



INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE AND MANAGEMENT

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**DUPONT ANALYSIS OF SELECTED INDIAN COMMERCIAL BANKS TO MAKE INFORMED
DECISION: AN EMPIRICAL INVESTIGATION**

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ABSTRACT

Selecting best bank is a complicated task. The choice becomes even difficult as common people can make out very little from the published financial results. In the present study we have considered DuPont analysis as our tool to measure the financial performance of the twelve selected Indian commercial banks. The data considered for the purpose of the study is pertaining to the period from 2000 to 2009. Firstly we have performed subjective analysis of the DuPont ratios and ROA in order to reach to conclusion. But, as subjective analysis is not free from bias we have objectified the subjective values with the help of normalization techniques. Results from both the analysis have suggested that Kotak Mahindra Bank is the best amongst the lot followed by HDFC Bank. The present study can be an eye-opener so that banks having small asset size may not be neglected for long.

KEY WORDS

DuPont Analysis, Indian Commercial Banks, Normalization, ROA.

INTRODUCTION

The ever changing world of banking business environment has motivated the finance and banking researchers to do work in examining banking performance. In the recent years, the problem of banking and its financial system soundness has become more important in all over the world due to several instances of failures in banking system. The problem is more acute in western countries whereas Indian banking survived the recession due to strict supervisory framework by the Reserve Bank of India. In this juncture it is necessary to analyze the financial performance of Indian banks to ascertain their real strength. It is a complicated issue to measure banks' creditworthiness and risk exposures and it is also difficult to interpret banks' financial data. Thus, it is needed to use all available financial information as fully as possible from the official financial statements of banks to analyze banks' financial performance.

Over the years banking and finance authors are using many methods to measure the financial performance of the banks. Ratio analysis is one of the most commonly used tools to measure the financial performance of the banks. Different authors have used different versions of financial ratio analysis for the bank performance analysis using financial statement items as initial data sources. One of the important ratio analysis methods is DuPont Analysis. Saunders (2000) provided the model of financial analysis for financial institutions based on the DuPont system of financial analysis return on equity model. It is a system of analysis which focuses management's attention on the three critical elements of good financial condition--operating management, asset management, and capital structure management.

The DuPont Formula shows the interrelationship between five key financial ratios. The information contained in the balance sheet and Profit and loss statements are of no use until subjected to managerial analysis. The task becomes complicated when it comes to Banks. Little effort has been done to analyze banks by taking into consideration all the ratios of financial performance measurement. DuPont analysis aims at tracing down the components of ROE in order to get the complete picture. The present study aims at combining all the ratio set, and the systems to get the complete picture of bank performance so that informed decision can be taken. It is very difficult for ordinary people to rank banks on the financial performance parameters due to lack of understanding of the ratios. In order to rank banks the present study has taken comprehensive view of the financial performance by taking into consideration profitability, expenditure, debt and equity.

REVIEW OF LITERATURE

Several studies are being conducted over the years highlighting the financial performance of companies. DuPont analysis is one such tool devised to augment the financial measurement of the companies. But few studies are concerned with the measurement of financial performance of Indian commercial banks using the elements of DuPont analysis. It is observed by the authors that Return on Assets (ROA) is also used as a tool to measure the financial performance of the banking companies over the years. It is also observed that ROA demonstrate the ability of the management to acquire funds at low cost and invest them in profitable investments. In the previous study of (Simpson and Kohers, 2002) the same argument about ROA is reflected. Several studies also claim that ROA is "the most meaningful financial indicator in the banking industry" (Reger, Duhaime and Stimpert, 1992). Small firms which have a very small equity base can use ROA with ease as the big firms with large equity base can and this contributes to yet another advantage of ROA, but use of ROE can be give misleading results compared to ROA (Reger et al., 1992).

As pointed in the earlier studies, the ROE and ROA is found to be highly correlated in the banking sector. Both the ratios gives the same results in the direction of financial performance but the point of difference is their magnitude and interpreted analysis (Simpson and Kohers, 2002, Karr, 2005, Castelli, Dwyer and Hasan, 2006).

Previous studies lay much emphasis on Return on Equity (ROE) as one of the most commonly used bank financial performance measure. The use of ROE as a tool of financial measurement can be well found in much of the research, highlighting bank performance (Lindblom and Von Koch, 2002). ROE can also be said as a simple method to calculate and measure past performance while giving a good approximation of future ROE as pointed in the study conducted by Wilcox (1984).

Hopkins et al. (1997) strongly advocates for ROE and states ROE as the ultimate measure to ascertain the strength of any financial institution. They also pointed out that ROE can be effectively used for comparing banks differing in size and structure.

The use of ROE is based on the assumption as pointed in the study conducted by Lindblom et al. (2002). They argued that the "customer value creation is positively correlated to the financial performance [measured as ROE] of the bank". Also, the authors have warned that use of ROE can lead to inaccurate results as banking companies differ in size in the dimension of credit risk (Lindblom et al., 2002).

In the use of ROE minor differences in the account types are ignored, also different type of loan and deposits are ignored and the varying profit margins are not taken into account. Thus, all these figure as the limitation of use of ROE, highlighted in the study of Avkiran (1997). The use of ROE is having yet another limitation as it ignores cost of equity in its calculation (Fraker, 2006).

Individual ratios are used to measure the financial performance highlighting different dimensions like profitability, liquidity etc. but it is always wise to use a set of ratios. The set of ratios can effectively highlight the interrelation between the ratios and provide managers with the understanding as well as the information regarding the factors which are meaningfully affecting the bank performance.

From the previous studies it is well demonstrated that the ROE is calculated as Net Income Before Tax divided by Total Shareholder Equity; reflecting the percentage return on each dollar of shareholder's equity. Thus, the higher return signifying the maximization of stock holder's value. Usually in the calculation of ROE, Net Income Before Tax is usually considered in order to nullify the effect of different tax rates as also pointed in the study of Ahmad (1998) and Greuning and Iqbal (2008).

The DuPont analysis is based on reaching ROE while decomposing the ROE into its contributing ratios usually in the reverse way. Where as ROA is the measure of net income on per dollar of total asset owned by the firm during that period. Banks can afford higher default on loans if its equity ratio is high but the higher equity ratio can also have adverse impact on the ROE. Thus higher equity ratio can motivate banks to take more of credit risk and book profits when earnings are positive but equally the chances are there to magnify loss if earnings turn out to be negative (MacDonald and Koch, 2006: 66-70). Thus in the present study we have considered the higher value of equity ratio or Equity Multiplier as adverse whereas the lower value is considered favourable.

OBJECTIVE OF THE PAPER

An attempt has been made in this study to perform DuPont analysis of the selected commercial banks taking into account all the parameters of performance. The whole effort is concentrated in ranking the banks so that people can make informed choice. The study is structured in such a way that all the dimensions of financial performance is addressed and taken into purview in order to arrive at the final ranking.

METHODOLOGY

Ten years (2000 to 2009) data have been taken into account for empirical analysis and we have considered 12 banks from the Nifty list. The banks are Axis Bank, Bank of Baroda, Bank of India, Canara Bank, HDFC bank Ltd., IDBI Bank, ICICI Bank, Kotak Mahindra Bank, Oriental Bank of Commerce, Punjab National Bank, State Bank of India and Union Bank of India. For data collection Capital Line software was used.

In this paper the performance of the selected banks has been analyzed with the help of two methods – first is the financial method which is subjective in nature and the second is the statistical method which aims at objectification of the subjective treatment.

To analyze the performance of the 12 selected banks, we have considered the widely used DuPont analysis. In DuPont analysis five financial ratios are considered with the help of which we can study the performance of the banks. The five ratios are Profit Margin, Total Asset Turnover, Return on Investment, Equity Multiplier and Return on Equity. The DuPont Formula shows the interrelationship between these five key financial ratios. Formulae of the ratios are given below:

$$\begin{aligned} \text{Profit Margin (PM)} &= \text{Net Income} \div \text{Sales (or Total Revenue)} \\ \text{Total Asset Turnover (TAT)} &= \text{Sales (or Total Revenue)} \div \text{Total Assets} \\ \text{Return on Investment (ROI)} &= \text{PM} \times \text{TAT} \\ &= \text{Net Income} \div \text{Total Assets} \\ \text{Equity Multiplier (EM)} &= \text{Total Assets} \div \text{Total Equity} \\ \text{Return on Equity (ROE)} &= \text{PM} \times \text{TAT} \times \text{EM} \\ &= \text{ROI} \times \text{EM} \\ &= \text{Net Income} \div \text{Total Equity} \end{aligned}$$

In this paper, we have considered net profit in place of net income. To shorten the data set, average value of the five ratios over the period of ten years (2000-2009) has been calculated.

Beside these five DuPont ratios another important ratio Return on Asset (ROA) has also been used to study the performance of the banks. Changes in ROA are usually the cause of the most important changes in banks' performance and needs a thorough analysis. The formula of ROA is shown below:

$$\text{ROA} = \text{Earning before Tax} \div \text{Total Assets}$$

In order to rank banks and arrive at informed decision making the average values of ten years derived by DuPont analysis has been considered. The decision making process involved in selecting the best bank has been based on certain criteria. As the decision making is individual process and is based on individual judgment and hence is not free from bias. In order to make this decision making rational we have converted the subjective opinions into objective values. Instead of using the ordinal values for each factor, we ranked the banks for each DuPont factor.

Smaller rank value is more preferable than higher rank values. We transform the score value of each factor according to the range value such that each factor will have the same range. The value of each rank has either been 1 or 2 or 3..... or 12 based on the DuPont factor score. As smaller rank means higher value and preferable than higher rank we have normalized the sum of ranks in different way using the formula formulated by kardi (<http://people.revoledu.com/kardi/resources/index.html>).

$$\text{Normalized score} = \frac{1}{2} \left(1 - \frac{\text{Sum}}{\text{TotalSum}} \right)$$

All the values of DuPont ratios have been first normalized between the range values 0 to 1. Each ordinal score has been divided by the sum of all score in order to arrive at the weighted score and hence normalized. Only the value of Equity multiplier has been normalized using the following formula formulated by kardi (<http://people.revoledu.com/kardi/resources/index.html>).

$$\text{New score} = \frac{\text{nub} - \text{nlb}}{\text{oub} - \text{olb}} (\text{originalscore} - \text{olb}) + \text{nlb}$$

Where,

nub= New upper bound

nlb= New lower bound

oub= Old upper bound

olb= Old lower bound

In the present calculation 'nub' has been taken as 1 and 'nlb' as 0 whereas 'oub' has been taken as 50 and 'olb' as 1.

ANALYSIS AND INTERPRETATION

In order to undertake the DuPont analysis of the selected banks the average value of the ten years has been calculated. The five ratios have been calculated and presented in Table 1. Also each of the ratios has been individually analyzed by considering the average value of the selected banks and compared amongst themselves. To analyze individual ratios, we have drawn five graphs.

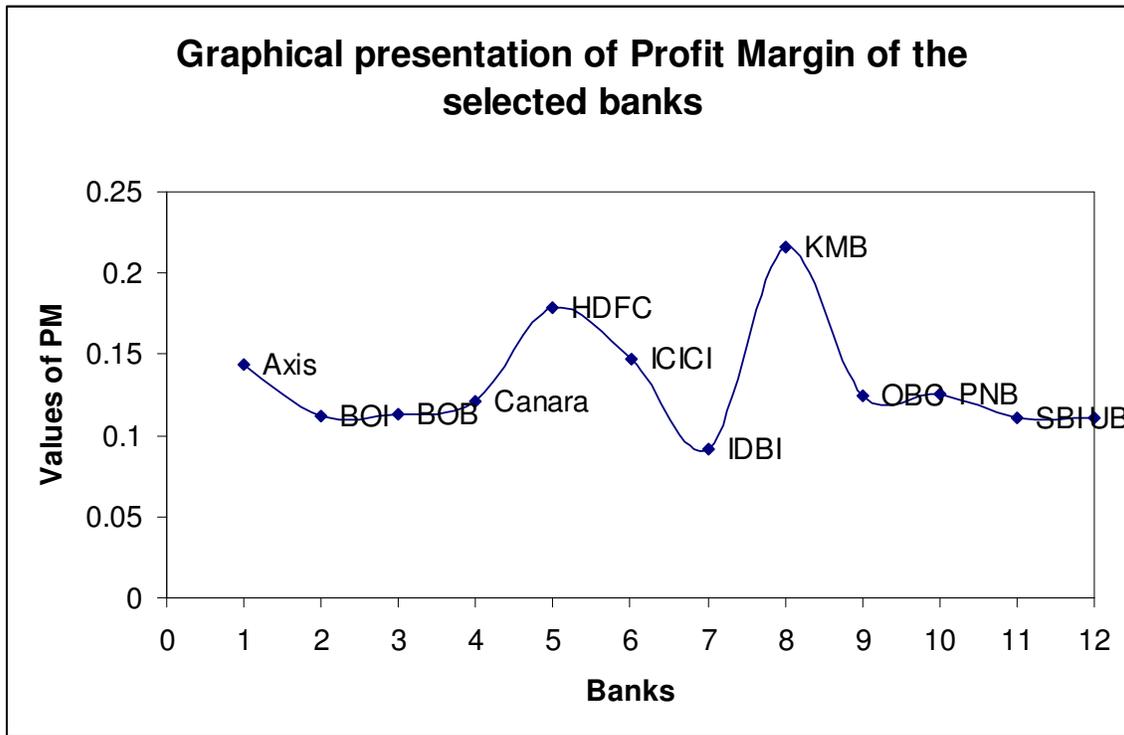
Table 1: Calculation of average DuPont ratios of twelve selected banks

Ratios	Axis	BOI	BOB	Canara Bank	HDFC Bank	ICICI Bank
PM	0.143125	0.112079	0.112615	0.121447	0.178629	0.147176
TAT	0.068495	0.073037	0.07404	0.077353	0.069533	0.064745
ROI	0.009593	0.007992	0.008149	0.009158	0.012239	0.009478
EM	21.11646	21.32604	17.13278	19.20572	13.77851	12.60122
ROE	0.197265	0.165327	0.139236	0.173214	0.168531	0.117547
Ratios	IDBI	KMB	OBC	PNB	SBI	UB
PM	0.091552	0.216044	0.124344	0.125537	0.11137	0.110651
TAT	0.077891	0.097429	0.083296	0.079337	0.075341	0.079673
ROI	0.006945	0.021596	0.010155	0.009649	0.008224	0.008458
EM	11.89376	6.97884	15.7921	19.16854	19.63835	19.57565
ROE	0.07684	0.104317	0.161005	0.180931	0.158818	0.163337

Source: Authors' own calculation

Each of the above ratios shown in table 1 has been graphically presented below to make the study of the banks performance easier. We have considered banks in the horizontal axis and the value of the individual ratios in the vertical axis.

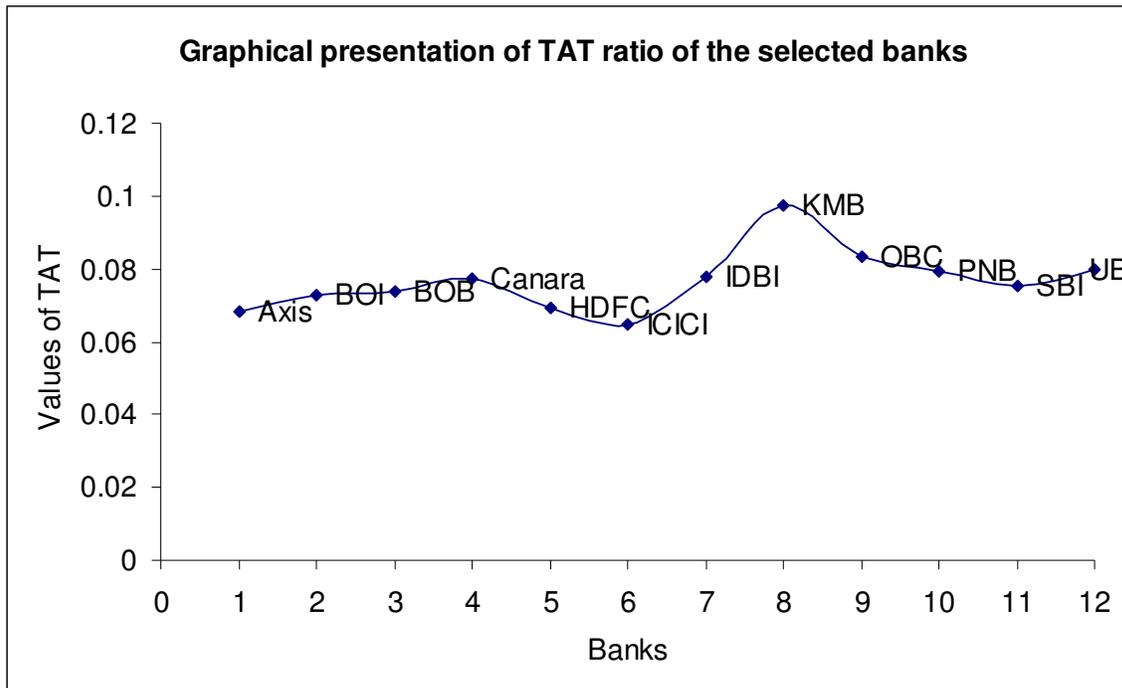
Figure 1: Graphical presentation of Profit Margin of the selected banks



Source: Authors' own calculation

Profit Margin (PM) ratio of the KMB is highest as compared to the other eleven banks. The IDBI has the lowest PM ratio of 0.091552 during the study period. Thus, among all the twelve banks KMB's operating management was performing well during the study period. The bank's earning was good during the period as compared to the other banks.

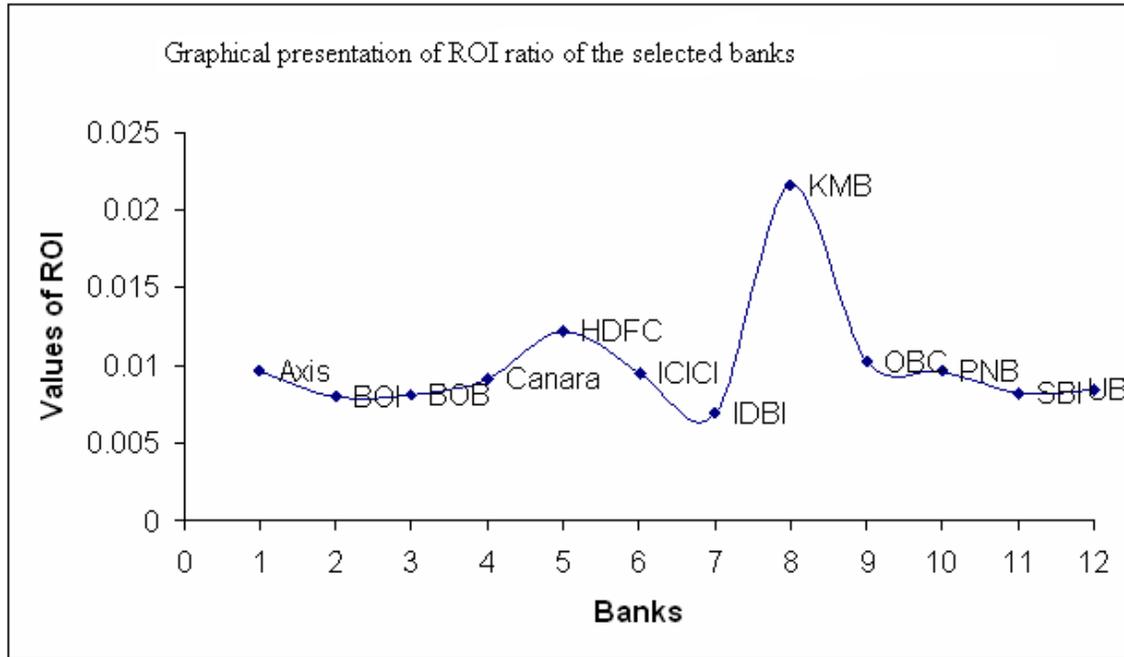
Figure 2: Graphical presentation of TAT of the selected banks



Source: Authors' own calculation

When TAT ratio rises across time, it is a good sign signaling superior asset management of the concerned company. TAT of KMB is again highest among all the twelve banks. It can be said that the bank is able to produce more sales from its assets as compared to the other banks. In other words, KMB is becoming more efficient in using its assets. On the contrary, ICICI Bank has the lowest TAT ratio (0.064745).

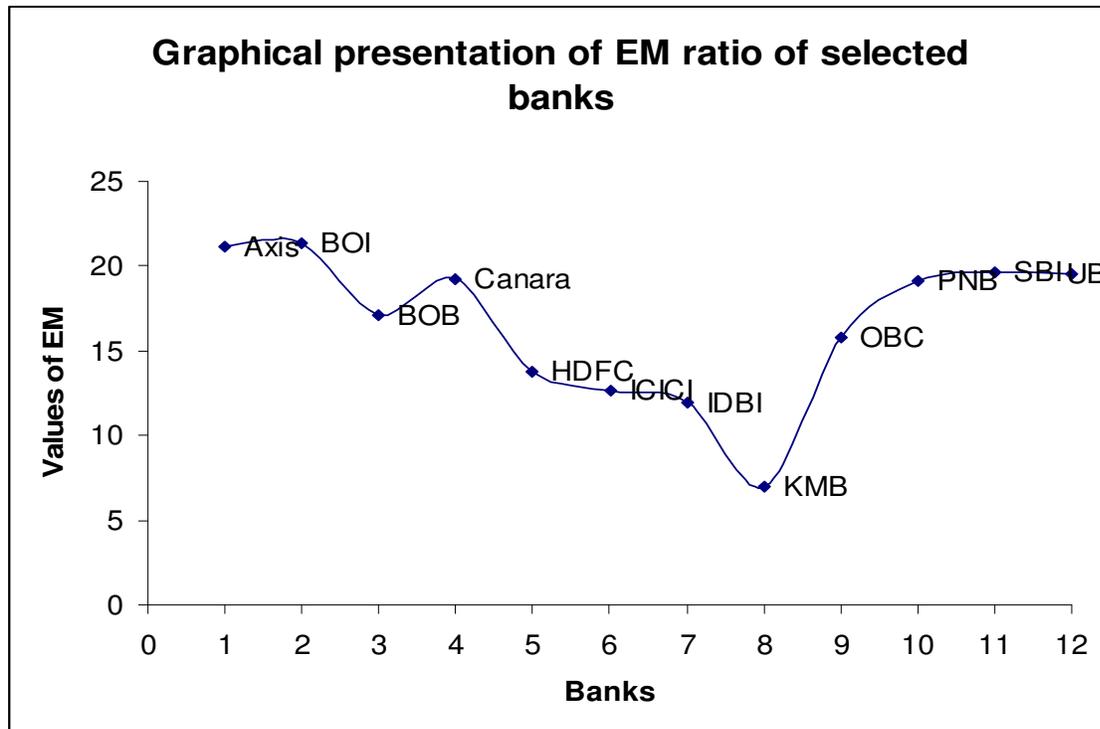
Figure 3: Graphical presentation of ROI ratio of the selected banks



Source: Authors' own calculation

ROI ratio measures the profitability of assets used by the firm. Like most profit measures, this ratio should be positive and growing over time. As KMB has highest PM ratio and TAT ratio, its ROI is also highest with the average value of 0.021596. The lowest average value of ROI is of IDBI.

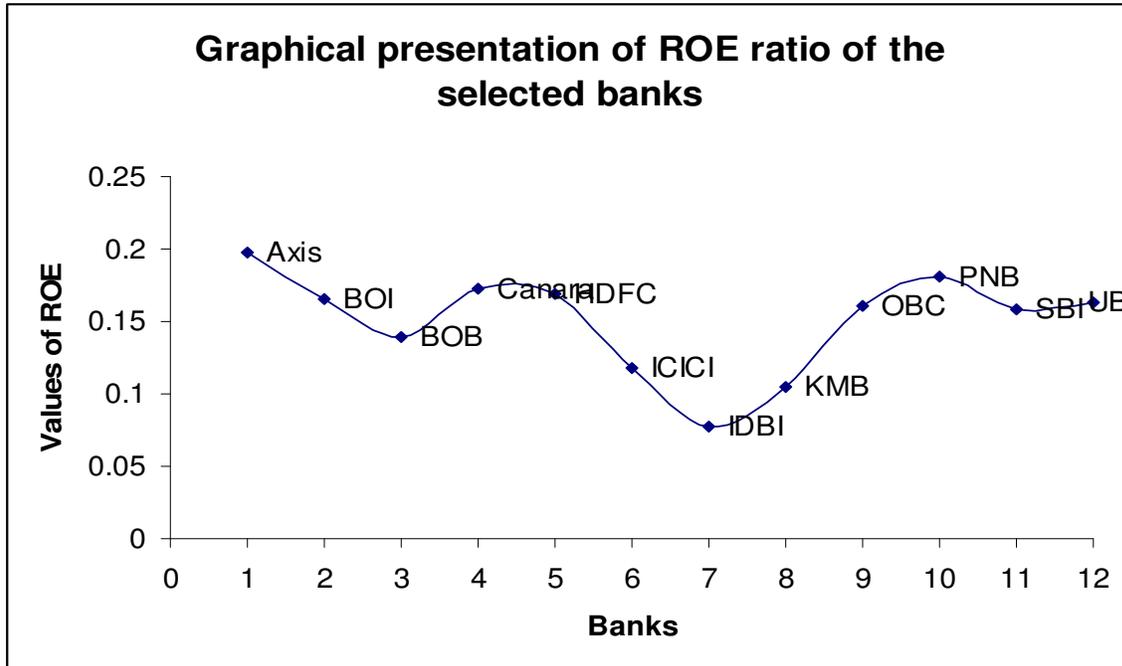
Figure 4: Graphical presentation of EM ratio of the selected banks



Source: Authors' own calculation

EM ratio implies that how much of the total asset is financed by equity capital. If the value of the ratio increases over the time, it means that the value of the total asset is increasing over the time and the extra value of the asset is financed by debt. So, lesser the value of EM more will be the efficiency of the firm. Among the twelve banks EM of KMB (6.97884) is the lowest. That means its performance is better when compared with the other banks. On the other hand, BOI's EM is highest (21.32604), which indicates that its capital structure management is poor.

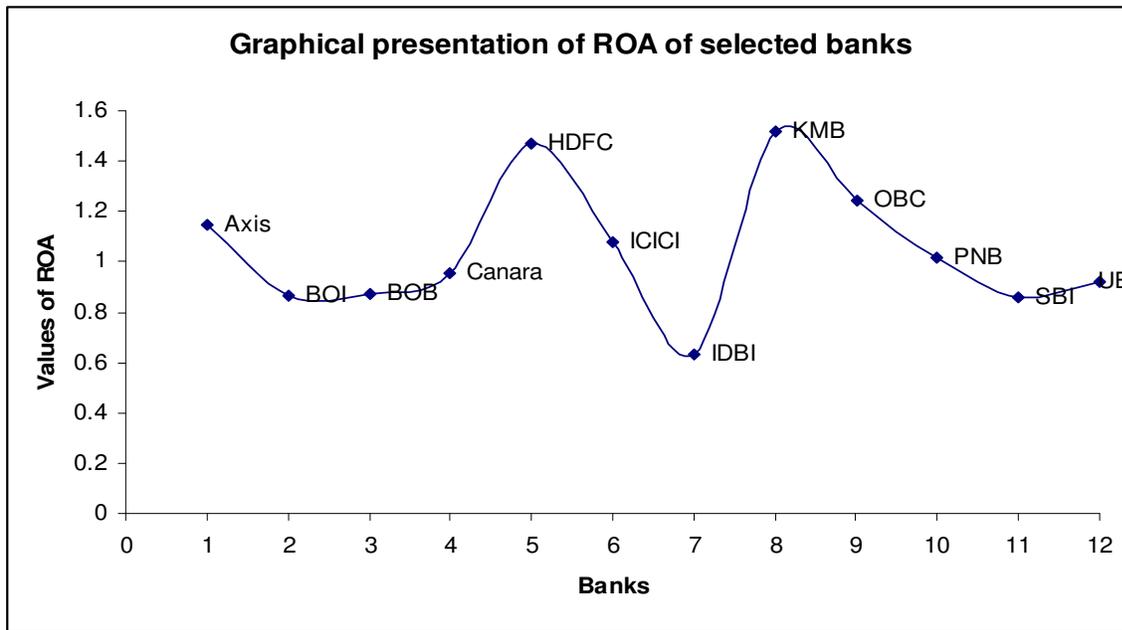
Figure 5: Graphical presentation of ROE ratio of the selected banks



Source: Authors' own calculation

Return on Equity represents the profitability of funds invested by the owners of the firm. All firms should attempt to make ROE as high as possible over the long-term. From the above graph, it is clear that ROE of IDBI is lowest and the ROE of Axis bank is highest. Axis bank's ROE is highest because of high value of EM ratio. It is not good for the bank. Because, it's higher return was coming from overuse of debt. The high ROE should be produced by high ROI, PM, and TAT and not from high EM. In our case, ROE of KMB is good. Because, it's ROI, TAT and PM are highest among the other banks and consequently its EM is lowest. BOI's managerial performance is not good, as its ROE is mostly based on the high value of EM which is sending bad signal to the stakeholders. BOB's operating management and asset management are moderate while its capital structure management is also moderate as compare to the other banks. So, we can say that its performance is moderate. Canara bank's performance is better than BOB, as its asset management and operating management both are better when compared to BOB. Consequently, its managers could not show good performance during the study period due to higher value of EM. When we considered the DuPont ratios of HDFC bank, we have found that its PM is good as compared to other banks, and also the values of other three ratios are good as compared to other banks. Hence, its ROE (0.168531) is better than other banks except KMB. On the other hand, ICICI bank's PM, TAT and EM are good while its ROE (0.117547) is not good because of low value of ROI. ROE of IDBI bank is poor because its value of ROI and PM are not good, although its EM and TAT are comparatively good. Financial performances of PNB, SBI and UBI are not at par as compared to the other banks during the study period. Their ROE values are very high because of high value of EM. ROI of these three banks are low but their PM and TAT values are good. Lastly, when we have considered OBC, we found that its ROE is also not good because of high value of EM and low value of TAT. After the detailed discussion on the DuPont ratios and considering the overall ranking, we can place KMB in the first position. HDFC bank stood in the second position in our calculation and ICICI bank can be placed in the third position.

Figure 6: Graphical presentation of ROA of the selected banks



Source: Authors' own calculation

During the study period, ROA of KMB is highest amongst the selected banks while the ROA of HDFC is closer to that of KMB and can be told almost same. Hence, it can be concluded that both KMB and HDFC are at par on the parameter of ROA. Both the banks have exhibited skills in effectively managing their assets and helping them to stay performing and give adequate returns. It is also evident that during the study period the amount of nonperforming assets was less and the earning of KMB and HDFC was handsome when compared with the other banks. BOI, BOB and Canara bank exhibited more or less the same amount of ROA. The ROA of ICICI dipped due to poor asset management during the study period. SBI, OBC and PNB all performed poorly on asset management front and hence their ROA is poor. IDBI bank performance in ROA is worst when compared with the other banks during the study period due to poor management of assets, investments which turned out to be sticky and dip in the earning before tax. Thus it can be said that KMB and HDFC are the best and at par in the ROA parameter while IDBI scored poorly on ROA parameter.

In the present section we have discussed about the objectification of the subjective treatment performed for deciding upon the best bank taking DuPont ratio as the base. Here, we have first ranked the banks after taking into consideration each of the DuPont ratio's value. Each of the banks has been ranked based on the ten years' average value, highest value getting rank one while the lowest value getting rank twelfth. In case of a tie same rank has been assigned. After assigning the rank values, the rank so assigned has been normalized. The final score of each bank based on ranking of the DuPont ratios are presented in Table 2.

Table 2: Average values of the ratios and scores of the selected banks

Measures	Axis	BOI	BOB	Canara	HDFC	ICICI
PM	0.143125	0.112079	0.112615	0.121447	0.178629	0.147176
TAT	0.068495	0.073037	0.07404	0.077353	0.069533	0.064745
ROI	0.009593	0.007992	0.008149	0.009158	0.012239	0.009478
EM	0.41054	0.414817	0.329241	0.371545	0.260786	0.23676
ROE	0.197265	0.165327	0.139236	0.173214	0.168531	0.117547
Scores%	45.89744	44.10256	44.74359	46.02564	47.17949	45.64103
Measures	IDBI	KMB	OBC	PNB	SBI	UB
PM	0.091552	0.216044	0.124344	0.125537	0.11137	0.110651
TAT	0.077891	0.097429	0.083296	0.079337	0.075341	0.079673
ROI	0.006945	0.021596	0.010155	0.009649	0.008224	0.008458

EM	0.222322	0.122017	0.30188	0.370787	0.380375	0.379095
ROE	0.07684	0.101954	0.161005	0.180931	0.158818	0.163337
Scores %	44.48718	48.07692	47.05128	47.17949	44.35897	45.25641

Source: Authors' own calculation

It is evident from the table 2 that KMB is the best bank amongst all the banks considered for study. The second position being shared jointly by HDFC bank and PNB due to the following reasons. Both the banks have scored more or less the same rank in all the parameters except in TAT and EM. The ranking of HDFC in TAT is tenth which is comparatively poor when compared to rank of PNB which is fourth in the same parameter. Another area where HDFC has regained much of its lost ground is the EM. The rank of PNB in the parameter EM is seventh where as the rank of HDFC is fourth. Thus in the aggregate both the banks scored the same points and thus shared the second spot jointly. OBC performance is at par with PNB and HDFC except in ROE where it scored more when compared to PNB and HDFC. Thus, OBC scored the third position. The final ranking of the selected banks during the study period is presented in table 3.

Table 3: Over all ranking of the Banks

Name of the bank	Overall score	Rank
KMB	48.07692	1
HDFC	47.17949	2
PNB	47.17949	2
OBC	47.05128	3
CANARA BANK	46.02564	4
AXIS BANK	45.89744	5
ICICI BANK	45.64103	6
UNION BANK	45.25641	7
BOB	44.74359	8
IDBI BANK	44.48718	9
SBI	44.35897	10
BOI	44.10256	11

Source: Authors' own calculation

CONCLUSION

DuPont analysis is widely used as a tool for financial analysis of the company. It's use is very limited in case of banking company's financial performance measurement. The present study uses DuPont as a tool of financial analysis and uses both subjective and objective treatment of the results of DuPont analysis. Kotak Mahindra Bank ranked first among the subjective analysis as well as in objective analysis. HDFC ranked the second position. The so called big banks were distant rank holders. It can be safely inferred from the present study that during the study period the banks which are small in asset size exhibited excellent asset management skills as well as consummate managerial skills in managing both its resources and people. So the myth of 'size matters' can be somewhat negated and the new statement can be 'Small is beautiful'.

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ABBREVIATION

- PM – Profit Margin
 TAT- Total Asset Turnover
 ROI- Return on Investment
 EM- Equity Multiplier
 ROE- Return on Equity
 AXIS- Axis Bank
 BOI- Bank of India
 BOB- Bank of Baroda
 CANARA- Canara Bank
 HDFC- HDFC Bank
 ICICI- ICICI Bank
 IDBI- IDBI Bank
 UB-Union Bank of India
 PNB- Punjab National Bank
 OBC- Oriental Bank of Commerce
 SBI- State Bank of India
 KMB- Kotak Mahindra Bank

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Thanking you profoundly

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