CHAPTER 2

REVIEW OF LITERATURE

Literature review is carried out to reflect on the significant findings of comparable research studies. It helps to identify areas where further research could be done and also the methodologies that may possibly be applied for such research. The review in this study has been done on two fronts; one part deals with impact studies of mergers and acquisitions that have used event study methodology (Fama & Miller 1972) and second part considers the mergers and acquisition studies done using Data Envelopment Analysis (Charnes et al 1978). While many authors have attempted to evaluate bank mergers using a combination of event study and accounting returns analysis (Avkiran 1999, Liu & Tripe 2002 and Kumar & Suhas 2010), very few like DeLong (2003) have attempted to evaluate bank mergers by analysing stock returns and bank efficiencies. Yet, in comparison with the vast literature that is available about bank mergers in US and Europe, limited research appears to have been done in developing economies like India.

2.1 Research on bank mergers in India

Banking consolidation in India could be broadly classified into two phases. In the first phase, before economic liberalisation, the entire banking sector was dominated by public sector banks and mergers were mostly carried out on the basis of regulatory compulsions (Bose 2007 and Kamesam 2007). Hence, most of the literature in pre-liberalisation phase dealt with public sector bank mergers and their financial implications on merged entities. In the second phase, after 1991, government relaxed its control over the banking sector and allowed participation from the private sector. The private sector
banks viewed consolidation as a route for rapid growth and started merging with each other based on commercial considerations. In this phase many researchers have studied widely about Indian bank mergers by using various frameworks.


In general, mergers are conceived on the basis of potential gains that could be realised in the form of economies of scale or economies of scope and a few authors have inquired into the rationale behind bank mergers. Murthy (2007), who studied the merger alliances among Indian banks, mentioned rapid growth intention, green field risk avoidance and risk diversification, as the reasons for bank mergers. It was also pointed out that perceived reasons like, need for a large customer base, new product / service offerings and need for a large capital base, also led to mergers among banks. Sharma (2002), in a study on the global trend towards consolidation in the banking industry, noted that the major motives for mergers were revenue
enhancement (through one-stop shopping for customers), ability to rationalise the branches and cutting down costs, higher profitability (through market share concentration), route for cross-border expansion and exit route (for troubled banks).

Similarly, Kakani & Mehta (2006) probed into the various motivations for mergers and observed that consolidation was sought to overcome the poor global competitive presence and position of the fragmented Indian banking sector. Besides, they argued that mergers were also pursued to overcome large intermediation costs and associated risks, and also to meet the new stringent international regulatory norms. They argued that it was imperative for the state to create a few large sized banks even at the cost of hurting the other stakeholders, including customers.

Though various points are quoted in favour of banking consolidation literature is replete with contradicting arguments. From a conceptual perspective, Bhattacharya & Menon (2007) cited global experiences in support of their argument favouring public sector bank mergers in India. Sukthankar (2007) favoured consolidation and believed that the banking sector could benefit from a distinct set of benefits arising out of mergers. However, it was cautioned that consolidation posed significant challenges and hence the process must be properly sequenced.

Mohan (2005) argued that there was no compelling rationale in favour of banking consolidation. It was observed that post-reform spreads of public sector banks had not declined and their stock values had increased. Hence, it was pointed out that consolidation was not the only key to further performance improvement. Banerjee (2007) also observed that the ultimate parameter for measuring bank mergers should not be size and that the interest of concerned stakeholders must be taken into consideration.
Although some of the conceptual studies support bank consolidation other quantitative studies raise questions about the alleged benefits of mergers. However, such quantitative studies have not considered all the bank mergers that were carried out during their time period of study. Some of the studies have not differentiated between bank-to-bank mergers and mergers between banks and non-banking financial institutions. Consequently, the results of these studies do not provide conclusive evidence on the effects of banking consolidation in India. Hence, there is a wide scope to analyse the impact of bank mergers on stock returns and bank efficiencies.

2.2 Methodologies used for bank merger analysis

Apart from conceptual analyses, researchers have used different statistical techniques to analyse bank mergers in India. While the stock price data were typically analysed using event study methodology, the accounting data has been studied either through ratio analysis or Data Envelopment Analysis (DEA). Sethi & Krishnakumar (2012) who surveyed merger analysis techniques reported that event studies seemed to dominate the research on bank mergers across the world. It was observed that research on Indian acquisitions was primarily based on accounting returns and that event study analysis and DEA studies were relatively less predominant.


Authors like Shanmugham & Das (2004) and Sanjeev (2006) have used financial ratios to analyse bank mergers in India. Similar analysis was

In the recent past bank efficiency gains have also been studied using DEA and Stochastic Frontier Analysis (Sufian 2004). In India, Kaur & Kaur (2010), Sanjeev (2009) and Kumar (2007) have applied DEA technique to analyse the post-merger efficiency gains of banks. Singapore bank mergers were analysed by Sufian (2007) using DEA technique. Berger (1993) and Hahn (2007) used DEA analysis to study US bank mergers.

Economic Value Addition (Sirower & O’Byrne 1998) and Residual Income (Guest et al 2010) have also been analysed in a few studies. In India, Singh & Gupta (2013) applied EVA and MVA approach for their analysis. In general, these studies have used the stock price data or accounting data for analysing merger gains experienced by various stakeholders.

2.2.1 Event study methodology

While banks cite various reasons for indulging in merger activities they may or may not be addressing the concerns of stockholders. Conceptually, shareholder wealth maximisation is the main objective of companies and market capitalisation is a major component of this wealth. Any action that would deplete the market value of stocks is considered detrimental by the stockholders. If consolidation does, in fact, lead to value gains, then stockholder wealth can be increased. Otherwise, it would lead to less profitable and valuable banking industry (Singh 2009). In this context, event study methodology (Fama & Miller 1972) has been widely used in finance, marketing and strategy to analyse the impact of public announcement on the stock price of firms.
Mathur et al (1997) and Agrawal & Kamakura (1995) have used event study approach to analyse the impact of celebrity endorser announcements. Mahadevan & Prescott (1995) and Koh & Venkatraman (1991) used this methodology to analyse the impact of joint venture announcements on stockholders. Likewise, Das et al (1998) and Woolridge & Snow (1990) studied the impact of strategic alliances, and investments, respectively, on stock returns.

MacKinlay (1997) has explained the event study procedure and its application in Economics and Finance. Any public announcement that could affect the share price of concerned firms is considered as an event and its impact on share price is analysed by computing the abnormal returns i.e. the difference between actual return and expected return. In market model, a broad index like S&P 500 is generally used as benchmark to compute the expected return. The market return model removes the portion related to variation in the market’s return and hence it is better than the constant mean return model. Consequently, the market model’s ability to detect event effects is more. If the abnormal returns are positive it could be implied that reaction of the stock market was positive and vice versa.

In India, Pandey (2001) and, Kumar & Rajib (2007), have used the event study technique, but these studies are not specific to the banking sector. Impact of Indian bank merger announcements were studied by Jayadev & Sensarma (2007), Anand & Singh (2008), and Kumar & Suhas (2010) using this technique. However, they have not considered all the bank merger announcements that were made during their corresponding time periods of study. Mann & Kohli (2009) and Selvam et al (2006) have also applied the event study technique, but they have each analysed only one merger in their studies.

Jayadev & Sensarma (2007) analysed six forced bank mergers that had happened between 1999 and 2006, and reported that neither the acquiring
nor the acquired banks’ shareholders had benefited. They had estimated the daily abnormal stock returns in a 4-day time window around the merger announcement using Sensex (market index) and 150 days clean period data. Post-liberalisation, some banks became too weak to continue to take deposits and were absorbed by stronger ones, sometimes voluntarily but mostly under instructions from the government and the RBI (Herd et al 2011). Consequently, the share price of banks which were forced to acquire weaker banks fell on public announcement of the merger even though an announcement to this effect was anticipated. However, analysis of three voluntary mergers (Jayadev & Sensarma 2007) indicated that acquiring banks’ shareholders gained more than those of the acquired banks. They had used a four-day time window similar to Chong et al (2006). Since the shareholders of both the acquiring bank and acquired bank appeared to lose value in forced mergers they suggested that the RBI should activate the Prompt Corrective Action system instead of forcing the banks to merge.

Anand & Singh (2008) analysed five market-driven bank merger announcements during the post-reform period from 1999 to 2005 and reported that merger announcements had positive and significant shareholder wealth effect on both acquiring and acquired banks. They had estimated stock returns during a 40-day time window around the date of merger announcement based on S&P CNX 500 (market index) and 120 days clean period data. Their results for two-factor model using CNX Bank Index were similar to the market model results. Likewise, Mann & Kohli (2009) evaluated stock market reaction to the announcement of merger between HDFC Bank and Centurion Bank of Punjab in India and reported that the stock market gave a positive response to both the stocks. However, Selvam et al (2006) who studied the merger of Bank of Madura with ICICI Bank in India found no difference in
the security price behaviour of ICICI Bank around merger announcement. Overall, the available literature in the Indian context appears to be neither comprehensive nor conclusive.

Pilloff & Santomero (1997) observed that the banking industry in US had experienced consolidation on a belief that gains can accrue through expense reduction, increased market power, reduced earnings volatility and scale and scope of economies. However, their review indicated that there was no positive relationship between mergers and gains in shareholder wealth or performance of merged entities. Similar interpretation was made by Berger et al (1999) who performed an elaborate review of US bank mergers.

DeLong’s (2003) findings about shareholder value creations are comparable to the above observations. The study involved 54 bank merger announcements between 1991 and 1995 in US. The results indicated that mergers involving partners with similar geographical location, activities and geographical location only were rewarded. DeLong & DeYoung (2007) had noted that typical bank mergers failed to create value to shareholders though they argued that the stock market valuation of bank mergers was better when viewed from a ‘Learning by Observing’ statistical framework. They studied the announcements concerning 216 mergers and acquisitions of US commercial banks between 1987 and 1999 using market model. They had computed abnormal returns in 5-day and 10-day window periods and in -10 to +5, window periods on the basis of 300 days’ clean period data ahead of 50-day time window around merger announcement.

Toyne & Tripp (1998) studied 68 bank merger announcements between 1991 and 1995 and reported that the returns for acquired banks were significantly positive and the returns for acquiring banks were significantly negative. They had used a 2-day time window and CRSP (Centre for Research in Security Prices) index for their analysis. Neely (1987) examined
merger announcements of 26 banks between 1979 and 1985 and reported that very large abnormal returns were observed in case of acquired banks during the announcement week and the returns were slightly negative for acquiring banks. Unlike the other studies, weekly data was used in this study where 119 weeks clean period data and 11 weeks event window were assumed.

Gutpa & Misra (2007) analysed 503 bank mergers that had happened from 1981 to 2004 in US from the perspectives of deal size and bid premium. Their analysis showed that acquired bank stocks gained value and acquiring bank stocks lost value. They had considered a three-day window (-1, +1) as announcement period for event study analysis and the CRSP equally weighted market index as benchmark index. These findings differ from the results of Cornett & De (1991), who had analysed 152 merger announcements in US during 1982 to 1986. They reported that significant positive returns were experienced by acquiring bank stock and acquired bank stocks.

Staff et al (1986) too had observed that while the increase in merger activity in US had resulted in larger and more powerful banks, it did not increase the wealth of the shareholders of these banks. They had analysed weekly stock price data corresponding to 163 merger announcements between 1978 and 1980, using S&P 500 index. Here too the results are not conclusive with some of the studies reporting gains to shareholders and some of the studies reporting loss or no gain to the shareholders.

Beitel et al (2004) studied 98 larger mergers and acquisitions of European acquiring banks from 1985 to 2000. They used country specific market indices and 252 days stock price data before and after merger announcement, to compute the abnormal returns in a 20-day time window. They investigated drivers of excess returns to the shareholders of acquired banks, the acquiring banks and to the merged entity. Overall, the shareholders of the acquired banks approved and benefitted from the transfer of corporate
control away from bad towards better managers. Acquiring banks were more successful when they took over qualitatively better managed targets that at the same time provided for a sufficient synergy and profit efficiency potential. It indicated that successful bidders did not search for real turnaround candidates.

Caruso & Palmucci (2008) performed an event study on mergers and acquisitions between publicly listed Italian banks. They used rumour date as event date instead of the announcement date and found that the overall market value creation was positive. They also observed that private benefits were more likely to drive the acquirer’s decisions rather than value creation goals. Their results were based on an analysis of 42 mergers during 1994 and 2003 and they had used banking sector index as the reference index. They had used a clean period data 150 days prior to the 30-day time window analysis.

Chehab (2002) evaluated the stock price reactions to large bank merger announcements and subsequent regulatory rejection in Canada. They analysed two merger announcements using Toronto Stock Index (TSE 300) as the market index with a 30-day time window and 229 days clean period data. They reported that merger announcements produced significant positive abnormal returns for acquired banks and regulatory denials resulted in significant negative returns.

Overall, academic studies of bank merger announcements in India, US and other economies appear to provide mixed evidence. Results of Indian studies are not consistent with each other since most of the researchers have not analysed all the bank mergers that had happened during their time period of study and the sample sets were rather different. This situation provides a broad scope to analyse the impact of Indian bank merger announcements on stock returns of corresponding banks.
However, event study results are sensitive to the time period selected around announcement date (Rhoades 1993) and they do not address the issue of actual gains resulting from consolidation since they are solely based on market expectation (Kumar & Suhas 2010). Consequently, analysis of actual accounting data is necessary to understand the financial implications of bank mergers. Though ratio analysis is a common choice for analysing accounting data, ratios do not capture the long-term performance (Sherman & Gold 1985). Hence, recent studies appear to prefer techniques like Stochastic Frontier Analysis and Data Envelopment Analysis which address this issue.

2.2.2 Data Envelopment Analysis (DEA)

In DEA, the efficiency of merged banks is analysed by constructing a frontier from actual accounting data. The banks that lie on the frontier are considered as reference points with unit efficiency. Whereas, banks that lie inside the frontier are considered to be relatively inefficient and their scores range from 0 to 1. If the efficiency of a bank improves after merger it could be implied that the merger resulted in an efficiency gain and vice versa. Various efficiencies such as cost efficiency, profit efficiency, technical efficiency and allocative efficiency are examined to identify the impact of merger on the performance of merged entity. Since DEA does not require any assumption to be made about the sampling distribution it has been extensively used to measure the efficiency of Decision Making Units (Kaur & Kaur 2010).

DEA has been used in various contexts such as education, retail, healthcare and especially banking. Zhu (2002) acknowledged this phenomenon and observed that banking industry had been the subject of DEA analysis by researchers in various areas. Berger (1993) used this technique to compare pre and post-merger efficiencies in the US banking industry with reference to cost, profit and market power gains. Many other researchers like Cornett &
Tehranian (1992), Linder & Crane (1992), Rhoades (1993 & 1998) and Schrantz (1993) have also applied DEA technique to study efficiency effects of mergers and acquisitions.

In the Indian context a few authors such as Shanmugam & Das (2004), Ataullah (2004), Sanjeev (2006), Bhattacharya et al (1997) and Sathye (2001) have used this technique to measure the efficiency of banks. A few others like Kaur & Kaur (2010) and Kumar (2007) have applied this methodology to compare the performance of Indian banks before and after India.

Compared to the studies in US where the sample sizes tend to be larger owing to a spate of post-liberalisation mergers and acquisitions, the current study deals with a relatively small sample size since the number of bank mergers in India are less. This also led to categorisation of all the banking consolidation activities in this study as ‘merger’. However, the choice of DEA for such small samples was validated by Evanoff & Israilevich (1991) who had noted that this technique was particularly suitable to study small samples. For example, Avkiran (1999), Oral & Yolalan (1990), Giokas (1991), Yeh (1996) and Sufian (2004) have also used small samples in DEA analysis. The choice of DEA methodology for this analysis involving small sample has considerable precedence.

It is generally presumed that larger banks would be able to benefit from the economies of scale and earn higher profits by taking on larger projects. Hence, the government, RBI and bank managers are in favour of bank consolidation for their own reasons. Mehta & Kakani (2006) identified this trend and noted that the banking sector was slowly but surely moving from a regime of ‘large number of small banks’ to ‘small number of large banks’. However, size alone cannot determine the performance and efficiency of a bank (Sukthankar 2007 and Srinivasan et al 2009) and hence many studies have assessed the relationship between size of a bank and its efficiency
(Kumar 2007, Sanjeev 2009, and Singh 2009). Though choice of input and output variables could affect the results, generally most of the studies found no strong evidence in favour of banking consolidation in India.

Sanjeev (2009) assessed the technical efficiency of public sector banks in India during 1997 to 2001 using interest expenses and non-interest expenses as inputs and interest income and fees, commission and brokerage as outputs. The study was done with an input orientation i.e. focusing on reduction of inputs with fixed outputs, and constant returns to scale assumption. Following an intermediation approach it was reported that there was no conclusive relationship between efficiency and size of banks.

Singh (2009) analysed the effectiveness of mergers in the Indian Banking System by examining the efficiency benefits of mergers among 12 scheduled commercial banks in India over the period 2000 – 05. The common inputs were shareholders capital, interest expenses and operating expenses. For cost efficiency calculation, annual increase in assets and total income were considered as outputs. For profit efficiency calculation, net profit was used in place of total income. It was reported that the mergers did not appear to adversely impact the cost efficiency and profit efficiency of banks. It was also argued that banks should not follow a herd mentality and must consider mergers if and only if they were able to justify the mergers with strong economic rationale.

The findings of Kumar (2007) were different. Fifteen bank mergers between 1993 and 2005 were analysed using interest expenses and non-interest expenses as inputs. Net interest income and non-interest income were considered as output variables. Year-on-year profit efficiencies were calculated than computing bank-wise efficiencies. Excess efficiency scores were obtained by deducting the average relative efficiency score of the entire industry from the relative efficiency score of the bank. Consequently, the
results are rather different from the results of similar studies and it was reported that bank mergers had positively influenced the efficiency of merged banks.

Kaur & Kaur (2010) who compared the cost efficiency of Indian banks before and after merger reported that the acquiring banks were usually weakened in forced mergers and no significant gains were made in voluntary mergers too. They had computed cost efficiency of banks that had operated between 1991 and 2008. The selected input variables were number of full-time employees, loanable funds and physical capital. The output variables were non-interest income, net-interest income and advances. The analysis was made on the basis of constant returns to scale assumption and modified version of intermediation approach.

Gourlay et al (2006) analysed the efficiency gains from bank mergers in India using the methodology developed by Bogetoft & Wang (2005). They had studied the mergers that happened from 1992 to 2005 using both production approach and intermediation approach. In the former approach, borrowings, fixed assets and other assets were considered as input variables and deposits, advances and investments were considered as output variables. In the second approach, deposits were considered as input variable and not as output variable. Though bank mergers possessed considerable potential efficiency gains, comparison with a control group of non-merging banks revealed that there was no sustained increase in efficiency gains. Merging banks did not gain a competitive advantage vis-à-vis their non-merging counterparts.

Though the choice of variables and time period of analysis would affect the results of DEA, the current literature on Indian bank mergers is not comprehensive and provides only an ambiguous picture of the merger scenario. There is no conclusive evidence in support of the argument that
mergers would result in better utilisation of resources and hence the financial performance and efficiency of merged banks would improve.

Berger & Humphrey (1993) summarised the research on US bank cost and profit functions and their policy implications to provide a backdrop for the likely implications of European financial integration. They reported that mergers had no significant predictable effect on efficiency – some mergers raised efficiency and others lowered it. Market concentration resulted in slightly less favourable prices for customers, but had little effect on profitability.

Hahn (2007) investigated the performance of the Austrian banks which participated in a domestic in-market merger operation between 1996 and 2002. In all 118 mergers were analysed and it was found that merged banks attained higher productive efficiency levels than banks that had not participated in such operations. The merger gains remained significant for more than five years though it tended to slightly reduce. Following Casu & Molyneux (2003), they had used an intermediation model with two outputs (total loans and other earnings) and two inputs (total expenses and total deposits).

Sufian (2004) observed that the merger programme was successful in Malaysia, particularly for the small and medium size banks, which benefitted mostly via economies of scale and they exhibited commendable overall efficiency level of 95.9% during 1998 – 2003. On the other hand the results suggested that the larger banks should shrink to benefit from scale advantages. Hence, decision-makers were urged to be more cautious in promoting mergers as a means to enjoy efficiency gains. Intermediation approach was adopted in this study with total loans and securities as outputs, and deposits along with labour and physical capital as inputs, to compute overall efficiency of 10 merged banks.
In certain economies like US, inherent inefficiencies were overcome by post-reform mergers and hence the results were generally positive. However, the same could not be said about bank mergers in India. While some studies have identified merger gains, other studies have pointed out that bank efficiencies were unaffected and had even declined in many cases. This inconsistency is mainly due to the differences in time period of analysis and choice of variables. Further, some of the studies have not considered that banks are operating with a profit motive in the post-reform period and they have also not made ‘variable returns to scale’ assumption which is more appropriate. Hence, an intermediation approach under ‘variable returns to scale’ assumption is necessary to analyse all post-reform bank mergers in India.

2.2.3 Stock returns and financial performance

Some of the studies have tried to assess whether the stockholders expectations matched the financial performance of merged firms by comparing event study results and financial ratios (Avkiran 1999, Liu & Tripe 2002, Kumar & Suhas 2010). Very few studies appear to have been done comparing event study results and bank efficiency (Kohers et al 2000). Though Sufian et al (2007) applied DEA technique to compare bank mergers in Singapore they had compared bank efficiency scores and financial ratios. Gauging the performance of banks on the basis of ratios could be misleading as these ratios do not capture the long-term performance (Sherman & Gold 1985). Hence, recent studies appear to prefer frontier analysis methods, such as DEA and SFA to explain performance of banks (Bhattacharyya & Chatri 2012). Among the frontier approaches, DEA does not require any assumption to be made about the distribution of data (Talluri 2000) and is gaining popularity now-a-days (Sufian 2007) since it is suitable for small samples (Evanoff & Israilevich 1991 and Avkiran 1999).
If the stockholders expectation about a merger deal is positive and it is also reflected in the efficiency scores it could be implied that there was no conflict of interest. If both the bank managers and stockholders are not in favour of a merger deal the merger is unlikely to take place unless and otherwise under pressure from regulatory authorities. Two more outcomes are also possible: the stockholders expectation may be positive whereas the efficiency scores may be low and on the contrary stockholders expectation may be negative while the efficiency scores are positive. These outcomes could be implied as conflict of interest between stockholders and managers.

Kohers et al (2000) appear to have analysed this association in US bank mergers. Using SFA and DEA they reported that abnormal stock returns could be explained the efficiency level of acquiring banks and the differences in efficiency between acquired and acquiring banks. DeLong (2003) furthered this analysis in US bank mergers, based on the findings of Berger & Humphrey (1992) that acquiring banks were significantly more efficient than acquired banks. This indicated that the acquirer might improve the efficiency of the acquired bank. Hence, DeLong (2003) hypothesised that, mergers in which the acquirer was more efficient than the target had a higher potential for improving efficiency. This contradicts the argument of Akhavein et al (1997) that firms which benefit most from mergers would be those that are least efficient at the outset. It was opined that acquiring banks use merger as an excuse to improve efficiency within the current organisation.

Whichever be the argument, it could be implied that more the difference in efficiency be the argument, it could be implied that more the difference in efficiency ratios, higher should be the abnormal stock returns of the merging banks (DeLong 2003). On this basis, stock returns and efficiency gains of banks involved in bank mergers have been analysed to understand how well stockholders comprehended a bank merger deal and whether their expectations
matched the efficiency gains made by the merged banks. This rationale could be further strengthened by the fact that shareholders’ capital is used as an input to calculate profit and cost efficiencies (Chu & Lim 1998 and Singh 2009).