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## **Profit Efficiency of Foreign Banks in India in the context of Off-Balance Sheet Items: A DEA Approach**

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**Abstract:** *This paper examines the profit efficiency among the twenty four foreign commercial banks in the context of Off-Balance Sheet Items (OBS) operating in India, using a non-parametric model called Data Envelopment Analysis, for a period of eleven years (2006- 2016). In literature, there are many econometric models are utilized to study the profit efficiency of commercial banks. There are many papers used DEA to study the performance of banks, but no one used in the context of OBS.*

**Keywords:** *OBS, Profit efficiency, DEA, financial ratios*

*G21,C14 and C61*

### **Introduction:**

Indian Banks had undergone a huge change in the financial system migrating from being one of the pillars to the very foundation of the economy. Coupled with economic reforms and the autonomy of Indian banks, India witnessed phenomenal growth across the national economy. Broad spectrum of technological swift and Foreign Investment in Banking opened new opportunities and the challenges posed to traditional Indian banking system were adequately addressed by the regulator of banks in India.

The foreign banks, though governed by separate policy and entered into the Indian Banking Sector, did not avail the same concessions as the Public-Sector Banks, which were very prominent due to the socialistic schemes adopted by the them. Foreign Banks were forgotten till the 1990's when the new economic reforms with opening of Banking Sector to Foreign Investments up to 74%.

Foreign Banks in India have always been object of curiosity for researchers given the scenario of high levels of NPAs and questionable profitability of Public Sector banks. Having reported well in all parameters of performance like capital adequacy, profitability etc., the foreign banks were the source of research studies. Hence this research paper focuses on profitability and efficiency of foreign banks in India.

### **Foreign Banks – A game changer Indian in Banking system**

A road map for the presence of foreign banks in India was released by RBI in 2005. This was the first regulatory policy on foreign banks in India. This policy suggested two phases of implementation. The first phase was defined from March 2005 to March 2009 and the foreign banks were allowed to operate in India only by way of setting up a Wholly Owned Subsidiary or the existing branches should be converted into a Wholly Owned Subsidiary. The second phase was planned to be launched after the assessing the outcome of the first phase. After the 2008-09 Global financial crisis, the RBI did not immediately proceed the second phase but carefully reviewed the outcomes of crisis and policies of developed nations.

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### **Current Number of Foreign Banks in India**

As of December 2016, there are 45 foreign banks from 26 countries operating as branches in India and some foreign banks are from various countries operating as representative offices in India. Apart from that, few foreign banks have entered into India as Non-Banking Finance Companies.

There are 334 foreign bank branches in India. This strength is less than 1% of the total branch network in the country. However, they account for approximately 7% of the total banking sector assets and around 11% of the profits.

Most of the foreign banks in India are prominent players and their business is usually focused on trade finance, external commercial borrowings, wholesale lending, investment banking and treasury services. Some other banks are focusing on personal banking and portfolio management.

RBI policy on the presence of foreign banks in India is relied upon two cardinal principles viz. reciprocity and single presence as Wholly Owned Subsidiary.

By reciprocity, it means that overseas banks are given near national treatment in India on the condition that the home country of foreign banks, should allow the Indian banks to open their branches there without much restrictions. Under single mode of presence, it means that RBI allows either of the branch as one mode or a wholly owned subsidiary (WOS) mode in India.

Significant policy guidelines of RBI towards foreign banks are as follows:

1. Banks have to adhere to mandated Capital Adequacy requirements as per Basel Standard.
2. They should have to meet minimum capital requirement of Rs. 5 billion.
3. They should need to maintain minimum CRAR at 10%
4. Priority sector targets for foreign banks in India is 40%.

Apart from the above, the foreign banks are expected to follow other norms as set by Reserve Bank of India from time to time.

### **RBI Regulations on Licensing and Operating of Foreign Banks in India:**

The Reserve Bank of India is firm on its proposal that foreign banks run their business operations in India as a wholly owned subsidiary (WOS), rejecting a suggestion of availing dual licenses.

Large foreign banks operating under the branch licensing norms approached the RBI, the banking regulator for separate licenses, one for a retail subsidiary (WOS) and another for corporate banking under the branch route.

However, the RBI wants foreign banks to operate only as WOS. The sub-prime crisis of 2008 had alerted the RBI to tighten the rules on foreign banks in India. As a result, in 2013, RBI had released norms for setting up a wholly owned subsidiary for overseas lenders. Though the RBI had not made it mandatory for existing foreign banks to convert their Indian operations into a subsidiary, the regulator had expected voluntary adoption of the same.

While branch licensing for Indian banks has been liberalized allowing them to freely open branches subject to certain conditions, foreign banks collectively are given about 15-20 branch licenses in a year.

However, large foreign banks like Standard Chartered, Citibank and HSBC, have so far shown little interest in adopting the WOS route. Till now, only a few smaller lenders like DBS Bank and SBM Bank (Mauritius), have opted to convert their branches into a subsidiary. Taking a middle-path, the large foreign banks had opted a dual license arrangement – one for retail banking operations under the subsidiary format and another for branches to do wholesale banking.

### **Off-Balance Sheet Items**

Balance sheet reveals the state of affairs of an organisation. Beyond the disclosures of assets and liabilities as appearing in the balance sheet there are items which are disclosed as footnotes or notes to Balance Sheet.

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There are items which appear outside the balance sheet of banks which carry equal significance in determining the bank's solvency, liquidity and profitability. Usually the off-balance sheet items appear under the head 'Contingent Liabilities' which include Forward Exchange Contracts, Guarantees in India and outside India, Acceptances and Endorsements.

These Off-balance Sheet items often carry huge risk in the form derivatives and guarantees. Since they are not part of balance sheet, they were not the part of risk assessment system. But the scams in US and the downfall of many of the biggest banks across the world changed the way in which banks operated since then. Despite not been disclosed they were considered in analysing their appropriate risk profile and exposure like the required capital adequacy ratios. Being Basel II compliant, the profitability of most commercial banks, world over, was influenced to a great extent by the Off-balance sheet items. Other than the traditional Interest income, fee-revenue generated from banking and other financial services, like Guarantee Commission and Forward Exchange Contract- premium contributed to large portion of profits of foreign banks.

The average global rate of interest has declined over the years from 2003 to 2012, from 9.35% to 7.06% (Dr. Paritosh C. Basu, Bhagirathi Krishnan and Ganesh Janakiraman 2014). Post the resultant decline in interest revenue, banks across the world have explored the ways of generating income through off balance sheet items and fee-based incomes. In the background of this scenario, the profitability assessment on the assets in the balance sheet will not reveal the true position of the related profitability. The need to ascertain the real efficiency on the part of the commercial banks and its attendant solvency, in the light of high exposures of Off-balance Sheet items, calls for a serious insight into research perspective of Off-balance sheet items.

Among the scheduled commercial banks in India, foreign banks have reported higher profitability rate in general and in terms of off balance sheet exposures too. Hence this study focuses on the profitability, profit efficiency and Off-balance Sheet exposures of foreign banks in India.

### **Literature Review:**

Most of the researchers used CAMEL Model to study the performance of banks. This model reveals only the performance, not the efficiency. In the recent past, researchers started using Data Envelopment Analysis, introduced by Charnes, Coopers and Rhodes [1]

Asish Saha & Ravi Sankar (2000) did study the efficiency of public sector banks for the period 1991-1997 [2] and study revealed that Corporation Bank, Bank of Baroda, SBI, Canara Bank were the top performance.

Sangeetha and Mathew (2013) studied the efficiency of twenty six public banks of India for the 2009 to 2011 period. Their study found that only IDBI, Corporation Bank and State Bank of India were consistently efficient over the entire period. It was observed that forty to fifty percentage banks were under the average efficiency scores.[3]

A paper(2014) titled, Technical Efficiency of Banks in India using DEA", utilized the CCR model of DEA to measure the technical efficiency of public and private sector banks, by Nandakumar & Archana Singh [4]

Hafiz Khalil Ahamad & etal (2015) studied the technical efficiency and the sources of banks in Pakistan, using 2 stage DEA [5].

Sandeepa Kaur & P.K.Gupta (2015) explored the productive efficiency of Indian banks for the period from 1991-2013 focusing on post-reforms period [6]

Sunitha Shree R & .Suresh Kumar P (2015) did efficiency tests, using cross- efficiency measure on selected private sector banks with the inputs of Deposits, Borrowings, operating expenses and outputs of Inputs and Advances. The study found that the Federal Bank was the most efficient among the private sector banks. [7]

We did study the OBS and profitability of foreign banks in India[10] and this work motivated us to study the profit efficiency.

### **Data and Methodology:**

There are variety of methods to study the efficiency such as Efficient frontier, Data Envelopment Analysis, Stochastic, Dominance (SD), Free Disposal Hull(FDH), Stochastic Frontier and Distribution Free Hull (DFH).

In this study we deployed one version of DEA called BCC model with input oriented and Variable -Return – Scale and the analysis based on the secondary data collected from RBI website [7]

DEA: First DEA was introduced by Charnes, Cooper and Rhodes [1 ] in 1978 and it was used only to study the technological efficiency characterized by Constant-Return-Scale. Latter Bankers, Charnes and Cooper developed a model to accommodate the technologies that are characterized by Variables- Return-Scale. Subsequently many models developed by many other, an alternate to regression models.

We utilized DEA to find the efficiency of a bank, with respect to its peer group. The general Charnes, Cooper and Rhodes (CCR) model is given as: (fractional version)

$$\text{Max}_{u,v} z = \frac{u_1 y_{1,0} + u_2 y_{2,0} + \dots + u_n y_{n,0}}{v_1 x_{1,0} + v_2 x_{2,0} + \dots + v_m x_{m,0}}$$

Subject to the constraints

$$\frac{u_1 y_{1,j} + u_2 y_{2,j} + \dots + u_n y_{n,j}}{v_1 x_{1,j} + v_2 x_{2,j} + \dots + v_m x_{m,j}} \leq 1$$

$$u_i \geq 0 \quad (1 \leq i \leq n) \& v_j \quad (1 \leq j \leq m)$$

The objective of this fractional linear Programming Problem is to obtain the weights  $u_i, v_j$  which could maximize the ratio DMU0, the DMU0 is being evaluated.

The above is the fractional version and non-negativity constraint is not sufficient. Now we could convert the above model into an equivalent Linear Programming Model as:

$$\text{Max}_{u,v} z = u_1 y_{1,j} + u_2 y_{2,j} + \dots + u_n y_{n,j}$$

Subject to the constraints:

$$v_1 x_{1,j} + v_2 x_{2,j} + \dots + v_m x_{m,j} = 1$$

$$u_1 y_{1,j} + u_2 y_{2,j} + \dots + u_n y_{n,j} \leq v_1 x_{1,j} + v_2 x_{2,j} + \dots + v_m x_{m,j}$$

$$u_i \geq 0 \quad (1 \leq i \leq n) \& v_j \quad (1 \leq j \leq m)$$

Every bank is considered as Decision Making Unit(DMU) for each year starting from 2006 to 2016.

We have considered four inputs and three inputs as given in the following table 1 and table 2 is the data utilized for a particular year:

Table 1: Inputs and Outputs for DEA

Input	Output
Cash in hand	Non-interest Income
Investments	Return on Assets
Money at call and short notices	Return of Equity
Off-Balance Sheet Items	

The inputs used to measure the efficiency are Cash reserves, Investments, Money at call and Off-Balance sheet values which generate income to banks as interest and non-interest income. On the other hand, Non-Interest Income, Return on Assets and Return on Equity are taken as outputs. The profit efficiency is measured with the model profitability measures like Return on Assets and Return on Equity. The profit efficiency is further measured with the OBS related Non-Interest Income. This DEA model focuses on measuring the profit efficiency in the context of Off-Balance sheet items.

Table 2: Sample data for the year 2012

DMU	Cash hand in	Money at call and short notice	Investments	OBS	Non Interest Income	ROA	ROE
AB BANK LIMITED	3	0	162	156	187	7.05	12.96
ABU DHABI COMMERCIAL BANK	6	0	2265	2728	47	1.87	7.28
AMERICAN EXPRESS BANKING CORP.	0	0	3412	59	5046	0.20	0.64
BANK OF AMERICA N.A.	59	1592	82258	5463364	5079	3.62	13.89
BANK OF BAHRAIN & KUWAIT B.S.C.	8	252	3395	6395	107	2.14	10.98
BANK OF CEYLON	3	403	602	548	44	3.08	6.04
BANK OF NOVA SCOTIA	14	322	34831	208266	2289	2.24	17.96
BANK OF TOKYO MITSUBISHI UFJ LTD	36	30	35867	388561	1613	2.26	7.02
BARCLAYS BANK PLC	105	0	116000	6779482	875	0.91	3.30
BNP PARIBAS	25	5750	33866	4462442	730	0.73	3.95
CITIBANK N.A.	2358	1578	431667	11529502	13933	1.64	12.42
CREDIT AGRICOLE	0	1498	40141	6139194	2633	4.92	17.29
CTBC BANK	3	0	520	1122	59	0.02	0.06
DBS BANK LTD.	36	1293	147806	5544122	3110	1.12	15.12
JP MORGAN CHASE BANK N.A.	0	0	133038	8217448	3468	2.90	11.02
KBC BANK NV	0	0	1592	5374	179	1.20	6.57
KRUNG THAI BANK PUBLIC COMPANY LIMITED	0	45	349	30	20	2.12	7.71
MASHREQ BANK PSC	0	502	400	2248	222	5.76	9.23
MIZUHO BANK LTD	2	6736	6586	75401	1075	4.00	5.32
PT BANK MAYBANK INDONESIA TBK	0	0	0	0	0	0.48	0.49
ROYAL BANK OF SCOTLAND N.V.	772	7500	77214	2151968	8180	1.96	17.75
SHINHAN BANK	10	350	2811	6149	173	2.52	8.66
SOCIETE GENERALE	1	0	18462	741509	86	1.17	5.21
SONALI BANK	16	24	55	522	59	2.23	13.79
STANDARD CHARTERED BANK	2022	0	273239	16787474	29882	1.49	12.76

### Results and Analysis:

The following table shows the average efficiency score, inefficiencies and standard deviation for the study period:

Table 3: Descriptive Statistics

DMU					
YEAR	Average	S. D	Min	Max	Inefficiency
AB BANK LIMITED	0.961419	0.092316	0.711837	1	0.040129
ABU DHABI COMMERCIAL BANK	0.380615	0.401599	0.028874	1	1.627324
AMERICAN EXPRESS BANK	1	0	1	1	0
BANK OF AMERICA N.A.	0.883832	0.296182	0.037631	1	0.131437
BANK OF BAHRAIN & KUWAIT B.S.C.	0.296873	0.304807	0.030488	1	2.368449
BANK OF CEYLON	0.617374	0.338172	0.193693	1	0.619763
BANK OF NOVA SCOTIA	0.825672	0.387919	0.025574	1	0.211135
BANK OF TOKYO-MITSUBISHI UFJ LTD	0.30039	0.449392	0.028201	1	2.329008
BARCLAYS BANK PLC	0.308738	0.44679	0.005742	1	2.238989
BNP PARIBAS	0.399152	0.41542	0.016271	1	1.505314
CITIBANK N.A.	0.89131	0.179661	0.580055	1	0.121944
CREDIT AGRICOLE	0.401646	0.475516	0.026734	1	1.489752
CTBC BANK	0.490216	0.32301	0.002016	1	1.039916
DBS BANK LTD.	0.399236	0.444982	0.006282	1	1.504786
JP MORGAN CHASE BANK N.A.	1	0	1	1	0
KBC BANK NV	0.900144	0.227357	0.247062	1	0.110934
KRUNG THAI BANK PUBLIC COMPANY LIMITED	0.955086	0.099927	0.752974	1	0.047026
MASHREQ BANK PSC	1	0	1	1	0
MIZUHO BANK LTD	0.320071	0.438099	0.017494	1	2.124309
ROYAL BANK OF SCOTLAND N.V.	0.582446	0.404209	0.02818	1	0.716897
SHINHAN BANK	0.268748	0.267686	0.0197	1	2.72096
SOCIETE GENERALE	0.268456	0.376884	0.006906	0.97449	2.725003
SONALI BANK	1	0	1	1	0
STANDARD CHARTERED BANK	1	0	1	1	0

The following table shows the ranks of the considered based on the average score:

Table 4: Ranks of the banks based on average efficiency scores

Bank	Average	rank
AMERICAN EXPRESS BANK	1	1
JP MORGAN CHASE BANK N.A.	1	1
MASHREQ BANK PSC	1	1
SONALI BANK	1	1
STANDARD CHARTERED BANK	1	1
AB BANK LIMITED	0.961419	6
KRUNG THAI BANK PUBLIC COMPANY LIMITED	0.955086	7
KBC BANK NV	0.900144	8
CITIBANK N.A.	0.89131	9
BANK OF AMERICA N.A.	0.883832	10
BANK OF NOVA SCOTIA	0.825672	11
BANK OF CEYLON	0.617374	12
ROYAL BANK OF SCOTLAND N.V.	0.582446	12
CTBC BANK	0.490216	14
CREDIT AGRICOLE	0.401646	15
DBS BANK LTD.	0.399236	16
BNP PARIBAS	0.399152	17
ABU DHABI COMMERCIAL BANK	0.380615	18
MIZUHO BANK LTD	0.320071	19
BARCLAYS BANK PLC	0.308738	20
BANK OF TOKYO-MITSUBISHI UFJ LTD	0.30039	21
BANK OF BAHRAIN & KUWAIT B.S.C.	0.296873	22
SHINHAN BANK	0.268748	23
SOCIETE GENERALE	0.268456	24

The above tables reveal that the average score of efficiency is the highest with American express, JP Morgan chase, Mashreq Bank N.A., Sonali Bank and Standard Chartered Bank. Out of the 45 foreign banks operating in India, out 24 banks have been within the parameters of this study. The pioneer foreign bank like Citi Bank has achieved 9th rank in efficiency score. The sixth to ten rank holding banks have attained their efficiency relatively better. From 11th rank the foreign banks had shown drastic decrease in efficiency and poses serious concern of their functioning in India.

#### References:

- [1]. A. Chranes, W W Cooper and E Rhodes, "Measuring the efficiencies of Decision Making Units", European Journal of Operations Research, Vol 2 (6), 1978, 429- 444
- [2]. Asish Saha & Ravi Sankar (2000),"Rating of Indian Commercial Banks: A DEA approach", European journal of Operational Research vol124 (1), 2003, 187-203
- [3]. Sangeetha and Mathew (2013), "A study on technical efficiency of public sector banks in India". International Journal of Business and Economics Research, Volume 2(2), pp. 15-21.

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- [4]. Nandakumar & Archana Singh (2014), “Efficiency Analysis of Banks using DEA: A Review, International Journal of Advance Research and Innovation, Volume 1 (2014) 120-126
- [5]. Hafiz Khalil Ahamad & etal (2015),”An analysis of banks performance in Pakistan using two-step double bootstrap dea approach”, Pakistan Economic and Social Review Volume 53, No. 2 (Winter 2015), pp. 331-350
- [6]. Sandeepa Kaur & P.K.Gupta (2015), “Productive Efficiency mapping of the Indian Banking System Using Data Envelopment Analysis”, Procedia Economics and Finance 25, 227-238
- [8]. Sunitha Shree R& Suresh Kumar P (2015) ,” Performance Efficiency of Selected Private Sector Banks in India Using Data Envelopment”, International Journal of Innovative Research & Development,Vol6(4), 241-252
- [9]. Neemi K Avkiran, Productivity Analysis in the Service Sector with Data Envelopment Analysis, 3rd Edition, ISBN 0-9580550-1-7
- [10]. N Pushkala, J Mahamayi, K A Venkatesh,, Off-Balance sheet items and profitability of foreign banks in india- an insight, August 2016, Shanlax journal of Management, vol8 (2), 84-98
- [11]. www.rbi.org accessed on 25th July, 2017.