

# “Assessing the efficiency of foreign banks in Indian context”

## AUTHORS

Namita Rajput  <http://orcid.org/0000-0001-7978-0959>  
Monika Gupta

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Namita Rajput (India), Monika Gupta (India)

## Assessing the efficiency of foreign banks in Indian context

### Abstract

Since early 1990s, the Indian financial sector has noticed various changes in the policies and prudential norms to raise the banking standards in India to the international intensity. In 1991, financial reforms have taken place which enhanced flexibility, operational autonomy and competition in the banking environment. In 1992, the government constituted a committee under the supervision of Dr. Narasimham. Subsequent on the recommendations, a series of development were commenced. In 1993, the approval was accepted for the entry of new private banks and further in 1994, allowed the entry of foreign banks in banking sector. Hence, the operations of foreign banks (FBs) received a considerable boost after the post reform era. The RBI (Reserve Bank of India) policy for foreign banks has greatly been liberalized which implying new opportunities for growth and different representations in India. The present study makes an attempt to measure the efficiency change of foreign banks operating in India during 2005-2010. By using frontier based non-parametric technique, i.e., DEA, the result exhibits that the efficiency of FBs has shown continuous improvement following the route of deregulation with little drifts.

**Key words:** DEA technique, efficiency change, foreign banks, Indian financial sector.

**JEL Classification:** D21, G21, G28, L33, N10.

### Introduction

Indian financial sector has continuously faced the rapid change in the banking system as well as functionality basics. Before reform period, it was not a perfect or flexible banking industry. To create a more diversified, profitable, efficient and elastic banking system, Government of India (GOI) commenced a comprehensive banking reforms plan in 1992. One of the major objectives of financial reforms in India was to promote flexibility, operational autonomy and competition in the system and to raise the banking standards in India to the international best practices (Reddy, 2002). "Every aspect of the functioning of the banking industry, be it profitability, non-performing asset management, customer service, risk management, human resource development, etc., has to undergo the process of transformation to align with international best practices" (Muniappan, 2003). Therefore, it becomes essential to introduce reform plan for better improvement of Indian banking sector. The broad framework of this plan was sketched by the Committee on the Financial System under the supervision of Narasimham (1991), while the definite shape to the plan was provided by the Committee on the Banking Sector Reforms (Narasimham, 1998). Hence, the Indian banking sector, which was predominantly controlled by the government, was liberalized. As a result, the GOI allowed new private sector to enter the banking sector from 1993, and further, the foreign banks (FBs) from 1994. Since then a large number of FBs showed their interest in opening the banks and respective branches in India to gain the significant benefits of liberalized regime of Indian financial system. Foreign banks in India have brought the latest technology and new banking

practices. This helped the domestic banks to improve their performance and provide better customer services. Due to their fast and efficient working style and better customer service foreign banks in India captured a large customer base. In 1998-1999, 44 FBs were operated in India. The top position is acquired by FBs in total number of banks in all three bank groups of Indian scheduled commercial banking system, i.e., 27 banks of public sector banks (PSBs) and 34 banks of private sector banks (PrSBs). The pattern is continued as 32 FBs, 28 PSBs and 22 PrSBs at present (RBI, 2011).

The Reserve Bank of India announced a new rule for foreign banks in India in 2008-2009 by allowing them to grow in an unregulated way. Now foreign banks in India are permitted to set up their local subsidiaries. The policy conveys that foreign banks in India may not acquire Indian ones (except for weak banks identified by the RBI, on its terms) and their Indian subsidiaries will not be able to open branches freely (Thyagarajan & Udhayakumar, 2009). After the entry of foreign banks in India, the Indian banking sector has become more competitive, efficient. In Asia Pacific zone, India is considered to be most leading investment market because of the growth of Indian economy, the diversity of income streams and product lines gave them the robustness to grow (Neeraj Swaroop, 2011).

There are thirty-two (32) foreign banks which are presently operating in India through 308 branches with 1026 ATMs and 72.8% of offsite ATMs. Besides, there are 45 foreign banks operating through representative offices. *Standard Chartered Bank*, the oldest foreign bank that came to India 150 years ago is now operating with 95 branches. It is followed by HSBC, which entered India in 1867, with 50 branches. Citibank has 43 branches and ABN Amro Bank which is known by Royal Bank of Scot-

land N.V. at present has 31 branches. The other banks that have a double digit branch presence are Deutsche Bank (13) & DBS Bank (10). The enhanced number of branches (from 189 in 1998-1999 to 308 in 2009-2010) makes us curious about the functioning of FBs. Considering the present scenario, an evaluation of performance and efficiency level is needed about the functioning of FBs. This paper is an attempt to provide insights with respect to their functioning, profitability and will also map the efficiency level in post-liberalized regime.

In the above backdrop, this paper assesses the efficiency of the foreign banks operating in India. The focus of the paper is to determine whether efficiency of the foreign owned banks have improved in the recent time period.

The paper is organized as follows. Section 1 gives a review of the existing literature in the areas of efficiency measurement of foreign banks in the Indian context. The conceptual declaration and research objectives are exposed in Section 2. Section 3 identifies database and methodology used. Interpretation of the results and analysis of this paper are summarized in Section 4. The last section highlights the conclusions.

## 1. Review of literature

To analysis of the dimensions of banking sector have been the most interested area for financial researchers. The term efficiency includes many aspects of the banking system. Improved efficiency in banking can result in improved profitability, suitable innovations with greater safety and soundness. An efficient financial system contributes to resource generation, intermediation and allocation and hence contributes to economic growth and risk mitigation process (Mohan, 2005). Some studies proved that banks are more efficient with high efficiency scores and are more capable to survive as compare to banks which have low efficiency scores (Barr & Siems, 1994). Thus there is a significant importance of the assessment of performance and efficiency judgment of the financial institutions. Researchers have done different evaluations of bank performance but most of these studies have been restricted to comparative studies like, Rangrajan & Mempilly (1972), Thyagrajan (1975), Angadi (1983), Sarkar & Das (1997), Denizer et al. (2000), Kumar & Verma (2003), Sathye (2003), Atallah et al. (2004), Shanmugam & Das (2004), Prasad & Ghosh (2005), Gunjan (2006), Sensarma (2006), Kumar & Sreeramulu (2007), Sahoo et al. (2007), Gupta et al. (2008), Mahesh & Rajeev (2008), Rezvanian & Mehdian (2008), Awdeh & Moussawi (2009), Rakhe (2010), Uppal (2010) and Uppal (2011). The existing literature is broadly classified as comparison among vari-

ous bank groups working in Indian banking system. Though there have been a few studies on efficiency assessment of the foreign banks only such as Dasgupta (2001), Chandrashekhar (2002), Gormley (2007) and Shanthi (2010), although there is ample literature available on efficiency of public sector banks. Our present study measures the technical efficiency of foreign banks in India for the recent period, as a group as well as interbanks, on a cross sectional data.

## 1. Conceptual declaration and research objectives

**1.1. Concept of productivity and efficiency.** Productivity is understood as the ability and willingness of an economic unit to produce maximum possible output with given inputs and technology. The higher is the output per unit of input, the higher is the productivity. Efficiency, on the other hand, measures performance of the bank in a normative sense by comparing it with the industry leader within or across the borders. Though, it is expected that there would be a co-movement in productivity and efficiency, score of a bank in terms of these two measures may actually diverge. While, a bank may improve in terms of productivity over a period, its efficiency score may decline if rise in its productivity is slower than that of the industry's best performer. In other words, the concept of efficiency relates to how well a bank employs its resources relative to existing production possibilities frontier. Hence, the analysis of banking efficiency relies on intra-sector comparisons, involves both technological and relative pricing aspects and has partial indicator value for analyzing productivity performance. The concept of productivity, on the other hand, refers to the performance of the sector as a whole and effectively combines changes in efficiency and technological advances in an average measure (Oster & Antioch, 1995).

**1.2. Measurement of efficiency.** There are two approaches for determining efficiency of a firm: parametric (econometric) and non-parametric (based on mathematical programming). These methods differ in several important ways. The parametric approach is based on the underlying relationship between the parameter under study and various observed independent variables. It, therefore, requires a specific pre-specified function form of the production or cost function. Non-parametric approach is based on the optimizing behavior of the firms under study. It is based on the concept of efficiency similar to one in the parametric approach but differs from it since this approach does not require any pre-specified function. It takes the data of the actual operations of the firms under study and frontier is formed as the piecewise linear

combination of the “most efficient observations.” Thus, efficiency is relative to the “observed best”, rather than an absolute value.

**1.3. Entry of foreign banks in India.** The Reserve Bank of India would like foreign banks to get a flavor of semi-urban India and the rural hinterland. Going by the statistics provided in the RBI’s annual report, it appears that foreign banks are being gently nudged away from metros, when they apply for permission to open a new branch. Most foreign banks follow a strategy of first setting up base in metros – Mumbai, New Delhi, Kolkata and Chennai. Then, in the next stage, they move to the mini-metros such as Bangalore, Hyderabad, Pune and Ahmedabad. Over the last few years, some banks have been talking about expanding their reach beyond the conventional circuits of these eight places. Foreign banks in India have got approval from the Reserve Bank of India to open 10 branches and 7 representative offices during the period of July 2006-June 2007 period. In year 2008-2009 the RBI had permitted 12 foreign branches and two representative offices to be opened. As a result, total number of branches of the 32 FBs operating in India as on March 31, 2010, stood at 308 which is a small rise of 5.12 % over the figure of 293 in the previous fiscal. The RBI has been cautious in giving fresh approvals for foreign banks to open branches in India. According to its Annual Report for 2009-2010, the RBI issued six approvals to foreign banks to open branches in India. As on April 30, 2010, 34 foreign banks were operating in India with 311 branches. Besides, 45 foreign banks were also operating in India through representative offices (RBI Publication, 2011).

India had committed to the World Trade Organization (WTO) in 1997 to give 12 new branch licenses to foreign banks every year, including those given to new entrants and the existing players. However, the Indian regulator has all along been allowing foreign banks to open more branches, going beyond its commitment to WTO. Despite their growing presence, foreign banks still have a very small market share in the Indian banking industry but their returns from Indian operations are far higher than those of their local counterparts, i.e., public and private sector banks. That’s why foreign banks are ready to walk the extra mile to do business anywhere in India. In the emerging financial and banking scenario of openness and promotion of greater economic efficiency, the need for an expanded role and operation of foreign banks has gained further backing in India. By the year 2010, the list of foreign banks in India is going to become more quantitative as numbers of foreign banks are still waiting with baggage to start business in India. There have been many

factors for foreign sector banks entry in India. Many factors like growth patterns, continued growth momentum, liberalized regime, and licence policy gave FBs ample and enormous opportunities to route towards efficiency and excellence. The scenario improved further with the RBI roadmap of removal of limitations on the operations of wholly-owned subsidiaries of foreign banks and treating them at par with domestic banks in April 2009. By virtue of the liberalized regime, there are some more foreign banks which are going to set-up their business in India in coming years like Royal Bank of Scotland, Switzerland’s UBS, US-Based GE Capital, Credit Suisse Group, Industrial and Commercial Bank of China. According to the latest data released by the Reserve Bank, only one new foreign lender – First Rand Bank of South Africa – entered India (RBI, 2011).

**1.4. Research objectives.** Foreign banks have an important and progressive position in Indian banking system. Through this paper, we will observe the improved performance of FBs through the efficiency measurement. The purpose of this paper is to evaluate the efficiency of foreign banking sector as a group and individual foreign banks operating in India over the study period (2005-2010). The significant insights are achieved by empirical exploration which could be helpful for the management of Indian financial & non-financial counterparts. Additionally, this will provide new findings to analyze if the changes in efficiency have been in the desirable direction. This will provide useful information to regulators and policy makers to formulate the policy. We can postulate the above mentioned research objectives as follows:

- ◆ To analyze the overall performance of FBs operating in India (as a group).
- ◆ To measure the efficiency of each bank towards the elements of efficiency and overall performance.

To achieve the above objectives, empirical hypotheses are formulated as:

*Hypothesis 1: Efficiency of foreign banks (as a group) is improved during the recent time period from 2005-2006 to 2009-2010.*

*Hypothesis 2: Efficiency measures have resulted in higher efficiency level of each individual banking unit of foreign sector banks.*

## **2. Database and methodology**

**2.1. Database.** The study has measured the efficiency level of all FBs operating in India during the recent five years from 2005-2006 to 2009-2010. The focus of the paper is to assess the efficiency scores and to observe the relative efficiency of the banks using DEA analysis. While there are 32 FBs that are

working at present but due to the limitation of incomplete data of five banks, the paper excluded such banks from the sample. Those banks are American Express Banking Corporation, Bank International Indonesia, First Rand Bank, JSC VTB Bank & UBS AG. Thus, in this study, the sample size of 27 FBs is taken which is sufficiently large to take care of the constraints imposed by the requirement of the DEA model.

**3.2. Methodology. Data Envelopment Analysis (DEA).** Data Envelopment Analysis (DEA) is a non-parametric linear programming based data analysis methodology introduced by Charnes, Cooper, and Rhodes in 1978, today called the CCR model. Building on the ideas of Farrell (1957), the seminal work “Measuring the efficiency of decision making units” by Charnes et al. (1978) applies linear programming to estimate an empirical production technology frontier for the first time. Since then, there have been a large number of books and articles written on DEA or applying DEA on various sets of problems. Other than comparing efficiency across DMUs within an organization, DEA has also been used to compare efficiency across firms. There are several types of DEA with the most basic being CCR, however there are also DEA which address varying returns to scale, either CRS (constant returns to scale) or VRS (variable return to scale). The main developments of DEA in the 1970s and 1980s are documented by Seiford & Thrall (1990).

It assumes constant returns to scale and an orientation. The study suggests the fact that banks use certain inputs to produce certain outputs. Thus, the efficiency of the banks will be measured with respect to how efficiently they are able to utilize their inputs. Efficiency is measured by the ratio of weighted outputs to weighted inputs. The study suggests the fact that banks use certain inputs to produce certain outputs. The ratio has the following form:

$$u_1 y_1 + u_2 y_2 + \dots \dots u_n y_n,$$

$$v_1 x_1 + v_2 x_2 + \dots \dots v_n x_n,$$

where  $u, v$  are the weights for the outputs,  $(y_1, \dots, y_n)$  and inputs  $x$   $(x_1 \dots \dots x_n)$ , respectively. Assume that for each of the  $N$  firms there are data on  $K$  inputs and  $M$  outputs and represented by the column vectors  $x_i$  and  $y_i$  respectively for the  $i^{th}$  firm. This may be expressed as  $(u' y_i / v' x_i)$ , where  $u$  is an  $M \times 1$  vector of output weights and  $v$  is a  $K \times 1$  vector of input weights. To arrive at the optimal weights, we define the following linear programming problem as:

$$\text{Max } u, v (u' y_i / v' x_i), \tag{1}$$

Subject to

$$u' y_j / v' x_j \leq 1, j = 1, 2, \dots, n,$$

$$u, v \geq 0 \tag{1}$$

Solving (1) will involve finding values for  $u$  and  $v$  such that the efficiency measure for each firm is maximized. A notable difficulty with this particular model formulation is that it can have an infinite number of solutions. Thus, an additional constraint is added,  $v' x_i = 1$  so that this problem can be avoided. The new model, known as the transformation model, thus becomes:

$$\text{Max } \mu, v (\mu' y_i), \tag{2}$$

Subject to,  $v' x_i = 1$

$$\mu' y_j - v' x_j \leq 0, j = 1, 2, \dots, N,$$

$$\mu, v \geq 0 \tag{2}.$$

To reflect the transformation,  $u$  has been replaced by  $\mu$  and  $v$  has been replaced by  $v$ . This form in equation (2) is known as the multiplier form of the DEA linear programming problem. Using duality in linear programming, one can derive an equivalent envelopment form of this problem:

$$\text{Min } \theta, \lambda \theta, \tag{3}$$

Subject to,  $-y_i + Y \lambda \geq 0$

$$\theta x_i - X \lambda \geq 0 \tag{3}$$

$\lambda \geq 0$ , where  $\theta$  is a scalar and  $\lambda$  is a  $N \times 1$  vector of constants.

The value obtained for  $\theta$  will be the efficiency for the  $j^{th}$  Decision Making Unit (DMU). The linear programming problem would be solved for each DMU taken in the study.  $\theta = 1$  will identify the technically efficient DMU and all other DMUs would have  $\theta < 1$ , implying that the efficiency scores of all other DMU will be measured relative to the technically efficient units that have a score of  $\theta = 1$ . In this study each bank under observation will be treated as a DMU. A separate frontier will emphasize the changes taking place in the macro economy and the supervisory policies of RBI. DEA gives us the relative efficiency measure of the DMUs. DEA results are sample specific. They don't reflect the absolute efficiency measures. This means that the best performing DMU out of the group will be shown as 100 percent efficient. The rest of the DMUs will be benchmarked against this one. Another expressing way of this is to say that an efficient unit doesn't necessarily produce the maximum output viable for a given level of input (Miller & Noulas, 1996).

In this paper, we have adopted the intermediation approach. Hence, deposits, investments, operating expenses and number of employees are used as *inputs*

and advances, return on assets (ROA), interest income and non-interest income are taken as *outputs*.

### 3. Interpretation of results

*Hypothesis 1: Efficiency of foreign banks (as a group) is improved during the recent time period from 2005-2006 to 2009-2010.*

Foreign banks (as a group) showed an increasing pattern of efficiency as it is shown in parameters (Table 1, see Appendix), i.e., DEA efficiency score, net profit and net profit ratio (NP ratio) with respective figures (Figures 1, 2, 3). In 2005-06, *DEA efficiency score* of FBs was 0.790, and then it showed a continuous upward trend till 2008-2009, which is the best performing year. In 2008-2009 FBs had 100% efficiency level as the score was 1 but in 2009-2010, it showed a declining trend in efficiency. Overall an escalating trend is shown by foreign banks as it grew from 0.790 to 0.862. Similar trends are shown by other parameters also like, *net profit* and *NP ratio*. These results are consistent with findings of another study considering a temporal trend carried out by Rajput & Gupta (2010) which reported that the efficiency of FBs increased for the study period of 2005-2010 in relation to PSBs and PrSBs, leading to a conclusion of acceptance of our hypothesis.

*Hypothesis 2: Efficiency measures have resulted in higher efficiency level of each individual banking unit of foreign sector banks.*

The analysis exhibit mixed results for individual banking unit of foreign sector banks. There are two banks (Antwerp Diamond Bank and State Bank of Mauritius) which are 100% efficient throughout the assessment years (Table 2). Four banks verified the highest efficiency level, 1, in all the years with only a fluctuation in 2006-2007 (Agricol Bank, Mashreq Bank and Sonali Bank) or in 2007-2008 (AB Bank Credit) whereas another bank, i.e., Shinhan Bank demonstrated much fluctuation but overall get 100% efficiency. Ten out of 27 FBs confirmed the escalating level of efficiency. On the other hand, ten FBs specified a downward tendency, including a fully efficient bank in the first four years of the study like Mizuho Corporate Bank, but in 2009-2010, it became less efficient. Hence, our hypothesis is accepted for 17 foreign banks which showed increasing trend in the efficiency and rejected in remaining 10 banks with the inverse picture exhibited in the results.

### Conclusion

An increasing trend of efficiency is shown by foreign banks operating in India. Due to their fast and efficient working style and better customer service

foreign banks in India captured a large customer base. In a comparative parlance with PSBs and PrSBs, the efficiency of FBs has shown a substantial improvement during the post-reform era. The study done by Rajput & Gupta (2010), Rezvanian & Mehdiyan (2008) and Gunjan, (2006), exhibited that in case of foreign banks the efficiency has been excellent and consistent throughout the period of study and the foreign banks have dominated the list of the highly efficient banks as compared to all scheduled commercial banks.

Leading position of FBs in India is related to the prompt services to customers as they committed to making a play in India to win the “race for the customer” and build a value-creating customer franchise in advance of regulations potentially opening up post 2009 vis-a-vis other players in the field. At a time when banks around the world are coping with a wide spectrum of effects of the financial meltdown, from slack economic activity to fresh debt crises, India presents a refreshing contrast, pushing ahead with the expansion of its own financial system. RBI has just released a discussion paper on the enhancement of FBs in the country, thus picking up the threads of the “Road Map” laid out six years ago.

The extent to which Indian policy makers and bank managements develop and execute such a clear and complementary agenda to tackle emerging discontinuities will lay the foundations for a high-performing sector in 2010-2011. At the same time, they should stay in the game for potential acquisition opportunities as and when they appear in the near term. Maintaining a fundamentally long-term value-creation mindset will be their greatest challenge. The present context is, of course, vastly changed; globally, banks are still to find their feet after bailouts by governments, particularly across the western world. Whether they will see the RBI paper as a reference point in their own roadmaps towards better health is to be seen. Should they read the fine-print, they will find pathways altered by the global financial crisis that shattered certain long-held assumptions about the infallibility of banks “too big to fail” or “too connected to fail”. The impact of the entry of FBs in Indian banking sector as the credit of banks in India has risen by over 25 per cent in 2004-2005 and the growth momentum is expected to continue over the next few years. Participation in the growth curve of the Indian economy in the next four years will provide foreign banks a launch pad for greater business expansion when they get more freedom after April 2009.

## References

1. Angadi (1983). "Measurement of efficiency in Banking Industry", *Reserve Bank of India Occasional Papers*, Vol. 3, No. 1, pp. 110-117.
2. Ataullah et al. (2004). "Financial liberalization and bank efficiency: a comparative analysis of India and Pakistan", *Applied Economics*, Vol. 36, pp. 1915-1924.
3. Awdeh & Moussawi (2009). "Bank Efficiency and Foreign Ownership in the Lebanese Banking Sector", *Review of Middle East Economics and Finance*, Vol. 5, No. 2, Article 4, Available at <http://www.bepress.com/meef/vol5/iss2/art4>.
4. Barr & Siems (1994). "Forecasting Bank Failure: A Non-Parametric Approach", *Recherches Economiques de Louvain*, Vol. 60, pp. 411-29.
5. Chandrashekhar (2002). "The Foreign Threat in Banking" *Economic Perspective*, Vol. 19, Issue 05, Mar. 02, p. 15.
6. Charnes et al. (1978). "Measuring the Efficiency of Decision Making Units", *European Journal of Operational Research*, Vol. 2, No. 6, pp. 429-444.
7. Cooper et al. (2000). "Data Development Analysis: A Comprehensive Text with Models, Applications, References and DEA-Solver Software", *Kluwer Academic Publishers*, Boston.
8. Dasgupta (2001). "India calls in foreign funds", *Euromoney Publications*, p. 12, available at <http://www.elibrary.ru/item.asp?id=4909400>.
9. Denizet et al. (2000). "Measuring banking efficiency in the pre and post-liberalization environment: evidence from the Turkish banking system", World Bank Policy Research Working Paper No. 2476.
10. Farrell (1957). "The Measurement of Productive Efficiency", *Journal of the Royal Statistical Society, Series A*, Vol. 120, No. 3, pp. 253-281.
11. Gormley (2007). "The Impact of Foreign Bank Entry in Emerging Markets: Evidence from India", Presentation at MIT, Olin School of Business, Washington University, New York Federal Reserve Bank, pp. 1-54.
12. Gunjan (2006). "Data Envelopment Analysis (DEA) for Measuring Technical Efficiency of Banks", *The Journal of Business Perspective*, Vol. 10, No. 1, pp. 13-27.
13. Gupta et al. (2008). "Dynamics of Productive Efficiency of Indian Banks", *International Journal of Operations Research*, Vol. 5, No. 2, Oxford University Press, New Delhi, pp. 78-90.
14. Kumar & Sreeramulu (2007). "Employees' Productivity and Cost – A Comparative Study of Banks in India During 1997 to 2008", *Reserve Bank of India Occasional Papers (Winter)*, Vol. 28, No. 3, pp. 35-50.
15. Kumar and Varma (2003). "Technical Efficiency, Benchmarks and Target: A Case Study of Indian Public Sector Banks", *Prajnan*, Vol. 31, No. 4, pp. 275-300.
16. Mahesh & Rajeev (2008). "Producing Financial Services: An Efficiency Analysis of Indian Commercial Banks", *Journal of Services Research*, Vol. 8, pp. 7-27.
17. Miller & Noulas (1996). "The Technical Efficiency of Large Bank Production", *Journal of Banking and Finance*, Vol. 20, pp. 495-509.
18. Mohan (2005). "India's experience with financial sector development", In: Basu P (ed) *India's Financial Sector: Recent Reforms, Future Challenges*, Macmillan India Ltd., New Delhi.
19. Muniappan (2003). "Management Challenges in Banking", *Address at the NIBM Annual Day*, January 6.
20. Narasimham M. (1991). "Report of the committee on financial system", *Reserve Bank of India*, Mumbai.
21. Narasimham M. (1998). "Report of the committee on banking sector reforms", *Ministry of Finance*, New Delhi.
22. Neeraj Swaroop (2011). StanChart's regional chief executive for India and South Asia, RBI.
23. Oster & Antioch (1995). "Measuring Productivity in the Australian Banking Sector", Reserve Bank of Australia.
24. Prasad & Ghosh (2005). "Competition in Indian Banking", IMF Working Paper, July 2005.
25. Rajput & Gupta (2010). "Efficiency, Productivity and Soundness of the Banking Sector in India: Data Envelopment Analysis", Accepted for publication in *BVIMR, Management Edge*, December issue 2011.
26. Rakhe (2010). "Profitability of Foreign Banks vis-à-vis other Bank Groups in India – A Panel Data Analysis", *RBI Occasional Papers (Monsoon)*, Vol. 31, No. 2, pp. 49-67.
27. Rangarajan and Mampilly (1972). "Economies of Scale in Indian Banking", *Technical Studies for Banking Commission Report*, Reserve Bank of India, Bombay, pp. 244-268.
28. Reddy (2002). "RBI and banking sector reforms", Reserve Bank of India Monthly Bulletin (December), pp. 99-1008.
29. Rezvanian & Mehdian (2008). "Efficiency change, technological progress and productivity growth of private, public and foreign banks in India: evidence from the post-liberalization era", *Applied Financial Economics*, Vol. 18, pp. 701-713.
30. Sahoo et al. (2007). "Productive performance evaluation of the banking sector in India using data envelopment analysis", *International Journal of Operations Research*, Vol. 4, No. 2, pp. 63-79.
31. Sarkar & Das (1997). "Development of Composite Index of Banking efficiency: The Indian Case", *Reserve Bank of India Occasional Papers*, Vol. 18, No. 4, pp. 679-709.
32. Sathye (2003). "Efficiency of Banks in a Developing Economy: The Case of India", *European Journal of Operational Research*, Vol. 148, pp. 662-671.
33. Seiford & Thrall (1990). "Recent developments in DEA, the Mathematical Programming Approach to Frontier Analysis", *Journal of Econometrics*, Vol. 46, pp. 7-38.

34. Sensarma (2006). "Are Foreign Banks always the best? Comparison of State-Owned, Private and Foreign Banks in India", *Economic Modelling*, April 7, pp. 717-735.
35. Shanmugam & Das (2004). "Efficiency of Indian commercial banks during the reform period", *Applied Financial Economics*, Vol. 14, pp. 681-686.
36. Shanthi (2010). "Performance Evaluation of Foreign Banks Operating in India", *Business and Economics*, American Edition, pp. 1-256.
37. The RBI (2009). "The Report of the Committee on Financial Sector Assessment".
38. The RBI. 'The Report on Trend and Progress of Banking in India', *RBI Publication*, Various years.
39. The RBI. "Statistical Tables Relating to Banks in India", Various years.
40. The RBI (2010). A Profile of Banks, *RBI Publication*, available at: [www.rbi.org.in](http://www.rbi.org.in).
41. The RBI (2010; 2011). Financial Stability Reports, *RBI Publication*, monthly report, March 2010, 2011, available at: [www.rbi.org.in](http://www.rbi.org.in).
42. The RBI (2011). Headcount of foreign bank drops in 2010: RBI, Press Trust of India (PTI), March 2011 (Mumbai).
43. Thyagrajan (1975). "Expansion of commercial banking: an assessment", *Economic and Political Weekly*, Vol. 10, pp. 1819-1824.
44. Thyagarajan & Udhayakumar (2009). "A Role of Foreign Banks in India – A Synopsis".
45. Uppal (2010). "Indian Banking: Emerging Issues and Enhancing Competitive Efficiency", *The IUP Journal of Business Strategy*, Vol. 7, No. 1, 2, pp. 71-82.
46. Uppal (2011). "New Competition and Emerging Changes in Indian Banks: An Analysis of Comparative Performance of Different Bank Groups", *Indian Journal of Commerce & Management Studies*, Vol. 2, Issue 1 (January 2011), pp. 223-237.

## Appendix

Table 1. Efficiency parameters for foreign banks (as a group)

Years	Efficiency scores	Net profit (crore Rs.)	NP ratio (%)
2005-2006	0.790	3069	1.52
2006-2007	0.793↑	4585↑	1.65↑
2007-2008	0.870↑	6612↑	1.81↑
2008-2009	1↑	7510↑	1.99↑
2009-2010	0.862↓	8214↑	2.14↑
Overall	↑	↑	↑

Source: RBI Publication (2009-2010), A Profile of Banks.

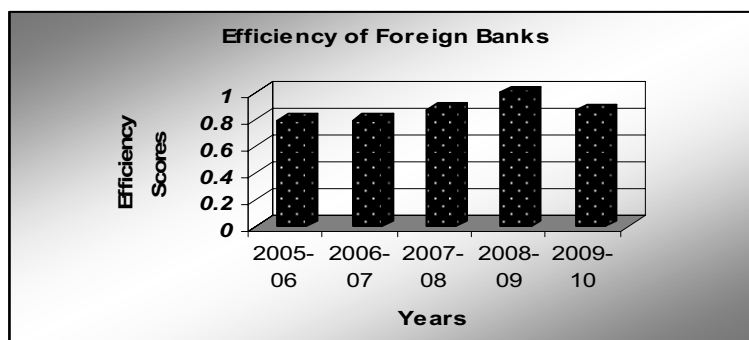


Fig. 1. Efficiency of foreign banks

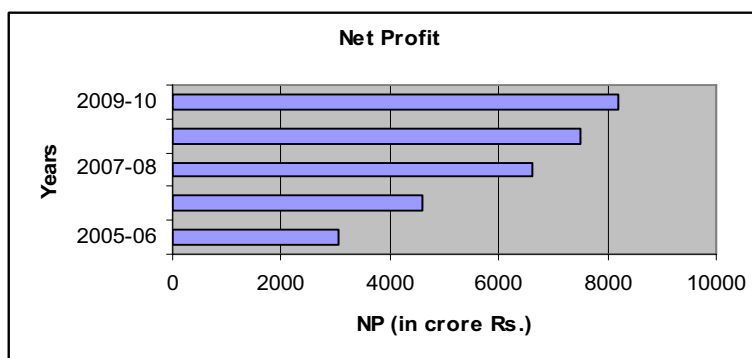
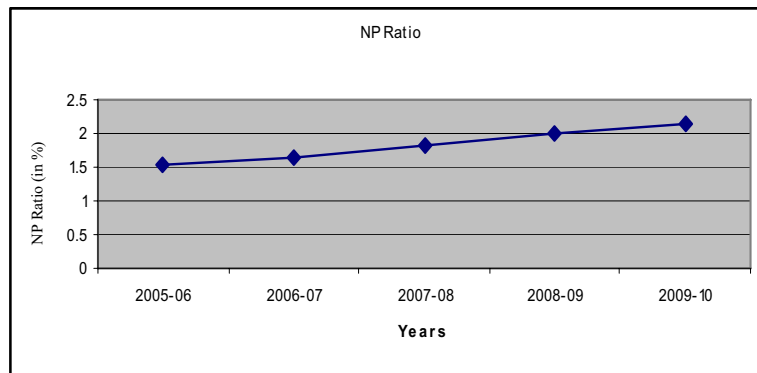


Fig. 2. Net profit of foreign banks





**Fig. 3. NP ratio of foreign banks**

**Table 2. DEA efficiency scores of foreign bank (individual)**

No.	Name of the bank	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	Overall
1	AB Bank	1	1*	0.854↓	1↑	1*	*
2	Abu Dhabi Comm. Bank Ltd.	1	0.693↓	0.784↑	0.522↓	0.395↓	↓
3	Antwerp Diamond Bank	1	1*	1*	1*	1*	*
4	Bank of America	0.773	0.737↓	0.644↓	0.782↑	0.756↓	↓
5	Bank of Bahrain & Kuwait	0.445	0.529↑	0.640↑	0.635↓	0.467↓	↑
6	Bank of Ceylon	0.639	0.573↓	0.673↑	1↑	0.472↓	↓
7	Bank of Nova Scotia	0.754	0.864↑	1↑	1*	1*	↑
8	Bank of Tokyo Mitsubishi UFJ	0.646	0.865↑	1↑	1*	1*	↑
9	Barclays Bank	1	0.528↓	0.805↑	0.637↓	0.552↓	↓
10	BNP Paribas	0.558	0.759↑	0.613↓	0.719↑	0.601↓	↑
11	ChinaTrust Commercial Bank	0.937	1↑	1*	1*	1*	↑
12	Citibank	0.875	0.856↓	0.965↑	0.932↓	0.839↓	↓
13	Credit Agricole Bank	1	0.931↓	1↑	1*	1*	*
14	DBS Bank Ltd	1	1*	1*	0.896↓	0.884↓	↓
15	Deutsche Bank	0.755	0.446↓	0.479↑	0.686↑	0.809↑	↑
16	HSBC	0.707	0.694↓	0.716↑	0.725↑	0.619↓	↓
17	JPMorgan Chase Bank	0.661	0.830↑	0.948↑	1↑	0.802↓	↑
18	Krung Thai Bank	1	0.622↓	0.772↑	0.767↓	0.458↓	↓
19	Mashreq Bank	1	0.936↓	1↑	1*	1*	*
20	Mizuho Corporate Bank	1	1*	1*	1*	0.892↓	↓
21	Oman International Bank	0.505	0.478↓	1↑	0.542↓	1↑	↑
22	Royal Bank of Scotland N.V.	0.920	0.962↑	0.846↓	1↑	0.841↓	↓
23	Shinhan Bank	1	0.848↓	1↑	0.894↓	1↑	*
24	Societe Generale	0.717	0.955↑	1↑	1*	0.761↓	↑
25	Sonal Bank	1	0.954↓	1	1*	1*	*
26	Standard Chartered Bank	0.791	0.899↑	1↑	1*	0.967↓	↑
27	State Bank of Mauritius	1	1*	1*	1*	1*	*

Note: \* means stable position, ↑ showing increasing and ↓ showing decreasing trend as compare to previous year. The change is shown in 'Overall', comparing 2005-2006 and 2009-2010.