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1. See Mullineaux (1976, p. 277).

2. See the succinct summary of Williamson's views and supporting empirical evidence in *Armour and Teece* (1978).

3. It is also possible that the expected net benefits of consolidation are dependent on size and other characteristics of a particular MBHC.

4. In many of these states, MBHCs partially consolidated their subsidiaries. Such companies were not included in this study because of the heterogeneous nature of *their* organizational changes.

5. The states are New York, Florida, Ohio, New Jersey, Virginia, Alabama, and Tennessee. The number of companies drawn from each state is seven, three, three, one, four, two, and one respectively.

The Impact of Bank Holding Company Consolidation: Evidence from Shareholder Returns

by Gary Whalen

Many states have chosen to legally restrict intrastate branching by banks to some degree. In a large proportion of such states, banks are able to circumvent the prohibition on statewide branching because they are permitted to adopt a multibank holding company (MBHC) form and to acquire affiliate banks throughout the state. However, because subsidiary banks in a MBHC continue to be separately incorporated entities, and because a number of legal-regulatory impediments to full organizational integration exist, it has been argued that MBHCs are imperfect substitutes for branch banking systems? That is, MBHCs may be less able to exploit size-related economies than pure branch banking organizations.

On the other hand, researchers such as O. Williamson have argued that it might be optimal for relatively large firms to operate as multi-divisional holding companies, rather than to merge all operating units into a single subsidiary.²

Beginning with New York in the mid-1970s, a number of states have amended their branching laws to permit MBHCs to transform their affiliates into branches by merging them into one large bank subsidiary (or several large ones). Interestingly, in states where such activity has been authorized, MBHCs have chosen to consolidate their subsidiary banks in varying degrees suggesting that the management of competing companies disagree about the expected net benefits of consolidation or, alternatively, about the costs of retaining the MBHC form.³

No empirical evidence currently exists on the net benefits of holding company consolidation. Such evidence could be of value because legislation authorizing such activity is currently being considered in several states. Measurement of the impact of total consolidation on the equity value of the consolidating MBHC is the subject of this study.⁴

In brief, the expected net benefits of consolidation are inferred by examining the behavior of the daily stock returns of a sample of 21 bank holding companies in seven states when the intention to merge their affiliates is first announced.⁵ The behavior of their stock returns

6. See Fama et al. (1969).

7. For various applications of the event study technique, see any of the various studies cited in the references.

8. See the discussion in Eisenbeis et al. (1984, p. 893) and in Jain (1985, pp. 221-22).

9. There is some fragmentary survey evidence that suggests that the impact of consolidation might be negative, particularly in the short run. There are several reasons this might be the case. Benefits of consolidation could be long-term and/or non-pecuniary. For example, consolidation might permit the parent to limit subsidiary risk-taking. In addition, loss of subsidiary independence might lower morale and productivity. See the discussion in the Association of Bank Holding Companies (1978, pp. 24-29).

10. Some responding MBHCs reported that organizational change was undertaken in response to financial difficulties. See Association of Bank Holding Companies (1978, p. 34).

over some period containing the announcement date presumably reflects investor estimates of the impact of the organizational change on the future profitability and market value of the banking organization. The event-study framework first used by Fama et al. (1969) is employed!

I. The Event Study Framework

In the event-study framework, the focus is on the observed behavior of a sample of firms' stock market returns, actually the "abnormal" portion of these returns, around the time at which some material development (the event) potentially affecting each firm's market value is initially made known.⁷ "Abnormal returns" presumably reflect the capital market's estimate of the expected net impact of the development on the future profitability and market value of the firm. Abnormal returns may be observed prior to the event either because of market anticipation or leakage of information about the event. In an efficient market, only normal returns should be evident after the new relevant information is fully digested by market participants. However, if the announcement represents a strategic management decision, it is possible that abnormal returns prior to the event may precipitate rather than reflect the impact of the decision. The time pattern of the abnormal returns may suggest the direction of causality.⁸

In this study, the critical event is each MBHC's first public announcement of the intention to consolidate all of its subsidiary banks and effectively transform itself into a branch banking organization. Positive abnormal returns around the event date suggest that the announced consolidation is expected to boost future profitability and to generate net benefits for holding company shareholders.

The interpretation of negative abnormal returns is more difficult. Such returns may indicate that investors expect the change to depress the holding company's market value?

Alternatively, because the decision to consolidate is a strategic one, the announcement might be the result rather than the cause of the negative abnormal returns.¹⁰ Again, the timing of the returns should suggest which one of these interpretations is correct. In particular, negative abnormal returns very close to the announcement date suggest that the announcement is responsible for the negative returns, rather than the reverse.

It should be noted that the discovery of significant abnormal returns only provides insight on the consolidation impacts expected by shareholders. The presence of abnormal returns does not permit the analyst to unambiguously determine the effect of consolidation on social welfare. For example, positive abnormal returns could reflect either expected gains in efficiency due to consolidation or expected profitability increases due to consolidation-related changes in competition at the local level. In the latter case, the shareholders gain comes at the expense of holding company customers.

II. Methodology

The basic procedure used to calculate the abnormal returns for each company in this study is the same as that used in a large number of previous event studies published to date.

First, the event date for each company had to be determined. This date was defined to be the date on which a company's intention to consolidate was first reported in the financial press. These dates were discovered by searching the indexes of three publications: The Wall Street Journal, The American Banker, and Funk and Scott's Index of *Corporations* and *Industries*. Thus, announcement dates (AD), rather than effective dates, were used as event dates. In efficient markets, investors presumably react around the time at which a material development is announced rather than when the announced action is taken, and so cause the firm's stock price and market value to adjust around announcement dates rather than effective dates.

11. *Different estimation periods were tried, but this did not change the reported results in any material way.*

12. *A number of researchers have found that there is a strong industry effect on the returns of bank stocks and have argued that this influence should be controlled for in event studies of banking firms. See Eisenbeis et al. (1984, p. 883), Shick and Sherman (1980), and Keen (1983).*

13. *Alternative versions of equation (2) were estimated using techniques suggested in Scholes and Williams (1977) and Dimson (1979) to correct for statistical problems caused by infrequent securities trading. In addition, standardized abnormal returns were generated using the technique reported in Linn and McConnell (1983). Neither of these two methods produced results different from those reported and so are not presented.*

14. *The average proportion of the organization's total assets accounted for by the lead bank for these three large holding companies was about 98 percent, vs. about 56 percent for the rest of the sample.*

Second, an interval around each company's event date, during which the impact of the event is expected to be discernible had to be determined. In this study, daily stock return data were used, and abnormal returns over the interval beginning 120 trading days before and ending 90 trading days after each company's event date were generated and examined? This period will be referred to here as the examination period.

Third, one of a variety of methods had to be used to generate "normal returns" for each company over the examination period. The first step in this process was to estimate a form of the "market model" equation for each company over the 140-day period beginning 260 trading days before its event date. This 140-day period is referred to as the estimation period. In the market model, the stock returns of a firm in any period are presumed to be a linear function of returns on a broad market index and occasionally of a second factor, the returns on an industry index. In this paper, the reported results were obtained using a two-factor version of the market model.¹² Symbolically, the estimated equations had the following general form:

$$(1) \quad R_{jt} = a_j + b_{1j}R_{mt} + b_{2j}R_{bt} + e_{jt},$$

where

R_{jt} = daily continuously compounded rate of return of company j,

R_{mt} = daily continuously compounded rate of return of Standard and Poor's 500 Index,

R_{bt} = daily continuously compounded rate of return of OTC Index of bank stocks,

e_{jt} = a stochastic disturbance term with standard properties, and

a_j, b_{1j}, b_{2j} = regression coefficients to be estimated.

"Normal returns" for each company over the examination period are simply its predicted returns obtained using its estimated market

model equation and realized returns on each of the two stock indices.¹³

"Abnormal returns" for each company over the examination period were generated by subtracting normal returns from realized returns. Symbolically, abnormal returns were calculated using equation (2) below:

$$(2) \quad ar_{jt} = R_{jt} - RHAT_{jt},$$

where

ar_{jt} = "abnormal return" for the jth company,

$RHAT_{jt}$ = the predicted "normal return" for the jth company obtained using equation (1).

Because of the possibility that the returns of various companies might be affected by a variety of company-specific developments (aside from the specific event of interest) during the examination period, the abnormal returns of each company were not analyzed individually. Rather, as is typically done in event studies, various portfolios of subject firms were formed in event time, and the abnormal returns of the companies included in the portfolio were averaged cross-sectionally at each point in event time over the examination period to produce a series of average abnormal returns (AAR). Then this series was cumulated over various segments of event time to produce a cumulative average abnormal return measure (CAAR) for the particular sample of companies. These steps are represented in equation (3) and (4), respectively:

$$(3) \quad AAR_t = (1/J) \sum_{j=1}^J ar_{jt},$$

$$(4) \quad CAAR_{t_2, t_1} = \sum_{t=t_1}^{t_2} AAR_t,$$

where

AAR_t = the average abnormal return at event date t,

J = the number of companies in the sample,

$CAAR_{t_2, t_1}$ = the cumulative average abnormal return over the t₂ - t₁ trading day interval of event time.

The sign, size, and statistical significance of the cumulative average return measures indicate the capital market's estimate of the market value impact of MBHC consolidation and are the focus of the analysis in this paper.

If the event is perceived to have no signifi-

cant impact on firm value, both the average return and cumulative average return measures should fluctuate randomly around zero over the examination period. If, on the other hand, the event is expected to have a beneficial impact on future firm profitability and market value, a preponderance of the average abnormal returns in the interval prior to the announcement date should be positive, causing the cumulative average abnormal return measure to be positive as well. A run of negative average abnormal returns in this period, due either to perceptions that the costs of consolidation will outweigh the benefits, or possibly to some other exogenous factor, will cause the cumulative average return measure to be negative.

If markets are efficient, and the consolidation announcement is responsible for the average abnormal returns observed, any marked runup or decline in the cumulative average return measure should cease once the information is fully digested by the market. It seems reasonable to expect that this process should be complete by the end of the day following the announcement date.

III. Results

Average and cumulative average abnormal returns for selected trading days over the period from 90 trading days before to 60 trading days after the announcement date for the entire sample and several subsamples are presented in tables 1 to 3. The subsamples exclude one or more very large money center institutions. The rationale for excluding such institutions from the analysis is twofold. First, virtually all of their banking assets were concentrated in their lead institution prior to consolidation. Thus, consolidation might not strongly influence their market value.⁴ Second, two of these three institutions announced their consolidation in 1975, when money center bank stocks were depressed due to the deep recession and related large loan losses.

Table 1 Average and Cumulative Average Abnormal Returns
Entire sample

Event date	AAR	CAAR	NP ^a
AD - 90	-.0019	-.0019	8
AD - 85	-.0019	-.0165	12
AD - 80	.0067	-.0102	16
AD - 75	.0055	.0006	12
AD - 70	.0015	-.0066	10
AD - 65	-.0043	-.0141	8
AD - 60	-.0002	-.0188	9
AD - 55	-.0025	-.0237	7
AD - 50	.0020	-.0177	10
AD - 45	-.0016	-.0194	8
AD - 40	-.0007	-.0319	12
AD - 35	-.0045	-.0358	5
AD - 30	.0013	-.0402	10
AD - 25	-.0005	-.0427	11
AD - 20	-.0032	-.0500	6
AD - 15	-.0055	-.0580	3
AD - 14	-.0050	-.0631	8
AD - 13	.0045	-.0586	12
AD - 12	.0034	-.0551	12
AD - 11	.0015	-.0537	10
AD - 10	-.0039	-.0576	7
AD - 9	-.0032	-.0608	8
AD - 8	-.0036	-.0644	10
AD - 7	.0044	-.0600	13
AD - 6	.0018	-.0582	9
AD - 5	-.0008	-.0590	8
AD - 4	-.0017	-.0608	12
AD - 3	-.0013	-.0621	9
AD - 2	.0018	-.0602	11
AD - 1	.0020	-.0582	13
AD	-.0002	-.0585	7
AD + 1	.0034	-.0551	14
AD + 10	-.0034	-.0659	4
AD + 20	-.0024	-.0645	12
AD + 30	.0005	-.0656	9
AD + 40	-.0008	-.0606	8
AD + 50	.0041	-.0577	10
AD + 60	-.0018	-.0616	7

a. Number of companies with positive residuals.

15. Again, it is possible that MBHCs consolidate to lower profit variability, rather than raise profitability.

A plot of the CAAR measure for the entire sample over the complete examination period appears in figure 1. Plots for the two subsamples are similar and are not included. CAAR measures calculated over various sub-intervals of the examination period and associated test

statistics appear in tables 4 to 6. The methods used to develop the test statistics are detailed in the appendix.¹⁵

Examination of the plot and the data in the tables reveal that beginning roughly 50 to 60 trading days prior to the announcement date, the CAAR measures turn negative and decline more or less steadily until the event date. The results are remarkably similar, regardless of the sample used. Formal tests indicate that the negative cumulative average abnormal return measures calculated from AD - 90 to AD + 1 are significantly different from zero for all three samples (see tables 4 to 6).

In the post-announcement period, the CAAR measures generally fluctuate around the level attained on AD + 1, which implies that average abnormal returns are essentially random during this period. Formal tests confirm that the CAAR measures calculated in this time period are not significantly different from zero.

Thus, if one looks only at the cumulative average return measures calculated beginning on AD - 90 and ending on AD + 1, the results suggest that investors expect consolidation to generate negative net benefits. This finding raises questions about the motives of holding company management.¹⁵

However, as noted above, the decision to consolidate is a strategic one and could be made in response to deteriorating corporate performance. This suggests that the impact of consolidation, particularly any positive impact, might be evident only for a relatively short time immediately around the announcement date. Accordingly, cumulative average abnormal return measures and appropriate test statistics were calculated over a variety of shorter sub-intervals within the examination period.

The data in tables 4 to 6 reveal that negative average abnormal returns in the pre-announcement period were heavily concentrated in the period from AD - 45 to AD - 8. CAAR meas-

Table 2 Average and Cumulative Average Abnormal Returns Excluding Citicorp

Event date	AAR	CAAR	NP ^a
AD - 90	-.0025	-.0025	7
AD - 85	-.0015	-.0142	12
AD - 80	.0073	-.0075	16
AD - 75	.0049	-.0006	11
AD - 70	.0017	-.0057	10
AD - 65	-.0052	-.0137	7
AD - 60	.0005	-.0167	9
AD - 55	-.0031	-.0203	6
AD - 50	.0018	-.0152	9
AD - 45	-.0024	-.0171	7
AD - 40	-.0010	-.0307	11
AD - 35	-.0041	-.0327	5
AD - 30	.0009	-.0371	9
AD - 25	.0012	-.0397	11
AD - 20	-.0028	-.0446	6
AD - 15	-.0054	-.0515	3
AD - 14	-.0045	-.0560	8
AD - 13	.0042	-.0518	11
AD - 12	.0030	-.0489	11
AD - 11	.0022	-.0467	10
AD - 10	-.0035	-.0501	7
AD - 9	-.0038	-.0539	7
AD - 8	-.0024	-.0563	10
AD - 7	.0050	-.0513	13
AD - 6	.0021	-.0493	9
AD - 5	-.0016	-.0508	7
AD - 4	-.0014	-.0522	12
AD - 3	-.0004	-.0526	9
AD - 2	.0032	-.0495	11
AD - 1	.0033	-.0461	13
AD	-.0008	-.0470	6
AD + 1	.0019	-.0451	13
AD + 10	-.0027	-.0584	4
AD + 20	-.0012	-.0511	12
AD + 30	-.0006	-.0569	8
AD + 40	-.0008	-.0493	8
AD + 50	.0072	-.0424	10
AD + 60	-.0020	-.0514	6

a. Number of companies with positive residuals.

ures calculated during this interval and the AD - 45 to AD - 3 period are negative and significant.

In contrast, CAAR measures calculated from the AD - 7 to AD + 1, AD - 2 to AD + 1 and AD - 2 to AD - 1 are uniformly positive,

although their statistical significance is marginal. For the subsamples excluding the large money center institutions, the CAAR measures approach significance at the 10 percent level (two-tail test) and are significant for the AD - 2 to AD - 1 period.¹⁶

Table 3 Average and Cumulative Average Abnormal Returns
Excluding three large money-center banks

Event date	AAR	CAAR	NP ^a
AD - 90	-.0018	-.0018	6
AD - 85	-.0015	-.0147	11
AD - 80	.0084	-.0074	15
AD - 75	.0039	-.0043	9
AD - 70	.0013	-.0091	8
AD - 65	-.0032	-.0161	7
AD - 60	-.0003	-.0181	8
AD - 55	-.0037	-.0210	5
AD - 50	.0007	-.0161	7
AD - 45	-.0013	-.0163	7
AD - 40	-.0003	-.0319	11
AD - 35	-.0025	-.0303	5
AD - 30	.0009	-.0374	8
AD - 25	.0007	-.0381	9
AD - 20	-.0037	-.0424	4
AD - 15	-.0052	-.0471	3
AD - 14	-.0038	-.0509	8
AD - 13	.0006	-.0503	9
AD - 12	.0006	-.0497	9
AD - 11	.0017	-.0480	9
AD - 10	-.0027	-.0507	7
AD - 9	-.0009	-.0516	7
AD - 8	.0026	-.0490	10
AD - 7	.0016	-.0474	11
AD - 6	-.0011	-.0485	7
AD - 5	-.0009	-.0494	6
AD - 4	-.0001	-.0494	11
AD - 3	-.0003	-.0497	8
AD - 2	.0025	-.0472	10
AD - 1	.0031	-.0441	12
AD	-.0004	-.0446	6
AD + 1	.0019	-.0427	11
AD + 10	-.0032	-.0532	3
AD + 20	-.0020	-.0504	10
AD + 30	-.0007	-.0588	7
AD + 40	-.0024	-.0516	6
AD + 50	.0074	-.0450	8
AD + 60	-.0004	-.0501	6

a. Number of companies with positive residuals.

IV. Summary and Conclusions

The results do not provide strong support for the contention that subsidiary bank consolidation has a large positive impact on the expected future profitability and market value of MBHCs. In fact, negative significant cumulative average abnormal returns are observed for several time periods beginning before and ending just after the announcement date. The data indicate that the bulk of the negative average abnormal returns are clustered in the period beginning roughly 45 trading days before and ending just prior to the announcement date. These results suggest that investors expect that the costs of consolidation typically outweigh any benefits.

If this interpretation of the results is correct, it is difficult to explain why holding company management pursues such a course of action. It may be that partial rather than total consolidation is optimal for the typical MBHC. The observed preference of MBHCs for partial consolidation lends credence to this view. Alternatively, MBHC management might consolidate to reduce profit variability rather than raise profitability.¹⁷ At any rate, the evidence indicates that the inability to consolidate does not impose significant efficiency costs on MBHCs. The implication is that legislation permitting total consolidation is likely to generate marginal benefits.

However, cumulative average abnormal returns are positive over very short intervals immediately around the consolidation announcement date and approach statistical significance in some cases. In particular, the

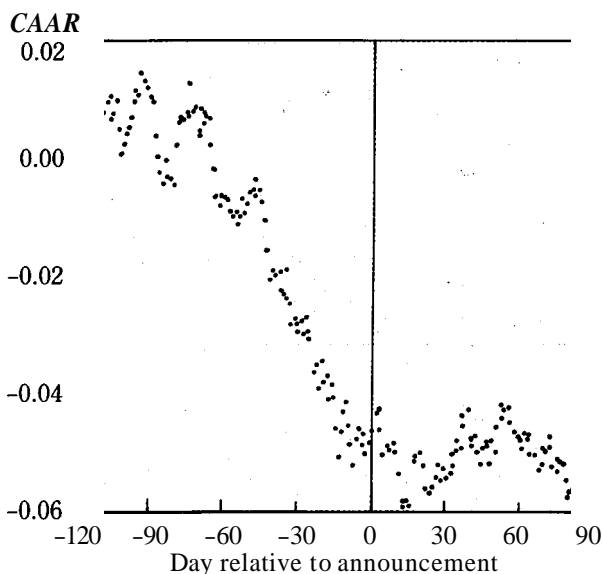
16. It should be noted that total consolidation is not the only way to limit subsidiary risk-taking. Selective corporate control over certain key subsidiary decisions and access to timely subsidiary performance data would also allow the parent company to monitor and limit the risk-taking of subsidiaries, while retaining the MBHC form.

17. Most of the CAAR measures calculated over short intervals around the announcement date are significant at the 10 percent level, if a one-tail test is used.

subsample results suggest that consolidation is expected to yield greater benefits for smaller MBHCs, which makes sense intuitively. Positive cumulative average returns following negative cumulative returns also suggest that consolidation might be the result rather than the cause of poor performance and does generate positive expected net benefits, albeit of rather modest proportions.

It should be noted that the failure to find a large positive consolidation impact could be due to a number of factors. The sample size is rather small. Further, although great care was taken in correctly identifying announcement dates, it is possible that the intention to consolidate may have been made public by some companies prior to the date used in this study. Other contaminating events, such as earnings or merger announcements, may have influenced the reported results. It is also possible that some part of the holding company stock price reaction may have occurred when it became apparent that state laws would be changed to permit consolidation, rather than when the company announced this action.

Fig. 1 Cumulative Average Abnormal Returns



Company returns might also be influenced by other provisions of the enacted legislation that affected competitive conditions throughout the state. More research on this issue is necessary before the findings presented here can be accepted as definitive.

Appendix

The procedure used to calculate the estimated standard errors of the CAAR measures and the resultant t-statistics is the same as that used in Ruback (1982) and several other event studies. The formula used to compute the t-statistics is given in equation (A1) below:

$$(A1) \quad t = CAAR_{t2, t1} / se(CAAR_{t2, t1})$$

where

$CAAR_{t2, t1}$ = the cumulative average abnormal return over the $t2 - t1$ trading day interval of event time, and

$se(CAAR_{t2, t1})$ = estimated standard error.

The formula used to calculate this standard error is given in equation (A2) below:

$$(A2) \quad se(CAAR_{t2, t1}) = [Q \cdot \text{var}(AAR) + 2(Q - 1) \cdot \text{cov}(AAR)]^{1/2},$$

where

$$Q = t2 - t1 + 1,$$

$\text{var}(AAR)$ = the variance of the AAR_t series calculated using the following 60 trading days: AD - 120 to AD - 91 and AD + 61 to AD + 90,

$\text{cov}(AAR)$ = the covariance of the AAR_t series calculated over the same 60 day interval.

This formulation adjusts the estimated standard error for observed autocorrelation in the

AAR_t series, possibly introduced by the clustering of events in calendar time.

Table 4 Cumulative Average Abnormal Returns: All Companies ($J = 21$)

Time period	CAAR	t-statistic
AD - 90 to AD + 1	-.0551	-2.27 ^a
AD - 45 to AD + 1	-.0373	-2.14 ^a
AD - 45 to AD - 8	-.0466	-2.99 ^a
AD - 45 to AD - 3	-.0443	-2.67 ^a
AD - 7 to AD + 1	.0093	1.25
AD - 2 to AD + 1	.0070	1.43
AD - 2 to AD - 1	.0039	1.18
AD + 2 to AD + 60	-.0066	-0.34

Table 5 Cumulative Average Abnormal Returns: All Companies Except Citicorp ($J = 20$)

Time period	CAAR	t-statistic
AD - 90 to AD + 1	-.0452	-1.98 ^a
AD - 45 to AD + 1	-.0304	-1.88 ^a
AD - 45 to AD - 8	-.0416	-2.84 ^a
AD - 45 to AD - 3	-.0379	-2.43 ^a
AD - 7 to AD + 1	.0113	1.57
AD - 2 to AD + 1	.0076	1.59
AD - 2 to AD - 1	.0039	1.95 ^a
AD + 2 to AD + 60	-.0063	-0.34

Table 6 Cumulative Average Abnormal Returns: All Companies Except Three Large, Money-Center Banks ($J = 18$)

Time period	CAAR	t-statistic
AD - 90 to AD + 1	-.0427	-1.94 ^a
AD - 45 to AD + 1	-.0302	-1.93 ^a
AD - 45 to AD - 8	-.0346	-2.48 ^a
AD - 45 to AD - 3	-.0347	-2.33 ^a
AD - 7 to AD + 1	.0063	0.91
AD - 2 to AD + 1	.0070	1.52
AD - 2 to AD - 1	.0056	1.72 ^a
AD + 2 to AD + 60	-.0073	-0.42

a. Significant at 10 percent level, two-tail test.

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