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Wealth effects of bank mergers in India: a study of impact on share prices, volatility and liquidity

Abstract

Mergers have the potential of possible value creation for various stakeholders, which in turn may affect their wealth. The wealth effect of merger may be noticed right from the time when the merger is announced, as share market would, generally react to such announcement affecting the stock characteristics of the company. The impact of such reaction has been a matter of concern and confusion particularly from the perspective of shareholder's of bidder banks. The market reaction to merger announcement has primarily been examined in terms of impact on stock returns and very little attention has been paid to other stock characteristics. This paper examines the impact of merger announcements in Indian banking sector on shareholder's wealth, focusing on three stock characteristics namely, stock returns, volatility and liquidity of the bidder banks. It is assumed that volatility and liquidity also influence value for the shareholder's wealth. The paper is based on the study of market reaction of merger announcements in Indian banking since 1999. It was found that the merger announcement had a mixed impact on the returns to the shareholders of the bidder banks. As far as other stock characteristics are concerned, there was limited impact of merger announcement on volatility in share prices of the bidder banks and no significant impact on the liquidity of the shares of bidder banks.

Keywords: merger, merger announcement, market reaction, stock characteristics, pre-announcement period, post-announcement period, bidder banks, target banks, returns, volatility, liquidity.

JEL Classification: G21, D4.

Introduction

Over the last two decades, the banking and financial services industry has experienced profound changes. One of the most important effects of this restructuring process has been an increase in consolidation activity (Cybo-Ottone & Murgia, 2000). Globally, mergers and acquisitions (M&A's) have become a prominent strategic alternative for corporate restructuring, and the financial service industry has also experienced major merger waves, leading to the creation of very large banks and financial institutions. M&A's in the banking sector evokes high interest simply for the fact that after decades of strict regulations, easing of the ownership and control regulations has led to a wave of M&A's in banking industry throughout the world (Focarelli, 2003). The main motivations for this unprecedented wave of consolidation in the financial sector are common to most countries. In response to fundamental changes in regulation and technology, financial institutions have attempted to improve their efficiency and attract new customers by increasing their geographical reach and the range of products they offer. The desire to preserve falling margins by increasing market share and attracting new customers is often fulfilled by way of M&A's that allow financial institutions to increase rapidly their size and to improve their knowledge of new products and markets. Furthermore, mergers help financial institutions diversify their portfolios or increase their market share (Amel et al., 2004). Mergers have the potentials of possible value creation for various stakeholders. For example, shareholders in

the target bank may gain from the merger as the premium offered to induce acceptance of the merger offers much more price than the book value of the shares. Similarly, shareholders of the bidder bank may gain in the long run with the growth of the company not only due to economies of scale but also due to other factors. It will be interesting to examine as to how the market players view these potential gains and reacts to merger announcement. Mergers result in overall benefits when the consolidated entity is more valuable than the aggregate of two separate pre merger banks (Pilloff, 1996). M&A announcement, being an important piece of information for any company, should normally result in significant impact on share prices. Such an impact may be reflected in positive abnormal returns for the bidder banks, on merger announcement, if market perceives positive gains from the merger. Such announcement may also impact other stock characteristics such as volatility and liquidity of the stock.

This paper examines the impact of merger announcements in Indian banking sector on stock returns, volatility and liquidity of the bidder banks. Market reaction to merger announcement in developing countries may be quite different and distinct from that of in case of developed countries due to the existence of different regulatory framework. Mergers in developing countries, like India have not necessarily been market driven but have taken place at the initiative of regulator too. In such a situation, where mergers are taking place in the Banking sector with a variety of considerations, including policy initiatives, it is interesting to understand how markets in developing countries react to merger announcement and in turn impact shareholders' value.

1. Prior research

The underlying rationale for consolidation of banks has focused primarily on the achievement of efficiency improvements through cost reductions (Campa and Hernando, 2006). Bank mergers can increase value by reducing cost and/or increasing revenues (Houston, 2001). It may also reduce industry risks through the elimination of weak banks and create better diversification opportunities. However, consolidation could increase bank's propensity to take risk through increases in leverage and off-balance sheet operations. Furlong (1994) stated that an early view of consolidation in banking was that it made banking more cost efficient because larger banks could eliminate excess capacity in areas like data processing, marketing or overlapping branch networks. Cost efficiency also could increase if more efficient banks acquired less efficient ones. However, empirical evidence does not offer conclusive support to this contention, as Akhavein et al. (1997) find little change in cost efficiency but an improvement in profit efficiency of large US banks after M&A's, especially if both merger participants were relatively inefficient prior to the merger. On the other hand, Hughes and Mester (1997) provide evidence to suggest that there are scale economies in banking. Rhoades (1996) reported that American banks consolidated in response to the removal of restrictions on bank branching across states, indicating that regulatory impediments to organic growth could also drive M&A. Harada & Takatoshi (2011) examines short and long-term performances of consolidation of larger scale banks. Likewise, the examination of M&A's in European banking found that industry consolidation was beneficial (by providing social benefits) in the first economic integration stages, but could damage welfare in the more advanced stages as few big banks safeguard price agreements to forestall foreign competition (Somoye, 2008). The possible impact of merger on performance of bidder bank and the premium to be paid to the shareholder's of the target bank would generally be expected to influence the share price of the company. The findings of US event studies that look at share prices around the time of merger announcement reveal that, on average, total shareholder value (i.e. the combined stock returns of the bidder and the target) is not affected by the announcement of the deal since, on average; the bidder suffers a loss that offsets the gains of the target. Studies by Baradwaj, Fraser and Furtado (1990), Cornett and Tehranian (1992), Hannan and Wolkan (1989), Hawawini and Swary (1990), Neely (1987), Trifts and Scanlon (1987), Siems (1996), Houston and Ryangert (1994) and Becher (2000) also report positive reaction in the stock prices of target banks and negative reaction in the stock prices of bidding banks to merger announcements. On the other hand,

in their study of mergers in European banking markets, Cybo-Ottone and Murgia (2000) find positive and significant gains in shareholder's value of bidder banks and Campa and Hernando (2006) also report positive returns to shareholders of target banks and zero returns to bidder banks. Scholtens and Wit (2004) examines the short-term wealth effects of bank mergers in the US and European market to both the target and bidder banks shareholders. The study finds that there are significant differences in the shareholder wealth effects of US and European bank mergers but there are situations in which market reactions do not significantly differ. Both targets and bidders show positive cumulative abnormal returns in Europe whereas in the U.S. only target show positive abnormal returns. The overall value of bank mergers is positive in Europe and neutral in the US. Gayle de Long (2003) uses event study methodology to find out if bank mergers create value. The results indicate that although market reacts positively upon announcement of mergers that focus activities, geography and partner's earning stream, focusing mergers do not necessarily produce long-term benefits. Another interesting study is made by Annalisa Caruso and Fabrizio Palmucci which conducts an event study on Italian banks and is of the view that choosing announcement date as the event date may only give partial reactions of the market because of leakage of information. Among the few event studies on the Italian market, Ferretti (2000) finds a negative market reaction for bidders, while Resti and Siciliano (1999) find significant gains for the target banks. Thus, the empirical evidence suggests that commercial banks M&A's do not significantly improve cost and profit efficiency and, on average, do not generate significant shareholder value. There is evidence in favor of exploiting scale economies, but only up to a size well below that of the most recent large deals. Economies of scope are harder to pin down; there is no clear-cut evidence of their existence (Amel et al., 2004).

Though, a number of studies have been carried out in the developed countries on the issue of value creation to the shareholders of the acquirer bank as a result of merger, there seems to be a dearth of literature in so far as developing countries are concerned. Moreover, the studies in developing countries have examined impact of mergers, primarily on the stock returns. Chong (2005) examines the impact of forced bank mergers on the shareholder's wealth of Malaysian banks using event study methodology. The results of the study shows that the forced merger scheme destroys economic value in aggregate and acquiring banks tend to gain at the expense of the target banks. Choi and Murtagh (2004) investigate the effects of mergers and acquisitions among South Korean commercial banks for the period of

1998-2002. They do not find significant abnormal returns for the bidders in the post-announcement period. Also, they do not find significantly negative returns immediately before its public announcement; in contrast they find significantly negative abnormal returns for the target banks for a particular window. The results indicate that there is evidence of speculation on target banks being acquired. Ritu Basu et al. (2004), in one of IMF working paper, examine the effects of bank consolidation on performance between December 1995 and December 2000 using a large panel of more than 100 banks from Argentina. The results show a positive and significant effect of bank consolidation on performance as bank returns increase with consolidation and insolvency risk is reduced. Somoye (2008) analyzes published audited accounts of 20 out of 25 banks in Nigeria that emerged from the consolidation exercise. They find that consolidation process has not improved the overall performances of bank significantly. Dymski (2002) reconsiders causes and implications of the global bank merger wave, especially for developing economies. This paper argues that bank mergers are not efficiency driven; instead this merger wave has arisen because of macro structural circumstances and because of shifts over time in bank's strategic motives. Anand and Singh (2008) analyze five mergers in the Indian banking sector during the period from 1999 to 2005 to study the returns to shareholders as a result of merger announcement using event study methodology. The results indicated that merger announcement in the Indian banking industry have positive and significant shareholder wealth affect both for bidder and target banks. Jayadev and Sensarma (2010) examine some critical issues of consolidation in Indian banking with particular emphasis on views of two important stakeholders i.e. shareholders and managers. Kumar et al. (2011) examine the impact of M&A announcement on Indian bank stock returns and observe that in case of forced mergers, neither the bidder nor the target shareholders have benefited but in case of voluntary mergers, the bidder banks shareholders have gained more than those of target banks. Sharma & Warne (2012) study the impact of merger with reference to successful movement of merger between two banks and observe that acquirer loses market price when announcement come into market and, on the other hand, the target gains with the announcement news. Goyal & Joshi (2012) examine the growth of a bank through M&A's and suggest that mergers have the potential to create severe personnel trauma and stress which can result in psychological, behavioral, health and performance problems for both individuals and companies involved. Khan (2011) compares pre and post merger financial performance of merged banks with the help of financial parameters like gross profit mar-

gin, net profit margin, operating profit margin etc. The results of the study indicate that their performance has been positively impacted by M&A's and suggest that merged banks can obtain efficiency and gains through M&A's and pass the benefit to equity shareholders in the form of dividend. Kemal (2011) uses 20 vital accounting ratios to analyze the financial performance of Royal Bank of Scotland (RBS) in Pakistan after merger. The results do not suggest any post-announcement improvement in the financial performance of RBS in areas of profitability, liquidity, assets management, leverage and cash flows.

Thus, prior studies in the area have focused primarily on banks mergers in developed markets and have based their conclusions mainly on stock returns. The impact on shareholders wealth cannot be gauged only on the basis of stock returns, ignoring other stock characteristics such as volatility and liquidity. This paper makes a modest attempt to fill this gap.

2. Data and methodology

During the period of study, 22 bank mergers took place. Not all of the acquirer banks were listed in the stock exchange at the time of merger; therefore, share price data was not available in case of unlisted banks. The data regarding share prices and other financial information for profiling the sample banks were available only for 13 banks, which form the sample of this study.

2.1. Impact on stock returns. Event study methodology was used to examine the impact of merger announcement on stock returns. Both daily and weekly share price data were used as many shareholders did not react on daily basis to the changes in market expectations. It is may be the traders and not the shareholders for whom daily share price returns may actually matter in such announcements. Therefore, weekly returns were also computed to analyze if they result in any significant returns to the shareholders.

The daily share price data was collected for 160 days prior to the date of announcement and 40 days after the date of announcement. Likewise, the weekly share price data was collected for 130 weeks before the announcement date and 26 weeks after the announcement date.

For each security j , the following stochastic process model is used to calculate abnormal return:

$$AR_{jt} = R_{jt} - (\alpha + \beta * Rm_t),$$

where, AR_{jt} is the abnormal return for bank stock j at time t ; R_{jt} is the actual return for bank stock j at time t ; α is the ordinary least square (OLS) estimate of the intercept of the market model regression; β is the ordinary least square (OLS) estimate of the slope of the coefficient in the market model regression; Rm_t

is the Return to the market at time t as approximated by the BSE sensex.

The abnormal returns were then calculated to find cumulative abnormal return (CAR). Daily pre-event CAR (CAR_i -41 to -1 days) and post-event CAR (CAR_j 0 to 40 days) were calculated. Similarly, weekly pre-event CAR (CAR_i -26 to -1 week) and post-event CAR (CAR_j 0 to 26 weeks) were calculated. They were further tested for significance at the 5% level by calculating standardized cumulative abnormal return (SCAR) for both pre-event ($SCAR_i$) and post-event ($SCAR_j$) each where:

$$SCAR_i = CAR_i / \text{Standard error of } CAR_i,$$

$$SCAR_j = CAR_j / \text{Standard error of } CAR_j.$$

It is the post-event SCAR ($SCAR_j$) of the bidder banks, which is then analyzed to ascertain if bank mergers have resulted in any significant abnormal returns to the shareholders of the bidder banks.

2.2. Impact on volatility in stock prices. In order to measure the impact on volatility, daily share price data were used. Standard deviation was used to estimate the volatility in stock returns. Pre-event volatility is estimated by calculating standard deviations of returns from -160 days to -41 days and is termed as σ_i . Post-event volatility is estimated by calculating standard deviations of returns from +41 days to +160 days and is termed as σ_j . The ratio (Pre-event / Post-event or Post-event/Pre-event) of volatility was tested at the 5% level of significance.

2.3. Impact on stock liquidity. Liquidity means the degree to which an asset or security can be bought or sold in the market without affecting its price. Liquidity is characterized by high level of trading activity. Thus, it has been estimated by first calculating natural log of the daily trading volumes. Pre-event and post-event means were then calculated and their difference was divided by the standard error to ascertain the change in liquidity. Pre-event liquidity has been calculated from -160 to -41 days and is termed as μ_i . Post-event liquidity has been calculated from +41 days to +160 days and is termed as μ_j . The results were tested at the 5% level of significance.

2.4. Merger announcement and stock returns. Normally, the impact of M&A announcement should be noticeable only after the announcement has been made i.e. post-announcement period. However, few of the studies in developed economies have also examined the impact of M&A announcement in the pre-announcement period (Cornett, 2006; Campa and Hernando, 2001), but in case of emerging economies, none of the studies seems to have examined the impact of M&A announcement in the pre-announcement period. But, in view of the possibili-

ty of leakage of information or spread of rumors regarding the possible merger, it was considered desirable to examine the movement of share prices immediately before the announcement of merger. The leakage of information is all the more likely in countries where the mergers are facilitated by regulator/policy makers and because of this, the merger takes place after due consultation with such authorities. Therefore, the impact of merger announcement has been examined for post-announcement period as well as pre-announcement period.

2.5. Impact on stock returns during post-announcement period. The impact of M&A announcement was examined both on daily and weekly stock returns as most of the shareholders do not react on daily basis to the market expectation. Kumar et al. (2011) have already examined this issue in detail, for the Indian banking sector. The results of daily data were different from that suggested by weekly data and were mixed so that they do not help us in conclusively ascertaining whether the impact was insignificant, significantly positive or significantly negative. However, from the perspective of a long-term investor, the news is not very good as the probability of positive returns declines as we shift from daily returns to weekly returns.

Since, the results were mixed; an attempt was made to identify some of the bank characteristics that could influence $SCAR_j$. The results indicate that no specific pattern of bank characteristics like type of the merger, size gap ratio of the banks, level of NPA's and financial health of the banks can be identified as being associated with significantly positive or negative impact of merger announcement.

2.6. Impact on stock returns during pre-announcement period. Ordinarily, one would expect absence of any abnormal returns prior to the announcement of merger but the results of some of the studies in the developed countries show significant abnormal returns in the Pre-announcement period (Cornett, 2006; Campa and Hernando, 2001). Thus, it is quite possible with the kind of market conditions in India, that some information (incomplete and unreliable) may be leaked prior to the formal announcement of merger. This is particularly true in case of facilitated mergers because the proposal has to pass through various channels before it is finalized for announcement and implementation. In order to examine whether there is significant impact of such potential leakages of information on the share prices, the daily and weekly $SCAR_i$ is calculated for pre-announcement period. The results showed by Kumar et al. (2011) indicate that market had started building some expectations about the merger much before the announcement has been made public. This is an issue of real concern for the

policy makers as it indicates the role of insiders in the market and possibility of information leakage in the market much before the announcement of a proposed merger has been made public.

2.7. Relationship between $SCAR_i$ and $SCAR_j$. $SCAR_i$ being significant in some of the mergers does indicate the possibility of leakage or rumor in the market. The impact of leakage or rumor on the post-announcement period return has not been explicitly examined by any of the studies in the developed economies as the issue may not be of so much relevance in those economies, but in case of emerging economies, where the mergers are not necessarily market driven, it may be interesting to examine if there is any relationship between pre-announcement period return and post-announcement period return. Generally, one would expect the impact of merger announcement to be less significant in case there has already been a significant impact on share prices during the pre-announcement period and the information during post-announcement period is not significantly different from the one leaked during the pre-announcement period. Therefore, it may be interesting to examine the relationship between pre-merger $SCAR$ and post-merger $SCAR$. Kumar et al. (2011) reveal that significant $SCAR_i$ reflects more the leakage of information than the presence of rumor.

Interestingly, all the mergers during the period 1999-2003, had positive impact on the share prices as their $SCAR_j$ were significantly positive. However, in the case of mergers during the period of 2004-2008, only one out of nine had significant positive impact on the share prices while four mergers had significant negative impact for the rest of the mergers. This would indicate that general economic and industry specific conditions may play a significant role in determining the impact of merger announcement on share prices.

In a way, the context in which the study has been conducted may significantly influence the results of the study of this kind. This supports the contention that findings may be inherent for mergers in developed and developing economies. However, returns cannot be studied in isolation, it is important to study them along with volatility and liquidity, which also influence value for shareholder's wealth.

2.8. Merger announcement and volatility. Merger announcement may have medium to long-term implications for the volatility in the stock prices. Theoretically, any reduction in volatility of share prices would mean value creation for the shareholders and increase in volatility would adversely influence shareholders' wealth. The volatility is expected to increase close to the merger announcement and thus may not be a matter of great concern for the shareholders. One would, generally, expect the volatility to come down as the market absorbs the information. Thus, the changes in volatility were examined by excluding the period close to M&A announcement. Thus, comparisons were made between the volatility in share prices before and after the merger announcement excluding the -40 to +40 day period. For the purpose of examining the impact of merger announcement on volatility, analysis has been restricted to daily returns only as daily share prices were considered more relevant for examining the changes in volatility. Table 1 shows pre-event (σ_i) and post-event volatility (σ_j). The ratio between σ_i and σ_j were computed for the purposes of comparison.

For discovering changes in standard deviation of daily returns, we use the F test for equality of variances, at the 5% significance level.

$$F = (\sigma_i)/(\sigma_j) \text{ or } (\sigma_j)/(\sigma_i).$$

Table 1. Pre-event (σ_i) and post-event (σ_j) volatility

Name of the bidder bank (target)	Pre-eventvolatility (σ_i)	Post-eventvolatility (σ_j)	$(\sigma_i)/(\sigma_j)$	$(\sigma_j)/(\sigma_i)$
Indian Overseas Bank (Bharat Overseas Bank)	0.022	0.039		1.71*
Bank of Baroda (Banaras State Bank)	0.024	0.023	1.03	
Bank of Baroda (South Gujarat Bank)	0.033	0.026	1.26	
HDFC Bank (Centurion Bank of Punjab)	0.027	0.038		1.405
Centurion Bank of Punjab (Bank of Punjab)	0.038	0.024	1.57*	
Centurion Bank (Lord Krishna Bank)	0.030	0.024	1.23	
Oriental Bank of Commerce (Global Trust Bank)	0.048	0.023	2.07*	
ICICI Bank (Sangli Bank)	0.024	0.021	1.16	
Federal Bank (Ganesh Bank of Kurundwad)	0.024	0.033		1.37
Punjab National Bank (Nedungadi Bank)	0.027	0.048		1.76*
ICICI Bank (Bank of Madura)	0.036	0.043		1.19
HDFC Bank (Times Bank)	0.031	0.037		1.18
IDBI Bank (United Western Bank)	0.036	0.035	1.01	

Note: Significant at the 5% level.

As can be observed from the above table, in majority of the cases (nine out of thirteen), no significant change was noticed in the degree of volatility. Thus,

it may be concluded that merger announcement have not significantly impacted the volatility of share prices in case of bank mergers in case of In-

dia. The four acquirer banks which show a significant change are Centurion Bank of Punjab, Indian Overseas Bank, Oriental Bank of Commerce and Punjab National Bank.

Normally, it is assumed in the market that if there are to be any fluctuations in the stock due to the happening of a certain event, then that takes place in the pre-announcement period rather than post-announcement. This is due to the fact that whatever uncertainty or non-disclosure of information about the event is there, it is there before the event and it normally dies out or settles down after the happening of the event. Hence, pre-event volatility should be greater than the post-event volatility. However, it was observed that, in the four cases where the impact on volatility was significant, increase in volatility was noticed in two cases whereas the remaining two cases showed significant decline in volatility of share prices.

2.9. Merger announcement and liquidity. M&A announcement may also increase the volume of trading activity in the share of the acquiring bank. This may result in increased liquidity of the stock, which may be considered valued addition for the stock. In order to examine the impact of M&A announcement on liquidity of the stock, mean trading volumes, in terms of number of shares traded before and after the announcement, were compared. Since, changes in the volume are natural near the date of announcement, it was decided to exclude the period -40 to +40 and the mean trading volumes were compared for the periods before the announcement and after the announcement. Table 2 shows the mean trading volumes during the pre-event (-41 to -160 days) and post-event (+41 to +160 days). It also shows the standard error and the *t*-value. For evaluating the significance of change in trading volume, we use the *t*-test, equal variances, at the 5% significance level.

Table 2. Pre-event (μ_i) and post-event (μ_j) liquidity

Name of the bidder bank (target)	Pre-event liquidity (μ_i)	Post-event Liquidity (μ_j)	Standard error	<i>t</i> value
Indian Overseas Bank (Bharat Overseas Bank)	12.177	11.21	1.26	0.76
Bank of Baroda (Banaras State Bank)	9.995	10.361	1.83	-0.199
Bank of Baroda (South Gujarat Bank)	13.32	12.46	0.85	1.01
HDFC Bank (Centurion Bank of Punjab)	11.133	12.20	1.11	-0.96
Centurion Bank of Punjab (Bank of Punjab)	14.33	13.62	1.41	0.505
Centurion Bank (Lord Krishna Bank)	13.22	12.12	1.11	0.71
Oriental Bank of Commerce (Global Trust Bank)	12.925	12.01	0.99	0.91
ICICI Bank (Sangli Bank)	12.37	12.65	0.98	-0.28
Federal Bank (Ganesh Bank of Kurundwad)	11.20	10.66	1.71	0.31
Punjab National Bank (Nedungadi Bank)	11.24	13.93	1.54	1.73
ICICI Bank (Bank of Madura)	11.42	11.86	1.17	-0.38
HDFC Bank (Times Bank)	11.75	11.86	1.00	-0.11
IDBI Bank (United Western Bank)	13.63	14.04	1.2	-0.36

As in each case, the *t*-value was less than 1.96, it may be concluded that none of the banks show any significant change in the liquidity. This would imply that there was no significant impact of merger announcement on liquidity of the shares of the bidder banks.

Conclusions

Thus, to sum up, there are five mergers (more than 40% of cases) where daily data shows results different from that suggested by weekly data. Therefore, this implies that the result could be influenced by the fact whether the stock price data was taken on daily basis or weekly basis. Also, the merger announcement had a mixed impact on the returns to the shareholders of the bidder banks. In case of daily returns, five banks had significantly positive returns to the shareholders; four banks had significantly negative

returns and four banks showed no significant results. However, in case of weekly returns, three banks had significantly positive returns, four banks had significantly negative returns and four banks had no significant returns. Further, none of the bank characteristics such as the type of merger, size gap ratio of bidder and target banks, NPA's of the target banks and the financial health of the target bank were found to be influencing the impact of merger announcement on share prices. Interestingly, greater proportion of bank mergers during the period of 1999-2003 exhibited significant abnormal returns as compared to the bank mergers which took place after 2003. As far as other stock characteristics are concerned, there was limited impact of merger announcement on volatility in prices of the bidder banks. There was no significant impact of merger announcement on liquidity of the shares of bidder banks.

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