

A COMPARATIVE STUDY ON THE FINANCIAL PERFORMANCE OF DOMESTIC SYSTEMATICALLY IMPORTANT BANKS (D-SIBS) IN INDIA USING EXTENDED DUPONT ANALYSIS

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Abstract

Systematically important banks play an important role in a country's financial system due to their size, interconnectedness, complexity, substitutability and cross-jurisdictional activity. Their collapse raises the possibility of a domino effect that could severely impact the country's economy. The RBI adopted the guidelines of D-SIBs in 2014, which was framed by BCBS and FSB in 2011, and identified SBI, HDFC and ICICI banks as Domestic systematically important banks for India.

The paper aims to analyse the profitability of D-SIBs in India. The study is based on the secondary data which has been collected from the annual report of the respective banks (SBI, ICICI and HDFC) for the period 2017-18 to 2022-23. ROE of D-SIBs is measured by using extended Dupont analysis having five drivers – Asset Turnover Ratio, Equity Multiplier Ratio, Tax Burden Ratio, Interest Burden Ratio and Operating Margin Ratio. One-way anova along with post-hoc analysis has been applied to determine whether there exists any significant difference among the 5 drivers of ROE of D-SIBs. The analysis revealed that profitability of D-SIBs is comparatively in a good state, where HDFC bank exhibits the highest profitability followed by ICICI bank and SBI bank. The one-way Anova test revealed that there was significant difference in asset yield, interest burden, operating margin and return on equity. However, there was no significant difference found in tax burden ratio among the D-SIBs. The present study will help to provide an insight into the profitability of the D-SIBs in India.

Keywords: Domestic Systematically Important Banks, Dupont analysis, Profitability, Return on Equity one-way Anova and Post-hoc analysis.

JEL Classification: G21.

1. INTRODUCTION

Banking is an important branch of commerce and banks are essential commercial institution which facilitate trade. Banks occupy an important position in the modern business world. No country can make commercial and industrial progress

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without a well-organised banking system. So, it can be said that development of any countries solely depends on the banking system of a country. The Global financial crisis revealed that problems faced by certain large and highly interconnected financial institutions hampered the orderly functioning of the financial system, which in turn negatively impacted the real economy. In response to recent crisis, a series of reforms measures were unveiled, broadly known as Basel III, to improve the resiliency of banks and banking system. However, the policy measures were not adequate to deal with the systemic risks and moral hazard issues posed by these larger banks. Therefore, Financial Stability Board (FSB), in consultation with the Basel Committee on Banking Supervision (BCBS) and national authorities, has identified global systemically important banks since 2011. In October 2012, BCBS finalized its framework for dealing with Domestic Systemically Important Bank (DSIB). The D-SIB framework focuses on the impact the distress or failure of banks will have on the domestic economy. As opposed to the G-SIB framework, D-SIB framework is based on the assessment conducted by the national authorities, who are best placed to evaluate the impact of failure on the local financial system and the local economy.

The Reserve Bank of India (RBI) issued the framework for dealing with domestic systemically important bank on July 22, 2014. The D-SIB framework mandates the Reserve Bank to disclose the names of banks designated as D-SIBs since 2015 and to categorize these banks into appropriate buckets based on their Systemic Importance Scores (SISs). The indicators which are used for assessment are size, interconnectedness, substitutability and complexity. Based on their systemic importance scores, banks are plotted into five different buckets. These buckets are required to have additional Common Equity Tier 1 Capital (CET 1) requirements ranging from 0.20% to 0.80% of risk weighted assets (RWA). The RBI had announced SBI (State Bank of India) and ICICI (Industrial Credit and Investment Corporation of India) as D-SIB in 2015 and 2016. Later in the year 2017, HDFC (Housing Development Finance Corporation) Bank was also classified as a D-SIB, along with SBI and ICICI Bank. Wherein, SBI was placed in Bucket-3, ICICI Bank and HDFC Bank Bucket-1 (*RBI press release, 2023*).

The Collapse of such large banking institution has the potential to disrupt the entire financial system due to its size, interconnectedness, complexity and substitutability. In this backdrop, the present paper aims to analysis the profitability of D-SIBs in India with the help of extended Dupont model.

2. LITERATURES REVIEW

A brief review of relevant literature is given below chronologically:

Ansah-Adu and Sai (2015) investigated bank profitability in Ghana, during and after the globe financial crises (2006 to 2012) with the help of five step Dupont model. The empirical results of the suggests that banks operating profit margin ratio, asset turnover ratio, leverage ratio and interest burden ratio were found to be positive and significant determinants of bank profitability (ROE) during the period of study.

Bhowmik (2016) compared the financial soundness of the State bank of India and ICICI bank during 2008-09 to 2014-15. The findings reveals that the soundness of SBI and ICICI bank in respect of quality of asset portfolio, liquidity management and quality of earnings has shown no significant difference during the study period. Hoverer, CRAR was found to be significantly difference in respect of two banks.

Porkodi et al., (2017) assessed the financial performance of ICICI bank and HDFC bank for the period of five years (2013-2017). The study reveals that the financial performance of HDFC bank is better than ICICI bank.

Brahmaiah & Ranajee (2018) examined the factors influencing the profitability of Indian commercial banks considering increased globalization, intensified competition, and enhanced concentration for the period of ten years (2005-2015). The results indicate that profitability of banks in India is affected by both internal and external factors.

Rajendran & Sudha (2019) evaluated the financial performance of HDFC bank with the help of various financial ratios. The study was conducted for the period of five years (2015-2019). The findings reveals that the financial soundness of the bank was satisfactory during the study period.

Tandon et al., (2020) measured the financial health and risk of banks operating in India. The data used for the study pertains from 2014-15 to 2017-18. HDFC bank outperformed than other banks in terms of risk management and performance.

Gupta and Kashiramka (2021) attempted to identify systemically important banks (SIBs) in India by using SRISK to measure the expected capital shortfall of banks in systemic event. The sample size comprises a balanced data set of 31 listed Indian commercial banks from 2006 to 2019. Public sector banks are more vulnerable to macroeconomic shocks owing to their capital inadequacy vis-à-vis the private sector banks. The study also emphasizes that size should not be used as a standalone factor to assess the systemic importance of a bank.

Gupta & Jain (2022) studied systemic importance and moral hazard behavior in Indian Banking System. The study is based on the secondary data, and the study has been conducted for the period of 9 years (2012 to 2019). The finding reveals that the loan growth ratio raises NPLs with a relatively higher value when banks are experiencing prior sizable loan losses as compared to when banks are relatively safe, indicating moral hazard behavior in the Indian banking industry. However, when the systemic importance of the bank is considered, the systemically important banks are found to be engaged in risky lending irrespective of their level of distress, whereas the opposite results are found for the least important banks.

Shrivastava (2022) authors attempted to understand the existing practices of Domestic Systemically Important Banks (D-SIBs) in India in relation to the impact of ESG factors on profitability of D-SIBs. The study has been conducted for the period of three years (2019-2021). ESG parameters has a significant impact on the overall profitability of banks. This suggests that there is scope of integrating an ESG framework to overall productivity of banks.

Narayan et al., (2023) identify the systemically important financial institutions in India and their contributing role to Indian systemic risk during various global and domestic events. The study was conducted for the period of 19 years (2004-2022). State Bank of India, ICICI Bank, HDFC Bank, and HDFC Ltd. contribute more than 50% to the aggregate risk in India, demonstrating a significant systemic risk concentration. Moreover, probability of default, leverage, loan, liquidity, board size, and Basel norms are significant drivers of systemic risk.

The above review showed that most of the studies have been conducted on the identification of D-SIBs in India and evaluating the systemic importance and moral hazard behavior in Indian Banking System by using various risk models. Few studies on the selected bank sample have also been conducted, but not on the aspect of D-SIBs in India. Therefore, the present study aims to conduct a compressive study on the profitability in terms of ROE and the drivers associated to it of D-SIBs in India.

3. OBJECTIVE OF THE STUDY

Specifically, the study aims at addressing the following objectives.

- To examine the profitability of D-SIBs through Dupont model.
- To compare the drivers of ROE in terms of Equity multiplier, Asset yield, Tax burden, Interest Burden and operating margin among D-SIBs in India.

3.1. HYPOTHESIS OF THE STUDY

The following hypotheses has been formulated against the stated objectives:

- H₀₁: There is no significant difference in Asset Turnover Ratio among D-SIBs.
- H₀₂: There is no significant difference in Equity Multiplier ratio among D-SIBs.
- H₀₃: There is no significant difference in Tax Burden Ratio among D-SIBs.
- H₀₄: There is no significant difference in Interest Burden Ratio among D-SIBs.
- H₀₅: There is no significant difference in Operating Margin Ratio among D-SIBs.
- H₀₆: There is no significant difference in ROE among D-SIBs.

3.2. METHODOLOGY OF THE STUDY

The present study is comparative in nature, assessing the profitability of D-SIBs of India. The study is based on the secondary data, which has been collected from the annual reports of the respective banks (State bank of India, Housing Development Finance Corporation Limited and Industrial Credit and Investment Corporation of India) and other related sources for the period 2017-2018 to 2022-23. In the fiscal year 2015-16, SBI and ICICI Bank were designated as Domestic Systemically Important Banks (D-SIBs), while HDFC bank received this designation in the subsequent fiscal year, which was 2017. So, in order to conduct a comparative study, the aforementioned study period has been chosen.

The methodology for this study involves the following stages. The first stage involves Collection of data from the annual report of the respective banks. The second stage is to prepare the data by calculating the financial ratios of Extended Dupont model of each bank for the period 2017-2018 to 2022-23. The third stage involves computation of extended Dupont ratios of the respective banks. And, fourth stage involves comparative analysis of the calculated Dupont ratios among D-SIBs by using one-way Anova.

3.3. MODEL SPECIFICATION

In order to achieve the objectives of this paper, extended Dupont model has been adopted to analyse the profitability of D-SIBs in India. To measure bank's performance five sub-parameters have been considered to calculate the ROE. Variables are collected from the balance sheets and income statements of the concerned bank for the relevant period.

The reason for choosing 5 step Dupont analysis over 3 step Dupont analysis is that in the 3 step rise in ROE is dependent on an increase in net profit margins, asset turnover, and equity multiplier. In contrast, a 5-step Dupont analysis reveals that an increase in equity multiplier does not always imply an improvement in ROE. It also provides a further breakdown of the profit margin ratio (net income/sales) into two components tax burden and interest burden, multiplied by the operating profit margin. This provides both management and the financial analyst with more detailed information about a company and its immediate competitors (Kent Baker & Powell, 2005). The extend Dupont formula has been mathematically expressed as under:

$$ROE = \frac{\text{Net Profit After Taxes}}{\text{Earnings Before Taxes}} \times \frac{\text{Earnings Before Taxes}}{\text{Earnings Before Interest and Taxes}} \times \frac{\text{Earnings Before Interest and Taxes}}{\text{Total Revenue}} \times \frac{\text{Total Revenue}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Total Equity}}$$

Or,

$$ROE = [\text{Tax Burden Ratio} \times \text{Interest Burden Ratio} \times \text{EBIT Margin Ratio} \times \text{Asset Turnover Ratio} \times \text{Equity Multiplier Ratio}]$$

The extended Dupont ratios and its responses has been presented in the table 1 given below.

Table 1: Extended Dupont ratios and its responses

Dupont Ratios	Performance	
	Increase	Decrease
Asset Turnover	Higher the value of ATR more efficient the bank in terms of asset management.	Lower ATR implies that the bank is not utilising its assets efficiently and most likely has management issues.
Equity Multiplier	A high EM indicates that a firm is highly leveraged and therefore has a higher risk of bankruptcy.	A low EM indicates that the bank is less leveraged and therefore has a lower risk of bankruptcy.
Tax Burden	A high TB implies that the bank is able to retain a large portion of its pretax income, indicating a lower tax rate.	A low TB implies that the bank is not able to retain its pretax income, indicating a higher tax rate.
Interest Burden	Higher IB indicates that the bank is able to manage its interest expenses efficiently	Lower IB indicates that the bank is less effective in managing interest expenses.
Operating Margin	Higher OM indicates that the bank is able to generate more revenue while incurring reduced operational expenses.	Lower OM indicates that the bank has lower revenue and higher operational expenses.

Source: Compiled and constructed by the authors

After computation of extended Dupont ratios one-way Anova and Post-Hoc test has been applied on Dupont ratios among the D-SIBs (SBI, HDFC & ICICI). The tests were run in SPSS.

4. DATA ANALYSIS AND DISCUSSION

This section provides an empirical result and interpretation of profitability of D-SIBs in India by using extended Dupont analysis, wherein ROE has been broken down into 5 sub parameters so as to identify the drivers responsible for the increase or decrease of ROE among SBI, HDFC and ICICI banks. Furthermore, Anova and Post-Hoc test has been applied to determine whether there exists any significant difference in 5 drivers of ROE among SBI, HDFC and ICICI banks.

Table 2: Descriptive statistics of Asset Yield among D-SIBs in India

Dupont Ratio	Banks	2018	2019	2020	2021	2022	2023	N	Mean	Std. Deviation	Min	Max
Asset Yield	SBI	0.085	0.085	0.088	0.080	0.079	0.080	6	0.083	0.003	0.079	0.088
	HDFC	0.092	0.096	0.093	0.089	0.079	0.081	6	0.088	0.006	0.079	0.096
	ICICI	0.106	0.106	0.109	0.103	0.090	0.095	6	0.101	0.007	0.090	0.109

Source: Compiled and constructed by the authors.

The above Table 2 represents the asset yield ratio (Total Revenue to Total Asset) of SBI, HDFC and ICICI banks. Notably, ICICI bank leads with highest ratio of 0.101 followed by HDFC and SBI Bank of 0.088 and 0.083 respectively. This indicates that ICICI bank is using its assets more efficiently than HDFC bank and SBI bank. The State Bank of India has the lowest ratio 0.083, indicating less efficient assets utilization in comparison to HDFC and ICICI banks.

Table 4: One-way Anova Showing Total Asset Yield

ANOVA					
Asset Yield					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.001	2	.001	14.385	.000
Within Groups	.001	15	.000		
Total	.002	17			

Source: Compiled and constructed by the authors by using SPSS.

Table 5: Multiple comparison using Fishers LSD Post-Hoc Analysis

Multiple Comparisons						
Dependent Variable: Asset Yield						
LSD						
(I) Banks	(J) Banks	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
SBI (Asset Yield)	HDFC (Asset Yield)	-.00550	.00358	.145	-.0131	.0021
	ICICI (Asset Yield)	-.01867*	.00358	.000	-.0263	-.0110
HDFC (Asset Yield)	SBI (Asset Yield)	.00550	.00358	.145	-.0021	.0131
	ICICI (Asset Yield)	-.01317*	.00358	.002	-.0208	-.0055
ICICI (Asset Yield)	SBI (Asset Yield)	.01867*	.00358	.000	.0110	.0263
	HDFC (Asset Yield)	.01317*	.00358	.002	.0055	.0208

*. The mean difference is significant at the 0.05 level.

Source: Compiled and constructed by the authors by using SPSS.

Table 4 determines the existence of significant difference in asset yield among the D-SIBs. The result of one-way Anova indicates that the means of the three banks (SBI, HDFC and ICICI) were unequal, $F(2,15) = 14.385$, $p = .000$ (which is less than .05 LoS). Therefore, we reject the null hypotheses and accept the alternative hypothesis and conclude that there exists significant difference in the asset yield among the D-SIBs.

Fishers LSD Post-hoc analysis (Table 5) reveals that SBI bank has lower Asset yield ratio than ICICI bank. Moreover, in comparison with HDFC bank with ICICI bank, HDFC bank has the lower ratio than ICICI bank.

While, there was no significant difference found in asset yield among SBI bank and HDFC bank, therefore null hypotheses have been accepted and conclude that there is no minimum difference in the average mean of asset yield among the SBI and HDFC bank.

Table 6: Descriptive statistics Equity Multiplier among D-SIBs in India

Dupont Ratio	Banks	2018	2019	2020	2021	2022	2023	N	Mean	Std. Deviation	Min	Max
Equity Multiplier	SBI	15.702	16.582	16.719	17.585	17.152	16.589	6	16.721	0.578	15.702	17.585
	HDFC	10.066	8.413	8.959	8.575	8.584	8.743	6	8.890	0.552	8.413	10.066
	ICICI	10.163	10.843	11.201	9.987	9.627	9.131	6	10.158	0.698	9.131	11.201

Source: Compiled and constructed by the authors.

Table 6 presents equity multiplier (Total asset to Total equity) among D-SIBs. The data indicates that SBI bank has comparatively higher leverage of 16.721 compared to ICICI bank and HDFC bank of 10.158 and 8.890 respectively. It is

noteworthy that SBI bank consistently holds a higher leverage throughout the year, indicating that the bank is leveraging its debts to purchase more assets in order to generate higher returns. However, this can also lead the bank into higher debt burden and high financial risk as it will increase the interest expenses and default risk and would make it more vulnerable during economic downturn and liquidity crises, in contrast, HDFC and ICICI banks maintain lower leverage of 8.890 and 10.158 respectively, indicating the banks has a lower debt burden and financial risk in comparison to SBI bank.

Table 7: One way Anova Showing Equity Multiplier

ANOVA					
Equity Multiplier					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	212.025	2	106.013	235.231	.000
Within Groups	6.760	15	.451		
Total	218.786	17			

Source: Compiled and constructed by the authors by using SPSS.

Table 8: Multiple comparison using Fishers LSD Post-Hoc Analysis

Multiple Comparisons						
Dependent Variable: Equity Multiplier						
LSD						
(I) Banks	(J) Banks	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
SBI (Equity Multiplier)	HDFC (Equity Multiplier)	7.83150*	.38759	.000	7.0054	8.6576
	ICICI (Equity Multiplier)	6.56283*	.38759	.000	5.7367	7.3890
HDFC (Equity Multiplier)	SBI (Equity Multiplier)	-7.83150*	.38759	.000	-8.6576	-7.0054
	ICICI (Equity Multiplier)	-1.26867*	.38759	.005	-2.0948	-.4425
ICICI (Equity Multiplier)	SBI (Equity Multiplier)	-6.56283*	.38759	.000	-7.3890	-5.7367
	HDFC (Equity Multiplier)	1.26867*	.38759	.005	.4425	2.0948
*. The mean difference is significant at the 0.05 level.						

Source: Compiled and constructed by the authors by using SPSS.

Table 7 determines the existence of difference in Equity Multiplier among SBI, HDFC and ICICI banks. The result of one-way Anova reveals that the means of the three banks (SBI, ICICI & HDFC) were unequal, $F(2,15) = 235.231$, $p = .000$ (which is lesser than .05 LoS). Therefore, the alternative hypothesis has been

accepted and concludes that there exists significant difference in the equity multiplier among the D-SIBs.

Fishers LSD post-hoc analysis (table 8) reveal reveals that SBI bank has the highest equity multiplier ratio compared to ICICI bank and HDFC banks. Therefore, the alternative hypothesis is accepted and concludes that there is a significant difference in the equity multiplier ratio of SBI, HDFC and ICICI banks.

Table 9: Descriptive statistics of Tax Burden among D-SIBs in India

Dupont Ratio	Banks	2018	2019	2020	2021	2022	2023	N	Mean	Std. Deviation	Min	Max
Tax Burden	SBI	0.372	0.441	0.652	0.683	0.711	0.738	6	0.600	0.140	0.372	0.738
	HDFC	0.650	0.651	0.714	0.744	0.748	0.748	6	0.709	0.043	0.650	0.748
	ICICI	0.702	0.574	0.515	0.710	0.733	0.736	6	0.662	0.086	0.515	0.736

Source: Compiled and constructed by the authors.

Table 9 presents the tax burden ratio (profit after tax to profit before tax) among SBI, HDFC and ICICI banks. HDFC bank and ICICI banks exhibit a relatively higher tax burden ratio of 0.709 and 0.662 respectively, indicating superior performance in managing tax efficiency, in contrast average tax burden ratio of SBI is comparatively lower at 0.600, compared to HDFC and ICICI banks. This indicates that SBI is the least performer in managing tax efficiency among the three banks.

Table 10: One-way Anova Showing Tax Burden

ANOVA					
Tax Burden					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.036	2	.018	1.572	.240
Within Groups	.173	15	.012		
Total	.209	17			

Source: Compiled and constructed by the authors by using SPSS.

Table 10 exhibits the existence of difference in tax burden among SBI, HDFC and ICIC banks. The result of one-way Anova reveals that the means of the three banks (SBI, ICIC & HDFC) were equal, $F(2,15) = 1.572$, $p = .240$ (which is greater than .05 LoS). Therefore, null hypothesis has been accepted and concludes that there is no significant difference in the tax burden ratio among the D-SIBs.

Table 11: Descriptive statistics of Interest Burden among D-SIBs in India

Dupont Ratio	Banks	2018	2019	2020	2021	2022	2023	N	Mean	Std. Deviation	Min	Max
Interest Burden	SBI	-0.208	0.088	0.437	0.423	0.593	0.806	6	0.356	0.332	-0.208	0.806
	HDFC	0.812	0.804	0.736	0.694	0.739	0.816	6	0.767	0.046	0.694	0.816
	ICICI	0.379	0.266	0.553	0.612	0.792	0.870	6	0.579	0.212	0.266	0.870

Source: Compiled and constructed by the authors.

Table 11 presents the interest burden ratio among SBI, HDFC and ICICI banks. The average interest burden of HDFC bank is 0.767, which is highest among all the banks indicating that HDFC bank is managing its interest burden efficiently. Whereas, SBI's average interest burden ratio has the lowest value of 0.356 among all banks indicating that the bank is the least performer in managing tax efficiency. Despite ICICI Bank and SBI Bank having lower tax burden ratios compared to HDFC Bank, an upward trend has been observed throughout the year. In the financial year 2023, the tax burden ratios for all three banks are more or less similar.

Table 12: One-way Anova Showing Interest Burden

ANOVA					
Interest Burden					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.506	2	.253	4.030	.040
Within Groups	.942	15	.063		
Total	1.449	17			

Source: Compiled and constructed by the authors by using SPSS.

Table 12 determines the existence of difference in Interest burden ratio among SBI, HDFC and ICICI banks. The result of one-way Anova reveals that the means of the three banks (SBI, ICIC & HDFC) were unequal, $F(2,15) = 4.030$, $p = .040$ (which is lesser than .05 LoS). Hence, null hypothesis has been rejected and so concluded that there is a significant difference in the interest burden ratio among the D-SIBs during the study period.

Table 13: Multiple comparison using Fishers LSD Post-Hoc Analysis

Multiple Comparisons						
Dependent Variable: Interest Burden						
LSD						
(I) Banks	(J) Banks	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
SBI (Interest Burden)	HDFC (Interest Burden)	-.41033*	.14471	.013	-.7188	-.1019
	ICICI (Interest Burden)	-.22217	.14471	.146	-.5306	.0863
HDFC (Interest Burden)	SBI (Interest Burden)	.41033*	.14471	.013	.1019	.7188
	ICICI (Interest Burden)	.18817	.14471	.213	-.1203	.4966
ICICI (Interest Burden)	SBI (Interest Burden)	.22217	.14471	.146	-.0863	.5306
	HDFC (Interest Burden)	-.18817	.14471	.213	-.4966	.1203
*. The mean difference is significant at the 0.05 level.						

Source: Compiled and constructed by the authors by using SPSS.

Fishers LSD post hoc analysis (table 13) reveals that interest burden ratio of SBI is lower compared to HDFC bank. So, the alternative hypothesis is accepted and thereby concluded that interest burden ratio differs significantly among SBI and HDFC banks.

Whereas, there was no significant difference in the interest burden ratio of SBI bank with ICICI bank and HDFC bank with ICICI bank. Therefore, the null hypothesis has been accepted.

Table 14: Descriptive statistics of Operating Margin among D-SIBs in India

Dupont Ratio	Banks	2018	2019	2020	2021	2022	2023	N	Mean	Std. Deviation	Min	Max
Operating Margin	SBI	0.192	0.180	0.188	0.201	0.206	0.198	6	0.194	0.009	0.180	0.206
	HDFC	0.346	0.344	0.353	0.395	0.410	0.368	6	0.369	0.025	0.344	0.410
	ICICI	0.243	0.212	0.224	0.262	0.274	0.286	6	0.250	0.026	0.212	0.286

Source: Compiled and constructed by the authors.

Table 14 presents the operating margin ratio among SBI, HDFC and ICICI banks. The given data indicates that average operating margin ratio of HDFC bank is

0.369, surpassing the ICICI bank's ratio which is 0.250, indicating that the HDFC bank were able to generate more revenue while incurring reduced operational expenses compared to ICICI bank. On the other hand, average operating margin of SBI bank is 0.196, which is lower than the HDFC bank and ICICI bank. This Indicates that the SBI has lower revenue and higher operational expenses compared to HDFC and ICICI banks.

Table 15: One-way Anova Showing Operating Margin

ANOVA					
Operating Margin					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.096	2	.048	85.781	.000
Within Groups	.008	15	.001		
Total	.104	17			

Source: Compiled and constructed by the authors by using SPSS.

Table 15 determines the existence of difference in operating margin ratio among SBI, HDFC and ICICI banks. The result of one-way Anova (refer table 15) reveals that the means of the three banks (SBI, ICIC & HDFC) were unequal, $F(2,15) = 85.781$, $p = .000$ (which is lesser than .05 LoS). Hence, alternative hypothesis has been accepted and so concluded that there is a significant difference in the operating margin ratio among the D-SIBs during the study period.

Table 16: Multiple comparison using Games-Howell Post-Hoc Analysis

Multiple Comparisons						
Dependent Variable: Operating Margin						
Games-Howell						
(I) Banks	(J) Banks	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
SBI (Operating Margin)	HDFC (Operating Margin)	-.17517*	.01185	.000	-.2112	-.1391
	ICICI (Operating Margin)	-.05600*	.01242	.009	-.0940	-.0180
HDFC (Operating Margin)	SBI (Operating Margin)	.17517*	.01185	.000	.1391	.2112
	ICICI (Operating Margin)	.11917*	.01628	.000	.0745	.1638

ICICI (Operating Margin)	SBI (Operating Margin)	.05600*	.01242	.009	.0180	.0940
	HDFC (Operating Margin)	-.11917*	.01628	.000	-.1638	-.0745
*. The mean difference is significant at the 0.05 level.						

Source: Compiled and constructed by the authors by using SPSS.

Games-Howell post-hoc analysis (table 16) reveals that operating margin ratio of SBI bank is lower than ICICI bank and HDFC bank. In case of operating margin ratio of HDFC bank with SBI bank and ICICI bank, HDFC bank has the higher operating margin ratio than ICICI bank and SBI bank. Furthermore, ICICI bank has the higher ratio than SBI bank but lower than HDFC bank. Hence the null hypothesis is rejected and concluded that there is a significant difference in the operating margin ratio among the D-SIBs.

Table 17: Descriptive statistics of ROE among D-SIBs in India

Dupont Ratio	Banks	2018	2019	2020	2021	2022	2023	N	Mean	Std. Deviation	Min	Max
ROE %	SBI	-1.978	0.981	7.874	8.131	11.718	15.504	6	7.038	5.965	-1.978	15.504
	HDFC	16.889	14.532	15.451	15.626	15.386	15.892	6	15.629	0.701	14.532	16.889
	ICICI	6.971	3.724	7.780	11.666	13.793	15.868	6	9.967	4.185	3.724	15.868

Source: Compiled and constructed by the authors.

Table 17 presents the return on equity among SBI, HDFC and ICICI banks. The data reveals that HDFC bank has the higher ROE of 15.629 compared to ICICI bank which is 9.967, the reason being higher asset yield ratio, optimised Equity multiplier, efficient tax burden ratio and higher Interest burden and operating margin ratios in comparison to ICICI bank. On the other hand, SBI bank has the lowest ROE of 7.038 compared to ICICI bank and HDFC bank.

Table 18: One way Anova Showing return on Equity

ANOVA					
ROE %					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	228.889	2	114.444	5.340	.018
Within Groups	321.476	15	21.432		
Total	550.365	17			

Source: Compiled and constructed by the authors by using SPSS.

Table 15 determines the existence of difference in return on equity among SBI, HDFC and ICICI banks. The result of one-way Anova (refer table 17) reveals that the means of the three banks (SBI, ICICI & HDFC) were unequal, $F(2,15) =$

5.340, $p = .018$ (which is lesser than .05 LoS). Hence, alternative hypothesis has been accepted and thereby concluded that there is a significant difference in the return on equity among the D-SIBs during the study period.

Table 19: Multiple comparison using Games-Howell Post-Hoc Analysis

Multiple Comparisons						
Dependent Variable: ROE %						
Games-Howell						
(I) Banks	(J) Banks	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
SBI (Return on Equity)	HDFC (Return on Equity)	-8.59100	2.68574	.051	-17.2468	.0648
	ICICI (Return on Equity)	-2.92867	3.25845	.655	-12.0333	6.1759
HDFC (Return on Equity)	SBI (Return on Equity)	8.59100	2.68574	.051	-.0648	17.2468
	ICICI (Return on Equity)	5.66233	1.89764	.063	-.3968	11.7215
ICICI (Return on Equity)	SBI (Return on Equity)	2.92867	3.25845	.655	-6.1759	12.0333
	HDFC (Return on Equity)	-5.66233	1.89764	.063	-11.7215	.3968

Source: Compiled and constructed by the authors by using SPSS.

Games-Howell post-hoc analysis (table 19) reveals that there is no significant difference in return on equity between SBI, ICICI & HDFC banks. Hence, the null hypothesis has been accepted.

5. SUMMARY OF FINDINGS & CONCLUSIONS

The major findings of the study are summarised below:

- The average asset yield ratio of ICICI bank is comparatively higher than HDFC bank and SBI bank.
- The average equity multiplier of SBI bank is higher compared to ICICI and HDFC banks, indicating that the SBI bank has been using more debt and less equity to finance its assets compared to ICICI and HDFC banks.
- The average tax burden ratio was found to be more efficient in case of HDFC bank followed by ICICI bank and SBI bank. Moreover, an increasing trend in interest burden has been witnessed for SBI, HDFC and ICICI banks.

- HDFC bank were found to be better in managing its interest burden efficiently throughout the study period compared to ICICI bank. On the other hand, average interest burden of SBI bank was found to be lower in comparison to ICICI bank and HDFC bank.
- The average operating margin ratio of HDFC bank was higher than that of ICICI bank. Moreover, SBI bank has the lowest operating margin ratio in comparison to ICICI bank and HDFC bank.
- HDFC bank exhibited a higher Return on Equity compared to ICICI bank and SBI bank. The reason being higher asset yield ratio, optimized equity multiplier, efficient tax burden ratio, higher interest burden and operating margin ratio, in comparison to ICICI bank and SBI bank throughout the study period.
- The One-way Anova test revealed that there was a significant difference in the asset yield ratio among the D-SIBs. Further Fishers LSD post-hoc analysis reveals that ICICI bank has the highest asset yield ratio than SBI bank. Moreover, in comparison to HDFC bank with ICICI bank, HDFC bank has the lower ratio than ICICI bank.
- Equity multiplier ratio was significantly different among the D-SIBs. Further, Fishers LSD post-hoc analysis revealed that SBI bank has the highest ratio than HDFC and ICICI banks. In comparison with HDFC bank with ICICI bank, HDFC bank has lower ratio than ICICI bank.
- There was no significant difference found in case of tax burden ratio among D-SIBs.
- Interest burden was found to be significantly different among the D-SIBs. Further, Fishers LSD post-hoc analysis revealed that SBI bank had lower ratio compared to HDFC bank. However, there was no significant difference in the interest burden ratio of SBI bank with ICICI bank as well as HDFC bank with ICICI bank.
- Operating margin ratio was significantly different among D-SIBs. Games-Howell post-hoc analysis revealed that operating margin ratio of SBI bank was lower than ICICI bank and HDFC bank, HDFC bank has the higher ratio than ICICI bank and SBI bank and ICICI bank has the higher ratio than SBI bank but lower than HDFC bank.
- Return on equity was found to be significantly different among D-SIBs. Games-Howell post-hoc analysis revealed that there was no significant difference found in return on equity of HDFC, ICICI and SBI banks.

The above findings clearly demonstrate that profitability of D-SIBs in India is comparatively in a good state, where HDFC bank exhibits the highest profitability followed ICICI bank and SBI bank. However, SBI bank was found to have a lower RoE, owing to its lower performance in the associated profitability drivers. The equity multiplier ratio of SBI bank was comparatively higher than the ICICI and HDFC bank, indicating that the bank is using a high amount of debt to finance its assets, which could increase the financial risk and obligations in its forthcoming operational years. Therefore, the SBI bank must take strategic steps to reduce its reliance on borrowed funds in order to improve its overall financial health. The operating margin ratio of SBI bank was consistently found to be lower compared to other two banks, indicating that the bank has lower revenue and higher operational expenses compared to ICICI and HDFC banks. Therefore, the bank needs to take steps to increase its revenue and reduce its expenses in order to generate higher RoE in the forthcoming years. Thus, it is recommended that SBI bank must focus in improving its equity multiplier ratio and Operating margin ratio, in order to gain higher probability and stability in the forthcoming years.

6. LIMITATION AND FUTURE SCOPE OF THE STUDY

- The study relies on secondary data limiting its scope to the assumption that these data sources expose the reality and an accurate picture of state of affairs of business.
- As the study is centered around a single analysis, it restricts to give a conclusive inference on the overall financial health of the D-SIBs in India. It can be elaborated in future by taking other financial ratios in order to measure the overall financial soundness of D-SIBs in India.
- As the present study is focused in examining the profitability of D-SIBs in India. Leaving room to conduct a comparative analysis on the financial health and stability of D-SIBs of other nations.

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