

LIQUIDITY RISK MANAGEMENT IN INDIAN PRIVATE SECTOR BANKS

Mary George¹, Jinsu Ann Markose², Dr. Prakash³

¹P.G Student, Department of Commerce/(Christ Deemed to be University) Bengaluru, India

²P.G Student, Department of Commerce/ (Christ Deemed to be University) Bengaluru, India

³Assistant Professor, Department of Commerce/(Christ Deemed to be University)

ABSTRACT

ALM has attracted many researchers to carry out different studies, which were mainly focused on various aspects of ALM such as a tool for managing risks, caused by changes in the interest and liquidity position of the bank. This paper examines the asset-liability mismatches in the Indian private sector banks using the maturity gap analysis to understand the short-term & long-term liquidity patterns and strategies in maintaining the liquidity risk. A strong liquidity position in the banking industry is always essential. The probabilities of default in the banking industry will increase, in case the bank fails to manage their liquidity risk. The transformation in banking process has made it necessary to take up the practice of ALM as a strategic planning to survive in this competitive and risky environment. The present paper studies about how ALM is used as a tool for managing liquidity risk using RBI-prescribed Gap model in seven banks, namely, Axis Bank, Federal Bank, HDFC, ICICI, Kotak Mahindra, IndusInd, and Yes Bank. The findings of this paper conclude that nearly all the banks face a shortage of funds and are exposed to risk. In the case of few banks, ALM needs an improvement in reducing its current liabilities and increasing its current assets.

Keywords: ALM, Bankex, Gap analysis, Private Sector Banks Liquidity risk.

1. INTRODUCTION

Banks have a major role to play in the financial system, and they must be prudent in all ways to achieve constant growth. (Alan Bollard, 2011). The most important assurance for the bank is that the bank's assets should be notably more than the liabilities.(Elliott, 2014). Liquidity is an important aspect the banks have to cover after the recent financial crisis. It is the capacity of the bank to meet both expected and unexpected money at a reasonable expense and without acquiring any losses. Liquidity risk is the inability of a bank to meet its financial demands. It is

happening due to the bank's failure to convert their security assets to cash without a loss or lesser loss of capital and income in the business process (Manish Kumar, 2013). In a bank, the fund manager assesses the liquidity gap and manages it by adjusting the residual surplus or deficit balance. Asset Liability Management (ALM) is a powerful tool in managing liquidity risk in modern banking as it has both macro and micro level objectives (A. Karthigeyan, 2017). In the present scenario, there is liquidity and maturity problem in most of the banks and banks have to manage assets, liabilities and non-performing assets. Hence the banker's are forced to strictly manage their assets as well as their liability in equal, therefore in today's context the ALM is getting more importance among the bankers, researchers and policy makers.

2. OBJECTIVES OF THE STUDY

For fulfilling the above gap the researcher framed the objective as, to have an overview of liquidity risk in Indian Banks and to assess the liquidity risk management in selected private sector banks.

3. LITERATURE REVIEW

Asset-liability management helps in preparing the banks to face the emerging challenges. Many authors (Dharmendra Singh, 2016); (P. K. Jain, 2004); (Bassey, 2015); (Dr. R Umarani, 2015) (Bandyopadhyay, 2016) (R.BharathVajan, 2017) have highlighted the importance of ALM and liquidity risk.

In April 2017 policy, the Reserve Bank of India (RBI) made substantial changes in liquidity management—moving from a deficit to neutral liquidity. Indeed the objective, then, was to help banks transmit the RBI's rate cut to borrowers more quickly. However, after nine months, Indian banks are dealing with the problem in plenty, either in a situation of tight liquidity or excess liquidity, there is a need to ensure that the key policy repo rate is the operational rate. Few papers have addressed the issues related to bank liquidity and have offered some interesting viewpoints

(G Suresh, 2018) For examining the liquidity management practice in the banking sector generally, the GAP analysis was used .In most of the banks, the percentage of cumulative mismatch to cumulative outflow is not in tune within the RBI's prescribed upper limit which becomes a major challenge for Indian Banks, since the Indian Banks have not enforced such guidelines in totality

The study by (Parvinder Arora, 2007) stated that there are various techniques used to analyze the ALM practices like VAR, stress testing, Scenario Analysis, Ratio analysis, and GAP analysis. The GAP analysis is more appropriate to examine the ALM practices since non-availability of data's relating to 'statement of structured liquidity and 'statement of short-term dynamic

liquidity. (Pragathi K.M., 2018) conducted a study on the profitability position of Kotak Mahindra Bank. They used various methods to analyze the ALM practices like Duration Method, VAR, Value at risk method and Simulation Method

(Nallari, 2005) Examined the interest rate sensitivity using canonical analysis in Indian Banks and discussed the issues faced by Indian Banks from the period 1992-2004. It was found out that SBI and its associates were efficiently managed. (Singh, 2013) assesses the liability management and Interest rates risk in banks through duration analysis. The findings indicate that the short-term deposits are high and there is not much difference in the consumption of loans and advances.

(Shyam Lal Dev Pandey, 2010) Through a descriptive study examined the Analysis of Financial Position of ALM in Indian Banking Industry. For this study, the liquidity ratios of the banks were taken. From the research work carried out, it can be concluded that among the four banks taken under consideration, SBI on an average is the most profitable as far as the returns, earning/share, dividend and the net profits is concerned. Among the private sector banks taken into consideration, on an average, there is variance in the ratios calculated, ICICI and HDFC banks are performing well in some aspects. Therefore it can be seen how ALM is essential in the bank and can be concluded that the overall financial performance for any bank depends a lot on the credibility of its ALM team. In the case of a few banks, ALM needs an improvement in reducing its current liabilities and increasing its current assets and even NPA of the banks should also be monitored (Deene, 2015) stated that Asset-Liability Management can be used as a significant tool & technique to improve net interest income/interest spread by managing market risks so as to manage the liquidity of the bank effectively and efficiently. (R.BharathVajan, 2017) examined the profitability of banks using statistical tools like comparative statement, ratio analysis, mean, standard deviation, coefficient of variation. They concluded the study by telling that ALM is a daily process that should be managed otherwise it will cause harm to the banks in case of liquidity, profitability, and solvency as it is irreversible.

All the studies strongly conclude that the maturity of Indian bank deposits is shrinking over the years because of the narrowing liquidity premium paid by the banks for long-term deposits. This will be the major challenge for Indian banks. Further, they conclude that a proper structure for ALM in banks can be achieved only by following the RBI guidelines but the Indian banks have not imposed such guidelines in totality. By the above-given statements, we can confirm that this is the reason why Indian bank's NPA is increasing.

4. METHODOLOGY

For the present study seven banks were selected, which are listed in the BSE Bankex index. Since this study is related to liquidity risk management and if banks can manage risks like operational risk, business risk, market risk, and liquidity risk it will facilitate them to do well in the capital market, so the sample size was selected from the Bankex index. The chosen banks are HDFC Bank, ICICI Bank, Yes Bank, IndusInd Bank, Axis Bank, Kotak Mahindra Bank, and Federal Bank. The researcher has chosen only private banks which are listed in BSE Bankex. The required data for the present study consist of the assets and liabilities of a sample of banks with nation-wide operations from the study period 2013-14 to 2017-18. The necessary financial data is obtained from the Reserve Bank of India's website and their respective banks website. This study is carried out as per the guidelines of asset-liability management issued by RBI on scheduled commercial banks. This present study focuses on gap analysis on assessing liquidity risk of selected commercial banks with their Asset Liability Management techniques.

Construction of Data

Gap Analysis technique of asset-liability management is used to assess liquidity and interest rate risk. It measures the gap between rate sensitive Assets(RSA) and rates sensitive Liabilities(RSL)at a given date by grouping them into time buckets according to residual maturity period.

Thus, $Gap = RSA - RSL$; $Gap\ ratio = RSAs/RSLs$.. The positive gap indicates a surplus of funds because the maturing assets exceed maturing liabilities and negative gap suggests liquidity shortfall because maturing liability exceeds maturing asset

5. RESULTS AND INTERPRETATION

i). Axis bank

From the analysis of Table A1, it is observed that in the year 2014-15 in very short-term bucket (1-14 days) and long-term time bucket, that is, 1-3 years, 3-5 years and above 5 years, it showed a positive gap between RSA and RSL, this indicates that the bank has better long-term assets in comparison to its long-term liabilities. As a result, it suggests that there is no default risk for the bank but faces excess liquidity that has to be managed by investments. In the year 2015-16 the bank faces a negative gap in the short and medium term time buckets which implies a fall in short & medium term investments and lending which indicates a shortage of funds leading to default risk that has to be managed either by existing disinvesting securities or borrowing funds. In the following years that is, 2016-17 and 2017-18 there is a negative gap in one of the short-term time bucket (15-28 days) and medium term time buckets which indicates that liabilities of

the bank are more than the assets which mean that there will be a shortage of cash which may force the bank to arrange the funds from other expensive sources which will further lead to severe liquidity problems. In the year 2018-19 all the short and long-term time buckets showed a positive gap which is due to an increase in short & long-term loans and investments.

TABLE (Compiled from RBI website and respective Bank Annual Reports)

TABLE A1(Axis Bank)

		MATURITY BUCKETS								
		1-14 d	15-28d	29-d-3m	3-6m	6m-1y	1-3y	3-5y	Above5y	Total
2018	Loan	130154.3	121929.7	210542	188350	260285.7	747758.6	582335	2155148	4396503
	Investment	409908	40627.6	134588.2	79918.7	170636	167845.1	96534.2	438703	1538761
	Deposit	406459.7	129375.9	497073.9	351967.8	669590.6	355697.9	164363.7	1961698	4536227
	Borrowings	95490.4	27712.8	132641.5	198466.4	226315.3	301126.8	231989.9	266418.4	1480162
	Gap	38112	5469	-284585	-282166	-464984	258779	282516	365735	-81125
2017	Loan	101587	113828	179688	196170	238198	650176	481601	1769448	3730694
	Investment	252141	27766	80669	84365	148085	136011	69435	489463	1287934
	Deposit	303350	127067	385892	446671	671572	328407	70365	1810464	4143788
	Borrowings	16592	34292	131024	164141	198888	105733	168061	231578	1050309
	Gap	33786	-19766	-256560	-330278	-484178	352048	312610	216869	-175469
2016	Loan	111013	46974	168765	134193	281924	605211	437647	1602010	3387737
	Investment	330582	35251	85972	70699	187343	135081	54006	416307	1315241
	Deposit	217675	79430	306295	331121	682636	367679	117136	1477705	3579676
	Borrowings	105441	36917	131950	97814	214649	227712	99707	171614	1085804
	Gap	118479	-34122	-183507	-224043	-428018	144900	274810	368999	37498
2015	Loan	76407	61857	142399	125325	195644	583412	329651	1296135	2810830
	Investment	173095	14345	122173	96250	170691	191925	107861	447088	1323428
	Deposit	241182	92433	241261	230645	407015	562068	166005	1283810	3224419
	Borrowings	11078	17443	39945	84392	201238	208308	62237	172942	797583
	Gap	-2758	-33674	-16634	-93462	-241917	4962	209269	286471	112257
2014	Loan	55912	20019	91140	82764	147872	527325	289316	1086321	2300668
	Investment	153226	26646	74826	100647	128173	178720	89145	384101	1135484
	Deposit	171129	68972	241011	328028	499164	264166	188443	1048532	2809446
	Borrowings	72	6278	59066	45994	62836	160179	81017	87467	502909
	Gap	37937	-28586	-134111	-190611	-285955	281699	109000	334423	123797

ii). Federal bank

From the analysis of interest rate sensitivity of Federal bank (see Table A2), it is observed that in the following years 2014-15, 2015-16 it has a positive gap between RSA and RSL in the very short term time bucket (1-14 days) and long-term time bucket that is, 3-5 years and over 5 years.

This indicates that the bank has better very short term & very long-term investments and lending when compared to deposits and borrowings and there won't be any liquidity problems and default risk during the short term. In the year 2016-17 the bank shows a negative gap in one of the short-term time buckets (15-28 days), medium-term time bucket(29-3 months, 6-1 year) and also in the long-term time bucket(1-3 years and over five years). So this implies that the rate sensitivity liabilities is more in the year 2016-17, which can lead to liquidity problems and default risk which forces the bank to procure fund from other resources. In the year 2017-18, it shows a positive gap in the short term time bucket which means that the bank can meet its interest and other expenses in the short term time bucket when compared to its medium-term time buckets. The long-term time bucket (3-5 years, over 5 years) also indicated a positive gap which implies an increase in RSA which means, they are safe regarding liquidity. Also, In the year 2018-19, that the bank shows a positive gap in the long-term time bucket (3-5 and over 5 years) ,short-term time bucket(1-14 days) &one of the medium term time bucket (29- 3 months) which indicates that the bank has more assets when compared to liabilities which implies that they can meet all the requirements without any default.

TABLE A2: FEDERAL BANK

		1-14 d	15-28d	29-d-3m	3-6m	6m-1y	1-3y	3-5y	Above5y	Total
2018	Loan	28376.9	16724.6	92482.5	78744.3	120011.1	359944.1	111356.4	111934.8	919574.7
	Investment	67292.6	2993.8	35863.8	11445.1	20609.2	35077	30299.8	104229.4	307810.7
	Deposit	25924.8	23125.4	92379.9	88931.1	172068.1	483557.5	22748	211190	1119925
	Borrowings	29415	6561.4	6651.1	14992.2	9024.4	33762.9	14178	750	115335
	Gap	40329.7	-9968.4	29315.3	-13733.9	-40472.2	-122299	104730.2	4224.2	-7874.4
2017	Loan	30461	15634	58938	60733	84584	306397	84656	91961	733363
	Investment	43860	12438	10750	16113	23628	40967	14163	120042	281961
	Deposit	31320	24805	93864	79735	159696	379583	14163	193479	976646
	Borrowings	11482	718	4606	7068	6369	18598	10133	0	58973
	Gap	31518.4	2549.3	-28782.8	-9956.1	-57852.8	-50817.5	74522	18524.2	-20295.3
2016	Loan	32383	5063	31146	50320	73012	267524	63026	58429	580902
	Investment	54675	3386	13743	13117	10118	29807	22074	104636	251555
	Deposit	19401	16090	54511	56096	156358	312739	10647	165877	791717
	Borrowings	41044	0	869	2561	4024	2599	49	0	51146
	Gap	26612.3	-7640.8	-10490	4780.7	-77253.1	-18007	74403.7	-2812.2	-10406.4
2015	Loan	42070	6581	43054	39198	60899	254071	34124	32853	512850
	Investment	23058	1964	12749	1056	4775	2347	7533	152206	205688
	Deposit	21891	17086	57441	66527	129060	259508	13979	142759	708250
	Borrowings	5991	0	313	4191	3691	8299	598	0	23082
	Gap	37246.8	-8541.7	-1950.3	-30463.7	-67076.8	-11388.4	27080.4	42299.5	-12794.2
2014	Loan	25157	5408	20603	21128	66331	203959	42155	49620	434361
	Investment	22996	3245	18835	3629	5142	2633	7008	177691	241179

Deposit	25890	19363	48284	56846	139821	273491	20956	12662	597313
Borrowings	16575	300	6847	9060	7562	14035	2500	0	56880
Gap	5688.9	-11010.2	-15693.2	-41149	-75910.1	-80934.5	25706.3	214648.9	21347.1

iii). *Icici bank*

From the analysis of 2018-19(Table A3) it is understood that there is a positive gap in one of the short-term time bucket (1-14 days), medium-term time bucket and one of the long-term time bucket (29-3 months, 6months-1 year, 1-3 years) This implies that ICICI bank has more RSA when compared to RSL which indicates that there won't be any default risk and the surplus funds can be used through investments. In the year 2017-18, there is a positive gap in the short term time bucket and long-term time bucket (3-5 years and over five years). It is found that it has better short term& long term investments and lending when compared to medium term time bucket. While considering the following years 2014-15, 2015-16, 2016-17, it is observed that the bank has followed a similar trend(i.e.), the bank has negative gaps in the long run as well as the medium term time bucket, this shows that the long and medium-term RSL is more when compared to the medium and long-term RSA. So the bank might find it challenging to meet their customer requirements like interest on deposits.

TABLE A3: ICICI BANK										
		1-14 d	15-28d	29-d-3m	3-6m	6m-1y	1-3y	3-5y	Above5y	Total
2018	Loan	104704.8	114084.8	388057.1	448622.1	552756.4	1240469	905127.2	1370132	5123953
	Investment	550583.3	100440	94783.2	99057.9	191411.3	274485.7	275685.9	443494.5	2029942
	Deposit	670359.3	83340.3	357184.8	294857.1	487247.8	557322.3	1586823	1572618	5609752
	Borrowings	186143.4	48153.1	130092.2	97585.3	215439.8	531721.2	267450.8	352000.4	1828586
	Gap	-201215	83031.4	-4436.7	155237.6	41480.1	425911.2	-673460	-110992	-284444
2017	Loan	83102	86615	315671	322603	517144	1284126	924537	1108523	4642321
	Investment	313068	78398	92595	92172	105792	208007	285991	439043	1615066
	Deposit	553966	77275	308370	359445	326211	497017	1393293	1384813	4900391
	Borrowings	23049	80377	70161	67703	231642	468435	215540	318655	1475562
	Gap	-180845	7360.2	29735.1	-12372.6	65082.7	526680.2	-398305	-155901	-118566
2016	Loan	77617	66218	262944	293775	544822	1456285	716919	934059	4352639
	Investment	386945	92784	66139	83065	142620	154822	278198	399545	1604118
	Deposit	239919	64018	297478	262498	536836	453907	1185525	1174077	4214257
	Borrowings	58860	22148	103160	132032	401445	422158	404176	204095	1748074
	Gap	165783.4	72836.3	-71555.3	-17689.2	-250840	735042.2	-594584	-44567.5	-5573.6
2015	Loan	55308	63509	240409	273278	403853	1563200	592052	683612	3875221
	Investment	361325	112193	68953	65432	159217	139683	214532	459959	1581292
	Deposit	236963	95240	239316	265328	335021	533336	976972	933452	3615627
	Borrowings	109407	29924	94043	157164	264609	384309	217967	466752	1724174

	Gap	70263.4	50538.4	-23996.8	-83782.1	-36559	785237.1	-388355	-256634	116712
2014	Loan	34216	45665	200984	253002	358048	1297204	596860	601048	3387027
	Investment	294482	102418	74321	110122	218245	222736	243349	504545	1770218
	Deposit	236020	85791	232028	243371	427549	499966	817291	777122	3319137
	Borrowings	82044	8007	99580	165350	197354	306698	191219	497339	1547591
	Gap	10634.2	54286.3	-56302.4	-45597.1	-48609.7	713275.5	-168301	-168869	290517.6

iv). Hdfc bank

From the analysis of 2018-19 from the table A4, it is observed that there is a negative gap in one of the long-term time bucket (over 5 years), medium-term and one of the short-term time bucket (15-28 days), which indicates that there is more RSL when compared to RSA which suggests that the bank has high chances of liquidity risk in that particular year. HDFC Bank has also shown a positive gap in short-term time buckets in the year 2014-15, 2015-16, 2016-17 & 2017-18 which indicates it has an excellent short RSA base. In the following years, HDFC bank has also shown a positive gap as far as medium-term time bucket is concerned except for the year 2016-17 & 2017-18 which shows a negative gap. The long-term time bucket (over 5 years) has also demonstrated a negative gap in the following years, which can lead to earning capacity problems as there forms a negative gap between interest gained and interest paid(interest paid is more than interest received) which in turn indicates that the banks have to rely on expensive sources of funds during emergency situations.

TABLE A4: HDFC BANK										
		1-14 d	15-28d	29-d-3m	3-6m	6m-1y	1-3y	3-5y	Above5y	Total
2018	Loan	321707	167613.5	504021.6	541808	738354.8	3095751	677503.1	536572.1	6583331
	Investment	675790.1	49914.7	178298.8	164096.2	242043.6	705570.7	99612.9	306675.4	2422002
	Deposit	565282.2	202887.9	708314.5	739886.1	1115690	3102545	147337.3	1305763	7887706
	Borrowings	225858.8	33676.1	71163.4	198219.3	176651.3	183946.4	171784.5	169750	1231050
	Gap	206356.1	-19035.8	-97157.5	-232201	-311943	514829.7	457994.2	-632265	-113423
2017	Loan	310928	234872	458910	446835	639100	2460749	551147	443142	5545682
	Investment	527436	80196	215298	133804	200574	601865	79446	306016	2144633
	Deposit	542526	142316	475038	439756	697907	2875847	134948	1128058	6436397
	Borrowings	51841	35452	76611	64317	161783	125435	63199	161650	740289
	Gap	243996.7	137300	122558.8	76564.9	-20016.6	61331.2	432445.6	-540551	513630.1
2016	Loan	219782	202399	434778	346487	618827	2079862	406803	337002	4645940
	Investment	605282	120108	224761	115159	139732	452498	35154	265668	1958363
	Deposit	467469	128734	368151	393018	782401	2228908	123615	971946	5464242
	Borrowings	353411	26699	83426	39601	100463	89771	17676	138646	849690
	Gap	4184.3	167075	207962.3	29027.8	-124305	213682.1	300666.7	-507922	290370.7
2015	Loan	208602	111721	383232	268737	380139	1735123	282474	284922	3654950

	Investment	430053	49519	133194	83798	133952	371884	20031	293987	1516418
	Deposit	324764	91969	229486	244321	312666	2034105	103866	1166780	4507956
	Borrowings	33183	12788	72230	19115	21882	144619	28750	119570	452136
	Gap	280708.2	56482.4	214711.1	89098.4	179544.3	-71716.5	169889.1	-707441	211275.8
2014	Loan	172748	82788	348418	245851	294508	1437174	225971	222545	3030003
	Investment	251658	28728	55279	95358	72781	352356	63420	289931	1209511
	Deposit	280315	105272	184930	261278	185682	1671279	93774	890845	3673375
	Borrowings	23396	4590	44782	12101	25251	110530	84429	89312	394390
	Gap	120694.4	1654.4	173984.8	67831	156356.9	7720.4	111188.2	-467681	171748.7

v). *Indusind bank*

From the analysis of Table A5 , in the year 2018-19, the bank shows a positive gap in the very short term which means that it can meet interest and expenses in the short term and won't be any liquidity problems in the short term time bucket. But in the medium term (29-3, 3-6months) and one of the long-term (above five yrs) bank has a negative gap which indicates an increase in liabilities, which will affect the bank adversely regarding liquidity. In the year 2017-18, there is a negative gap in short-term (15-28days), medium term and one of the long-term time bucket (3-5yrs) which implies that the bank is found to have more RSL than RSA. In the following years 2015-16 and 2016-17 there is a negative gap in the short term and medium term time buckets which indicates a fall in the short term and medium term lending, which suggests a shortage of cash. In the year 2014-15 it shows a negative gap in the short time and medium term (29-3, 3-6months) which implies there is a fall in short and medium-term investment and lending, and it means a shortage of cash which can affect the earnings and liquidity of banks. By assuring liquidity, it can reduce adverse situations in banks regarding liquidity and profitability.

TABLE A5: INDUSIND BANK										
		1-14 d	15-28d	29-d-3m	3-6m	6m-1y	1-3y	3-5y	Above5y	Total
2018	Loan	116751.2	52142.2	123660.8	119997.2	196516.2	491344.6	156755.7	213368.7	1470537
	Investment	366.6	49.8	26619.2	47168.5	66524	36655.7	300385.7	500767.2	500767.2
	Deposit	98335.8	35575.3	201681.6	92290.9	333525	217653.4	160170.3	377259.4	1516392
	Borrowings	82446.4	8146.9	8146.9	30325.9	33877.5	156012.5	18780.8	451553.9	382890.8
	Gap	-63664.4	8469.8	-59548.5	44548.9	-104362	154334.4	278190.3	-114677	72021.3
2017	Loan	102532	18832	132827	88838	155180	387999	110283	145313	1141805
	Investment	965	0	5486	3565	18230	51308	28270	259197	367021
	Deposit	85569	44350	179247	130729	250425	180551	128777	266075	1265722
	Borrowings	6036	0	31193	46623	39931	27730	43025	30000	224537
	Gap	11892.9	-25517.9	-72126.9	-84949.4	-116946	231027.2	-33248.4	108436.2	18567.4
2016	Loan	106139	28144	125014	57835	108888	327910	91267	55997	901193
	Investment	812	0	19309	28760	43456	30390	40554	177263	340543
	Deposit	59496	46837	156975	65733	166460	144722	103231	186551	930004
	Borrowings	93718	6626	0	34966	34757	70146	2656	7089	249959

	Gap	-46262.9	-25317.8	-12651.8	-14103.6	-48873.3	143431	25933.8	39619	61774.4
2015	Loan	64917	8436	37488	40231	61340	352843	68903	53724	687882
	Investment	2050	0	36007	10619	26311	27051	42049	151706	295793
	Deposit	59028	22151	150279	66358	92136	90046	35737	225609	741344
	Borrowings	45814	0	8938	15917	53824	72037	1563	8089	206181
	Gap	-37874.7	-13715.3	-85721.6	-31424.8	-58309.2	217811.2	73653.1	-28267.5	36151.2
2014	Loan	32188	6030	33196	33500	189301	143937	55133	57733	551018
	Investment	17	2497	31577	3632	14883	24096	25768	146071	248540
	Deposit	52735	38010	120367	91541	65769	81098	41157	114346	605023
	Borrowings	31737	6291	20824	17176	15796	52706	-	3089	147620
	Gap	-52267.4	-35774.6	-76418	-71584.8	122618.3	34229.5	39744	86368.2	46915.4

vi). Kotak mahindra

Statement of interest rate sensitivity analysis (see Table A6) reveals that in the year 2018-19 there is a positive gap in short-term and long-term time buckets (3-5yrs, over 5yrs) which means that the bank can meet interest and other expenses in both short and long-term, and it can satisfy all liquidity requirements. In the year 2017-18, it shows a negative gap in one of the short-term (15-28days) medium-term time bucket and one of the long-term time bucket(1-3yrs)which implies there is more RSL compared to RSA, and it can lead to an adverse situation, and the bank might take loans from other banks and financial institutions, sometimes at higher rates which can affect the profitability of bank . In the following year, 2015-16,2016-17 the medium term time bucket showed a negative interest rate sensitivity, from this it can be understood that bank has less medium term RSA base. The long-term time bucket showed a positive gap in both the years which indicate that there is more RSA than RSL So that there will be enough cash to meet requirements of customers and it improves the overall functioning of the banks. But in the year 2015-16 the short term time bucket showed a negative gap which indicates bank has less short-term RSA base, which leads to liquidity problems. In the year 2014-15 it shows a negative gap in the short and medium term time buckets (29-3 months, 3-6 months). This indicates that the bank has better long-term interest and loans when compared to short& medium term time buckets and that the bank is exposed to liquidity risk.

TABLE A6: KOTAK MAHINDRA										
2018	Loan	57180.5	59049.8	147957.3	105829.4	126336	777168	206053	217605.2	1697179
	Investment	201057.7	17388.7	58372.6	51344	70756	191677.3	17476.6	34853.8	642926.7
	Deposit	147970.6	61010.5	261665	245802.1	253142.5	941048.1	12005.6	3788.3	1926433
	Borrowings	54096	2178.2	31034.2	61636.6	28695.6	51248.2	22652.7	0	251541.5
	Gap	56171.6	13249.8	-86369.3	-150265	-84746.1	-23451	188871.3	248670.7	162131.7
2017	Loan	47562	38196	134986	100691	93232	625340	142129	178686	1360821
	Investment	215968	10049	42490	27443	23791	104562	3719	20281	448304
	Deposit	127909	51025	223554	254173	206713	692738	13009	5136	1574259
	Borrowings	59058	5825	23723	33142	11918	61749	11120	4420	210955
	Gap	76563.1	-8603.7	-69801	-159181	-101608	-24586.1	121718.6	189410.7	23911.8
2016	Loan	74604	31042	124036	70653	96336	513481	116751	159750	1186653
	Investment	168197	32098	57907	50785	58877	91932	21107	28441	509344
	Deposit	181320	53480	182023	253607	206034	411465	92817	5686	1386430
	Borrowings	29647	613	70868	25187	30492	32862	1563	18522	209753
	Gap	31834.4	9046.9	-70947	-157355	-81313.7	161086.9	43477.4	163983.3	99813.4
2015	Loan	39174	10044	51736	47418	67515	267075	78004	100642	661607
	Investment	87809	10729	33170	33088	35360	77649	5720	17816	301340
	Deposit	118923	44570	89015	123411	81632	280250	7156	3648	748603
	Borrowings	33010	232	11780	13022	36196	9535	2430	15293	121497
	Gap	-24950.5	-24028.8	-15889.4	-55927	-14953.2	54939.9	74137.8	99518.2	92847
2014	Loan	40734	10670	39566	37657	55076	210995	59737	75843	530276
	Investment	63572	14007	34503	31697	23845	66168	7192	13862	254846
	Deposit	89392	32137	98276	92754	57739	206255	10801	3369	590723
	Borrowings	58436	2106	13319	11943	16555	18211	2830	5557	128956
	Gap	-43522.8	-9565.1	-37527	-35342.9	4626	52696.7	53299	80778.8	65442.7

vii). Yes bank

While considering the short term time bucket, assets were more than liabilities when compared to the holdings in medium & long term(see Table A7), which indicates a positive gap in the short term time bucket from the year 2016-17& 2017-18, which implies that the bank is strong enough to meet all the requirements, and there won't be any default risk. It also indicates that in the year 2016-17,2017-18 & 2018-19, it has a negative gap in medium-term time bucket (29-3, 3-6months) & one of the short-term time bucket(15-28 days) which implies that liabilities, when compared to the assets, is more which indicates a shortfall in liquidity requirements. One of the long-term time bucket 3-5 yrs showed a negative gap in the following years, which implies that inflows are not sufficient to meet their outflows. The analysis reveals that in the year 2015-16 the short term and medium term RSL were more than RSA except for two long-term time buckets

(1-3 years and over five years) which may affect the earning capacity of the bank. In the year 2014-15, all the short term, medium term time bucket showed a negative gap which is due to a fall in short-term loans and investments which can lead to adverse situations to the bank regarding liquidity and profitability that has to be managed either by disinvesting existing securities or borrowing funds.

		TABLE A7: YES BANK								
		1-14 d	15-28d	29-d-3m	3-6m	6m-1y	1-3y	3-5y	Above5y	Total
2018	Loan	37305.05	72905.99	115475.8	148767.2	265795.2	708650.7	358786.6	327652.1	2035339
	Investment	203715.6	75887.61	45484.69	35487.29	61563.74	44110.38	134284.6	83455.47	683989.4
	Deposit	159377.1	818975.5	252977.2	202682.1	389251.4	181873.3	719657.5	19665.19	2007381
	Borrowings	52937.17	14135.49	51672.2	69982	24335.08	131991.7	101783.4	302098.9	748935.8
	Gap	28706.35	-684317	-143689	-88409.7	-86227.6	438896.1	-328370	89343.5	-36989.3
2017	Loan	50663	36958	114277	94725	191444	421372	198757	214430	1322627
	Investment	118013	52523	40538	43777	49856	29801	98707	67103	500318
	Deposit	111257	50993	180054	210791	246531	116423	490442	22248	1428739
	Borrowings	15066	13258	26809	42010	48896	29420	45425	165182	386067
	Gap	42353.27	25229.76	-52047.9	-114299	-54127.5	305330.9	-238403	94103.15	8139.45
2016	Loan	26759	22989	113972	78337	127515	352093	127014	133419	982099
	Investment	157780	35109	29365	40057	64240	48416	62885	50534	488385
	Deposit	101287	45595	123753	168515	269921	97372	300180	10572	1117195
	Borrowings	18002	5097	26174	20710	31423	67810	27680	119694	316590
	Gap	65249.33	7406.051	-6589.82	-70831.1	-109589	235326.9	-137960	53686.66	36698.83
2015	Loan	26412	16238	86841	81114	98254	262004	92126	92510	755498
	Investment	1639	7558	45918	21353	11957	63364	44478	236018	432285
	Deposit	81122	45118	116998	136151	239439	89005	195399	8526	911758
	Borrowings	24450	1300	23346	31548	15268	58522	20213	87558	262204
	Gap	-77521.9	-22621.9	-7584.69	-65231.2	-144496	177840.5	-79007.8	232443.6	13820.59
2014	Loan	17164	2363	70228	31407	84426	128891	147501	74350	556330
	Investment	1000	1150	6918	3766	10458	68050	92876	225286	409504
	Deposit	70744	41902	117346	134913	173758	52519	144046	6692	741920
	Borrowings	44596	9695	17444	21855	18448	26864	5642	68600	213143
	Gap	-97175.5	-48083.4	-57643.5	-121595	-97322.3	117557.5	90689.28	224343.6	10770.23

5. CONCLUSION

Therefore it can be seen how ALM is essential in the bank and can be concluded that the overall financial performance for any bank depends a lot on the credibility of its ALM team. The report shows that over the period of study, HDFC Bank's RSA shows positive Gap in the short run in almost all the years which can be considered as a positive sign, though the bank had more negative Gaps in the long term, which reveals that it has low long-term investment/advance base. ICICI Bank, when compared with all the banks in the study, had a positive gap in the short run as

well as the long run, though some years it had a negative gap. From the analysis, Yes Bank and Federal Bank has shown negative gap's in almost all the time buckets (i.e.) short, medium and long-term time buckets which need appropriate attention, hence the ALM of Yes Bank and Federal Bank needs to make specific strategies to increase its current assets and reduce the current liabilities for improvement. IndusInd and Kotak Mahindra Bank have negative mismatches in the short and medium term in many instances. If they continue to maintain negative gaps in the short run, there are chances that they will lose their interest income due to any future increase in the interest rates and vice versa. Axis Bank had shown a positive gap in the long run which is a positive sign as this positive Gap shows strong long-term deposit and advances base of this bank. But positive Gaps in the long run alone cannot be interpreted as an absolute positive result as far as they have short-run negative mismatches.

6. SCOPE FOR FUTURE RESEARCH

The research can also be further conducted to test the relationship between liquidity risk exposure and stock price movement of the bank.

ACKNOWLEDGEMENT

I thank our research Guide and our institution who provided insight and expertise that greatly assisted our research.

REFERENCES

- [1] A. Karthigeyan, V. M. (2017). Liquidity Risk Management in Select Private Sector Banks in India: A Gap Analysis Approach. *International journal of management and business studies*, 19-25.
- [2] Alan Bollard, C. H. (2011). The role of banks in the economy - improving the performance of the New Zealand banking system after the global financial crisis.
- [3] Bandyopadhyay, G. (2016). An Analysis of the Non-Performing Assets of Some Selected Public Sector Banks in India.
- [4] Basse, G. E. (2015). BANK PROFITABILITY AND LIQUIDITY MANAGEMENT: A CASE STUDY OF SELECTED NIGERIAN DEPOSIT MONEY BANKS. *International Journal of Economics, Commerce, and Management*, 1-24.
- [5] Deene, D. S. (2015). ASSET LIABILITY MANAGEMENT IN INDIAN BANKING INDUSTRY - WITH SPECIAL REFERENCE TO INTEREST RATE RISK

- MANAGEMENT IN VIJAYA BANK. *International Journal of Advanced Research in Management (IJARM)*, 122-134.
- [6] Dharmendra Singh, I. M. (2016). Liquidity Management: A Comparative Study of Oman Banks and Multinational Banks. *International Journal of Applied Sciences and Management*, 157-170.
- [7] Dr. R Umarani, M. J. (2015). AN ANALYSIS OF ASSET-LIABILITY MANAGEMENT IN INDIAN BANKS. *International Journal of Business and Administration Research Review*, 179.
- [8] Elliott, D. J. (2014). Bank Liquidity Requirements: An Introduction and Overview.
- [9] Manish Kumar, G. C. (2013). LIQUIDITY RISK MANAGEMENT IN BANK: A CONCEPTUAL FRAMEWORK. *AIMA Journal of Management & Research*.
- [10] Mohapatra, S. C. (2009). An Empirical Study of Asset Liability Management Approach by the Indian Banks. *The IUP Journal of Bank Management*, 7-11.
- [11] Nallari, R. a. (2005). Study of Asset Liability Management in Indian Banks: Canonical Correlation Analysis for the period 1992-2004. *Spandan*, available at [http://intranet.iimk.ac.in/spandan/Spandan/Article Research/RahulRahul.pdf](http://intranet.iimk.ac.in/spandan/Spandan/Article%20Research/RahulRahul.pdf).
- [12] P. K. Jain, v. G. (2004). Asset-Liability Management Among Commercial Banks In India-A Canonical Correlation Analysis. *The Journal of Business Perspective*, 25- 40.
- [13] Parvinder Arora, A. G. (2007). The ALM Practices in Commercial Banks in India. *The Icfai Journal of Applied Finance*, 80-96.
- [14] Pragathi K.M., V. K. (2018). An Analysis of Asset-Liability Management in Banking Sector: A Case Study of Kotak Mahindra Bank. *IOSR Journal of Business and Managemen*, 1-7.
- [15] R.BharathVajan, K. V. (2017). A STUDY ON ASSET LIABILITY MANAGEMENT. *International Journal of Pure and Applied Mathematics*, 249-253.
- [16] *Rbi Guidelines On Asset Liability Management Practices In Banks*. (n.d.). Retrieved from RBI: <http://www.rbi.org.in>
- [17] Shyam Lal Dev Pandey, S. K. (2010). An Analysis of Financial Position and Various Elements of Asset and Liability Management (ALM) in Indian Banking Industry. *Management Convergence*, 56-66.

- [18] Singh, P. (. (2013). ASSET-LIABILITY MANAGEMENT IN BANKS: A DYNAMIC APPROACH. *AIMA Journal of Management & Research*.
- [19] Suresh.G, K. P. (2018). Asset-Liability Management as a Risk Management Tool in Commercial Banks in India. *IUP Journal of Bank Management*, 21-49.