LIQUIDITY AND PROFITABILITY OF PUBLIC AND PRIVATE SECTOR BANKS OF INDIA : A COMPARATIVE STUDY

A Dissertation Submitted to Dibrugarh University in Partial Fulfillment of the requirements for Award of the Degree of Master of Philosophy in Economics

By

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2018

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PREFACE

In the progress of an economy, banking sector plays a vital role. Being the core of financial sector, a strong banking system is much needed to fulfil the requirement of trade and industry. Banks are now a days facing a number of challenges like increasing competition, stringent prudential norms, raising customer expectations, high amount of non performing assets, asset liability management , rising pressure on profitability, liquidity and credit risk management and so on. To sustain financial health of bank, focus has to be given to the liquidity and profitability of banks. Liquidity is the ability to meet short term financial obligations and profitability measures the success of any business organisation. Liquidity and profitability are the most integral parts of a bank. Perhaps, the most difficult task for a bank is to have desired amount of profits while maintaining a good liquidity level. The public sector and private sector banks constitutes the major portion of our banking system. An analysis of these banks can give a clear picture of our banking system. The present study is an attempt to examine the liquidity and profitability positions of public and private sector banks in India. The factors that can affect the liquidity and profitability of banks are studied and a comparison is made between the public and private sector banks in case of the determinants of liquidity and profitability. The study will be beneficial in judging the efficiency of banking sector in India. The results will be helpful to the banking sector in taking future decisions.

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LIST OF TABLES

Table No.	Title of the Table	Page no.
Table 3.1	Assets and Deposits of Public and Private Sector Banks in India during 2005-17 (At Constant Prices of 2010)	33
Table 3.2	Ratios of Liquid Assets to Total Assets	35
Table 3.3	T test results for Liquid Assets to Total Assets	37
Table 3.4	Ratios of Liquid Assets to Total Deposits	38
Table 3.5	T test results of Liquid Assets to Total Deposits	40
Table 3.6	Ratios of Liquid Assets to Demand Deposits	41
Table 3.7	T test results of Liquid Assets to Demand Deposits	43
Table 3.8	Ratios of Total Advances to Total Deposits	44
Table 3.9	T test results of Total Advances to Total Deposits	45
Table 3.10	Return on Assets	47
Table 3.11	T test results of Return on Assets	49
Table 3.12	Return on Equity	50
Table 3.13	T test results of Return on Equity	51
Table 3.14	Net interest margin	52
Table 3.15	T test results of Net interest margin	54
Table 3.16	Operating profits	55
Table 3.17	T test results of Operating profits	56
Table 4.1	Descriptive statistics(for public sector banks)	65
Table 4.2	Hausman test results(for public sector banks)	65
Table 4.3	Diagnostic tests(for public sector banks)	66

Table 4.4	Robust Regression Results(for public sector banks)	68
Table 4.5	Descriptive statistics(for private sector banks)	70
Table 4.6	Hausman test results(for private sector banks)	70
Table 4.7	Diagnostics tests(for private sector banks)	71
Table 4.8	Robust Regression Results(for private sector banks)	72
Table 5.1	Descriptive statistics (fo. public sector banks)	81
Table 5.2	Hausman test results(for public sector banks)	81
Table 5.3	Diagnostics tests(for public sector banks)	82
Table 5.4	Robust Regression Results(for public sector banks)	84
Table 5.5	Descriptive Statistics(for private sector banks)	86
Table 5.6	Hausman Test results(for private sector banks)	86
Table 5.7	Diagnostics tests(for private sector banks)	87
Table 5.8	Robust Regression Results(for private sector banks)	88

LIST OF FIGURES

Figure No.	Title of the Figure	Page No.
Fig 1.1	Structure of Indian Banking System	4
Fig 3.1	Trend of Ratios of Liquid Assets to Total Assets	36
Fig 3.2	Trend of Ratios of Liquid Assets to Total Deposits	39
Fig 3.3	Trend of Ratios of Liquid Assets to Demand Deposits	42
Fig 3.4	Trend of Ratios of Total Advances to Total Deposits	45
Fig 3.5	Trend of Return on Assets	48
Fig 3.6	Trend of Return on Equity	51
Fig 3.7	Trend of Net interest margin	53
Fig 3.8	Trend of Operating profits	56

	Robust Regression Results(for public sector banks)	68
	Descriptive statistics(for private sector banks)	70
5	Hausman test results(for private sector banks)	70
7	Diagnostics tests(for private sector banks)	71
8	Robust Regression Results(for private sector banks)	72
1	Descriptive statistics (for public sector banks)	81
2	Hausman test results(for public sector banks)	81
3	Diagnostics tests(for public sector banks)	82
.4	Robust Regression Results(for public sector banks)	84
.5	Descriptive Statistics(for private sector banks)	86
.6	Hausman Test results(for private sector banks)	86
5.7	Diagnostics tests(for private sector banks)	87
5.8	Robust Regression Results(for private sector banks)	88

LIST OF FIGURES

Figure No.	Title of the Figure	Page No.
Fig 1.1	Structure of Indian Banking System	4
Fig 3.1	Trend of Ratios of Liquid Assets to Total Assets	36
Fig 3.2	Trend of Ratios of Liquid Assets to Total Deposits	39
Fig 3.3	Trend of Ratios of Liquid Assets to Demand Deposits	42
Fig 3.4	Trend of Ratios of Total Advances to Total Deposits	45
Fig 3.5	Trend of Return on Assets	48
Fig 3.6	Trend of Return on Equity	51
Fig 3.7	Trend of Net interest margin	53
Fig 3.8	Trend of Operating profits	56

LIST OF ABBREVIATIONS

CAGR-	Compound Annual Growth Rate
CAR-	Capital Adequacy Ratio
COF-	Cost of Fund
CV-	Coefficient of Variation
GDP-	Gross Domestic Product
NPA-	Non Performing Assets
NII-	Non Interest Income
NIM-	Net Interest Margin
PrSB-	Private Sector Bank
PSB-	Public Sector Bank
RBI-	Reserve Bank of India
ROA-	Return on Equity
ROE-	Return on Equity
SD-	Standard Deviation

CONTENTS

		Page No.
Preface		*i*
Acknowledgement		*ii*
List of Tables		*iii-iv*
List of Figures		*v*
List of Abbreviations		*vi*
CHAPTER I	**: INTRODUCTION**	**1-14**
CHAPTER II	**: REVIEW OF LITERATURE**	**15-30**
CHAPTER III	**: A COMPARISON ON LIQUIDITY AND PROFITABILITY OF PUBLIC AND PRIVATE SECTOR BANKS**	**31-58**
CHAPTER IV	**: DETERMINANTS OF BANK LIQUIDITY OF PUBLIC AND PRIVATE SECTOR BANKS**	**59-74**
CHAPTER V	**: DETERMINANTS OF BANK PROFITABILITY OF PUBLIC AND PRIVATE SECTOR BANKS**	**75-90**
CHAPTER VI	**: SUMMARY AND CONCLUSION**	**91-96**
BIBLIOGRAPHY		**97-108**

CHAPTER I

INTRODUCTION

CHAPTER I

INTRODUCTION

1.1 Prelude

Banking sector plays an important role in the development of an economy. In India banking is one of the fastest growing sector facilitated with large network of bank branches, servicing financial services to their customers. In mobilizing the savings of general public, banks perform significant role. For the existence of every commercial organization, profit is the most crucial factor and profitability shows the relationship between the amounts of profit with several other factors. Compare to other business operations, banks in general needs to be more concerned about balancing profitability and liquidity. Liquidity is required to meet the withdrawal demands of customers and profitability is required to meet the expenses of a bank. In the year 1969, then Prime Minister Indira Gandhi nationalized 14 major commercial banks of India with an aim of expansion and development of priority sectors. In 1980, with the nationalization of six more banks, government occupied nearly 91% share of the total banking business. However, the poor performances of the public sector banks were becoming a matter of concern for the country. The continuously increasing non performing assets in the portfolio of banks posed a threat to the financial stability of our economy. Banking reforms therefore become a necessary tool of the liberalization agenda. The Narsimham Committee set up it 1991 brought

reforms to the Indian banking system. With these reforms under the shade of liberalization, privatization and globalization major changes were experienced in the functioning of banks. With the deregulation of interest rates and entry of new private and foreign banks, efficiency of banking system improved in India. Increased competition, modern and advanced information technologies reducing cost, erosion of product and geographical boundaries, less regulated government policies have all forced public sector banks to compete with private sector and foreign banks operating in the country.

The global financial crisis of 2008 has drawn the attention of researchers on the study of liquidity of banking units. The Basel committee on Banking Supervision has also laid down various norms to ensure that financial institutions have enough capital to meet its obligations and absorb unpredicted losses. The present study is an attempt to study the liquidity and profitability of major players of Indian banking system i.e. public and private sector banks.

1.2 Over view of Indian Banking Industry

Indian Banking industry comes into existence with the establishment of the 'General bank of India' in the year 1786. Later in 1850, 'Credit Lyonnais' a foreign based bank started its business in Calcutta. The banking activities then emerged and proposed from there in Calcutta. In 1865, the first fully owned Indian Bank was established in Allahabad.

In 1935 the Reserve bank of India was established by the Reserve Bank of India Act of 1934. Initially the bank was privately owned but was nationalized on 1st January 1949. The Banking Regulation Act of 1949 empowered RBI to regulate, control and inspect the banks in India. By 1960's Indian banking industry started facilitating the speed of financial development of Indian economy. Fourteen largest commercial banks were nationalized in July 19, 1969 by the then Prime Minister Indira Gandhi. Again in 1980, six more commercial banks were nationalized. The primary reason for the nationalization was to give more control on credit delivery to the government of India. Through nationalization of banks, government of India undertook around 91% control on banking business in India. In 1993 the New Bank of India was merged with the Punjab National Bank and hence the number of total nationalized bank becomes 19.

In early 1990's, the Narasimham Rao Government took the policy of liberalization which provided license to a small number of private banks. This was named New Generation Tech Savy Banks and included the Global Trust Banks which later on amalgamated with Oriental Bank of Commerce, Axis Bank, ICICI Bank and HDFC Bank. This step along with the growth of Indian economy led to retail boom in India. Indian Banking industry witnessed rapid growth with both private sector and public sector banks contributing strongly for its development. Today, Indian banking operation is fair in terms of supply and product range but reaching the rural India is still a challenge for the private sector and foreign banks operating in India.

1.3 Structure of Indian banking System:

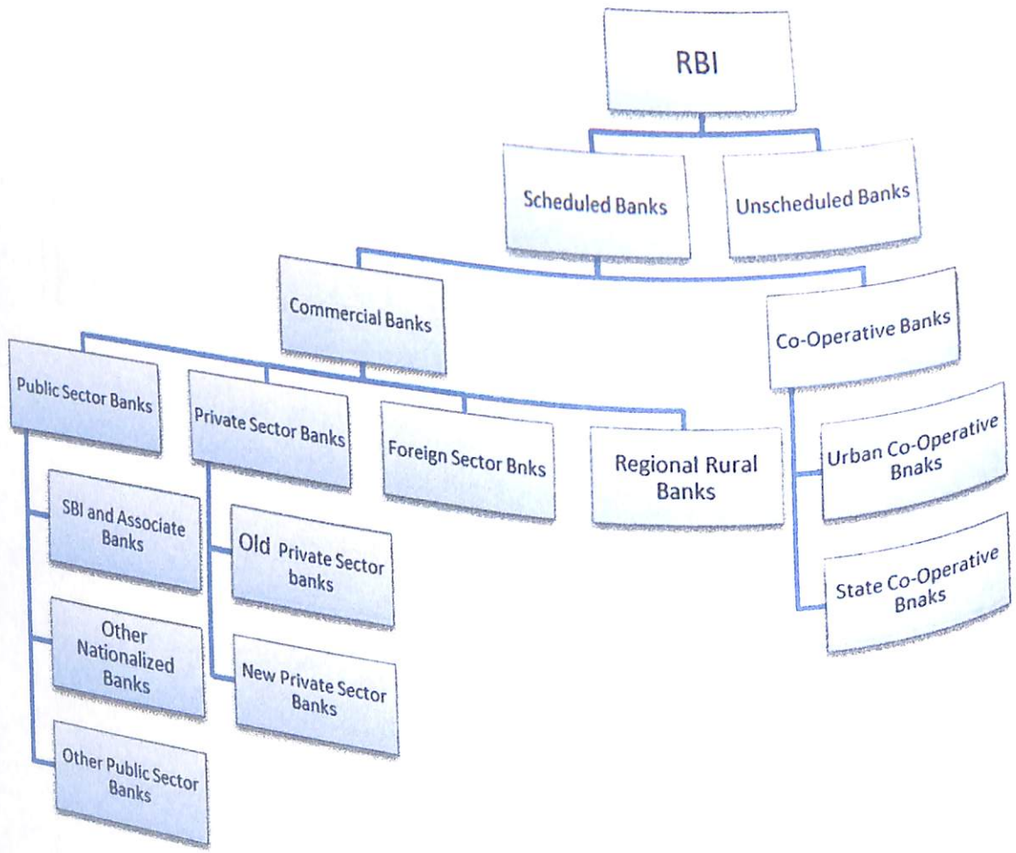

Fig 1.1: Structure of Indian Banking System

A. Scheduled commercial banks- Scheduled banks refer to a bank listed in the 2nd schedule of Reserve Bank of India act, 1934. Scheduled banks are empowered to perform normal banking business such as accepting deposits, advancing loans and other banking services. They are eligible for taking loans at bank rate from RBI. Schedule commercial banks possess the membership of clearing house. The scheduled banks are divided into four groups' viz public sector banks, private sector banks, foreign banks and regional rural banks.

i) Public Sector Banks – Public sector banks are operated by the government of India. The major shareholders of these banks are either the government of India or RBI. At present there are 27 schedule commercial banks operating in India including 21 nationalized banks and SBI and its 5 associates.

ii) Private Sector Banks- The majority of shares of private sector banks are held by private shareholders and not by government. The first private sector bank of India was Indusind Bank set up in 1994. Private sector banks are divided into 2 categories – old private sector banks and new private sector banks.

iii) Foreign banks – Foreign banks are the bank of other countries having their branches in India. Foreign banks have make the Indian banking system more efficient and competitive bringing latest technology and banking practices. At present there are about sixteen foreign banks in India with 180 branches operating in most of the big cities of India.

iv) Regional Rural Banks- Regional rural banks are operating at regional level in states of India. The main objective of these banks is to serve the rural people. Earlier there were 82 regional rural banks in India but as per 2018 reports currently 64 regional banks are operating in various states and union territories of India

B. Non Schedule banks- Non schedule banks are those banks which are not included in the 2nd schedule of RBI. RBI has no specific control over such banks. These banks are not allowed to borrow money from RBI for its banking activities but they can approach RBI for accommodation under abnormal circumstances.

1.4 Liquidity

Liquidity is the degree with which an asset without any change in its price can be easily bought or sold in the market. More precisely, it is the ability of a firm or financial institution to meet the cash demand with low or no financial loss. In case of bank, liquidity refers to the assets that are either in form of cash or immediately convertible into cash without any serious loss of time and money. Direct cash holding in currency or holding creditworthy securities including government bills with short term maturities provides liquidity to a bank.

The literature on finance holds that liquidity is difficult to define but it's easy to identify. In economics liquidity represent the ability to exchange wealth for goods and services. The meaning of liquidity emphasized two important aspects. First aspect describes it as a flow concept while the others holds it as the ability to realize these flows. The Basel committee on banking Supervision (2006) describes liquidity as the funds that can meet funding requirement and business needs very easily.

For the upliftment of an economy, a healthy and strong banking sector is of paramount importance. The efficiency and viability of banks is much affected by the liquidity level they possess. In order to avoid the risk of being called illiquid, banks must meet their financial obligation when they come due (Crocket, 2008). Banks act as liquidity provider in a financial system but at times banks may face shortage of liquidity due to unexpected deposits withdrawal or large amount of standby credit drawn. Therefore effective risk management is required to maintain coordination of the cash inflows and outflows (Nagret, 2009). Liquidity shortage of one bank can spread to other banks affecting the entire financial system and as such liquidity is not only important for an individual banking but the entire banking industry. Liquidity is expressed neither as an amount nor ratio but as an ability of bank to fulfill its mandatory obligation (Tian, 2009).

1.5 Profitability

Profitability is the capacity of an organization or firm to have benefits from their business activities. Profit is usually the reward of the entrepreneur. It acts as the performance measure of a business. Increasing profits attracts investors, expands the market and also enable a business to survive for a long period of time. Profit maximization is the main goal for business ventures and they spend countless hours and efforts to find out ways of reducing cost and increasing sales (Schreibfedar, 2006). Like all business banks receives profits by earning more than their expenses. Banks profits come mainly from the interest charged on loans and the fees charged for the services it renders. Likewise, the main item of expense for banks is the interest they have to pay on liabilities. Deposits, money borrowed from other banks and financial institutions, commercial papers form the liabilities of a bank and the loans and the securities are the major assets for a bank. Profits are earned by using leverage

which is measured through return on assets and return on equity. It is important to note here that not all assets earn return for a bank. To meet cash withdrawal banks keep cash with them which earns no interest. Moreover, the loan loss reserves kept to cover losses when borrowers don't pay back loans also does not contribute to profits. Thus, commercial banks have to effectively manage its business to ..rn significant amount of profits while maintaining a decent liquidity level. More profitability can absorb the shocks and avert risks that banks can face. Profitability is a prerequisite for innovation, diversification and efficiency of commercial banks (Hempell, 2002). The stability of commercial banks to a great extent depends on profitability.

1.6 Objectives of the Study:

- To compare the liquidity and profitability positions of public and private sector banks.
- To determine the bank specific factors affecting liquidity of public and private sector banks.
- To find out the bank specific factors determining profitability of public and private sector banks.

1.7 Research Questions:

- Is there any difference between the public and private sector banks in terms of their liquidity and profitability positions?
- Whether the factors determining liquidity differ between the public and private sector banks?

- Whether there is any similarity among the determinants of profitability of public and private sector banks?

1.8 Data and Methodology of the Study

1.8.1 Sources of Data:

The study is based entirely on secondary data. The data are collected from the official website of Reserve Bank of India (RBI). The data are collected for both the public and private sector banks for the period 2005 to 2017. Data mainly on the total assets, liquid assets, total deposits, demand deposits, total advances, net interest margins, return on assets, return on equity, operating profits ratios are collected for both public and private sector banks as a whole. The public sector banks studied in this study are State Bank of India and all the twenty nationalized banks of India except Bharatiya Mahila Bank ltd. and all the private sector banks except Bandhan bank limited and IDFC bank limited as all these banks are of recent origin and data are not available for the banks from 2005.The data are collected for each banks' total assets, deposits, non performing assets, capital adequacy ratio (total of tier 1 and tier 2 capital), return on assets, equity and cost of funds for the period 2005-2017.

1.8.2Methodology of the Study:

The methodology employed in data analysis is objective specific.

To satisfy the first objective, different ratios like ratio of liquid assets to total deposits, liquid assets to total deposits, liquid assets to demand deposits and liquid assets to total advances are calculated for public and private sector banks respectively.

All the data are converted into constant prices taking 2010 as the base year. A descriptive statistics is used to examine which banking group is maintaining higher liquidity and profitability with consistency. Moreover, the compound annual growth rate (CAGR) is calculated for all the ratios to see the annual growth in liquidity and profitability of public and private sector banks. For comparative analy s independent t test is performed.

To solve the second and third objectives, the study used longitudinal or panel data model. Panel data is a multi-dimensional data consisting of observations on multiple phenomena studied over multiple time periods for the same firm or individual. Panel data technique includes both cross sectional and time series dimensions and therefore provides adequate data points in order to reduce the likelihood of biasness in the parameter estimators. This technique helps to predict effects that the pure time series or cross sectional data fails to detect. The increased sample size due to pooling of time series and cross section data provides for more accurate estimates with more degrees of freedom and lesser problem of muticollinearity.

A panel data contains N entities each of them measured through T time period. The total number of observation is NT. In this study N is each of the public sector and private sector banks of India selected for the study observed on T time period (year) on several different parameters. The time period considered in the study is 2005 to 2017 and 21 public sector banks and 19 private sector banks are studied over these periods. The panel data is short with more entities and a few time periods. Further,

fixed effects and random effects model are run and Hausman test is done to decide whether to choose random effects model or the fixed effects model to fulfill the objectives of the study.

1.9 Value of the Study:

Profitability is the key parameter of performance which reflects efficient utilization of all available resources. Banks are now a days facing a number of challenges like increasing competition, stringent prudential norms, raising customer expectations, high amount of non performing assets, asset liability management , rising pressure on profitability, liquidity and credit risk management and so on. To have desired amount of profits while maintaining a good liquidity position to avoid short term financial losses is perhaps the most important and difficult task for banks. Profitability is the main indicator for the survival of bank business and liquidity is the key predictor of bankruptcy and solvency. Therefore, the study of the factors affecting liquidity and profitability of banks becomes valuable.

The success of an economy mainly depends on effective performance of its financial institutions. Capital market of India is dependent on the growth and success of banking sector. Therefore, it is high time to analyze the financial performance of banking institutions of India. A comparative analysis of public and private sector banks will help in judging the efficiency of banking sector in India. The study is conducted by using various ratios as a tool to analyse the liquidity and profitability positions of public sector and private sector banks undertaken for the study. These

ratios are helpful not only in evaluating the past trends but also in predicting the future performance.

1.10 Limitations of the Study:

1. The study is entirely based on secondary data and the limitations of secondary data are also applicable to this study. The data are collected from published reports and internet sources. Hence data are subject to window dressing and may not show the actual positions of the banks.
2. The research work is confine to public and private sector banks only for the evaluation and determination of factors responsible for liquidity and profitability. This can be extended to foreign banks and co-operative banks also as Indian co-operative banks also form a major part of Indian banking system.
3. Only the variables relating to banks are studied neglecting the key macroeconomic variables like GDP, inflation rate, interest rates etc. which may cause significant impact on liquidity and profitability of banks. There may be remarkable change in the structure of Indian economy during the study period which is ignored in this research work.
4. The study has focused only the quantitative aspect. But there may be some qualitative aspects like management efficiency, employees performance which may improve the profitability of banks could have been taken into consideration.

1.11 Organization of the Chapters:

There are six chapters in the study with the following contents-

Chapter- I Introduction:

The first chapter is an introductory one that contains the objectives of the study, research questions, description about the data and research methodology, significance of the study, and some of the important aspects necessary for the study. The chapter ends with this organization of the dissertation.

Chapter - II Review of Literature:

This chapter makes a detailed review of literature. It covers the review of some of the major studies on the selected domain. A critical study of existing studies, their limitations and the research gap are also included in this chapter.

Chapter III – A Comparison on Liquidity and Profitability of Public and Private Sector Banks:

Chapter III covers the investigation to satisfy the first objective of the study. The study shows the positions of both banking groups in terms of their liquidity and profitability levels. A comparison is made to find out which banking group is in better liquidity and profitability positions over the years.

Chapter IV- Determinants of Liquidity of Public and Private Sector Banks:

Chapter IV deals with the second objective of the study. It tries to find out the variables which determine the liquidity of the public and private sector banks of India.

Chapter V- Determinants of Profitability of Public and Private Sector Banks:

Chapter V is devoted to the third objective of the study. This chapter tries to explain the impact of a set of variables relating to the banking sector on the profitability of public and private sector banks. An attempt is made to identify the differences among the determinants of profitability of both banking groups.

Chapter VI- Summary and Conclusion:

Chapter VI summarises the major findings and highlights the implications of the entire study. The contents in this chapter are important for policy prescription and further study on the same topic.

CHAPTER II

REVIEW OF LITERATURE

CHAPTER II

REVIEW OF LITERATURE

2.1 Literature on Liquidity

2.1.1 Theoretical Background

The inventory theory of capital and liquidity buffer holds that the size of liquidity buffer should reflect the opportunity cost of holding liquid assets rather than loans. The distribution of liquidity shock that the commercial banks can experience must also be taken in account. Commercial banks can manage the liquidity risk underlying their balance sheet by maintaining a stock of liquid assets. As Baltensperger (1980) stated that holding liquid assets may be a costly affair for banks but it reduces the risk of being out of cash in times of massive deposit withdrawals. Due to capital market imperfections and co-ordination failure in the interbank market, it may become difficult to raise liquidity in short notice giving rise to the problem of insolvency. Diamond and Dybviz (1983) and Diamond and Rajan (2001) also advocated that it is necessary for banks to hold a sufficient liquid assets in order to be secure from unexpected cash withdrawals. Thus, banks hold a buffer of liquid assets as self-insurance that equates the marginal benefit of holding assets to the marginal cost of alternative investments. (Mugenyah, 2015)

A similar theory to this, shift ability theory of liquidity was developed by Harold Moulton in 1915. The theory supported holding credit instruments as a form of

liquidity to protect themselves from liquidity risk. Commercial papers, prime banker's acceptance and treasury bills were regarded as important liquidity reserves. This reserves are marketable due to their short term maturity and certainty of capital. The commercial bank's loan commitment practice that prevails today is due to the shift ability theory. Thus, by holding assets with a ready mark ., commercial banks are in a position to avert liquidity risk.

The last theory relating to liquidity is the risk absorption hypothesis. The hypothesis supported that through increasing the amount of capital it holds, bank can create more liquidity. Banks with more liquid assets may face greater losses when they have to sell illiquid assets to meet heavy withdrawals. Risk absorption effect is relatively more for large banks because of their regulatory market disciplines (Mugenyah, 2010). Higher capital ratios are positively related with liquidity level.

2.1.2Empirical Review

Akhtar, Sadeqat and Ali (2011) made a comparative study between the conventional and Islamic banks of Pakistan to identify the liquidity risk. The results showed that size of bank and net working capital to net assets shares an insignificant positive relationship with liquidity risk for both banking groups. For the conventional banks, capital adequacy and return on assets in case of Islamic banks were positive determinants of liquidity. Conventional banks were more involved in long term financing projects. Additionally, conventional banks performed more well in terms of assets and return and were in a better profitable position.

A panel of 27 banks active in Romania from 2002 to 2010 to was analysed by Munteanu (2012) to examine the factors influencing banks liquidity in the pre-crisis (2002-2007) and crisis years (2008-2010). The study found that the influence of Z score, an important measures of bank's stability is significant in the crisis period and impaired loans i.e. the potential loss due to unfavorable market condition has a significant negative role to play in case of banks' liquidity.

Qin and Pastory (2012), in their paper, analyzed the total deposits to core funding, liquid assets to demand liabilities and gross loans to total deposits. The study found that commercial banks maintained a strong liquidity level especially in terms of liquid assets to demand liabilities. In a study on determinants of bank liquidity risk within the context of Euro area, using OLS regression Cuinelli (2013), found that bigger bank more specialized in lending activity have a high risk exposure while banks with higher capitalization are in a better liquidity position over long period. In a similar study on determinants of liquidity in Hungarian commercial bank, Vodava (2013), by applying panel data regression concluded that capital adequacy of banks, interest rate on loans and bank profitability are positively related to liquidity. Liquidity is negatively influenced by the size of bank, interest margin and monetary policy interest rates.

Meera and Dhar (2014), compared the liquidity ratio and assets liability management practices of public, private and foreign bank of India. Their result highlighted that due to the threat of financial crisis of various economy, Indian bank keeps more cash with them which can be problematic in the longer period as it

adversely affects profits. Further, public sector banks were found to be in a better liquidity position when compared to other banks in the short run.

While analyzing the liquidity of Moroccan banks Mehdi and Abderrassoul (2014), found the financial crisis to be negatively affecting the banking liquidity. There was a decrease in liquidity level during the study period. Bank size was found to be positively affecting liquidity. The study through panel technique found foreign direct investment, foreign assets, GDP, public deficit and M_3 to be the determining factors of bank liquid assets

Ramanarayan and Unas (2014), examined the components of liquidity management in Indian public sector banks such as the demand deposits to total deposits, liquid assets to total assets, advances to total assets. This result conclude that liquidity of bank have declined over the study period which may be due to decrease in investment with RBI. A negative relationship between bank liquidity and management efficiency is been addressed by Belad, Bellouma, Omri (2016). Efficiently managed banks are able to maintain more liquid assets. Further, traditional banks which rely more on lending activities have lower liquidity risk.

Racia, Stanisic and Stanic(2016), empirically investigated the influencing factors for liquidity risk in the Republic of Serbia and compared it with banks from countries that have become a member of EU from socialist countries. With an increase in NPL, domestic banks are facing with decreasing lending activities which has led to higher level of liquidity. Larger banks with a wide diversification of loans maintain a high loan to deposit ratio. In addition to this, banks having more capital are

save from liquidity risk exposure. With the growth in GDP, declining unemployment and exchange rate, risk of liquidity increases. During the expansion phase of business cycle, amount of liquid assets banks hold tends to fall with an increase in lending activities.

Sheefeni (2016), conducted a study on bank specific factors affecting commercial bank's liquidity in Namibia over a period of 14 years. Using OLS technique, the results revealed a negative association between return on equity and banks liquidity and capital adequacy, NPA were found to be positively related to bank's liquidity. Liquidity of banks is affected by the ownership pattern of banks. Singh and Sharma (2016), with an increase in deposit and capital, banks liquidity position improves. Profitability of banks and inflation are positively associated with bank's liquidity while there is a negative relationship between bank size and GDP with liquidity.

Ahmed and Rassol (2017), measured the bank liquidity with the help of stock approaches. Their study confirmed that larger banks with more assets invest more in risky assets and as such have less liquid assets as compared to the small banks. With the increase in GDP, growth rate and bank capital, there is an increase in bank's liquidity level. Non -performing loan is indirectly related to bank liquidity while the role of consumer price index and profitability is insignificant when dealing with liquidity.

Three key determinants of liquidity of commercial banks in Vietnam viz, size of banks, ratio of total loans to total deposits and capital to assets proportion was

identified by Deep and Nguyen (2017) in their study. Bank size was found to be positively related to liquidity while ratio of total loan to total deposits and capital assets proportion shared a negative relationship with liquidity of commercial banks.

The determinants of liquidity of the leading banks operating in Germany and UK were studied taking a sample of 14 banks from both the country by Elahi (2017). The study examined the effect of credit risk, bank size, profitability, financial leverage, income diversification and NIM on bank's liquidity. The results revealed that with the increasing net interest margins, bank involves themselves more in lending activities and hence have lower liquid assets at their disposal. For the Germen banks, liquidity is negatively affected by leverage ratio while the same was not a significant determinant for banks in U.K. All the other variables used in the study were found to be insignificant for both the countries commercial banks.

Hesanovic and Latic (2017), in a study on 19 commercial banks operating in Bosnia and Herzegovina revealed that poor credit growth lead to accumulation of excess liquidity in the post crisis period. Bigger banks keep more funds in form of excess reserves. Inflation has significant negative impact on excess liquidity while GDP growth is found to be insignificant.

Using pooled regression model Kaur and Sharma (2017), made an attempt to study the impact of banks specific factors on liquidity risk of banks. The study was undertaken for the period 2006-2016. It concludes that while only management efficiency affects liquidity negatively, deposits, liquidity management and quick ratio has positive relation with liquidity of bank.

Pushkale,Mahamayi and Venkatesh (2017), in their comparison between public and private sector banks regarding liquidity position found that private sector banks maintain a large portion of liquid funds to meet demand deposits. Moreover, both public and private banks keep lesser liquid assets with an aim of maximizing profits. In a similar comparative study, Rashid, Ramchandra and Fawzy (2017) have stated that Islamic banks due to limited human resources and prohibition from sourcing short term capital from conventional market are facing difficulties in managing liquidity. They talked about both cash liquidity and investment liquidity. Profitability, loan loss provision, size of the bank, return on assets were disclosed as the important elements for liquidity determination. In order to lower liquidity risk, integration between the policymakers and the managing body is required. Excess operating must be controlled so as to solve the liquidity problems.

2.2 Literature on Profitability

2.2.1 Theoretical Background

The market structure model explains the competition and profitability in the banking sector. The central assumption of the model is that industry structure as measured by market concentration in term of market share ratio influences bank's profitability. The model has two variant – structure conduct performance (SCP) model and the efficient structure hypothesis (ESH). The SCP model holds that external factors such as market conditions mainly determine profitability indirectly. Irrespective of efficiency, firm in more concentrated industries can earn higher profit than the firm in less concentrated industries (Goldberg et. al. 1996). The SCP model

stipulates that market concentration leads to collusion in large firms that results in greater profits. (Bhati and Hussain, 2010; Molyneux and Forbes, 1995) supported the SCP hypothesis as based on their empirical evidence they found significant positive co-relation between bank profitability and industry structure. A related theory of SCP, relative power market power hypothesis holds that firms with large market share and well differentiated products enjoys market power in price decision and earns supernormal profits.

On contrary to this, according to the ESH, better efficiency in banks leads to more profits. Efficient management lowers the operating cost of the bank and allow them to earn more profits. Smirlock (1985), empirically investigated the efficiency hypothesis. His results found that market concentration does not play any role in profitability while market share positively effects profit margins even after controlling for concentration.

Other theoretical models of bank profitability includes the agency cost theory contributed by Jensen and Meckling (1976). They argue that conflict of interest between management and ownership may cost to the firm defined as agency cost which is likely to affect in due course firm's profitability. The Bresnaham (1982) theory assumes that bank maximise profits by equating their marginal cost to the perceived marginal revenues. Moreover, Panzar and Rose (1987) assumes that actions of other participant affects the performance and profitability of banks. The signaling theory by Arrow and Spence holds that profitable firms signals information to the market. Banks with greater profitability signals its stakeholders and market for

additional investment through various disclosures. By doing so banks wish to receive a good reputation which increases its value and profitability (Muzahem, 2011).

2.2.2Empirical Review

Unal, Aktas and Acikalin (2007), in their study on the state owned and private owned banks of Turkey over the period 1997 to 2006 found the state owned banks to be more efficient than the private sector banks. Using net assets as a proxy for operating efficiency, they found means of net assets/total employment and net assets/total number of branches are different for both state and private owned banks. There is no any evidence showing private banks operating for more effectively than the state owed banks. And as such question raised in the study about whether to privatize the banks or not?

While examining the profitability determinants for Greek banking sector over the period 2000 to 2007 Alexiou and Sofoklis (2009), found bank size to be positively affecting banks profitability and the credit risk shares a negative relation with profitability. Greek banking industry acts as a risk averter in order to maximise the profit. The level of non-performing assets is higher for the Greek banks as compared to European banks. Consumption and inflation plays an important role in terms of bank's performance. Moreover, capital and cost efficiency measures also significantly affect profitability.

In a paper entitled "A comparative study of profitability of different groups of schedule commercial banks in India", Kheechee (2011) tried to find out the causes for differences in profitability of different sectors of commercial banks. He

discovered that the return on fund is very less for the private sector banks as compared to public and foreign sector banks due to inefficient management of portfolio of securities. The public sector banks are inefficient in managing their loan portfolio resulting less return on advances. Overall in managing banking business, foreign banks and private banks are more superior to the public sector banks.

Muhamad and Siddiqui (2012), analysed the performance of foreign banks in Pakistan and how it defers from that of the domestic banks. The regression results showed that foreign banks are earning more profit than the domestic banks. Rather than acquiring an existing player in the host country market, it is better for multinational banks to open their branches in host country. The GDP growth rate and inflation in the host country where found to be insignificant in determining the foreign bank's profitability. Capital adequacy was found to be the only determinant affecting foreign banks' ROA positively. In a similar study, Erina and Lace (2013), discovered that operational efficiency, portfolio composition and management shares negative relation with ROA whereas credit risk and capital positively influence ROA. As against this ROA is negatively affected by operational efficiency and credits risk and positively by capital portfolio composition. The study was conducted on Latvian commercial banks for the period 2006 to 2011.

A comparative study of 3 major private and public sector banks in India for the period 2009 to 2012 was made by Goel and Rekhi (2013) to compare their relative profit earnings. They found profitability and efficiency both to be inter correlated. The public sector banks being less efficient are not as much profitable as the other sectors. For measuring banks performance three different measures- return

on assets, return on equity and net interest margin was used. The study showed AXIS bank, one of the leading private sectors bank to have the highest return on assets.

Haque (2014), found that most of the commercial bank have faced a downward trend in their ROE from 2009 to 2013 while there is a growth of net internet margin for the same period. Despite the global financial system which is experiencing financial crunches, the performance evaluation of Indian banking industry has been stable and sound. The financial performance of different banking growth has more or less remained stable in terms of their ROA and NIM but they are not performing in the same manner in terms of their ROE.

To find out the determinants of market profitability of developing countries commercial banks, Lipunga (2014) used earnings yield as the market profitability measurement and return on assets (ROA) as internal profitability measurement. Employing correlation and regression analysis, the study found bank size, management efficiency and liquidity to be the variables influencing internal profitability and that of bank size, management efficiency and capital adequacy affecting the market profitability.

Staikouras and Wood (2015), found that European bank profitability is affected by the changes in the external macro- economic environment. Banks having non-loan earning assets are more profitable than those who are more depended on their assets. The firm specific market share (MSH) which is bank's assets divided by total assets value for all banks was found to be unstable and negative. The growth rate of GDP and variability in the interest rates has negative effect on profits.

Kamran, Johnson and Sammer (2016), worked on the determinants of profitability for Pakistani commercial banks for the period 2005 to 2009. They used spread ratio as a proxy for profitability and stressed the effect of assets, loans, equity, deposits, economic growth and market capitalization on the spread ratio. The study concluded that profitability directly depends on bank's total assets, loans, deposits, market capitalization. External macro- economic factors along with the management decisions affects a bank's profit and as such banks should be concerned about these factors while dealing with profitability.

In the study on Indian public sector banks to find out the determinants of profitability using multiple regression model Kedia (2016), conclude that net interest income, non performing assets, credit deposits ratio and operating expenses have correlation with bank's profit. The study used net profit as the proxy for profitability and examined that almost 60.2 % variation in the profit is due to the above mention variables. While the operating expenses have the lowest effect on profits and credit deposits ratio affects profits the most.

Mahmud et al. (2016), conducted a study on bank's specific variables affecting Bangladesh's commercial banks for the period 2003-13. Paris Winsten correlated panels standard error (PCSE) model was employed to remove the problem of heteroskedasticity and autocorrelation from the analysis. Results of panel regression shows bank size, operating expense ratio and gearing ratio to be negatively associated with profitability. Capital adequacy ratio shares a positive relationship with profitability. In determining bank's profitability NPL and liquidity were found to be insignificant.

Using a similar methodology, Nuhiu, Hoti,Bektashi (2017), investigated the profitability determinants through the financial performance indicators of Kosovo for the period 2010 to 2015. The study was conducted for 10 commercial banks in Kosovo. The results showed banks specific factors to be very much significant in terms of profitability determination. Banks with a desired level of liquidity together with lower capital adequacy and non-performing loan are tend to have more profits. With the increase in capital coupled with high level of liquidity leads to lower profits.

Shah and Khan (2017), probed the factors affecting profitability of commercial banks for eight years from 2007 to 2014 using the pooled regression model to assess the relationship between equity to assets, debt to assets, bank size and assets management with return on assets. From the analysis of t –statistics, p values it was found that the stated variables are significant in affecting commercial banks' profitability in Pakistan.

Srinivasn and Britto (2017), evaluated the impact of liquidity, solvency and efficiency on the profitability of Indian commercial banks. Throughout the study period pertaining from 2012 to 2016, public sector banks were found to be in a stable profit level while the turnover ratio for the private sector banks experienced jerk. The solvency ratio, capital adequacy ratio, liquidity ratio and profitability position of private banks were relatively better than the public sector banks. Moreover, the aforesaid ratios were found to be significantly affecting commercial bank profitability. Rising amount of non performing assets was found to be one of the most dangerous hindrances for Indian commercial banks.

Using pooled OLS on eight Malaysian banks for the period 2010-2015 Trofimov, Aris, Ying (2017) found that bank performance is significantly depended on the size of bank. The authors elaborated the association between banks performance and non performing loan. It concluded a negative relationship between NPL and profitability and hence suggests banks to be more concerned about their cost management for reducing credit risk and both direct and indirect measures of controlling cost must be adopted.

Rekik and Kalai (2017), aimed to study the determinants of profitability and efficiency of fourteen countries conventional banks. To estimate banks' cost and profit functions a Trans log flexible functional form was used. The study introduced two dummies viz. GCC that represented a country from Gulf Corporation Council and CHOC representing financial crisis after 2007. The study highlighted that the CHOC variable being positively related with bank profitability. The impact of financial crisis is not relevant for MENA countries bank having high average efficiency. They suggested that by improving assets quality, bank size and increasing non interest income, the conventional banks can have a growth in their profits.

Yigermal (2017), studied about the determinants of private commercial banks profitability in Ethiopia. For measuring profitability, the analysis used ROE and ROA. By applying panel econometrics, the study found a positive association between bank size and GDP with banks profitability while the interest rate and loan to deposit ratio shared a significant negative relationship. The loan concentration index had a positive relationship only with ROE. Yigermal suggested banks to merge with each other so as to have scale advantage.

Kumar and Thamilselvan (2018), in their study found that public sector banks are experiencing a fall down in their earnings and profit margins because of their low quality assets and increased sub-standard assets. Higher level of non perfoming loans are the main obstacle for the banks in India. HDFC bank is in overall top position with industrial development bank being the last due to the under- utilisation of resources.

Vadrale and Katti (2018), attempted to distinguish between the public and private sector banks in terms of profitability position. Using several ratios for analysing profitability the study hold spread ratios to be the real indicator of profitability which was found to be better for private sector banks. No doubt cost of funds was same for both the sectors, return on fund was higher for the private sector banks and as such they were in better profitable positions. The study regarded the public sector banks to be stable while the private sectors banks were found to be more profitable.

2.3 Conclusion and Research Gap:

A review of previous studies provide a platform to this study as the researchers has well explained the independent and dependent variables used in this study. However, there exists many knowledge gap regarding the liquidity and profitability analysis especially in the context of Indian banking industry. In addition to this only a few studies have made a comparative study on the public and private sector banks of India regarding liquidity and profitability positions. Thus, the present study adds to the literature by presenting a comparison between the public and private sector banks operating in India. The study allow us to explore the similarities

and dissimilarities between the two banking group in respect of the determinants of liquidity and profitability.

CHAPTER III

A COMPARISON ON LIQUIDITY AND PROFITABILITY OF PUBLIC AND PRIVATE SECTOR BANKS

CHAPTER III

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3.1 Introduction:

Banking sector had played a revolutionary change towards the growth of our economy and henceforth it is the key indicator to analyze the level of development of any country. If the banking sector does not perform well agriculture, industry, trade activities all will be affected. Efficient banking system reflects a sound intermediation process and banks contribution towards economic growth. So, liquidity and profitability analysis of banks is essential for evaluating banks business life. As both liquidity and profitability are the integral parts of banking and without anyone of these, banks cannot sustain. Public and private sector banks are the major drivers of Indian Commercial Banks and a comparison on their liquidity and profitability position can give a clear picture about the financial health of our banking industry.

3.2 Liquidity Portion of the Public and Private Sector Banks:

This section deals with the study of Liquidity level of public and private sector banks. To study Liquidity level, four ratios has been used which are discussed in the succeeding sections. Firstly, the total assets, liquid assets, total deposits, demand deposits and total advances of both banking group is analyzed in constant prices taking 2010 as the base year. All the current year data are collected from the

central bank website and are converted into constant prices of 2010 to bring a clear picture of the banking business of public and private sector banks of India. The compound annual growth rate value of all the mentioned indicators is been calculated for both the banks.

Table 3.1: Assets and Deposits of Public and Private Sector Banks in India during 2005-17 (At Constant Prices of 2010)

	Total Assets		Total Deposits		Demand Deposits		Total Advances		Liquid Assets	
Year	PSB	PrSB	PSB	PrSB	PSB	PrSB	PSB	PrSB	PSB	PrSB
2005	4342959.319	1591079.704	3353639.498	1203108.7	379659.1666	151941.0931	2869.169	792.1579	381754	139685.6
2006	5779621.138	2839592.307	4514649.163	2231089.533	562109.8623	240515.922	4704.43	1565.814	600821.2	191822.7
2007	8819886.778	4828446.295	7165701.027	3703080.327	825996.8395	399644.1391	7852.636	2739.584	972074.1	533954.6
2008	13352755.08	7680912.666	10922789.72	5538028.488	1192466.361	736091.7172	12105.82	4293.244	1460867	819275.8
2009	20401394.4	9179185.297	17159867.58	6590319.675	1433611.689	754807.1934	19064.12	5312.403	1905300	729870.8
2010	30285738.04	11507362.29	25839338.3	8228007.239	2231545.086	1345886.946	27335	6442	2723957	1145360
2011	45112969.77	16989211.76	37832011.47	12220763.41	2932665.902	1876712.829	40969.68	10230.04	3859597	1210083
2012	60156116.65	24910649.58	50072227.19	16767797.28	3140490.565	2044615.583	56870.94	14951.04	3966322	1001645
2013	79168011.99	34406603.05	65923559.57	23679571.28	4386501.385	2722539.379	76072.84	20859.12	5317691	1527145
2014	105397420.8	44338770.47	87710677.28	30791038.44	4640268.194	3354116.264	99527.41	28767.46	8670643	2291477
2015	121744797.8	58892487.67	102820767.7	40900293.46	5251107.373	4583859.31	115410.7	40170.43	10889995	2643908
2016	127188661.2	86048683.16	106491488.6	56058538.48	4744465.299	6387275.044	124235.4	60503.31	13630601	3407420
2017	135770910.7	112718194.7	116842250.3	79951301.97	5780130.894	11131655.56	125898.5	79314.57	20308802	7266105
CAGR	0.33	0.42	0.34	0.41	0.25	0.43	0.37	0.46	0.39	0.38

Source: Own Estimation

The public sector bank (PSB) total assets was 434295.9 million in 2005 which rose to 135770910.7 million by 2017 with an annual growth rate of 33%. Similarly, private sector banks (PrSB) total assets was 1591079.7 million in 2005 but it increases to 112718194.7 in 2017 with an annual growth rate of 42%. This means that the total assets of PrSBs are growing faster than the PSBs. Si ıarly, the Deposits of PrSB was 1203108.7 million in 2005 which increases to 79951301.9 million in 2017. In case of deposits also the PrSB are having a higher growth with a CAGR value of 41% while the same for PSB is 34%. Likewise, as shown in the table 3.1, the demand deposits of PrSB is much higher than the PSBs with an annual growth rate of 43%. The total advances of both sector banks are also growing significantly. The total advances of private sector bank were 79314.57 million in 2017 and 125898.5 million for the public sector banks.

However, in case of liquid assets the public sector banks are at a better position with holding 20308802 million liquid assets in 2017 while the private sector banks have 7266105 million of assets as liquid within its disposal. The CAGR value for liquid assets is 39% for public and 38% for the private sector banks which means although public sector banks assets, deposits and advances are not growing at a high rate compared to private sector banks but still their liquid assets growth is more than the private sector banks.

To study liquidity four indicators has been calculated which are the liquid assets to total assets, liquid assets to total deposits, liquid assets to demand deposits and total advances to total deposits. These ratios are obtained for the study period and

their mean, standard deviation and coefficient of variation are calculated. The following sections discuss the ratios.

3.2.1 Liquid assets to total assets

Liquid asset is the sum of cash in hand, balance with RBI, balance with other banks in India and abroad and money at call or short notice. This liquid asset to total assets ratio shows the capability of bank to absorb liquidity shocks. When the ratio is higher, we can say that the bank is in good liquidity position.

Table 3.2

Ratios of Liquid Assets to Total Assets (in %)

Year	PSB	PrSB
2005	8.79	8.77
2006	10.39	6.75
2007	11.02	11.05
2008	10.94	10.66
2009	9.33	7.95
2010	8.99	9.95
2011	8.55	7.12
2012	6.59	4.02
2013	6.71	4.43
2014	8.22	5.16
2015	8.94	4.48
2016	10.71	3.95
2017	14.95	6.44
CAGR	0.04	-0.02
Mean	9.55	6.98
SD	2.16	2.55
CV	22.65	36.36

Source: Own Estimation

The table 3.2 shows bank sector wise mean, standard deviation and coefficient of variation of liquid assets to total assets of public and private banks. Public sector banks have low standard deviation and coefficient of variation compared to private sector banks which signifies that public sector banks are more consistent in managing more liquid assets over total assets. Moreover, the CAGR values also show public sector banks to have higher growth in their liquid sets to total assets ratio. The figure below shows the trend of liquid assets to total assets ratio of both banks over the years.

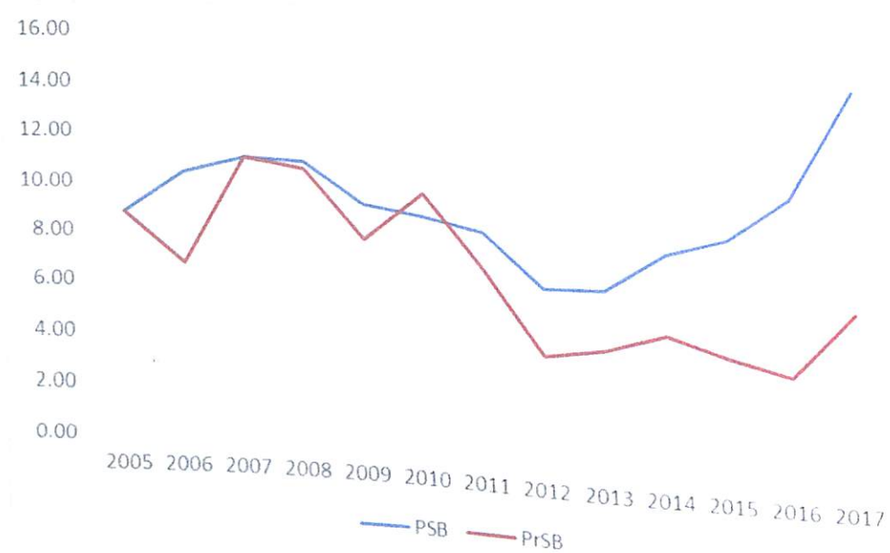

Fig 3.1: Trend of Ratios of Liquid Assets to Total Assets

The mean values for liquid assets to total assets for public bank is 9.5 and for private sector bank is 6.9. Therefore, public sector banks mean value is greater than that of private sector banks but to check whether the difference is statistically significant or not, t test is done and the results are shown in table 3.3

Table 3.3

T test results for Liquid Assets to Total Assets

	PSB	PrSB
Mean	9.553322	6.985376
Variance	4.685661	6.451906
Observations	13	13
Hypothesized Mean Difference	0	
Df	23	
t Stat	2.774358	
P(T<=t) two-tail	0.010786	
t Critical two-tail	2.068658	

Source: own estimation

Since, p value is less than alpha (0.01<0.05), it indicates that the both banking sector differs significantly in case of their liquid assets to total assets ratios.

3.2.2 Liquid assets to Total Deposits

This ratio measures the total liquidity available out of the total deposits of commercial banks. Here deposits include demand deposits, saving deposits, term deposits and deposits of other financial institutions. This ratio indicates the ability of banks to meet the unexpected deposit withdrawal by its customers with the liquid assets from its balance sheet.

Table 3.4

Ratios of Liquid Assets to Total Deposits (in %)

Year	PSB	PrSB
2005	11.38	11.61
2006	13.30	8.59
2007	13.56	14.41
2008	13.37	14.79
2009	11.10	11.07
2010	10.54	13.92
2011	10.20	9.90
2012	7.92	5.97
2013	8.06	6.44
2014	9.88	7.44
2015	10.59	6.46
2016	12.79	6.07
2017	17.38	9.08
CAGR	0.05	-0.02
Mean	11.54	9.67
SD	2.55	3.24
CV	22.09	33.52

Source: Own Estimation

Table 3.4 shows the CAGR value of the ratio was higher for public sector banks. Moreover, public sector banks are more stable in maintaining its liquid assets to total deposits ratio with a low coefficient of variation value of 22.09. This can also be explained through the fig 3.2 where the graph for public sector banks shows a higher trend.

Fig 3.2: Trend of Ratios of Liquid Assets to Total Deposits

The mean values for liquid assets to total assets for public bank is 11.5 and for private sector bank is 9.6 which means public sector banks mean value is greater than that of private sector banks but to check whether the difference is statistically significant or not, t test is done and the results are shown in table 3.5

Table 3.5

T test results of Liquid Assets to Total Deposits

	PSB	*PrSB*
Mean	11.54802	9.677967
Variance	6.508654	10.52739
Observations	13	13
Hypothesized Mean Difference	0	
Df	23	
t Stat	1.633581	
P(T<=t) two-tail	0.115963	
t Critical two-tail	2.068658	

Source: own estimation

Since, the p value is greater than the alpha value (0.11>0.05) indicate that there is no significant difference between the public and private sector banks in terms of liquid assets to total deposits ratio.

3.2.3 Liquid assets to demand deposits

The demand deposits are very liquid in nature and can be withdrawn without any prior notice. So, banks must invest these assets in highly liquid form. The ratio is calculated by dividing the liquid assets by total demand deposits of bank in a particular year. The higher is the ratio, higher is the ability of bank to meet the demand from deposits.

Table 3.6

Ratios of Liquid Assets to Demand Deposits (in %)

Year	PSB	PrSB
2005	100.5	91.93
2006	106.8	79.75
2007	117.6	133.60
2008	122.5	111.3
2009	132.90	96.69
2010	122.06	85.10
2011	131.60	64.47
2012	126.29	48.98
2013	121.22	56.09
2014	186.85	68.31
2015	207.38	57.67
2016	287.29	53.34
2017	351.35	65.27
CAGR	0.10	0.02
Mean	162.6	77.89
SD	76.84	25.13
CV	47.2	32.26

Source: Own Estimation

Table 3.6 shows that that the liquid assets to demand deposits ratio were more stable for the private sector banks with a low coefficient of variation value of 32.26. But the CAGR value is much higher for public sector banks than the private sector banks. The graphs shows that public sector banks variation is more because of the

increase in the ratio after 2013 to a great extent while private sector are maintaining low ratios.

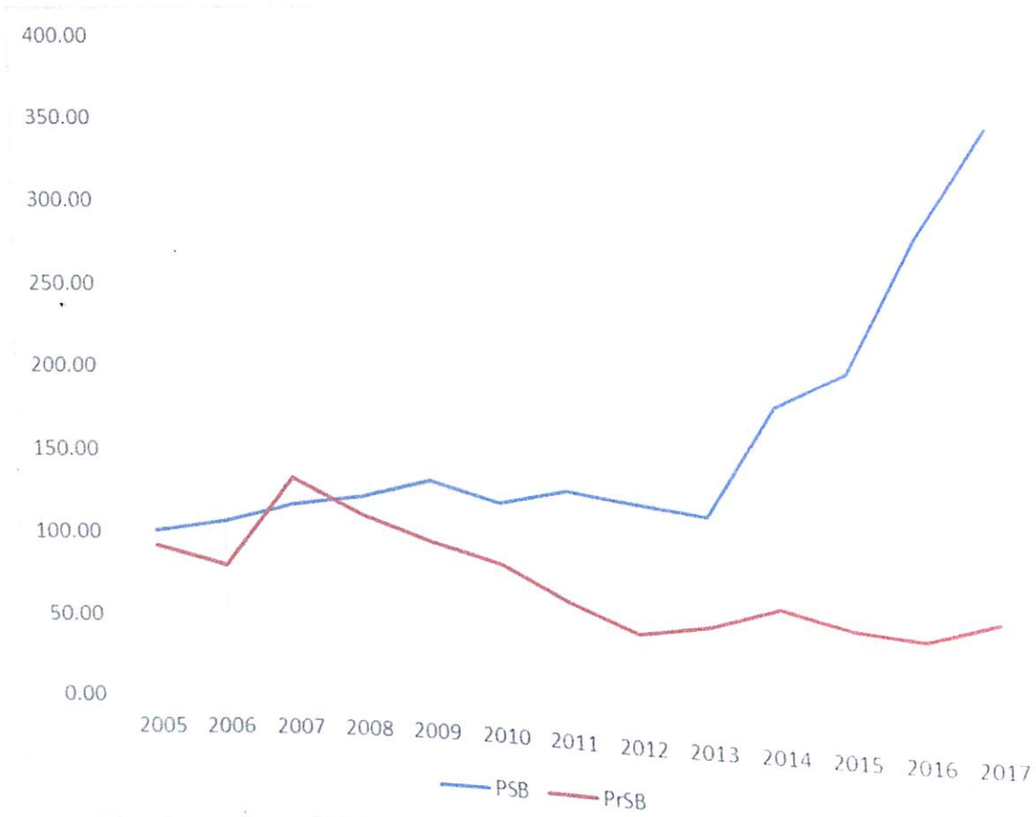

Fig 3.3: Trend of Ratios of Liquid Assets to Demand Deposits

The difference in mean values of both banking group is very large. The mean value for public sector bank is 162.6 and for private sector bank is 77.8. T test is done to check whether the difference is statistically significant. Results are shown in table 3.7

Table 3.7

T test results of Liquid Assets to Demand Deposits

	PSB	*PrSB*
Mean	162.6633	77.89025
Variance	5905.429	631.5805
Observations	13	13
Hypothesized Mean Difference	0	
Df	15	
t Stat	3.780419	
P(T<=t) two-tail	0.001814	
t Critical two-tail	2.13145	

Source: own estimation

Since, the p value is less than the alpha value (0.00<0.05) indicate that there is significant difference between the public and private sector banks in terms of liquid assets to demand deposits ratio.

3.2.4 Total advances to total deposits

The total advances to total deposits ratio is used to measure bank's liquidity by comparing bank's total loans to its total deposits for the same period. If the ratio is high, it means that the bank does not have enough liquidity to meet unforeseen cash requirements. However, a lower ratio signals that bank is not earning as much as it could be.

Table 3.8

Ratios of Total Advances to Total Deposits (in %)

Year	PSB	PrSB
2005	0.085	0.065
2006	0.10	0.0701
2007	0.10	0.073
2008	0.11	0.077
2009	0.11	0.080
2010	0.10	0.078
2011	0.10	0.083
2012	0.11	0.089
2013	0.11	0.088
2014	0.11	0.093
2015	0.11	0.098
2016	0.11	0.10
2017	0.10	0.09
CAGR	0.02	0.03
Mean	0.10	0.085
SD	0.007	0.012
CV	7.23	14.51

Source: Own Estimation

Table 3.8 shows that public sector banks have both low standard deviation and coefficient of variation value than the private sector banks. Therefore, Public sector banks are found to be more consistent in managing their advances to deposits ratio. However, both the banks are maintaining stable total advance to total deposit ratio as shown in figure 3.4

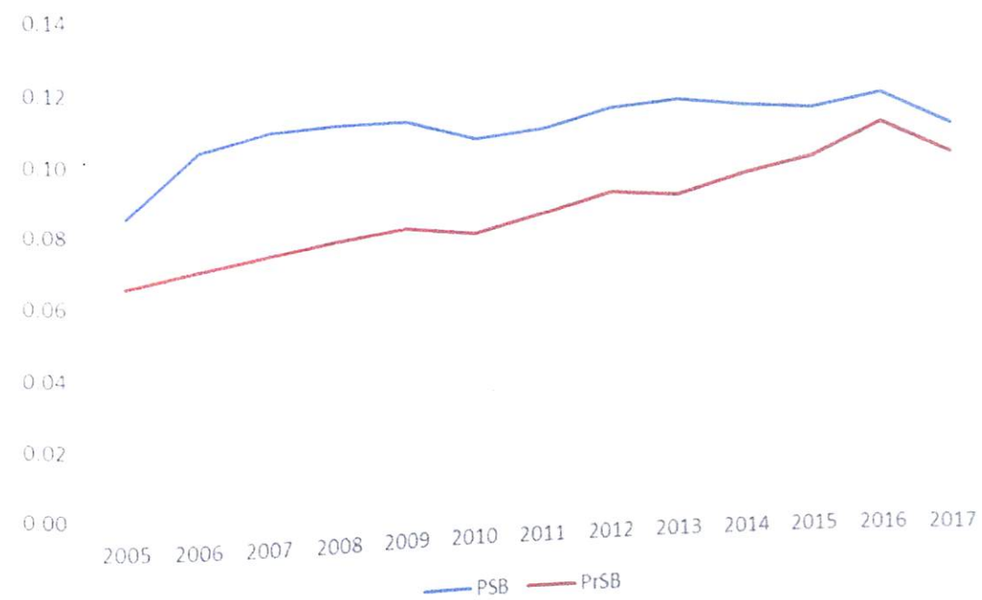

Fig 3.4: Trend of Ratios of Total Advances to Total Deposits

Moreover, T test is done to check whether the mean of both sectors is statistically different. Results are shown below

Table 3.9

T test results of Total Advances to Total Deposits

	PSB	*PrSB*
Mean	0.108804	0.08509
Variance	6.2E-05	0.000152
Observations	13	13
Hypothesized Mean Difference	0	
Df	20	
t Stat	5.838546	
P(T<=t) two-tail	1.0305	
t Critical two-tail	2.085963	

Source: own estimation

Since, the p value is greater than the alpha value (1.03>0.05) indicate that there is no difference between the public and private sector banks in terms of total advances to total deposits ratio.

From the aforesaid analysis, it is clear that the public sector banks are more consistent in maintaining its liquid assets reserves over the years as the indicators shows public sector banks to be more stable than the private sector banks with a low co efficient of variation. The mean value for private sector is found to be more in case of liquid assets to total deposits ratio than the public sector banks while the other indicators have higher mean value for public sector banks. The CAGR of liquidity is much higher for public sector banks than the private sector banks. The growth in liquid assets to total assets is 40% for public sector banks while the same for private sector banks turns out to be -20% which clearly shows that the liquid assets reserve of public sector bank is growing to a large extent than the private sector banks.

3.3 Profitability of Public and Private Sector Banks

The profitability of the public and private sector bank is measured through return on assets, return on equity, net interest margin and operating profits ratios. All the indicators are converted into constant prices by taking 2010 as the base year.

3.3.1 Return on Assets

Return on assets (ROA) is defined as net income divided by average total assets. It shows bank's efficiency in managing its assets to generate earnings. This

ratio is also known as return on investment or ROI. It tells us what earning were created from invested capital or assets.

Table 3.10

Return on Assets (in %)

Year	PSB	PrSB
2004-2005	0.90	0.87
2005-2006	0.79	0.89
2006-2007	0.89	0.82
2007-2008	1.02	1.00
2008-2009	1.05	0.99
2009-2010	0.99	1.27
2010-2011	1.06	1.59
2011-2012	0.77	1.83
2012-2013	0.54	2.09
2013-2014	0.20	2.138
2014-2015	0.13	2.21
2015-2016	0.09	1.75
2016-2017	0.02	1.32
Mean	0.65	1.44
SD	0.40	0.51
CV	61.37	35.75
CAGR	-0.26	0.03

Source: Own Estimation

As per the table the private sector banks are showing a low coefficient of variation value of 35.75 than the public banks which implies that the private sector

banks are getting stable return on their assets. Moreover, the annual growth rate of profit is very high of private sector banks. Public sector banks due to the increasing amount of non performing assets are facing negative returns on assets. According to the 2016 reports, 3.5% of total assets of public sector banks constitute NPA which means this percent of assets are not generating any returns to the bank whereas the same for private sector bank is only 0.9%. The figure below showing ROA of both banking group also shows the graphs of public and private sector banks are far away from each other. While the private sector banks are showing growth over the years but the public sector bank is not able to earn returns out of it assets.

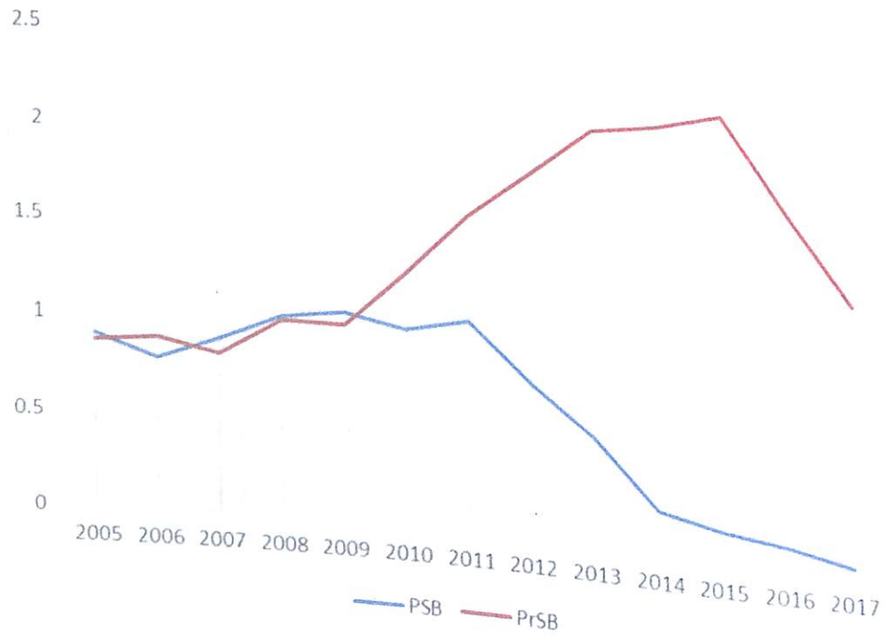

Fig 3.5: Trend of Return on Assets

The mean value of public sector bank is 0.65 and for private sector bank is 1.44. To test whether the difference is statistically significant or not, t test has been done and the t test results are as shown in table 3.11

Table 3.11

T test results of Return on Assets

	PSB	*PrSB*
Mean	0.655049	1.447045
Variance	0.206351	0.059633
Observations	13	13
Hypothesized Mean Difference	0	
Df	18	
t Stat	-4.6008	
P(T<=t) two-tail	0.000222	
t Critical two-tail	2.100922	

Source: own estimation

Since, the p value is less than the alpha value (0.00<0.05) indicate that there is significant difference between the public and private sector banks in terms of return on assets.

3.3.3 Return on Equity

Return on equity (ROE) is a measure of financial performance obtained by dividing net income by shareholder's equity. The price of shares largely depends on ROE in the absence of speculation. It shows bank's profitability from the viewpoint of shareholders. The banks' ability to attract capital depends on ROE.

Table 3.12

Return on Equity (in %)

Year	PSB	PrSB
2004-2005	14.81	14.75
2005-2006	11.72	14.91
2006-2007	13.93	15.75
2007-2008	15.96	15.09
2008-2009	17.81	10.84
2009-2010	18.29	11.93
2010-2011	18.08	15.72
2011-2012	12.3	19.49
2012-2013	8.32	22.70
2013-2014	3.30	22.04
2014-2015	2.26	20.74
2015-2016	3.95	15.98
2016-2017	0.43	11.80
Mean	10.8	16.29
SD	6.48	3.86
CV	59.61	23.7
CAGR	-0.25	-0.018

Source: own estimation

Table 3.12 again shows private sector banks to more efficient than the public sector banks in earning returns on their shareholders equity. The mean value for private sector banks shows that these banks are in better earning position. Public sector banks have a huge downfall in their returns which is also depicted in the figure 4.6

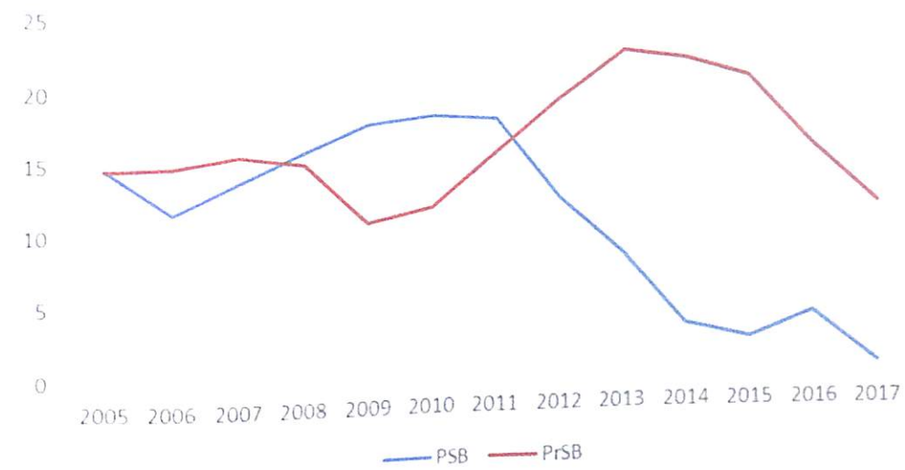

Fig 3.6: Trend of Return on Equity

Now to test the differences in the mean values of both banking group is statistically significant or not, t test is done.

Table 3.13

T test results of Return on Equity

	PSB	PrSB
Mean	10.86991	16.29098
Variance	83.98896	16.75708
Observations	13	13
Hypothesized Mean Difference	0	
Df	22	
t Stat	-1.02739	
P(T<=t) two-tail	0.315402	
t Critical two-tail	2.073873	

Source: own estimation

Since, the p value is greater than the alpha value (0.31>0.05) indicate that there is no significant difference between the public and private sector banks in terms of return on equity.

3.3.3 Net interest margin

Net interest margin (NIM) is a measure of the difference between the interest income generated by banks and the interest paid to their lenders relative to the amount of their assets. The NIM is helpful in measuring profitability of a banks' investing and lending activities once a specific time period. An increase in NIM increases the profitability on banks.

Table 3.14

Net interest margin (in %)

Year	PSB	PrSB
2004-2005	4.33	2.17
2005-2006	3.78	2.59
2006-2007	3.46	2.21
2007-2008	2.29	2.45
2008-2009	2.38	2.81
2009-2010	2.26	2.90
2010-2011	3.32	3.32
2011-2012	2.87	3.29
2012-2013	2.53	3.58
2013-2014	2.29	3.77
2014-2015	2.04	3.91
2015-2016	1.86	4.01
2016-2017	1.74	3.94
Mean	2.708	3.15
SD	0.79	0.66
CV	29.25	21.19
CAGR	-0.07	0.050

Source: own estimation

Table 3.14 shows public sector banks have standard deviation of .79 and high coefficient of variation of 29.25, implying that there is greater variation in profit and less uniform cash control. While the private banks with low standard deviation and coefficient of variation shows more consistency in profits. The figure 3.7 shows private sector banks with increasing margins over the years while the same for public sector banks is on a declining trend.

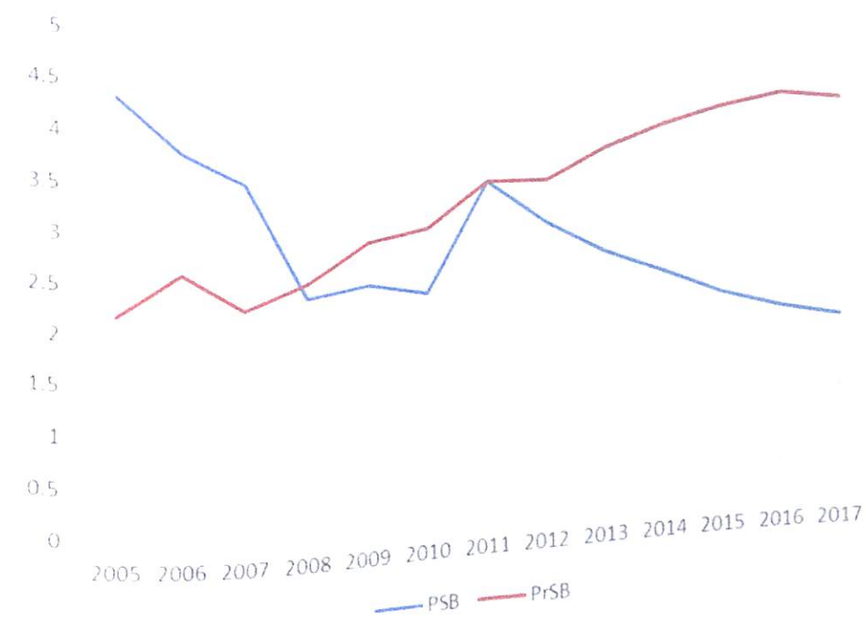

Fig 3.7: Trend of Net interest margin

T test is done to check the mean values of both banking groups statistically different or not. Results are as shown in table 3.15

Table 3.15

T test results of Net interest margin

	PSB	*PrSB*
Mean	2.708584	3.154475
Variance	0.123387	0.106121
Observations	13	13
Hypothesized Mean Difference	0	
Df	24	
t Critical one-tail	1.710882	
P(T<=t) two-tail	0.000319	
t Critical two-tail	2.063899	

Source: own estimation

Since, the p value is less than the alpha value (0.00<0.05) indicate that there is difference in profitability between the public and private sector banks as measured by net interest margin.

3.3.4 Operating profits

Operating profits measure a banks' profit on ongoing core business operations excluding deduction of interest and taxes. It is calculated by deducting operating expense from the net interest income. The operating expense for a bank mainly includes salaries, marketing, advertising expenses etc. This are the profits earned by a bank over its total interest income.

Table 3.16

Operating profits (in %)

Year	PSB	PrSB
2004-2005	2.73	1.39
2005-2006	1.82	1.42
2006-2007	1.94	1.61
2007-2008	1.72	1.94
2008-2009	1.95	2.25
2009-2010	1.88	2.67
2010-2011	2.10	2.47
2011-2012	1.95	2.35
2012-2013	1.69	2.60
2013-2014	1.44	2.905
2014-2015	1.23	3.05
2015-2016	0.927	3.19
2016-2017	1.31	3.40
Mean	1.75	2.40
SD	0.45	0.66
CV	25.86	27.45
CAGR	-0.059	0.07

Source: own estimation

The above table shows the coefficient of variation value of public sector bank to be lesser than that of private sector banks. But the private sector banks are having more growth on their operating profits than the public sector banks with a high CAGR value of 7%. Even though public sector banks have low CV value but the operating profits of private sector banks have an increasing trend over the years which means

these banks are more efficiently operating their business to earn desirable profits. The figure 3.8 shows the increasing trend of private sector banks.

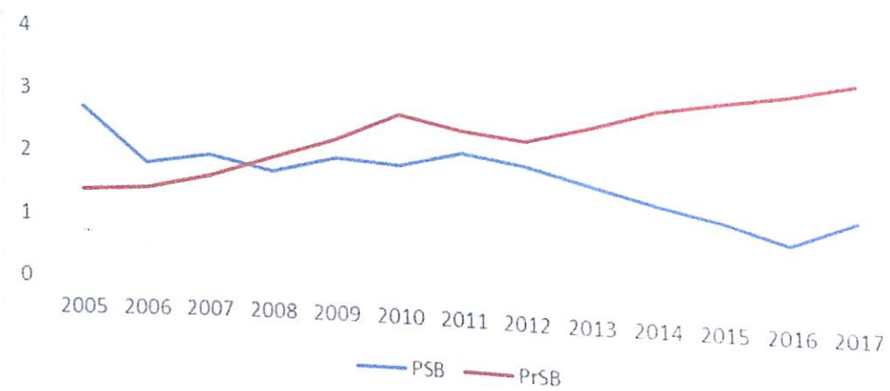

Fig 3.8: Trend of Operating profits

The mean operating profits is 1.75 for public sector banks and 2.4 for the private sector banks. To check whether this difference is statistically significant, t test is run.

Table 3.17

T test results of Operating profits

	PSB	*PrSB*
Mean	1.751655	2.40873
Variance	0.057215	0.130183
Observations	13	13
Hypothesized Mean Difference	0	
Df	24	
t Stat	-5.93614	
P(T<=t) two-tail	3.99006	
t Critical two-tail	2.063899	

Source: own estimation

Since, the p value is greater than the alpha value (3.9>0.05) indicate that there is no significant difference in profitability between the public and private sector banks as measured by operating profits.

The above findings clearly depicts that private sector banks are more profitable than the public sector banks with greater mean value for all the four indicators of profitability over the years. The private sector bank shows a low coefficient of variation in their return on assets, return on equity and net interest margins and even though the public sector banks are having lower variation in operating profits, the CAGR value is much higher for private sector banks which means that private sector banks are earning more profits through their operations over the years. Moreover, the CAGR value for all the four indicators confirms that private sector banks are in far better profitability positions as compare to the public sector banks.

3.4 Conclusion:

The liquidity and profitability of Indian public and private sector banks are clearly reflected in the aforesaid analysis. This chapter answers to the first research question that there is very much differences between the public and private sector banks in terms of their liquidity and profitability positions. The results shows that public sector banks are more efficient in holding liquid assets as compare to private sector banks. Public sector banks can better absorb liquidity shocks and meet the unexpected deposits withdrawals. Private sector banks with an aim of making more profits are mobilizing most of its funds into risk weighted assets which yields more

return and less liquidity. Private sector banks are in more profitable position than the public sector banks. Public sector banks with increasing non performing assets are experiencing negative return on their assets in recent years which are deteriorating their profits. Private sector banks are more efficiently managing their assets and equities. Also the business operations of private sector banks are more efficient than the public sector banks which enable them to earn more profits

CHAPTER IV

DETERMINANTS OF BANK LIQUIDITY OF PUBLIC AND PRIVATE SECTOR BANKS

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DETERMINANTS OF BANK LIQUIDITY OF PUBLIC AND PRIVATE SECTOR BANKS

4.1 Introduction:

Many economist regards liquidity as the lifeblood of a financial institution. Banks liquidity undoubtedly plays as a lever in the capacity of banks to provide funds in the economy. It is the availability of funds or the assurance of the availability of funds to meet banks cash flow commitments including the off balance sheet cash flow item whenever they fall due. When a bank can honor in full all its financial obligations, it develops a sense of customer's loyalty and satisfaction. On the other hand, a poor liquidity level could lead to failure of banks to meet their obligations. In such situations, customers losing their confidence on bank may engage in a run on the bank. A study of the variables affecting liquidity therefore becomes necessary owing to the importance liquidity holds for a bank. Studies of Melese (2015), Kaur and Sharma (2017), Pushkalaet. al (2017) have shown liquidity of a bank increases with an increase in their assets, capital adequacy ratio and deposits. The present study tries to identify the determinants of liquidity of public and private sector banks operating in India.

4.2 Theoretical Framework:

There are many bank related and macroeconomic variables that affects the liquidity of banks. This section deals with some of the important bank specific variables and their relationship with liquidity based on theories and concepts. The variables are bank size, profitability, cost of fund, de· ·sits, asset quality and capital adequacy ratio. Bank Size is considered to be one of the most important variables determining liquidity. The 'Too big to fail' hypothesis argues that bank size is negatively correlated with liquidity. Bigger banks tend to hold less liquid assets because of the expectation of liquidity assistance from the lender of last resort in case of liquidity shortage. However, small banks have higher liquidity ratios. Shen et al. (2009) found that with several branch openings, increases the liquidity risk exposure coupled with huge financial commitments. Large banks can mobilize their deposits with less difficulty and are able to grant more loans. Studies of Vodova (2011), Singh and Sharma (2016) found a negative relationship between bank size and liquidity.

Profitability as measured by return on equity shows the generation of income of a bank. Bank with higher profits may tends to involve themselves more in risky strategies that can lead to liquidity problems. Studies of Vodova (2011), Sheefeni (2016) discovered that liquidity level decreases with the increase in profitability. However, some studies concluded that profitability affects bank's liquidity positively (Singh and Sharma, 2016; Vodava, 2013). Banks with higher profitability may have more liquidity because the additional returns are not always distributed as soon as

they are obtained. While banks facing lower returns have low retained earnings which negatively impact its liquidity level.

Deposits are the major source of bank's fund and when there is unexpected withdrawal of cash by its depositors, bank's face liquidity problems. Diamond and Dybviz (1983), banks' with adequate deposits can insure the liquidity of firms with short term debt to prevent any liquidity crisis. Deposits of bank were found to be a significant determinant of bank's liquidity in many studies. Kaur and Sharma (2017) Pushkala, Mahamayi, Venkatesh (2017) discovered that banks with higher deposits maintain larger liquidity position.

Cost of funds also plays important role in determining liquidity. To meet sudden demand for cash, banks are sometimes forced to borrow from the central bank and interbank markets. If the funding cost increases, banks tend to keep more liquid asset with them. Munteanu (2012), Qin and Pastory (2012), Singh and Sharma (2016) found a positive correlation between cost of funding and liquidity level of commercial banks.

Asset quality as measured by non-performing loan is a significant factor affecting liquidity. (Mugenyeh, 2009; Vodova, 2011; Belad, Bellouma and Omri, 2016). Non performing loans are those loans for which the borrower is not making any payment and both the interest and principal amount remain unpaid. Huge non performing loan can be very dangerous to a bank and the depositors and investors losing their confidence on the bank may start a bank run which can cause severe liquidity problems. The loan portfolio quality has a direct impact on bank's financial

performance and hence banks with higher amount of non performing loans are more likely to face liquidity problems.

Capital adequacy measures banks strength. It helps banks to withstand losses during the crisis period. The capital adequacy ratio guarantees stability to the financial system by lowering the risk of insolvency. Moreove it reduces the probability of liquidity risk. However, Roman and Sargu (2015) argue that bank capital and liquidity is negatively related because when banks have higher capital ratio, the shareholders will pressurize the management to increase the profitability. To do so banks will grant more loans at high interest rates through transferring their liquid assets into loans. Vodova (2011), Sheefeni (2016) and Mahmud (2016) found a positive co-relation between capital adequacy and liquidity in their respective studies.

4.3 Research Methodology:

To identify the factors affecting liquidity of both public and private sector banks, the technique of panel data is used. In the study balanced panel data of Indian public sector and private sector banks from the period pertaining from 2005-2017 has been considered. Hausman test was applied to check whether to select the fixed effect estimates or random effects estimates for the given set of data. Fixed effect estimates are usually correlated with the regressors (1. The dependent variable considered in this study is liquidity which is defined as liquid asset (sum of cash in hand, available balance with RBI, balances with other banks and money at call short notice) over total assets.

Model specifications

Based on the theoretical framework, the following model has been formed to run our regression for public and private sector banks separately

$$LIQ_{it}=\alpha_{it}+\beta_1 SIZE_{it}+\beta_2 DEP_{it}+\beta_3 CoF_{it}+\beta_4 NPA_{it}+\beta_5 CAR_{it}+\beta_6 ROE_{it}+\varepsilon_{it}$$

Where $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are the co-efficients of determinant variables and ε is the error term. A panel with i representing bank and t representing time (year) is constructed. The data comprised 21 public sector banks and 19 private sector banks separately within a time period of 2005-2017. The total number of observation is 273 for public and 247 for private sector banks.

- LIQ = Liquid assets/Total assets

Independent Variables:

- Size= Bank Size
- DEP= Deposits
- CoF= Cost of funds
- NPA= Net Npa (assets quality indicator)
- CAR= Capital Adequacy ratio
- ROE= Return of equity (Profitability indicator)

i represents Bank and t represents time (year)

Specification of the variables

The table below shows the independent variables and dependent variables and their measurement

Variable	Measurement
Dependent variable	
Liquidity	Liquid asset/Total asset (in million)
Independent variables	
Bank Size	Logs of total assets
Deposits	Sum of demand, saving and term deposits. (in million)
Funding Cost	Total interest expense/ total liability (in%)
Profitability	Return on Equity (in %)
Asset Quality	Net NPA/Net Advances (in %)
Capital Adequacy ratio	Tier I + Tier II capital (in %)

4.4 Analysis for Public Sector Banks:

As a first step descriptive statistics of the data is given in table 4.1. The table shows mean, standard deviation, minimum and maximum value for all the variables used in the study for the period 2005-2017. The total no. of observation is 273

Table 4.1

Descriptive statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
Liquidity	273	.0850348	.0302572	.0382919	.236251
Bank size	273	445.9627	6962.815	11.96512	112286.2
COF	273	6.080345	.9204936	4.234837	8.159767
NPA	273	2.491923	2.599279	.15	13.99
Deposits	273	1586338	1280244	141706.6	6217040
ROE	273	11.18846	10.19594	-23.23493	31.62095
CAR	273	12.2585	1.303906	9.21	18

Source: Own estimation

The Hausman test was done to choose the appropriate model between fixed effects and the random effects model. The null hypothesis is that the preferred model is random effects with the alternative hypothesis being the model is fixed effect. If the p value is less than 0.05 we reject the null hypothesis and choose the fixed effect model.

Table 4.2

Hausman test results

Test Summary	Chi.sq. Statistics	Chi Sq. d.f.	Prob.
Cross Section Random	5.39	4	0.2494

Source: Own estimation

Results shows the p value is greater than the conventional significance level of 5% and thus we cannot reject the null hypothesis and accordingly the appropriate model for our study is random effect model.

Table 4.3

Diagnostic tests

a. VIF

Variable	VIF	1/VIF
ROE	4.15	0.240678
NPA	3.96	0.252633
CAR	1.33	0.752527
Deposits	1.15	0.868089
COF	1.14	0.874273
Banksize	1.03	0.971889
Mean VIF	2.13	

b. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 12.12

Prob> chi2 = 0.0005

c. Breusch-Godfrey LM test for autocorrelation

H0: no serial correlation

Chi2= 29.068

prob>chi2= 0.000

Source: Own estimation

A series of diagnostics test was done. Firstly, multicollinearity was tested through the variance inflation factor (VIF). VIF is tested for all the variables included in the model and results clearly depicts that none of the variables are collinear as the VIF value is less than the threshold value of 10.

Secondly to detect heteroskedasticity, Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was performed. According to the results the p value is less than the 5% level of significance and therefore the null hypothesis of constant variance is rejected. Hence, the model suffers from the problem of heteroskedasticity.

Thirdly, to detect autocorrelation Breusch-Godfrey LM test for autocorrelation was performed. Here the null hypothesis is that there is no serial correlation. But the p value is 0.000 which is less than the 5% significance level so we reject the null hypothesis and conclude that the model suffers from the problem of autocorrelation also.

The results of diagnostic test clearly depicts that the model suffers from both the problem of autocorrelation and heteroskedasticity and hence the robust regression is used which solves these two problems in panel data. The results of robust regression of random effect model is given in table 4.4

Table 4.4

Robust Regression Results

Variables	Co efficient	Standard error	P value
Bank Size	1.15007	5.43008	0.022
Deposits	0.09461	0.041009	0.048
ROE	.0003903	.0004314	0.375
COF	-.0140618	.0027083	0.000
NPA	-.0011629	.0021503	0.559
CAR	-.0006185	0014604	0.650
Cons_	.1830381	.0268308	0.000
R square = 0.4678			
No. of observation = 273			
Prob(f statistic) = 0.0000			

Source: Own estimation

The regression results show a negative relation between banks liquidity and the capital adequacy ratio. This association can be attributed to the shareholders asking for higher profits. To meet the shareholder's requirement of high profitability, banks have to invest in illiquid assets which give higher return and less liquidity. Moreover, the coefficient of capital adequacy ratio is not statistically significant. The bank size is found to be significantly affecting liquidity positively. Similar results were also found by Melese, (2015) and Jhat et al (2018) in their respective studies. The results does not support 'the too big to fail' hypothesis. Again, the coefficient of NPA to net advances showed a negative relationship with liquidity. This means an increase in non -performing assets would lead to a decrease in the liquidity level of banks. Moreover, this result is not statistically significant.

Further, the regression analysis displays a negative relationship between profitability as proxied by ROE and liquidity. This can be due to the fact that to earn more profits, banks have to invest in illiquid assets that give higher returns. The relationship between ROE and liquidity is not statistically significant. COF and liquidity is found to be sharing a statistically significant negative relationship. This results was against the conclusion found by Vodova (2011), Jhat et al (2018) in their studies. Lastly, the coefficient of deposits is found to be positively affecting banks liquidity. The result is also statistically significant. Kaur and Sharma (2017), Pushkala et al (2017) discovered that banks with higher deposits maintain larger liquidity buffer.

4.5Analysis for Private Sector Banks

As a first step descriptive statistics of the data is given in table 3.5. The table shows mean, standard deviation, minimum and maximum value for all the variables used in the study for the period 2005-2017

Table 4.5

Descriptive statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
Liquidity	247	.0897004	.053717	.036	.328
Bank size	247	12.61745	1.477403	9.071	15.972
COF	247	6.493113	1.148[illegible].06	2.295	8.889
NPA	247	1.249399	1.161608	.01	6.34
Deposits	247	614960.5	1003951	6630.345	6436397
ROE	247	12.73325	9.504917	-63.787	25.79
CAR	247	14.86134	4.936096	9.58	56.41

Source: Own estimation

The hausman test was done to choose the appropriate model between fixed effects and the random effects model. The null hypothesis is that the preferred model is random effects with the alternative hypothesis being the model is fixed effect. If the p value is less than 0.05 we reject the null hypothesis and choose the fixed effect model.

Table 4.6

Hausman test results

Test Summary	Chi.sq. Statistics	Chi Sq. d.f.	Prob.
Cross Section Random	1.51	5	0.9123

Source: Own estimation

Results show the p value is greater than the conventional significance level of 5% and thus we cannot reject the null hypothesis and accordingly the appropriate model for our study is random effect model.

Table 4.7

Diagnostics tests

a. VIF

Variable	VIF	1/VIF
ROE	2.00	0.500345
NPA	2.20	0.454239
CAR	1.21	0.829622
Deposits	3.37	0.296509
COF	1.12	0.895379
Banksize	3.63	0.275457
Mean VIF	2.25	

b. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 156.68

Prob> chi2 = 0.0005

c. Breusch-Godfrey LM test for autocorrelation

H0: no serial correlation

Chi2= 77.283

prob>chi2= 0.000

Source: Own estimation

A series of diagnostics test was done. Firstly, muticollinearity was tested through the variance inflation factor (VIF). VIF is tested for all the variables included in the model and results clearly depicts that none of the variables are collinear as the VIF value is less than the threshold value of 10.

Secondly to detect heteroskedasticity, Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was performed. According to the results the p value is less than the 5% level of significance and therefore the null hypothesis of constant variance is rejected. Hence, the model suffers from the problem of heteroskedasticity.

Thirdly, to detect autocorrelation Breusch-Godfre· LM test for autocorrelation was performed. Here the null hypothesis is that there is no serial correlation. But p valure is 0.000 which is less than the 5% significance level so we reject the null hypothesis and conclude that the model suffers from the problem of autocorrelation also. The results of diagnostic test clearly depicts that the model suffers from both the problem of autocorrelation and heteroskedasticity and hence the robust regression is used which solves these two problems in panel data. The results of robust regression of random effect model is given below

Table 4.8Robust Regression Results

Variables	Co efficients	Standard error	P value
Bank Size	-.0204296	.006239	0.001
Deposits	0.45209	0.05200	0.384
ROE	-.0001069	.0003113	0.731
COF	-.0030536	.0017768	0.086
NPA	.0000263	.0027786	0.992
CAR	.0021681	.0002236	0.000
Cons_	.3329525	.0693229	0.000
R square = .2871			
No. of observation = 247			
Prob(f statistic) = 0.0000			

Source: Own estimation

The regression result shows a positive relationship between banks liquidity and profitability. Banks with higher amount of returns may have more liquid assets as the returns cannot always distribute as soon as they are obtained. However, this result was not statistically significant. The cost of funds was found to be significantly affecting bank`s liquidity. The relationship was negative. This result does not follow the prediction that with increasing funding cost banks raises their liquid assets buffer. Non-performing loans was found to be positively related to private bank's liquidity. Similar result was obtained for Slovakian commercial banks by Vodova (2011). However, the result was not found to be statistically significant.

The capital adequacy ratio was significantly affecting bank's liquidity positively. As banks capital ratio increased banks liquidity level also increased. This result is similar to studies of Vodova (2011). Sheefeni (2016). Capital adequacy ratio guarantees stability to financial system by lowering risk of insolvency which in turn reduces liquidity risk.

The regression result shows a negative relationship between bank size and liquidity. This result was also statistically significant at 5% significance level. This result is due to the fact that large banks can mobilize their deposits with less difficulty and are able to grant more loans which reduce its liquidity level. Studies of Vodova (2011); Singh and Sharma (2016) also found a negative relation between banks size and liquidity. Deposits of banks were found to be positively affecting liquidity in case of private banks. However, the result was not statistically significant.

4.6 Conclusion:

The panel data regression results show that the determinants of liquidity vary for both banking groups. Therefore, the answer to the second research question is that the factors determining liquidity differs between the public and private sector banks. Bank size as measured by logarithm of total assets is significant determinant of liquidity of both public and private sectors banks. But in case of public sector banks with an increase in size, liquidity level also raises as the results shows a positive association. Public sector banks with an increase in their size, increases the amount of liquid assets adequately to manage liquidity risk. However, private sector banks relying more on financial markets with their increasing size holds less liquidity (Lastuvkova, 2016). Likewise with increase in deposits, public sector bank liquidity level rises significantly as compared to private sector banks. Capital adequacy ratio guarantees stability reducing the risk of insolvency. A bank equipped with capital can meet its short term and financial obligations without any difficulty. Private sector banks with more capital adequacy can therefore maintain better liquidity positions. However, this ratio is not a significant determinant for public sector banks.

Moreover, the profitability and non performing assets shows insignificant results for both the sectors. This can be attributed to the fact that the additional returns earned might not be distributed as soon as they are obtained. Similarly, the non performing assets may not affect liquidity if the funds are still available through deposits but loans are not increasing at the same time, the situation can be controlled.

CHAPTER V

DETERMINANTS OF BANK PROFITABILITY OF PUBLIC AND PRIVATE SECTOR BANKS

CHAPTER V

DETERMINANTS OF BANK PROFITABILITY OF PUBLIC AND PRIVATE SECTOR BANKS

5.1 INTRODUCTION:

Banks finance the economic needs of the economy. Increasing profitability signals better performance of the banking sector. It denotes ability of banks to earn sufficient return on capital and employees used in business operations. According to a RBI report of 2016, profitability of Indian Scheduled Commercial banks are gradually declining. Indian banks are experiencing major hurdles in the dynamic environment in the past few years. In order to maintain financial stability and absorb negative shocks, it is necessary to determine the factors influencing the overall performance of Indian banks. The present study tries to find out the internal factors affecting profitability of banks in India. There are numbers of studies on the profitability analysis of banks. Some studies specify returns on assets and return on equity as profitability measure and assess the impact of internal and external factors on profitability. Moreover, net interest's margins, operating profits are also taken as proxy for profitability in some studies. One of the basic measures of profitability is return on assets which corrects for bank size. It gives useful information on profitability of banks. The present study tries to find out the determinant of profitability measured through ROA.

5.2 Theoretical Framework:

Based on theories and concepts some important bank specific variables are discussed here with their effects on profitability of banks.

Bank size is an important determinant of profitability. For the banking sector the existence of economics and dis economics of scale are decided through the size of total assets of a bank. Bank size is measured by the logarithm of total assets to keep it consistent with other variables. Larger banks enjoy more economics of scale which help them to earn more return. Arellano and Bond (1991) postulated that banks can increase their profitability with the cost advantages they experience through their growing size. However, Regehr and Sengupta (2016) bank size increases bank's profitability but at a decreasing rate. A firm enjoys economics of scale up to a certain point and then dis economics of scale begin to operate. This means that profitability increases only up to a level and then disses economics of scale set in. Thus, literature has both the views regarding the relationship between profitability and bank size.

Bank with adequate capital are more capable of handling losses and risk of shareholders. Capitalized banks are save to meet its financial obligations. A bank can adhere to the regulatory capital standards when it is equipped with high amount of capitals and hence advance more funds as loan increasing its profit-share. Moreover, the fear of going bankrupt is also minimal reducing their funding cost and increasing profitability. (Burger 1995, Bourke 1989). Henceforth, capital adequacy ratio is also a key factor affecting profitability.

Another variable considered under study is non- performing assets. An asset for which the interest and the principal amount remain overdue for 90 days is called non performing asset (NPA). The NPA result lower profitability for a bank. With increasing NPA, banks risk taking capacity reduces and it becomes difficult to invest on risky assets. Nonperforming assets have opportunities costs, the non interest earning assets could have been invested somewhere else to earn more. Moreover, cost is also invested in attempts to recover the bad loans.

Loans are the main source of earning for commercial banks. Deposits creates loan and so higher the deposits higher will be the loan advancing by the bank resulting in higher internet margins. Therefore, there is a positive relation between banks profitability and deposits. But if a bank fails to transport its deposits into loan efficiently it might have adverse efforts on banks' profits.

Cost of Fund is determined by the rate of interest paid to depositors on financial products including saving accounts and time deposits. The spread between the cost of fund and the interest rate charged for its loan are one of the main sources of profit for a bank. As the cost of fund increases, profitability is reduced by a decline in gross margins. But SienPeng and Mansor (2017) argued that as banks main source of funding is deposits, higher the cost of funds; higher will be the lending rate that bank charges and hence profitability increases.

Last but on the least non interest income can also affect profitability to a great extent. Deregulation of interest rates during the reform has totally made the banking sector more competitive. Banks have started to diversify their business focusing more

on fee based activities. Non interest income (NII) expands banks source of earning and contributes to profit. Most researchers believe that NII can not only increase profit but also reduces the risk to a bank. While according to others, NII can increase income in the initial stage of development but as the bank business expands; the rising operating cost for earning NII decreases the net income. Lepetit et al. (2018) holds that if the proportion of commission in total income is much high, profit will decrease. Thus, literature has both the views on non-interest income.

5.3 Research Methodology:

The present study analyzes balanced panel data of Indian public sector and private sector banks from the period pertaining from 2005-2017). The dependent variable considered in this study is return on assets as an indicator of bank profitability. Independent variables included are – bank size, non interest income, cost of fund, deposits, non performing loan and capital adequacy ratio. Hausman test was applied to check whether to select the fixed effect estimates or random effects estimates for the given set of data.

Model specifications

The specification of determinants of profitability is to be estimated has been formulated in the following equation. The regression is run for public and private sector banks separately using the equation.

$$ROA_{it} = \alpha_{it} + \beta_1 SIZE_{it} + \beta_2 DEP_{it} + \beta_3 CoF_{it} + \beta_4 NPA_{it} + \beta_5 CAR_{it} + \beta_6 NII_{it} + \varepsilon_{it}$$

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ β_6 are the co-efficient of determinant variables and ε is the error term. A panel with i representing bank and t representing time (year) is constructed. The data comprised 21 public sector banks and 19 private sector banks separately within a time period of 2005-2017. The total number of observation is 273 for public and 247 for private sector banks.

- ROA= return on Assets (profitability indicator)

Independent Variables:

- Size= Bank Size
- DEP= Deposits
- CoF= Cost of funds
- NPA= Net NPA/Net advances
- CAR= Capital Adequacy ratio
- NII = Non interest income

i represents Bank and t represents time (year)

Specification of the variables

The table below shows the independent variables and dependent variables and there measurement

Variable	Measurement
Dependent variable	
Profitability	Return on assets (in %)
Independent variables	
Bank Size	Logs of total assets
Deposits	Sum of demand, saving and term deposits. (in million)
Funding Cost	Total interest expense/ total liability (in %)
NII	Non Interest Income (in %)
Asset Quality	Net NPA/Net Advances (in %)
Capital Adequacy ratio	Tier I + Tier II capital (in %)

5.4 Analysis for Public Sector Banks:

As a first step descriptive statistics of the data is given in table 4.1. The table shows mean, standard deviation, minimum and maximum value for all the variables used in the study for the period 2005-2017.

Table 5.1

Descriptive statistics

Variable	Observation	Mean	Std Dev.	Min	Max
ROA	273	.6499615	.5769929	-1.37	2.01
COF	273	6.080345	.9204936	4.234837	8.159767
NPA	273	2.491923	2.599279	.15	13.99
DEPOSITS	273	1586338	1280244	141706.6	6217040
CAR	273	12.2585	1.303906	9.21	18.16
NII	273	44416.53	173096	-1009.968	1440930
BANK SIZE	273	445.9627	6962.815	11.96512	112286.2

Source: Own estimation

The Hausman test was done to choose the appropriate model between fixed effects and the random effects model. The null hypothesis is that the preferred model is random effects with the alternative hypothesis being the model is fixed effect. If the p value is less than 0.05 we reject the null hypothesis and choose the fixed effect model.

Table 5.2

Hausman test results

Test Summary	Chi.sq. Statistics	Chi Sq. d.f.	Prob.
Cross Section Random	1.02	3	0.7972

Source: Own estimation

Result shows the p value is greater than the conventional significance level of 5% and thus we cannot reject the null hypothesis and accordingly the appropriate model for our study is random effect model.

Table 5.3

Diagnostics tests

a. VIF

Variable	VIF	1/VIF
NPA	1.44	0.696268
CAR	1.31	0.762989
Deposits	1.21	0.827748
COF	1.07	0.935085
NII	1.06	0.947510
Banksize	1.02	0.980895
Mean VIF	1.18	

d. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 20.16

Prob> chi2 = 0.0000

e. Breusch-Godfrey LM test for autocorrelation

H0: no serial correlation

Chi2 = 29.786

prob>chi2 = 0.000

Source: Own estimation

A series of diagnostics test was done. Firstly muticollinearity was tested through the variance inflation factor (VIF). VIF is tested for all the variables included in the model and results clearly depicts that none of the variables are collinear as the VIF value is less than the threshold value of 10.

Secondly to detect heteroskedasticity, Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was performed. According to the results the p value is less than the 5% level of significance and therefore the null hypothesis of constant variance is rejected. Hence, the model suffers from the problem of heteroskedasticity.

Thirdly, to detect autocorrelation Breusch-Godfrey LM test for autocorrelation was performed. Here the null hypothesis is that there is no serial correlation. But our p value is 0.000 which is less than the 5% significance level so we reject the null hypothesis and conclude that the model suffers from the problem of autocorrelation also.

The results of diagnostic test clearly depicts that our model suffers from both the problem of autocorrelation and heteroskedasticity and hence we use the robust regression which solves these two problems in panel data. The results of robust regression of random effect model is given in table 5.4

Table 5.4

Robust Regression Results

Variables	Co efficient	Standard error	P value
Bank Size	0.41307	001777	0.013
Deposits	-0.12008	0.01940	0.378
NII	-0.37108	0.051408	0.522
COF	-.0916332	.019705	0.000
NPA	-.1619706	.010713	0.000
Capital	.0600505	.0202409	0.002
Cons_	.9027311	.3799907	0.015
R square = 0.7514			
No. of observation = 260			
Prob(f statistic) = 0.0000			

Source: Own estimation

The cost of funds ratio in significant determinant of return on assets with negative relationship, which indicates that holding other variables constant: a unit change in the ratio will result in the decline of bank's profitability measured through ROA. These results are in contrast to the studies of SeinPeng and Mansor (2017). The non-performing assets of a bank as proxied by net NPA to net advances are affecting bank's profitability negatively. These results are significant at the 5% significance level as p value is less than 0.05. With increasing NPA, bank's risk taking capacity reduces and profits fall.

The regression results also showed a negative relationship between deposits and bank profitability. This result opposes the prediction. Public banks are not being successful to mobilize their deposits efficiently and hence not earning desired returns out of their deposits. However, the result is not statistically significant.

The non interest income is found to be negatively affecting public banks ROA. Some researches argue that NII can increase income in the initial stage of development. But as the bank business expands, the rising operating cost for earning NII decreases the net income. Moreover, the result is not significant at the conventional threshold level.

Further, the capital adequacy ratio displays a positive and significant relationship with bank's profitability. Francis (2013) also found a positive relation between profitability and bank capital. Banks equipped with high amount of capital can advance more funds as loans, increasing its profit. Bank size as measured by logarithm of total assets was found to be positively affecting bank's profitability. When bank's grows in size they enjoy economics of scale and cost advantages which allow them to increase their profit share.

5.5 Analysis of Private Sector Banks

The descriptive statistics of the data is given in table 4.5. The table shows mean, standard deviation, minimum and maximum value for all the variables used in the study for the period 2005-2017.

Table 5.5

Descriptive Statistics

Variable	Obs	Mean	Std Dev.	Min	Max
ROA	247	1.103482	.7070275	-3.38	2.13
COF	247	6.493113	1.148106	2.295	8.889
NPA	247	1.249399	1.161608	.01	6.34
Deposits	247	614960.5	1003951	6630.345	6436397
CAR	247	14.86134	4.936096	9.58	56.41
NII	247	31122.71	67477.73	17.859	484703.8
BANK SIZE	247	12.61745	1.477403	9.071	15.972

Source: Own estimation

The hausaman test was done to choose the appropriate model between fixed effects and the random effects model. The null hypothesis is that the preferred model is random effects with the alternative hypothesis being the model is fixed effect. If the p value is less than 0.05 we reject the null hypothesis and choose the fixed effect model.

Table 5.6

Hausman Test results

Test Summary	Chi.sq. Statistics	Chi Sq. d.f.	Prob.
Cross Section Random	22.20	4	0.0002

Source: Own estimation

Result shows the p value is less than the conventional significance level of 5% and thus we reject the null hypothesis and accordingly the appropriate model for the study is fixed effect model.

Table 5.7

Diagnostics tests

a. VIF

Variable	VIF	1/VIF
NPA	1.30	0.767619
CAR	1.19	0.842524
Deposits	3.44	0.290548
COF	1.14	0.878667
NII	1.05	0.953208
Banksize	3.61	0.277086
Mean VIF	1.95	

b. Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

chi2(1) = 158.81

Prob> chi2 = 0.0000

c. Breusch-Godfrey LM test for autocorrelation

H0: no serial correlation

Chi2 = 43.889

prob>chi2 = 0.000

Source: Own estimation

A series of diagnostics test was done. Firstly multicollinearity was tested through the variance inflation factor (VIF). VIF is tested for all the variables included in the model and results clearly depicts that none of the variables are collinear as the VIF value is less than the threshold value of 10.

Secondly to detect heteroskedasticity, Breusch-Pagan / Cook-Weisberg test for heteroskedasticity was performed. According to the results the p value is less than the 5% level of significance and therefore the null hypothesis of constant variance is rejected. Hence, the model suffers from the problem of heteroskedasticity.

Thirdly, to detect autocorrelation Breusch-Godfrey LM test for autocorrelation was performed. Here the null hypothesis is that there is no serial correlation. But p value is 0.000 which is less than the 5% significance level so we reject the null hypothesis and conclude that the model suffers from the problem of autocorrelation also. The results of diagnostic test clearly depicts that the model suffers from both the problem of autocorrelation and heteroskedasticity and hence the robust regression is used which solves these two problems in panel data. The results of robust regression of fixed effect model is given below

Table 5.8 Robust Regression Results

Variables	Co efficients	Standard error	P value
Bank Size	.0487391	.0446928	0.290
Deposits	0.1107	0.051408	0.044
NII	0.62107	0.028707	0.044
COF	-.0826657	.0312318	0.016
NPA	-.3910303	.0853393	0.000
Capital	.0148035	.0074379	0.062
Cons_	1.184612	.5393718	0.041
R square = 0.5919			
No. of observation = 247			
Prob(f statistic) = 0.0000			

Source: Own estimation

The regression results display COF to be negatively affecting bank's profitability. The result is also significant at the 5% significance level. Banks always try to keep cost of funds low in order to earn more profits. If banks have to pay more to their depositors then their profits will be reduced.

The ratio of non- performing assets to net advances is also negatively affecting private banks profitability. Banks with more loans for which no payment is made are not able to generate more profits. The non interest earned assets could have been invested somewhere else to earn profits. The result is also statically significant.

Again, the results shows non- interest income to be statistically significant for private sector bank's ROA. The relationship is positive which means with increasing non- interest income banks can generate more profits. Private Banks are able to generate more non -interest income. Yaksel et al (2018) also found similar results in his study for Soviet country banking sector. Further, the coefficient of capital adequacy ratio is found to be positively affecting bank's ROA. Banks with higher capital adequacy ratio are able to earn more profits. This result is also significant for private sector banks. Deposits of banks display a positive and significant relationship with bank ROA. This results contrast with the results of Javid (2016). Banks having more deposits within their disposals can earn more profits by mobilizing them into loans. The regression result also shows bank size to be positively related to banks profitability. Bigger banks with more assets can earn more profits through the cost advantage they enjoy. But this result is not statistically significant.

5.6 Conclusion:

This chapter give an answer to the third and last research question of the study that there is similarity among the determinants of profitability of public and private sector banks operating in India. The study depicts similar results for both public sector and private sector banks. The non performing assets which fails to generate return affects both private and public sector banks profitability negatively. Bank could have invested these assets somewhere else to generate returns. Moreover, the result for capital adequacy ratio also shows that profitability of banks shares a positive relationship with the ratio. A capitalized bank has lower probability of going bankrupt which reduces their funding cost and increases profitability. Similarly, cost of funds also shows same results for profitability of both sector banks. When cost of funds increases, banks will charge higher lending rates which will increase their profits. Deposits and non-interest income are sharing a positive association with profitability of private sector banks. But not significant for public sector banks which may indicate that public sector banks are not able to mobilise their deposits effectively. Moreover, mostly being a public sector bank, these banks do not charge a high rate for the services like debit and credit cards, locker facilities etc. it renders to its customers.

CHAPTER VI

SUMMARY AND CONCLUSION

CHAPTER- VI

SUMMARY AND CONCLUSION

The financial health of an economy can be measured through its banking business conditions. Bank plays an essential role for the development of agriculture, industry and trade. The liquidity and profitability level are the two important aspects that a bank has to consider while doing its business. The study has been concerned with the analysis of liquidity and profitability position of public sector and private sector banks operating in India. A comparison on both these leading sectors of the country can give a clear picture about the banking health of our country.

The entire study is completed in six chapters. This chapter concludes the finding of previous chapter along with the policy prescriptions based on the findings that can be helpful for banks.

The first chapter is an introductory one. In this chapter an overview of the Indian banking system along with the structure is presented. Some important concepts like liquidity, profitability are also discussed in the chapter. It also covers the objectives of the study, research questions, methodology employed to fulfill the objectives and the organization of chapters. The objective of the study is mainly to compare the public and private sector banks of India in terms their liquidity and profitability positions along with the factors influencing the liquidity and profitability of the banks. A panel data regression is done to find out the significant factors affecting both banking groups' liquidity and profitability.

The second chapter discussed the review of literature related to the present study. It includes the review of some of the major studies on the selected domain. The research gap is also identified in this chapter. In doing the review of existing literature it was found that the many bank specific variables share a significant relationship with bank liquidity and profitability. In case of Indian banking industry bank size, deposits, capital adequacy ratio are the significant factors affecting liquidity and profitability. However, most of the studies is limited to a one sector only without making a comparative study on different sectors. As the public and private sector banks are the most important part of the Indian banking industry, this study tries to make a comparative analysis of these sectors in case of their liquidity and profitability positions.

In the third chapter, the positions of public sector and private sector banks in terms of their liquidity and profitability level are analyzed. The liquidity level is measured through four selected ratios which are liquid assets to total assets, liquid assets to total deposit, liquid assets to demand deposit and total advances to total deposits. Likewise, profitability is measured through return on assets, return on equity, net interest margin and operating profit. The time period covered in the study is 2005-17. In terms of liquidity, public sector banks show better results than private sector banks. The public sector banks are having higher annual growth in their liquidity level than the private sector banks. Moreover, the liquidity of public sector banks is more stable over the years than the private sector banks. The trend lines of the liquidity ratios show an increasing trend for public sector banks. In case of

profitability positions, private sector banks are doing well than the public sectors banks. The increasing amount of non-performing assets are hindering the profits of public sector banks. These banks are not been able to earn returns out of their assets and in recent years the return on assets of public sectors banks are coming out to be negative. Along with this, the return on equity and net interest margin of private banks are also higher in comparison to the public sector banks. Thus, the private sector banks are in a better profitability positions than the public sector banks.

The fourth chapter deals with the determinants of liquidity of public and private sector banks. The factors influencing liquidity of public and private sector banks is analyzed through the panel data regression technique. The results for public sector banks show bank size, deposits and cost of fund to be the significant determinants of banks liquidity. Bank size and deposits affects liquidity positively while the cost of funds is found to be negative determinant of liquidity. Contrary to this, for private sector banks, banks size is found to be sharing a negative relationship with liquidity. Depending more on financial markets, private sectors banks hold less liquidity with increasing size. The capital adequacy ratio also significantly affects private sectors banks liquidity positively while this ratio is not significant for public sectors banks. The funding cost shares a negative relationship with liquidity of both banking groups. This means when the funding cost increases, banks keep lesser liquidity with themselves to cover the cost through investing in illiquid assets. In this way, the chapter points out the major determinants of public and private sector banks liquidity.

The fifth chapter contains the analysis done to satisfy our third objective. In this chapter, the factor influencing profitability of public and private sector bank is discussed. From the regression results, it is found that non-performing assets is a significant determinant of public and private sector banks profitability. With the increasing amount of assets that doesn't generate returns to bank; a bank ability to raise profits declines. Capital adequacy ratio and cost of funds are the two other important factors sharing significant association with public and private sectors banks profitability. An increase in banks capital adequacy ratio guarantees more profits through higher risk taking capacity. Similarly, when funding cost increases, bank charges higher lending rate on loans which enables them to earn more. The non interest income i.e. the income earned through other sources except interest affect profitability of private sector banks significantly in positive direction. Private sector banks charges higher fees for the services it renders than the public sector banks which helps them to earn significant profits.

Policy Prescriptions

Based on the findings the study, the study prescribes the following suggestions:

- Bank size, Deposits, capital, cost of funds are the significant drivers of both liquidity and profitability of Indian commercial banks. Hence, banks should focus on these variables which can improve their liquidity position as well as profitability. Through expanding its network and covering more people by way of opening more branches, banks can increase its assets and deposits

which will also be beneficial to them from the view point of liquidity and profitability positions. The mainstream banks often neglect the low income group people but it is recommended that the customer deposit base can be increased through providing access of product to more customers especially the low income earners.

- Profitability is the prime factor for survival of any business. The NPA is adversely affecting profits of both banking groups. Strict credit policy and debt collection policy should be undertaken to reduce the amount of bad debt. There should be a mechanism for the identification of loan defaulters and necessary actions must be taken against them. The government should put a limit on the amount of money that bank can lend.
- Capital Adequacy Ratio is significantly affecting both liquidity and profitability of private sector banks positively. So, private sector banks can further improve their profits through increasing capital intake.
- Deposits are found to be positively contributing to profits of private sector banks but it is an insignificant factor when we consider the public sector banks. So, public sector banks can also effectively channelize its deposits so as to earn profits.

Conclusion

The study is concerned with the analysis of liquidity and profitability of public and private sector banks in India. The preceding chapters clearly show the importance of studying banks liquidity and profitability. An attempt is made in the study to determine the factors and their influence on the liquidity and profitability of public sector and private sector banks through the technique of panel data regression. The results of regression clearly shows that the liquidity and profitability of public and private sector banks of India are influenced by many factors and their relationship with liquidity and profitability is not same for public and private sector banks. These differences in results can be mainly due to the heterogeneity in the business operations of both sectors. However, the non performing assets are found to be negatively affecting profitability of both sector banks at a high significance level. The profitability of banks can be increased through reducing the amount of bad loans.

The further works may identify the qualitative factors influencing liquidity and profitability. The effect of macroeconomic variables may also be examined. Research may be carried out to evaluate the measures undertaken by banks to mitigate liquidity risks.

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