Impact of credit risk management on performance of banks

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Abstract
The connotations of the risk vary as per situational context and its application. One perspective defines ''risk'' as the future issues which can be avoided or mitigated, rather than present problems that must be immediately addressed. Risk is inherent in any walk of life but in financial sectors it is more significant. Literature on risk reveals that due to regulated environment, banks could not afford to take risks. But during the last two decades banks are invariably faced with different types of risks that may have a potentially negative effect on their business. These risks to which banks are exposed to be market risk, operational risk, credit risk and liquidity risk. Out of them, the credit risk is most critical for the survival of the banks as it is directly linked to the major as well as the primary activity of banks i.e., lending funds to the borrowers as money or other instruments. Considering its critical importance, the study aims to identify the various parameters underlying the concept of credit risk management in banks. The study also aims to investigate the impact of various credit risk parameters on bank efficiency. The study uses the secondary data from the data sources available on credit risk management and the various institutions facilitating risk management in banks.

Keywords: credit risk, financial sector, risk management, bank performance

Introduction

The concept of risk varies with respect to the context within which it operates. Risk is a probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action. Risk is inherent in any walk of life in general and in financial sectors in particular. In finance risk is the probability that an actual return on an investment will be lower than the expected return. Risk at the apex level may be visualized as the probability of a banks' financial health being impaired due to one or more contingent factors. Till recently, due to regulate environment, banks could not afford to take risks. A bank is a financial institution and a financial intermediary that accepts deposits and channels those deposits into lending activities, either directly by loaning or indirectly through capital markets. In doing their businesses banks are often faced with a double edged sword of risk & returns & they have to balance the two in order to survive & generate profits. If the concept of risk management is applied to banking sector then banks are invariably faced with different types of risks that may have a potentially negative effect on their business. The major financial & non-financial risks encountered by the banking sector as per the Reserve Bank of India guidelines issued in Oct. 1999 are market risk, operational risk, credit risk and liquidity risk.

Credit risk is defined as the possibility of losses associated with diminution in the credit quality of borrowers or counterparties. In a bank's portfolio, losses stem from outright default due to inability or unwillingness of a customer or counterparty to meet commitments in relation to lending, trading, settlement and other financial transactions. Credit risk is the risk of loss due to a debtor's non-payment of a loan or other line of credit (either the principal or interest (coupon) or both). The default events include a delay in repayments, restructuring of borrower repayments and bankruptcy.

Credit risk is most critical for the survival of the banks as it is directly linked to the major as well as the primary activity of banks i.e., lending funds to the borrowers as money or other instruments. The importance of credit risk came to the forefront due to the recent Global Economic meltdown caused by the subprime mortgage crisis in the US in July 2007 and its adverse effect on financial markets. Since exposure to credit risk continues to be the leading source of problems in banks world-wide, banks and their supervisors are expected to be able to draw useful lessons from past experiences. Banks should now have a keen awareness of the need to identify measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred (Basel, 1999) [3]. The banks need to be ready to face the impact of credit risk as it is inherent in their dealings. Credit Risk management is the human activity which integrates recognition of risk, risk assessment, developing strategies to manage it, and mitigation of risk using managerial resources. Credit risk management is very important to banks as it is an integral part of the loan process. In recent years, financial sector failures and banking sector weaknesses have induced policy makers to devise prudent risk management mechanism. Against this backdrop, Basel Capital Adequacy norms, originally conceived during 1988, brought about broad agreement among G-10 central banks for applying Common Minimum Capital Standards to their banking industries. Such standards are aimed at putting all banks on an equal footing with respect to capital adequacy so as to promote safety and soundness in banking. Keeping in view the seriousness of credit risk and need to manage the same appropriately, RBI issued guidelines on Credit Risk Management on October 12, 2002. These guidelines focused that the banks should give credit risk prime attention and should put in place a loan policy to be cleared by their boards that covers the methodology for measurement, monitoring and

control of credit risk. The major issue before the banks currently is to identify measure, manage & implement the policies in order to reduce risk & comply with the directives & at the same time be able to maintain a balance between the profitable investment opportunities & the capital adequacy. Also the banks have to give special treatment to the credit risk management because of its direct bearing on its financial performance & efficiency.

Review of Literature

Credit risk is the most basic & significant one in the banking business. According to Chen and Pan (2012) [8], credit risk is the degree of value fluctuations in debt instruments and derivatives due to changes in the underlying credit quality of borrowers and counterparties. Coyle (2000) [11] defines credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. Credit risk is the risk faced by the banks on their borrowings. This risk interchangeably called 'counterparty risk' is capable of putting the bank in distress if not adequately managed.

The main factors responsible for credit risk include limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, direct lending, massive licensing of banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank (Kithinji, 2010) [22]. An increase in bank credit risk gradually leads to liquidity and solvency problems. Credit risk may increase if the bank lends to borrowers without any adequate knowledge of their creditworthiness. The indicators of credit risk include the level of bad loans (Non- performing loans), problem loans or provision for loan losses (Jimenez & Saurina, 2006) [20].

Prior to financial sector deregulation, banks were highly motivated to grant credit facility to clients who could easily express their creditworthiness (Bryant, 1999) [6]. Deregulation offered the opportunity to meet the demands for credit across a wide range of borrowers. Large amount of bad credit, as a result of boom-time advances in the 1980's, caused the banks to be too cautions in extending credit (Boyd, 1993; Bryant, 1999) [4, 6]. Credit risk management processes enforce the banks to establish a clear process for approving new credit as well as for the extension to existing credit. These processes also follow monitoring with particular care, and other appropriate steps are taken to control or mitigate the risk of connected lending (Basel, 1999) [3]. Thus it is necessary to establish a proper credit risk environment, sound credit granting processes, appropriate credit administration, measurement, monitoring and control over credit risk, policy and strategies that clearly summarize the scope and allocation of bank credit facilities as well as the approach in which a credit portfolio is managed i.e. how loans are originated, appraised, supervised and collected, a basic element for effective credit risk management (Basel, 1999) [3]. Credit scoring procedures, assessment of negative events probabilities, and the consequent losses given these negative migrations or default events, are all important factors involved in credit risk management systems (Altman, Caouette, & Narayanan, 1998) [1]. The most current credit modeling framework in place is Basel II Accord. This accord has positively been a substance in leading the drive towards building applicable credit risk modeling and capital adequacy requirements. However, for these activities, banks must have a

good knowledge about risk management, pricing of loan on competitive market, marginal risk adjusted contribution, monitoring of economic capital (Cuthberston & Nitzsche, 2003) [12]. The banks very frequently suffer from poor lending practice (Koford & Tschoegl, 1999) [23]. Thus monitoring, and other appropriate steps, are necessary to control or mitigate the risk of connected lending when it goes to companies or individuals (Basel, 1999) [3]. Keeping in view the seriousness of credit risk and need to manage the same appropriately, RBI issued guidelines on Credit Risk Management on October 12, 2002. These guidelines focused that the banks should give credit risk prime attention and should put in place a loan policy to be cleared by their boards that covers the methodology for measurement, monitoring and control of credit risk.

A proper approach to risk identification, measurement and control will safeguard the interests of banking institution in long run. Froot and Stein (1998) [15] found that credit risk management through active loan purchase and sales activity affects banks' investments in risky loans. Banks that purchase and sell loans hold more risky loans (Credit Risk and Loss loans and commercial real estate loans) as a percentage of the balance sheet than other banks. Again, these results are especially striking because banks that manage their credit risk (by buying and selling loans) hold more risky loans than banks that merely sell loans (but don't buy them) or banks that merely buy loans (but don't sell them). Treacy and Carey (1998) [30] examined the credit risk rating mechanism at US Banks. They highlighted the architecture of Bank Internal Rating System and Operating Design of rating system and made a comparison of bank system relative to the rating agency system. They concluded that banks internal rating system helps in managing credit risk, profitability analysis and product pricing. Ferguson (2001) [13] analyzed the models and judgments related to credit risk management and concluded that proper risk modeling provides a formal systematic and disciplined way for firms to measure changes in the riskiness of their portfolio and help them in designing proper strategic framework for managing changes in their risk. Muninarayanappa and Nirmala (2004) [26] highlighted the objectives and factors that determine the direction of bank's policies on credit risk management. They concluded that success of credit risk management require maintenance of proper credit risk environment, credit strategy and policies. They also observed that proper credit risk management is important for the survival of banks. There are many potential sources of risk including liquidity, credit, interest rate, market, foreign exchange and political risks (Campbell, 2007) [7]. Gray, *et al.* (1997) [19] concluded that out of so many risks, credit risk is the biggest risk faced by banks and financial intermediaries. Bank problems, mostly failures and financial distress have afflicted numerous banks, many of which have been closed down by the regulatory authorities (Brown bridge and Harvey, 1998) [5]. Among other factors, weakness in credit risk management has all along been cited as the main cause for bank problems (Chijoriga, 1997 and Richard *et al.,* 2008) [9, 10, 29].

Thus there are many aspects in which credit risk and its management is associated with the efficiency of banks. These aspects have been excellently analyzed by Berger *et al.* (1997) who found that there is a negative relationship between efficiency and risk in failed banks. The success of banks business depends on accurate measurement and efficient management of credit risk to a greater extent than any other

risks (Gieseche, 2004) [16]. It was even found that credit risk management maximizes bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable limit in order to provide framework for understanding the impact of credit risk management on banks' profitability (Kargi, 2011) [21].

Rajagopal (1996) [28] made an attempt to overview the bank's risk management and suggests a model for pricing the products based on credit risk assessment of the borrowers. He concluded that good risk management is good banking, which ultimately leads to profitable survival of the institution. Bagchi (2003) [2] examined risk identification, risk measurement, risk monitoring, risk control and risk audit as basic considerations for credit risk management. He concluded that proper credit risk architecture, policies and framework of credit risk management, credit rating system, monitoring and control contributes in success of credit risk management system which in turn contributes to the performance. Basel Committee on Banking Supervision has also emphasized on credit risk management and the bearing it has on the financial stability of banks. Poudel (2012) [27] appraised the impact of the credit risk management in bank's financial performance in Nepal using time series data from 2001 to 2011. The result of the study indicates that credit risk management is an important predictor of bank's financial performance. Fredrick (2010) [14] demonstrated that credit risk management has a strong impact on bank's financial performance in Kenya.

Marrison (2002) [25] articulate that the competitive advantage of a bank is dependent on its capability to handle credit valuably. Bad loans cause bank failure as the failure of a bank is seen mainly as the result of mismanagement because of bad lending decisions made with wrong appraisals of credit status or the repayment of non-performing loans and excessive focus on giving loans to certain customers. Goodhart (1998) [17] states that poor credit risk management which results in undue credit risk causes bank failure. Kolb (1992) [24] states that the failure of banks is mainly due to the risky credits they give. Irrespective of the extent of risk involved, effective credit risk management can reduce bank failures. Most studies in credit risk management have been inclined to focus on the problems of developing an effective method for the disposal of the bad debts, rather than for the provision of a regulatory and legal framework for their prevention and control (Campbell, 2007) [7].

Need of the Study
On making the review of the previously conducted studies, it is identified that credit risk management should be at the centre of banks' operations in order to maintain financial sustainability and reaching more clients. It is revealed from the literature that majority of the studies on the area focused on developing the conceptual framework of credit risk management. However some of the researches have also been conducted on identifying the influence of credit risk management on banks but very few researches focused on exploring the relationship between credit risk management and efficiency in banks. Moreover most of these studies have been conducted in other parts of the globe. This creates a gap and opportunity to explore this untapped area of research. Thus the present study aims at addressing this gap and understanding the impact of credit risk management on efficiency of banks. The proposed paper will assess the intricacies of credit risk management in banking sector in general and its relation to the bank performance.

Objectives of the Study
The study has been conducted with the following objectives:
- To analyze the relationship between credit risk management and bank efficiency.
- To study influence of credit risk management on the bank performance in terms of bank profitability.

Methodology and Data Collection
The study is empirical in nature based on secondary data. HDFC Bank has been selected for the study as it is the pioneering private sector bank in India. The study was conducted for a period of ten years from 2006-07 to 2015-16. The data of the selected bank has been taken from the annual reports, financial statements and Basel III disclosures. For the purpose of the study the various variables that have been taken are capital adequacy ratio, net non-performing assets and net NPA ratio (i.e. percentage of net NPA to net advances) for studying credit risk management. Also the variables that have been taken to study bank performance are profit figures, earning per share (EPS) and average return on assets (ROA). For analyzing the data Correlation has been applied to test the hypotheses.

Hypotheses
On the basis of the objectives considered for the study, the following hypotheses are developed:
- **Hypothesis 1:** Capital adequacy ratio does not significantly influence net profit.
- **Hypothesis 2:** NPA ratio does not significantly influence net profit.
- **Hypothesis 3:** NPA does not significantly influence net profit.
- **Hypothesis 4:** NPA ratio does not significantly influence EPS.
- **Hypothesis 5:** Capital adequacy ratio does not significantly influence EPS.
- **Hypothesis 6:** NPA does not significantly influence EPS.
- **Hypothesis 7:** NPA does not significantly influence return on assets.
- **Hypothesis 8:** Capital adequacy ratio does not significantly influence ROA.
- **Hypothesis 9:** NPA ratio does not significantly influence ROA.

Data Analysis and Findings
The data analysis begins with the presentation of the correlation between the various elements used in the study. The hypotheses formulated were then tested using the regression analysis. The regression equations used for the testing the hypothesis were in the form of $Y1 = a + \beta1X1$

Correlation between the elements of credit risk management and bank efficiency
Pearson's product moment correlation was used to determine the strength of the relationship the elements of credit risk management have with each other and with elements of the efficiency. The results of the correlation analysis are presented in Table1

Table 1

	NETPROFIT	EPS	ROA	NPA	CAR	NPAR
NETPROFIT	1					
EPS	.799**	1				
ROA	.843**	.848**	1			
NPA	.764**	.868**	.744**	1		
CAR	.616*	.625*	.840**	.478*	1	
NPAR	-.130*	-.128**	-.436*	.195*	-.291*	1

**Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)

It is seen from the Table 1 that the correlation between NPA and CAR with elements of bank efficiency (i.e. profit, EPS, ROA) is positive. And the correlation between NPAR and elements of efficiency is negative. Based on the correlation results one would expect to find positive regression coefficients when conducting regression analysis with elements of credit risk management as predictor variable and elements of efficiency as dependent variable.

Hypotheses Testing
Regression Test for Hypothesis H1
$H_o 1$: Capital adequacy ratio does not significantly influence net profit
H_o1 hypothesizes that capital adequacy ratio does not have significant impact on net profit. This hypothesis was tested with the help of simple regression analysis.

Table 2: Regression analysis of CAR and NETPROFIT

		Model Summary		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616ᵃ	.379	.317	.88507
a. Predictors: (Constant), CAR				
b. Dependent variable: NETPROFIT				

It is seen from the Table 2 that the R square value of .379 reveals that CAR explains 37% of variance in NETPROFIT. Thus based on the above results, it is safe to reject the null hypothesis and conclude that CAR significantly influences NETPROFIT

Regression Test for Hypothesis H2
$H_o 2$: NPA ratio does not significantly influence net profit
H_o2 hypothesizes that NPA ratio does not have significant impact on net profit. This hypothesis was tested with the help of simple regression analysis.

Table 3: Regression analysis of NPAR and NETPROFIT

		Model summary		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.130ᵃ	.017	.081	.91643
a. Predictors: (Constant), NPAR				
b. Dependent variable: NETPROFIT				

From table 3, the R square value of .017 reveals that NPA ratio explains 1.7% of variance in NETPROFIT, which is not a significant variance. Thus null hypothesis is accepted.

Regression Test for Hypothesis H3
$H_o 3$: NPA does not significantly influence net profit
H_o3 hypothesizes that NPA does not have significant impact on net profit. This hypothesis was tested with the help of simple regression analysis.

Table 4: Regression analysis of NPA and NETPROFIT

		Model Summary		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.764ᵃ	.583	.572	.98824
a. Predictors: (Constant), NPA				
b. Dependent variable : NETPROFIT				

From table 4, the R square value of .583 reveals that NPA explains 58% of variance in NETPROFIT. The null hypothesis is thus rejected.

Regression Test for Hypothesis H4
$H_o 4$: NPA ratio does not significantly influence EPS
H_o4 hypothesizes that NPA ratio does not have significant impact on EPS. This hypothesis was tested with the help of simple regression analysis.

Table 5: Regression analysis of NPAR and EPS

		Model Summary		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.128ᵃ	.016	.082	. 883445
a. Predictors: (Constant), NPAR				
b. Dependent variable : EPS				

The R square value of .016 reveals that NPA ratio explains 1.6% of variance in EPS, which is not reasonably enough. The null hypothesis is thus accepted.

Regression Test for Hypothesis H5
$H_o 5$: CAR does not significantly influence EPS
H_o5 hypothesizes that CAR ratio does not have significant impact on EPS. This hypothesis was tested with the help of simple regression analysis.

Table 6: Regression analysis of CAR and EPS

		Model Summary		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.625ᵃ	.390	.329	.76673
a. Predictors: (Constant), CAR				
b. Dependent variable : EPS				

The R square value of .390 reveals that CAR explains 39% of variance in EPS. The null hypothesis is thus rejected.

Regression Test for Hypothesis H6
$H_o 6$: NPA does not significantly influence EPS
H_o6 hypothesizes that NPA does not have significant impact on EPS. This hypothesis was tested with the help of simple regression analysis.

Table 7: Regression analysis of NPA and EPS

		Model Summary		
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.868ᵃ	.753	.732	.69833
a. Predictors: (Constant), NPA				
b. Dependent variable : EPS				

The R square value of .753 reveals that CAR explains 75% of variance in EPS. The null hypothesis is thus rejected.

Regression Test for Hypothesis H7
H$_o$7: NPA does not significantly influence ROA
H$_o$7 hypothesizes that NPA does not have significant impact on ROA. This hypothesis was tested with the help of simple regression analysis.

Table 8: Regression analysis of NPA and ROA

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.744ᵃ	.554	.509	.21642
a. Predictors: (Constant), NPA				
b. Dependent variable : ROA				

The R square value of .554 reveals that NPA explains 55% of variance in ROA. The null hypothesis is thus rejected.

Regression Test for Hypothesis H8
H$_o$8: CAR does not significantly influence ROA
H$_o$8 hypothesizes that CAR does not have significant impact on ROA. This hypothesis was tested with the help of simple regression analysis.

Table 9: Regression analysis of CAR and ROA

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.840ᵃ	.706	.676	.17566
a. Predictors: (Constant), CAR				
b. Dependent variable : ROA				

The R square value of .706 reveals that CAR explains 70% of variance in ROA. The null hypothesis is thus rejected.

Regression Test for Hypothesis H9
H$_o$9: NPA ratio does not significantly influence ROA
H$_o$9 hypothesizes that NPA ratio does not have significant impact on ROA. This hypothesis was tested with the help of simple regression analysis.

Table 10: Regression analysis of NPAR and ROA

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.436ᵃ	.190	.109	.29149
a. Predictors: (Constant), NPAR				
b. Dependent variable : ROA				

The R square value of .190 reveals that NPA ratio explains 19% of variance in ROA. The null hypothesis is thus rejected.

Conclusions
The study investigated the impact of credit risk on the performance and efficiency of HDFC bank. The analysis of the data reveals that the non-performing assets ratio has an inverse relationship with the performance and efficiency measures of the bank which indicates that the lower the NPA ratio, the better the performance of the bank. From the findings it is safely concluded that banks performance indicators i.e. ROA, EPS and profit are influenced by the levels of non-performing loans and capital adequacy ratio thereby exposing them to great risk of illiquidity and distress.

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