

Assessment of Earnings Manipulation in the Banking Sector: An Analysis on Selected Indian Banks

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Abstract

Earnings manipulation is often conducted to misrepresent the true financial health of a business enterprise. This can be carried out either through fraudulent accounting practices or material misstatement that fails to reflect the real profitability of an enterprise. There have been instances of financial scams and banking frauds in recent years resulting into huge amount of non-performing assets. The present paper aims to examine evidences of earnings manipulation of India's top-3 listed banks namely HDFC Bank, ICICI Bank and State Bank of India, following their recognition as risk-free banks. The study thus makes an attempt to detect the possibilities of material misstatement by the selected Indian banks using the popularly used Beneish M-score model (1999), Roxas M-score model (2011) and Montier C-score model (2008) for the current financial year 2023-24. ICICI Bank scores were found to be satisfactory, though contradictory scores observed in case of the other two banks.

Key Words: Beneish M-score, Roxas M-score, Montier C-score, financial fraud, Banking, earnings manipulation.

JEL Classification: F65, G20, L84

1. Introduction

Financial statements mirror the performance of a business enterprise. Financial statements are prepared and presented with the primary motive of providing necessary information to its users. One of the critical issues in current accounting research is the behavior of company managers who tend to submit financial reports that are favorable to their side (Beneish, 2001; Septiani et al., 2020). Transparency remains a vital issue regarding the annual reports provided by the company. Decisions made following those reports became fraudulent and destroyed the belief of stakeholders (Khatun et al., 2022). Recent scams and financial fraud in India's banking sector resulted into huge amount of non-performing assets (NPAs) leading into financial insolvency. The process of approving loan and advances are not clear and transparent which further indicates the loopholes in the regulatory system of the financial institutions in India.

An analysis of frauds reported across Indian banks has depicted that the number of fraud cases reported in FY 2023-24 were 36,075, up by nearly 300 per cent from the 9,046 cases reported in FY 2021-22. However, the amount involved has dropped by 46.7% from Rs 45,358 crore to Rs 13,930 crore in FY 2023-24, as shown in Table – 1. Most frauds occurred in digital payments (card payments and internet), but the highest value frauds were reported primarily in loan portfolios, with public sector banks contributing the most by value. Public sector banks have reported over three-fold jump in compensation towards frauds or e-frauds reported by their customers to ₹140 crore during 2023-24.

Table – 1: Anatomy of Banking Frauds in India

	AMOUNT (in ₹ cr)	PSU banks	Pvt banks
FY20	1,85,468	1,48,224	34,211
FY21	1,32,389	77,879	45,515
FY22	45,358	32,288	10,653
FY23	26,127	18,750	6,159
FY24	13,930	10,507	3,170

	NUMBER OF FRAUDS	PSU banks	Pvt banks
FY20	8,703	4,410	3,065
FY21	7,338	2,888	3,705
FY22	9,046	3,044	5,312
FY23	13,564	3,392	8,979
FY24	36,075	7,472	24,210

Source: Compiled from different sources

During the year 2022, state-owned State Bank of India (SBI) reported the country's biggest frauds totaling to ₹22,842 crore, by ABG Shipyards Company and its promoters. Earlier in the year 2023, the private-sector ICICI Bank was involved in a bank loan fraud case following improper sanctioning of big-ticket loans to the Videocon Group during 2018, at the behest of Ms. Chanda Kochhar, the then chairman of the ICICI Bank. The number one private-sector lender HDFC Bank, based on market capitalization, has also been in the news for operational lapses and cyber-security issues leading to data theft and unauthorized transactions in the customer's account (Chakraborty, 2023). Despite of such issues prevailing in the country's banking sector, the Reserve Bank of India (RBI) in a circular dated March 31, 2023 identified the private lenders ICICI Bank and HDFC Bank besides the state-owned State Bank of India (SBI) as 'Domestic Systemically Important Banks (D-SIBs)'. D-SIBs have been categorized as those financial institutions which are 'too big to fail' (TBTF) with an expectation to receive governmental support in times of distress and advantages in the financial markets. In this context, the present research paper aims to investigate the presence of fraudulent information in the financial statements of the three banks. The ratio-based Beneish M-score model (1999), Roxas M-score model (2011) and the Montier C-score model (2008) has been used in examining the existence of frauds in the financial report of the country's top-3 banks, namely ICICI Bank, HDFC Bank and State Bank of India (SBI), following their recognition as risk-free banks. Thus, the present paper aims to test the authenticity and accuracy of their financial statements for the current financial year 2023-24. The present study is intended to serve the policy-makers in devising plans, policies and appropriate strategies to resolve issues related to banking frauds and unethical accounting practices.

The research paper has been structured as follows: the literature review summarizes the past studies in the field of earnings manipulation. The methodology section presents the sample selection, data sources and the methodologies used to detect financial frauds. The penultimate section narrates the crucial findings of the study, followed by conclusion and scope for further research. A list of references is given at the end for further reading.

2. Literature Review

Khatun et al. (2022) examined the number of listed commercial banks in Bangladesh engaged in earnings manipulation involving micro-level variables like accounting accruals, intangible

assets, etc. A total of 30 listed commercial banks were selected as sample size for the study, covering a ten-year period from 2009 to 2018. The first stage activity was to find the likely and non-likely manipulator banks using the Beneish M-score model (1999). Based on the M-score benchmark value of (-) 2.22, the banks were put into two groups. To identify the most influential variables, an independent sample t-test was further conducted with the help of Statistical Package for Social Sciences (SPSS). Although, the results did not show any increasing or decreasing trend in manipulation, however the figures of likely manipulators were more than non-likely manipulators in all the years under review. Results of the t-test further revealed that the overstating revenues, increasing intangible assets, lessening cost and accruals were the most appealing items for preparing a fraudulent financial report by the Bangladesh commercial banks. Valaskova and Fedorko (2021) have investigated the number of storage and transport companies in the selected Visegrad countries who were engaged in earnings manipulation during the period from 2015 to 2018. A sample size of 68 Slovakian and 135 Czech Republic enterprises were selected from the transporting and storage sector based on several criterions related to total assets, revenues and net profit. Using the Beneish M-score threshold limit of (-) 2.22, the study has found that 78 percent of the Slovak enterprises reported profit manipulation as compared to 62 percent of Czech enterprises, during the review period. The highest number of manipulators was recorded during the year 2016, having detected 68 Slovak and 131 Czech enterprises, constituting 100 percent and 97 percent of the total sample size respectively. Salim et al. (2020) examined the factors of the fraud triangle that influenced financial shenanigans. The study comprised of 5 independent variables; three variables of pressure elements (i.e. Financial Stability, External Pressure, and Financial Target); one variable of opportunity elements (i.e. Monitoring Effectiveness); and one variable of rationalization elements (i.e. Auditor Change). The dependent variable was Financial Shenanigans (FRAUD), which was measured based on the Beneish M-Score formula. The purposive sampling method was employed to select a sample size of 39 manufacturing companies listed in Indonesia Stock Exchange (IDX) during the years 2017 and 2018 respectively. The methodology applied was hypothesis testing using logistic regression. The results displayed Financial Stability (as proxied by the ratio of asset change), External Pressure (as proxied by Leverage Ratio), and Monitoring Effectiveness (as proxied by the percentage of Independent Commissioners) having a major influence upon Financial Shenanigans. On the other hand, Financial Target (as proxied by the Return on Assets) and External Auditor Change had no significant effects on the tendency of Financial Shenanigans. Gyawali (2021) examined the viability of the Beneish model in detecting the presence of earnings manipulation in the financial statements of private commercial banks in Nepal. The study was conducted on 16 private commercial banks in Nepal during the years 2018 and 2019 respectively. Using Beneish M-score model and its threshold value for different ratio indexes, the results showed that four Nepalese banks (Nepal Bangladesh Bank, Standard Chartered Bank, Global IME Bank, Nepal SBI Bank) were engaged in income manipulation during the study period. The researcher further pointed out that though the Beneish model was originally recommended for manufacturing companies, but its application can be extended to other sectors in predicting banking frauds. Septiani et al. (2020) used discriminant analysis to test the ability of the Beneish model in detecting financial statement frauds of listed Indonesian banks. A sample of 114 financial statements from 38 banking companies were classified into fraudulent and non-fraudulent groups based on the Beneish model covering the period from 2016 to 2018. Further analysis of each of the eight Beneish M-score ratios in the grouping classified 28 samples as fraudulent and 86 samples as non-fraudulent. The results found that the Beneish M-score was able to detect banking frauds by 89.5 percent using the discriminant

analysis method. Out of the individual eight ratios used in Beneish M-score model, days sales in receivables index (DSRI) was found as the most dominant ratio in grouping the sampled Indonesian banks.

Based on literature review, it was observed that the Beneish M-score model (1999) has been widely used by the researchers to predict and detect any firms' fraudulent financial reporting behavior. However, there is a scarcity of studies in India that dealt with the detection of fraudulent financial reporting practices in the Indian banking sector. The present study intends to fill that research gap, in the backdrop of rising banking frauds, increasing non-performing assets and evidence of bank failures.

3. Research Methodology

3.1 Research Objectives

The study has three-fold objectives as given below:

- (I). To examine whether the selected banking firms in India were engaged in earnings manipulation and unethical accounting practices, using the fraud detection models of Beneish M-score (1999), Roxas M-score (2011) and Montier C-score (2008)
- (II) To identify the specific variable/(s) of the Beneish, Roxas and Montier models used in the falsification of information and earnings overstatement by the selected banking firms

3.2 Sample Selection

The study considers sample size of three listed banking firms in India, based on the Reserve Bank of India (RBI) circular on the 'Framework for dealing with Domestic Systemically Important Banks (D-SIBs)' in India dated March 31, 2023. The three private lenders namely ICICI Bank, HDFC Bank and the state-owned State Bank of India (SBI) were listed as domestic systemically important banks in India. Hence, the present study uses the purposive sampling technique to consider the above three listed banks in a bid to check evidences of falsification of information in their financial statements and qualitative disclosures for the FY 2023-24.

3.3 Methodologies Used

There has been a plethora of models to detect financial shenanigans such as the Beneish M-score model (1999), Dechow F-score (2011), Altman Z-score (1968), Benford's law (1938) and Jones model (1991) of discretionary accruals (Majidah and Aryanty, 2022). Talab et al. (2017) concluded Beneish model as the most effective model known for its popularity, simplicity and reliability in the earnings management field. Ozcan (2018), Akra and Chaya (2020), Mavengere and Dlamini (2023) has recommended Beneish M-score as the leading forensic accounting tool to spot fraud in financial accounts because it generates more findings than assessments of other fraud detection methods. The Beneish and Roxas models were regarded as efficient modern tools for detecting misrepresentations in companies' financial statements (Tkachenko et al., 2020). Further, Parikh and Shah (2022) has recommended the use of Montier C-score model as an alternative to the widely-used M-score models, in the detection of financial statement frauds. The present study has thus employed the application of Beneish (8-variable) M-score model and the modified Roxas (5-variable) M-score model in addition to the James Montier C-score model (6-variable) in detecting evidences of financial shenanigans within the financial statements of domestic systemically important banks in India for the FY 2023-24.

3.3.1 Beneish M-score Model (1999)

The Beneish M-Score model (1999), designed by Professor Messod Daniel Beneish, is a financial statement analysis tool to predict fraud or fraud on the company’s financial statements (Septiani et al., 2020). Beneish M-score consists of eight ratios to describe financial statement deformation resulting from earnings manipulation or identifying management preferences in earnings manipulation (Gyawali, 2021). The data inputs needed to calculate the individual variables entering the Beneish M-score model, as shown in Table-2, can be collected from the financial statements of the respective companies. The model for the calculation of Beneish M-Score (8 variable) model is given as follows.

$$M\text{-SCORE} = - 4.84 + (0.920 \times DSRI) + (0.528 \times GMI) + (0.404 \times AQI) + (0.892 \times SGI) + (0.115 \times DEPI) - (0.172 \times SGAI) + (4.679 \times TATA) - (0.327 \times LVGI)$$

Where, DSRI = Days Sales in Receivables Index, GMI = Gross Margin Index, AQI = Asset Quality Index, SGI = Sales Growth Index, DEPI = Depreciation Index, SGAI = Sales, General and Administrative expenses Index, TATA = Total Accruals to Total Assets, LVGI = Leverage Index

Table – 2: Financial Ratios to Measure Beneish- M Score

DSRI	=	$\frac{\text{Days Sales in Receivables}_t}{\text{Days Sales in Receivables}_{t-1}}$
GMI	=	$\frac{\text{Gross Margin Index}_{t-1}}{\text{Gross Margin Index}_t}$
AQI	=	$\left(1 - \frac{\text{Current Asset} + \text{Property Plant \& Equipment}}{\text{Total Asset}}\right)_t \div \left(1 - \frac{\text{Current Asset} + \text{Property Plant \& Equipment}}{\text{Total Asset}}\right)_{t-1}$
SGI	=	$\frac{\text{Sales}_t}{\text{Sales}_{t-1}}$
DEPI	=	$\left(\frac{\text{Depreciation}}{\text{Depreciation} + \text{Property Plant \& Equipment}}\right)_{t-1} \div \left(\frac{\text{Depreciation}}{\text{Depreciation} + \text{Property Plant \& Equipment}}\right)_t$
SGAI	=	$\left(\frac{\text{Sales, General \& Administrative Expense}}{\text{Sales}}\right)_t \div \left(\frac{\text{Sales, General \& Administrative Expense}}{\text{Sales}}\right)_{t-1}$
TATA	=	$\left(\frac{\text{Total Accruals}}{\text{Total Asset}}\right)_t$
LEVI	=	$\left(\frac{\text{Total Liabilities}}{\text{Total Asset}}\right)_t \div \left(\frac{\text{Total Liabilities}}{\text{Total Asset}}\right)_{t-1}$

Source: Beneish, 1999; Khatun et al., 2022

The limit value of the Beneish M-score model is fixed at -2.22. When the consolidated Beneish M-Score is greater than -2.22, the company can be categorized as conducting frauds. But if the consolidated M-score is below or equal to -2.22, the company can be categorized as NOT conducting frauds (non-fraud) (Salim et al., 2020). Empirically, companies with higher M-Score have higher tendency to commit fraud.

Beneish (1999) has further suggested threshold values for different ratio indexes (DSRI, GMI, AQI, SGI, DEPI, SGAI, LVGI and TATA) based on his research study across manipulating organizations and non-manipulating organizations, as given below in Table - 3.

Table – 3: Beneish Threshold Mean Values for different Ratio Indexes

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

Source: Beneish, 1999; Gyawali, 2021

If the individual ratio index surpasses the threshold value (non-manipulators) as shown in Table-3, it gives an indication that the ratio indexes bears a positive relationship with earnings manipulation, thereby corroborating the evidence of being engaged in profit manipulation. On the other hand, organizations depicting ratios within the threshold value (non-manipulators) are considered to be engaged in true and fair financial reporting practices, devoid of any kind of frauds.

3.3.2 Roxas Modified M-score Model (2011)

Continuing the research of Beneish, M. L. Roxas in 2011 substantiated the need to shorten the eight-variable Beneish M-score model. M.L. Roxas reduced the number of intermediate indices to five when calculating the consolidated M-score index, excluding the less significant SGAI, LVGI and TATA indicators. For the modified model of M. L. Roxas, the index coefficients of intermediate variables were changed and the threshold value of M-score (5 variable) model was fixed at -2.76. Hence, with an M-score value less than - 2.76, falsification of information in the company's financial statements is unlikely. But with an M-score value greater than - 2.76, there is a high probability of falsification of information in the company's financial statements, and hence its reliability needs to be increased (Pedchenko et al., 2022; Zhitlukhina et al., 2016).

The model for the calculation of Roxas M-Score (5 variable) model is given as follows.

$$\text{M-SCORE} = - 6.065 + (0.823 \times \text{DSRI}) + (0.906 \times \text{GMI}) + (0.593 \times \text{AQI}) + (0.717 \times \text{SGI}) + (0.107 \times \text{DEPI})$$

Where, DSRI = Days Sales in Receivables Index, GMI = Gross Margin Index, AQI = Asset Quality Index, SGI = Sales Growth Index, DEPI = Depreciation Index

3.3.3 Montier C-Score model (2008)

James Montier's C-score model was introduced in the year 2008 in his work titled as '*Cooking the Books, or, More Sailing under the Black Flag*' ("compilation of accounting registers"). This indicator was aimed at identifying whether the companies used creative accounting techniques to cook its information in the financial statements or not, or to short sell them (i.e. sell their shares now to profit from buying them back at a lower price in future).

C-score is a discrete score ranging from 0 to 6, each input designed to identify a part of earnings manipulation. If any of the calculated indicators of the Montier model meets the criteria for assessing the reliability of information in the company's financial statements, then the value of the assessment is given as 1, otherwise as 0. The C-score is a product of six indicators that characterize the criteria for assessing the reliability of information in the company's financial statements (Pedchenko et al., 2022), as shown below in Table-4.

Table - 4: Indicators of the Montier C-Score (2008)

Sr. No.	Variables	Indication
[1]	Growing difference between net income and cash flow from operations.	An increasing difference between net income and cash flow from operation indicate that earnings are being manipulated. In general, management has less control over a company's cash flow than it has over its earnings. Earnings can be overstated by using highly subjective estimations such as depreciation, bad debt, and pension returns, etc. An increasing Difference between net income and cash flow from operations indicates red flags of manipulation in this Model.
[2]	Increasing days sales outstanding (DSO)	Account receivables are growing faster than sales, as seen by an increasing Days sales outstanding. The primary goal of this measurement is to detect channel stuffing. (Sending inventory to customers) An increasing Days sales outstanding (DSO) provide a signal of manipulation in this Model.

[3]	Growing day's sales of inventory (DSI)	Slowing sales are indicated by rising inventory, which is negative indication for the company. An increasing Day sale of inventory (DSI) indicates financial misstatements in this Model.
[4]	Increasing Other current assets to revenues	Top management may know that investors frequently examine DSI and DSO, thus to hide the things which they don't want investors to notice they may use other current assets. An increasing Other current asset to revenues indicates earning manipulation in this Model.
[5]	Declines in depreciation relative to gross property	Firms can easily change the estimate of useful asset life to meet a quarterly or yearly profit target. Decreasing depreciation relative to gross property provide a signal of manipulation in this Model.
[6]	High total asset growth	Some firms use their acquisition strategy to distort their earnings. High asset growth companies receive a signal of manipulation in this Model.

Source: Parikh and Shah, 2022

In addition, the individual scores of all the six input criteria is further aggregated to a composite C-score value which is bounded between 0 (no evidence of earning manipulation) to 6 (all the red flags or signals of fraud are present), as shown below in Table-5.

Table – 5: Assessment of Montier C-Score Composite Values

The interval of the generalizing indicator (C-Score)	Assessment of the reliability of information in financial statements of the enterprise
0	The probability of disclosing inaccurate information in the company's financial statements is absent
1-2	The probability of disclosing inaccurate information in the company's financial statements is low
3-4	The probability of disclosing inaccurate information in the company's financial statements is average
5-6	The probability of disclosing inaccurate information in the company's financial statements is high

Source: Pedchenko et al., 2022

3.4 Data Sources

The data has been collected from the audited financial statements of three domestic banks, with no emphasis on primary data. The period of the study is limited to the current financial year 2023-24, following the framework for D-SIBs published by the banking regulator RBI dated March 31, 2023.

4. Results and Discussion

Table-6 presents the descriptive statistics for each of the individual ratio indexes of the entire study sample for the FY 2023-24.

Table – 6: Descriptive Statistics of M-Score Ratios (All Research Samples)

Particulars	DSRI	GMI	AQI	SGI	DEPI	SGAI	TATA	LVGI
Mean	0.851	1.149	1.009	1.378	1.018	0.977	- 0.014	1.253
Median	0.852	1.132	1.007	1.285	1.003	0.926	- 0.007	1.036
Std. Dev.	0.059	0.118	0.009	0.192	0.041	0.097	0.017	0.479
Maximum	0.909	1.275	1.019	1.598	1.064	1.089	- 0.002	1.803
Minimum	0.791	1.041	1.001	1.250	0.986	0.917	- 0.034	0.921

Source: Calculated

At first, the eight ratios for calculating Beneish M-score along with the results of individual indicators entering the Beneish model were developed using M.S. excel. Compared with the

benchmark value of -2.22, the Beneish M-score helps to identify the number of banks disclosing misleading information in their financial statements and qualitative disclosures. Data collected from the 03 listed commercial banks were tested using the basic model of M. D. Beneish (8 variable) followed by the modified model of M. L. Roxas (5 variable), to find the consolidated M-score values for the period 2023-24 as shown below in Table-7.

Table – 7: Beneish and Roxas M-Scores of Selected Indian Banks (FY: 2023-24)

Indicators	Index Coefficients	ICICI Bank	HDFC Bank	State Bank of India
DSRI	+ 0.920	0.791	0.852	0.909
GMI	+ 0.528	1.041	1.275	1.132
AQI	+ 0.404	1.001	1.019	1.007
SIG	+ 0.892	1.285	1.598	1.250
DEPI	+ 0.115	1.003	1.064	0.986
SGAI	- 0.172	0.926	1.089	0.917
TATA	+ 4.679	- 0.034	- 0.007	- 0.002
LVGI	- 0.327	0.921	1.803	1.036
M-Score value modeled after M. D. Beneish (8 variable) (normal value -2.22)		- 2.52	- 2.23	- 2.28
M-Score value modeled after M. L. Roxas (5 variable) (normal value -2.76)		- 2.85	- 2.35	- 2.70

Source: Calculated

Based on the calculated values of Beneish (8-variable) M-score indicator as shown in Table-7, all the three listed Indian banks were found to have scores below the benchmark value of - 2.22. This manifested that the banks under investigation did not falsify information in their financial statements for the FY 2023-24, which is evidence of its reliability. On the contrary, the calculated values of M. L. Roxas (5-variable) model showed that only ICICI Bank was comfortably placed below the benchmark value of - 2.76 for the said FY 2023-24. Both HDFC Bank and State Bank of India fell short of the modified M-score threshold value of -2.76, though by a nominal margin, giving indications to financial statement falsification and disclosure of inaccurate information in their financial reports.

The financial data related to the individual ratio indexes constituting the Beneish M-score and Roxas modified M-score models were collected from the financial statements of the respective banks. The explanatory variables entering the Beneish and Roxas M-score models were measured based on inter-annual changes, as depicted below in Tables from 8 to 15.

Table – 8: Days Sales in Receivables Index (DSRI)

Banks	Net Receivables _(t) /Sales _(t) (2023-24)	Net Receivables _(t-1) /Sales _(t-1) (2022-23)	DSRI
ICICI Bank	0.448	0.567	0.791
HDFC Bank	0.773	0.907	0.852
State Bank of India	1.086	1.195	0.909

Source: Calculated

Days Sales in Receivables Index (DSRI), as shown in Table-8, compares the ratio of a company's receivables to sales in the current year (t) with the previous year (t-1). The calculated values of

DSRI were found to be the highest for SBI at 0.909, followed by HDFC Bank (0.892) and ICICI Bank (0.791) respectively. Further, the DSRI values of all the banks were found to lie within the Beneish threshold value of 1.031 (non-manipulators). Thus, the DSRI values failed to show any evidences of manipulation in the financial statements of the investigating banks.

Table – 9: Gross Margin Index (GMI)

Banks	Gross Margin Percent _(t-1) (2022-23)	Gross Margin Percent _(t) (2023-24)	GMI
ICICI Bank	0.502	0.482	1.041
HDFC Bank	0.537	0.421	1.275
State Bank of India	0.436	0.385	1.132

Source: Calculated

Gross Margin Index (GMI), as shown in Table-9, is measured as the ratio of gross margin of the previous year (t-1) to the gross margin of the current year (t). GMI is a ratio that measures the company's profitability, where this ratio represents the company's prospects. Excepting ICICI Bank, the GMI ratios of the other two banks surpassed the Beneish threshold value of 1.041 (non-manipulators), depicting possibilities of earnings overstatement. For both HDFC Bank and SBI, the ratio indicators pertaining to GMI were found to be higher than the Beneish threshold value depicting a positive relationship between GMI and earnings management.

Table – 10: Asset Quality Index (AQI)

Banks	$1 - (\text{PPE}_{(t)} + \text{CA}_{(t)})/\text{TA}_{(t)}$ (2023-24)	$1 - (\text{PPE}_{(t-1)} + \text{CA}_{(t-1)})/\text{TA}_{(t-1)}$ (2022-23)	AQI
ICICI Bank	0.919	0.918	1.001
HDFC Bank	0.936	0.918	1.019
State Bank of India	0.943	0.936	1.007

Source: Calculated

Asset Quality Index (AQI) index, as shown in Table-10, measures the non-current assets to total assets ratio for the current year (t) with reference to the previous year (t-1). The calculated values of AQI were found to be the highest for HDFC at 1.019, followed by State Bank of India (1.007) and ICICI Bank (1.285) respectively. Though the AQI values were higher than 1.0, but they lay below the Beneish threshold value of 1.031 (non-manipulators). Thus based on the asset quality index, it can be concluded that the banks may not be engaged in costs accruals and earnings manipulation.

Table – 11: Sales Growth Index (SGI)

Banks	Sales _(t) (2023-24)	Sales _(t-1) (2022-23)	SGI
ICICI Bank	1658487109	1290627859	1.285
HDFC Bank	2583405755	1615855367	1.598
State Bank of India	4151306555	3321030602	1.250

Source: Calculated

Sales Growth Index (SGI) index, as shown in Table-11, presents the ratio between sales in current year (t) and sales in year (t-1), in Rs.'000. The calculated values of SGI were found to be highest for HDFC at 1.598, followed by ICICI Bank (1.285) and State Bank of

India (1.250) respectively. However, the SGI values of investigating banks lay beyond the Beneish threshold value of 1.134 (non-manipulators), thereby depicting higher chances of earnings manipulation.

Table – 12: Depreciation Index (DEPI)

Banks	$DEP_{(t-1)}/(PPE_{(t-1)} + DEP_{(t-1)})$ (2022-23)	$DEP_{(t)}/(PPE_{(t)} + DEP_{(t)})$ (2023-24)	DEPI
ICICI Bank	0.514	0.512	1.003
HDFC Bank	0.613	0.576	1.064
State Bank of India	0.072	0.073	0.986

Source: Calculated

Depreciation index (DEPI), as shown in Table-12, compares the depreciation rate of the firm in the current year (t) corresponding to the previous year (t-1). The calculated values of DEPI were found to be the highest for HDFC at 1.064, followed by ICICI Bank at 1.003 and State Bank of India at 0.986 respectively. Though the DEPI values were close to zero or slightly exceeded the limit value of 1.0, but the ratio indices were found to lay close to the Beneish threshold value of 1.001 (non-manipulators). For HDFC Bank, the DEPI index was slightly on the higher side thereby raising the likelihood of unethical practices (either through increased estimates of the asset value or adoption of a new method) within the organization.

Table – 13: Sales, General and Administrative expense Index (SGAI)

Banks	$SG\&A_{(t)}/Sales_{(t)}$ (2023-24)	$SG\&A_{(t-1)}/Sales_{(t-1)}$ (2022-23)	SGAI
ICICI Bank	0.236	0.255	0.926
HDFC Bank	0.825	0.757	1.089
State Bank of India	0.362	0.395	0.917

Source: Calculated

Sales, General and Administrative Expense Index (SGAI), as shown in Table-13, compares the selling, general and administrative expenses to sales in the current year (t) with the previous year (t-1). The calculated values of SGAI were found to be the highest for HDFC Bank at 1.089, followed by ICICI Bank at 0.926 and SBI at 0.917 respectively. Moreover, the SGAI index for ICICI Bank and SBI lay below the Beneish threshold value of 1.054 (non-manipulators). But considering the SGAI index value of HDFC Bank of 1.089, there may be a possibility of earnings overstatement and a positive relationship between SGAI and earnings management.

Table – 14: Total Accruals to Total Assets (TATA)

Banks	Total Accruals _(t) (2023-24)	Total Assets _(t) (2023-24)	TATA
ICICI Bank	- 637260931	18715145766	- 0.034
HDFC Bank	- 234436855	36176230869	- 0.007
State Bank of India	- 96274358	61796939450	- 0.002

Source: Calculated

As depicted in Table-14, high total accrual to total assets (TATA) ratio indicates the potential condition of a business enterprise to be associated with a higher likelihood of earnings

manipulation. The TATA values of all the investigating banks were negative and well below the Beneish threshold value (non-manipulators) of 0.018, indicating least possibility of falsification of information in their financial statements.

Table – 15: Leverage Index (LVGI)

Banks	$(CL_{(t)}+LTD_{(t)})/TA_{(t)}$ (2023-24)	$(CL_{(t-1)}+LTD_{(t-1)})/TA_{(t-1)}$ (2022-23)	LVGI
ICICI Bank	0.117	0.127	0.921
HDFC Bank	0.220	0.122	1.803
State Bank of India	0.143	0.138	1.036

Source: Calculated

Leverage Index (LVGI), as shown in Table-15, compares the ratio of total debts to total assets on a year-on-year basis. The calculated values of LVGI were found to be the highest for HDFC Bank at 1.803, followed by SBI at 1.036 and ICICI Bank at 0.921 respectively. For ICICI Bank, the index was way below the threshold value with no significant increase in leverage. Though the LVGI index of SBI is above the index value of 1.0, but it lay within the Beneish threshold value (non-manipulators) of 1.037 indicating minimal likelihood of earnings manipulation. But in case of HDFC Bank, the ratio index surpassed the index value of 1.0 as well as the Beneish threshold value (non-manipulators) leading to possibilities of earnings overstatement and manipulation.

4.1 Benchmarking with the Beneish Model

The summarized scores of the individual ratio indices have been presented below in Table 16.

Table – 16: Benchmarking with the Beneish Model (FY: 2023-24)

Indicators	ICICI Bank	HDFC Bank	SBI	Non-manipulators	Manipulators
DSRI	0.791	0.852	0.909	1.031	1.465
GMI	1.041	1.275	1.132	1.041	1.193
AQI	1.001	1.019	1.007	1.039	1.254
SGI	1.285	1.598	1.250	1.134	1.607
DEPI	1.003	1.064	0.986	1.001	1.077
SGAI	0.926	1.089	0.917	1.054	1.041
TATA	- 0.034	- 0.007	- 0.002	0.018	0.031
LVGI	0.921	1.803	1.036	1.037	1.111

Source: Compiled by the Author

The results showed that the SGI values of all the three selected banks under review for the financial year 2023-24 surpassed the Beneish threshold limit (1.134) for non-manipulators, indicating the possibilities of earnings manipulation. Further, the GMI values of HDFC Bank and SBI for the year 2023-24 were found to be higher than the Beneish threshold limit of 1.041 confirming higher possibilities of material misstatement. Moreover, HDFC Bank depicted higher scores in five out of the eight variables GMI, SGI, DEPI, SGAI and LVGI respectively. Hence, the possibilities of earnings manipulation by the private player HDFC Bank cannot be ruled out completely and requires further investigation for authenticity.

4.2 Comparisons between the Beneish, Roxas and Montier Models

A comparison of the results related to the assessment of reliability of information in the financial statements of the selected banks based on the C-Score according to the model of J. Montier (6 variables), M-Score according to the model of M. D. Beneish (8 variable) and M. L. Roxas (5 variable) has been presented below in Table-17. The results showed similarities in the scores of HDFC Bank and State Bank of India indicating signs of earnings manipulation. ICICI Bank displayed lesser chances of earnings overstatement based on similarities in the results obtained in case of Montier C-score, Beneish M-score and Roxas M-score models.

Table – 17: Comparisons between Montier, Beneish and Roxas Scores (FY 2023-24)

Banks	Value C-Score for J. Montier model (6 variables)	Value M-Score for M. D. Beneish model (8 variables)	Value M-Score for M.L. Roxas model (5 variables)	Availability misrepresentation of financial credibility enterprise reporting
ICICI Bank	2	-2.52	-2.85	+/+/+
HDFC Bank	3	-2.23	-2.35	++/+/-
State Bank of India	3	-2.28	-2.70	++/+/-

(Note: Conventional designations: “+” - the probability of disclosing inaccurate information is low or the company's financial strength is strong; “++” - the probability of disclosing inaccurate information or the company's financial strength is average or stable; “-” - the probability of disclosing inaccurate information is high or the company's financial strength is weak).

Source: Compiled by the Author

5. Conclusion

Based on the results of Beneish (8-variable) M-score model, all the selected banks under review were not found to be engaged in earnings manipulation or income overstatement as their consolidated M-scores were below the Beneish threshold value of -2.22 which further justifies their selection as domestic systemically important banks by the RBI. But the results were found to be contradictory for HDFC Bank and State Bank of India when evaluated using the modified Roxas (5-variable) M-score model, as their consolidated M-scores were found to be greater than the - 2.76 benchmark that indicated them as likely manipulators. HDFC Bank was found to be engaged in fraudulent financial reporting for the FY 2023-24 as it depicted red flags for GMI, SGI, DEPI, SGAI and LVGI scores compared to the Beneish threshold value (non-manipulators) for ratio indices. State Bank of India successfully achieved a consolidated M-score below the Beneish benchmark value of -2.22, but fell short of the Roxas M-score threshold value by a nominal margin. The Montier C-score composite values displayed low to average possibilities of financial statement falsifications by the selected banks for the FY 2023-24. Further, all the fraud detection models used confirmed ICICI Bank as being potentially sound with no major indications of fraudulent accounting practices or wrong accounting policies.

6. Limitations & Future Scope

The study is restricted to the current financial year 2023-24, while to predict the tendency of Financial Shenanigans there requires a longer period of time to acquire more consistent results. The study did not have any emphasis on primary data as the financial data were collected from the publicly available financial statements of the three listed banking companies. Moreover, the samples were only restricted to commercial banks in India listed as D-SIBs by the country's

banking regulator. The study is limited to the applications of the most widely used Beneish (8-variable), Roxas (5-variable) M-score and Montier C-score (6-variable) models, with no emphasis on other models of fraud detection having lower exposure. Moreover, the Beneish and Roxas models were developed keeping in mind the fraudulent practices of listed manufacturing companies, hence these fraud detection models may not be appropriate for financial institutions, such as banks and insurance companies. The Montier C-score model is another useful model that provides red flags or signals of fraud with the use of information from the company's financial statements.

The application of all the three models in tandem in the present study provides a comprehensive view in the detection of financial statement frauds of the selected Indian banks. With these, probable manipulations can be detected and stricken measure can be applied to such fraudulent banking companies. The present study can be further extended to include more number of business enterprises across different sectors for an extended time-period. Even the research scope can be broadened using the application of fraud triangle components of pressure, opportunity and rationalization. More studies can be conducted to investigate the impact of earnings management on the stock prices of companies.

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