RESEARCH

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Impact of Merger Announcements on Shareholders' Wealth: Evidence from Indian Private Sector Banks

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Executive Summary

This study analyses five mergers in the Indian banking sector to capture the returns to shareholders as a result of the merger announcements using the event study methodology (Brown and Warner, 1980, 1985; and MacKinlay, 1997). These are mergers of the Times Bank with the HDFC Bank, the Bank of Madura with the ICICI Bank, the ICICI Ltd. with the ICICI Bank, the Global Trust Bank with the Oriental Bank of Commerce, and the Bank of Punjab with the Centurion Bank. The Fama and Miller (1972) market model and Cox and Portes' (1998) two-factor model form the theoretical framework of this study. The aim is to understand the shareholder wealth effects of bank mergers.

- Using the single-factor model, the study finds that the average cumulative abnormal return (CAR) of the bidder banks is positive and substantial. These results are also statistically significant. Thus, the bidder banks got significant positive abnormal returns.
- The two-factor model results reveal that the merger announcement in the Indian private sector banks generated a positive and statistically significant CAR of 5.24 per cent, 7.83 per cent, and 8.59 per cent in a one-day, two-day, and three-day run-up window respectively to the shareholders of the bidder banks.
- The single-factor model finds that the combined CAR for all the target banks is positive, significant, and substantial. The combined CAR has been propped up due to very high CAR registered by the Bank of Madura.
- The bidder banks created a wealth of Rs 4,117.98 million in a one-day window (single-factor model) as a result of the merger announcements.
- In the case of target banks, the shareholders of the Global Trust Bank and the Bank of Punjab appear to be the losers; they lost Rs 382.55 million in a one-day run-up window (single-factor model) and Rs 128.74 million in a one-day window (single-factor model) respectively.
- The Oriental Bank of Commerce and the Global Trust Bank combined lost 14.78 per cent in value on a weighted average basis in a 11-day period (-5, 5) window. This merger was the first major move to bail out a sick bank.

The merger announcements in the Indian banking industry have positive and significant shareholder wealth effect both for bidder and target banks. The market value weighted CAR of the combined bank portfolio as a result of merger announcement is 4.29 per cent in a three-day period (-1, 1) window and 9.71 per cent in a 11-day period (-5, 5) event window.

KEY WORDS

Merger Announcements

Indian Banking Sector

Shareholder Wealth Effects

Cumulative Abnormal Returns

Single Factor Model

Two Factor Model

The issue of possible effects of merger announcements on the firm value has been extensively researched in financial economics and strategic management in the US and the European settings. The theories based on synergy and efficiency argue in favour of mergers and consolidation whereas theories based on agency cost, free cash flow conflict, and managerial incentive vote against mergers on the ground that wealth is destroyed. Roll (1986), based on hubris hypothesis, suggests that in merger and acquisition transactions, wealth migration takes place from the bidder bank shareholders to the target bank shareholders and no wealth is created in the process.

The research studies in the US find positive average abnormal returns to the target bank shareholders[1] and mixed evidence with respect to returns to the bidder banks. A large number of studies find negative average abnormal returns[2] and positive abnormal returns to bidding bank shareholders[3].

Cybo-Ottone and Murgia's (2000) event study analysis of 54 mergers and acquisitions deals covering 13 European banking markets of the European Union and the Swiss market for the period 1988 to 1997 find positive and significant increase in the shareholder value of bidder and target banks at the time of the deal's announcement. Ismail and Davidson's (2005) examination of 102 merger announcements in the European financial services industry between 1987 and 1999 finds positive returns for target bank shareholders in different event windows.

Penas and Unal (2004) find positive and significant adjusted returns of merging banks' bonds across pre-merger and announcement months due to diversification gains and gains associated with too-big-to-fail status whereas Houston, James and Ryngaert (2001), in their study of 64 large bank acquisitions announced during the period 1985-1996, find negative and significant cumulative abnormal return of 3.47 per cent to bidder banks in a 4-day run-up window to the day of announcement. The abnormal returns to target banks are 20.8 per cent and significant too.

DeLong (2001 and 2003) found that the non-US domestic bank mergers differ quantitatively from the US domestic bank mergers in that non-US bidders earn more and the non-US targets earn less than their US counterparts.

The Indian banking sector reforms, initiated post-1991, allowed diversification of ownership through private equity participation in the public sector banks to enhance efficiency and productivity through competition. As a result, the share of public sector banks in the aggregate assets of the Indian banking sector reduced from 90 per cent in 1991 to 75 per cent in 2004. Twelve new private sector banks have been set up and foreign investment in private sector banks has been allowed up to 74 per cent since 1993. Consolidation in the banking sector with the merger of development financial institutions (DFIs) with their own commercial banking subsidiary or *vice versa* is a step towards universal banking.

Pandey (2001) has examined the issue of takeover announcements, open offer and its impact on shareholder value in the Indian corporate sector. Kumar and Rajib (2007) identify the characteristics of merging firms in India based on their study of 227 acquirer and 215 target firms during the period 1993-2004.

But no study on mergers' impact on shareholders' value appears to have been done in the Indian banking sector. An attempt has been made in this paper to analyse the impact of merger announcements of the Indian private sector banks on the shareholders' wealth of the bidder and target banks. For this purpose, five mergers in the Indian private sector banks during the post-liberalization period from 1999 to 2005 have been studied.

RESEARCH DESIGN

Sample Selection

Event study analysis has been done for each of the banks involved in the following five merger announcements in the Indian private sector banks: the Times Bank with the HDFC Bank (1999), the Bank of Madura with the ICICI Bank (2000), the ICICI Ltd with the ICICI Bank (2001), the Global Trust Bank (GTB) with the Oriental Bank of Commerce (OBC) (2004), and the Bank of Punjab (BOP) with the Centurion Bank (2005). The merger of the Times Bank with the HDFC Bank was the first market-driven merger in the Indian private sector banking history. The merger of the Bank of Madura and sub-

[1] See for example, Baradwaj, Fraser and Furtado (1990); Cornett and De (1991); Cornett and Tehranian (1992); Zhang (1995); Siems (1996); Houston et al. *(2001)* and Scholtens and Wit (2004).

[2] See for example, Trifts and Scanlon (1987); Hannan and Wolken (1989); Hawawini and Swary (1990); Houston and Ryngaert (1994); Siems (1996); and Houston, *et. al*. (2001).

[3] See for example, Desai and Stover (1985); Pettway and Trifts (1985); James and Wier (1987); Cornett and De (1991); and Scholtens and Wit (2004).

sequently of the ICICI Ltd. with the ICICI Bank resulted in the first universal bank in India. The merger of the Global Trust Bank with the Oriental Bank of Commerce was the first major move to bail out a sick bank. The merger of the Bank of Punjab with the Centurion Bank is a modest attempt towards consolidation in the Indian banking sector. The merger announcement of the IDBI Bank with the IDBI on January 20, 2005 has not been included in the sample on the ground that banking subsidiary has got merged with the DFI and the bank as an entity has lost its existence.

The profile of the bidder and target banks in terms of size, profitability, and risk is as in Tables 1A and 1B respectively.

The profile of the bidder and target banks and the size of mergers indicate that the bidder banks are larger than the target banks except in the case of reverse merger of the ICICI Ltd with the ICICI Bank.

Hypotheses of the Study

The value of taking over an ongoing target bank to a bidder bank is the present value of the target's earnings and the discounted growth opportunities that the target bank has (Miller and Modigliani, 1961). As long as the expected rate of return on the growth opportunities is greater than the opportunity cost of capital, the merged banking entity creates shareholder value and the bank merger should be undertaken. However, when the expected rate of return on these growth opportunities is less than the cost of capital, the merged banking entity destroys shareholder value and the merger should not happen.

The sources of the potential value creation are economies of scale and scope (Bradley, Desai and Kim 1983, 1988); combination of complementary resource, generation of efficiency improvements, and increased competitiveness (Coase, 1937); gaining fast access to new technologies or new markets, benefiting from economies of scale in research and/or production, tapping into the sources of knowhow located outside the boundaries of the firm, and finally, monopoly type advantages (Jensen and Ruback, 1983; Mandelkar, 1974; Freedman, 1989; and Porter, 1987); and corporate control (Manne, 1965; and Alchian and Demsetz, 1972).

Coase (1937) argues that mergers increase firm value as the developments in technology lead to increase in firm size due to mergers and acquisitions (M&A) and further reduces the transaction cost. Bradley, Desai and Kim (1983, 1988) found that mergers create synergies through economies of scale, effective management, improved production techniques, and the combination of complementary resources. It supports the hypothesis that M&A facilitate synergies between the merged organizations, generate efficiency improvements, and in-

Table 1A: Profile of Bidder Banks
(For the financial year ending before the merger announcement)

	HDFC Bank	ICICI Bank (BOM)	ICICI Bank (ICICI)	Oriental Bank of Commerce	Centurion Bank
Financial Year Ending	**31/03/1999**	**31/03/2000**	**31/03/2001**	**31/03/2004**	**31/03/2005**
Capital adequacy ratio (%)	11.9	19.64	11.57	14.47	21.42
Fund-based income as a % of operating income	90.53	93.43	90.13	97.1	85.61
Fee-based income as a % of operating income	9.46	6.56	9.86	2.89	14.38
Yield on fund advances (%)	10.22	9.51	8.11	8.08	12.22
Break-even yield ratio (%)	16.36	18.23	11.91	9.37	7.66
Cost of funds ratio (%)	6.55	6.43	4.81	5.07	4.7
Net profit margin (%)	18.55	10.05	11.01	17.03	5.96
Adjusted return on net worth (%)	24.31	9.17	12.5	26.22	4.06
Owners funds (Rs in million)	3,389.3	11,495.1	12,890.8	26,768	4,686.5
Advances (Rs in million)	14,005.6	36,573.4	70,314.6	196,807.6	21,939.5
Market value of Equity before the date of announcement (Rs in million)	18,400	29,798.4	21,617.2	51,446.6	15875.6

Source: www.insight.asiancerc.com database and CMIE PROWESS database.

Table 1B: Profile of Target Banks
(For the financial year ending before the merger announcement)

	Times Bank	Bank of Madura	ICICI Ltd	Global Trust Bank	Bank of Punjab
Financial Year Ending	**31/03/1999**	**31/03/2000**	**31/03/2001**	**31/03/2004**	**31/03/2005**
Capital adequacy ratio (%)	9.97	15.83	n.a.	0	9.23
Fund-based income as a % of operating income	92.84	92.06	n.a.	93.77	87.22
Fee-based income as a % of operating income	7.16	7.93	n.a.	6.22	12.77
Yield on fund advances (%)	n.a.	11.11	n.a.	9.79	8.27
Break-even yield ratio (%)	n.a.	15.97	n.a.	15.79	8.01
Cost of funds ratio (%)	8	6.97	n.a.	7.44	4.48
Net profit margin (%)	7.4	9.72	5.77	-37.29	-15.94
Adjusted return on net worth (%)	15.56	21.11	17.43	-101.84	-25.31
Owners funds (Rs in million)	1,687.8	2,157.1	79,727	2,675.2	2,411.9
Advances (Rs in million)	8,869.6	16,654.2	568,373	32,761.1	24,169.9
Market value of equity before the date of announcement (Rs in million)	2470.5	1434.8	45,589.3	1279.10	3507

Source: www.insight.asiancerc.com database and CMIE PROWESS database.

crease competitiveness. By increasing economies of scale and spreading costs over a larger customer base, mergers enable banks to provide services at lower prices.

Jensen and Ruback (1983) conclude that "corporate takeovers generate positive gains, that target firm shareholders benefit, and that bidding firm shareholders do not lose."

Mandelkar (1974) argues that finance theory suggests employment of a capital budgeting model in M&A deal evaluation. The maximization of shareholder value drives the M&A activity not only in the domestic market but also globally.

Finance theory implies that M&A occur in the hope of positive synergistic effects (Porter, 1987). Empirically, many managers have citied synergy arguments in order to justify their actions. The reasons offered are gaining fast access to new technologies or new markets, benefiting from economies of scale in research and/or production, tapping into the sources of knowhow located outside the boundaries of the firm, and finally, monopoly type advantages.

Lubatkin (1983 and 1987) lists the motivations behind the mergers in the following seven areas:

- ***Monopoly Theory:*** Gaining market power.
- ***Efficiency Theory:*** Operating synergies, financial synergies, and management synergies.
- ***Valuation Theory:*** Bidder managers have better information about the target's financial performance than the stock market.
- ***Empire Building Theory:*** Planned and executed by managers who maximize their own utility instead of their shareholders' value.
- ***Process Theory:*** Managers have only limited information and base decisions on imperfect information.
- ***Raider Theory:*** Managers create wealth transfers from the stockholders of the companies they bid for.
- ***Disturbance Theory:*** Merger waves are caused by economic disturbances.

Manne (1965) and Alchian and Demsetz (1972) gave the argument of corporate control for surge in the M&A activity. The takeover market facilitates competition in the market. Any underperforming firm is a potential takeover target and thus a management team can use an acquisition to improve the performance of acquired firms' assets.

The managers make investment decisions in such a manner that they increase corporate wealth rather than the shareholders' wealth (Shleifer and Vishny, 1989). In their model, managers are hesitant to pay out cash to the shareholders either through increased dividends or through share repurchase route. Investments made by the managers can be in the form of acquisitions in which the managers overpay.

Berger (1998) advances value-maximizing managerial ego, mimicry, the need to reduce uncertainty and defensive considerations, and high levels of corporate reserves and share valuations among the motives behind consolidation in the banking sector. Empire-building is included among possible non-value-maximizing motives given that executive compensation tends to increase with firm size. Banking organizations may overpay for acquisitions when corporate governance structures are insufficient to align managerial incentives with those of the owners; what is more, management teams with large ownership stakes often block outside acquisitions.

Roll (1986) suggests a theory based on managerial hubris. In such a scenario, managers are prone to excessive self-confidence. The manager who has the most optimistic forecast of another firm's value falls prey to the winner's curse in a bidding competition. Their argument is that from deal to deal, rational CEOs become more aggressive in the bidding process. They concede increasing fractions of expected synergies to the target shareholders in order to win the bidding game. In a recent study, Malmendier and Tate (2004) explore, both theoretically and empirically, the CEO overconfidence hypothesis. Table 2 lists the different hypotheses of merger announcements.

Based on the above research findings, the present study intends to test the following hypothesis:

Ho: The merger announcement does not create shareholder value either for the bidder bank or for the target bank.

Analytical Tools Used

The event study methodology (Brown and Warner, 1980 and 1985; Pruitt and Peterson, 1986; Etebari, Horrigan and Landwehr, 1987; MacKinlay, 1997; and McWilliams and Siegel, 1997) has been used to estimate cumulative average abnormal returns (CAR) in a 1-day, 2-day, 5-day, 10-day, 15-day, 20-day, and 40-day window period. The basis for event study analysis is the semi-strong version of the efficient market hypothesis (EMH). It assumes that all publicly available information is incorporated in the stock prices immediately on announcement.

Cox and Portes (1998) observed that by attributing the otherwise unexplainable changes in stock prices to specific new information, the event study analysis allows that new information to be "valued." Valuations produced by this method are based upon information that is freely available.

The event study methodology has been extensively used (Table 3) to assess the impact of an announcement of a particular strategy on the firms' stock prices. This analytical approach is well accepted and has been used widely in various disciplines such as finance, accounting, marketing, strategy, e-commerce, and law.

The methodology has also been applied to assess

Table 2: Merger Hypotheses[4]

Hypotheses	Impact on Shareholders' Wealth of Acquiring Banks at Merger Announcement	Impact on Shareholders' Wealth of Target Banks at Merger Announcement	Studies
Manager-utility-maximization	Reduce	Increase	Amihud and Lev (1981); Born, Eisenbeis and Harris (1988); Sushka and Bendeck (1988); and Siems (1996).
Hubris	Reduce	Increase	Roll (1986); Bradley, Desai, and Kim (1988); and Siems (1996).
Synergy	Increase	Increase	Jensen and Ruback (1983); Bradley, Desai and Kim (1988); Hawawini and Swary (1990); Siems (1996); and Penas and Unal (2004).
Diversification	Increase	Increase	Jensen and Meckling (1976) Amihud, Dodd and Weinstein (1986) Saunders, Strock and Travlos (1990), Siems (1996), and Penas and Unal (2004)
Market power	Increase	Increase	Eckbo (1983); Stillman (1983); Boyd and Graham (1991); and Siems (1996).

[4] **Source:** Siems (1996).

Table 3: Applications of Event Study Methodology[5]

Study	*N*	Event	Model (Clean Period)	Total Days for the Model	Window	Total Days for the Window
Mathur, Mathur, and Rangan (1997)	5	Celebrity endorser announcements	-55 to +5	60	Multiple: including -2 to 2	Multiple 5
Madhavan and Prescott (1995)	136	Joint ventures	-60 to -15	45	Multiple: including -2 to 0	Multiple 3
Worrel, Davidson III and Glascock (1993)	26	Departures and appointments of key executives attributable to firings	-30 to 30	60	-1 to 0	2
Nayyar (1993)	163	Related diversification of service firms	Not available	Not available	-1 to 1	3
Das, Sen, and Sengupta (1998)	119	Strategic alliances	-210 to -11	200	0 to +1	2
Koh and Venkatraman (1991)	239	Joint ventures	-270 to -71	200	-1 to 0	2
Woolridge and Snow (1990)	767	Strategic investment decisions	Not available	Not available	-1 to 0	2
Nayyar (1995)	324	Customer service change announcements	-270 to -91	180	-1 to +1	3
Lane and Jacobson (1995)	89	Brand extension announcements	-320 to -60	260	0 to 1	2
Kelm, Narayanan, and Pinches (1995)	501	R&D innovations and commercialization stages	-120 to -21	100	-1 to 1	3
Agrawal and Kamakura (1995)	110	Celebrity endorser announcements	-244 to -6	239	-1 to 0	2

the impact of some marketing and advertising related events such as brand extension announcements (Lane and Jacobson, 1995; Mortanges and Tourani, 1998), celebrity endorser announcements (Agrawal and Kamakura, 1995; Mathur, Mathur and Rangan 1997), announcements of R&D innovation and commercialization stages (Kelm, Narayanan and Pinches, 1995), announcement of green marketing strategies (Mathur and Mathur, 2000), and customer service change announcements (Nayyar, 1995). Moreover, the methodology has also been used to assess the impact of some business strategies such as related diversification of service firms (Nayyar, 1993), strategic investment decisions (Woolridge and Snow, 1990; Mitchell and Stafford, 2000), joint ventures (Koh and Venkatraman, 1991; Madhavan and Prescott, 1995), strategic alliances (Das, Sen and Sengupta, 1998), voluntary spin-offs (Miles and Rosenfeld, 1983), international cross-listing (Miller, 1999), and takeovers (Rau and Vermaelen, 1998).

The methodology has also been employed in assessing some managerial decisions such as departures and appointments of key executives attributable to firings (Worrell, Davidson and Glascock (1993). The event study methodology assesses whether specific events create abnormal stock returns. Abnormal stock returns are the differences between the observed returns and the estimated returns derived from either market model or mean adjusted return method or market adjusted return method. The market model method has been used extensively in the earlier researches (Brown and Warner, 1985; Campbell, Lo and MacKinlay, 1997; Peterson 1989).

Event Definition and Date of Announcement

For the purpose of this study, the first date of media announcement of the merger has been taken as the event date (day zero). Table 4 enumerates the date of an-

[5] Sangphet and Cavusgil (2001), "Stock Market Reactions to International Joint Venture Announcement: An Event Analysis," *International Business Review,* 10, 139-154.

nouncement of the mergers. The first possible date when the news of the merger was made public has been used. The same has been obtained from either the news clippings or the information available on the web sites of the respective banks.

Window Period and Clean Period Data

The event window has been taken from -40 days to the date of announcement to 40 days (except in the case of GTB, where the share price data subsequent to the date of the merger announcement is not available). The clean period data for the bidder banks has been taken as 120 days before and 120 days after the 40-day window period. Similarly, for the target banks, the share price data for 200 days before and 40 days after the 40-day window period (generally the share price data thereafter is not available) has been considered as the clean period data. The share price data and market index data, namely, S&P CNX 500[6] and CNX Bank Index (Bank Nifty)[7] have been taken from the official website of the National Stock Exchange of India Limited (http://www.nse-india.com).

Estimating CAR Using Single-factor (Market) Model

Fama, *et. al.*, (1969) market model assumes that all interrelationships among the returns on individual assets arise from a common market factor that affects the return on all assets. The expected returns on individual assets are generated by the following model[8]:

The daily residual returns (r_{jt}) are estimated for each bidder and target bank in a 40-day window under the single-factor market model as follows:

$$r_{jt} = R_{jt} - (\alpha + \beta * R_{mt}), \qquad (1)$$

where,

r_{jt} = Abnormal return for bank stock j at time t
R_{jt} = Actual return for bank stock j at time t
α = Ordinary least squares (OLS) estimate of the intercept of the market model regression
β = Ordinary least squares (OLS) estimate of the coefficient in the market model regression
R_{mt} = Return to the market (S&PCNX 500) at time t.

The daily average abnormal returns (AR_t) of merger announcement in a 40-day (-40, +40) window are estimated for bidder bank groups and target bank groups by taking arithmetic average of the residual returns (r_{jt}) of the respective banks in that group.

$$AR_t = \sum_{J} r_{jt} / N \qquad (2)$$

where

AR_t = Average abnormal returns of merger announcement
N = Number of firms in the bidder / target bank blocks (i.e., 5 each)

The cumulative average abnormal returns (CAR) of merger announcement in a 40-day (-40, +40) window are estimated for bidder bank groups and target bank groups by summation of the average abnormal returns (AR_t) in the respective window.

$$CAR = \sum_{t=-40}^{t=40} AR_t \qquad (3)$$

Table 4: Event Dates

Sl. No	Bidder Bank	Target Bank	Date of Announcement
1	HDFC Bank	Times Bank	Nov 26, 1999
2	ICICI Bank	Bank Of Madura	Dec 08, 2000
3	ICICI Bank	ICICI Ltd.	Oct 25, 2001
4	OBC	GTB	July 26, 2004
5	Centurion Bank	Bank of Punjab	June 20, 2005

[6] The S&P CNX 500 is India's first broad-based benchmark of the Indian capital market for comparing portfolio returns *vis-à-vis* market returns. The S&P CNX 500 represents about 96% of the total market capitalization and about 93% of the total turnover on the NSE.

[7] The CNX Bank Index (Bank Nifty) is an index comprised of the most liquid and large capitalized Indian Banking stocks. The index has 12 stocks from the banking sector which trade on the National Stock Exchange. The index is a market capitalization weighted index with base date of January 01, 2000, indexed to a base value of 1000. CNX Bank Index constituents represent about 9% of the total market capitalization as on March 31, 2005.

[8] Fama and Miller (1972), pp. 267-269.

where

CAR = Cumulative average abnormal returns of merger announcement

Estimating CAR Using Two-factor Model

Fama and Miller (1972) market model allows the expected returns to be the linear function of any number of independent, symmetric stable variables[9]. Cox and Portes (1998) considered S&P 500 and the FTSE-100 as the proxies for market index in their model to estimate the expected returns. Abnormal returns for the present study are estimated using two proxies of market portfolio, namely, S&P CNX 500 and Bank Nifty under the two-factor model:

$$r_{jt} = R_{jt} - (\alpha + \beta_1 * R_{mt} + \beta_2 * R_{(bm)t})^{10} \quad (4)$$

where

r_{jt} = Abnormal return for bank stock j at time t

R_{jt} = Actual return for bank stock j at time t

α = Ordinary least squares (OLS) estimate of the intercept of the market model regression

β_1 = Ordinary least squares (OLS) estimate of the coefficient of S&P CNX 500 in the two-factor market model regression

β_2 = Ordinary least squares (OLS) estimate of the coefficient of Bank Nifty in the two-factor market model regression

R_{mt} = Return on the market portfolio – Market index (S&P CNX 500) at time t

$R_{(bm)t}$ = Return on the market portfolio – Banking index (Bank Nifty) at time t.

The daily average abnormal returns (AR_t) of merger announcement in a 40-day (-40, +40) window are estimated for the bidder and target bank groups by taking arithmetic average of the residual returns (r_{jt}) of the respective banks in that group.

$$AR_t = \Sigma r_{jt} / N \quad (5)$$
$$J = 1$$

where

AR_t = Average abnormal returns of merger announcement

N = Number of firms in the bidder/target bank blocks (i.e., 5 each)

The cumulative average abnormal returns of merger announcement in a 40-day (-40, +40) window are estimated for the bidder and target bank groups by summation of the average abnormal returns (AR_t) in the respective window.

$$CAR = \Sigma_{t=-40}^{t=40} AR_t \quad (6)$$

where

CAR = Cumulative average abnormal returns of merger announcement

t-statistic of residual return : $\frac{r_{jt}}{\hat{S}(r_j)}$ (7)

where

$\hat{S}(r_j)$ is the standard deviation of residual of bank j for the clean period

t-statistic of average abnormal return: $\frac{AR_t}{\hat{S}(AR)}$ (8)

where

$\hat{S}(AR)$ is the standard deviation of average abnormal returns of bidder banks/ target banks during the clean period

t-statistic of CAR = $\frac{CAR}{\hat{S}(AR)\sqrt{t}}$ (9)

where

t = Respective window period.

Weighted Average Cumulative Abnormal Returns

To capture the market's reaction to the combined (bidder and target banks) value effects (perceived synergy of the proposed merger), weighted average cumulative abnormal returns are estimated in respect of each of the five merger announcements. The weights used are 30-day average market value of equity one month before the month in which the deal has been announced. The resultant equation is:

$$\text{Portfolio CAR} = (AR_{Bi} * ME_{Bi} + AR_{Ti} * ME_{Ti}) / (ME_{Bi} + ME_{Ti})$$

where ME_{Bi} and ME_{Ti} are 30-day average market value of equity one month before the month in which the deal has been announced; and AR_{Bi} and AR_{Ti} are residual of bidder bank and target bank respectively on day i. The

[9] p. 269

[10] Cox and Portes (1998).

weighted average portfolio CAR has been estimated using both single-factor and two-factor model[11].

Statistical Significance of Event Returns

The null hypothesis that there are no abnormal returns associated with the merger announcement needs to be statistically tested. The statistical significance of the daily residual returns of each bank (r_{jt}), daily average abnormal returns (AR_t) of bidder banks/target banks and cumulative abnormal return, has been examined using the *t*-statistic. If the estimated value of *t*-statistic is greater than 1.96 and less than 2.58, it is significant at 5 per cent level. If its value exceeds 2.58, it is significant at 1 per cent level. In the event of the *t*-statistic being significant, it implies that there are abnormal returns associated with the bank merger announcements in India.

The absolute wealth created as a result of the merger announcements for the shareholders of bidder and target banks has been estimated by multiplying the cumulative abnormal returns in the 1-day (-1, +1), 2-day (-2, +2), 5-day (-5, +5), 10-day (-10, +10), 15-day (-15, +15) and 40-day (-40, +40) window with the market capitalization on a day preceding the commencement of the respective window period.

RESULTS OF THE STUDY

The results of the event study using market model with respect to bank merger announcements are as under:

CAR Using Single-factor Model

In the following section, the summary statistics, residual returns, average abnormal returns, and the cumulative abnormal returns using the single-factor model are reported.

Summary Statistics

The summary statistics provides the details of regression results for estimating the expected return during the window period. Tables 5A and 5B list the summary statistics of bidder banks and target banks respectively.

CAR Estimates during the Window Period

The estimates of cumulative abnormal returns of the bidder and target banks in the different windows are reported in Tables 6A and 6B respectively.

The estimates of cumulative abnormal returns of the bidder and target banks in the different run-up windows are as in Tables 7A and 7B respectively.

Table 5A: Summary Statistics-Bidder Banks

		Coefficients	Std. Error	*t*	Sig.
HDFC Bank	α	0.0028	0.0027	1.0370	0.3013
	β	0.5121	0.1168	4.3842	0.0000
ICICI Bank (BOM)	α	-0.0026	0.0034	-0.7525	0.4529
	β	0.5917	0.1512	3.9124	0.0001
ICICI Bank (ICICI Ltd.)	α	0.0000	0.0022	0.0000	1.0000
	β	1.0259	0.1841	5.5720	0.0000
Oriental Bank of Commerce	α	0.0013	0.0020	0.6890	0.4920
	β	1.9050	0.0930	20.5270	0.0000
Centurion Bank	α	-0.0024	0.0037	-0.6465	0.5199
	β	1.2486	0.3123	3.9978	0.0001

	HDFC Bank	ICICI Bank (BOM)	ICICI Bank (ICICI)	OBC	Centurion
Std. Deviation	0.0363	0.0445	0.0297	0.0446	0.0355
Variance	0.0013	0.0020	0.0009	0.0020	0.0013
R Square	0.1091	0.0888	0.1651	0.7290	0.1719
Adjusted *R* square	0.1034	0.0830	0.1598	0.7270	0.1611

[11] The market value weighted portfolio CAR of four merger deals using two-factor model is not significant in different event windows. HDFC Bank and Times Bank merger does not form a part of the sample because Bank Nifty index data is not available during that period. Hence, these results have been omitted in order to conserve space.

Table 5B: Summary Statistics-Target Banks

		Coefficients	Std. Error	*t*	Sig.
Times Bank	α	0.0020	0.0092	0.2152	0.8310
	β	0.0651	0.4261	0.1528	0.8795
Bank of Madura	α	-0.0014	0.0022	-0.6254	0.5330
	β	0.4753	0.0884	5.3745	0.0000
ICICI Ltd.	α	-0.0026	0.0023	-1.1437	0.2545
	β	0.6094	0.1156	5.2706	0.0000
Global Trust Bank	α	-0.0031	0.0030	-1.0342	0.3036
	β	1.3154	0.1154	11.4035	0.0000
Bank of Punjab	α	0.0008	0.0030	0.2793	0.7804
	β	1.2672	0.2934	4.3195	0.0000

	Times Bank	BOM	ICICI Ltd	GTB	BOP
Std. Deviation	0.0503	0.0296	0.0312	0.0454	0.0391
Variance	0.0025	0.0009	0.0010	0.0021	0.0015
R Square	0.0010	0.1554	0.1503	0.5730	0.1062
Adjusted *R* square	-0.0310	0.1500	0.1449	0.5680	0.1010

Table 6A: CAR of Bidder Banks

Event Window	HDFC Bank	ICICI Bank (BOM)	ICICI Bank (ICICI Ltd)	Oriental Bank of Commerce	Centurion	Combined
(-1, +1)	0.1396**	0.0843	0.1238**	-0.0732	0.0591	0.0667**
(-2, +2)	0.1787**	0.0906	0.1331**	-0.0900	0.0423	0.0710*
(-5, +5)	0.3794***	0.0644	0.2067**	-0.1433	-0.0088	0.0997*
(-10, +10)	0.4113**	-0.0527	0.2000	-0.0858	-0.0294	0.1281*
(-15, +15)	0.4860**	0.0534	0.1397	-0.1764	-0.0211	0.1048
(-40, +40)	0.3912	0.4345	-0.2658	-0.3029	0.2351	0.1019

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table 6B: CAR of Target Banks

Event Window	Times Bank	BOM	ICICI Ltd	GTB	BOP	Combined
(-1, +1)	0.1287	0.2195***	-0.0277	n/a	-0.0368	0.0089
(-2, +2)	0.2354**	0.3724***	0.0283	n/a	-0.0971	0.0678*
(-5, +5)	0.4123**	0.7600***	0.1316	n/a	0.0571	0.2825***
(-10, +10)	0.3376	1.1250***	0.0432	n/a	-0.0523	0.3034***
(-15, +15)	0.5064*	1.0710***	0.0399	n/a	-0.0274	0.3024***
(-40, +40)	0.6996	1.3904***	-0.0244	n/a	-0.0615	0.3511**

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

CAR Using Two-factor Model

Summary Statistics

The summary statistics using the two-factor model of bidder and target banks are given in Tables 8A and 8B respectively. The historical data of Bank Nifty index is available on the NSE site from Jan 1, 2000 onwards; hence data for the HDFC Bank and the Times Bank are not available. Therefore, the two-factor model methodology has been used to estimate the abnormal returns for the remaining four merger announcements.

CAR Estimate during the Window Period

The estimates of cumulative abnormal returns of the bidder and target banks in the different event windows using the two-factor model are reported in Tables 9A and 9B respectively.

The estimates of cumulative abnormal returns of the bidder and target banks using the multi-factor model in the different run-up windows are as in Tables 10A and 10B respectively.

Table 7A: CAR in Run-up Window of Bidder Banks

Run-up Window	CAR of HDFC Bank	CAR of ICICI Bank (BOM)	CAR ICICI Bank (ICICI)	CAR of OBC	CAR of Centurion Bank	CAR of Bidder Banks
(-1, 0)	0.0665	0.1117*	0.1068**	-0.0165	0.0287	0.0595***
(-2, 0)	0.0310	0.1479*	0.1591***	-0.0212	0.0526	0.0739***
(-3, 0)	0.0506	0.1401	0.2075***	-0.0208	0.0336	0.0822**
(-4, 0)	0.0452	0.1634	0.2132***	0.0037	0.0462	0.0943***
(-5, 0)	0.0409	0.1151	0.2155***	-0.0017	0.0336	0.0807**

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table 7B: CAR in Run-up Window of Target Banks

Run-up window	CAR of Times Bank	CAR of Bank Of Madura	CAR of ICICI Ltd	CAR of GTB	CAR of Bank Of Punjab	CAR of Target Banks
(-1, 0)	0.1852***	0.1476***	-0.0452	-0.2379***	0.0006	0.0101
(-2, 0)	0.1852**	0.2221***	0.0436	-0.2185***	0.0139	0.0493
(-3, 0)	0.1859**	0.2941***	0.0935	-0.2510***	0.0515	0.0748**
(-4, 0)	0.1703	0.3736***	0.0796	-0.2079**	0.0925	0.1016**
(-5, 0)	0.1918	0.3610***	0.1241	-0.0992	0.0819	0.1319***

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table 8A: Summary Statistics of Bidder Banks Using Two-factor Model

		Coefficients	Std. Error	*t*	Sig.
ICICI Bank (BOM)	α	-0.0016	0.0028	-0.5988	0.5500
	β	-0.2399	0.1508	-1.5910	0.1137
	BANK NIFTY	1.5689	0.1683	9.3235	0.0000
ICICI Bank (ICICI)	α	-0.0005	0.0020	-0.2453	0.8065
	β	0.3912	0.2309	1.6948	0.0921
	BANK NIFTY	0.7258	0.1722	4.2150	0.0000
Oriental Bank of Commerce	α	0.0003	0.0020	0.1610	0.8720
	β	0.4190	0.2300	1.8250	0.0700
	BANK NIFTY	1.1650	0.1690	6.9140	0.0000
Centurion Bank	α	-0.0025	0.0040	-0.6860	0.4950
	β	0.7870	0.6950	1.1330	0.2610
	BANK NIFTY	0.3330	0.4490	0.7430	0.4600

	ICICI (BOM)	ICICI Bank (ICICI)	OBC	Centurion
Std. Deviation	0.0445	0.0297	0.0446	0.0354
Variance	0.0020	0.0009	0.0020	0.0013
R Square	0.4149	0.2505	0.7922	0.1780
Adjusted *R* Square	0.4074	0.2409	0.7896	0.1560

Statistical Significance of CAR

The statistical significance of cumulative abnormal returns in the single-factor model and the two-factor model is given in Tables 11A and 11B respectively.

FINDINGS OF THE STUDY

Bidder Banks

Single-factor Model Results

The average cumulative abnormal returns of the bidder

Table 8B: Summary Statistics of Target Banks Using Two-factor Model

	Coefficients	Std. Error	*t*	Sig.	
Bank of Madura	α	-0.0016	0.0020	-0.7210	0.4720
	β	0.3310	0.1170	2.8310	0.0052
	BANK NIFTY	0.2650	0.1414	1.8720	0.0631
ICICI Ltd	α	-0.0030	0.0020	-1.4890	0.1390
	β	0.1390	0.1230	1.1290	0.2610
	BANK NIFTY	0.8790	0.1290	6.8310	0.0000
Global Trust Bank	α	-0.0039	0.0030	-1.2990	0.1970
	β	0.6640	0.3380	1.9640	0.0520
	BANK NIFTY	0.5380	0.2630	2.0460	0.0430
Bank of Punjab	α	0.0006	0.0030	0.2180	0.8280
	β	0.0992	0.5360	0.1850	0.8540
	BANK NIFTY	0.8650	0.3350	2.5830	0.0110

	BOM	ICICI Ltd	GTB	BOP
Std. Deviation	0.0296	0.0312	0.0454	0.0391
Variance	0.0009	0.0010	0.0021	0.0015
R Square	0.1740	0.3460	0.5910	0.1430
Adjusted *R* Square	0.1634	0.3380	0.5820	0.1320

Table 9A: CAR of Bidder Banks Using Two-factor Model

Event Window	ICICI (BOM)	ICICI BANK (ICICI)	OBC	Centurion	Combined
(-1, +1)	0.0533	0.1070**	-0.0377	0.0670	0.0474*
(-2, +2)	0.0712	0.1214*	-0.0566	0.0579	0.0485
(-5, +5)	0.0354	0.1874*	-0.0983	0.0055	0.0325
(-10, +10)	0.0465	0.1944	-0.0543	-0.0277	0.0398
(-15, +15)	-0.0070	0.1801	-0.0877	0.0197	0.0263
(-40, +40)	0.0428	-0.1501	-0.0713	0.2680	0.0232

* Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level

Table 9B: CAR of Target Banks Using Two-factor Model

Event window	BOM	ICICI Ltd	GTB	BOP	Combined
(-1, +1)	0.2154***	-0.0459	n/a	-0.0171	-0.0163
(-2, +2)	0.3711***	0.0160	n/a	-0.0579	0.0302
(-5, +5)	0.7592***	0.1024	n/a	0.0911	0.2445***
(-10, +10)	1.1159***	0.0060	n/a	-0.0537	0.2782***
(-15, +15)	1.0719***	0.0238	n/a	-0.0395	0.2362**
(-40, +40)	1.3535***	0.1099	n/a	0.0015	0.3105*

* Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level

Table 10A: CAR in Run-up Window of Bidder Banks Using Two-factor Model

Run-up t window	ICICI Bank (BOM)	ICICI Bank (ICICI)	OBC	Centurion	Average
(-1, 0)	0.0794	0.0975**	-0.0041	0.0368	0.0524**
(-2, 0)	0.1217	0.1525***	-0.0250	0.0638	0.0783***
(-3, 0)	0.1216	0.1951***	-0.0217	0.0485	0.0859***
(-4, 0)	0.1164*	0.2029***	-0.0065	0.0582	0.0928***
(-5, 0)	0.0720	0.2036***	-0.0111	0.0429	0.0769**

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table 10B: CAR in Run-up Window of Target Banks Using Two-factor Model

Run-up Window	Bank of Madura	ICICI Ltd	GTB	BOP	Average
(-1, 0)	0.1429***	-0.0546	-0.2320***	0.0213	-0.0306
(-2, 0)	0.2189***	0.0324	-0.2201***	0.0428	0.0185
(-3, 0)	0.2925***	0.0736	-0.2514***	0.0892	0.0510
(-4, 0)	0.3676***	0.0595	-0.2122**	0.1225	0.0844**
(-5, 0)	0.3561***	0.1071	-0.1031	0.1047	0.1162***

*significant at 10% level, ** significant at 5% level, *** significant at 1% level

Table 11A: Statistical Significance of CAR (Single-factor Model)

	Bidder Banks	Target Banks
Day before announcement (-1)	0.31%	4.82%***
	(0.1928)	(2.7125)
Day of merger announcement (0)	5.63%***	-3.82%**
	(3.4606)	(-2.147)
Day after merger announcement (+1)	0.72%	-0.11%
	(0.4437)	(-0.0633)
Day before announcement to day of announcement (-1, 0)	5.95%***	1%
	(2.5833)	(0.3999)
Day before announcement to day after announcement (-1, +1)	6.67%**	0.89%
	(2.3654)	(0.2899)

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

Table 11B: Statistical Significance of CAR (Two-factor Model)

	Bidder Banks	Target Banks
Day before announcement (-1)	0.41%	1.78%
	(0.2695)	(1.061)
Day of merger announcement (0)	4.83%***	-4.84%***
	(3.1694)	(-2.8848)
Day after merger announcement (+1)	-0.50%	1.43%
	(-0.3269)	(0.8516)
Day before announcement to day of announcement (-1, 0)	5.24%**	-3.06%
	(2.4317)	(-1.2896)
Day before announcement to day after announcement (-1, +1)	4.74%	-1.63%
	(1.7955)	(-0.5613)

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

banks are positive and substantial as we move from a 3 day (-1, +1) to 5 day (-2, +2) to a 11 day (-5, +5) event window wherein it has gone up from 6.67 per cent to 7.10 per cent to 9.97 per cent. These results are also statistically significant. The cumulative abnormal returns for 21 day (-10, +10) window are as high as 12.81 per cent. The cumulative abnormal returns for 31 day (-15, +15) window and 81 day (-40, +40) event window are 10.48 per cent and 10.19 per cent respectively. In a nutshell, the bidder banks got significant positive abnormal returns.

On a case-by-case basis, the HDFC Bank and the ICICI Bank (ICICI Ltd.) have generated substantial positive and significant returns. The cumulative abnormal returns of the HDFC Bank was 48.6 per cent in an event window of 31 days (-15, +15). The ICICI Bank earned a cumulative abnormal return of 20.67 per cent in an 11 day (-5, +5) window in respect of its merger with the ICICI Ltd. The merger provided access to the retail-lending portfolio and the benefit of a large balance sheet of the ICICI Ltd to the ICICI Bank. As a result, the ICICI Ltd. gained access to the low-cost funds of the ICICI Bank.

The merger of the Times Bank with the HDFC Bank has added significant value in terms of increased branch network, expanded geographic reach, enhanced customer base, and the opportunity to cross-sell and leverage alternative delivery channels.

The ICICI Bank became one of the largest private sector banks in India after its merger with the Bank of Madura in 2001 with the combined assets of Rs 173.27 billion and total deposits of Rs 134.60 billion. The ICICI Bank gained substantial but not significant abnormal returns during the Bank of Madura merger announcement. For a 40-day (-40, +40) window, the cumulative abnormal returns came to 43.45 per cent.

The Oriental Bank of Commerce is the only exception in the list of bidders with substantially negative cumulative abnormal returns in each of the event windows studied. It registered a negative cumulative abnormal returns of 17.64 per cent in the 15-day (-15, +15) window.

As a result of merger, the Centurion Bank of Punjab combined entity occupies the position among the top-10 private sector banks in India. The combined entity has a nationwide reach since the branch network and

business portfolio of the two banks will complement each other. The Centurion Bank has 82 per cent of its business from retail segment and the Bank of Punjab has a strong position in small and medium enterprises loans and agricultural sector loans. For the Centurion Bank, it is a mixed bag. Closer to the event, the cumulative abnormal returns are positive and the 40-day (-40, +40) window cumulative abnormal returns are also positive at 23.51 per cent. Negative cumulative abnormal returns of 0.88 per cent, 2.94 per cent, and 2.11 per cent are registered for 5-day (-5, +5), 10-day (-10, +10) and 15-day (-15, +15) window respectively.

Run up Window Results: Single-factor Model

In the case of the HDFC Bank, the residuals prior to the event date are negative; so, the cumulative abnormal returns are less substantial in the run-up window as compared to the window cumulative abnormal returns. A 6.65 per cent CAR is registered on the day before announcement and the day of announcement combined. The results are statistically not significant.

The cumulative abnormal returns for the ICICI Bank in the case of its merger with the Bank of Madura and the ICICI Ltd. are substantial and positive. In the case of the latter merger, cumulative abnormal returns are significant and are in excess of 20 per cent in 3 days, 4 days, and 5 days before the event.

The Oriental Bank of Commerce has registered mainly negative cumulative abnormal returns in the run-up period although it is neither substantial nor significant. On the other hand, the Centurion Bank has registered positive cumulative abnormal returns, which are again substantial but not significant.

Two-factor Model Results

The merger of the Bank of Madura with the ICICI Bank yielded positive cumulative abnormal returns in a one-day (-1, +1) window of 5.33 per cent to the shareholders of the ICICI Bank. However, it was not statistically significant. The merger of ICICI with the ICICI Bank resulted in substantial and significant cumulative abnormal returns of 10.7 per cent.

The Oriental Bank of Commerce registered negative cumulative abnormal returns of 5.66 per cent in a two-day window and 9.83 per cent in a five-day (-5, +5) window. The Centurion Bank generated positive cumulative abnormal returns of 6.7 per cent and 5.79 per cent in a one-day (-1, +1) and two-day (-2, +2) window respectively.

Run-up Window Results – Two-factor Model

The merger announcement in the Indian private sector banks, by taking into account S&P CNX 500 Index and Bank Nifty Index as two independent variables, generated a positive and statistical significant cumulative abnormal returns of 5.24 per cent, 7.83 per cent, and 8.59 per cent in a one-day (-1,0), two-day (-2, 0), and three-day (-3, 0) run-up window respectively to the shareholders of the bidder banks. The use of the two-factor market model resulted in a higher value of *R* square.

Target Banks

Single-factor Model Results

The combined cumulative abnormal returns for all target banks are positive, significant, and substantial. As the window increases from a 2-day (-2, +2) window to a 40-day (-40, +40) window, cumulative abnormal returns increase from 6.78 to 35.1 per cent. The combined cumulative abnormal returns have to be read with caution as the average has been propped up due to a very high CAR registered by the Bank of Madura. The cumulative abnormal returns are 139 per cent in the 40-day (-40, +40) window.

Considering other banks, the Times Bank has also registered substantial, positive, and significant cumulative abnormal returns. The CAR for the 40-day (-40, +40) window is approx. 70 per cent. The ICICI Ltd. had CAR of 13.1 per cent in the 5-day (-5, +5) event window period. The cumulative abnormal returns are negative in the full 40-day (-40, +40) window and in the 1-day (-1, +1) window (less than 3% (negative) in both cases).

The Bank of Punjab has registered negative although insignificant cumulative abnormal returns. The only positive cumulative abnormal return of 5.71 per cent is in the 5-day (-5, +5) window.

Run-up Window Results: Single-factor Model

The requisite data is not available in the case of the Global Trust Bank; therefore, the run up window results assume significance. It has a negative, substantial, and statistically significant cumulative abnormal returns in the run-up window. There is a negative 23.8 per cent CAR a day before the date of merger announcement.

In the run-up period of -5 to day zero, the Times Bank CAR has hovered around the 18 per cent mark. The Bank of Madura again has substantial positive and significant cumulative abnormal returns. The average cumulative abnormal returns have also been propelled up by the Bank of Madura figures.

Two-factor Model Results

The shareholders of the Bank of Madura realized exceptionally high gains as a result of its merger announcement with the ICICI Bank. It was as high as 75.92 per cent in a five-day (-5, +5) window. The shareholders of the ICICI and the Bank of Punjab lost value to the extent of 4.59 per cent in (-1, +1) window and 5.79 per cent in (-2, +2) window respectively as a result of their merger announcement.

Run-up Window Results: Two-factor Model

The Global Trust Bank shareholders lost value to the extent of 23.2 per cent in a one-day (-1, 0) run-up window. It was primarily due to governance issues and financial distress faced by the bank and merger announcement was a bail out strategy. The Bank of Madura yielded cumulative abnormal returns of 29.25 per cent (significant at 1% level) in a three-day (-3, 0) run-up window. The cumulative abnormal returns in post-announcement window is greater than in the run-up window in the case of Bank of Madura.

COMPARATIVE ANALYSIS OF CAR IN VARIOUS WINDOWS

The cumulative abnormal returns of all the banks involved in the five mergers in the study have been examined by both the single-factor model and the two-factor model. However, the cumulative abnormal returns of the HDFC Bank and the Times Bank merger have been examined only by the single-factor model as the historical data of Bank Nifty index is available on the NSE site from January 1, 2000 onwards.

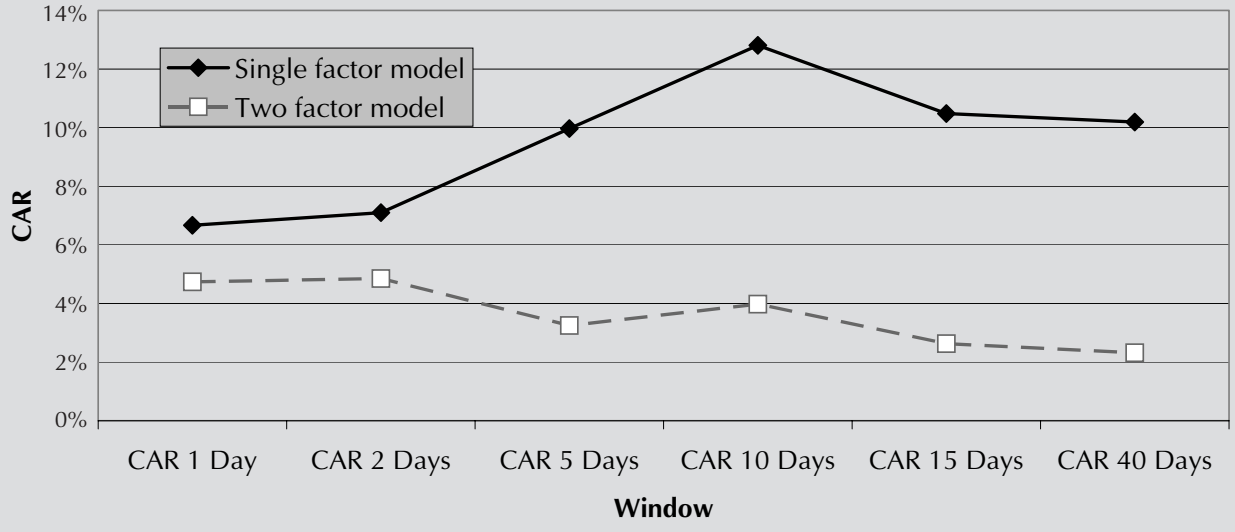
A graphical comparative analysis of cumulative abnormal returns of all bidder banks under different event windows are captured in Figures 1 and 2 and the cumulative abnormal returns of all the target banks under various windows are captured in Figures 3 and 4.

CAR of Bidder Banks

The merger announcement in the Indian private sector banks generated positive and statistical significant cumulative abnormal returns of 5.95 per cent, 7.39 per cent, 8.22 per cent, 9.43 per cent, and 8.07 per cent in a one-day (-1, 0), two-day (-2, 0), three-day (-3, 0), four-day (-4, 0) and five-day (-5, 0) run-up event window respectively to the shareholders of the bidder banks using the single-factor model. The two-factor model results are no different.

The studies in the US context find results contrary to the results of the present study. Baradwaj, Fraser and

Figure 1: CAR of Bidder Banks



Futardo (1990) report a negative and statistically significant CAR in (-1, 0) window of 1.28 per cent. Siems (1996), and Cornett and Tehranjan (1992) show CAR for a two-day (-1, 0) window of (-) 1.5 per cent and (-) 0.8 per cent respectively. Scholtens and Wit (2004) find a CAR of (-) 1.86 per cent for the US bank mergers and 2.56 per cent for the European bank mergers in a (-3, +30) window. The results of studies in the European context are consistent with the results of the present study. Ismail and Davidson (2005) report a CAR of 0.13 per cent in a (-1, 0) window to the shareholders of the bidder banks.

CAR of Target Banks

The single-factor model finds that the combined cumulative abnormal returns for all target banks are positive, significant, and substantial. As the window increases from a 2-day (-2, 2) window to a 40-day (-40, 40) window, the cumulative abnormal returns increase from 6.78 per cent to 35.11 per cent. Rad and Beek (1999), Cybo-Ottone and Murgia (2000), and Ismail and Davidson (2005) report announcement period returns for the target banks in the European context of 4.65 per cent, 12 per cent, and 2.3 per cent respectively in an event window of (-1, +1).

Figure 2: CAR of Bidder Banks (run up window)

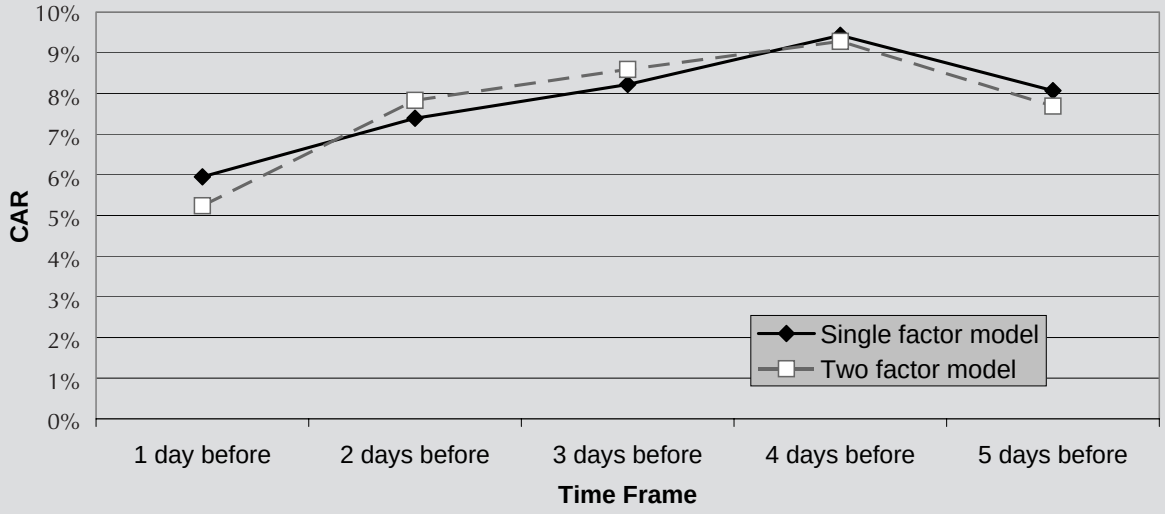


Figure 3: CAR of Target Banks

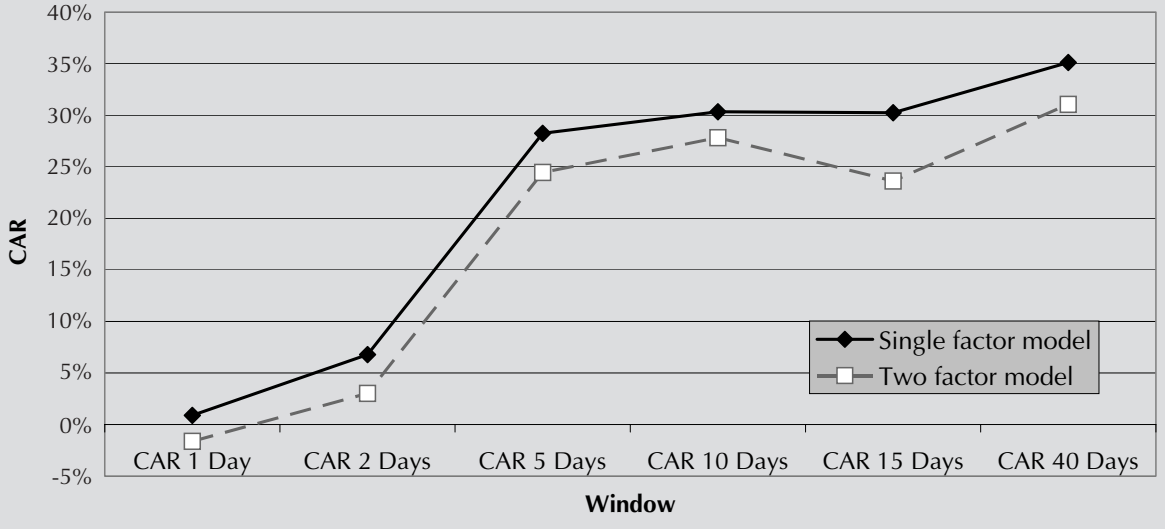
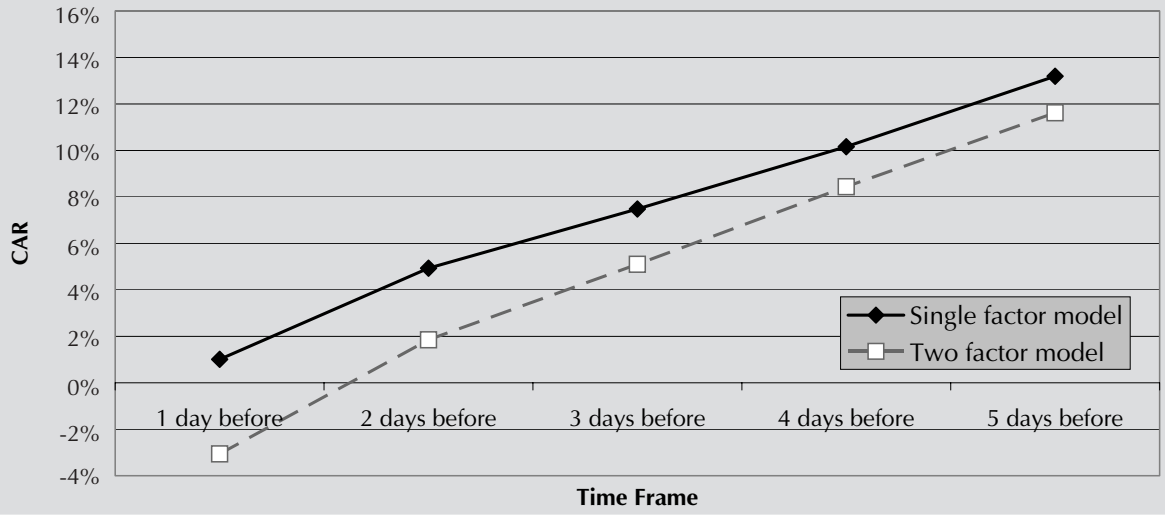


Figure 4: CAR of Target Banks (run up window)



The returns to the shareholders of target banks is a function of share exchange ratio and expected synergy gains from the merger. The merger announcements had significant abnormal returns in a run-up window of three days (-3, 0), four days (-4, 0), and five days (-5, 0) using single-factor model and in a 4-day (-4, 0) and 5-day (-5, 0) run-up window using a two-factor model. The target banks have realized significant cumulative abnormal returns of 8.44 per cent and 11.62 per cent in a four-day and five-day run-up window. Baradwaj, Fraser and Furtado (1990), Cornett and Tehranian (1992), and Zhang (1995) report CAR of 17.29 per cent, 8 per cent, and 6.13 per cent respectively to the shareholders of the target banks in the US in an event run-up window of 2 days (-1, 0).

The cumulative abnormal returns of the bidder banks in India are much higher than those of the target banks in a run-up window of one day, two days, and three days to the day of announcement in relation to both single-factor and multi-factor models. These findings are in contrast with that of Scholtens and Wit (2004) study of announcement effects of bank mergers in Europe and the US, wherein they found the cumulative abnormal returns of target banks much higher than those of the bidder banks.

The volatility of abnormal returns of the target banks in relation to the single-factor model is higher than that of the bidder banks. The average of the standard deviations of target banks abnormal returns is 1.88 per cent as against 1.4 per cent in the case of bidder banks. These findings are in agreement with that of Scholtens and Wit (2004).

Weighted Average Abnormal Returns

The market-value weighted average CAR for both target and bidder banks in different event windows using the single-factor model are reported in Table 12. The HDFC Bank–Times Bank merger has created significant

Table 12: Market Value Weighted Portfolio CAR

Event Window	HDFC Bank – Times Bank %	ICICI Bank – BOM %	ICICI Bank – ICICI Ltd. %	OBC – GTB %	Centurion – Bank of Punjab %	Average %
(-1, +1)	13.86**	8.88	2.89	-8.34**	4.16	4.29**
(-2, +2)	18.38**	10.01	6.74	-9.91**	1.70	5.39*
(-5, +5)	38.24***	8.79	15.96**	-14.78**	0.32	9.71**
(-10, +10)	40.47***	17.74	10.18	-9.40	-3.36	11.13*
(-15, +15)	48.79***	8.78	7.71	-18.76	1.23	9.55
(-40, +40)	41.91	46.66	-11.46	-32.56	16.15	12.14

*Significant at 10% level, ** Significant at 5% level, *** Significant at 1% level.

and positive abnormal returns to their shareholders in all the windows except in (-40, +40) window. The Oriental Bank of Commerce–Global Trust Bank merger has destroyed the value to their shareholders in all the event windows. The combined cumulative portfolio abnormal returns are positive, significant, and substantial in all the event windows except in (-15, + 15) and (-40, +40) windows. As the window increases from a one-day (-1, +1) to two-day (-2, 2) window to a five-day (-5, +5) window, the cumulative portfolio abnormal returns increase from 4.29 per cent to 5.39 per cent to 9.71 per cent respectively.

Comparing the present results to the other studies in the area of bank mergers in the US and Europe, the trend is similar. Zhang (1995), in the context of the US Bank mergers, and Cybo-Ottone and Murgia (2000), in the context of the European Bank mergers, estimate a weighted average portfolio CAR of 7 per cent and 3 per cent respectively in (-2, +2) window. Ismail and Davidson (2005) attribute this to leakage of information about the merger to the market and estimate such period to be at least 10 days before the announcement.

The bidder banks have created a wealth of Rs 4,117.98 million in a one-day window (single-factor model) as a result of the merger announcements. The Oriental Bank of Commerce lost value of Rs 3732.8 million in a one-day window at the time of announcement of its merger with the Global Trust Bank. In the case of target banks, the shareholders of the Global Trust Bank and the Bank of Punjab appear to be the losers as they lost Rs 382.55 million in a one day run-up window (single-factor model) and Rs 128.74 million in a one-day window (single-factor model) respectively.

CONCLUSIONS

An event study methodology has been used to explore the short-term shareholder wealth effects of the Indian bank mergers during the period 1999 to 2005. The merger of the Times Bank with the HDFC Bank (1999), the Bank of Madura with the ICICI Bank (2000), the ICICI Ltd. with the ICICI Bank (2001), the Global Trust Bank (GTB) with the Oriental Bank of Commerce (OBC) (2004), and the Bank of Punjab (BOP) merger with the Centurion Bank (2005) have been studied. This is the first study of stock market valuation and estimation of abnormal returns in the context of Indian bank mergers. The results document positive and significant increase in value to the shareholders of bidder banks, target banks, and their combined portfolio. The Oriental Bank of Commerce and the Global Trust bank are an exception. The findings of the study are in agreement with the European and the US bank mergers and acquisitions except for the fact that the value to the shareholders of bidder banks has been destroyed in the US context.

From the study, it emerges that merger announcement in the Indian banking industry has positive and significant shareholders' wealth effect both for the bidder and target banks.

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