CREDIT RISK MANAGEMENT IN NBFCS-A COMPARITIVE ANALYSIS

B. Lavanya , Y.Maheshwari
Asst. Prof. , Student
SMS department, CBIT-Gandipet

ABSTRACT- Credit risk management (CRM) is the practice of mitigating losses by understanding the adequacy of a company's capital and loan loss reserves at any given time. The study "Credit risk management in NBFCs-A Comparitive Analysis." is conducted as there is a vital need to compare the CRM practices of the companies. The objectives of the study are: i) To study the credit risk management system in the non-banking sector. ii) To examine credit risk and probability of default of the select companies. iii) To determine the solvency credit worthiness of the select companies. iv) To compare the level of CRM practices of the companies under study. With reference to this study, the data is collected from secondary sources .The data is analyzed using Merton model for credit risk and ratio analysis. Using Merton model, the probability of default of Muthoot finance is found to be lesser when compared to that of Bajaj finance. Both the companies are having higher NPAs which are to be reduced by adopting sufficient credit risk management practices.

Keywords: Credit risk, Probability of default, Merton model

INTRODUCTION

Credit risk may be defined as the potential that a borrower or counter-party will fail to meet their obligations in accordance with agreed terms. In short, credit risk is the probability of loss from a credit transaction. Credit risk management is the assessment of risk that comes in an investment. NBFCs have been playing a complementary role to the other financial institutions including banks in meeting the funding needs of the economy. NBFCs account for 12.3% assets of the total financial system. Non-banking finance companies (NBFCs) are at a higher risk of defaults than traditional banks, due to their higher exposure to non-traditional segments of the market. Therefore, there is a need to study the techniques of credit risk management employed in NBFCs.

REVIEW OF LITERATURE

K.C. Iyer and Dhruba Purkayastha,(2017), explored the relevance of credit ratings for infrastructure project finance, historical credit default data for infrastructure projects around on credit risk assessment and provided directions for policy makers, regulators, and lenders to reduce the use of external credit ratings for guiding investments in infrastructure projects.*Md. Abdulah Ali Bazi,(2017),*in his study, analyzed that Credit Risk Management(CRM) can be an effective tool to reduce NPA accumulation in selected financial market players in India. *Gupta ,Geetika,(2017),*identified that, to achieve effective Credit Risk Management, banks need to improve in five areas: Organizational structure of Credit Risk, Credit Process, Credit Decision Analytics, Credit Risk Reporting and Technology.

*Omid Sharifi,(2016),*in his study, reported three credit risk indicators, which are the Capital Adequacy ratio, NPA ratio and Credit-Deposit ratio and four profitability ratios, which are: Return on Assets, Return on Equity, Net Interest Margin and Net Profit Margin. *Chandapurkar,(2015),*found that Credit rating can give only an indication and cannot give any pool proof and cut percent reliability of its assessment. *Andrew R. Finley, Stephen J. Lusch, and Kirsten A. Cook (2015)* ,studied the effectiveness of the R&D Tax Credit-Evidence from the Alternative Simplified Credit.

P.A.Sakyi,(2014, from the results of the study revealed that NBFIs have been safe as far as bankruptcy is concerned, over the period under study. *Idowu Abiola,(2014),*in his research paper, revealed that credit risk management has a significant impact on the profitability of commercial banks.*Fernando García,(2013),*has found a model to estimate the solvency function, that allows for a set of companies to be ranked according to their solvency level, by considering a relevant set of economic and financial variables and going beyond the described restrictions of statistical techniques.

GD Gyamfi, (2012),in his research, examined the effectiveness of the credit management techniques used by the firms. He recommended that firms should encourage their clients to insure against risk that might affect their businesses and help in managing their clients risk bearing portfolio. It was also recommended that the continuous use of written policies that guided most of the firms on credit granting should be encouraged by all the firms.*Dimitrios Louzis ,Angelos Vouldis and Vasilios L. Metaxas*,(2012) discussed the Macroeconomic and bank-specific determinants of non-performing loans in Greece in his study titled:"A comparative study of mortgage, business and consumer loan portfolios"*Olaf weber,(2011),* concluded that Canadian banks are proactive regarding environmental examinations of loans and that there is a need for a more accountancy related reporting on environmental risk management in financial institutions. Further research is needed to be able to calculate costs and benefits of integrating environmental and sustainability issues into the credit risk management.

*Danson Musyoki,(2011),*emphasized on all the parameters that will have an inverse impact on banks' financial performance, however the default rate is the most predictor of bank financial performance vis-à-vis the other indicators of credit risk management. The recommendation is to advice banks to design and formulate strategies that will not only minimize the exposure of the banks to credit risk but will enhance profitability and competitiveness of the banks.*Rob Nijskens and Wolf Wagner (2011),*

made his study on the topic:"Credit risk transfer activities and systemic risk: How banks became less risky individually but posed greater risks to the financial system at the same time",*Piergiorgio Alessandri and Mathias Drehmann(2010)*,emphasized on an economic capital model integrating credit and interest rate risk in the banking book.

RESEARCH METHODOLOGY

i) Objectives of the study

1. To study the credit risk management system in the non-banking sector.
2. To examine credit risk and probability of default.
3. To determine the solvency credit worthiness of the select companies.
4. To compare the level of credit risk management practices of the companies under study.

ii) Sources of data

The collection of data is done through secondary sources. Data is collected from the following sources:

- Annual Reports and financial statements
- Data published on corporate websites
- Brochures and Manual books of NBFCs
- Journals and corporate magazines published.

iii) Tools for analysis

There are many methods for evaluating credit risk. The methods used in the study are as follows:

- Merton model for credit risk
- Ratio analysis

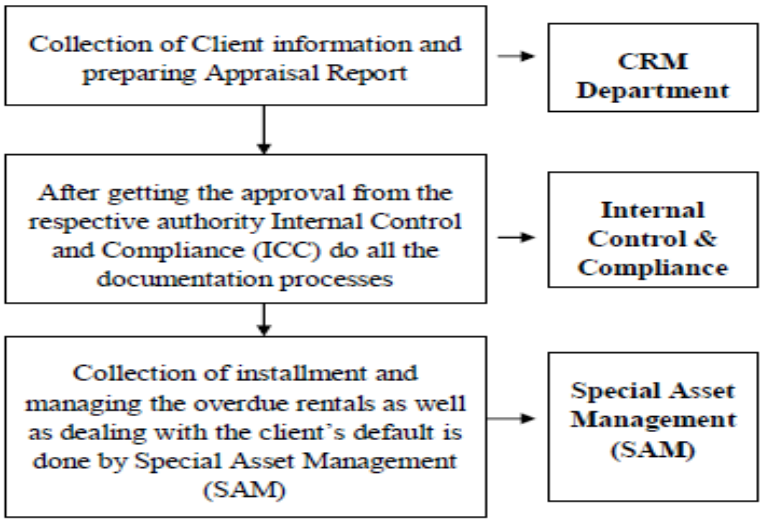
The Merton model is an analysis model – named after economist Robert C. Merton – that is used to assess the credit risk of a company's debt. The model measures changes to default probabilities based on the distance to default (DD) of a firm which is a combination of asset values, debt, and the standard deviation of asset value fluctuations, from which Probabilities of Default (PD) can be calculated . The point of default is considered to be where debt exceeds assets, and the greater the volatility of the assets, the closer the entity moves to default. With the help of these techniques, interpretations are made regarding credit risk.

iv) Scope of the study

This study emphasizes the application of risk management techniques in NBFCs. The scope is confined to make a micro-level comparison of the select companies relating to CRM practices and their impact on financial performance of the companies. The study is based on data derived from annual reports. While there are many other models, the study applies only Merton model to calculate probability of default, which is a measure of credit risk. The study is a comparison which is confined only to two companies- Muthoot finance and Bajaj finance.

RESULTS &DISCUSSIONS

i) CREDIT RISK MANAGEMENT SYSTEM IN THE NON-BANKING SECTOR



1. CRM department: The credit risk management (CRM) department collects the client information and prepares the appraisal report. credit appraisal is the assessment of various risks that can impact on the repayment of loan. In short, it is determined "Will the NBFC get its money back?". Depending on the purpose of loan and the quantum, the appraisal process may be simple or elaborate.

2. Internal control & compliance: After getting the approval from respective authority, internal control and compliance does all the documentation process. credit-related documents, including the loan contract, financial statement, business plan, documents of the lender's security interest, and other papers that are used by the lender in evaluating creditworthiness of a prospective borrower.
3. Special Asset Management: A special assets department is setup to monitor and/or liquidate loans made to financially struggling or troubled companies. As per prevailing rules, all the banks/FIs are required to maintain provision/reserve against disbursed credits/loans in order to safeguard and protect the interest of the depositors.

ii) RISK ADJUSTED PROBABILITIES AND PROBABILITY OF DEFAULT OF MUTHOOT FINANCE

D	16986.1
T	5
Rf	2%
CS	9%
V(0)	23492.56
Sigma	22.60%
price of the call option©	9178.463759
d1	1.092266596
d2	0.586915233
N(d1)	0.862642031
N(d2)	0.721369681
Price of the bond	9800.127174
value of the bond	14314.09624

D	16986.1
T	5
Rf	2%
CS	9%
V(0)	23492.56
Sigma	56.59%
price of the call option©	13692.43204
d1	0.967988706
d2	-0.297363935
N(d1)	0.833474995
N(d2)	0.383094338
Price of the bond	9800.127174
value of the bond	9800.127955
P(D)	0.616905662

Price of the bond and value of the bond are calculated with the given formulae .d1 and d2,the risk adjusted probabilities are also calculated with the known formulae. Normal distributions of these risk adjusted probabilities are calculated using excel function. In order to calculate the probability of default, price of the bond and value of the bond are made equal by adjusting the volatility rate. Thus at an implied volatility rate, probability of default is calculated with the known formula.

Implied volatility is calculated to predict the future returns where the value of the bond gets adjusted to price of the bond with an increase in the price of the equity. At an implied volatility of 56.59%,the Probability of default is determined to be 61%.

iii) RISK ADJUSTED PROBABILITIES AND PROBABILITIES OF DEFAULT OF BAJAJ FINANCE

D	49249.65
T	5
Rf	2%
CS	9.60%
V(0)	58849.96
Sigma	47.10%
price of the call option©	28555.16011
d1	0.790638879
d2	-0.262549139
N(d1)	0.785422624
N(d2)	0.396449053
price of the bond	27574.79859
value of the bond	30294.79989

D	49249.65
T	5
Rf	2%
CS	9.60%
V(0)	58849.96
Sigma	54.31%
price of the call option©	31275.16141
d1	0.83618213
d2	-0.378183511
N(d1)	0.798473775
N(d2)	0.352647137
price of the bond	27574.79859
value of the bond	27574.79859
P(D)	0.647352863

Similarly,d1 and d2 are calculated for Bajaj finance also using the given formulae. Volatility rate is adjusted to be 54.31% so as to make price of the bond and value of the bond equal. So here, at an implied volatility of 54.31%, probability of default of Bajaj finance is calculated.

At an implied volatility of 54.31%, the probability of default of Bajaj finance is found to be 64% which is higher when compared to that of Muthoot finance which is at 61%. Generally, the higher the default probability, the higher the interest rate the lender will charge the borrower. Creditors typically want a higher interest rate to compensate for bearing higher default risk.

iv) DETERMINATION OF CREDIT WORTHINESS OF THE SELECT NBFCs:

	CURRENT RATIO		QUICK RATIO		DEBT/EQUITY RATIO		INT. COVERAGE RATIO	
	Muthoot finance	**Bajaj finance**	**Muthoot finance**	**Bajaj finance**	**Muthoot finance**	**Bajaj finance**	**Muthoot finance**	**Bajaj finance**
Mar'13	1.08	2.29	3.52	3.6	4.67	2.85	1.54	1.72
Mar'14	1.26	1.87	3.02	5.18	3.04	4	1.45	1.69
Mar'15	1.2	2.69	3.66	5.9	2.85	4.71	1.49	1.6
Mar'16	1.16	2.1	3.42	22.37	2.43	4	1.58	1.67
Mar'17	0.94	1.6	4.19	12.09	2.61	5.13	1.84	1.74

For Muthoot finance the current ratio has decreased from 1.26 in the year 2014 to 0.94 in the year 2017. For Bajaj finance it has decreased from 2.69 in the year 2.15 to 1.6 in the year 2017. Thus it can be seen that the decrease in current ratio of Muthoot finance is minimal. As both the companies are maintaining a current ratio above 1.0, it can be inferred that Muthoot is financially sound than Bajaj finance.

Quick ratio of Bajaj finance has fallen drastically from 22.37 in 2016 to 12.09 in 2017, which shows that the company has failed in timely collection of receivables, Thus showing the lack of credit risk management practices. Quick ratio of Muthoot finance has slightly increased from 3.42 in the year 2016 to 4.19 in the year 2017.Thus,it can be inferred that Muthoot has a better liquidity position than Bajaj finance.

The debt/equity ratio of Bajaj finance has decreased from 4.0 in 2016 to 5.13 in 2017.,which is a good sign showing that the company has been aggressive in financing its growth with debt(associated with high levels of risk) .Debt equity ratio of Muthoot finance has slightly increased from2.43 in the year 2016 to 2.61 in the year 2017 which represents a slight increase in level of risk.

From the table, it can be inferred that both the companies are having an interest coverage ratio greater than 1.5,which represents lesser risk of default. Interest coverage ratio of Bajaj finance has increased slightly in the recent year. Muthoot finance is increasing its ICR year after year, which is a positive sign.

v) RATIOS THAT DEPICT THE CREDIT MANAGEMENT PRACTICES

	ROA		ROE		P/B RATIO	
	Muthoot finance	**Bajaj finance**	**Muthoot finance**	**Bajaj finance**	**Muthoot finance**	**Bajaj finance**
Mar'13	3	9.1	14.4	17.2	1.4	3.9
Mar'14	2.5	9.6	13.2	18.7	1.6	3.2
Mar'15	3	9.3	18.3	18	1.1	1.7
Mar'16	3.4	10.1	26.9	17.6	1.7	1.7
Mar'17	3.8	8.9	30.5	20	2	1.4

The table shows that ROA of Muthoot finance is increasing every year from 2.5 in the year 2014 to 3.8 in the year 2017 and that of Bajaj finance is fluctuating like 9.3 in 2015 to 10.1 in 2016 and has again decreased to 8.9 in 2017.Thus, It can be interpreted that Muthoot finance is earning more money on less investment.

From the table, it can be inferred that ROE of Muthoot finance has been continuously increasing from 13.2 in the year 2014 to 30.5 in the year 2017, which suggests that a company is increasing its ability to generate profit without needing as much capital. It

also indicates how well a company's management is deploying the shareholders' capital. ROE of Bajaj finance has slightly increased from 17.6 in the year 2016 to 20 in the year 2017., which when compared with Muthoot finance is less.

P/B ratio of Muthoot is increasing over the period,from1.1 in the year 2015 to 2 in the year 2017 depicting its efficient credit risk management practices. Whereas ,the P/B ratio of Bajaj is decreasing from 1.7 in the year 2015 to 1.4 in the year 2017 ,showing the reason for the undervaluation of its shares.

ANALYSING THE FACTORS THAT CLEARLY REPRESENT THE CREDIT RISK MANAGEMENT IN THE SELECT NBFCs

NPA OF MUTHOOT

	Muthoot finance
Mar'13	3950
Mar'14	3435
Mar'15	4392
Mar'16	6006
Mar'17	4602

NPA OF BAJAJ

	Bajaj finance
Mar'13	0.19%
Mar'14	0.28%
Mar'15	0.45%
Mar'16	0.28%
Mar'17	0.44%

Higher NPAs worsens the financial health of the NBFC .

NPAs of Muthoot finance has decreased from 6006 million in the year 2016 to 4602 million in the year 2017 which shows that proper credit risk management practices have been adopted in order to lessen the number of NPAs. Whereas in case of Bajaj finance, NPAs have drastically increased from 0.28% in the year 2016 to 0 .44% in the year 2017 which depicts lack of credit risk management.

FACTORS THAT REPRESENT CRM PRACTICES:

	AUM		OPEX		INT. SPREAD	
	Muthoot finance(in million rupees)	Bajaj finance(in million rupees)	Muthoot finance(in million rupees)	Bajaj finance(in million rupees)	Muthoot finance	Bajaj finance
Mar'13	260004	175170	10562	8500	9.24	9.9
Mar'14	218615	240610	11279	11510	8.39	9.6
Mar'15	234085	324100	11904	14280	8.38	8.9
Mar'16	243789	442290	13006	18980	8.92	8.7
Mar'17	272785	601940	15319	25640	10.9	8.7

Muthoot has around Rs.2,72,000 million worth Assets Under Management(AUM) which shows its excellence in the non banking sector. The rate of increase in AUM of Bajaj finance is also quite high, which shows the NBFCs are prospering in their business.

Operating expenses is considered to be one of the important factors that represent the credit risk management in the company. Increasing OPEX reduces profits. Bajaj finance has to adopt management techniques to reduce OPEX. Muthoot finance's OPEX has also been increased. So, control measures have to be taken.

Interest spread is the difference between the NBFC's average lending rate and its cost of funds. The greater the spread, the more profitable the financial institution is likely to be; the lower the spread, the less profitable the institution is likely to be. Spread of Muthoot is increasing and that of Bajaj is decreasing. Hence, it can be inferred that Muthoot is more profitable than Bajaj.

CONCLUSION

Muthoot finance is financially sound and has good credit worthiness. It has lesser probability of default when compared to Bajaj finance, and thus offers loans at lesser interest rates. The ROE of the NBFC is abnormally high at 30.5%,where usually banks provide upto 18-20%.It adopts efficient credit risk management practices. Overall, it can be said that Muthoot finance is

managing most of the credit risk management factors effectively. Bajaj finance is also functioning well in many of the areas. But, proper credit risk management policies have to be framed to make it more profitable. The company can go for factoring technique inorder to ensure timely collection of debts and to minimize credit risk.Thus it can be concluded that credit risk management is essential for the Non banking financial companies, like regular banks.

ACKNOWLEDGMENTS

We would like to extend my profound gratitude to our college, CBIT, faculty members, friends and family members for guiding and supporting in completing this study.

REFERENCES

1. *Andrew R. Finley, Stephen J. Lusch, and Kirsten A. Cook (2015)* ,"The Effectiveness of the R&D Tax Credit: Evidence from the Alternative Simplified Credit", The Journal of the American Taxation Association: Spring 2015, Vol. 37, No. 1, pp. 157-181.
2. *Danson Musyoki,(2011*),"The impact of credit risk management on the financial performance of Banks in Kenya for the period (2000 – 2006) ",International Journal of Business and Public Management Vol. 2(2): 72-80.
3. *Dimitrios Louzis ,Angelos Vouldis and Vasilios L. Metaxas*,(2012),"Macroeconomic and bank-specific determinants of non-performing loans in Greece: A comparative study of mortgage, business and consumer loan portfolios", Journal of Banking & Finance, 2012, vol. 36, issue 4, 1012-1027
4. *Fernando García,(2013)*,"Credit risk management: A multicriteria approach to assess credit worthiness ",Mathematical and Computer modeling, volume 57.
5. *GD Gyamfi,(2012),*''Assessing the Effectiveness of Credit risk Management Techniques of Microfinance firms in Accra'', Journal of Science and Technology (Ghana) Vol 32, No 1 (2012)
6. *Gupta ,Geetika,(2017),* "Assessing credit risk in SME: need to focus on credit rating",Asian journal of multi-disciplinary studies,Vol 4, No 1 (2017)
7. *Idowu Abiola,(2014),"*The impact of credit risk management on the commercial banks performance in Nigeria", International Journal of Management and Sustainability, 2014, 3(5): 295-306
8. *K.C. Iyer and Dhruba Purkayastha,(2017)*,''Credit Risk Assessment in Infrastructure Project Finance: Relevance of Credit Ratings'' , The Journal of Structured finance winter 2017, Vol. 22, No. 4: pp. 17-25.
9. *Md. Abdulah Ali Bazi,(2017),* "The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region", Borsa Istanbul Review, 2017, vol. 17, issue 4, 238-248
10. *Omid Sharifi,(2016),* "Effect of Non Performing Assets on the Profitability of Public Sector Banks of India", International Journal of Engineering and Management Research, Volume-6, Issue-5, September-October 2016
11. *Olaf weber,(2011),* "Environmental Credit Risk Management in Banks and Financial Service Institutions", Article in Business Strategy and the Environment 21(4):248-263 · May 2012
12. *Piergiorgio Alessandri and Mathias Drehmann(2010),*"An economic capital model integrating credit and interest rate risk in the banking book", Journal of Banking & Finance, vol. 34, issue 4, 730-742
13. *P.A.Sakyi,(2014):*"Risk and performance of non-bank financial institutions", International Journal of Financial Services Management 7(1):19-35 · May 2014
14. *C. R. Kothari (2009)* ,"Research Methodology: Methods & Techniques" (Second Revised Edition), New Age International Publishers, New Delhi.
15. *David A. Dubofsky and Thomas W. Miller,* "Derivatives: Valuation and Risk Management", Publication Date - September 2002,ISBN: 9780195114706
16. *Paul Hopkin and Institute of Risk Management* ,"Fundamentals of Risk Management: Understanding, Evaluating and Implementing Effective Risk Management" ,Oct 3, 2014
17. Bajaj finance financials are retrieved from the URL *http://www.moneycontrol.com/financials/bajajfinance/balance-sheet/BAF*.
18. Chandapurkar,(2015), "Credit risk management in KSPC, an analysis" ,Gulbarga university, retrieved from URL: *http://shodhganga.inflibnet.ac.in/handle/10603/48072*
19. HSBC Global Research: India NBFCs – October 2013,Financial Services – IBEF Report, FICCI: Financial Foresights: Fitch: India Ratings & Research Report – January 2013,rbinews reports from Times of India, Financial Express, Economic Times, The Hindu retrieved from *https://www.dnb.co.in/bfsisectorinindia/nonbankc2.asphttp://indiafinancing.com/overview-of-the-indian-nbfc-sector.html*
20. Muthoot finance financials are retrieved from the URL *http://www.moneycontrol.com/financials/muthootfinance/balance-sheet/MF10*