Bank-Specific and Macroeconomic Determinants of Liquidity of Public and Private Sector Commercial Banks in India

Dr. P. Arun Prakash[1], Dr. R. Umamaheswari[2],

[1]Assistant Professor, Department of Commerce
Accounting and Finance,
PSG College of Arts and Science, Coimbatore - 641014.
[2]Associate Professor and Head, Department of Commerce
Accounting and Finance,
PSG College of Arts and Science, Coimbatore - 641014.

ABSTRACT

This study is a maiden attempt to determine the bank-specific and macroeconomic variables influencing the liquidity of public and private sector commercial banks in India. For the purpose of this study, 20 public sector banks and 19 private sector banks have been considered for the period from 2005 to 2019. Credit to Deposit Ratio and Current Assets to Total Assets are proxied as measures of explained variable. Capital Adequacy Ratio, Deposits to Total Assets, Return on Assets, Return on Equity, Net Interest Margin, Operating Profits to Total Assets, Non-Performing Assets to Total Assets are proxied as bank-specific determinants. Gross Domestic Product, Consumer Price Index and Real Interest Rate are proxied as macroeconomic variables. The results of Multiple Regression Analysis showed that explanatory variables such as Capital Adequacy Ratio, Deposits to Total Assets, Return on Assets, Non-Performing Assets to Total Assets, Gross Domestic Product, Consumer Price Index and Real Interest Rate are the major factors determining the liquidity of public and private sector commercial banks in India.

KEY WORDS: Liquidity, Capital Adequacy Ratio, Deposits to Total Assets, GDP and Consumer Price Index.

1. INTRODUCTION

The association between liquidity and profitability has been a critical aspect in corporate finance. Liquidity has been considered as rudimentary element for financial sector and more specifically for banking sector. As liquidity is having direct nexus with banking sector, economic development is affected by mismanagement of liquidity. Liquidity of commercial banks has become a debatable topic since the major episodes of financial crisis throughout the world. Many commercial banks are in the verge of bankruptcy situation due to lack of adequate liquidity in their financial structure. Moreover, banking companies operate under the strict supervision and regulatory measures of Reserve Bank of India. Credit creation function of the commercial banks is predominantly affected by policy rate changes announced by RBI's Monetary Policy Committee. Public sector commercial banks have to park their surplus funds mostly in government securities. In this peculiar phenomenal context, the study aims at finding the nexus between liquidity of commercial banks and bank-specific and macroeconomic determinants. The study has

been organized into 5 sections comprising literature review, research methodology, interpretation of analytical results and conclusion.

2. REVIEW OF LITERATURE

In this section, the association between liquidity of public and private sector commercial banks and bank-specific and macroeconomic determinants are studied in the context of their statistically significant relationship. An attempt has been made to identify the research gap between the present study and the existing literature on liquidity of commercial banks.

(**Ashraf et al., 2017**) analysed the impact of banks profitability on liquidity management of Pakistan Banks for the period from 2006-2015. The results of regression analysis showed that return on equity, capital adequacy ratio and interest coverage ratio had positive and significant influence on return on assets of Pakistan Banks. Similarly, return on assets and interest coverage ratio revealed positive relationship with return on equity. The regression co-efficient ofreturn on assets, return on equity and capital adequacy ratio indicated a positive and statistically significant relationship with earnings per share of Pakistan Banks.

(**Assfaw, 2019**) examined the influence of firm-specific and macroeconomic variables on liquidity position of private commercial banks in Ethiopia using Panel Data Fixed Effect Model for the period from 2011-2017. The estimates of empirical model showed that deposit structure, profitability, G-Sec purchases and bank size had negative and significant relationship with liquidity of commercial banks whereas economic growth and inflation has positive significant relationship with liquidity of commercial banks.

(**Bagh et al., 2017**) studied the impact of liquidity management on the profitability of Pakistani banks using multiple regression analysis for the period of 2006-2016. The results indicated that advances to deposits ratio, cash to deposit ratio and deposits to assets ratio were positively influencing return on assets except current ratio. It was also observed that current ratio, advances to deposits ratio, cash to deposit ratio and deposits to assets ratio had positive and statistically significant association with return on equity.

(**Singh & Sharma, 2016**)investigatedthe relationship bank-specific and macroeconomic and liquidity of Indian banks for the period 2000–2013 using balanced panel data of 59 commercial banks. The results of Panel Data Fixed Effect Model showed that profitability, funding cost, deposits structure, capital adequacy ratio and inflation were positively correlated with liquidity. Similarly, bank size and GDP had negative association with liquidity of Indian commercial banks.

(**Thi et al., 2017**)identified major determinants of the liquidity of commercial banks in Vietnam using a regression model with the ordinary least square (OLS) method for the period from 2009-2016. The results of regression co-efficient showed that liquidity of Vietnam banks was highly influenced by size, loan to deposit ratio and capital to assets proportion. While size was positively associated with liquidity. Whereas loan to deposit

ratio and capital to assets proportion ratio had negative relationship with liquidity of Vietnam banks.

3. RESEARCH METHODOLOGY

The objective of the present study is to find the nexus between bank-specific and macroeconomic determinants and liquidity of public and private sector commercial banks in India. The study has considered 39 public and private sector commercial banks for the period of 15 years from 2005 to 2019. Merged banks have been excluded to have a full-fledged data set. For the purpose of analysis, Multiple Regression Analysis has been applied. Before applying the regression tool, the following null hypothesis has been assumed.

H_0 – There is no statistically significant relationship between bank-specific and macroeconomic determinants and liquidity of public and private sector commercial banks.

Statistical tools such as Descriptive Statistics and Multiple Correlation Analysis are used as preliminary tools. Based on the extensive review of the existing literature on commercial banks liquidity, the following regressors have been chosen. Namely, Capital Adequacy Ratio, Deposits to Total Assets, Return on Assets, Return on Equity, Net Interest Margin, Operating Profits to Total Assets, Non-Performing Assets to Total Assets, Gross Domestic Product, Consumer Price Index and Real Interest Rate. Similarly, Credit to Deposit Ratio and Current Assets to Total Assets are used as two measures of dependent variable.i.e., liquidity of commercial banks.

4. MODEL SPECIFICATION

$$CDR = \beta_1 CATA + \beta_2 CAR + \beta_3 DTA + \beta_4 ROA + \beta_5 ROE + \beta_6 NIM + \beta_7 OPTA + \beta_8 NPATA + \beta_9 GDP + \beta_{10} CPI + \beta_{11} RIR + \mu$$

$$CATA = \beta_1 CDR + \beta_2 CAR + \beta_3 DTA + \beta_4 ROA + \beta_5 ROE + \beta_6 NIM + \beta_7 OPTA + \beta_8 NPATA + \beta_9 GDP + \beta_{10} CPI + \beta_{11} RIR + \mu$$

5. ANALYSIS AND DISCUSSION OF RESULTS

To study the properties of data set, descriptive statistics has been analyzed as first stage preliminary analysis. After that, multiple correlation analysis has been used to check the absence multicollinearity problem among the chosen regressors. After ensuring the satisfactory results of these two tests, multiple regression analysis is applied to find the explanatory power of the chosen independent variables on dependent variable.

TABLE NO 1 DESCRIPTIVE STATISTICS OF BANK-SPECIFIC AND MACROECONOMIC DETERMINANTS OF PUBLIC AND PRIVATE SECTOR COMMERCIAL BANKS

	CDR	CATA	CAR	DTA	ROA	ROE	NIM	OPTA	NPATA	GDP	CPI	RIR
	Public Sector Commercial Banks											
Mean	69.19291	3.294226	12.14750	85.70360	0.419367	6.933076	2.495535	1.758675	3.167533	6.980682	117.5087	4.247199
Maximum	86.93624	10.34613	18.16000	92.25624	2.010000	31.62095	3.781489	3.324299	16.49000	8.497585	167.5983	7.556488
Minimum	44.61485	1.103582	2.00000	73.40980	-5.490000	-103.2725	1.044690	0.171958	0.150000	3.086698	66.04385	-1.983859
Std. Dev.	7.565275	1.736235	1.451146	3.083849	0.934478	17.20078	0.526298	0.489949	3.162209	1.39456	34.59005	2.326508
	Private Sector Commercial Banks											
Mean	74.61173	3.651581	14.59041	80.24919	0.955387	10.63107	3.020373	2.107836	1.491587	6.975158	118.6379	4.264689
Maximum	107.17988	8.486847	56.41000	92.56838	2.020000	25.79015	5.618141	3.921486	7.490000	8.497585	167.5983	7.556488
Minimum	45.88094	1.150408	7.51000	52.24213	-3.380000	-63.78709	1.075312	-0.675763	0.010000	3.086698	66.04385	-1.983859
Std. Dev.	12.21242	1.666384	4.842025	9.826313	0.833920	11.65052	0.715313	0.871512	1.376484	1.392732	34.51792	2.324361

The descriptive statistics analysis explains the basis properties of data set such as mean, minimum, maximum and standard deviation. As can be seen from Table 1, Return on Equity shows the maximum variability in public sector banks whereas Credit to Deposit Ratio exhibits high variability in private sector banks. Independent variable deposit to total assets indicates the high mean values for both public and private sector commercial banks in India.

TABLE NO 2 MULTIPLE CORRELATION ANALYSIS OF BANK-SPECIFIC AND MACROECONOMIC DETERMINANTS OF PUBLIC AND PRIVATE SECTOR COMMERCIAL BANKS

Public Sector Commercial Banks										
	CAR	DTA	ROA	ROE	NIM	OPTA	NPATA	GDP	CPI	RIR
CAR	1.00									
DTA	-0.26	1.00								
ROA	0.55	-0.18	1.00							
ROE	0.53	-0.14	0.77	1.00						
NIM	0.31	-0.22	0.48	0.44	1.00					
OPTA	0.47	-0.33	0.60	0.55	0.77	1.00				
NPATA	-0.47	0.14	-0.79	-0.78	-0.49	-0.50	1.00			
GDP	-0.05	0.07	-0.11	-0.11	0.022	-0.04	0.16	1.00		
CPI	-0.33	0.01	-0.63	-0.62	-0.60	-0.49	0.71	0.07	1.00	
RIR	-0.40	-0.01	-0.33	-0.34	-0.18	-0.23	0.39	0.16	0.40	1.00
Private Sector Commercial Banks										
	CAR	DTA	ROA	ROE	NIM	OPTA	NPATA	GDP	CPI	RIR
CAR	1.00									
DTA	-0.38	1.00								
ROA	0.31	-0.36	1.00							
ROE	0.15	-0.15	0.93	1.00						
NIM	0.35	-0.30	0.51	0.37	1.00					
OPTA	0.28	-0.42	0.72	0.70	0.67	1.00				
NPATA	-0.24	0.25	-0.73	-0.70	-0.28	-0.45	1.00			

GDP	-0.12	0.04	-0.10	-0.12	-0.01	-0.03	0.20	1.00		
CPI	0.00	-0.11	-0.01	-0.09	0.06	0.06	0.11	0.09	1.00	
RIR	-0.15	-0.02	-0.06	-0.09	0.05	0.04	0.19	0.16	0.41	1.00

The results of Multiple Correlation Analysis present the high, moderate and weak correlation among variables through correlation co-efficient values. In this study, multiple correlation has been used to check the absence of multicollinearity problem among the independent variables. As can be seen from Table 2, there is no multicollinearity problem in the data set as correlation co-efficient are less than 80%. It does not exceed the limit.

TABLE NO 3 MULTIPLE REGRESSION ANALYSIS OF BANK-SPECIFIC AND MACROECONOMIC DETERMINANTS OF PUBLIC AND PRIVATE SECTOR COMMERCIAL BANKS

Model 1 – Credit to Deposit Ratio					
Public Sector Commercial Banks			Private Sector Commercial Banks		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
C	163.5183	0.0000	C	137.8043	0.0000
CATA	-1.435038	0.0000	CATA	0.116734	0.6859
CAR	-0.508833	0.0196	CAR	-0.347786	0.0002
DTA	-1.135161	0.0000	DTA	-0.925152	0.0000
ROA	-0.715070	0.5644	ROA	2.547985	0.2117
ROE	0.099103	0.1151	ROE	-0.037865	0.7326
NIM	0.346278	0.6669	NIM	1.158113	0.1241
OPTA	-0.724379	0.4202	OPTA	0.105409	0.9128
NPATA	-1.167712	0.0000	NPATA	0.179180	0.6927
GDP	-0.420839	0.0180	GDP	-0.233005	0.3993
CPI	0.179061	0.0000	CPI	0.107255	0.0000
RIR	-0.120475	0.3262	RIR	-0.333011	0.0699
R-squared	0.712084		R-squared	0.763832	
Adjusted R-squared	0.701087		Adjusted R-	0.753802	
Model 2 – Current Assets to Total Assets Ratio					
Public Sector Commercial Banks			Private Sector Commercial Banks		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
C	26.02964	0.0000	C	7.329614	0.0008
CDR	-0.111684	0.0000	CDR	0.005420	0.6859
CAR	0.053755	0.3787	CAR	-0.036171	0.0753
DTA	-0.200422	0.0000	DTA	-0.071894	0.0000
ROA	-0.758718	0.0278	ROA	-0.369420	0.4011
ROE	0.020208	0.2499	ROE	0.022071	0.3551
NIM	0.125918	0.5748	NIM	-0.447127	0.0056
OPTA	-0.332139	0.1848	OPTA	0.420360	0.0418
NPATA	0.095129	0.0394	NPATA	0.420433	0.0000
GDP	-0.031936	0.5219	GDP	0.096982	0.1028
CPI	0.013752	0.0015	CPI	0.008785	0.0033

RIR	0.063539	0.0629	RIR	0.105929	0.0072
R-squared	0.574571		R-squared	0.411085	
Adjusted R-squared	0.558322		Adjusted R-	0.386073	

The results of Multiple Regression Analysis are presented in Table 3. Two measures are used proxies of liquidity namely credit to deposit ratio and current assets to total assets ratio. The regression co-efficient of Model 1 shows that predictor variables such as Return on Equity, Net Interest Margin and Consumer Price Index are having positive and statistically significant association with liquidity of public sector commercial banks. In case of private sector commercial banks, independent variables like Consumer Price Index is having positive and significant relationship with liquidity. Regressors such as Current Assets to Total Assets, Capital Adequacy Ratio, Deposits to Total Assets and Gross Domestic Product are negatively associated with liquidity of public sector banks. The regression co-efficient of Capital Adequacy Ratio, Deposits to Total Assets and Real Interest Rate are negatively associated with liquidity of private sector banks. The results of Model 2 reveal that explanatory variables such as Non-Performing Assets to Total Assets, Consumer Price Index and Real Interest Rate are having positive and statistically significant relationship with Current Assets to Total Assets of public sector commercial banks. Regression co-efficient of Operating Profits to Total Assets, Non-Performing Assets to Total Assets, Consumer Price Index and Real Interest Rate are having positive and statistically significant relationship with Current Assets to Total Assets Ratio of private sector commercial banks. It is observed from regression result that regressors such as Credit to Deposit Ratio, Deposits to Total Assets and Return on Assets are having negative and significant relationship with Current Assets to Total Assets Ratio of public sector commercial banks. The regression co-efficient of Net Interest Margin is having a negative and statistically significant relationship with Current Assets to Total Assets Ratio of private sector commercial banks. By comparing Model 1 and Model 2, it is found that Model 1 has more explanatory power than Model 2. It is verified through checking the R Squared values of Model 1. R Squared Values are 71.2% and 76.38% respectively for both public and private sector commercial banks.

6. CONCLUSION

This study evaluated the bank-specific and macroeconomic factors determining the liquidity of public and private sector commercial banks in India for a period of 15 years from 2005 – 2019 using Ordinary Least Square Method of Multiple Regression Analysis. It has identified some of the major factors. It is found that explanatory variables such as Capital Adequacy Ratio, Deposits to Total Assets, Non-Performing Assets to Total Assets, Gross Domestic Product and Consumer Price Index are the crucial factors determining the liquidity of public sector commercial banks in India. Similarly, Capital Adequacy Ratio, Deposits to Total Assets, Consumer Price Index and Real Interest Rate are the most predominant factors determining the liquidity of private sector commercial banks in India. The results of this study will be useful for policy makers. As sectorial comparison is made between public and private sector commercial banks, the unique

attributes of the particular sector has been captured through the regression model. It will be highly useful to enhance the liquidity of commercial banks in India.

SCOPE FOR FUTURE RESEARCH

The study has restricted its sample units to public and private sector commercial banks. Regional Rural Banks and Foreign Banks shall be included in future research. In term of model building, the study has adopted conventional Ordinary Least Square Regression Method for analysis purpose. Advanced models like Panel Data Least Square Regression model will reflect the heteroskedasticity among the chosen commercial banks.

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