

Consequence of Financial Crisis on Liquidity and Profitability of Commercial Banks in India: An Empirical Study

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Abstract: In this paper we attempted to investigate impact of Financial Crisis on liquidity and profitability of public and private sector banks in India. Liquidity and profitability are two important parameters among many variables on which strength of banking systems depends. In order to accomplish this study, we have considered from year 2005 to 2018 and empirical evidences were drawn using descriptive statistics, correlation matrix and panel regression model. Mean ROA indicates low profitability for sample banks throughout the period of with substantial variations among banks. The result of correlation indicates that no two variables are highly correlated. ROA is negatively correlated with all the determinants except capital adequacy ratio (CAR) whereas; liquidity is positively correlated with all the determinants except efficiency and bank size. There is an insignificant positive impact of crisis on banks' profitability and significant positive impact on liquidity. The positive association of liquidity with financial crisis indicating favorable and sound position of banks. The ownership structure indicates public banks are sound in maintaining their liquidity and private banks in earning capabilities during financial crisis.

Keywords: Financial Crisis, Profitability, Liquidity, Panel Data Analysis, Commercial Banks.

1. Introduction

A strong and healthy banking system is essential for stimulating economic growth of a country. However, financial crisis causes contractions in money supply leading to economic slowdown (Friedman and Schwartz,1963). It also leads to occurring of multiple events like drop price of assets, closure of financial and other corporates, disinflations, instabilities in foreign exchange markets etc. (Kindleberger,1978). Systematic events like sub-prime crisis may even lead to collapse of financial architecture in the country. This is so because such crisis may be source of volatility and illiquidity in the financial market followed by bankruptcy of financial intermediaries that have fragile balance sheet. Not only this in the era of globalized and liberalized economies systematic crisis in one country

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may influence the financial system of other country. For example, Sub-prime crisis (2008) had its origin in United of America but its spill-over affected many global economies. This type of spill-over affect can be termed as “Financial Contagion”. “Financial Contagion is a situation where instability in one financial system travels to other financial systems. Such instability may be in the form of falling stock prices, currency devaluation and banking crisis etc. Banking crisis may due to shrinking profit margin and loss of liquidity.

Sub-Prime crisis had its origin in reckless lending practices adopted by big banks like Lehman’s Brothers. Liberal credit policy of American bankers such as lucrative incentives, easy credit terms and climbing housing prices stimulated the borrowers to involve even in difficult mortgages in expectation of a quick refinance. These factors caused occurrence of default on Sub-prime Mortgage and Adjustable-Rate Mortgages at a high rate. Further, increasing interest rates forced moderate decline in the housing during 2006-2007. Thus, refinancing also became expensive. Increase in number of defaults and foreclosure of loans added fuel to fire. Subsequently, Subprime Mortgage offense rate increased from 10-15% during 1998-2006 to 25% in 2008 (Prasad A. et. al. 2011, Prasad et al. 2012). Global Financial Crisis had negative consequences on global economy. This global spread can be attributed to opening up of domestic financial sector for global economies. Further, excess use of financial derivatives and interest rate linked exchange rate bonds were the main causes of the financial crisis (Qasabeh & Alfahel, 2012).

Banks forgot that ignoring principles of good lending may help increase in business volume and targets achieving set by employer for better incentive. However, this has huge economic cost and moral hazard. Lending without adequate due-diligence led to accumulation of poor-quality assets on banks’ balance sheets. Loans and advances turning NPA beyond the prudential standard further strained the banks’ performance parameters such as capital adequacy ratio, efficiency, profitability and liquidity (Azmi et al., 2020). These are adequate signal to indicate potential threats of banks’ survival.

Liquidity is one of the important parameters to judge the financial strength and stability of banks. Bank’s liquidity management is the process of generating funds to meet contractual or relationship obligations at a reasonable price. Banks need liquidity to meet depositors’ withdrawals and to fund loan demands. Liquidity is an indicator of banks’ ability to honour immediate claims. Any mismatch in assets and liabilities (i.e., liabilities exceeding the assets) forces the bank to liquidity crisis thereby unable to honour immediate commitments. Further, declining earnings, accumulating NPAs, deposit concentrations, present and planned capital positions are some of the important factors that affects the quality of liquidity of any banks.

Profitability and liquidity are two important parameters of banks financial health. Thus, bank’s treasury department primary function is to trade-off between liquidity and profitability. If one gives preference to earnings one has to forego profitability and vice-versa.

The tremors of Sub-Prime Crisis (2008) were observed by many economies globally. India though well regulated; was not immune to spill-over effect of such crisis. However, we need to explore whether sub-prime crisis that originated in USA affected the liquidity positions of banks in India or not. If yes, what was the intensity?.

2. Critical literature review

Different authors have expressed the concept of non-performing loans (NPLs) in the literature, and the term varies from country to country. In its report on financial soundness, the International Monetary Fund (IMF) defined nonperforming loans as those whose interest and principal payments are 90 days or more past due (Isedu, 2020). NPLs were defined as those that do not generate income for a prolonged period of at least three months (Ozili, 2022). In a similar vein, Huljak et al. (2022) emphasise that NPLs are loans that are 90 days or more past due.

Oudat (2020) examined the impact of non-performing loans on the financial performance of commercial banks in Bahrain. A quantitative approach was adopted in this study. Panel data model was adopted in this study. The results of the study showed that non-performing loans has a positive and significant relationship with the financial performance (ROE) of commercial banks in Bahrain.

Isedu (2020) examined the effect of non-performing loans on loans and advances behavior of commercial banks in Nigeria. The study relied on secondary data of 18 Nigerian commercial banks during the period 2009-2018. Phillip – Peron method is adopted for the purpose of data testing. The study found a direct relationship between non-performing loans and the behavior of loans and advances of Nigerian commercial banks.

Ullah et al. (2020) aimed to measure the effect of the non-performing loans on the profitability (ROA) of public commercial banks in Bangladesh. An explanatory research design was adopted in this study. The study relied on secondary data of 5 commercial banks during the period 2014-2018. A multiple regression was used in this study. The results of the study indicated that the non-performing loans have a significant negative relationship with the return on assets of commercial banks in Bangladesh. Bhattarai (2019) discussed the determinants of the lending behavior of commercial banks in Nepal. The SPSS program was used in this study. The results of the study revealed that there is a significant effect of interest rate spread, liquidity ratio and exchange rate on the loans and advances provided by the Nepalese commercial banks. The study also found a positive and significant impact of exchange rate on the lending performance of banks. The study also indicated that there is a significant negative impact of interest rate spread on the lending behavior of commercial banks in Nepal.

Poudel (2018) aimed to measure the effect of credit risk as measured by non-performing loans on the profitability of commercial banks as measured by the return on equity in Nepal. Descriptive research design was adopted in the study. A panel data model was used of 15 Nepalese commercial

banks during the period 2002-2014. FEM was adopted for the purpose of data analysis. The results of the study indicated that credit risk had a negative and significant impact on the return on equity of commercial banks in Nepal. Serwadda (2018) examined the relationship between credit risk and financial performance (ROA) of Ugandan commercial banks. The study relied on secondary data of 20 commercial banks during the period 2006-2015 using Panel Data analysis. Descriptive statistics, correlation and regression analysis were used in this study. The study concluded that credit risk affects the financial performance of banks, as the study confirmed the existence of a negative relationship between non-performing loans and the financial performance (ROA) of commercial banks in Uganda.

Mburugu (2018) measured the impact of NPLs on the lending behavior of Kenyan commercial banks. A descriptive research approach was used in this study. The SPSS version 20 was used for the purpose of data analysis. In order to test the significant of the study model, f statistic test was adopted. The study relied on secondary data of 20 Kenyan commercial banks during the period 2013-2017. The results of the study indicated that non-performing loans had a positive and significant impact on the lending performance of commercial banks in Kenya. Ebenezer and Omar (2016) attempted to determine the impact of non-performing loans on the profitability of commercial banks in Nigeria. Panel data analysis was adopted in this study. The research sample consisted of 8 commercial banks during the period 2011-2014. The results of the study showed that the non-performing loans have a significant negative relationship with the profitability (ROA and ROE) of commercial banks in Nigeria.

Cucinelli (2015) discussed the impact of non-performing loans during the financial crisis on the lending behavior of Italian banks. The quantitative research design was adopted in this study. OLS regression and Hausman test was adopted in this study for the purpose of examine and analysis the data. The study found that non-performing loans negatively affected the lending behavior of banks. The study also concluded that there are no statistically significant differences in the lending behavior of banks during the financial crisis. Rabab'ah (2015) discussed the factors affecting the lending performance of commercial banks in Jordan. The secondary data of 10 commercial banks during the period 2005-2013 was used in the study. The results of the study indicated that there is a negative and statistically significant impact of the liquidity ratio, non-performing loans and window rate on the credit facilities of commercial banks. The results of the study also showed a positive and statistically significant effect of economic growth and the size of the bank on the credit facilities of commercial banks in Jordan. The study argued that the other independent variables affected insignificantly the lending performance of commercial banks in Jordan.

3. Hypotheses of the Study

On the basis of the objectives of the study, following main hypotheses have been framed for public, private and foreign banks.

H_01: There is no significant impact of sub-prime lending crisis on the profitability of Commercial banks.

H_02: There is no significant impact of sub-prime lending crisis on the liquidity position of Commercial banks.

4. Methodology and Dataset

This section includes the data genesis, sample selection, econometrics tools and model that are adopted in the current research.

4.1 Data Mining and Sampling

The dataset used in this research are being imported from RBI database, which is considered the most common gateway and authenticated source for data collection of all banks operating in India. This database administers 27 public, 26 private and 46 foreign banks. However, this research has taken 21 public and 18 private banks as sample. The sample selection was completely based on working scenario of banks during the sample period. Only those banks considered that was operating during the sample period. In addition, because of unavailability of data, few more banks were deducted from the final sample. The final list is in Appendix as Table 1. The sample is based on balanced panel data with 546 observations and period of 14 years ranging from 2005-2018. It is evident from past studies that they have also employed balanced panel dataset for evaluating profitability and liquidity (Curuk et al., 2016; Rashid and Jabeen, 2016; Bougatef, 2017; Akhtar et al., 2020).

4.2 Variables

Total nine Variables considered in the current study to analyse the impact of financial crisis on profitability and liquidity. Two of them are dependent variables, namely, return on assets and liquid assets to total assets. Rest seven are independent variables, of which, asset quality, efficiency, bank capital and bank size are bank-specific variables that are considered as control variables. The next two are dummy variables, one is for sub-prime lending crisis i.e. financial crisis (1 for 2008 & 2009 and 0 for rest of the years) and the other one is for ownership (1 for Public and 0 for Private). Further, for economic profit GDP is considered, the detail of each with formula and acronym is shown in Table 2.

4.3 Model and Tools used to measure profitability and liquidity

Panel data is being used in the current study for analysing the impact of sub-prime crisis on profitability and liquidity of commercial banks in India. A panel regression is different from general time series and cross-sectional regression model as it incorporates double subscript. Another important advantage of

using panel regression is that it helps in controlling unobserved variables which changes over time but not among entities. In addition, in panel model estimation time effect is also included which helps in controlling individual heterogeneity, by allowing firm specific random or fixed effect components (Baltagi, 2008). GMM is dynamic panel model and it is used to test the unobserved shocks and endogeneity problem. Hence, in this study there is no problem of endogeneity because all variables seem to follow BLUE estimates.

Table 2. Variables & their proxy measures used in the study

Variables	Proxy Measures	Acronym
<i>Dependent Variables</i>		
Profitability	Return on assets	ROA
Liquidity	Liquid Assets to Total Assets	LATA
<i>Independent variable</i>		
Asset quality	Net Non-Performing Assets to Net Advance	NNPANA
Efficiency	Operating profit to total assets ratio	OPETA
Bank Capital	Capital Adequacy Ratio	CAR
Bank Size	Log of assets	LSIZE
Financial Crisis	Dummy: 1 for 2008 & 2009 & 0 for other	FC
Ownership	Dummy: 1 for Public and 0 for Private banks	DUMMY
Economic Growth	Gross Domestic Growth Rate	GDP

There are many reasons for employing panel data estimation in current study. Firstly, in panel model firms are contemplated heterogeneous whereas this is not the case in time and cross-sectional data series, which results in biases. Therefore, the main reason is the ability in managing for heterogeneity. Secondly, panel data approach provides more variation in datasets, high information data, less multicollinearity with high efficiency and degree of freedom (Gujrati, 2009). The model used in this research consists of n cross sectional units, $n = 1, \dots, N$ observed at each t time period, $t = 1, \dots, T$. The total observation in dataset is $n \times t$. Past researches have constructed a panel data structure (Chowdhury and Rasid, 2017; Brooks, 2019). The following panel regression model uses the same panel dataset structure as designed by above mentioned researchers.

$$y_{nt} = \alpha + \beta x_{nt} + e_{nt} \quad (1)$$

Where, y_{nt} refers to regressand, α refers to intercept term, β is $K \times 1$ vector of parameter to be estimated, and x_{nt} is the n^{th} observations on K regressors which is $1 \times k$, $t = 1, \dots, T$, $n = 1, \dots, N$. The operational form of the model is:

$$\text{Liquidity/ Profitability} = f(\text{financial crisis, bank-specific, macro-economic variables}) \quad (2)$$

Where, liquidity is measured by liquid assets to total assets, profitability by return on assets. Asset quality, bank capital, bank size, efficiency are bank-specific variables whereas sub-prime crisis period includes dummy by name of financial crisis and GDP is used for macro-economic variable. Following two models are developed to analyse the impact of sub-prime crisis on liquidity and profitability by boarding the proxies used in equation 2.

$$ROA_{nt} = \alpha_n + \beta_1 CAR_{nt} + \beta_2 NNPANA_{nt} + \beta_3 OETA_{nt} + \beta_4 LSIZE_{nt} + \beta_5 GDP_{nt} + \beta_6 FC_{nt} + \beta_7 DUMMY_{nt} + \varepsilon_{nt} \quad (3)$$

$$LATA_{nt} = \alpha_n + \beta_1 CAR_{nt} + \beta_2 NNPANA_{nt} + \beta_3 OETA_{nt} + \beta_4 LSIZE_{nt} + \beta_5 GDP_{nt} + \beta_6 FC_{nt} + \beta_7 DUMMY_{nt} + \varepsilon_{nt} \quad (4)$$

Where:

n - represents individual banks,

t - indicates years,

ε_{nt} - random error term,

α_n - The constant term,

β_n - Co-efficient of independent variables,

And all other variables are defined in Table 2.

In addition, the current study has employed Fixed and Random Effects model for estimating panel data equations. Further, Hausman's test is employed for deciding between Random or Fixed Effects; where the null hypothesis is random effects and is an appropriate model

5. Empirical results and Discussion

This study is an attempt to investigate impact of sub-prime crisis profitability and liquidity on commercial banks in India using banks specific and macroeconomic variables through Panel Data regression analysis.

5.1 Descriptive Statistics

Descriptive statistics for different parameters considered for the study were computed and is presented in Table 3. Significant variation is observed for the selected variables statistics. Mean ROA (0.741) indicates low profitability for banks through period under study while Standard deviation (0.819) shows high variations from bank to bank. It is further observed that commercial banks in India were able to maintain Capital Adequacy Ratio (CAR) higher than the prescribed prudential regulation of 9% as the mean value for CAR is 13.31. An average size of sample banks is 5.89, with a variation of 0.62 and range from 3.93 to 7.54. The average Non-Performing Assets (NNPANA) for banks, which is an indicator of assets quality was at 2.25 and the maximum and minimum values was reported at 16.69 & -0.63, respectively and standard deviation (2.65) which suggests significant variation. The Mean Liquidity Ratio (LATA) was 0.33, which fluctuated and maintained a range of maximum (0.53) to a

minimum (0.22). The mean Efficiency (OPETA) is 0.01 and having a range between 0.00 to 0.04, thereby demonstrating low variation. The mean value for GDP (macroeconomic variable) growth rate is 5.57. Return on Assets (ROA) of banks deteriorated during the period of crisis, indicating banks profitability is compromised during the sample period, especially after financial crisis.

Table 3. Descriptive statistics of variables

	ROA	CAR	NNPANA	OPETA	LATA	LSIZE	GDP	FC	DUMMY
Mean	0.74143	13.31123	2.25020	0.01304	0.33903	5.89461	5.57312	0.14286	0.53846
Maximum	2.13	56.41	16.69	0.04167	0.53360	7.53842	7.08222	1.00000	1.00000
Minimum	-3.38	7.51	-0.63	0.00055	0.22259	3.93942	1.58760	0.00000	0.00000
Std. Dev.	0.81955	3.72018	2.64848	0.00818	0.05400	0.62303	1.44475	0.35025	0.49898
Observation	546	546	546	546	546	546	546	546	546

Source: Author's Calculation (STATA Output)

5.2 Pearson Correlation Analysis

The Pearson Correlation Analysis for the selected variables is presented in **Table 4**. The result of correlation indicates that no two variables are highly correlated. Maximum correlation between ROA and NNPANA is -0.7835. This is lesser than the threshold value of 0.80 (Hair et al., 1995). Based on correlation analysis it is further observed that bank size is positively correlated with NNPANA and OPETA, and negative with the rest of the variables. However, ROA is only positively correlated with CAR. Another important observation is that ROA has negative relationship with financial crisis. It is also observed that CAR has a positive association with efficiency, liquidity and financial crisis, whereas, negative association with the rest. Further, it is also observed that Liquidity has a positive relationship with all the variables except ROA, LSIZE and OPETA. However, the most important variable is financial crisis, which has negative and significant relation with both profitability and liquidity, indicating profitability has doubled the variation in comparison with liquidity, resulting deteriorate in banks' profits.

Table 4. Pairwise Correlation Matrix

	ROA	CAR	NNPANA	OPETA	LATA	LSIZE	GDP	FC	DUMMY
ROA	1.0000								
CAR	0.3731***	1.0000							
NNPANA	-0.7835***	-0.2851***	1.0000						
OPETA	-0.0912***	0.1508***	0.1257***	1.0000					
LATA	-0.1402***	0.0517	0.0681	-0.4537***	1.0000				
LSIZE	-0.0516	-0.2007***	0.2471***	0.1795***	-0.2605***	1.0000			
GDP	-0.1321***	-0.0841**	0.1659***	0.2025***	0.0035	0.0413	1.0000		
FC	-0.2803***	0.0931**	-0.2065***	-0.1678***	0.1471***	-0.1335***	-0.4536***	1.0000	
DUMMY	-0.2803***	-0.3199***	0.3028***	-0.2652***	0.1886***	0.5461***	0.0000	0.0000	1.000

Source: Author's Calculation (STATA output)

5.3 Analysis of Multicollinearity

Table 5 shows diagnostic of multicollinearity of all variables using variance inflation factor (VIF) and tolerance test. VIF is a multicollinearity test used to measure the relation between all independent variables before running the regression. It's the foremost assumption of panel regression as it estimates the amount of variance in the coefficient due to multicollinearity. The general thumb rule for multicollinearity, is that VIF should be less than 10 (Gujrati, 2009). In this study too, the value for all variables is less than the prescribed limit.

Table 5. VIF Value

1. VARIABLE	VIF	1/VIF
CAR	1.20	0.834905
NNPANA	1.26	0.792573
OPETA	1.41	0.706997
LSIZE	1.74	0.575578
GDP	1.31	0.764643
FC	1.32	0.758193
DUMMY	1.96	0.508960
Mean VIF	1.46	

Source: Author's calculation (STATA output)

5.4 Heteroscedasticity analysis

Heteroscedasticity is a special case in error term where the variances of the error term are not constant (Gujarati, 2009). In economics, variance is used to measure spread and heteroscedasticity is unequal spread. Breusch- pagan (BP-LM) test is employed to test the presence of unequal spread in the residuals (Greene, 2003). Moreover, to conclude, both the models have the presence of heteroscedasticity, as p-value is less than 0.05, which is shown in Table 6.

Table 6. Breusch-Pagan Test for Heteroscedasticity

Models	Chi-square	P-value
Model 1- ROA	chi2(1) = 119.29	Prob > chi2 = 0.0000
Model 2 - LATA	Chi2(1) = 11.89	Prob > chi2 = 0.0006

Variables: ROA and LATA

Source: Author's calculation (STATA output)

5.5 Auto-Correlation Analysis

The problem of serial correlation arises only when the error term in a different period are correlated with each other. Wooldridge test for autocorrelation is applied to test the presence of serial correlation (Wooldridge, 2002). The null hypothesis is that data has no serial correlation and alternate hypothesis is that data have a serial correlation. The result in **table 7** depicts, model 1 is free from serial-correlation

problem but model 2 has its presence. If the data has the problem of heteroscedasticity and auto correlation then robust standard errors employed to estimate the results.

Table 7. Wooldridge Test for Autocorrelation in Panel Data

Models	F-statistics	P-value
Model 1- ROA	F (1, 38) = 2.531	Prob > F = 0.1199
Model 2 - LATA	F (1, 38) = 55.538	Prob > F = 0.0000

Null hypothesis: No first-order autocorrelation

Alternate hypothesis: Null is not true

Source: Author's calculations (STATA Output)

5.6 Static Panel regression analysis

In this section results of panel regression analysis is presented. We have computed fixed effect and random effect model for the dependent variables ROA separately and adopted robust regression technique as the model has the presence of heteroscedasticity. Table 8 presents the regression result. Firstly, both FEM and REM results are calculated and highlighted in the first two column of the result table. Then, hausman test is conducted to select between FEM and REM. In this case, REM was selected. So finally, robust technique was conducted on REM basis and results are interpreted accordingly. The overall R² (0.69) indicates that 69% of the variability in ROA is attributed by selected independent variables. Thus, there is a statistically significant & positive impact of bank capital (CAR) and bank size (LSIZE) on bank profitability (ROA). However, there is an insignificant positive impact of financial crisis (FC) and GDP on the banks' earnings (ROA).

Table 8. Regression Result – Model 1

Variables (ROA)	Fixed Effect Model (FEM)	Random Effect Model (REM)	Robust Regression Model (RRM)
C	-0.9047 (-1.58)	-1.099*** (-2.78)	-1.0989 (-1.62)
CAR	0.0338*** (5.11)	0.0363*** (5.93)	0.0363** (2.23)
NNPANA	-0.2199*** (-28.81)	-0.2213*** (-29.45)	-0.2213*** (-12.34)
OPETA	-9.3758*** (-2.42)	-11.5544*** (-3.63)	-11.5544** (-2.44)
LSIZE	0.2996*** (3.22)	0.3577*** (5.36)	0.3577*** (3.20)
GDP	0.0076 (0.54)	0.0108 (0.79)	0.0108 (1.15)
FC	0.0268 (0.47)	0.0331 (0.59)	0.0331 (0.56)
DUMMY	-	-0.3119*** (-3.10)	-0.3119*** (-3.61)
Overall R ²	0.6640	0.6909	0.6909
Within R ²	0.6710	0.6707	0.6707
Between R ²	0.6952	0.7349	0.7349
Hausman Test		0.8699 (REM is selected)	

Source: Authors Calculation (STATA Output)

It is also observed that asset quality (NNPANA), efficiency (OPETA) and DUMMY had significantly and negatively impacted banks' earnings. Thus, insignificant impact of financial crisis on ROA signals the resilience of banks to the tremors of sub-prime crisis.

Table 9 presents the regression result for analysing the impact of financial crisis on liquidity (LATA) of commercial banks in India. Again, after evaluating both FEM and REM models and running hausman test, it concludes to use REM results. However, due to the presence of heteroscedasticity and serial correlation in the model, robust regression technique is employed and results are interpreted accordingly. The overall R² (0.34) indicates that 34% of the variability in LATA is attributed by selected independent variables. Thus, there is a statistically significant & positive impact of bank capital (CAR), asset quality (NNPANA), GDP, financial crisis (FC) and ownership (DUMMY) on bank liquidity (LATA). It is also observed that efficiency (OPETA) and bank size (LSIZE) had significantly and negatively impacted banks liquidity.

Table 9. Regression Result – Model 2

Variables (LATA)	Fixed Effect Model (FEM)	Random Effect Model (REM)	Robust Regression Model (RRM)
C	0.6318*** (12.88)	0.5382*** (14.51)	0.5382*** (8.42)
CAR	0.0027*** (4.76)	0.0029*** (5.31)	0.0029** (5.93)
NNPANA	0.0038*** (5.86)	0.0037*** (5.59)	0.0037*** (5.02)
OPETA	-2.1632*** (-6.52)	-2.4876*** (-8.64)	-2.4876*** (-5.99)
LSIZE	-0.0569*** (-7.13)	-0.0449*** (-7.16)	-0.0449*** (-4.19)
GDP	0.0044*** (3.65)	0.0049*** (4.07)	0.0049*** (4.75)
FC	0.0122*** (2.49)	0.0142*** (2.90)	0.0142*** (3.31)
DUMMY	-	0.0411*** (4.06)	0.0411*** (5.96)
Overall R ²	0.1984	0.3433	0.3433
Within R ²	0.4879	0.4860	0.4860
Between R ²	0.0008	0.1261	0.1261
Hausman Test		0.0929 (REM is selected)	

Source: Authors Calculation (STATA Output)

Summary of hypotheses testing

Hypotheses Tested	Results
H_01 : There is no significant impact of sub-prime lending crisis on the profitability of Commercial banks.	Accepted
H_02 : There is no significant impact of sub-prime lending crisis on the liquidity position of Commercial banks.	Rejected

6. Conclusion

In this section the researchers have briefly concluded the result of the study followed by some suggestions. The result mentioned above indicates that the performance of commercial banks deteriorated in terms of their earning ability during financial crisis period. It is concluded that asset quality (NPAs) of banks shows negative and significant outcome in the first model, which indicates that banks profits are converting into loans that finally converted into bad loans and results in an increment in NPAs. Further, insignificant impact of financial crisis on banks' earnings ability indicates the resilience of Indian banks to the shocks of financial crisis.

When deals with other determinants affecting profitability, all the independent variables are showing the same results based on the past literature. However, the main variable of the study i.e. financial crisis shows insignificant impact on profitability. In addition, it concluded that the liquidity position of banks was in sound position during the financial crisis. Upkeep of CAR more than the prescribed prudential regulation positively impacted the profitability ratios of banks. It is also observed that bigger banks reported higher profitability when compared with their smaller counterparts.

7. Suggestions

In the age of globalization and deregulated interest regime contagion effects of sub-prime crisis like situation is bound to come. The shock from market-based economy could be minimized if the banks increase their income base. The banks must try to broadened their income base by adding more and more fee-based products in their product portfolio because fee-based services are free from price volatility. Further, profit margins could also increase by making efforts in channelizing low-cost deposits.

Further, sub-prime crisis was the perfect example of banks ignoring basic principle of good lending simply to increase their customer base and capture bigger market share. Banks authority must shun away the policy of higher incentives and must be extra cautious and adopt utmost possible due diligence while approving credit proposal. This practice will help in avoiding wilful defaulters and prevent piling up of non-performing assets.

Further, besides having a robust credit appraisal mechanism, authorities must also develop a robust internal audit and internal transparency structure. Also, simply having a robust pre-sanction appraisal won't help in averting loan default. Post sanction credit must be regularly monitored and prompt correction action must be taken to recover loans delinquencies. Conservative approach in lending is always the best practices and banks must adopt this. Banks' Regulators and management must ensure deviations from prudential regulation and conservative credit policy is checked on time before doing the damage to the organisation. An Early Warning Signal (EWS) department must be established in every bank in line with some of the foreign banks to identify the forthcoming risk in advance and also avoid probability of defaults.

8. Implications of the study

Present study has analysed the impact of financial crisis on liquidity position of banks. The study has theoretical implications as it shows how financial crisis impact liquidity position of banks. Bank management can find the outcome of this research as useful and they can use these findings to frame their liquidity management policies. The results of the study may be helpful to the policy makers and Government to frame policies for a strong banking structure which can withstand such crisis in the future.

9. Limitations and Future Research

This study is confined to impact of financial crisis on commercial banks in India. However, a comparative study could be conducted to analyse financial crisis impact on other sectors banks in India. Further, impact assessment comparing impact of crisis on Indian and other countries could be also done. Only two variables are primarily being used namely, profitability and liquidity to assess impact of financial crisis on banking sector. Other bank-specific and macro-economic variables can also be included in future research.

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