabilities. A lower LTD/TA for manipulators as observed in mean statistics comparison substantiates this premise. Thus, a higher net income and total sales in proportion to assets of a company may be a sign of manipulation. While on the other hand, understatement of debt may be seen as an unscrupulous practice.

**Table 3 Ratio Analysis**

2018-19			2021-22		
Variable	Mean Difference	t	Variable	Mean Difference	t
GP/TA	.0205296	.381	GP/TA	-.0113176	-.202
NI/TA	.0531458	3.235*	NI/TA	.0471344	3.302*
RE/TA	.0235760	1.817*** *	RE/TA	.0288495	2.748*
EBIT/TA	.0560129	2.935*	EBIT/TA	.0422857	2.647*
TL/TE	-.2873392	-	TL/TE	.1922227	.653
LTD/TA	-.0557433	1.656*** *	LTD/TA	-.0598085	-2.227*
D/E	-.2552196	-2.357*	D/E	.1223315	.418
WC/TA	.0449683	-1.157	WC/TA	.0541455	1.799****
CA/TA	.0367184	1.369	CA/TA	.0059533	.174
CA/CL	.2831733	1.045	CA/CL	.8549186	2.893*
CFOP/NI	-1.6257766		CFOP/NI	-.2129393	-.189

AR/TS	-.0128686	.800	AR/TS	-.0096515	-.584
AR/TA	-.0002411	-1.508	AR/TA	.0028373	.242
INV/TS	-.0406919	-.579	INV/TS	-.0483278	-.758
INV/TA	.0265412	-.016	INV/TA	-.0019159	-.103
AP/COGS	1.0891883	-.656	AP/COGS	-1063.7552371	-1.432
TS/TA	.1828947	1.412	TS/TA	.0298896	.311
TS/TE	-.0251077	.011	TS/TE	.0331777	.126
		1.870*			
		-.087			

\*Significant at  $p < 0.05$ , \*\*\*\*Significant at  $p < 0.1000$

Source: Author's Computation

### Predicting Fraud in Financial Statements of Companies

Logistic regression was carried out to identify the predictors of fraud in financial statements of companies. The results presented in Table 4 indicate that Profitability ratio Net Income to Total Assets is a statistically significant predictor of the existence of manipulations in financial results, consistent with Spathis (2002)[23] and Adjei (2020)[1]. A positive coefficient of the ratio establishes that manipulators are more likely to show inflated profits. Long term debt to total assets was not found to be a significant predictor of earnings manipulation. No significant predictor in the years 2019-20 and 2020-21 affirms the association between pandemic and disinclination to doctoring the financial performance, as was established by ratio analysis above.

**Table 4 Logistic Regression Results for Financial Ratios of Companies**

Variable	2018-19	2019-20	2020-21	2021-22
NITA	5.581*	1.943	-.698	5.889*
LTDTA	-1.272	-.080	-.814	-1.045
Constant	-.563	-1.403	-1.124	-.385
R-squared	.079	.011	-.006	.075
Hit Rate	61.3	78.1	74.2	62.6
Chi-square	12.755	1.646	.917	12.114

\*Significant at  $p < 0.05$  Source: Author's Computation

#### **4. Conclusion**

Financial statement fraud detection has gained momentum in the wake of recent incidents of companies collapsing unexpectedly after showing sound business prospects for several years in their financial statements. This not only leads to economic losses but also raises serious concerns about the reliability of financial statements. If not detected and prevented, such manipulative practices can erode the confidence of the investors from the capital market in general. The paper supports the assertions of the fraud triangle theory by using its framework that is claimed to help combat financial statement fraud. The standard method explained by the theory when teamed with ratio analysis provides a useful tool for understanding and uncovering fraudulent conduct. In order to assess the dependability of financial results of listed companies, this study used two very popular techniques of forensic accounting namely Beneish Score and Ratio Analysis on the financial data of BSE S&P 200 companies excluding financial companies for the period 2018-2022. The Beneish M-score revealed that nearly half of the companies are likely to be involved in influencing their annual results. Subsequently, ratio analysis provided relevant information with respect to the ratios that help differentiate between likely manipulators and likely non-manipulators. Net Income to Total Assets, Long Term Debt to Total Assets, Current Assets to Current Liabilities, Total Sales to Total Assets are some such ratios that differ between the two groups of companies. The logistic regression analysis suggests that Net Income to Total Assets is a significant predictor of manipulations in financial statements of companies. A significantly higher value of this ratio may be observed carefully by the users of these statements. Thus, the study offers meaningful implications for the investors, auditors, managers and policy makers. Monitoring agencies and analysts may rigorously scrutinize the financial statements to look for possible frauds in it.

#### **5. Limitations and Future Scope**

Though this paper seeks to make some contribution in the otherwise scant literature on the topic, especially with respect to empirical studies in India. It has its own set of limitations. The study covered only top 200 listed entities, of which financial companies and those with missing data were removed. The sample size and the period under study can thus be increased for better results. Future research may also analyze a different set of ratios to identify other predictors of manipulations in the financial statements. Using the techniques adopted in this paper, a comparative study may also be carried out among companies operating in developing countries with similar economic and legal landscape.

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