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Assessing the effectiveness of the Beneish M-Score Model to Detect Financial Manipulation in Selected Indian Public and Private Banks

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ABSTRACT :

Financial manipulation poses a significant threat to the stability and integrity of the banking sector. This study evaluates the efficacy of the Beneish M-Score Model in detecting financial manipulation within selected Indian public and private banks. The research employs a comprehensive analysis of financial statements and uses the Beneish M-Score Model, which incorporates various financial ratios, to identify potential manipulations. It also uses statistical tools with the help of Excel and SPSS. The researcher has selected 6 banks whether 3 from private sector banks namely City Union Bank Ltd. Bandhan Bank Ltd, and HDFC Bank Ltd, and 3 public sector banks namely Bank of India, Bank of Maharashtra, and Canara Bank for the study of ten years from 2013-14 to 2022-23. The findings shed light on the model's accuracy among different ratios and most of the financial ratios were not manipulated and did not breach their respective threshold ratios. Also, most of the M-scores are less than the threshold value of -2.22. It also distinguishes genuine financial reporting from manipulated practices, offering valuable insights for regulatory bodies, investors, and financial analysts. This research contributes to the ongoing discourse on financial transparency and fraud detection, particularly in India's dynamic banking landscape. This research is limited to the banking sector with a few numbers of banks and data used only for ten years.

Keywords: M-score, Banking Sector, NPA, Manipulation, Threshold, and Banking Fraud.

1. Introduction

The widespread problem of financial manipulation in public and private banks is examined in this paper. It examines the history of these activities and concentrates on the research challenge of identifying and comprehending these manipulations (McNichols, M. F. 2000).

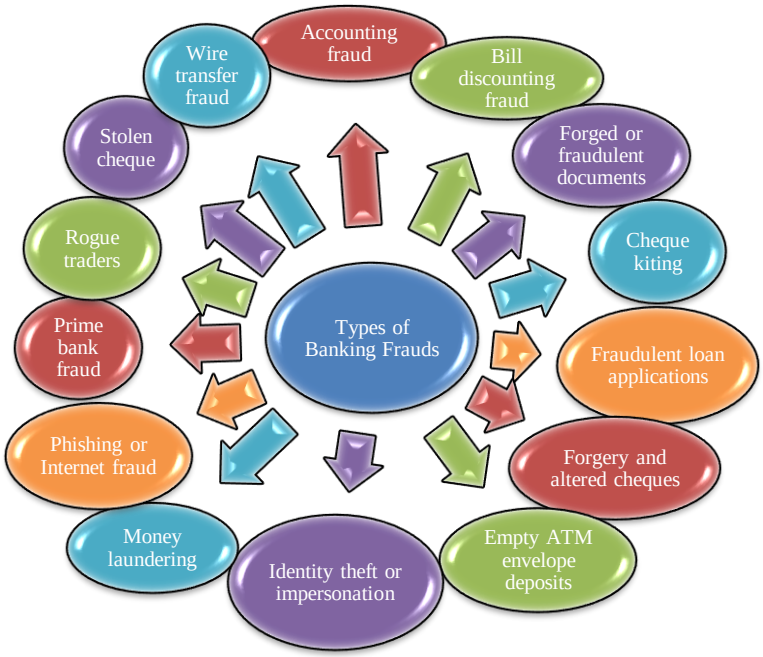
One of the goals is to evaluate how well the Beneish M-Score Model works in this situation. The protection of financial integrity and the promotion of an open banking environment depend heavily on this research (Sharif, D. M. J. 2023).

1.1 Financial Fraud in Banks

Misusing a financial institution or its services for one's benefit or to further illegal activity is known as bank fraud, a serious financial crime. It may entail methods like forging identities, establishing fictitious accounts, altering account information, and using credit cards, ATM cards, or other fraudulent access to cash held by financial institutions (Idolor, E. J. 2010).

Penalties for this offense include fines, jail time, and potentially the loss of business licenses. By putting in place security measures such as robust encryption, two-factor authentication (2FA) for identity verification, fraud detection and prevention protocols, and anti-fraud monitoring systems, banks may guard themselves against bank fraud (Chien, C., et al 2022).

Figure-1



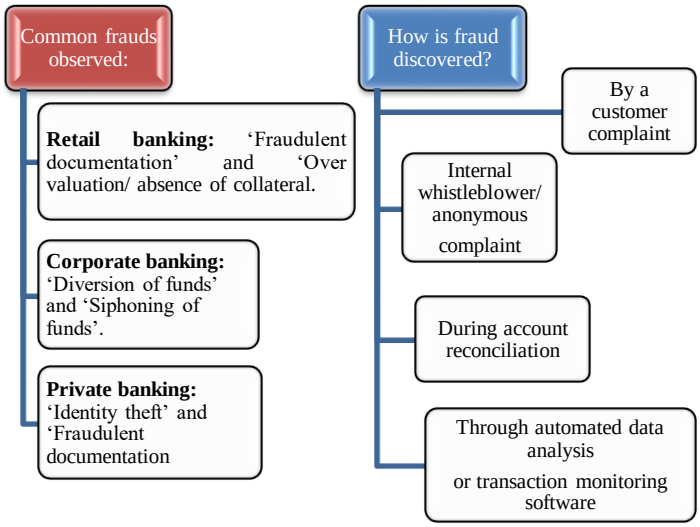
Types of Financial Fraud

Source: Self-Developed

Consumers must take precautions to safeguard their financial information and be aware of the risks of financial fraud. Bank fraud can be committed for several reasons, such as generating a quick profit by exploiting the bad luck of others or by subverting the financial system. They might move money or makeup information on a bank loan using their access to a bank account (Vanasco, R. R. 1998). Identity theft, also known as impersonation, is an increasingly common issue in today's society. It involves the theft of another person's data, such as name, address, credit card information, bank account number, driver's license number, Social Security number (in the USA), or National Insurance number (in the UK), to perpetrate fraud or other crimes (Levi, M., & Wall, D. S. 2004). Money laundering is the act of hiding the sources of monies that have been gained unlawfully. It can involve moving funds between financial institutions or using fictitious identities to conceal the money's true source (Zali, M., & Maulidi, A. 2018). Using shell businesses, foreign bank accounts, or anonymous online wallets, organized crime organizations or individuals with access to other people's credit card information may try to conceal the transfer of payments (Pacini, C., et al 2020). The unauthorized use of credit or debit cards that results in losses for cardholders is known as payment card fraud. Theft and online account hacking are two ways it can be accomplished. Phishing is the practice of using fraudulent methods to obtain private or financial information, frequently to steal money or data (Sakharova, I. 2012, June).

Figure-2

Common Types of Banking Sector Fraud



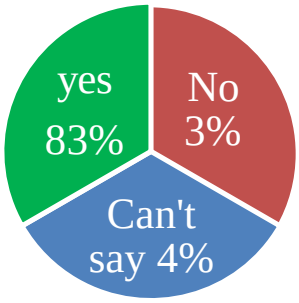
Source: India Banking Fraud Survey by Deloitte (figure self-developed)

The act of fabricating "prime banks" to deceive investors into purchasing imaginary financial products is known as prime bank fraud (Stark, J. R., & Vietmeyer, N. B. 2003). To benefit, rogue traders commit crimes such as securities fraud and other offenses. While wire transfer fraud entails a thief or fraudster utilizing stolen personal information to gain unauthorized access to a bank account, stolen check fraud involves the illegal acquisition and use of another person's check (Kantšukov, M., & Medvedskaja, D. 2013).

1.2 Financial Statement Manipulation in Indian Public and Private Banks

The manipulation of financial statements in Indian public and private banks has become a serious issue, casting doubt on the reliability of financial reporting and the health of the banking industry. Public and private banks, major participants in India's financial system, are essential to the country's economic expansion and investor trust. The openness and accuracy of their stated financial health, however, are called into question by instances of financial statement falsification (Shrimali, G., et al 2011). In order to give a more positive impression than the true financial situation, this phenomenon entails the deliberate falsification of financial information, including income, assets, and liabilities. Such manipulations may be carried out for a variety of reasons, such as luring investors, hitting performance goals, or even masking underlying financial issues (Macintosh, N. B. 2009). Due to the systemic significance of public and private banks, any manipulation can have far-reaching effects on clients, regulatory agencies, shareholders, and the stability of the financial system as a whole (Omarova, S. T. 2016). In order to monitor and guarantee adherence to reporting standards, regulatory organizations like the Securities and Exchange Board of India (SEBI) and the Reserve Bank of India (RBI) are essential (Sabarinathan, G. 2010). As the financial sector develops, it is critical to fortify regulatory frameworks, improve auditing procedures, and cultivate a transparent culture in order to protect the accuracy of financial statements and preserve confidence in the Indian public and private banking industry. The framework for a more thorough examination of the issues and possible fixes related to financial statement manipulation in Indian public and private banks is established by this introduction (Chaudhary, K., & Sharma, M. 2011).

Figure-3 Banking Fraud Survey Response



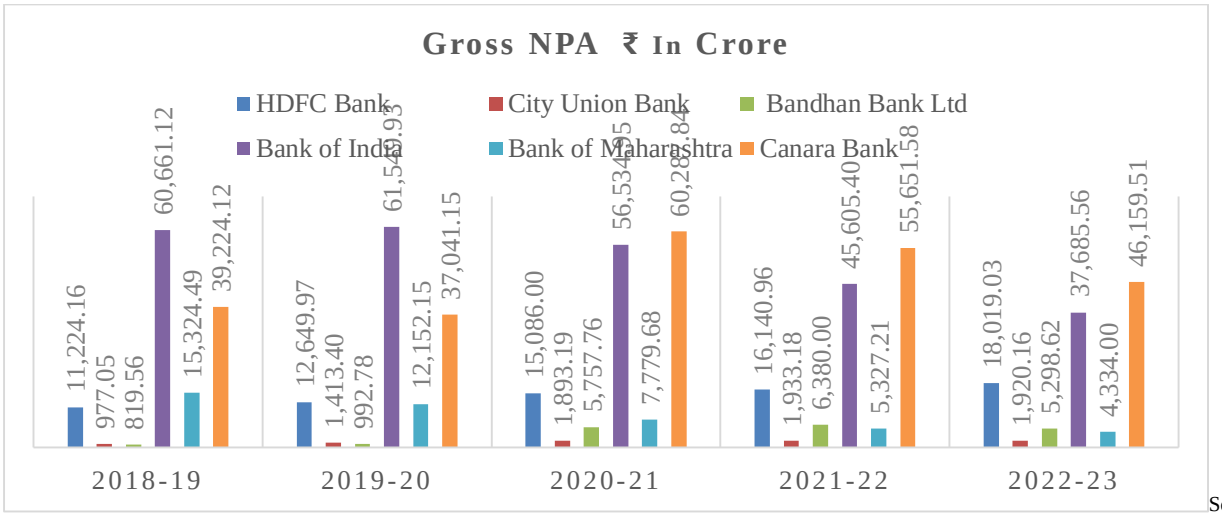
By Customer

Figure 3 shows that, according to the Deloitte banking fraud survey, over the next two years, will the cost of antifraud measures (already adopted or to be adopted) in your organization increase? All things considered, a sizable majority of respondents said they intended to spend money improving or putting specific anti-fraud procedures into place. Even if the majority of these expenses are covered by components of a fraud risk management framework, they show that banks have realized that controlling the risk of fraud is an ongoing process that calls for consistent investment in order to address both present and potential fraud situations.

1.3 NPA Situation in Selected Indian Public and Private Banks

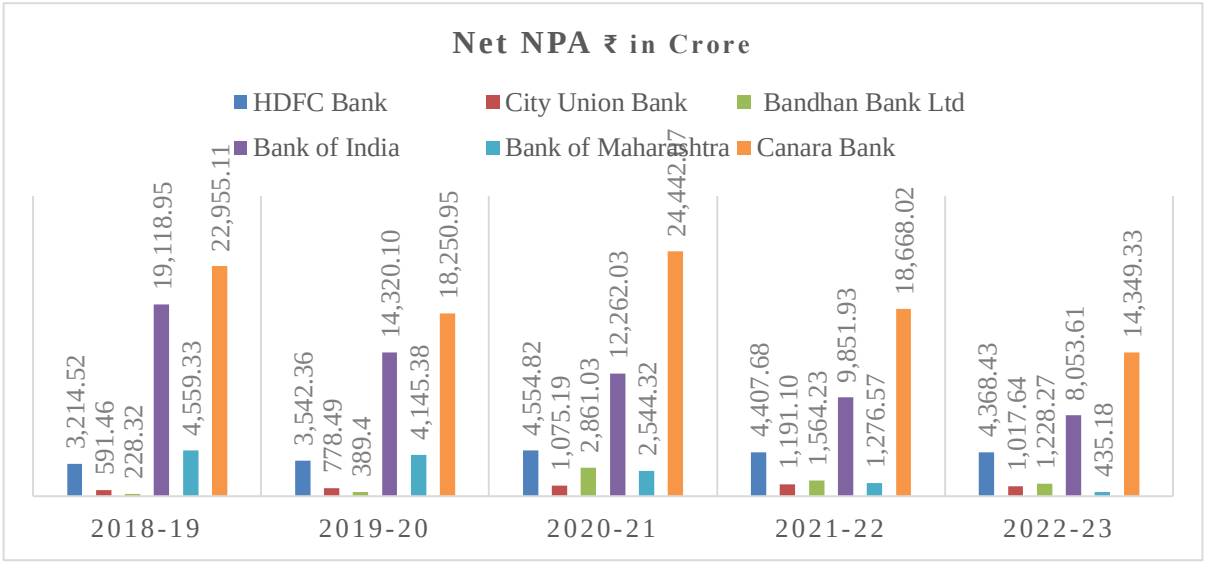
The banking industry, which had formerly flourished in Mumbai, was in a terrible situation. Financial stability was blighted by Non-Performing Assets (NPAs), which loomed over a few Indian public and private banks like shadows (Datta, P. 2023). As loans soured, public banks struggled to manage growing non-performing assets (NPAs) due to bureaucratic red tape (Hinojosa, P. B. 1994). Private banks, which were before thought to be strong, also had difficulties as a result of economic downturns. Customer and investor confidence was negatively impacted by the NPA crisis, which spread to be a major worry. Tight controls and creative solutions were put in place to help the banking industry recover as financial institutions struggled to navigate these choppy waters (Mohan, R., & Ray, P. 2023). The survival of these institutions depended on it, and the Indian economy's tenacity was called into question. It was a race against time. Both public and private sector banks in India struggle with Non-Performing Assets (NPA), which are loans that could default. Before write-offs and recoveries are taken into account, the total amount of non-performing loans is represented by gross NPA. On the other hand, Net NPA accounts for write-offs and recoveries, giving a more realistic picture of the true strain on a bank's balance sheet (Gupta, B. 2012). Due to a variety of economic issues, public sector banks frequently have greater gross non-performing assets (NPAs), but private sector banks typically maintain lower NPAs through strict risk management. Maintaining the stability and expansion of the Indian banking industry depends on continuous efforts to address non-performing assets (NPAs) (Kaur, K., & Singh, B. 2011).

Graph-1



Source: Moneymarket.com

The above graph shows that the presented data shows the gross NPA financial numbers (in crore rupees) for various banks from 2018-19 to 2022-2023. HDFC Bank Between 2018 and 2022, the gross non-performing assets (NPA) increased by a steady amount, from 11,224.16 crore to 18,019.03 crore. Bank City Union, from 977.05 crore in 2018-19 to 1,933.18 crore in 2021-22, there was a steady rise in the gross NPA, which then slightly decreased in 2022-23. Bank of Bandhan Ltd. Gross NPA increased significantly between 2018-19 and 2021-22, from 819.56 crore to 6,380.00 crore. The gross NPA does, however, noticeably decline in 2022-2023. Indian Bank's gross non-performing assets (NPA) dropped steadily from 60,661.12 crore in 2018-19 to 37,685.56 crore in 2022-2023 throughout the years. Maharashtra Bank, Additionally, from 15,324.49 crore in 2018-19 to 5,327.21 crore in 2021-22, the gross NPA has continuously declined. In 2022-2023, there is a minor uptick, though. Bank Canara, the trend of the gross NPA has been erratic, down in 2019-20, increasing in 2020-21, and then declining in 2021-22 and 2022-23.



Graph-2

Source: Moneymarket.com

The above graph shows that HDFC Bank From 3,214.52 crores in 2018–19 to 4,368.43 crores in 2022–2023 are the Net NPAs. HDFC Bank has managed to keep its Net NPA levels comparatively low about its overall assets, even with the increase. Between 2018 and 2022, City Union Bank's Net Non-Performing Assets (NPAs) increased from 591.46 crores to 1,017.64 crores. The bank must successfully monitor and manage its non-performing assets because the bank's asset quality has been negatively damaged. Net Non-Performing Assets (NPAs) of Bandhan Bank Ltd. increased significantly from 228.32 crores in 2018–19 to 2,861.03 crores in 2020–21. Net NPAs subsequently drop to 1,228.27 crores in 2022–2023, however, the bank should keep concentrating on lowering bad loans. Bank of India's Net NPAs decreased from 19,118.95 crores in 2018–19 to 8,053.61 crores in 2022–2023; this is a downward trend. Although the bank appears to have improved the quality of its assets, it should keep trying to lower NPAs. Bank of Maharashtra: From 4,559.33 crores in 2018–19 to 435.18 crores in 2022–2023 are the bank's net non-performing assets (NPAs). Effective risk management has allowed the bank to considerably raise the quality of its assets. The Net NPA trend for Canara Bank has been erratic, rising from 22,955.11 crores in 2018–19 to 24,442.07 crores in 2020–21 and then down to 18,668.02 crores in 2021–22. To guarantee ongoing progress, the bank must keep an eye on and manage

its non-performing assets. For banks to evaluate their asset quality and financial health, net NPA monitoring is essential. Effective risk management and debt recovery measures are shown by a decreasing trend, which is generally considered good. To address possible concerns in the loan portfolio, however, attention and proactive measures are required in response to swings and rises.

1.4 A Brief Introduction of Beneish M-Score and Its Importance

A forensic accounting method called the Beneish M-Score Model is used to identify financial statement tampering or financial manipulation. The methodology, created by Professor Messod Beneish, evaluates many financial measures and indicators to determine the probability of profit manipulation. The Beneish model is a statistical model that determines whether a corporation has manipulated its earnings using eight factors and financial statistics. Its capacity to spot irregular trends in accruals, sales growth, and other important metrics—and to provide a numerical score that denotes the probability of manipulation—makes it relevant for identifying financial fraud. Elevated M-scores indicate a higher likelihood of financial manipulation, making them a crucial instrument for analysts and investors to evaluate the accuracy of disclosed financial information and arrive at better conclusions.

Figure-4

Eight Variables of Beneish M-score Model

Figure 4 shows that the rapidity at which a business collects accounts receivable is measured by DSRI, which shows how effectively it manages cash flow. GMI evaluates profitability patterns and represents the health of the company's gross margin. The AQI measures asset quality and highlights possible balance sheet issues. Sustainability in sales growth is assessed by SGI, which is critical for long-term success. The DEPI evaluates if depreciation costs are sufficient. SGAI evaluates the effectiveness of administrative and sales cost management. LVGI measures the influence of financial leverage on the stability of the company. TATA examines accruals about total assets and offers information about the quality of earnings. Together, these financial indicators provide a thorough picture of the performance and health of a company's finances.

2. Review of Literature

The analysis of public and private banks reveals a dichotomy of resilience and fragility in the maze-like world of financial writing. The Beneish M-score model, which analyzes the subtleties of manipulation, shows itself as a guiding light beneath the surface. It reveals the complex dance between truth and deception in the financial sphere through a tale woven with statistics. There are several reviews from selected sector banks and models.

2.1 Review Related to Beneish M-score Model

An instrument for predicting fraud that finds evidence of earnings manipulation in financial statements is the Beneish M-Score model. It has successfully identified 82% of Malaysian enterprises, 76% of US SEC-enforced firms, and 71% of US fraudulent scandals M-Score, (K. M. B. 2016). The study, which focuses on businesses from 2001 to 2014, investigates how well the Beneish m-score model detects financial fraud. The findings indicate that while sales, asset quality, and leverage indexes are not relevant indicators, gross margin, depreciation, sales, administrative load, and total accruals are (Herawati, N. 2015). The study looks into how well the Beneish M-model and Altman Z-score identify financial wrongdoing and Enron Corporation business failure. Financial figures were manipulated by management, according to the analysis. The study suggests that to effectively safeguard stakeholders, audits should use both approaches (MacCarthy, J. 2017). The study looks into the relationship between falsified financial statements in manufacturing companies listed on the Indonesia Stock Exchange from 2013 to 2017 and financial soundness, industry type, and audit opinion (Irwandi, S. A., et al. 2019). According to the study, the choice of the forensic tool has a major impact on the results of fraud detection, which may have implications for investors' and auditors' policy choices (Kukreja, G., et al. 2020). With a 66/03 percent accuracy rate, the study assesses the Beneish M-Score Model's suitability for identifying financial crime among 137 Tehran Stock Exchange companies. This suggests a new model is required (Lotfi, N., & Aghaei

Chadegani, A. 2018). Financial statement manipulation in Polish enterprises can be effectively detected using the Beneish M-score model, which can distinguish between manipulators and non-manipulators. Results from a small sample test are consistent with earlier research, suggesting that a more extensive study is necessary (Hołda, A. 2020). The efficacy of the Beneish M-Score model in identifying fraudulent financial reporting was examined in this study. The results showed that two factors were ineffective, 28 manipulator companies were correctly categorized as fraud firms, and 33 non-manipulator companies were correctly classified (Triani, N. 2019). Research in the fields of forensic accounting and industry sectors is made possible by the efficacious detection of financial statement fraud in Bosnian small and medium-sized businesses by the Beneish M-Score model (Halilbegovic, S., et al. 2020).

2.2 Review Related to Public and Private Sector Banks

This paper examines the efficiency of managing non-performing assets in India's public and private sector banks, analyzing changes in banking operations since the early 1990s (Chaudhary, K., & Sharma, M. 2011). The study highlights the critical importance of customer satisfaction by finding that public sector banks in Jammu have higher customer satisfaction with service quality than private sector banks (Mengi, P. 2009). Using an econometric model, the study forecasts credit risk in the Indian commercial banking industry, identifying distinct factors and a noteworthy inverse link between GDP and credit risk (Thiagarajan, S., et al. 2011). The existence of financial institutions depends on effective risk management, particularly in India where credit risk has increased due to economic liberalization. Increased portfolio diversification helps lower NPAs and concentration risk (Arunkumar, R., & Kotreshwar, G. 2006). The study examines the viability of 20 established and 10 recently established private sector banks in India's banking industry in the wake of Global Trust Bank's bankruptcy (Aspal, P. K., & Dhawan, S. 2014). Only 31.25% of Indian private sector banks are found to be efficient by the study, suggesting that NPA levels and output metrics like deposits, advances, and investments might be improved (Vegesna, S., & Dash, M. 2014). Six of the thirteen banks in the study had good or exceptional performance when their financial performance was assessed using the CAMELS grading methodology for Old Private Sector Banks in India (Bodla, B. S., & Bajaj, R. V. 2010). This study investigates the relationship between customer happiness, service quality, and behavioral intentions in Indian banks. The findings indicate that customer satisfaction is highly connected with referral propensity, and that service quality has a major impact on customer satisfaction. This could enhance banks' brand perception (Bedi, M. 2010). For Indian banks, non-performing assets (NPAs) pose a serious threat to their profitability and net value. An economy-wide decline in asset value and credit default risk are indicators of excessive non-performing assets (NPAs). To attain 0% NPAs, government efforts are insufficient (Kaur, K., & Singh, B. 2011).

3. Methodology

Research technique describes the systematic procedure for obtaining and assessing data for a research publication. It guides the processes of gathering, analyzing, and interpreting data in order to provide trustworthy study results.

3.1 Sample for the study

The researcher has selected 6 banks whether 3 from private sector banks namely City Union Bank Ltd. Bandhan Bank Ltd, and HDFC Bank Ltd, and 3 public sector banks namely Bank of India, Bank of Maharashtra, and Canara Bank for the study of ten years from 2013-14 to 2022-23.

3.2 Data Collection and Sources

The researcher has selected two sources for data collection where first is Capitaline and another is www. Moneymarket.com. Data has been collected for the eleven years from the years 2012-13 to 2022-3, where 2012-13 as a (t-1) and 2013-14 as a (t). The researcher has chosen different types of financial statements as sources for data collection namely Profit and Loss A/C, Balance Sheet, Cash Flow Statements, Fund Flow Statements, Financial Overview Statements, and other required financial statements from annual reports of selected Indian public and private sector banks.

3.4 Data Analysis Methods and Tools

There are two types of methods used for data analysis one is the selected model which name is the Beneish M-score model which has eight variables for data calculation that detects financial statement manipulation or fraud and another is the required statistical tools, like SPSS, Excel mean, Standard Deviation, Variance, etc and.

3.4.1 About Beneish M-score Model

the Beneish m-score model is a statistical tool that uses different types of selected sectors' financial statements to detect whether the selected sector either manipulated their financial reports or earnings or not. It has eight variables for data calculation. According to Mantone (2013), the M-score is a useful tool for illustrating the probability of engaging in earning manipulation and other fraudulent behaviors. A cumulative M-score greater than -2.22 is interpreted by Warshavsky (2012), Mantone (2013), and Omar et al. (2014) as a sign of possible earnings manipulation and false financial reporting.

Beneish M-score = 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

Where,

- **DSRI** = Sales Index = $Receivables\ (t)/Sales(t)\ Receivables\ (t-1)/Sales(t-1)$
- **GMI** = Gross Margin Index = Sales (t−1) − Cost of goods sold (t−1)/Sales(t−1) Sales(t)− Cost of goods sold (t)/Sales(t)
- **AQI** = Asset Quality Index = [1 – Current Assets (t)+ PP&E(t)]/$Total\ Assets\ (t)$ ⌈1 – Current Assets (t−1) + PP&E(t−1) ⌉/Total Assets(t−1)
- **SGI** = Sales Growth Index = $Sales\ (t)\ Sales(t-1)$
- **DEPI** = Depreciation Index = Depreciation(t−1)/ [Depreciation (t−1) + PP&E (t−1)] Depreciation (t)/[Depreciation (t)+ PP&E (t)]
- **SGAI** = Sales and General Administration Expenses Index = $Sales,\ General\ and\ Administrative(t)/Sales(t)\ Sales,\ General\ and\ Administrative\ Expenses\ (t-1)/Sales(t-1)$

- **TATA** = Total Accrual = [LTD (t)+ Current liabilities (t)]/Total Assets (t) [LTD(t−1) + Current liabilities (t−1)]/Total Assets (t−1)
- **LVGI** = Leverage Index = ΔCurrent Assets(t)– ΔCash(t)– ΔCurrent liabilities(t)−ΔCurrent maturities of LTD(t) − Δincome tax payable(t)−Depreciation and amortization (t) Total Assets.

Table-1

Different Variables with Their Explanations

S. N	Variables	Explanation
1	DSRI	Over two years, this variable indicates whether revenues and receivables are in balance or not. Overstatement of sales and profitability is associated with a higher likelihood of large increases in DSRI (Beneish M D, 1999).
2	GMI	Gross margins are worse when the GMI is higher than 1. Lev and Thiagarajan proposed that a declining gross margin is a bad indicator of a business's future (Beneish M D, 1999).
3	AQI	If the AQI is higher than 1, the corporation may have boosted its use of cost deferral (Beneish M D, 1999).
4	SGI	Although expansion does not always equate to manipulation, experts believe that growth companies are more likely to engage in financial statement fraud than other types of businesses because of the pressure managers face to meet profit targets due to their capital requirements and financial conditions (Beneish M D, 1999).
5	DEPI	The rate of asset depreciation has slowed down if the DEPI is greater than 1. This could indicate that the business has changed to a more profitable plan or has revised its estimates of the useful life of its assets (Beneish M D, 1999).
6	SGAI	Analysts see a disproportionate rise in sales as a bad sign for a company's future (Beneish M D, 1999).
7	TATA	The ratio of total debt to total assets in year t compared to the same ratio in year t – 1 is known as the leveraged value of assets (LVGI). An increase in leverage is indicated by an LVGI larger than 1 (Beneish M D, 1999).
8	LVGI	In previous research, total accruals were utilized to evaluate how managers affect profitability through discretionary accounting decisions. Higher positive accruals, or less cash, are predicted to be linked to a higher risk of manipulating earnings (Beneish M D, 1999).

If the M-score >-2.22 then it is likely to be manipulated in financial statements or earnings of selected sectors.

If the M-score <-2.22 then it is unlikely to manipulate in financial statements or earnings of selected sectors. (Warshavsky (2012), Mantone (2013) and Omar et al. (2014).

Table-2

The Threshold Values of Beneish M-score Ratios

Ratios	Non-Manipulators	Manipulators
DSRI	1.031	1.465
GMI	1.041	1.193
AQI	1.039	1.254
SGI	1.134	1.607
DEPI	1.001	1.077
SGAI	1.054	1.041
TATA	1.037	1.111
LVGI	0.018	0.031

The above table shows the threshold manipulator and non-manipulator ratios which are found from the mean value which has 1708 companies for calculating threshold ratios of non-manipulators and 50 companies for calculating threshold ratios of manipulators (Beneish M D, 1999). This also shows that there is a positive relationship between all eight financial ratios with their earnings manipulation (Beneish M D, 1999).

4., Result and Discussion

In this section, the researcher analyses the selected sector banks' data and finds the result of whether banks manipulated their financial statements or not. The above methodology section describes manipulation and not manipulation scores. Here it indicates that,

If the M-score >-2.22 then it is likely to be manipulated in financial statements or earnings of selected sectors.

If the M-score <-2.22 then it is unlikely to manipulate in financial statements or earnings of selected sectors. (Warshavsky (2012), Mantone (2013) and Omar et al. (2014).

In this study researcher has used eight financial ratios namely DSRI, GMI, AQI, SGI, DEPI, SGAI, TATA, and LVGI as a variable for calculating of M-score to detect whether selected Banks have manipulated or not manipulated in their financial statements and all the M-scores that are in green indicate that they have not manipulated their financial statements, and the M-scores in red indicate that they have manipulated their financial statements.

Table-3

Bandhan Bank Ltd.

Years	Constant	DSRI	GMI	AQI	SGI	DEPI	SGAI	TATA	LVGI	M-score
2022-23	-4.84	0.924	1.023	1.326	1.101	0.143	1.138	0.036	0.999	-2.271
2021-22	-4.84	1.049	1.015	1.265	1.148	0.158	1.018	0.042	1.031	-2.101
2020-21	-4.84	1.041	1.005	0.380	1.170	0.175	0.955	0.050	1.017	-2.399
2019-20	-4.84	0.878	0.976	1.035	1.614	0.179	0.858	-0.020	1.041	-2.220
2018-19	-4.84	1.063	1.007	1.072	1.399	0.191	0.911	0.017	1.017	-2.038
2017-18	-4.84	1.042	0.998	0.308	1.275	0.265	1.036	0.057	0.924	-2.276
2016-17	-4.84	1.042	0.930	6.578	2.495	0.210	0.535	-0.140	1.026	0.433
2015-16	-4.84	0.625	1.011	-0.139	7.767	0.131	0.194	-0.134	17.338	-3.171
2014-15	-4.84	0.912	1.014	1.104	1.276	0.009	0.883	-0.733	1.145	-5.838
2013-14	-4.84	0.917	0.951	0.828	1.452	0.003	0.608	-0.802	1.023	-6.055
Maximum	-4.84	1.063	1.023	6.578	7.767	0.265	1.138	0.057	17.338	0.433
Minimum	-4.84	0.625	0.930	-0.139	1.101	0.003	0.194	-0.802	0.924	-6.055
Mean	-4.84	0.949	0.993	1.376	2.070	0.146	0.814	-0.163	2.656	-2.794
Median	-4.84	.95	.99	1.01	1.05	1.34	.17	.90	.00	1.02
Std. Deviation	.000	.134	.031	1.888	2.042	.083	.286	.327	5.159	1.901

Breach the threshold value for = Manipulator

Breach the threshold value for = Non-manipulator

M-score >-2.22, and M-score <-2.22.

The above table 3, which includes different financial ratios and measures for 2013–14 to 2022–23, looks to be a financial performance study for Bandhan Bank Ltd. All constant values in this column are -4.84, suggesting that the data is normalized or standardized. Bandhan Bank Ltd describes that there are three years namely 2021-22, 2018-19, and 2016-17 with ratios of -2.101, 2.038, and 0.433 breach the threshold value of -2.22 financial statements of the respected banks that have been manipulated, and the rest of the years there are no manipulated financial statements because all M-scores of these years are less than a normal M-score that is -2.22. Bandhan Bank Ltd. describes that the values of DSRI for ten years are 0.924, 1.049, 1.041, 0.878, 1.063, 1.042, 1.042, 0.625, .912, and 0.917 respectively and there is no breach the threshold value for the manipulator is 1.031 (Table 2) but in 2021-22, 2020-21, 2018-19, 2017-19, and 2016-17 are breach the threshold value for the non-manipulator with DSRI ratios 1.049, 1.041, 1.063, 1.042, and 1.042 respectively. The values of GMI ratios from 2022-23 to 2013-14 are 1.023, 1.015, 1.005, 0.976, 1.007, 0.998, 0.930, 1.011, 1.014, and 0.951 which neither breach the threshold value of manipulator 1.193 (Table 2) for the manipulator nor the threshold value of 1.041(Table 2) for the non-manipulator. The values of AQI ratios from 2022-23 to 2013-14 are 1.326, 1.265, 0.380, 1.035, 1.072, 0.308, 6.578, -0.139, 1.104, and 0.828 respectively, and among these AQI ratios, in 2021-22 and 2016-17 are 1.265 and 6.578 respectively which are breach the threshold manipulator value of 1.254 (Table 2), it means in these both years financial statements of the respected bank were manipulated and AQI ratios in 2022-23, 2018-19, and 2013-14 are 1.326, 1072, and 1.104 respectively which breach the threshold non-manipulator value of 1.039 (Table 2), it means in these years financial statements of respected bank were non manipulated but cross the non-manipulator threshold. The values of SGI ratios from 2022-23 to 2013-14 are 1.101, 1.148, 1.170, 1.614, 1.399, 1.275, 2.495, 7.767, 1.276, and 1.452 respectively, and among these SGI ratios, in 2019-20, 2016-17, and 2015-16 are 1.614, 2.495, and 7.767 respectively which are breach the threshold manipulator value of 1.607 (Table 2), it means in these both years financial statements of the respected bank were manipulated and SGI ratios in 2021-22, 2020-21, and 2018-19 are 1.148, 1.170, and 1.399 respectively which breach the threshold non-manipulator value of 1.134 (Table 2), it means in these years financial statements of the respected bank were non manipulated but cross the non-manipulator threshold. The values of DEPI ratios from 2022-23 to 2013-14 do not breach the threshold values of the manipulator and non-manipulator which are 1.077 and 1.001 respectively, which means there is no fraudulence in the related ratios of the respected bank. The values of SGAI ratios from 2022-23 to 2013-14 are between 0.194 and 1.138 and in 2022-23, The value of the SGAI ratio is 1.138 and it breaches the threshold value of 1.041 (Table 2) which means there is fraudulence in the related ratios of the respected bank and rest of the years there is no any fraudulence in the respected ratio of the respected bank. The values of TATA ratios from 2022-23 to 2013-14 are between -0.802 and 0.057 and the TATA ratios 2022-23, 2021-22, 2020-21, and 2017-18, are 0.036, 0.042, 0.050, and 0.057 which are breach threshold ratio value of 0.031 (Table 2) of respected ratio, it means in these years the respected bank is likely to manipulate its financial ratio, and rest of the years there is no manipulated in respected ratio. The value of LVGI ratios from 2022-23 to 2013-14 are between 0.924 and 17.338 and in 2015-16, and 2014-15 were 17.338 and 1.145 respectively which breach the threshold value of 1.111 (Table 2), means in these years the respected ratios are likely to manipulated and in 2019-20, the value of the ratio is 1.041 which breach the threshold value of non-manipulator of 1.037 (Table 2). finally, the Beneish M-score indicates that except for 2021-22, 2018-19, and 2016-17 are -2.101, -2.038, and 0.433

respectively which breach the threshold value of the M-score (-2.22) in the respected years, and it means in these years the respected bank was manipulated its financial statements and rest of the years there is no manipulated in financial statements of the respected bank. The maximum cores have indicated all ratios and m-scores with their numerical numbers. The minimum cores have indicated all ratios and m-scores with their numerical numbers. The mean scores have indicated all ratios and m-scores with their average. The median cores have indicated all ratios and m-scores with their middle values—the Std. Deviation cores have indicated all ratios and m-scores with their A measure of the dispersion or spread of the values around the mean.

Table-4

City Union Bank Ltd.

Years	Constant	DSRI	GMI	AQI	SGI	DEPI	SGAI	TATA	LVGI	M-score
2022-23	**-4.84**	**0.976**	**0.999**	**0.977**	**0.775**	**1.402**	**0.988**	**0.002**	**0.738**	**-2.568**
2021-22	**-4.84**	**1.137**	**0.984**	**0.962**	**0.860**	**1.061**	**0.948**	**-0.009**	**0.805**	**-2.466**
2020-21	**-4.84**	**0.715**	**0.996**	**0.947**	**0.943**	**1.107**	**0.946**	**-0.006**	**0.853**	**-2.777**
2019-20	**-4.84**	**1.104**	**1.002**	**0.922**	**0.917**	**1.012**	**1.034**	**-0.003**	**0.795**	**-2.441**
2018-19	**-4.84**	**0.913**	**0.971**	**0.917**	**0.928**	**0.985**	**0.990**	**-0.005**	**0.800**	**-2.630**
2017-18	**-4.84**	**0.975**	**1.001**	**0.893**	**0.933**	**0.994**	**0.930**	**-0.007**	**0.783**	**-2.554**
2016-17	**-4.84**	**1.145**	**0.993**	**0.885**	**0.903**	**1.068**	**0.945**	**0.007**	**0.798**	**-2.367**
2015-16	**-4.84**	**0.837**	**0.992**	**0.852**	**0.904**	**1.132**	**1.018**	**-0.008**	**0.797**	**-2.738**
2014-15	**-4.84**	**0.979**	**0.984**	**0.766**	**1.008**	**1.046**	**1.022**	**-0.073**	**0.839**	**-2.883**
2013-14	**-4.84**	**0.901**	**0.979**	**0.698**	**1.007**	**0.999**	**1.065**	**-0.041**	**0.789**	**-2.831**
Average	**-4.84**	**0.968**	**0.990**	**0.882**	**0.918**	**1.080**	**0.989**	**-0.014**	**0.800**	**-2.626**
Maximum	**-4.84**	**1.145**	**1.002**	**0.977**	**1.008**	**1.402**	**1.065**	**0.007**	**0.853**	**-2.367**
Minimum	**-4.84**	**0.715**	**0.971**	**0.698**	**0.775**	**0.985**	**0.930**	**-0.073**	**0.738**	**-2.883**
Median	**-4.84**	**.98**	**.99**	**.91**	**.92**	**1.05**	**.99**	**-.01**	**.80**	**-2.60**
Std. Deviation	**.000**	**.136**	**.010**	**.089**	**.068**	**.123**	**.046**	**.024**	**.031**	**.176**

Breach the threshold value for = Manipulator

Breach the threshold value for = Non-manipulator

M-score >-2.22, and M-score <-2.22.

Table 4 which includes different financial ratios and measures between the years 2013–14 to 2022–23, looks to be a financial performance study for City Union Bank Ltd. All values in this column are -4.84, suggesting that the data is normalized or standardized. City Union Bank Ltd. describes that there are no year's financial statements of the selected banks that have not been manipulated all M-scores are less than a normal M-score which is -2.22. Among the eight ratios only two values of two ratios namely DSRI and DEPI have a threshold value and the rest of the ratios' values are under the threshold value of respected ratios of the respected bank. Among the ratio values of DSRI are 1.137, 1.104, and 1.145 in the respected years 2021-22, 2019-20, and 2016-17 these ratios don't breach the threshold of manipulator value of 1.465 (Table 2) but breach the threshold of non-manipulator value 1.031 (Table 2), it means respected ratio has not manipulated in the respected bank. The ratio values of DEPI from 2022-23 to 2013-14 are between 0.985 and 1.402 and among the ratios three years breached the threshold value of 0.031 (Table 2) respected ratio and these respected years are 2022-23, 2020-21, and 2015-16 with respected ratio's values are 1.402, 1.107, and 1.132, and in the years 2021-22, 2019-20, 2016-17, and 2014-15 the values of respected ratio are 1.061, 1.012, 1.068, and 1.046 which breaches the threshold value of non-manipulator 1.001 (Table 2) which means in these years there is no fraudulence in the financial statements of the respected bank. The maximum cores have indicated all ratios and m-scores with their numerical numbers. The minimum cores have indicated all ratios and m-scores with their numerical numbers. The mean scores have indicated all ratios and m-scores with their average. The median cores have indicated all ratios and m-scores with their middle values—the Std. Deviation cores have indicated all ratios and m-scores with their A measure of the dispersion or spread of the values around the mean.

Table-5

HDFC Bank Ltd.

Years	Constant	DSRI	GMI	AQI	SGI	DEPI	SGAI	TATA	LVGI	M-score
2022-23	-4.84	1.062	1.013	1.005	0.795	1.055	0.795	0.007	0.710	-2.430
2021-22	-4.84	1.015	1.020	1.015	0.852	0.896	0.852	0.001	0.687	-2.461
2020-21	-4.84	1.037	1.008	1.009	0.849	0.957	0.849	-0.004	0.743	-2.488
2019-20	-4.84	1.040	1.006	1.017	0.805	1.016	0.805	0.011	0.643	-2.403
2018-19	-4.84	1.006	0.999	1.026	0.869	1.090	0.869	0.025	0.734	-2.342
2017-18	-4.84	0.935	1.013	1.120	0.864	1.020	0.864	-0.020	0.657	-2.562
2016-17	-4.84	1.065	1.011	0.983	0.811	1.116	0.811	-0.028	0.750	-2.591

2015-16	-4.84	0.879	0.998	1.085	0.862	1.007	0.862	0.080	0.642	-2.164
2014-15	-4.84	0.971	0.990	1.143	0.950	1.000	0.950	0.033	0.733	-2.247
2013-14	-4.84	0.903	0.987	1.547	0.946	1.082	0.946	-0.072	0.708	-2.627
Average	-4.84	0.991	1.004	1.095	0.860	1.024	0.860	0.003	0.701	-2.432
Maximum	-4.84	1.065	1.020	1.547	0.950	1.116	0.950	0.080	0.750	-2.164
Minimum	-4.84	0.879	0.987	0.983	0.795	0.896	0.795	-0.072	0.642	-2.627
Median	-4.840	1.010	1.007	1.021	.857	1.018	.857	.004	.709	-2.445
Std. Deviation	.0000	.0663	.0107	.1675	.0531	.0658	.0531	.0402	.0413	.1487

Breach the threshold value for = Manipulator

Breach the threshold value for = Non-manipulator

M-score >-2.22, and M-score <-2.22.

Table 5, which includes different financial ratios and measures for 2013–14 to 2022–23, looks to be a financial performance study for HDFC Bank Ltd. All values in this column are -4.84, suggesting that the data is normalized or standardized. HDFC Bank Ltd. describes that there is only one year namely 2015-16 with a ratio of -2.164 breaches the threshold value of -2.22 financial statements of the respected banks that have been manipulated, and the rest of the years there are no manipulated financial statements because all M-scores of these years are less than a normal M-score that is -2.22. Among the eight ratios only three ratios namely the AQI ratio in 2013-14 and the DEPI ratio in 2018-19, 2016-17, breached the threshold respected manipulator value of ratios 1.254 (Table 2) and 1.077 (Table 2) and the rest of the ratio's values are under the threshold value of respected ratios of the respected bank, but ratios DSRI in 2022-23, 2020-21, and 2016-17 with the value of ratio 1.062, 1.037, and 1.065 respectively, AQI in 2017-18 and 2014-15 with the value of ratio 1.120 and 1.143 respectively DEPI in 2022-23, 2019-20, 2017-18, and 2015-16 with value of ratio 1.055, 1.016, 1.020, and 1.007, and TATA in 2018-19 with value of ratio 0.025 which breaches the threshold respected non-manipulator value 1.031, 1.039, 1.001, and 0.018 (Table 2) of respected bank. The maximum cores have indicated all ratios and m-scores with their numerical numbers. The minimum cores have indicated all ratios and m-scores with their numerical numbers. The mean scores have indicated all ratios and m-scores with their average. The median cores have indicated all ratios and m-scores with their middle values—the Std. Deviation cores have indicated all ratios and m-scores with their A measure of the dispersion or spread of the values around the mean.

Table-6

Bank of India

Years	Constant	DSRI	GMI	AQI	SGI	DEPI	SGAI	TATA	LVGI	M-score
2022-23	-4.84	1.047	1.000	0.994	1.191	0.884	0.963	0.037	1.003	-2.102
2021-22	-4.84	1.073	1.020	1.718	0.969	1.118	1.102	0.075	0.991	-1.791
2020-21	-4.84	0.994	1.013	0.432	0.967	1.025	1.140	-0.039	1.000	-2.942
2019-20	-4.84	1.110	0.992	1.054	1.080	0.961	0.971	0.040	1.008	-2.106
2018-19	-4.84	1.088	1.024	1.165	1.037	1.499	0.998	0.026	0.983	-2.102
2017-18	-4.84	0.918	0.994	0.796	0.951	-0.025	1.086	0.019	0.993	-2.728
2016-17	-4.84	1.193	0.999	1.386	1.014	-2.125	1.061	0.026	1.001	-2.383
2015-16	-4.84	1.035	1.015	0.826	0.954	1.416	1.075	-0.026	0.998	-2.638
2014-15	-4.84	0.912	1.011	0.674	1.129	0.819	0.992	-0.006	1.001	-2.621
2013-14	-4.84	1.012	1.002	1.131	1.022	0.954	1.059	0.008	0.889	-2.336
Average	-4.84	1.038	1.007	1.018	1.031	0.653	1.045	0.016	0.987	-2.375
Maximum	-4.84	1.193	1.024	1.718	1.191	1.499	1.140	0.075	1.008	-1.791
Minimum	-4.84	0.912	0.992	0.432	0.951	-2.125	0.963	-0.039	0.889	-2.942
Median	-4.840	1.041	1.006	1.024	1.018	.957	1.060	.022	.999	-2.359
Std. Deviation	.000	.0855	.0110	.366	.080	1.059	.060	.033	.0350	.3558

Breach the threshold value for = Manipulator

Breach the threshold value for = Non-manipulator

M-score >-2.22, and M-score <-2.22.

Table 6 describes different financial ratios and measures for 2013–14 to 2022–23, which looks to be a financial performance study for the Bank of India. All values in this column are -4.84, suggesting that the data is normalized or standardized. Bank of Maharashtra describes that there are four years namely 2022-23, 2021-22, 2019-20, and 2018-19 with the respected ratios -2.102, -1.791, -2.106, and -2.102 breach the threshold value of -2.22 financial statements of the respected banks that have been manipulated, and the rest of the years there are no manipulated financial statements because all M-scores of these years are less than a normal M-score that is -2.22. Out of the eight ratios, four ratios namely DSRI, GMI, SGI, and LVGI were not manipulated

in their financial ratios or statements in whole years but the AQI ratio in 2021-22 and 2016-17 with a ratio of 1.718 and 1.386, DEPI in 2021-22, 2018-19, and 2015-16 with a ratio of 1.118, 1.499, and 1.416, SGAI in 2021-22, 2020-21,2017-18, 2016-17, 2015-16, and 2013-14 with a ratio of 1.102, 1.140, 1.086, 1.061, 1.075, and 1.059, and TATA in 2022-23, 2021-22, and 2019-20 with a ratio of 0.037, 0.075, and 0.040 respectively which are breach the threshold values of 1.254, 1.077, 1.041, and 0.031 (Table 2) of the respected ratios related to respected bank. In the threshold of non-manipulator ratios, the DSRI breaches its threshold value in most of the years, AQI, SGI, and TATA breach the threshold value in only three years, and DEPI breaches its threshold value only in 2020-21, but among these eight ratios, there are two ratios namely GMI and LVGI were not any fraudulence changes in their financial ratios or statements. The maximum cores have indicated all ratios and m-scores with their numerical numbers. The minimum cores have indicated all ratios and m-scores with their numerical numbers. The mean scores have indicated all ratios and m-scores with their average. The median cores have indicated all ratios and m-scores with their middle values. The Std. Deviation cores have indicated all ratios and m-scores with their A measure of the dispersion or spread of the values around the mean.

Table-7

Bank of Maharashtra

Years	Constant	DSRI	GMI	AQI	SGI	DEPI	SGAI	TATA	LVGI	M-score
2022-23	-4.84	0.993	0.979	1.004	1.160	0.985	0.806	0.034	1.002	-2.162
2021-22	-4.84	1.069	0.973	1.002	1.081	0.945	1.330	-0.004	1.002	-2.440
2020-21	-4.84	1.151	1.027	0.995	1.103	1.107	1.109	0.012	1.002	-2.187
2019-20	-4.84	1.059	0.986	1.025	1.060	1.071	1.376	0.018	0.970	-2.333
2018-19	-4.84	1.097	1.019	0.971	0.984	0.653	0.408	0.064	1.031	-2.058
2017-18	-4.84	1.126	0.995	1.011	0.929	0.883	1.067	0.027	0.982	-2.321
2016-17	-4.84	0.991	1.027	0.994	0.964	1.172	2.065	-0.026	1.009	-2.796
2015-16	-4.84	0.975	0.989	1.008	1.029	0.921	1.163	0.008	1.001	-2.479
2014-15	-4.84	1.042	0.995	0.996	1.064	0.868	1.072	0.022	0.999	-2.313
2013-14	-4.84	0.947	0.997	1.003	1.103	0.913	0.927	0.026	0.918	-2.286
Average	-4.84	1.045	0.999	1.001	1.048	0.952	1.132	0.018	0.991	-2.338
Maximum	-4.84	1.151	1.027	1.025	1.160	1.172	2.065	0.064	1.031	-2.058
Minimum	-4.84	0.947	0.973	0.971	0.929	0.653	0.408	-0.026	0.918	-2.796
Median	-4.840	1.050	.995	1.002	1.062	.933	1.090	.020	1.001	-2.317
Std. Deviation	.000	.067	.019	.013	.071	.145	.428	.023	.030	.204

Breach the threshold value for = Manipulator

Breach the threshold value for = Non-manipulator

M-score >-2.22, and M-score <-2.22.

Table 7, which includes different financial ratios and measures for 2013–14 to 2022–23, looks to be a financial performance study for the Bank of Maharashtra. All values in this column are -4.84, suggesting that the data is normalized or standardized. Bank of Maharashtra describes that there are three years namely 2022-23, 2020-21, and 2018-19 with the respected ratios -2.162, -2.187, and -2.058 breach the threshold value of -2.22 financial statements of the respected banks that have been manipulated, and the rest of the years there are no manipulated financial statements because all M-scores of these years are less than a normal M-score that is -2.22. Out of eight financial ratios five financial ratios did not breach the threshold and did not manipulate their financial statements but three ratios namely DEPI in 2020-21 and 2016-17 with a ratio of 1.107, and 1.172, TATA in 2022-23 and 2018-19 with a ratio of 0.034, and 0.064, and SGAI in 2021-22, 2020-21, 2019-20, 2017-18, 2016-17, 2015-16, and 2014-15, with the ratios of 1.330, 1.109, 1.376, 1.067, 2.065, 1.163, and 1.072 respectively breach the threshold respected values of 1.077, 0.031, and 1.041 (Table 2) of the respected ratios to related the respected bank. In the threshold of non-manipulator ratios, the DSRI breaches its threshold value in 2021-22,2020-21, 2019-20, 2018-19, and 2014-15, SGI breaches its threshold value in 2022-23, DEPI breaches its threshold value in 2019-20, and TATA breaches its threshold value in 2017-18, 2014-15, and 2013-14 but among these eight ratios, there are three ratios namely GMI, AQI and LVGI were not any fraudulence changes in their financial ratios or statements. The maximum cores have indicated all ratios and m-scores with their numerical numbers. The minimum cores have indicated all ratios and m-scores with their numerical numbers. The mean scores have indicated all ratios and m-scores with their average. The median cores have indicated all ratios and m-scores with their middle values—the Std. Deviation cores have indicated all ratios and m-scores with their A measure of the dispersion or spread of the values around the mean.

Table-8

Canara Bank

Years	Constant	DSRI	GMI	AQI	SGI	DEPI	SGAI	TATA	LVGI	M-score
2022-23	-4.84	0.975	0.983	1.003	1.201	0.757	0.886	0.054	1.001	-2.090
2021-22	-4.84	1.077	0.997	0.996	1.020	1.018	1.026	0.019	1.003	-2.312
2020-21	-4.84	1.256	1.029	0.995	1.484	0.728	1.125	-0.030	0.997	-1.989
2019-20	-4.84	0.936	1.014	1.013	1.063	0.952	0.978	0.015	1.002	-2.402
2018-19	-4.84	0.995	1.000	0.994	1.108	1.075	0.871	-0.003	0.994	-2.370

2017-18	-4.84	1.113	1.014	0.997	0.985	0.860	1.097	0.034	1.000	-2.257
2016-17	-4.84	1.189	1.011	1.004	1.001	0.528	1.087	0.013	1.001	-2.305
2015-16	-4.84	1.017	1.003	1.003	1.012	2.510	1.093	0.003	0.999	-2.278
2014-15	-4.84	0.994	1.004	1.006	1.111	0.574	1.060	0.011	0.998	-2.391
2013-14	-4.84	1.113	1.006	1.002	1.053	0.952	1.104	-0.002	1.040	-2.372
Average	-4.84	1.066	1.006	1.001	1.104	0.995	1.033	0.011	1.003	-2.277
Maximum	-4.84	1.256	1.029	1.013	1.484	2.510	1.125	0.054	1.040	-1.989
Minimum	-4.84	0.936	0.983	0.994	0.985	0.528	0.871	-0.030	0.994	-2.402
Median	-4.840	1.047	1.005	1.002	1.058	.906	1.073	.012	1.000	-2.308
Std. Deviation	.000	.101	.0122	.005	.1484	.562	.091	.022	.0130	.1360

Breach the threshold value for = Manipulator

Breach the threshold value for = Non-manipulator

M-score >-2.22, and M-score <-2.22.

Table 8, which includes different financial ratios and measures for 2013–14 to 2022–23, looks to be a financial performance study for Canara Bank. All values in this column are -4.84, suggesting that the data is normalized or standardized. Canara Bank describes that there are two years namely 2022-23 and 2020-21 with the respected ratios -2.090 and -1.989, breach the threshold value of -2.22 financial statements of the respected banks that have been manipulated, and the rest of the years there are no manipulated financial statements because all M-scores of these years are less than a normal M-score that is -2.22. Out of eight financial ratios five financial ratios did not breach the threshold and did not manipulate their financial statements but three ratios namely DEPI in 2015-16 with a ratio of 2.510, SGAI in 2020-21, 2017-18, 2016-17, 2015-16, 2014-15, and 2013-14 with the ratios of 1.125, 1.097, 1.087, 1.093, 1.060, and 1.104, and TATA in 2022-23 and 2017-18 with the ratios 0.054 and 0.034 respectively breach the threshold respected values of 1.077, 1.041, and 0.031 (Table 2) of the respected ratios to related the respected bank. In the threshold of non-manipulator ratios, the DSRI breaches its threshold value in 2021-22, 2020-21, 2017-18, 2016-17, and 2013-14, SGI breaches its threshold value in 2022-23 and 2021-22, DEPI in 2021-22 and 2018-19, TATA in 2021-22, and 2013-14, but among these eight ratios, there are two ratios namely GMI and AQI were not any fraudulence changes in their financial ratios or statements. The maximum cores have indicated all ratios and m-scores with their numerical numbers. The minimum cores have indicated all ratios and m-scores with their numerical numbers. The mean scores have indicated all ratios and m-scores with their average. The median cores have indicated all ratios and m-scores with their middle values—the Std. Deviation cores have indicated all ratios and m-scores with their A measure of the dispersion or spread of the values around the mean.

5. Conclusion

It explores financial manipulation in public and private banks in India, focusing on the history and research challenge of identifying and understanding these manipulations. The Beneish M-Score Model is evaluated to protect financial integrity and promote an open banking environment. Bank fraud involves using financial institutions or services for personal gain or illegal activity, with penalties including fines, jail time, and potential loss of business licenses. Financial statement manipulation in Indian banks has become a serious issue, casting doubt on the reliability of financial reporting and the health of the banking industry. The Deloitte banking fraud survey shows that the cost of antifraud measures will increase in organizations over the next two years. Tight controls and creative solutions are needed to maintain the stability and expansion of the Indian banking industry. The model identifies earnings manipulation and false financial reporting, with a score greater than -2.22 indicating potential manipulation. The study found a positive correlation between all eight financial ratios and earnings manipulation, proving its usefulness in detecting financial statement manipulation and fraud. Bandhan Bank Ltd breached the threshold value of -2.22 for manipulated financial statements in three years. Banks with higher M-scores are more likely to manipulate their financial statements and earnings. The study also examined financial ratios and measures from 2013-2014 to 2022-23 for City Union Bank Ltd., HDFC Bank Ltd., Bank of India, and Bank of Maharashtra. The Beneish M-Score model's effectiveness may vary due to dynamic market conditions, limited sample size, and potential changes in accounting practices. Conduct a comprehensive study with a larger sample, consider regional economic nuances, and regularly update the model to enhance its adaptability to evolving financial landscapes.

REFERENCES :

1. Arunkumar, R., & Kotreshwar, G. (2006). Risk management in commercial banks (A case study of public and private sector banks). In Indian Institute of Capital Markets 9th Capital Markets Conference Paper.
2. Aspal, P. K., & Dhawan, S. (2014). Financial performance assessment of banking sector in India: A case study of old private sector banks. The Business & Management Review, 5(3), 196.
3. Bedi, M. (2010). AN INTEGRATED FRAMEWORK FOR SERVICE QUALITY, CUSTOMER SATISFACTION AND BEHAVIORAL RESPONSES IN INDIAN BANKING INDUSTRY--A COMPARISON OF PUBLIC AND PRIVATE SECTOR BANKS. Journal of Services Research, 10(1).
4. Beneish, M. D. (1999). The detection of earnings manipulation. Financial Analysts Journal, 55(5), 24-36.
5. Beneish, M. D., Harvey, C. R., Tseng, A., & Vorst, P. (2020). Unpatented innovation and merger synergies. Review of Accounting Studies, 1-39.
6. Beneish, M. D., Lee, C. M., & Nichols, D. C. (2013). Earnings manipulation and expected returns. Financial Analysts Journal, 69(2), 57-82.
7. Bodla, B. S., & Bajaj, R. V. (2010). An analysis of the efficiency of private sector banks in India. The IUP journal of bank management, 9(1), 60-82.

8. Chaudhary, K., & Sharma, M. (2011). Performance of Indian public sector banks and private sector banks: A comparative study. International journal of innovation, management and technology, 2(3), 249.
9. Chien, C., George, A., Shekhar, S., & Apel, R. (2022). Estimating the Earnings Loss Associated with a Criminal Record and Suspended Driver's License. Ariz. L. Rev., 64, 675.
10. Datta, P. (2023). Judicial review of central banks: an Indian perspective. Indian Law Review, 7(1), 96-117.
11. Gupta, B. (2012). A comparative study of non-performing assets of SBI & associates & other public sector banks. SIT Journal of Management, 2(3), 175-189.
12. Halilbegovic, S., Celebic, N., Cero, E., Buljubasic, E., & Mekic, A. (2020). Application of Beneish M-score model on small and medium enterprises in Federation of Bosnia and Herzegovina. Eastern Journal of European Studies, 11(1).
13. Herawati, N. (2015). Application of Beneish M-Score models and data mining to detect financial fraud. Procedia-Social and Behavioral Sciences, 211, 924-930.
14. Hinojosa, P. B. (1994). Forestry administration and reforestation in Bulacan, Philippines: A case study of local forestry bureaucracy and the National Forestation Program (Doctoral dissertation, State University of New York College of Environmental Science and Forestry).
15. Hołda, A. (2020). Using the Beneish M-score model: Evidence from non-financial companies listed on the Warsaw Stock Exchange. Investment Management & Financial Innovations, 17(4), 389.
16. Https://www.equitymaster.com/detail.asp?Date=03/03/2022&story=6&title=Indias-Worst-Performing-Banks-on-this-All%2dimportant-Ratio
17. Https://www2.deloitte.com/in/en/pages/finance/articles/deloitte-india-banking-fraud-survey.html
18. Idolor, E. J. (2010). Bank frauds in Nigeria: Underlying causes, effects and possible remedies. African Journal of Accounting, Economics, Finance and Banking Research, 6(6), 62.
19. Irwandi, S. A., Ghozali, I., & Pamungkas, I. D. (2019). Detection fraudulent financial statement: Beneish M-score model. WSEAS Transactions on Business and Economics, 16(1), 271-281.
20. Kantšukov, M., & Medvedskaja, D. (2013). From dishonesty to disaster: the reasons and consequences of rogue traders' fraudulent behavior. In (Dis) Honesty in management (pp. 147-165). Emerald Group Publishing Limited.
21. Kaur, K., & Singh, B. (2011). Non-performing assets of public and private sector banks (a comparative study). South Asian Journal of Marketing & Management Research, 1(3), 54-72.
22. Kukreja, G., Gupta, S. M., Sarea, A. M., & Kumaraswamy, S. (2020). Beneish M-score and Altman Z-score as a catalyst for corporate fraud detection. Journal of Investment Compliance, 21(4), 231-241.
23. Levi, M., & Wall, D. S. (2004). Technologies, security, and privacy in the post-9/11 European information society. Journal of law and society, 31(2), 194-220.
24. Lotfi, N., & Aghaei Chadegani, A. (2018). Detecting corporate financial fraud using Beneish M-score model. International Journal of Finance & Managerial Accounting, 2(8), 29-34.
25. Maccarthy, J. (2017). Using Altman Z-score and Beneish M-score models to detect financial fraud and corporate failure: A case study of Enron Corporation. International Journal of Finance and Accounting, 6(6), 159-166.
26. Macintosh, N. B. (2009). Accounting and the truth of earnings reports: Philosophical considerations. European Accounting Review, 18(1), 141-175.
27. Mantone, P. S. (2013). Using analytics to detect possible fraud: Tools and techniques.Hoboken, New Jersey: John Wiley & Sons, Inc. ISBN: 978-1-118-71598-7
28. Mcnichols, M. F. (2000). Research design issues in earnings management studies. Journal of accounting and public policy, 19(4-5), 313-345.
29. Mengi, P. (2009). Customer satisfaction with service quality: An empirical study of public and private sector banks. IUP Journal of Management Research, 8(9).
30. Mohan, R., & Ray, P. (2023). Non-performing Assets of Indian Banking: An Evolutionary Journey. In India's Contemporary Macroeconomic Themes: Looking Beyond 2020 (pp. 267-313). Singapore: Springer Nature Singapore.
31. M-Score, K. M. B. (2016). Detecting financial statement fraud by Malaysian public listed companies: The reliability of the Beneish M-Score model. Jurnal Pengurusan, 46, 23-32.
32. Omar, N., Koya, R .K., Sanusi, Z. M., &Shafie, N. A. (2014). Financial statement fraud: A case examination using Beneish model and ratio analysis. International Journal of Trade, Economics and Finance, 5(2), 184-186. Https://doi.org/10.7763/IJTEF.2014.V5.367
33. Omarova, S. T. (2016). Bank governance and systemic stability: The golden share approach. Ala. L. Rev., 68, 1029.
34. Pacini, C., Stowell, N. F., Katz, I. J., Patterson, G. A., & Lin, J. W. (2020). An analysis of money laundering, shell entities, and no ownership transparency that washes off and on many shores: a building tidal wave of policy responses. Kan. JL & Pub. Pol'y, 30, 1.
35. Sabarinathan, G. (2010). Securities and exchange board of India and the regulation of the Indian securities market. IIM Bangalore Research Paper, (309).
36. Sakharova, I. (2012, June). Payment card fraud: Challenges and solutions. In 2012 IEEE international conference on intelligence and security informatics (pp. 227-234). IEEE.
37. Sharif, D. M. J. (2023). Detecting Earnings Manipulation Practice by the M-Score Model: Evidence from the Listed Power Companies of Bangladesh.
38. Shrimali, G., Slaski, X., Thurber, M. C., & Zerriffi, H. (2011). Improved stoves in India: A study of sustainable business models. Energy Policy, 39(12), 7543-7556.
39. Stark, J. R., & Vietmeyer, N. B. (2003). The SEC and prime bank securities frauds: Past, present and future. Securities Regulation Law Journal, 31(1), 4-49.

40. Thiagarajan, S., Ayyappan, S., & Ramachandran, A. (2011). Credit risk determinants of public and private sector banks in India. European Journal of Economics, Finance and Administrative Sciences, 34(34), 147-153.
41. Triani, N. (2019). Fraudulent Financial Reporting Detection Using Beneish M-Score Model in Public Companies in 2012-2016. Asia Pacific Fraud Journal, 4(1), 27-42.
42. Vanasco, R. R. (1998). Fraud auditing. Managerial Auditing Journal, 13(1), 4-71.
43. Vegesna, S., & Dash, M. (2014). Efficiency of public and private sector banks in India.
44. Warshavsky, M. (2012). Earnings quality. Financial valuation and litigation Expert (FVLE), 39, 16-20.
45. Zali, M., & Maulidi, A. (2018). Fighting against money laundering. BRICS law journal, 5(3), 40-63.