MODELING BANK MERGERS IN THE 1990s:
THE POTENTIAL DILUTION EFFECT

Stanley Block[*]

Abstract

As mergers become increasingly important in the financial services industry, the need for proper sensitivity analysis to assess the financial impact of the merger is essential. Unlike industrial mergers, there is almost always initial dilution in a bank merger. This is because of the homogenous nature of bank P/E ratios and the high premium over book value that is typically paid. The problem of dilution was further compounded by an SEC ruling in March of 1996 that restricted the repurchase of outstanding shares for two years after merger under a pooling of interests financial recording. Given these factors, the initial dilution can only be overcome by more rapid post-merger earnings growth by the holding company. The author models the factors that affect the growth rate after merger and indicates the relative importance of the premium paid, the size of the merging institutions, the absence or presence of synergy and a number of other variables.

INTRODUCTION

The process of negotiating and consummating a merger is often an easier task than producing the anticipated benefits from the acquisition. All too often the acquiring firm's management foresees future gains that far outstrip realized performance [8]. Many of the large corporate mergers of the last two decades have resulted in subsequent divestitures.

Bank mergers, in large measure, have followed the same hazardous path as industrial mergers. Often, the price paid for a potential acquiree has outstripped the potential future benefits. The emphasis in this paper is in developing analytical techniques that will allow for sounder acquisitions by bank holding companies. As the industry moves more toward interstate banking and the removal of barriers between financial institutions, mergers will not only be an important component in bank management, but an *overriding* one. The two largest bank mergers in U.S. history were consummated in the mid-1990s between Chemical Bank and Chase Manhattan; and between Wells Fargo and First Interstate. More such mergers can be expected in the future.

The advantages of multibank holding companies are many: larger capitalizations and loan capacity, lower capital costs, diversification and risk reduction, and shared expertise and cost reductions in such areas as data processing, marketing and trust operations. Also the multibank holding company allows for the attraction and retention of top management. At the same time, there is the danger of a lost personal touch with customers and employees because of centralized decision making, the presence of higher operating costs as new affiliate banks adopt the personnel and retirement policies of the bank holding company, and the danger of lost incentives as ownership is shifted from a small community to the headquarters of the bank holding company.

There is empirical evidence from the research of Benston, Hunter, and Wall [2], Schranz [10], Cornett and Tehranion [5], Rose [9] and others that opportunities and pitfalls exist in the bank holding company structure. There is the continual tradeoff between the benefit of greater market share penetration and problems related to organizational expansion.

In this paper, the author addresses a central issue generally associated with stock for stock exchanges by bank holding companies for acquired banks; that is, there is almost always an initial dilution in earnings per share. Why? Because the acquiring bank generally pays a premium over the current book value of the acquired bank, and

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*Texas Christian University

also acquires the new affiliate bank at a higher P/E ratio than its own. Assume two banks both have a P/E ratio of 10, and a 50 percent premium over current value is paid for the acquired bank. The acquired bank is being paid a P/E of 15 for its shares. Since the acquiring bank has a P/E of 10, it is acquiring the new bank and that bank's earnings at a higher P/E ratio than its own. It is a mathematical and accounting fact that anytime you *acquire another firm at a higher P/E ratio than your own, you have an automatic dilution in earnings per share*. This type of dilution in bank mergers is quite common because bank P/E ratios tend to be much more homogeneous than industrial P/E ratios. Given that banks tend to have fairly similar P/E ratios at the outset and the acquired bank usually receives a premium, initial dilution is somewhat inevitable. In industrial mergers, this is not always the case. There may be much greater disparity between P/E ratios for industrial firms [3]. A hightech firm with a P/E of 30 may acquire a retail outlet for its products that has a P/E of 10. Even if a 100 percent premium is paid, the hightech firm is still acquiring the outlet at an effective P/E of 2/3 of its own (30 to 20). Not only is dilution avoided, but there is an initial accretion in earnings per share.

The problem of dilution in bank mergers is further exacerbated by an SEC ruling in March of 1996 that states that a firm using pooling of interest financial reporting cannot buy back its stock for up to two years if it planned the stock buyback as part of the acquisition.[1] Banks invariably use pooling of interest financial reporting in large mergers to avoid the creation of goodwill, which must be amortized against earnings over a maximum period of 40 years. Goodwill also may not be added to a bank's capital account for regulatory purposes. In the past, banks had issued large amounts of new shares to the acquired bank's stockholders, and then partially mitigated the dilutive effect of the new shares by simultaneously announcing a share repurchase program. This is no longer possible. If a bank wants to use pooling of interest financial reporting to avoid goodwill creation, as most banks do, it must forego a related stock repurchase plan for the mandatory two years.

This rule applies to industrial firms as well as banks, but is much more significant in the case of banks because dilution is much more likely to be present in bank mergers. For this reason, understanding and controlling dilution has taken on increasing importance since the SEC ruling.

CONTROLLING DILUTION IN BANK MERGERS

At this stage, the author wishes to point out that there is nothing inherently wrong with the initial dilution that is common in stock for stock exchanges in bank acquisitions. The initial dilution may, in time, lead to strong earnings growth, substantial market penetration, and a higher market value for the acquiring bank. The question becomes, "How much dilution is too much dilution?" and this is not an easily answered question. In this paper, the author will address this question through a financial model. In the study, the potential acquisition of TARGET Bank by BHC (Bank Holding Company) Corp. will be considered. In the analysis, the initial and subsequent impact of paying a premium over the acquiring firm's P/E ratio will be considered. Then, the impact of synergistic effects will be evaluated in relationship to the initial dilution. Other significant variables influencing initial dilution and subsequent performance are then considered. These include an examination of the effect of the relative sizes and growth rates of the participating firms.

HYPOTHETICAL MERGER

Assume the financial characteristics shown in Table 1 for the TARGET Bank (the acquisition candidate) and for BHC Corp. (the acquiring bank).

Both banks are shown to have the same P/E ratio (10X) and price ($40). If their shares were exchanged purely on the basis of current market price, there would be no immediate dilution of earnings per share (they would be trading shares at equal P/E ratios). However, it is most unlikely that TARGET Bank would accept a buyout at its current market price. Inevitably, some premium above market value or book value is expected. In a study of bank mergers published in 1990, Adkisson and Fraser [1] found a premium of price to book value in the range of 1.6 to 1.8 times. In other studies published in the late 1980s, Cheng, Gup and Wall [4] reported an average premium of 2 times book value, and Fraser and Kolari [6] reported an average premium of 1.5.

TABLE 1
Financial Characteristics Of Merging Banks

	TARGET	BHC Corporation
Earnings ………………………………..	$4,000,000	$12,000,000
Shares ………………………………	1,000,000	3,000,000
Earnings Per Share ………………………..	$4.00	$4.00
P/E Ratio ………………………………..	10X	10X
Price Per Share ……………………………	$40	$40
Book Value Per Share ……………………..	$36	$34
Assets ……………………………………	$400,000,000	$1,400,000,000
Return On Assets ………………………….	1%	.857%
Growth Rate In EPS ………………………	18%	10%
Weighted Growth Rate (based on earnings)	¼ (18%) + ¾% (10%) = 12%	

In Table 2, we can observe the impact of various size premiums on post-merger earnings per share of BHC. The premium, in this case, represents the extent to which the acquiring firm paid a higher P/E ratio than its own for the acquisition. It also indicates the value above current market value that it paid for the acquired bank. For example, in Column (3), it is assumed that a 25 percent premium is offered. This would indicate TARGET Bank was acquired at 12.5 times its current earnings (10 P/E × 1.25). This would also imply an acquisition price of $50 per share (BHC Corp.'s P/E of 12.5 times TARGET Bank's EPS of $4.00).

TABLE 2
Impact Of Paying A Premium Over Acquired Bank's P/E Ratio

	(1) No Merger	(2) 0 Premium	(3) 25% Premium	(4) 50% Premium	(5) 100% Premium	(6) 200% Premium
New Shares ………..		1,000,000	1,250,000	1,500,000	2,000,000	3,000,000
Total Shares of BHC	3,000,000	4,000,000	4,250,000	4,500,000	5,000,000	6,000,000
Total Earnings …….	$12,000,000	$16,000,000	$16,000,000	$16,000,000	$16,000,000	$16,000,000
Initial EPS of BHC ..	$4.00	$4.00	$3.76	$3.56	$3.20	$2.67
Growth Rate ……….	10%	12%	12%	12%	12%	12%
Future EPS of BHC						
Year 1 …………..	4.40	4.48	4.21	3.99	3.58	2.99
2 …………..	4.84	5.02	4.72	4.47	4.01	3.35
3 …………..	5.32	5.62	5.29	5.01	4.49	3.75
4 …………..	5.85	6.29	5.92	5.61	5.03	4.20
5 …………..	6.44	7.04	6.63	6.28	5.63	4.70
6 …………..	7.08	7.88	7.43	7.03	6.31	5.26
7 …………..	7.79	8.83	8.32	7.87	7.07	5.89
8 …………..	8.57	9.89	9.32	8.81	7.92	6.60
9 …………..	9.43	11.08	10.44	9.87	8.87	7.39
10 …………..	10.37	12.41	11.69	11.05	9.93	8.28

Because TARGET Bank has 1,000,000 shares outstanding, as previously indicated in Table 1, the total purchase price is $50,000,000 (1,000,000 × $50). Based on BHC Corp.'s current price of $40 per share, 1,250,000 new BHC shares will be issued.

$$\frac{\text{Purchase Price of TARGET Bank}}{\text{BHC Corp.' s Stock Price}} = \frac{\$50,000,000}{\$40} = 1,250,000 \text{ shares}$$

After the merger, BHC Corp. will have 4,250,000 shares outstanding.

3,000,000	Old shares of BHC Corporation
1,250,000	Shares issued in their merger to TARGET Bank
4,250,000	Total post-merger shares of BHC Corporation

Also, immediately after the firms consolidate their operations, their total combined earnings will be $16,000,000.

12,000,000	Earnings of BHC Corp.
4,000,000	Earnings of TARGET Bank
16,000,000	Total post-merger earnings

Initial earnings per share after the merger will be $3.76.

$$\frac{\text{Total Post- Merger Earnings}}{\text{Total Post - Merger Shares}} = \frac{\$16,000,000}{4,250,000} = \$3.76$$

Since initial earnings per share without a merger are shown in Column (1) of Table 2 as $4.00, the bank has suffered an initial dilution of 24¢ in earnings per share ($4.00 down to $3.76). This type of dilution is the norm rather than the exception in bank stock for stock exchanges.

The extent of the initial dilution will depend on the magnitude of the premium that is paid. In Table 2, the initial EPS goes from $4.00 based on 0 premium down to $2.67 based on a 200 percent premium. At a typical premium of 50 percent, initial earnings per share are $3.56, indicating a beginning dilution of $.44.

The justification for the initial dilution is often based on the assumption of more rapid earnings growth in the future. At the bottom of Table 1, one can observe that TARGET Bank is assumed to enjoy an 18 percent growth rate in earnings per share while the growth rate for BHC Corp. is 10 percent. If each is weighted in terms of the relative contribution to total earnings that each will provide, the weighted average growth rate is 12 percent.

$$\frac{\$4,000,000}{\$16,000,000} (18\%) + \frac{\$4,000,000}{\$16,000,000} (10\%)$$
$$\frac14 (18\%) + \frac34 (10\%) = 4.50\% + 7.50\% = 12\%$$

The more rapid post-merger growth rate should reverse much of the early dilution. As indicated in Table 2, the 25 percent and 50 percent premiums are overcome in the 4th and 7th years, respectively; that is, the year in which the post-merger EPS exceed earnings per share under an assumption of no merger. A graphic relationship of the consequences of a 0 premium, a 25 percent premium and a 50 percent premium is presented in Figure 1. The outcomes are compared to a strategy of no merger.

As further indicated in Figure 2, firms that pay a 100 percent or 200 percent premium are unable to overcome the initial dilution throughout the 10-year time period under analysis. One can only assume they made a bad agreement or that additional synergistic effects of the merger will overcome the dilutionary impact.

In Table 3, we see the post-merger adjustment to BHC Corp.'s P/E ratio that will be necessary to maintain its market price at $40 per share. For example, at a 50 percent premium, EPS drop from $4.00 to $3.56 and the P/E ratio must increase from 10 to 11.24 to maintain the share price at $40. At a 200 percent premium, the P/E must actually go from 10 to 14.98 to maintain the stock price.

FIGURE 1
Impact Of Premiums On Earnings Per Share
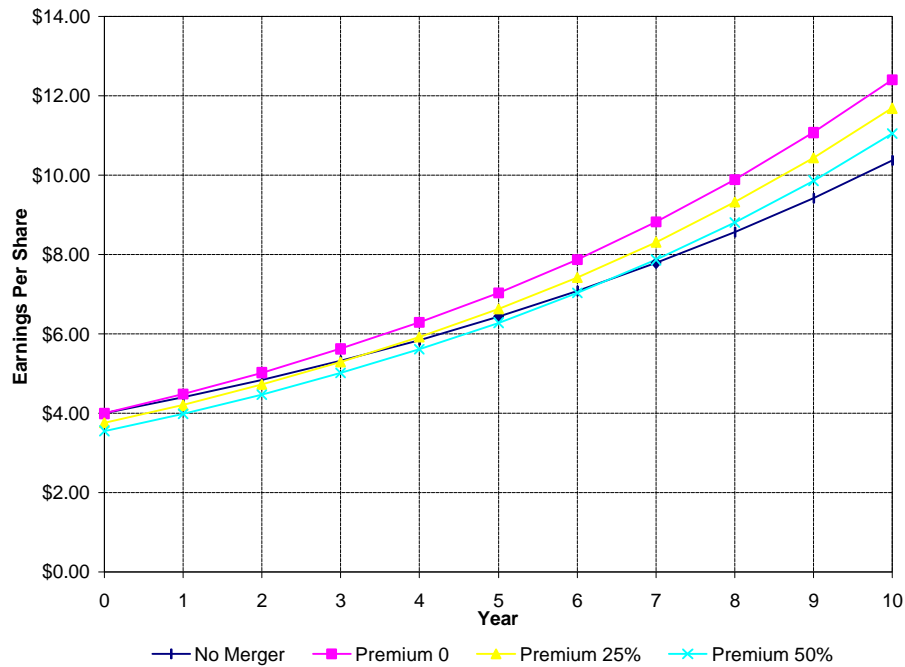
TABLE 3
P/E Ratio Necessary To Maintain Current Market Price

|	No Merger	0 Premium	25% Premium	50% Premium	100% Premium	200% Premium
EPS	$4.00	$4.00	$3.76	$3.56	$3.20	$2.67
P/E	10.00	10.00	10.64	11.24	12.50	14.98
Price	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00

THE IMPACT OF SYNERGY

Synergy refers to the concept that the whole may be greater than the sum of the parts. It is the so-called 2 + 2 = 5 effect. Synergistic effects associated with bank mergers relate to the potential for such factors as cost reductions related to eliminating overlapping functions, higher loan to asset ratios, and geographical diversification [2, 7, 9, 11]. There is also the possibility of eliminating inefficiencies in the acquired bank and for sharing the expertise that the holding company possesses.

As previously pointed out, many of these benefits are elusive. Higher expenses usually accompany the more complicated organization structure of a bank holding company, and there may be a loss of spontaneity between the bank and customers as decisions are filtered to higher levels in the organization. At the extreme, there may be negative synergy as 2 + 2 begins to equal 3 instead of the anticipated 5.

In the present analysis, we shall assume some measure of synergy is, in fact, possible. In Table 4, we see the effect of a 10 percent synergistic impact on the total earnings of the two firms. In each case first year, post-merger

FIGURE 2
Impact Of Large Premiums On Earnings Per Share
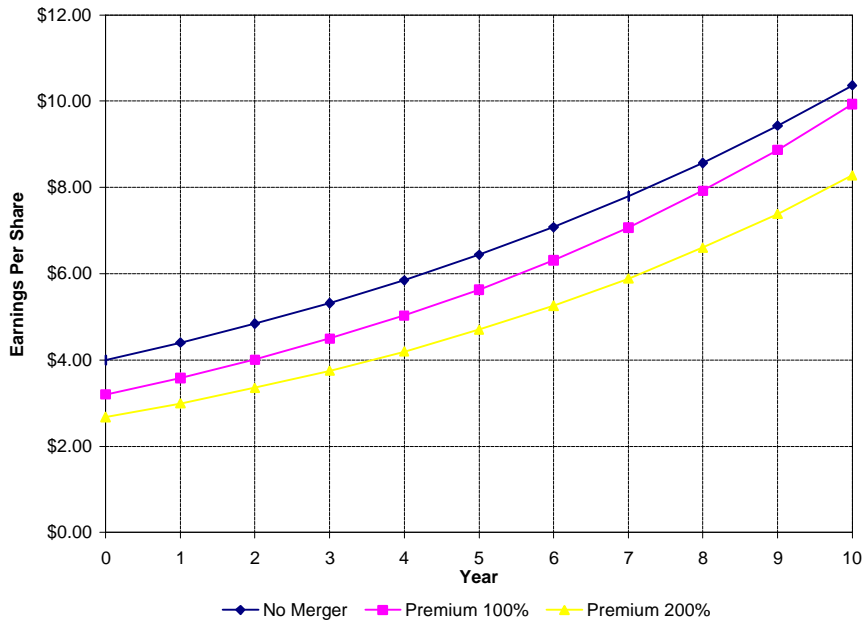
earnings are initially increased by the 10 percent synergistic effect (as well as the 12 percent growth rate) and then advanced forward at a continuing 12 percent growth rate. Obviously, there is a beneficial effect at all the premium levels. Note that a merger with a 100 percent premium will now exceed the "no merger" strategy in the 8th year. However, even with the 10 percent synergy, the merger with the 200 percent premium does not equal the "no merger" strategy over the 10-year time horizon.

The effect of 10 percent synergy is further portrayed in Figure 3, in which we see breakeven (crossover) points in earlier years and higher total earnings potential than in Figure 1 or 2.

TABLE 4
Impact Of 10 Percent Synergy On Earnings Per Share

	No Merger	0 Premium	25% Premium	50% Premium	100% Premium	200% Premium
Initial EPS	$4.00	$4.00	$3.76	$3.56	$3.20	$2.67
Growth rate	10%	12%	12%	12%	12%	12%
Year 1	4.40	4.93[1]	4.63[2]	4.39[3]	3.94[4]	3.29[5]
2	4.84	5.52	5.19	4.92	4.41	3.68
3	5.32	6.18	5.81	5.51	4.94	4.12
4	5.85	6.92	6.51	6.17	5.53	4.61
5	6.44	7.75	7.29	6.91	6.19	5.16
6	7.08	8.68	8.06	7.74	6.93	5.78
7	7.79	9.86	9.03	8.67	7.76	6.47
8	8.57	11.04	10.11	9.74	8.69	7.24
9	9.43	12.36	11.32	10.91	9.73	8.11
10	10.37	13.84	12.68	12.22	10.90	9.08

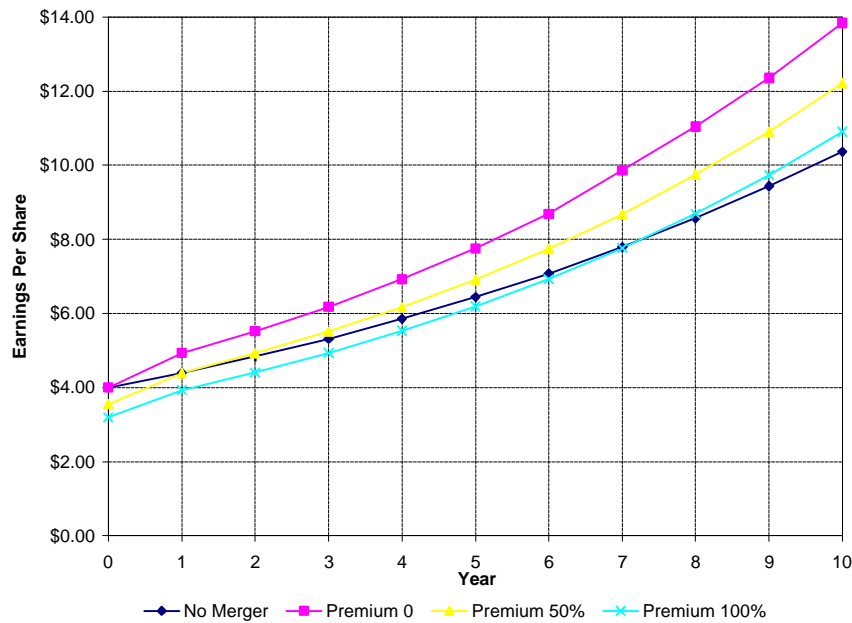1. $4.00 \times 1.10 \times 1.12 =$　4.93　　　　4. $3.20 \times 1.10 \times 1.12 =$　3.94
2. $3.76 \times 1.10 \times 1.12 =$　4.63　　　　5. $2.67 \times 1.10 \times 1.12 =$　3.29
3. $3.56 \times 1.10 \times 1.12 =$　4.39

FIGURE 3
Impact Of Synergy On Earnings Per Share

In Table 5, we can observe the percent of synergy that would be necessary to overcome the no merger strategy in a given year. The four periods under study are the 2nd, 3rd, 5th and 10th years. Once again, the synergy is assumed to take place in the first year and be carried on into the future.

TABLE 5
Percent Of Initial Synergy Necessary To Exceed The
No Merger Strategy In A Given Year

Breakeven Year	25% Premium	50% Premium	100% Premium	200% Premium
2	2.6%	8.3%	20.7%	44.5%
3	.7	6.3	18.4	41.8
5		2.5	14.2	36.8
10			14.5	25.1

The analysis in Table 5 was computed in the following manner. With a *no* merger strategy, earnings per share (as indicated in Table 2), would be $4.84 in year 2. This is the value that a merger must produce at the end of two years to achieve breakeven with a no merger strategy over that time period. This number is then translated back to the end of the first year for the merged firm. Based on a 12 percent growth rate, $4.84 would translate back to $4.32 post-merger earnings per share at the end of year one for a merged firm ($4.84 / 1.12 = $4.32). An acquiring firm paying a 50 percent premium, without considering synergy, would have earnings per share of $3.99 (Table 2) at the end of one year. In order to equal the $4.32 figure, initial synergy must be 8.3 percent ($4.32 / $3.99 = 1.083). For a firm paying a 200 percent premium, the initial required synergy for breakeven in year 2 is 44.5% ($4.32 / $2.99 = 1.445).

The equation for the necessary synergy to breakeven with a no merger strategy in a given year is:

$$BE_{syn.} = \left(\frac{EPS\,(1+g)^n}{(1+g^*)^{n-1}} \div EPS^*\,(1+g^*)^1 \right) - 1$$

where:

$BE_{syn.}$ = Extent of initial synergy necessary to break even.
EPS = Initial earnings per share without the merger.
g = Growth rate without the merger.
n = Number of periods over which the breakeven point
      is to be established.
g^* = Growth rate with the merger.
EPS^* = Initial earnings per share with the merger.

For a 50 percent premium and a 2 year breakeven, the calculation is as follows (the values in the formula are from Table 2).

$$BE_{syn.} = \left(\frac{\$4.00(1.10)^2}{(1.12)^1} \div (\$3.56)(1.12)^1 \right) - 1$$

$$= \left(\frac{\$4.84}{1.12} \div \$3.99 \right) - 1$$

$$= (\$4.32 \div \$3.99) - 1$$

$$= 1.083 - 1$$

$$= .083$$

The necessary initial synergy to breakeven after the second year with a 50 percent initial premium is 8.3 percent.

For a 50 percent premium for 5 years, the calculation is:

$$BE_{syn.} = \left(\frac{\$4.00(1.10)^5}{(1.12)^4} \div (\$3.56)(1.12)^1 \right) - 1$$

$$= \left(\frac{\$6.44}{1.574} \div \$3.99 \right) - 1$$

$$= (\$4.09 \div \$3.99) - 1$$

$$= 1.025 - 1$$

$$= .025$$

Thus, the necessary synergy is 2.5 percent to breakeven after five years with a 50 percent premium.

Using this approach, the bank can determine the extent of synergy necessary to breakeven with a no merger strategy for any given percentage premium in a specified year.

EXPANDING THE ANALYSIS - THE EFFECT OF DIFFERENT SIZES

There are three principle variables that affect the determination of post-merger earnings per share: (A) the extent of premium paid over the acquiring firm's P/E ratio, (B) the relative size of the firms, and (C) the relative growth rates of the firms. The absence or presence of synergy may also be considered along with any of these factors. Up until now, the analysis has been concentrated on variable (A). In this section, variable (B) will be examined and in the following section, variable (C).

In Table 6, it is assumed a 50 percent premium is being paid and that the acquired bank continues to have an 18 percent growth rate versus 10 percent for the acquiring bank (1.8 relationship). The factor that varies is the relative size of the two banks. In the prior example, the acquired bank was assumed to be 1/3 as large as the acquiring bank in terms of earnings - $4,000,000 vs. $12,000,000 (as indicated in Table 1). The current assumption is that the acquiring bank still has earnings of $12,000,000, but we look at different earnings levels for the acquired bank. Thus, the acquired bank in Table 6 may be 10%, 33%, 50%, 67% or 100% as large as the acquiring bank.

TABLE 6
Relative Size Effect On Earnings Per Share

Relative Size	(1) .10	(2) .33	(3) .50	(4) .67	(5) 1.00	(6) No Merger
Acquired Bank's Earnings …………...	$1,200,000	$4,000,000	$6,000,000	$8,000,000	$12,000,000	
BHC Earnings ………	12,000,000	12,000,000	12,000,000	12,000,000	12,000,000	
Total Earnings of BHC	13,200,000	16,000,000	18,000,000	20,000,000	24,000,000	12,000,000
New Shares ………….	450,000	1,500,000	2,250,000	3,000,000	4,500,000	
Old BHC Shares …….	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	
Total BHC Shares …..	3,450,000	4,500,000	5,250,000	6,000,000	7,500,000	3,000,000
Initial Post-Merger EPS for BHC ……….	$3.83	$3.56	$3.43	$3.33	$3.20	$4.00
Growth Rate …………	10.72%	12%	12.67%	13.20%	14%	10%
Future EPS of BHC Year 1 ……………	$ 4.24	$ 3.99	$ 3.86	$ 3.77	$ 3.65	$ 4.40
2 ……………	4.69	4.47	4.34	4.27	4.16	4.84
3 ……………	5.19	5.01	4.89	4.83	4.74	5.32
4 ……………	5.74	5.61	5.51	5.47	5.40	5.85
5 ……………	6.36	6.28	6.21	6.19	6.16	6.44
6 ……………	7.04	7.03	7.00	7.01	7.02	7.08
7 ……………	7.79	7.87	7.89	7.93	8.00	7.79
8 ……………	8.62	8.81	8.89	8.98	9.12	8.57
9 ……………	9.54	9.87	10.01	10.17	10.40	9.43
10 ……………	10.56	11.05	11.28	11.51	11.86	10.37

In Column (1), the assumption is that the acquired bank is only 10 percent as large as the acquiring bank. This would imply that it had earnings of $1,200,000 in comparison to $12,000,000 for BHC Corp. and total earnings for BHC Corp. after merger would be $13,200,000. Also, its shares outstanding would be equal to 10 percent of the shares outstanding for the acquiring bank. Since the acquiring bank has 3,000,000 shares outstanding, this would imply 300,000 pre-merger shares outstanding for the acquired bank. With a 50 percent premium being offered (and the pre-merger stock prices and P/E ratios being equal for the two banks), 450,000 new shares will be issued. This figure is arrived at by multiplying 300,000 shares times 150 percent (based on the 50 percent premium).[2]

With 450,000 new shares issued, BHC Corp. will have 3,450,000 shares outstanding as further indicated in Column (1) of Table 6. Initial post-merger earnings per share are $3.83 for BHC Corp. Assuming no synergy, the combined growth rate after the merger is 10.72 percent. Because the acquired bank is 1/10 as large as the acquiring

bank, it contributes 1/11 to the *overall* growth rate, while the acquiring bank contributes 10/11. The combined growth rate is 10.72%.

$$\frac{1}{11} \ (18\%) \ + \ \frac{10}{11} \ (10\%) \ = \ 1.63\% \ + \ 9.09\% \ = 10.72\%$$

The effect of the initial post-merger earnings per share and growth rate of 10.72% is shown for the 10 years of earnings growth in Column (1). This can be compared to Column (2), which represents data from an earlier section of the paper when the relative size ratio was .33 ($4,000,000 in earnings for the acquired bank versus $12,000,000 for the acquiring bank) or against other relative ratios in columns (3) through (5). Column (6) simply shows the effect of no merger for BHC Corp.

Generally speaking, the larger the size of the acquisition, the greater the initial dilution in earnings per share, and the higher the earnings potential over the 10-year time horizon. A graphic presentation of these relationships is presented in Figure 4 for no merger, a .33 size ratio and a 1.0 size ratio.

FIGURE 4
Impact Of Size On Earnings Per Share
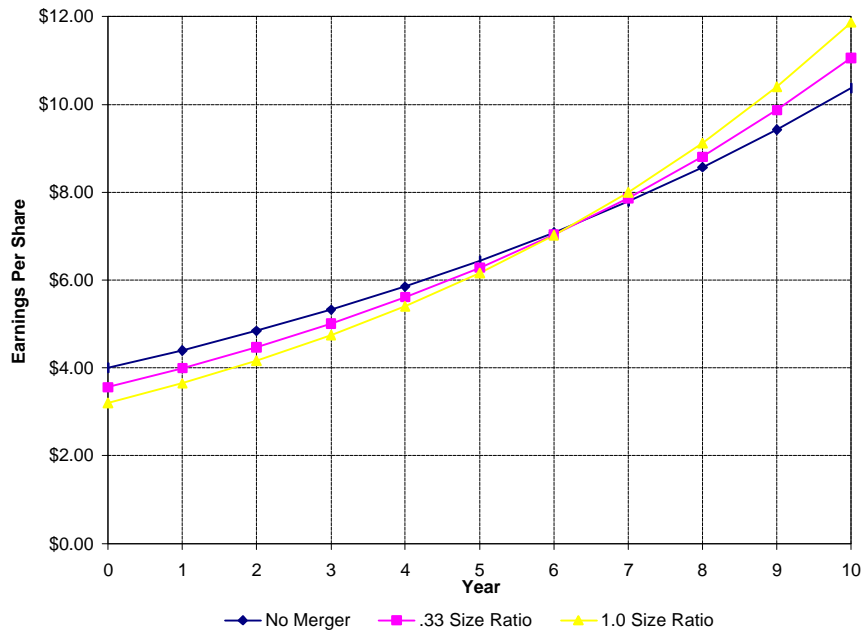
EFFECT OF DIFFERING GROWTH RATES

As previously discussed, the three key variables affecting earnings per share are (A) the extent of premium paid over the acquiring firm's P/E ratio, (B) the relative size of the firms, and (C) the relative growth rates of the firms. We have been looking at the first two factors and shall now observe the third.

Assume a 50 percent P/E premium and a relative size ratio of .33, but that relative growth rates are allowed to vary. The results are presented in Table 7.

In Table 7, the growth rate of the acquiring bank is assumed to be the 10 percent previously used, but the relationship of the growth rate of the acquired bank to the acquiring bank varies. In Column (1), the acquired bank is assumed to grow at 50 percent of the rate of the acquiring bank. With a .33 size relationship (one to three), the acquired bank contributes 1/4 of the *combined* growth rate and the acquiring bank 3/4. Thus, in Column (1), the combined growth rate is 8.75 percent.

$$1/4 \ (5\%) + 3/4 \ (10\%) = 8.75\%$$

TABLE 7
Relative Growth Rate Effect On Earnings Per Share
(Assumes 50 Percent Premium And .33 Relative Size Relationship)

Relative Growth Rates	(1) .5	(2) 1.8	(3) 3.0	(4) No Merger
Initial Post-Merger EPS for BHC ……….	$3.56	$3.56	$3.56	$4.00
Combined Growth Rate	8.75%	12%	15%	10%
Futures EPS of BHC				
Year 1 ……………...	3.87	3.99	4.09	4.40
2 ……………...	4.21	4.47	4.71	4.84
3 ……………...	4.58	5.01	5.42	5.32
4 ……………...	4.98	5.61	6.23	5.85
5 ……………...	5.42	6.28	7.16	6.44
6 ……………...	5.89	7.03	8.23	7.08
7 ……………...	6.41	7.87	9.46	7.79
8 ……………...	6.97	8.81	10.88	8.57
9 ……………...	7.58	9.87	12.51	9.43
10 ……………...	8.24	11.05	14.38	10.37

At the other extreme, we can view the impact of the acquired bank having a growth rate three times as rapid as the acquiring bank's rate of 10 percent. This leads to a combined growth rate of 15 percent.

$$1/4 (30\%) + 3/4 (10\%) = 15\%$$

As indicated in Column 3 of Table 7, the 10th year earnings per share figure for the relative growth rate of 3.0 is $14.38. This can be compared to a meager $8.24 for 10th year earnings in Column (1) under the .5 relative growth assumption. In between the two extremes of .5 relative growth and 3.0 times relative growth is the 1.8 relationship developed in earlier sections of the paper, and the no merger strategy. A graphic representation of these effects is presented in Figure 5.

COMBINING THE THREE KEY VARIABLES

An analyst charged with the responsibility of analyzing the merger impact on earnings per share must continually assess the combined effect of the premium paid over the acquiring firm's P/E ratio, the relative size of the firms and the relative growth ratios. Sensitivity analysis must be applied to all three variables. Simulation may also be used to determine a best case, a worst case, and an expected value of outcomes.

To demonstrate the multicative, interactive effect, consider the implications of a best case and worst case type outcome (both positive and negative synergy could further complicate the analysis, but are not explicitly assumed for now). A best case analysis for the acquiring bank might be a zero P/E ratio premium, a 1 to 1 size ratio, and a 3 to 1 relative growth rate differential. Under this arrangement, the initial earnings per share are $4.00, the combined growth rate is 20 percent and the 10th year earnings per share are $24.74. A worst case would be a 200 percent P/E ratio premium, a 1 to 1 size ratio, and a .5 relative growth rate pattern. The initial earnings per share would be $1.23, the combined growth rate is 7.5 percent, and the 10th year earnings per share are $2.52.

FIGURE 5
Impact Of Relative Growth Ratio On Earnings Per Share
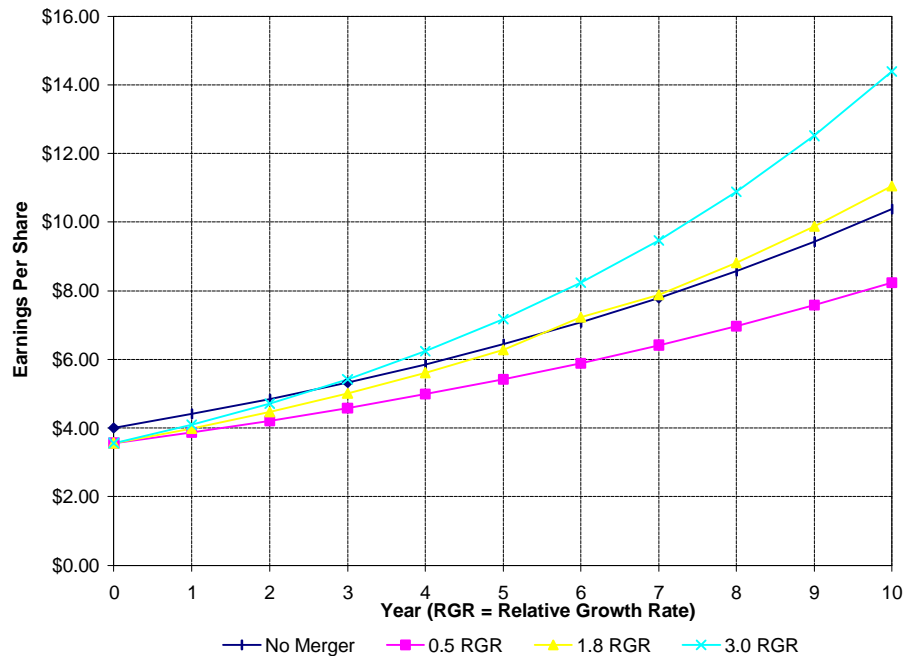
While no one would suggest that such outcomes are likely, they help define the extreme boundaries that can be reached. Clearly, the three variables of premium, size and growth rate are not independent of each other. A high premium will generally be associated with a high relative growth rate for the acquired bank, and the *size* effect will also play a significant role. Whereas, an acquiring bank may be willing to pay a high premium for a rapidly growing bank, that tendency is greatly reduced when the acquisition candidate is of equal size. The initial dilution is simply too large to present to outside financial analysts. Other types of third variables constraints can also be envisioned. For example, the price premium and sizes of the banks might indicate a good match, but the relative growth rate ratio is totally unacceptable.

SUMMARY

This paper has stressed the importance of considering potential dilution and subsequent earnings growth in bank mergers. Bank mergers, in which there is a stock for stock exchange, are different from many industrial mergers in that there is usually an initial dilution in earnings per share. This dilution is a consequence of the relative parity of bank P/E ratios as opposed to non-financial institutions. For example, at year-end 1995, the ten largest banks in the country all had P/E ratios that fell between nine and thirteen. This parity, accompanied by the high premiums that are generally paid, leads to initial dilution.

This initial dilution can only be overcome by a more rapid post-merger earnings growth by the holding company. Both the initial dilution and subsequent growth are also influenced by the relative size of the participating institutions and the absence or presence of synergy.

It is important that financial planners select a sufficiently long time horizon to analyze all the negative and positive considerations and to determine if the net payoff is sufficient to justify the acquisition. If banks do not do this, certainly security analysts and institutional investors will do it for them, and the treatment of the acquiring bank's stock in the market will reflect their conclusions, either positively or negatively.

ENDNOTES

1. If the stock buyback plan is totally unrelated to a merger, the waiting period is six months.

2. Another approach would be to determine the total purchase price and divide by the value of BHC shares.

    (300,000 TARGET shares × 1.5 × $40) ÷ $40

    $18,000,000 ÷ $40 = 450,000 shares

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