INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, ECONOMICS & MANAGEMENT

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     INTRODUCTION

     REVIEW OF LITERATURE

     NEED/IMPORTANCE OF THE STUDY

     STATEMENT OF THE PROBLEM

     OBJECTIVES

     HYPOTHESES

     RESEARCH METHODOLOGY

     RESULTS & DISCUSSION

     FINDINGS

     RECOMMENDATIONS/SUGGESTIONS

     CONCLUSIONS

     SCOPE FOR FURTHER RESEARCH

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CONTRIBUTIONS TO BOOKS
- Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS
- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

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- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

EFFICIENCY MEASUREMENT OF INDIAN PUBLIC AND PRIVATE SECTOR BANKS IN THE CONTEXT OF DOWNGRADED RATINGS

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ABSTRACT

The present paper is an endeavor to measure the technical efficiency, overall technical efficiency and scale efficiency of selected public and private sector banks in India, through the application of Data Envelopment Analysis (DEA). A sample of 16 banks (8 each from public sector and private sector) was selected containing 7 banks (5 public sector and 2 private sector banks downgraded recently from 'stable' to 'negative' by the world fame, 'Fitch Rating Agency'), for assessing the justification of decision made by the agency. The study found that SBI, Bank of Baroda, ICICI Bank and Axis Bank were having no such problem which may result into the downgrading of their ratings, though, the PNB, Canara Bank, IDBI Bank and 4 other private banks stood short of their claims of efficiency, which needs to be addressed immediately in the interest of the nation, in general, and banking sector in particular.

KEYWORDS

Banking Sector, Credit Rating Agency, Data Envelopment Analysis (DEA), DMUs (Decision Making Units), Technical Efficiency.

INTRODUCTION

The Indian economy saw the dawn of reforms in 1991 with the adoption of the policy of liberalisation, privatisation and globalisation (LPG) to put the troublesome economy on the path of progress with the help of world class technology and management coupled with the foreign capital. The economy gained momentum and achieved a growth rate of up to 9.6 per cent (2006-07) in GDP by surpassing the traditional Hindu Rate of Growth; and again tanked to 5.3 per cent growth in GDP (the lowest in 9 years) for the quarter ending on 31st March 2012. Since, a strong banking system is must for the sustainable and regular growth of the economy, by circulating the financial resources optimally in between various segments, hence, it was also upgraded accordingly during the reform period to meet out the desired economic goals and, consequently, new banking laws and regulations were framed and implemented, besides the adoption of banking reforms on the recommendations of the Committee on Financial System (CFS), also known as Narsimham Committee, in 1992 and 1997 in the form of Basel Agreement I and II, respectively. But all of a sudden, recession in US economy broke out in the last quarter of 2007 which engulfed the world economy into it, holistically; and, the US banking system was the worst hit sector. BRIC economies came out of it successfully. Then, Euro-debt-crisis appeared, adding significantly to the problem of recession, and hurting badly the ailing economies. The Asian Development Bank echoed the sentiment by lowering the economic growth rate in developing Asian countries (including India and Thailand) from 6.9 per cent to 6.6 per cent for 2012. The austerity measures in Europe and the lethargic pace of growth in US have adversely affected the growth in the exports of many economies including China (World's factory) which is an important driver of Asian economic particular. The Central Bank of South Korea lowered its key base rate from 3.25 per cent to 3 per cent and surprised the economists globally; global environment was cited as the main reason behind the move. The Central Bank of Japan also trimmed its outlook for growth and China, dominating the region showed signs of slowdown through its data release. The news of downgrading the ratings of 12 Indian banks and financial institutions due to their high exposure to domestic counterparties and holdings of domestic sovereign debt came from Fitch (Credit Rating Agency) at a time when whole world was watching towards Indian economy with great hopes and aspirations in the form of rescuer. Besides that, Rating Agency Moody's downgraded 15 of the world's biggest banks, including Morgan Stanley, due to their diminishing profitability, growth prospects and difficult operating conditions; and 28 banks (including Banko Standard of Spain, 4th biggest economy of Europe), due to their exposure towards Real Estate. The country's twin deficits for 2011/12 –the fiscal deficit at 5.9 per cent and the current account deficit at 3.8 per cent of GDP, persistent inflation, historical fall in rupee against US dollar, soaring fuel prices and, the political paralysis, induced the world fame Times Magazine of US to declare Dr. Manmohan Singh, the Prime Minister of India, as 'underachiever' and adding fuel to the fire. In the backdrop of happening of such unexpected and undesired events, the authors took up the study to measure the efficiency of Indian banks (public and private sector banks excluding foreign banks) to assess the justification of the decisions of the Credit Rating Agencies regarding downgrading the rating of the banks from stable to negative.

REVIEW OF LITERATURE

S.No.	Year	Author & Study	Methodology Used	Major Findings	Variables Used in the Study
1.	2011	**Farhan Akhtar, Muhammad et.al.** "Performance Efficiency of commercial Banks of Pakistan: Non-Parametric technique Data Envelopment Analysis (DEA)"	Data Envelopment Analysis (DEA), Banxia frontier Analyst	The study found 6 banks relatively efficient when the efficiency was measured in terms of 'constant returns to scale' and 8 banks when the efficiency was measured in terms of 'variable returns to scale'.	**Outputs:** Operating Income, Net-interest income **Inputs:** Operating expenses, advances and Capital.
2.	2011	**San, Ong Tze et. al.** "A comparison on Efficiency of Domestic and Foreign Banks in Malaysia: A DEA Approach"	Data envelopment analysis (DEA), Tobit Model	The study revealed that domestic banks were more managerially efficient than foreign banks in controlling their costs. **Tobit Model** suggested that PTE of banks was mainly affected by capital strength, loan quality, expenses and asset size.	**Outputs:** Total Loans, Total Investments **Inputs:** Total Deposits, Fixed Assets

No.	Year	Author & Title	Methodology	Findings	Inputs/Outputs
3.	2011	**Rajan S.S** "Efficiency and Productivity Growth in Indian Banking"	Data Envelopment Analysis (DEA), The (PSS) Semi-Parametric Estimation (SPE)	It was found that public sector banks and State Bank of India and its Associates were more efficient than domestic private banks and foreign banks. However, foreign banks were more efficient than domestic private banks due to their specialised activities.	**Outputs:** Loans, Investments **Inputs:** Deposits & Borrowings, Number of employees, Capital
4.	2010	**Nigmonov, Asror** "Bank Performance and Efficiency in Uzbekistan"	Data Envelopment Analysis	The results showed that the overall efficiency levels of banks on an average decreased and it was mainly due to technical inefficiency.	**Outputs:** Total credits –Reserve for possible loan losses Total non-interest income, Other non-interest income **Inputs:** Operational expenses, Fixed assets, Total Deposits
5.	2010	**Frimpong, Joseph Magnus** "Investigating Efficiency of Ghana Banks: A Non-Parametric Approach"	Data Envelopment Analysis (DEA), Efficiency-Profitability matrix, Intermediation Model Input-Output Specification.	It was found that only 4 banks (out of 22) were efficient. The 18 ineffici-ent banks had efficiencies ranging from 33 per cent to 89 per cent. Domestic private sectors banks were more efficient group of banks in Ghana with average efficiency level of 87 per cent.	**Outputs:** Advances (i.e. bills purchased and discounted, credits, overdrafts, loans) and Investment. **Inputs:** Deposits and Total expenditure
6.	2009	**Das, Abhiman, and Saibal, Ghosh** "Financial Deregulation and Profit Efficiency: A Non-Parametric Analysis of Indian Banks"	Data Envelopment Analysis (DEA)	The study revealed that liberalisation had not brought any significant changes among various types of Indian banks in context of technical and cost efficiency, but their profit and revenue efficiencies were significantly different.	**Outputs:** Loan Assets, Other Incomes and Investments **Inputs:** Physical capital, Labour, Loanable funds and Equity
7.	2008	**Ketkar,Kusum w. and Ketkar,Suhas** "Performance and Profitability of Indian Banks in the Post Liberalisation Period"	Data Envelopment Analysis (DEA), Fixed affects multiple regression models.	It was concluded through the study that Foreign banks working in India were more efficient followed by new private banks; while, the efficiency scores of all the banks increased over the reform period, and the nationalised banks registered the highest gains.	**Specification 1:** **Outputs:** Loans, Non-interest income, Deposits **Inputs:** No. of branches, Equity, Total operating expenses. **Specification 2:** **Outputs:** Loans, on-interest income. **Inputs:** No. of bank branches, Equity, Total operating expenses, Deposits
8.	2008	**Khankhoje, Dilip and Sathye,Milind** "Efficiency of Rural Banks: The case in India"	Data Envelopment Analysis (DEA) Model.	The study exposed that efficiency of rural banks improved significantly and showed positive results after the restructuring process adopted by the Government of India.	**Outputs:** Interest Income, non-Interest income. **Inputs:** Interest expenses, non-Interest expenses.
9.	2008	**Gupta, Omparaksh K. et. al.** "Dynamics of Productive Efficiency of Indian Banks"	Data Envelopment Analysis (DEA) Model, TOBIT Regression.	It was found through the study that SBI and its Associates had the highest efficiency among private and other nationalised banks and, the productive efficiency of the banks was positively impacted by the capital adequacy ratio.	**Outputs:** Interest Income, Fee based Income (commission, brokerage etc.) and Investment Income. **Inputs:** Interest expenses, Operating expenses
10.	2006	**Angelidis, Dimitrios** "Efficiency in the Italian Banking Industry: Data Envelopment Analysis and Neural Networks	Data Envelopment Analysis, Neural Networks, Malmquist productivity index,	The empirical results, though, confirmed that total productivity of Italian banking institutions increased at the rate of 3.5 per cent during the period under study, but DEA and Neural Networks exposed contradictory results at several points regarding the performance of banks.	**Outputs:** Total other earning assets, Total customer loans and Total deposits. **Inputs:** Personnel expenses, other operating expenses and total fixed assets
11.	2005	**Abhiman et. al.** "Liberalisation, Ownership And Efficiency in Indian Banking"	Data Envelopment Analysis (DEA) and Spearman Rank Correlations	The study revealed that the State Bank and its Associates scored much higher than all other groups, in terms of profit efficiency.	**Outputs:** investments, performing loan assets and other non-interest fee based incomes **Inputs:** Borrowed funds (deposits and other Borrowings), number of employees, fixed assets and equity.
12.	2001	**Vujcic, Boris, and Igor Jemric** "Efficiency of Banks in Transition- A DEA Approach"	Data envelopment analysis (DEA)	The study found that the Foreign banks were most efficient banks and the new banks performed better than the old banks. The significant cause of inefficiency among state owned and old banks vs. foreign banks and new ones was the number of employees and the fixed assets. The banks with more technical efficiency were also having less non-performing assets.	**Operational Approach** **Outputs:** Interest and Related Revenue, Non-interest Revenue **Inputs:** Interest and Related Cost, Commission for services and related cost, labour and Capital related administrative cost. **Intermediation Approach** **Outputs:** Total Loans Extended, Short-term securities. **Inputs:** Fixed assets and Software, Number of Employees, deposits

On the basis of the analysis of review of literature, it is clear that no study, so far has been conducted on the topic of 'Efficiency Measurement of Indian Public and Private Sector Banks in the context of Downgraded Ratings'; though, several studies have already been conducted on the measurement of efficiency of various types of banks operating in India and abroad by various researchers. Since, the global economy is passing through a phase of great tides, where all sorts of uncertainties are prevailing in the disturbed economic environment, therefore, in such a situation, only right direction and good health of the organisations clubbed with goodwill can help in taking out the global economy from the whirlpool of gloomy clouds. The Indian economy, with its strong banking system, has been performing nicely throughout the period of recession which started from US in 2008, but recently, several world fame rating agencies like Fitch, Standard and Poor and Moody's etc., have pointed out towards the ill health of several Indian organisations, including banks, and hence, hurt the economic sentiments of the nation. But, the government of India and the officials holding key positions in these organisations denied such charges. Hence, the researchers took up the study to confirm the claims and the counters in this regards.

OBJECTIVES OF THE STUDY

1) To measure 'technical', 'overall technical' and 'scale efficiency' of the sampled Indian banks with the help of DEA;
2) To study the slacks in outputs and inputs hampering the efficiency of the sampled banks; and
3) To make viable suggestions on the bases of findings of the study.

RESEARCH METHODOLOGY

SAMPLE OF THE STUDY

All banks (Public Sector, Private Sector and Foreign banks) operating in India, constitute the universe of the study. All public and private sector banks operating in India form the population of the study, out of which 16 banks (8 Public and 8 Private sectors) have been selected as the sample of the study, on the basis of purposive sampling technique. The sample specifically includes 7 banks- SBI, PNB, Canara Bank, Bank of Baroda, IDBI Ltd. ,ICICI and Axis Bank (5 Public and 2 Private sector banks) which have been downgraded by Fitch Rating Agency from 'stable' to 'negative', to draw the inferences.

DATA COLLECTION

The present study is purely based on secondary data. The data for the study were related to the total 16 banks (8 public and 8 private sector banks) including the banks (5 public and 2 private sector banks) downgraded by **Fitch Ratings,** the Global Credit Rating Agency. The Data (latest) for the purpose of analysis have been extracted from the website of the Reserve Bank of India for the financial year 2010-11.

STATISTICAL TOOL: DATA ENVELOPMENT ANALYSIS (DEA)

DEA is a non-parametric technique, developed by **Charnes, Cooper and Rhodes (1978)**, based on the principle of linear programming to construct a non-parametric piecewise frontier over the data to examine how a particular decision-making unit (DMU) – like a bank (in this study) – operates relatively to other DMUs in the sample, and assesses the efficiency of production units (in present study, the public and private banks) in comparison to a set of similar units operating in the same business environment. Efficiency=output / input and is used when there is only one output and one input, but if multiple number of outputs and inputs are involved in the study, DEA solves this problem by developing an efficiency frontier from weighted output and input. Data Envelopment Analysis (DEA) allows relative efficiency measures to be determined.

A common measure of relative efficiency is

Efficiency = Weighted sum of outputs
                   Weighted sum of Inputs

The efficiency desired for each unit is on a scale of 0-1 whereas '0' denotes an extremely inefficient unit and a score of '1' represents perfect efficient unit. Efficiency scores are relative, and, are derived by comparing the units in the data set for analysis. According to Charnes, Coopper and Rhods, "100% efficiency is obtained for a unit only when:

     a) None of its outputs can be increased without either;
i) Increasing one or more of its inputs, or
ii) Decreasing sum of its other outputs.
     b) None of its inputs can be decreased without either;
i) Decreasing some of its outputs, or
ii) Increasing sum of its other inputs."

The linear programming technique (DEA) also provides a set of targeted inputs and outputs for the inefficient units. For each inefficient unit, there are targeted units that would attain an efficiency score of '1' with the same set of inputs and outputs. These units are called as the peer units and their values of inputs and outputs serve as the targeted values for the inefficient units. The targeted values of the inputs and the outputs form the basis for the potential improvements of the inefficient units. The potential improvements for the inefficient units can be calculated as:

(Targeted Value – Actual Value) X 100
         Actual Value

INPUT-OUTPUT SELECTION FOR DEA ANALYSIS

There is a considerable disagreement among researchers about what constitute inputs and outputs of banking industry (**Sathye, 2002).** Through the literature, two approaches the 'production approach' and 'intermediation approach' are exposed. The production approach (pioneered by **Benston, 1965)** treats banks as the service providers to customers, and the 'intermediation approach' considers banks as intermediaries using deposits with other inputs such as labour and capital to produce outputs like loans. Hence, the intermediation approach views deposits as an input. The 'intermediation approach' and 'production approach' are best suited for analysing bank level efficiency and branch level efficiency, respectively (**Berger and Humphrey 1997**). Therefore, we have selected intermediation approach for selecting input and output variables for the present study. The input and output variables for the present study are as follows: **Inputs:** 'Deposits' and 'Interest expended' and, **Outputs: '**Advances', 'Investment' and 'Interest Income**'.**

RESULTS AND DISCUSSION

Through the application of non-parametric technique (DEA)[1] on data collected for 16 banks (both public and private sector banks including 7 banks downgraded by **Fitch**) comparative efficiency scores for various banks were obtained through **Table 1.**
The overall technical efficiency of a bank is the product of pure technical efficiency and scale efficiency. It is evident from the above table that the PTE (Pure Technical Efficiency) of the largest public sector bank (SBI) is perfect i.e. 1; but its SE (Scale Efficiency) is 0.969 which is below the mean efficiency score (0.974) of all the sampled banks taken together, and hence generating benefits less than the cost incurred for widening its scale operations. That is why its OTE (Overall Technical Efficiency) is also imperfect (0.969). Though, the bank is operating at an overall technical efficiency score of more than the average of public and private sampled banks, but is operating under a situation of diminishing returns to scale, hence, should curtail its scale of operations to treat the inefficiency and to attain status of a perfect bank. As the efficiency level of the bank is very high, albeit not perfect, hence, no cause of concern seems to be there. The Bank of

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[1] This Study used the software (DEAP) developed by Coelli (1996) to calculate the efficiency score.

Baroda is the only public sector bank having attained perfect efficiency level (1 score) in all the three fronts (OTE, PTE,& SE) and is the most efficient bank among all public sector banks under study, but surprisingly has no peers (perhaps because of its small size among public sector banks). How the threats can be issued for such a robust performance!

Canara Bank's PTE (0.890) and OTE (0.869) are operating below the average of sampled banks (0.938 and 0.914 respectively), only its SE (0.977) is better than the average of all sampled banks (0.974). The bank is suffering more due to its policies and decisions (PTE), than the problem of excessive scales, that is why, its OTE is also low. The bank has no peer count and hence, no takers or followers of its policies.

The Punjab National Bank, the lead bank of Northern India, is operating with a pure technical efficiency of 0.982, scale efficiency of 0.984, and overall technical efficiency of 0.966, in comparison to 0.938, 0.974 and 0.914, the mean efficiency scores respectively, for all sampled banks under study. The data signifies that the bank is operating with good efficiency scores, but is lacking in all the three fronts of efficiencies and there is a scope of improvement. The results show that the bank is operating with excessive scales, hence, its efficiency is adversely affected, therefore, a shrinking in its scale operations is the need of the hour, to surge its efficiency. The bank has no peer counts.

Vijaya bank is the least performer bank, not only among the sampled public sector banks, with lowest scores of OTE (0.795) and PTE (0.807), but also among all banks under study, exposing the weak policies of the bank; but is the only sampled public sector bank, showing increasing returns to scale, and hence, its operations need to be enhanced for the better performance. The bank escaped the downgrading even with its low performance and having no peers again. Syndicate bank, the last sampled public sector bank, showed a performance better than the average of all sampled banks under study taken together, with OTE (0.944), PTE (0.958) and SE (0.986), but working in a situation of decreasing returns to scale, capable of performing well subject to the contraction in its scale. The IDBI, UCO and Vijaya Banks are suffering from inefficiencies. Syndicate Bank is the 4th best performer after BOB, SBI and PNB out of 8 public sector sampled banks. It is clear from **Table 1** that 7 public sector banks are not operating up to the mark and are facing efficiency problems. Vijaya Bank is an exception to other 6 banks, as it is facing the problem of lack of proper scale, hence, requires to expend its scale by opening more branches or attracting more customers with same number of branches to increase its efficiency; all other 6 banks are suffering from the larger scales and hence, all of them are required to curtail their scales to be at an optimum level of efficiencies.

The analytical table is the proof of the fact that four private sector banks (ICICI, Axis Bank, Kotak Mahindra and HDFC), are operating with perfect efficiencies with a score of 1 each. Private sector banks are better performing in comparison to their counter parts (public sector banks). Remaining 4 private sector banks are facing problems of inefficiencies which can be solved only by increasing their scale of operations. Kotak Mahindra Banks is having the maximum number of peers followed by HDFC and SBI. The PTE of IndusInd Bank and Yes Bank was only 0.862 and 0.836 respectively as against the average (0.938) off all sampled banks under study. The low score of PTE puts them in the category of low performing banks. The position of these two banks is weaker in case of overall technical efficiency with scores of 0.804 and 0.821 respectively as against the mean score of 0.914.The Federal Bank is also an inefficient bank, though performing better than IndusInd and Yes Bank, and hence, need an orientation in its policies.

TABLE 1: EFFICIENCY SCORES OF SAMPLED BANKS

S. No.	Bank Name	OTE	PTE	SE	RTS	Peer Count
1	State Bank of India	**0.969**	**1.000**	**0.969**	drs	4
2	Punjab National Bank	**0.966**	**0.982**	**0.984**	drs	0
3	Canara Bank	**0.869**	**0.890**	**0.977**	drs	0
4	Bank of Baroda	**1.000**	**1.000**	**1.000**		0
5	IDBI Bank Ltd.	**0.868**	**0.905**	**0.959**	drs	0
6	UCO Bank	0.820	0.830	0.988	drs	0
7	Vijaya Bank	0.795	0.807	0.984	irs	0
8	Syndicate Bank	0.944	0.958	0.986	drs	0
9	ICICI Bank	**1.000**	**1.000**	**1.000**		1
10	Axis Bank	**1.000**	**1.000**	**1.000**		1
11	Kotak Mahindra Bank	1.000	1.000	1.000		9
12	HDFC Bank	1.000	1.000	1.000		7
13	Federal Bank	0.877	0.944	0.929	irs	0
14	IndusInd Bank	0.804	0.862	0.932	irs	0
15	Yes Bank	0.821	0.836	0.982	irs	0
16	ING Vysya Bank	0.899	1.000	0.899	irs	3
	Mean Efficiency	0.914	0.938	0.974		

Source: Authors' Calculations and bold figures denote the performance of the downgraded banks.

TABLE – 2: ACTUAL AND TARGET VALUES OF INPUTS AND OUTPUTS (all amounts are in crore rupees)

S. No.	Bank Name	Output						Input			
		Advances Actual	Advances Target	Investment Actual	Investment Target	Interest Income Actual	Interest Income Target	Interest Expended Actual	Interest Expended Target	Deposits Actual	Deposits Target
1	**State Bank of India**	756719	756719	295601	295601	81394	81394	48868	48868	933933	933933
2	**Punjab National Bank**	242107	242107	77724	**101564.379**	26986	**28253.615**	15179	**14899.915**	312899	**307145.95**
3	**Canara Bank**	212467	212467	83700	**88238.676**	23064	**24184.177**	15241	**13557.086**	293973	**261493.168**
4	**Bank of Baroda**	228676	228676	71261	71261	21886	21886	13084	13084	305439	305439
5	**IDBI Bank Ltd.**	157098	157098	68269	**97432.182**	18601	**19107.243**	14272	**12235.828**	180486	**163385.763**
6	**UCO Bank**	99071	99071	42927	**44862.745**	11371	**12183.89**	7526	**6248.959**	145278	**120626.659**
7	**Vijaya Bank**	48719	48719	25139	25139	5844	**6612.255**	3897	**3146.134**	73248	**55892.822**
8	**Syndicate Bank**	106782	106782	35068	**47732.823**	11451	**12962.609**	7068	**6768.612**	135596	**129852.386**
9	**ICICI Bank**	216366	216366	134686	134686	25974	25974	16957	16957	225602	225602
10	**Axis Bank**	142408	142408	71992	71992	15155	15155	8592	8592	189238	189238
11	**Kotak Mahindra Bank**	29329	29329	17121	17121	4304	4304	2058	2058	29261	29261
12	**HDFC Bank**	159983	159983	70929	70929	19928	19928	9385	9385	208586	208586
13	**Federal Bank**	31953	31953	14538	**15913.547**	4052	4052	2305	**2175.288**	43015	**38240.209**
14	**IndusInd Bank**	26166	**27016.243**	13551	**14657.613**	3589	**3653.827**	2213	**1908.581**	34365	**29637.777**
15	**Yes Bank**	34364	34364	18829	18829	4042	**4815.699**	2795	**2335.588**	45939	**37030.88**
16	**ING Vysya Bank**	23602	23602	11021	11021	2694	2694	1688	1688	30194	30194

Source: Actual Amounts have been taken from RBI Website, and Targeted Amounts have been calculated by the Authors, and the bold figures indicate the slacks in the performance sampled banks.

It was further found through **Table 2** that the desired amount of outputs was not attained by the banks with the inputs and hence, slacks were noticed. Surprisingly, no slacks were noticed in any output or input in case of SBI and hence, can safely be said that, absolutely there is no problem with the bank as far as the ratings of the Fitch agency are concerned. A little bit problems in efficiency are due to the policies of Government of India to expand the operations of the bank to attain the targets of financial inclusions and upliftment of the poor. It is clear from the **Table 2** that PNB was unable to generate the required amount of 'investment', given the amount of inputs; the actual amount of investment made by bank was Rs. 77724 crores only as against the targeted amount of Rs. 1,01,564.379 crores as per the analysis, which is significantly low. A down performance was also observed in 'interest income', though the difference is not as big as in case of 'investment'. The bank was able to balance the amount of 'advances' only in the form of output. Under performance was also noticed in both the inputs of the bank, and it is indicated that the bank must have introduced both inputs- 'interest expended' and 'deposits' as Rs. 14,899.915 and Rs. 307145.95 crores as against the actual amounts of Rs. 15179 and Rs. 312899 crores respectively, to be at the perfect level of efficiency and hence, a negative performance was observed. Canara bank, IDBI bank, UCO bank and Syndicate bank, followed the suit with Rs. 88238.67, Rs. 97432.182, Rs. 44862.745, Rs. 47732.823 crores targeted amount of 'investment' as against the actual amount of Rs. 83,700, Rs. 68269, Rs. 42927 and Rs. 35068 crores, respectively. Vijaya bank showed no slack in output. On the other hand, the bank employed 'interest expended' as actual input Rs. 15,241, Rs. 14,222, Rs. 7526, Rs. 7068 crores against a low targeted of Rs. 13557.086, Rs. 12235.828, Rs. 6248.959 and Rs. 6768.612 crores, respectively. Similarly slacks were also noticed in case of 'deposits' for the banks. Vijaya bank also joined the fleet of slacks in inputs with other public sector banks towards the downgraded rating. The Bank of Baroda, albeit, a small bank in comparison to grand SBI; performed nicely and no slacks in any input/output were observed.

Contrary to the public sector banks, the sampled private sector banks, particularly, the ICICI bank and Axis bank (which were downgraded by Fitch agency) showed wonderful results without any slacks, except the Federal, IndusInd and Yes bank which showed an underperformance in utilisation of the inputs, to generate the output in line with their counterpart public sector banks. The results of ICICI and Axis bank, through **Table 2,** definitely defy the charges levied on them by the rating agency, with the help of their robust performance. The IndusInd is the only bank (among all sampled banks) showing performance below targets in case of each output and input, though the amounts of slacks are not so big as in case of public sector banks particularly. The 'investment' of Federal bank was Rs.14538 crores as against the targeted amount of Rs. 15913.547 crores. The 'interest expended' and 'deposits' were in excess, in the form of inputs, with Rs. 2305 and Rs.43015 crores as against the targeted amount of Rs. 2175.288 and Rs. 38240.209 crores respectively, hurting the efficiency of the bank. The Yes bank was also in the same tracks with Federal bank showing almost the same results except an extra slack in 'investment' of the later. The ING Vysya bank confirmed its solidarity with the top performer banks under study with its par excellence performance having no deviation in any output and input. On the other hand, significant slacks were observed in the output of 'investment' and 'interest income' in case of PNB, IDBI and Syndicate Bank, which cause a serious challenge before the management of the banks and hence, they should not ignore the downgrading by the credit rating agencies. Among private sector banks, IndusInd Bank is in problem due to not being capable of generating targeted amount of all three outputs. Federal Bank and Yes Bank are only other private sector banks having little problem in the output of 'investment' and 'interest income' respectively. Hence, it can safely be concluded that Indian private sector banks are performing efficiently and the credit rating assessments do not suit their performances. Only IDBI (interest expended) and Vijaya Bank (deposits) have input slack problems, otherwise all other banks have perfectly deployed their inputs. As far as the private sector banks are concerned, again Federal Bank and Vijaya Bank are having problem in input installation (deposits only) otherwise other banks are efficient enough to handle their inputs.

A bank-wise statement was prepared [**Table 3(a)]** to see the slacks in outputs and the per cent slacks to the actual outputs (taking them as the base). IndusInd is the only bank among all sampled banks under study which is showing slacks in each of the three outputs. It is clear from **Table 3(a)** that the actual 'advances' of the bank are Rs.26166 crores against a target of Rs.27016.243 crores showing a deficiency of 3.25 per cent in target achievement. No other bank having slacks in outputs is deficient in 'advances'. As far as the slacks in 2nd output (Investment) are concerned, IDBI bank tops the list with 42.72 per cent deficiency, followed by Syndicate Bank (36.12 per cent) and PNB (30.67 per cent). Vijaya Bank and Yes Bank have no deviations between their actual and targeted performance. The IndusInd Bank, Federal Bank, Canara Bank and UCO Bank showed insignificant deviations in comparison to IDBI, Syndicate and PNB.

TABLE 3 (a): BANK-WISE SLACKS IN OUTPUTS (Amount in Rs. Crore)

S.No	Bank Name	Output I				Output II				Output III			
		Advances Actual	Advances Target	Slacks/ Deviations	Percent age	Investment Actual	Investment Target	Slacks/ Deviations	Percent age	Interest Income Actual	Interest Income Target	Slacks/ Deviations	Percent age
1	IndusInd Bank	26166	27016.24	850.243	3.25	13551	14657.613	1106.613	8.17	3589	3653.83	64.827	1.81
2	Federal Bank	31953	31953	0	0	14538	15913.547	1375.547	9.46	4052	4052	0	0
3	Syndicate Bank	106782	106782	0	0	35068	47732.823	12664.823	36.12	11451	12962.6	1511.609	13.20
4	UCO Bank	99071	99071	0	0	42927	44862.745	1935.745	4.51	11371	12183.9	812.89	7.15
5	IDBI Bank Ltd.	157098	157098	0	0	68269	97432.182	29163.182	42.72	18601	19107.2	506.243	2.72
6	Canara Bank	212467	212467	0	0	83700	88238.676	4538.676	5.42	23064	24184.2	1120.177	4.86
7	PNB	242107	242107	0	0	77724	101564.38	23840.379	30.67	26986	28253.6	1267.615	4.70
8	Vijaya Bank	48719	48719	0	0	25139	25139	0	0	5844	6612.26	768.255	13.15
9	Yes Bank	34364	34364	0	0	18829	18829	0	0	4042	4815.7	773.699	19.14

FIGURE 1: BANK-WISE SLACKS IN OUTPUTS
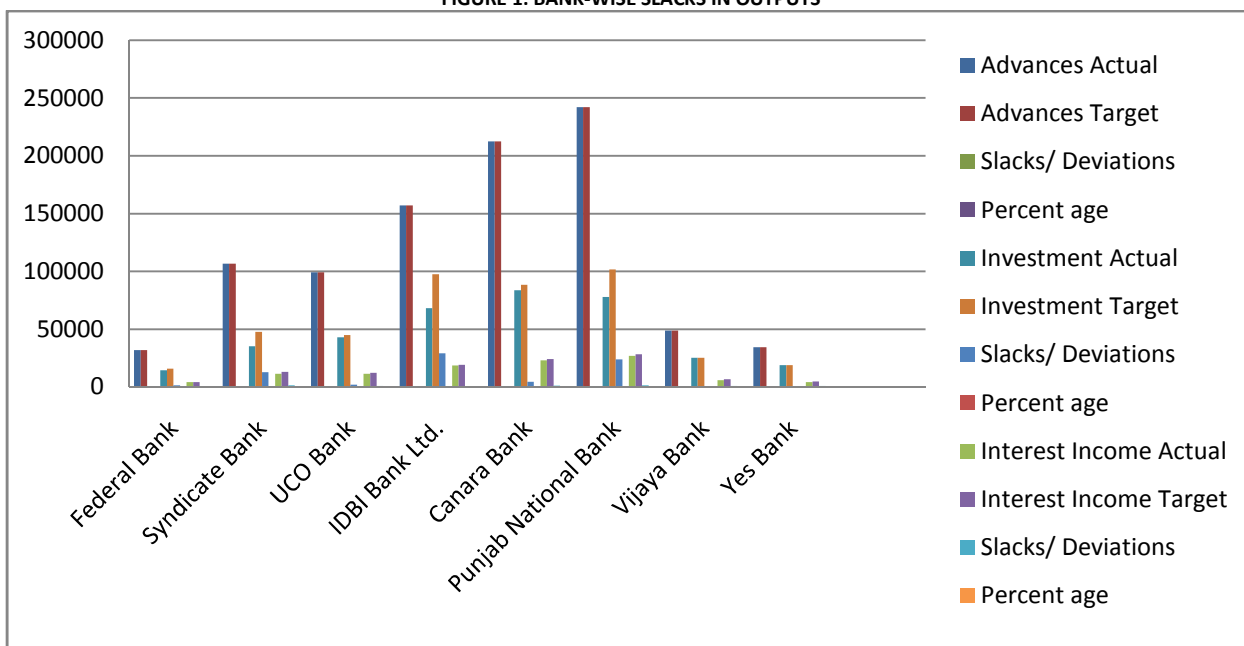
Federal Bank showed no deviations in output III (Interest Income) and contrary to this, Yes Bank showed the highest deviation of 19.14 per cent followed by Vijaya Bank (13.15 per cent), Syndicate Bank (13.20 per cent) and UCO Bank (7.15 per cent). The deviations shown by remaining four banks are smaller in percentage. The position regarding the variations in outputs of the banks can be visualised and understood easily with the help of Figure 1 also. From the above discussion, it is suggested that the IDBI Bank, Syndicate Bank and PNB should take immediate steps to eliminate the deviations in 'investment' output; Yes Bank, Vijaya Bank, Syndicate Bank and UCO Bank should strive to optimise output III (interest income); and the IndusInd Bank is required to make planning and policies to bring out a change capable of correcting the variations (-ve) in all the three outputs under study, so as to make it a competitive bank.

Since, the inputs are the generators of outputs, therefore, it is essential to make a proper selection and utilisation of them. 'Interest expanded' and 'deposits' are the inputs of the banks under study. It was observed through **Table 3(b)** that Vijaya Bank noticed the highest gap in input I (interest expanded) of 19.27 per cent, followed by UCO Bank (16.97 per cent), Yes Bank (16.44 per cent), IDBI Bank Ltd.(14.27 per cent), IndusInd Bank (13.76 per cent) and Canara Bank (11.05 per cent) respectively. The lowest gap of 1.84 per cent was observed in case of PNB for input I, followed by Syndicate Bank (4.24 per cent) and Federal Bank (5.63 per cent). Punjab National Bank (Rs.14899.915 crores), Canara Bank (Rs.13557.086 crores) and IDBI Bank (Rs.12235.828 crores) were the trouble-most banks in absolute amount of slacks.

TABLE 3 (b): BANK-WISE SLACKS IN INPUTS (Amount in Rs. Crore)

S. No	Bank Name	Input I				Input II			
		Interest Expended Actual	Interest Expended Target	Slacks/ Deviations	Percent age	Deposits Actual	Deposits Target	Slacks/ Deviations	Percent age
1	IndusInd Bank	2213	1908.581	304.419	13.76	34365	29637.78	4727.223	13.76
2	Federal Bank	2305	2175.288	129.712	5.63	43015	38240.21	4774.791	11.10
3	Syndicate Bank	7068	6768.612	299.388	4.24	135596	129852.4	5743.614	4.24
4	UCO Bank	7526	6248.959	1277.041	16.97	145278	120626.7	24651.341	16.97
5	IDBI Bank Ltd.	14272	12235.828	2036.172	14.27	180486	163385.8	17100.237	9.47
6	Canara Bank	15241	13557.086	1683.914	11.05	293973	261493.2	32479.832	11.05
7	PNB	15179	14899.915	279.085	1.84	312899	307146	5753.05	1.84
8	Vijaya Bank	3897	3146.134	750.866	19.27	73248	55892.82	17355.178	23.69
9	Yes Bank	2795	2335.588	459.412	16.44	45939	37030.88	8908.12	19.39

Source: Authors' Calculations

FIGURE 2: BANK-WISE SLACKS IN INPUTS
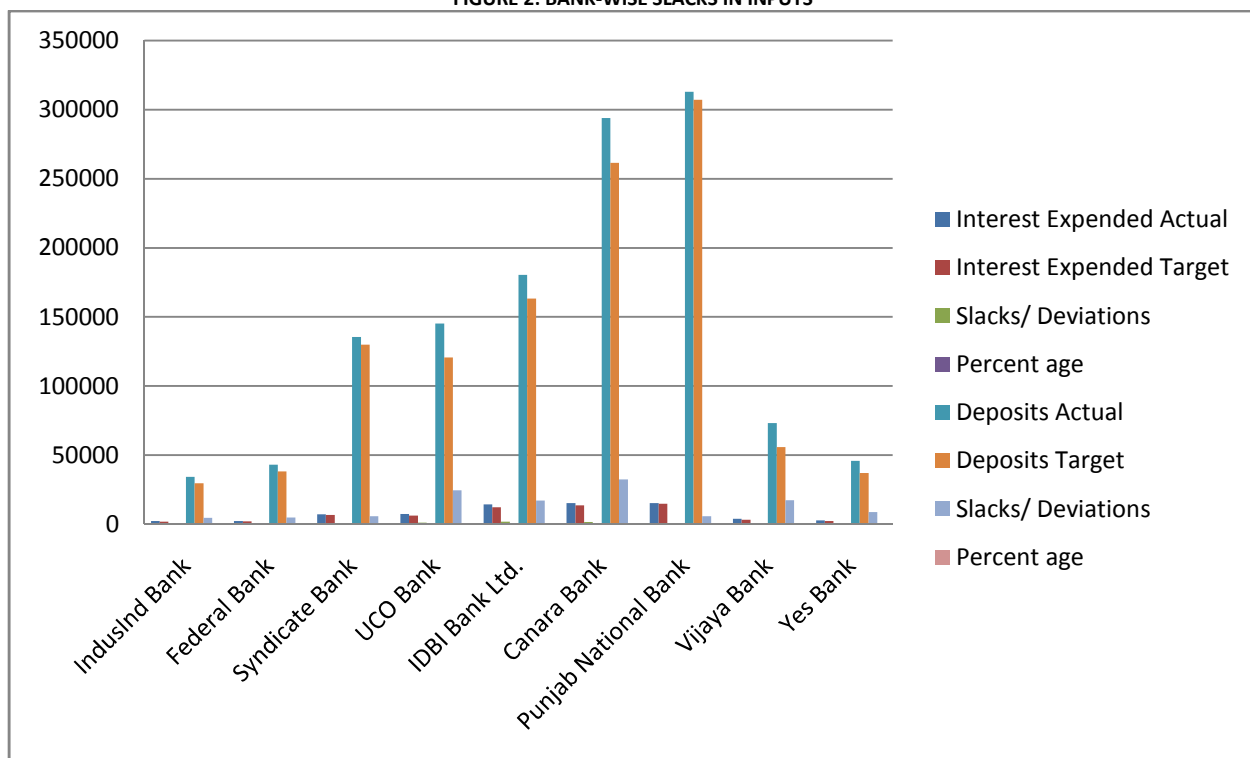
Similarly, Vijaya Bank, with highest variation of 23.69 per cent in input II topped the list of defaulters, followed by Yes Bank (19.39 per cent), UCO Bank (16.97 per cent), IndusInd Bank (13.76 per cent), Federal Bank (11.10 per cent), Canara Bank (11.05 per cent) and IDBI Bank (9.47 per cent). Again, PNB is the bank with least variations (1.84 per cent only) followed by Syndicate Bank (4.24 per cent). The Canara Bank (Rs.32479.832 crores) followed by UCO Bank (Rs.24651.341 crores) and Vijaya Bank (Rs.17355.178 crores) are the most disturbed banks as far as input II and the absolute figures of slacks are concerned. The position regarding the inputs' variations can easily be analysed with the help of figure 2. Therefore, it is suggested from the analysis made that the banks having high variations in inputs should take immediate measures to control them, and to bring the banks back on the path of progress by attaining perfect efficiency level.

CONCLUSION AND SUGGESTIONS

It was found through the study that SBI, Bank of Baroda, ICICI Bank and the HDFC Bank, which were downgraded by 'Fitch Rating Agency', are performing with perfect efficiency levels at OTE, PTE and SE front (SBI missed the perfection limit of OTE and SE by 3.1 per cent). The PNB is also performing with very high levels (more than 96 per cent) of efficiencies, where there can be no risk; but definitely, Canara, UCO and Vijaya Bank, are underperformers (performing below the mean score of sampled banks at all the three levels of efficiency measurement) and hence, attracted the warning. The efficiency of banks depends on the judicious use of inputs to generate outputs, but some serious slacks were observed in inputs- 'interest expanded' and 'deposits' in case of Vijaya Bank, Yes Bank, UCO Bank, Canara Bank and IndusInd Bank; similarly some serious variations in outputs of 'investment' and 'interest income' were noticed in case of Syndicate Bank, IDBI, PNB, Vijaya Bank and Yes Bank which ultimately led to inefficiency of the banks under study. Hence, the banks are required to rationalise their disturbed permutations and combinations of inputs and outputs highlighted through the study to attain a position of equilibrium. The smaller private sector banks, like Federal Bank, IndusInd Bank, Yes Bank and ING Vyasa Bank, though, are facing problem of low efficiencies which do not seem to be serious enough, as they are performing at a level of more than 80 per cent of efficiency. The Indian banking system has a sound base in the form of deposits with Central Government and RBI (about 24 per cent – 28 per cent in the form of SLR (Statutory Liquidity Ratio) and 4.75 per cent as CRR (Cash Reserve Ratio), the practice which is not generally followed throughout the globe. That is why, the statement made by financial services secretary D. K. Mittal, 'The Indian Banking Sector is safe, sound, strong and ready to face any global crisis and the rating agencies have no business to say that the Indian financial institutions are in bad shape', stands justified on the basis of the results derived from the analysis.

On the basis of above discussion, it is suggested that the Indian banking system needs an improvement in general, and the public sector banks in particular, as there is a scope of increasing overall, technical and scale efficiency of the banks. The public sector banks should curtail their scale while private sector banks should enhance their scale for better efficiencies. Hence, it can safely be concluded that the Indian Banking system is passing through a serious phase with good economic health and performance.

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