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X-Efficiency of Indian Commercial Banks and their Determinants of Service Quality: A Study of Post Global Financial Crisis

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Introduction

Present scenario of Indian commercial banks

- Role of the Indian banks has shifted from conventional functioning to need based functioning.
- Functions of Indian banks have always been under governmental control.
- Due to this, Indian banks survived the global financial crisis of 2007 without any adverse developments.

Literature Review

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Efficiency of the banks

Kisaka et al. (2014), Yona and Inanga (2014), Agbeja Oyedokun (2014), Toci and Hashi (2013), Ayadi Ines (2013), Raphael Gwahula (2013), Kumar and Charles (2012), Mahesh and Rajeev (2009)

Service quality of the banks

Lau et al. (2013), Sritharan (2013), Geetika and Shefali (2010), Glaveli et al. (2006), Jabnoun and Azaddin (2005), Joshua and Moli (2005), Arasli et al. (2005), Spathis et al. (2004), Spears (2004), Bodla (2004), Al-Tamini and Jabnoun (2004), Gerrard and Cunningham (2001)

Objectives

The objectives of the study have been

1) To study the X-efficiency of Indian commercial banks for the post financial period i.e. 2007-14.
2) To find the returns to scale of Indian commercial banks for the post financial period i.e. 2007-14.
3) To identify important determinants of service quality of efficient banks.

Research Design

Population and Sample

The research paper considers all the public (26) and private (19) sector banks operating in India. The efficiency of these banks was studied for the period 2007-14.

Data

a) Primary

Questionnaire method was used to collect the service quality data from 50 customers of each efficient banks (banks selected from the first stage of the analysis).

b) Secondary

The secondary data was extracted from Performance Prowess Database (CMIE) and National Accounts Statistics published by Center for Monitoring Enterprises, Report on Trend and Progress in Banking and RBI Bulletins-publications of Reserve Bank of India.

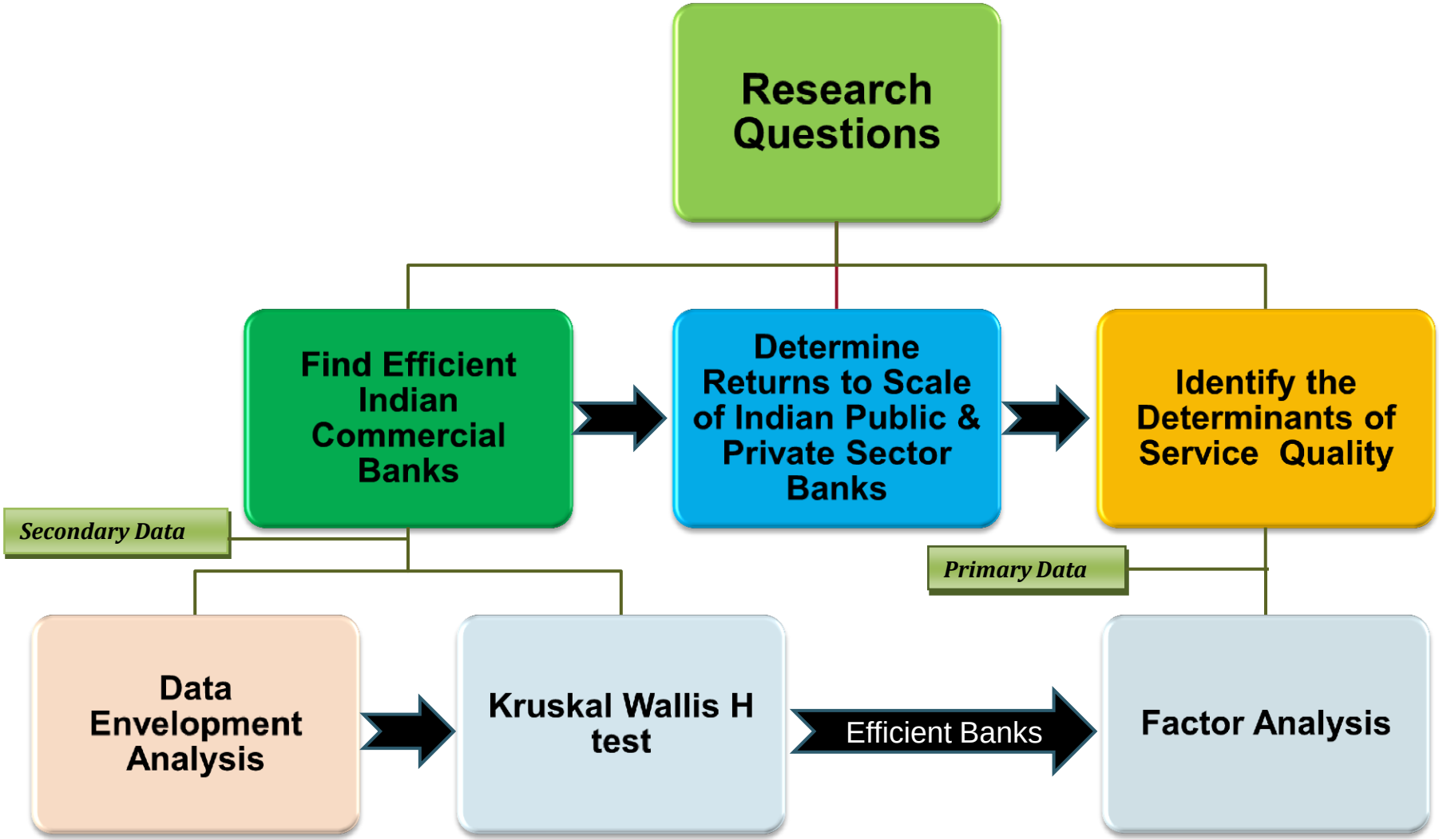
Research Design

To achieve the first two objectives of the research paper Data Envelopment Analysis (DEA) and Kruskal Wallis H test were used and following inputs and outputs were considered for analysis.

Inputs	Outputs
Loans & Advances	Deposits
Net Fixed Assets Ratio	Returns on Assets (ROA)
Financial Services Expenses Ratio	Non-Performing Assets Ratio (NPA Ratio)

To attain the third objective of identifying the important determinants of service quality Factor Analysis was applied.

Model of Research Paper



Source: Authors' compilation

Results of DEA – Public Sector Banks

S. No.	Banks	Technical Efficiency	Pure Technical Efficiency	Allocative Efficiency	Scale Efficiency	X-Efficiency	Returns to Scale
1	Allahabad Bank	0.8201	0.9341	0.8748	0.8780	0.7174	IRS
2	Andhra Bank	0.7335	0.9720	0.7866	0.7546	0.5770	IRS
3	Bank of Baroda	0.7874	1.0000	0.8070	0.7874	0.6354	IRS
4	Bank of India	0.5309	0.8498	0.7095	0.6247	0.3767	IRS
5	Bank of Maharashtra	0.5561	0.9565	0.7286	0.5814	0.4052	IRS
6	Canara Bank	0.6797	0.7947	0.7902	0.8553	0.5371	IRS
7	Central Bank of India	0.4857	0.8012	0.7015	0.6062	0.3407	IRS
8	Corporation Bank	0.6857	1.0000	0.7726	0.6857	0.5298	IRS
9	Dena Bank	0.6731	0.9703	0.7705	0.6937	0.5186	IRS

contd…..

Results of DEA – Public Sector Banks

S. No.	Banks	Technical Efficiency	Pure Technical Efficiency	Allocative Efficiency	Scale Efficiency	X-Efficiency	Returns to Scale
10	IDBI Bank	0.4513	0.7730	0.6884	0.5838	0.3107	IRS
11	Indian Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
12	Indian Overseas Bank	0.5545	0.8483	0.7438	0.6537	0.4124	IRS
13	Oriental Bank of Commerce	1.0000	1.0000	1.0000	1.0000	1.0000	IRS
14	Punjab & Sind Bank	0.6965	0.8892	0.7611	0.7833	0.5301	IRS
15	Punjab National Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
16	State Bank of Bikaner & Jaipur	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
17	State Bank of Hyderabad	0.6316	0.9012	0.8014	0.7008	0.5062	IRS

contd…..

Results of DEA – Public Sector Banks

S. No.	Banks	Technical Efficiency	Pure Technical Efficiency	Allocative Efficiency	Scale Efficiency	X-Efficiency	Returns to Scale
18	State Bank of India	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
19	State Bank of Mysore	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
20	State Bank of Patiala	0.9065	0.9869	0.9240	0.9185	0.8376	IRS
21	State Bank of Travancore	0.9037	0.9800	0.9227	0.9221	0.8338	IRS
22	Syndicate Bank	0.6111	0.9627	0.7891	0.6348	0.4822	IRS
23	UCO Bank	0.6612	0.9272	0.8071	0.7131	0.5337	IRS
24	Union Bank of India	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
25	United Bank of India	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
26	Vijaya Bank	0.5184	0.8458	0.7284	0.6129	0.3776	IRS

Findings of DEA - Public Sector Banks

- Indian Bank, Punjab National Bank and State Bank of India are found to be most technical efficient.
- IDBI Bank (0.4513), Vijaya Bank (0.5184) and Bank of India (0.5309) are relatively most technical inefficient.
- State Bank of Bikaner & Jaipur, Bank of Baroda and Punjab National bank are relatively most pure technical efficient banks.
- IDBI Bank, Canara Bank and Central Bank of India are most pure technical inefficient banks.
- State Bank of Bikaner & Jaipur, Indian Bank and State Bank of India are found to be highly allocative efficient.
- IDBI Bank, Central Bank of India and Bank of India are highly allocative inefficient banks.
- The X-inefficiency of IDBI Bank is 31.07 percent during 2007-14.

Results of DEA – Private Sector Banks

S.No.	Banks	Technical Efficiency	Pure Technical Efficiency	Allocative Efficiency	Scale Efficiency	X-Efficiency	Returns to Scale
1	Axis Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
2	Catholic Syrian Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
3	City Union Bank	0.9857	1.0000	0.8728	0.9857	0.8603	DRS
4	Dhanlaxmi Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
5	Federal Bank	0.7317	0.8516	0.7496	0.8592	0.5485	IRS
6	HDFC Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
7	ICICI Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
8	ING Vysya Bank	0.5964	0.8810	0.6834	0.6770	0.4076	IRS
9	IndusInd Bank	0.6463	0.7685	0.6779	0.8410	0.4381	IRS
10	Jammu & Kashmir Bank	0.8602	0.9416	0.7877	0.9136	0.6776	IRS

contd…..

Results of DEA – Private Sector Banks

S.No.	Banks	Technical Efficiency	Pure Technical Efficiency	Allocative Efficiency	Scale Efficiency	X-Efficiency	Returns to Scale
11	Karnataka Bank	0.7910	0.9908	0.7423	0.7983	0.5872	IRS
12	Karur Vysya Bank	0.6575	0.7409	0.7223	0.8874	0.4749	IRS
13	Kotak Mahindra Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
14	Lakshmi Vilas Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
15	Nainital Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
16	RBL Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
17	South Indian Bank	0.5784	0.7808	0.7079	0.7408	0.4094	IRS
18	Tamilnad Mercantile Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS
19	Yes Bank	1.0000	1.0000	1.0000	1.0000	1.0000	CRS

Findings of DEA - Private Sector Banks

- HDFC Bank, Axis Bank and RBL Bank are found to be technical efficient.
- South India Bank (0.5784), ING Vysya Bank (0.5964) and IndusInd Bank (0.6463) are relatively most inefficient.
- HDFC Bank, Axis Bank and RBL Bank are relatively most pure technical efficient banks.
- Karur Vysya Bank, IndusInd Bank and South Indian Bank are most pure technical inefficient banks.
- Axis Bank, Nainital Bank and RBL Bank are found to be highly allocative efficient banks.
- Indusind Bank, ING Vysya Bank and South Indian Bank are highly allocative inefficient banks.
- The X-efficiency of ING Vysya Bank is 40.76 percent during 2007-14.

Returns to Scale – Public & Private Sector Banks

Returns to scale	Public Sector Banks
Increasing returns to scale	Allahabad Bank, Andhra Bank, Bank of Baroda, Bank of India, Bank of Maharashtra, Canara Bank, Central Bank of India, Corporation Bank, Dena Bank, IDBI Bank, Indian Overseas Bank, Oriental, Bank of Commerce, Punjab & Sind Bank, State Bank of Hyderabad, State Bank of Patiala, State Bank of Travancore, Syndicate Bank, UCO Bank, Vijaya Bank.
Constant returns to scale	Indian Bank, Punjab National Bank, State Bank of Bikaner & Jaipur, State Bank of India, State Bank of Mysore, Union Bank of India, United Bank of India.
Decreasing returns to scale	NIL
Returns to scale	**Private Sector Banks**
Increasing returns to scale	Federal Bank, ING Vysya Bank, IndusInd Bank, Jammu & Kashmir Bank, Karnataka Bank, Karur Vysya Bank, South Indian Bank.
Constant returns to scale	Axis Bank, Catholic Syrian Bank, Dhanlaxmi Bank, HDFC Bank, ICICI Bank, Kotak Mahindra Bank, Lakshmi Vilas Bank, Nainital Bank, RBL Bank, Tamilnad Mercantile Bank, Yes Bank.
Decreasing returns to scale	City Union Bank.

Comparison of Efficiency – Public & Private Sector Banks

Kruskal-Wallis - Test Statistics			
Public Sector Banks	**Efficiency**	**Private Sector Banks**	**Efficiency**
Chi-Square	97.372	Chi-Square	87.434
df	25	df	18
Asymp. Sig.	0.000*	Asymp. Sig.	0.000*
* Significant at 1 percent level of significance			

- There has been a statistically significant difference in efficiency score among the public sector banks.
- Co-efficient of variation in efficiency (18.13%) shows the level of variation because of different public sector banks.
- There has been a statistically significant difference in efficiency score among the private sector banks.
- Co-efficient of variation in efficiency (23.75%) shows the level of variation because of different private sector banks.
- Six banks (State Bank of India, Punjab National Bank, Union Bank of India, Axis Bank, ICICI Bank and HDFC Bank) with largest branch network were found to be efficient on the basis of DEA and Kruskal - Wallis H test.

Identifying the Determinants of Service Quality

- To fulfill the third objective primary data technique i.e. questionnaire method was used.
- The analysis was based on the data collected from the customers of six efficient banks. To make the analysis comparable only those efficient banks were selected (for service quality) which were also having large branch network.
- The six efficient banks were State Bank of India, Punjab National Bank, Union Bank of India, Axis Bank, ICICI Bank and HDFC Bank.
- Responses were solicited from 300 respondents towards each dimension of service quality of public and private sector banks.

SERVQUAL Model – Its Five Dimensions

The information was diagnosed and tested to identify the importance attached to the five dimensions of service quality by customers of six efficient banks.

Five Dimensions of service quality are:

1. Responsiveness (Being willing to help)
2. Reliability (Delivering on promises)
3. Empathy (Treating customers as individuals)
4. Tangibles (Representing the service physically)
5. Assurance (Inspiring Trust and Confidence).

KMO and Bartlett's Test of Perceptions & Expectations of Customers

Panel A: Customers' Perceptions		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.767
Bartlett's Test of Sphericity	Approx. Chi-Square	595.721
	Df	45
	Sig.	0.000*
Panel B: Customers' Expectations		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.764
Bartlett's Test of Sphericity	Approx. Chi-Square	565.358
	Df	45
	Sig.	0.000*

- **KMO measure of perceptions and expectations values are 0.767 and 0.766 respectively.**
- **Bartlett's Test of perceptions and expectations of customers are found to be significant at 1 percent level of significance.**

Results of Factor Analysis – Efficient Indian Banks

Total Variance Explained						
Extraction Sums of Squared Loadings						
Components	Perceptions			Expectations		
	Total	Percentage of Variance	Cumulative Percentage	Total	Percentage of Variance	Cumulative Percentage
1	3.233	32.332	32.332	3.198	31.982	31.982
2	1.238	12.382	44.714	1.148	11.479	43.461
3	1.092	10.916	55.630	1.043	10.430	53.891

Out of ten statements for the five dimensions of SERVQUAL, three factors have been extracted both in case of customers' perceptions and expectations by using Principal Component Analysis.

Determinants of Service Quality of the Efficient Banks

Three factors have been extracted for the customers' perceptions of service quality:

- 'Responsiveness', the statement with highest loading is 'The fee charged by the bank is reasonable.'
- 'Reliability' includes the statement 'Bank takes keen interest in solving customers' problems'.
- 'Empathy' includes statement 'Bank provides special services for certain types of customers'.
- 'Three factors have been extracted for the customers' expectations of service quality:
- Tangibility' the statement with highest loading is 'Bank should provide anywhere anytime banking'.
- 'Empathy' includes the statement 'The staff of the bank should understand the specific needs of the customers'
- 'Reliability' includes the statement 'Bank should take keen interest in solving customers' problems'.

Conclusion

- Public sector banks are larger in number as well as holding larger share of Indian banking sector but due to high rate of non-performing assets and weak returns on assets private banks are performing better.
- 11 out of 19 private sector banks were found to be X-efficient i.e. more than 50 percent as compared to 30 percent public sector banks.
- Aggressive lending by banks has rendered many loans non-performing, impacting the banks' profitability.
- The macroeconomic situation in India is driving private sector banks to sharpen their focus on emerging sector and rural markets to boost growth.
- Efficient banks in private sector such as HDFC bank, ICICI bank and Axis bank are setting up their branches to strengthen their rural presence.
- The two dimensions which the customers perceive and expect to improve are reliability and empathy.
- Reliability basically means that the bank delivers its promises and empathy is related to the treatment given to the customers.

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