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# Measuring Financial Performance Using Camel's Model: A Comparative Analysis of Indian Public and Private Sector Banks

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***ABSTRACT***

*Execution assessment of the keeping money area is a convincing measure and pointer to check the soundness of monetary exercises of an economy. In the present investigation an undertaking has been made to survey the execution and monetary soundness of chose Public and Private Sector Banks in India. The investigation has been made for the time of 2016/17. CAMEL approach has been used to examine the financial strength of the selected banks. Composite Rankings and Independe` 1nt two sample t-test has been applied here to reach conclusion through the comparative and significant analysis of different parameters of CAMEL. The findings of the study show that Public Sector Banks, viz. Central Bank, Indian Bank, State Bank of India, Bank of Baroda and Bank of India has been ranked at the top five positions compared to other banks under the study in their financial performance during the study period. On the other hand, IDBI Bank is at a lowest position under the study. The Private Sector Banks, namely, IDFC Bank, HDFC Bank, Kotak Mahindra Bank, Yes Bank and ICICI Bank shared the top five positions. On the other hand, RBL Bank is at lowest position under the study. The empirical results show that there is a statistically significant difference between the CAMEL ratios of the selected Public Sector Banks, Private Sector Banks in India, thus, signifying that the overall performance of within and between Public Sector Banks and Private Sector Banks are different. Results depict that the excellent performance of the Banks in regard with various parameters of CAMEL can be attributed to the adoption of modern technology, banking reforms, and good recovery mechanisms. However, the Banks also need to improve its position with regards to a few sub-parameters (ratios) of CAMEL approach to strengthen their weak areas.*

**Keywords:** asset quality, capital sufficiency, earnings capacity, management quality, liquidity

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## INTRODUCTION

Managing an account segment assumes an essential part in the financial advancement of a nation. The saving money segment changes in India were begun as a subsequent measure of monetary progression and budgetary area changes in the nation. The managing an account division being the life line of the economy was treated with most extreme significance in the money related area changes. The changes were gone for to make the Indian keeping money industry more focused, profitable and productive and to take after global bookkeeping norms. The changes in the keeping money industry began in the mid-1990s have been proceeded till now and the Indian managing an account industry enrolled gigantic development in the post-progression time. Since the start of 1991, there have been extensive changes in the principles and control, association, degree and movement level of Indian Banking area. [Recent Economic

  

Survey (2016–2017) expresses that there are numerous change activities attempted in the keeping money area amid 2016–2017. These incorporate (I) Banks being permitted to raise capital from the market to meet capital sufficiency standards by weakening the administration's stake up to 52 for every penny. (ii) Pradhan Mantri Jan Dhan Yojana propelled (2014–2015) to furnish widespread access to saving money offices with no less than one fundamental managing an account represent each family. As indicated by (2016–2017), money related incorporation is continuing apace under PMJDY. Zero adjust account has declined reliably from about 58 percent in walk 2015 to around 24 percent as of December 2016. (iii) RBI discharged rules and welcomed applications for setting up instalments banks and neighborhood [1].

According to the Economic Survey (2016–2017), slow development and expanding obligation in a few divisions of the economy have affected the benefit nature of banks in the FY 2016–2017 and this is a reason for worry because of which the 2016–2017 confronted weight on the advantage nature of the Scheduled Commercial Banks as there was an expansion in net NPA (Nonperforming Advances) to the aggregate gross advances. NPA has expanded from 9.2 percent (September 2016) to 9.5 percent (March 2017).

As of late, the moves made by RBI to manage NPAs incorporates (i) Government is expecting to diminish the quantity of PSU (public segment banks) through solidification. (ii) Amendment in keeping money law to give RBI more powers. (iii) Stringent NPA recuperation leads, RBI's advance rebuilding plans. (iv) With manage changes and strict controls, banks might be gotten some information about 50 extensive NPA accounts by December 2017.

In addition, in the FY 2015–2016, credit off-take from banks kept on decelerating further. Net bank credit extraordinary developed at around 7 percent on a normal. The normal gross bank credit to industry shrunk by 0.2 percent in the FY 2016–2017.With increment in rivalry from private area and remote division banks, people in general segment banks were compelled to rebuild their exercises and were obliged to enhance polished methodology in the keeping money exercises. Additionally, the managing an account business is broadened from customary ways to deal with singular approach. With the move in client inclination from stores in banks to ventures, number of managing an account offices to clients at their doorstep, giving retail saving money items and esteem included administrations alongside their customary keeping money items, it has turned out to be basic for all the nationalized banks to hold the old clients and pull in the new clients by giving more esteem included administrations and saving money impetuses under single window framework and additionally to discover elective approaches to create more pay. So as to manage their present aggressiveness, banks must spotlight on their execution [2].

Hence, against this backdrop, the present study attempts to investigate the financial soundness and health of the selected commercial banks in India by measuring its financial performance using CAMEL model.

CAMEL approach is significant tool to assess the relative financial strength of a bank and to suggest necessary measures to improve weaknesses of a bank. CAMEL rating is an international (primarily USA) supervisory rating system to classify a bank/ financial institution's overall condition according to 6 factors. The six factors are represented by the acronym CAMEL'.

When introduced in 1979, the CAMEL system had five components. A 6th component -sensitivity to market risk - was added in 1996. The regulators that year also added an increased emphasis on an organization's management of risk. The 6 components are:

C – Capital ampleness
A – Asset quality
M – Management quality
E – Earnings capacity
L – Liquidity

CAMEL is essentially a proportion-based model for assessing the execution of banks. Different segments and proportions shaping this model are clarified beneath.

**Capital Adequacy**

Capital base of money related organizations encourages contributors in framing their hazard discernment about the establishments. Other than retaining unexpected stuns, it flags that the organization will keep on honoring its commitments. The most broadly utilized marker of capital ampleness is cash-flow to chance weighted resources proportion (CRWA). As indicated by Bank Supervision Regulation Committee (The Basel Committee) of Bank for International Settlements, a base 9 for each penny CRWA is required.

Capital sufficiency at last decides how well money related foundations can adapt to stuns to their accounting reports. Accordingly, it is valuable to track capital-sufficiency proportions that consider the most critical budgetary dangers remote trade, credit, and loan cost dangers by doling out hazard weightings to the organization's benefits. A sound capital base reinforces certainty of contributors. This proportion is utilized to secure investors and advance the solidness and effectiveness of budgetary frameworks around the globe.

**Asset Quality**

Asset quality decides the wellbeing of budgetary foundations against loss of significant worth in the benefits. The debilitating estimation of benefits, being prime wellspring of saving money issues, straightforwardly fill different regions, as misfortunes are in the long run discounted against capital, which at last uncover the winning limit of the foundation. With this background, the advantage quality is checked in connection to the level and seriousness of non-performing resources, sufficiency of arrangements, recuperations, circulation of benefits and so forth. Mainstream markers incorporate nonperforming advances to progresses, advance default to add up to advances, and recuperations to advance default proportions. The dissolvability of monetary organizations commonly is in danger when their advantages wind up plainly disabled, so it is essential to screen markers of the nature of their benefits as far as overexposure to particular dangers, inclines in nonperforming credits, and the wellbeing and gainfulness of bank borrowers particularly the corporate area. Offer of bank resources in the total money related part resources: In most developing markets, managing an account division resources involve well more than 80 for every penny of aggregate budgetary segment resources, though these figures are much lower in the created economies. Besides, stores as an offer of aggregate bank liabilities have declined since 1990 in numerous created nations, while in creating nations open stores keep on being prevailing in banks. In India, the offer of managing an account resources altogether money related area resources is around 75 for every penny, as of end-March 2008. There is, most likely, justify in perceiving the significance of broadening in the institutional and instrument-particular parts of money related intermediation in light of a legitimate concern for more extensive decision, rivalry and steadiness. In any case, the overwhelming part of banks in money related intermediation in developing economies and especially in India will proceed in the medium-term; and the banks will keep on being "unique" for a long-term. In such manner, it is valuable to underline the predominance of banks in the creating nations in advancing non-bank money related middle people and administrations incorporating into improvement of obligation markets. Indeed, even where part of banks is evidently reducing in developing markets, substantively, they keep on playing a main part in non-managing an account financing exercises, including the advancement of money related markets. One of the markers for resource quality is the proportion of non-performing credits to add up to loans [3].

Nonperforming Assets (NPAs): Advances are characterized into performing and non-performing progresses according to the rules of RBI. NPAs are additionally grouped into sub-standard, far-fetched and misfortune resources in light of the criteria gave by RBI. A benefit, including a rented resource, moves toward becoming non-performing when it stops to create pay for the Bank.

***Table 1.*** *Asset classification.*

| S. n. | Asset | Classification |
|---|---|---|
| 1 | Performing Asset: | |
| | • Standard Asset | Paid Regularly |
| 2 | Non-Performing Asset: | |
| | • Special Mentioned account (SMA) | Not paid for 90 days (3 months) |
| | • Sub-standard Asset | Not paid for another 12 months |
| | • Doubtful Asset | Not paid for another 12 months |
| | • Loss asset | Not paid or irrecoverable for more than 3 years |

An NPA is an advance or a propel where: 1, Intrigue or potentially portion of key stays late for a time of over 90 days in regard of a term advance; 2. The record stays "out-of-arrange" in regard of an Overdraft or Cash Credit (OD/CC); 3, The bill stays past due for a time of over 90 days if there should arise an occurrence of bills obtained and reduced; 4. An advance conceded for brief length products will be dealt with as a NPA if the portions of primary or intrigue consequently stay late for two yield seasons; and 5. An advance allowed for long length yields will be dealt with as a NPA if the portions of chief or intrigue consequently stay past due for one harvest season.

***Table 2.*** *Provisioning guidelines.*

| S. n. | Assets classification | Provision (%) |
|---|---|---|
| 1 | Standard assets | 0.40 |
| 2 | Sub-standard asset: | |
| | • Secured | 15 |
| | • Unsecured | 25 |
| | • Unsecured (infrastructures) | 20 |
| 3 | Doubtful assets: unsecured | 100 |
| | Doubtful assets: secured | |
| | • Up to 1 year | 25 |
| | • More than 1and up to 3 years | 40 |
| | • More than 3 years | 100 |
| 4 | Loss assets | 100 |

  

The Bank groups a record as a NPA just if the premium forced amid any quarter is not completely reimbursed inside 90 days from the finish of the applicable quarter. This is a key to the steadiness of the keeping money segment. There ought to be no dithering in expressing that Indian banks have completed an astounding activity in regulation of non-performing advances (NPL) considering the shade issues and general troublesome environment [3].

## Management Quality

Administration of monetary establishment is for the most part assessed as far as capital ampleness, resource quality, income and gainfulness, liquidity and hazard affectability evaluations. What's more, execution assessment incorporates consistence with set standards, capacity to plan and respond to evolving conditions, specialized capability, initiative and regulatory capacity.

Sound administration is a standout amongst the most essential factors behind budgetary foundations' execution. Pointers of nature of administration, be that as it may, are fundamentally relevant to singular establishments, and can't be effortlessly totaled over the segment. Besides, given the subjective idea of administration, it is hard to judge its soundness just by taking a gander at monetary records of the banks. All things considered, add up to progress to add up to store, business per worker and benefit per representative aides in checking the administration nature of the keeping money establishments. A few pointers, be that as it may, can together fill in as, for example, proficiency measures do as a marker of administration soundness.

## Earnings Ability

Pay and profitability are the prime wellspring of augmentation in capital base. It is examined as for credit cost methodologies and adequacy of provisioning. The most perfectly awesome pointer used to gauge picking up is the Return on Assets (ROA), which is net compensation after evaluations to indicate asset extent. In like manner, it also reinforces present and future exercises of the associations.

Being front line of security against deterioration of capital base from adversities, the prerequisite for high pay and advantage can barely be overemphasized. Though various markers are used to fill the need, for start to finish examination, the pointer is Interest Income to Total Income and Other pay to Total Income for the most part being used. Differentiated and most extraordinary markers, slants in efficiency can be all the more difficult to interpret for instance, shockingly high productivity can reflect over the best danger taking.

Strong pay and advantage profile reflects the ability to help present and future undertakings of banks. More especially, this chooses the capacity to ingest incidents, pay benefits to its financial specialists, back its advancement, and build up an attractive level of capital.

## Liquidity

An agreeable liquidity position insinuates a condition, where association can get satisfactory resources, either by growing liabilities or by changing over its advantages quickly at a sensible cost. It is, in like manner, generally overviewed with respect to general assets and commitment organization, as befuddling offers climb to liquidity risk. Beneficial store organization suggests a condition where a spread between rate tricky assets (RSA) and rate fragile liabilities (RSL) is kept up. The most frequently used gadget to impose advance expense introduction is the Gap among RSA and RSL, while liquidity is checked by liquid to indicate asset extent.

At first dissolvable budgetary associations may be made a beeline for conclusion by poor organization of at this very moment liquidity. Pointers should cover financing sources and catch gigantic advancement confounds. The term liquidity is used as a piece of various ways, all relating to openness of, access to, or convertibility into cash. An association is said to have liquidity in case it can without a lot of an extend address its issues for cash either in light of the way that it has cash close by or can for the most part collect or acquire cash. A market is said to be liquid if the instruments it trades can without a lot of an extend be bought or sold in sum with little impact on grandstand costs. Leverage is said to be liquid if the market for that advantage is liquid. The standard subject in each one of the three settings is cash. An organization is liquid in case it has arranged access to cash. A market is liquid if individuals can without a lot of an extend change over positions into cash or on the other hand. An advantage is liquid if it can without quite a bit of an extend be changed over to cash.

The liquidity of an establishment relies upon:

- The establishment's fleeting requirement for money
- Cash close by
- Available credit extensions
- The liquidity of the foundation's advantages
- The foundation's notoriety in the commercial center, – how ready will counterparty is to execute exchanges with or loan to the establishment

**Sensitivity to Market Risk**

It insinuates the peril that alterations in financial circumstances could inimically influence salary or conceivably capital. Market Risk incorporates exposures related with changes in credit costs, remote exchange rates, and product costs, esteem expenses, et cetera. While these things are basic, the fundamental peril in numerous banks is credit expense shot (IRR), which will be the point of convergence of this module. The upgraded thought of bank exercises makes them defenseless against various sorts of financial perils. Affectability examination reflects association's introduction to advance charge peril, outside exchange unconventionality and esteem risks (these threats are summed in publicize hazard). Hazard affectability is by and large surveyed with respect to organization's ability to screen and control feature possibility. Banks are logically connected with widened exercises, which are generally subject to promote shot, particularly in the setting of credit expenses and the doing of outside exchange trades. In countries that empower banks to make trades securities trades or item exchanges, there is also a need to screen markers of significant worth and product esteem shot.

Interest Rate Risk Basics: In the most oversimplified terms, loan cost hazard is an exercise in careful control. Banks are endeavoring to adjust the amount of repeating resources with the amount of repricing liabilities. For instance, when a bank has more liabilities re-estimating in a rising rate condition than resources repeating, the net premium edge (NIM) recoils. Then again, if your bank is resource touchy in a rising financing cost condition, your NIM will enhance since you have more resources repeating at higher rates.

Liquidity hazard is budgetary hazard because of dubious liquidity. An organization may lose liquidity if its FICO score falls, it encounters sudden surprising money surges, or some other occasion causes counterparties to abstain from exchanging with or loaning to the foundation. A firm is additionally presented to liquidity hazard if advertises on which it depends are liable to loss of liquidity.

Controllers are fundamentally worried about foundational ramifications of liquidity hazard. Business exercises involve an assortment of dangers. For comfort, we recognize distinctive classifications of hazard: showcase chance, credit chance, liquidity chance, and so on. Albeit such classification is advantageous, it is just casual. Use and definitions differ. Limits between classifications are obscured. A misfortune because of augmenting credit spreads may sensibly be known as a market misfortune or a credit misfortune, so showcase hazard and credit chance cover. Liquidity chance mixes different dangers, for example, advertise hazard and credit chance. It can't be separated from the dangers it mixes.

A critical however to some degree questionable recognize is that between showcase hazard and business chance. Market hazard is presentation to the unverifiable market estimation of a portfolio. Business chance is introduction to vulnerability in monetary esteem that can't be check to-showcase. The qualification between advertise hazard and business chance parallels the refinement between showcase esteem bookkeeping and book-esteem bookkeeping. The qualification between advertise hazard and business chance is equivocal in light of the fact that there is a tremendous "hazy area" between the two. There are numerous instruments for which markets exist; however, the business sectors are illiquid. Stamp to-advertise esteems are not normally accessible, but rather check to display esteems give a pretty much precise impression of reasonable esteem. Do these instruments posture business hazard or market chance? The choice is vital in light of the fact that organizations utilize in general sense diverse procedures for dealing with the two dangers.

Business chance is made do with a long-haul center. Procedures incorporate the watchful improvement of marketable strategies and suitable administration oversight. Book-esteem bookkeeping is by and large utilized, so the issue of everyday execution isn't material. The attention is on accomplishing a decent rate of profitability over an expanded skyline.

Market hazard is made do with a fleeting core interest. Long haul misfortunes are stayed away from by maintaining a strategic distance from misfortunes starting with one day then onto the next. On a strategic level, merchants and portfolio administrators utilize an assortment of hazard measurements length and convexity, the Greeks, beta, and so on to evaluate their exposures. These enable them to recognize and diminish any exposures they should seriously think about intemperate. On a more vital level, associations oversee showcase hazard by applying hazard points of confinement to dealers' or portfolio supervisors' exercises. Progressively, esteem in danger is being utilized to characterize and screen these cutoff points. A few associations additionally apply pressure testing to their portfolios [3].

**Concept of CAMEL Rating**

Based on this, the FICO assessment organizations rate the banks on a size of 5 – the most grounded was appraised as 1; the weakest was evaluated as 5.

Every one of the segment factors is appraised on a size of 1 (best) to 5 (most exceedingly terrible), with:

- 1 – Being the most astounding rating (which means minimum measure of administrative concern)

- 5 – Being the most reduced rating (which means greatest measure of administrative concern)

A general CAMEL score of 3, 4, or 5 can uncover a money related establishment to any of the casual and formal authorization activities accessible to the controllers. In India, according to the proposals of Padmanabhan Committee (1996), the banks ought to be appraised on a 5 point size of A to E, generally in light of global CAMEL rating model. The board has recommended that supervision of banks should center on characterized parameters of soundness, monetary, administrative and operational.

In light of these rules, RBI has advanced the model for rating banks in view of CAMEL. Every one of the 6 segments would be weighed on a size of 1 to 100 and would contain a few parameters with individual weightage. According to the rating scale in India:

a) A – Sound in each regard
b) B – Fundamentally solid, however with direct shortcomings
c) C – Financial, operational and additionally consistence shortcomings that give rise to supervisory concern
d) D – Serious or direct budgetary, operational or potentially administrative shortcomings that could hinder future reasonability
e) E – Critical money related shortcomings that render the likelihood of disappointment in the close term [4]

## REVIEW OF LITERATURE

The financial performance of banks has been analyzed by academicians, scholars and administrators, researchers using CAMEL model in the last decade. A summary of some of the studies referred for current study is given below.

People in general division banks; Andhra Bank, Bank of Baroda, Allahabad Bank, Punjab National Bank IDBI Bank, State Bank of Bikaner and Jaipur and UCO Bank has been positioned at the main five positions amid the examination time frame in their money related execution [3]. The private part banks, viz, Tamilnad Merchantile Bank, Kotak Mahindra Bank, HDFC Bank, Axis Bank, Karur Vysya Bank, ICICI Bank, Citi Union Bank and IndusInd Bank secured the best five positions. The remote banks, for example, Bank of Bahrain and Kuwait, HSBC Bank, The Royal Bank of Scotland, Deutsche Bank, CTBS Bank, Citi Bank, DBS Bank and Royal Bank of Scotland can remain at top five positions amid the examination time frame.

The performance of public sector banks in India using CAMEL approach for a 5-year period from 2009 to 2013 [5]. The results show that there is a statistically significant difference between the CAMEL ratios of all the Public Sector Banks in India, thus, signifying that the overall performance of Public Sector Banks is different. Also, the banks with least ranking need to improve their performance to come up to the desired standards.

The IDBI Bank was the best performing bank took after by Kotak Mahindra Bank and ICICI Bank [6]. Dhanalaxmi Bank relatively was the most noticeably awful entertainer took after by J&K Bank and Karnataka Bank Ltd. The consequences of the 't' - test uncovered that there is a noteworthy contrast in the Capital Adequacy, Asset Quality and Earning Capacity of open and private area banks in India, while there is no huge distinction in the Management, Liquidity Position and Sensitivity to advertise danger of the two unique banks gatherings. The examination reasoned that on a normal, there is no measurably huge contrast in the budgetary execution of the general population and private division banks in India, yet at the same time, there is a requirement for general change in the general population part banks to make their position solid in the aggressive market.

All public sector banks and thirteen private sector banks for study shows that each parameter is given equal weights [7]. Results shown that on average Karur Vysya Bank was at the top most position followed by Andhra bank, Bank of Baroda also it is observed that Central Bank of India was at the bottom most position. The largest Public sector bank in India availed 36th position.

Axis bank is ranked first under the CAMEL analysis followed by ICICI bank. Kotak Mahindra occupied the third position [8]. The fourth position is occupied by HDFC bank and the last position is occupied by IndusInd bank amongst all the selected 5 private sector banks. With the help of this analysis, it was inferred that in the public-sector banks, SBI is the top-ranking bank in India, with its performance in terms of financial soundness being the best [9]. Results indicate that the performance of SBI in the study period has been excellent. SBI's excellent performance can be attributed to the adoption of modern technology, banking reforms, and good recovery mechanisms. However, SBI needs to improve its position with regards to a few parameters including debt-equity, operating profit, and non-interest income to total income.

The financial performance of three selected Islamic Banks (Islami Bank Bangladesh Limited, Export Import Bank of Bangladesh Limited, Shahjalal Islami Bank Limited) over a period of eight years (2007-2014) in Bangladeshi banking sectors and it is found that all the selected Islamic Banks are in strong position on their composite rating system. They are basically sound in every respect i.e., sound in capital adequacy, asset quality, management quality, earning capacity and liquidity conditions [10].

A Theoretical Perspective; the capacity and centrality of managing an account part can't be under-evaluated in the improvement of an economy [11]. The quality of economy of any nation relies on the quality and productivity of monetary framework, which relies on a sound managing an account framework. Save Bank of India prescribed two supervisory rating models named as CAMEL (Capital Adequacy, Assets Quality, Management, Earning, Liquidity, Systems and Controls) and CACS (Capital Adequacy, Assets Quality, Compliance, Systems and Controls) for rating of Indian business, private and outside banks working in India. The present examination portrays the different budgetary proportions utilized as a part of the previously mentioned models to quantify the money related execution of managing an account division.

The literature reviewed above pertaining to the examination of overall performances and soundness of nationalized banks and foreign banks with the help of CAMEL Model approach in emerging economies is well established. However, the results appear to be ambiguous. The present study throws a light on CAMEL Model analysis of selected Public and Private Sector Banks in India which will be immense useful to the economy and various investors in vast spectrum to draw a bird's eye-view on their performances based on CAMEL rating.

## RESEARCH DESIGN AND METHODOLOGY

### Research Design

To look at the financial soundness of the selected commercial banks in India, a very simplified approach using internationally accepted CAMEL MODEL is used under the study. CAMEL is a ratio-based model used to evaluate the performance of banks with the help of different criteria, viz. Capital Adequacy, Asset Quality, Management Quality, Earnings Ability, Liquidity and Sensitivity to market risk whereas CAMEL RANKING indicates the banks relative position with reference to other banks. The present study is a descriptive yet conclusive research study based on analytical research design.

**Objectives of the Study**

- The main objective of the study is to analyze the financial performance and position of the selected Public and Private Sector banks in India using CAMEL model.
- In the present study, an attempt has been made to determine whether there is any significant difference between the means of CAMEL ratios of selected public sector and private sector banks.
- To rank the various selected commercial banks (Private and Public) operating in India.

**Hypothesis of the Study**

The present study tested the following null hypothesis:

$H0_1$: There is no significant difference between public and private sector bank's capital adequacy.

$H0_2$: There is no significant difference between public and private sector bank's asset quality.

$H0_3$: There is no significant difference between public and private sector bank's management quality.

$H0_4$: There is no significant difference between public and private sector bank's earnings ability.

$H0_5$: There is no significant difference between public and private sector bank's liquidity.

$H0_6$: There is no significant difference between public and private sector bank's CAMEL ratio

**Sample Design**

The sample design used under the study is Convenient Sampling technique as it will depict the real picture from the study which will lead to describe and conclude the study. The sampling method pertains to give relevant and reliable data as the sample unit is collected under this study is from the available resource (Commercial banks list) of overall population (Indian banking industry).

**Sample Unit**

In the present study, the various Commercial banks operating in India has been taken into account for the study. The Commercial banks in India have been categorized into Public sector, Private sector, and Foreign banks from which this study is concerned with the selected Public and Private sector banks.

**Sample Size**

Out of total 41 banks consisting 21 public sector and 20 private sector banks, the sample of selected banks consists of 10 Public Sector and 10 Private Sector banks as per their market capitalization for the study undergone.

**Data Analysis Tools and Techniques**

CAMEL approach has been used to examine the financial strength of the selected banks in India. Due to the unavailability of the data for factor S, i.e. sensitivity to market risk, the data has been analyzed using the rest of the 5 parameters. The statistical tools used along with their purpose is independent two sample t-test to reach the conclusion whether there is significant difference between the means of CAMEL Ratios of selected public and private banks.

***Table 3.*** *List of public sector banks selected for the study.*

  

| S. n. | Public sector banks | Market cap (Rs. Cr) |
|---|---|---|
| 1 | State Bank of India | 2,70,830.58 |
| 2 | Punjab National Bank | 41,972.72 |
| 3 | Bank of Baroda | 38,191.74 |
| 4 | Bank of India | 23,696.85 |
| 5 | Canara Bank | 23,297.30 |
| 6 | Indian Bank | 19,223.67 |
| 7 | Industrial and Development Bank of India | 16,436.30 |
| 8 | Central Bank | 15,370.65 |
| 9 | Union Bank | 12,087.78 |
| 10 | Syndicate Bank | 7,815.22 |

*Source:http://www.moneycontrol.com/stocks/marketinfo/marketcap/bse/banks-public-sector.html.*

***Table 4.** List of private sector banks selected for the study.*

| S. n. | Private sector banks | Market cap (Rs. Cr) |
|---|---|---|
| 1 | HDFC Bank | 4,74,163.38 |
| 2 | ICICI Bank | 1,99,948.86 |
| 3 | Kotak Mahindra Bank | 1,91,066.83 |
| 4 | Axis Bank | 1,29,617.76 |
| 5 | IndusInd Bank | 1,00,011.56 |
| 6 | Yes Bank | 69,797.62 |
| 7 | Federal Bank | 22,379.83 |
| 8 | RBL Bank | 21,205.44 |
| 9 | IDFC Bank | 19,170.51 |
| 10 | City Union Bank | 10,788.09 |

*Source: http://www.moneycontrol.com/stocks/marketinfo/marketcap/bse/banks-private-sector.html.*

## Data Collection Method

Analysis and interpretation has been given based on data collected from various secondary sources, viz. journals, statistics published by Reserve bank of India, annual reports published by the Banks, published research reports, various CAMEL related handbooks and various subject related online portals.

## Scope of the Study

Performance evaluation of selected Public and Private sector banks based on various parameters of CAMEL rating system is useful for banks as well as for those who deal with the bank in order to identify the weakness and take corrective measures as it rates and ranks banks in relation to other banks as per the health of the banks. In addition to this it helps to compare the financial soundness of public and private banks using ratios and statistical test like t-test. This also helps the prospective investors as they can evaluate the bank based on this study and take decision about their investments.

***Table 5.** Description of component of CAMEL model.*

| Category | Ratios | Formula | Significance | Evaluation criteria |
|---|---|---|---|---|
| Capital adequacy | CRAR | Tier-I and Tier-ii capital/aggregate of risk weighted assets (RWA) | It measures the ability of bank in absorbing losses arising from risk assets. The higher the value of this ratio, the better the financial health of a bank | Higher the better |
| | Debt/equity ratio | (Deposits + borrowings + other liabilities)/(capital + reserves) | This ratio thus indicates the bank's financial leverage. In the case of manufacturing sector the ideal ratio is 2:1. However, in the case of commercial banks, there is no standard norm for debt equity ratio. | Lower the better |
| | Coverage ratio | (Net worth-net NPAs)/total assets | This ratio indicates availability of capital to meet any incidence | Higher the better |

| | | | | |
|---|---|---|---|---|
| | | | of loss assets in NPAs | |
| Assets quality | Net NPA/net advances ratio | Nonperforming assets/net advances | This indicates the level of nonperforming assets in net advances | Lower the better |
| | Gov sec/invest ment ratio | Government securities/total investments | This ratio indicates bank's strategy as being high profits-high risk or low profits-low risk | Higher the safer |
| | Standard advances/t otal advances ratio | Std advances (net of total advances and gross NPAs)/total advances | This ratio means that if the bank has high performing assets it may result in higher earnings | Higher the better |
| Managem ent quality | Total advances/t otal deposit ratio | Total advances/total deposit | This ratio indicates the ability of a bank to convert its deposits into higher earning advances | Higher the better |
| | Business per employee | Total advances and total deposits/no of employees | This ratio is used to find out whether a bank is relatively over or under staffed | Higher the better |
| | Profit per employee | Profit/no of employees | This is also a ratio to check efficiency of bank in maximizing profits per employee | Higher the better |
| Earning ability | Return on asset | Net profit after tax/total assets | This ratio indicates the returns earned on assets deployed by the bank | Higher the better |
| | Income spread/total assets ratio | (Interest income earned – interest expenses)/total assets | This ratio portrays how much a bank can earn for every rupee of investments made in assets | Higher the better |
| | Operating profit/total asset ratio | Operating profit/total assets | This ratio portrays how much a bank can earn from its operations after meeting operating expenses for every rupee of investments made in assets | Higher the better |
| | Cost/incom e ratio | Operating expenses/net income | It indicates the ability of bank to meet the operating expenses from the revenue generated | Lower the better |
| Liquidity | Cash asset/total asset ratio | Cash asset/total asset | This ratio measures cash (which has the highest liquidity and safety among all assets) as a proportion of total assets | Higher the better |
| | Gov sec/total asset ratio | Gov sec/total asset | This ratio measures Government securities (most liquid and safe investments) as a proportion of total assets | Higher the better |
| | Liquid asset/total deposit ratio | Liquid asset/total deposit | This ratio indicates ability of the bank to meet its deposit obligations with available liquid funds | Higher the better |

*Source: Dr, Srinivasan and Yuva Priya Saminathan, A Camel model Analysis of Public, Private and Foreign Banks in India, Pacific Business Review International-Vol 8, Issue 9, March 2016.*

***Table 6.*** *Weights of variables considered in CAMEL ranking.*

| Category | Ratios | Weights | Reason | Composite weights | Reason |
|---|---|---|---|---|---|
| Capital adequacy | CRAR | 0.70 | CRAR indicates availability of capital for a given level of risk | 0.20 | |
| | Debt/equity ratio | 0.15 | | | |

| | | | | | |
|---|---|---|---|---|---|
| | Coverage ratio | 0.15 | weighted assets and considered as more important variable indicating capital adequacy of bank | | In CAMEL Assets quality and framings quality are considered very important because assets size indicates growths of the bank and earnings efficiency ensures survival of the bank, next important categories are capital adequacy which ensures safety of depositors and management quality which indicates productivity of the banks. Through liquidity deteriorates profitability of the banks and affects the overall performance of the banks |
| Asset quality | Net NPA/net advance ratio | 0.10 | Standard advances in total advances contribute to higher earning to banks where as NPAs results in decreasing profits levels. Therefore, standard advances/total advances ratio parameters is given higher weight | 0.25 | |
| | Gov sec/investment ratio | 0.30 | | | |
| | Standard advances/total advances ratios | 0.60 | | | |
| Management quality | Total advances/total deposit ratio | 0.25 | Total advances/total deposit ratio indicates top line of the bank incomes statements and should be given weight right | 0.20 | |
| | Business per employee | 0.25 | | | |
| | Profit per employee | 0.50 | | | |
| Earning ability | Return on assets | 0.25 | All the four variables explain the earning quality from various viewpoints such as earning from interest activities and ability to meet costs from income generated by the bank. All the variables are given equal weights because of their equal importance | 0.25 | |
| | Income spread/total assets ratio | 0.25 | | | |
| | Operating profit/total assets ratio | 0.25 | | | |
| | Cost/income assets | 0.25 | | | |
| Liquidity | Cash assets/total assets ratio | 0.25 | Liquid assets to total deposit ratio is considered more important as it ensures higher credibility in the minds of depositors | 0.10 | |
| | Gov. sec/total assets ratio | 0.25 | | | |
| | Liquid assets/total deposite ratio | 0.25 | | | |

*Source: Dr, Srinivasan and Yuva Priya Saminathan,A Camel model Analysis of Public, Private and Foreign Banks in India, Pacific Business Review International-Vol 8, Issue 9, March 2016.*

## LIMITATION OF THE STUDY

- The accuracy and reliability of the study depends upon the correctness of secondary data collected.
- There are lots of qualitative factors that affect the performance of the bank which is out of the scope of this study.
- The scope of the study is confined to the selected private and public sector banks. It ignores the study of foreign banks and other public and private banks.
- The methods discussed pertain only to banks though it can be used for performance evaluation of other financial institutions

## EMPIRICAL RESULTS AND DISCUSSION

### Performance of Public Sector Banks in India

Table 7 shows the composite ranking of CAMEL parameters of the selected Public Sector Banks in India for the year 2016/2017. It is cleared that the Central Bank holds first position in the CAMEL ranking method due their best financial performance compared to other selected Banks, especially in the context of liquidity, asset quality and earning ability but it still lags behind to perform better in terms of Capital adequacy and Management quality.

***Table 7.*** *CAMEL composite ranking of public sectors banks for the year 2016/2017.*

| Public sector banks | C rank | A rank | M rank | E rank | L rank | Composite rank |
|---|---|---|---|---|---|---|
| State Bank of India | 1 | 10 | 1 | 3 | 2 | 3 |
| Punjab National Bank | 7 | 5 | 8 | 8 | 8 | 8 |
| Bank of Baroda | 2 | 6 | 4 | 4 | 10 | 4 |
| Bank of India | 5 | 3 | 7 | 7 | 7 | 5 |
| Canara Bank | 3 | 7 | 6 | 5 | 6 | 7 |
| Indian Bank | 4 | 9 | 3 | 1 | 5 | 2 |
| IDBI Bank | 10 | 1 | 10 | 10 | 3 | 10 |
| Central Bank | 9 | 2 | 9 | 2 | 1 | 1 |
| Union Bank | 8 | 4 | 2 | 6 | 9 | 6 |
| Syndicate Bank | 6 | 8 | 5 | 9 | 4 | 9 |

Similarly, Indian Bank has managed to seize the second position with its better performance, particularly in terms of Earning ability and Management quality whereas State Bank of India has managed to secure the third position with its strong performance in terms of Capital adequacy, Management quality and Liquidity but does not have good Asset quality. This is followed by Bank of Baroda holding the fourth position with its performance attributable to better Capital adequacy, Management quality and Earning ability. The fifth position is occupied by Bank of India as a result of its good performance in context of Asset quality and Capital adequacy. In the same way, under the CAMEL analysis, the next sixth position is occupied by Union Bank with good Management quality. This is followed by Canara Bank holding seventh position with good performance in terms of Capital adequacy and lagging behind in context of Asset quality and Management quality. Next, Punjab National Bank is at eighth position with unsatisfactory performance in terms of management quality, earning ability and liquidity when compared to other selected bank under the study. Similarly, Syndicate Bank holds ninth position under the study with its unsatisfactory performance in terms of Asset quality and Earning ability and IDBI Bank stands at lowest position i.e. tenth position with its comparatively poor performance under the study of the selected Banks, particularly in terms of Capital adequacy, Management quality and earning ability.

### Performance of Private Sector Banks in India:

Table 8 shows the composite ranking of CAMEL parameters of the selected Private Sector Banks in India for the year 2016/17. It is cleared that the IDFC Bank holds first position in the CAMEL ranking method due their best financial performance compared to other selected banks, especially in the context of capital adequacy, management quality and liquidity, but it still lags behind to perform better in terms of asset quality and earning ability.

***Table 8.*** *CAMEL composite ranking of private sectors banks for the year 2016/2017.*

| Private sector banks | C rank | A rank | M rank | E rank | L rank | Composite rank |
|---|---|---|---|---|---|---|
| HDFC Bank | 6 | 10 | 3 | 2 | 3 | 2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| ICICI Bank | 3 | 1 | 4 | 10 | 9 | 5 |
| Kotak Mahindra Bank | 2 | 4 | 10 | 1 | 8 | 3 |
| AXIS Bank | 7 | 2 | 5 | 9 | 7 | 7 |
| IndusInd Bank | 8 | 9 | 7 | 6 | 4 | 8 |
| Yes Bank | 5 | 7 | 2 | 4 | 10 | 4 |
| Federal Bank | 10 | 6 | 9 | 3 | 5 | 9 |
| RBL Bank | 9 | 8 | 6 | 7 | 1 | 10 |
| IDFC Bank | 1 | 5 | 1 | 8 | 2 | 1 |
| City Union Bank | 4 | 3 | 8 | 5 | 6 | 6 |

Similarly, HDFC Bank has managed to seize the second position with its better performance, particularly in terms of Earning ability, Management quality and Liquidity but lags behind performing better in terms of Asset quality and Capital adequacy, whereas Kotak Mahindra Bank has managed to secure the third position with its strong performance in terms of Earning ability, Capital adequacy and Asset quality but does not have good Management quality and Liquidity. This is followed by Yes Bank holding the fourth position with its performance attributable to better Management quality and Earning ability but unable to maintain good Liquidity. The fifth position is occupied by ICICI Bank as a result of its good performance in context of Asset quality, Capital adequacy and Management quality. In the same way, under the CAMEL analysis, the next sixth position is occupied by City Union Bank with good Asset quality and Capital adequacy. This is followed by Axis Bank holding seventh position with good performance in terms of Asset quality and lagging behind in context of Earning ability, Capital adequacy and Liquidity. Next, IndusInd Bank is at eighth position with unsatisfactory performance in terms of asset quality, capital adequacy and management quality, when compared to other selected bank under the study. Similarly, Federal Bank holds ninth position under the study with its unsatisfactory performance in terms of Capital adequacy, Management quality and Asset quality and RBI Bank stands at lowest position i.e. tenth position with its comparatively poor performance under the study of the selected Banks, particularly in terms of Capital adequacy, Asset quality and Management quality.

## Independent Two Sample 'T' Test Results

For determining whether there is any significant difference between the means of CAMEL ratios of public sector and private sector banks in India, we have applied descriptive statistics in Table 9, which shows that the ratio of Capital adequacy of private sector is more than the private sector, but it shows that the asset quality ratio of private sector is comparatively less than the public sector.

***Table 9.*** *Descriptive statistics.*

| Parameters | Mean (public sector) | Mean (private sector) |
|---|---|---|
| Capital adequacy | 19.7329 | 21.4721 |
| Asset quality | 1.5427 | .9412 |
| Management quality | 83545419.4820 | 66289395.8600 |
| Earning ability | 11.5338 | 11.3945 |
| Liquidity | .0983 | .0847 |
| CAMEL | 16709091.1210 | 13257886.5578 |

It also shows that management quality ratio of public sector is higher than private sector. But when we see the Earning ability and Liquidity ratios, there is negligible difference; this is because of non-standardizing (non-uniform) values of

CAMEL ratios having more variance. And when we see the composite CAMEL ratio, Public sector is relatively higher.

Hence, in order to know the significance difference in the mean of public sector and private sector banks, we have applied Independent two-sample 't' test with the standardize values of ratios and the results are depicted in Table 10. The result shows that there is significance difference in Public and Private sector banks in terms of - Capital Adequacy, Asset Quality, Management Quality, Earning ability as the 'significant 2-tailed' value is less than '0.05' hence we 'reject the null hypothesis', but when we see in terms of Liquidity ratio, there is no significant difference in Public and Private sector banks as the 'significant 2-tailed' value is more than '0.05' hence we 'accept the null hypothesis' during the period of study.

***Table 10.*** *Independent samples test.*

| | | Levene's test for equality of variances | | t-Test for equality of means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | Df | Sig. (2-tailed) | Mean difference | Std. error difference | 95% Confidence interval of the difference | |
| | | | | | | | | | Lower | Upper |
| **C** | EVA | .653 | .430 | -5.262 | 18 | .000 | -87.41852 | 16.61251 | -122.32011 | -52.51692 |
| | EVNA | | | -5.262 | 14.947 | .000 | -87.41852 | 16.61251 | -122.83829 | -51.99874 |
| **A** | EVA | 3.611 | .074 | 5.458 | 18 | .000 | 105.84475 | 19.39299 | 65.10160 | 146.58791 |
| | EVNA | | | 5.458 | 12.549 | .000 | 105.84475 | 19.39299 | 63.79521 | 147.89430 |
| **M** | EVA | 1.445 | .245 | -3.287 | 18 | .004 | -79.67992 | 24.24168 | -130.60979 | -28.75004 |
| | EVNA | | | -3.287 | 13.257 | .006 | -79.67992 | 24.24168 | -131.94794 | -27.41189 |
| **E** | EVA | .110 | .744 | -4.436 | 18 | .000 | -92.74131 | 20.90727 | -136.66584 | -48.81677 |
| | EVNA | | | -4.436 | 17.882 | .000 | -92.74131 | 20.90727 | -136.68663 | -48.79598 |
| **L** | EVA | 2.118 | .163 | 1.046 | 18 | .309 | 38.03935 | 36.35959 | -38.34931 | 114.42801 |
| | EVNA | | | 1.046 | 10.081 | .320 | 38.03935 | 36.35959 | -42.88709 | 118.96578 |
| **CAMEL** | EVA | .075 | .788 | -2.984 | 18 | .008 | -2633.98900 | 882.61957 | -4488.30390 | -779.67410 |
| | EVNA | | | -2.984 | 17.973 | .008 | -2633.98900 | 882.61957 | -4488.50293 | -779.47508 |

## Findings

By considering all of the parameters of CAMEL approach, the finding of the study shows that:

- Public Sector Banks, viz. Central Bank, Indian Bank, State Bank of India, Bank of Baroda and Bank of India has been ranked at the top five positions compared to other banks under the study in their financial performance during the study period.
- On the other hand, IDBI Bank is at lowest position under the study.
- The Private Sector Banks, namely, IDFC Bank, HDFC Bank, Kotak Mahindra Bank, Yes Bank and ICICI Bank shared the top five positions.
- On the other hand, RBL Bank is at lowest position under the study.
- The empirical results show that there is a statistically significant difference between the CAMEL ratios of the selected Public Sector Banks, Private Sector Banks in India.
- The null hypothesis, viz. $H0_1$, $H0_2$, $H0_3$ and $H0_4$ are rejected as we find the significance difference between the financial performance of public and private sector banks using CAMEL model.
- It has also been determined that there is significant difference between the means of CAMEL ratios of public sector and private sector banks in India, using Descriptive statistics.
- Whereas, the null hypothesis $H0_5$ is not being rejected as we find there is no significance difference between the financial performance of public and private sector banks using CAMEL model using Independent two sample 't' test.

## CONCLUSION

By considering all of the parameters of CAMEL approach, as per the finding of the study, it can be concluded as the banks with excellent financial performance in regard with CAMEL parameters are ranked at 'top' positions, whereas the banks with poor financial performance in regard with CAMEL parameters are ranked at 'lower' positions when compared to the selected banks under the study. The empirical results show that there is a statistically significant difference between the CAMEL ratios of the selected Public Sector Banks and Private Sector Banks in India, thus, signifying that the overall performance of within and between Public Sector Banks and Private Sector Banks are different. Therefore, it can be concluded that the excellent performance of the Banks in regard with various parameters of CAMEL can be attributed to the adoption of modern technology, banking reforms, and good recovery mechanisms. However, the Banks also need to improve its position with regards to a few sub-parameters (ratios) of CAMEL approach to strengthen their weak areas to come up to the desired standards. The policy makers of the related lowest ranking banks should take necessary steps and try to find out solution to improve their weaknesses by using the findings this study.

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