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A MULTIPLE-METRIC STUDY OF THE RETURNS TO SHAREHOLDERS: THE CASE OF BANK HOLDING COMPANY MERGERS

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Abstract

This research is an event study that deals with shareholder reaction to the announcement of the merger of two bank holding companies (BHC). The work spans the time period 1980-1987. The period was chosen because of its correspondence with significant deregulation of the industry and significant swings in economic activity. The changing economic activity during the period allowed the study of the deregulation effects in different economic climates. The study employs three single-index and two double-index econometric models. An index of bank stocks was also developed to facilitate the analysis.

The results of this study provide additional evidence on 1) the significance of bank merger announcements, 2) the comparative announcement effects across exchanges, 3) a comparison of acquiring versus acquired effects, and 4) evidence on the consequences of model choice.

It is found that positive abnormal returns accrue to the shareholders of the acquired firm. The abnormal returns to the shareholders of the acquiring firm are either significantly negative or zero and are stock exchange dependent.

INTRODUCTION

The increase, in the 1980'S in the number of business combinations has lead to a commensurate increase in research concerning the factors that cause firms to make these acquisitions. A great deal of this research has dealt with the returns to common shareholders of acquiring and acquired firms. The amount of money involved as well as the number of affected companies grew significantly in the 1980's. This research deals with the returns to shareholders of the relatively large banking firms and bank holding companies (BHC's) involved in mergers and acquisitions. The shares of these BHC's trade on an organized exchange, primarily the over-the-counter exchange (OTC).

Empirical studies of mergers and acquisitions have generally concluded that there are gains available to the stockholders of the target firm.

The market and risk-adjusted model is used in this study as the basis for the measurement of abnormal returns. The study is econometrically unique in that it employs three single-index models and two double-index models.

There are several reasons to differentiate between this study of BHC's and the general studies of merger and acquisition activity. Many of the non-financial mergers were the result of a proxy fight. Such proxy fights are rare in the banking industry.

This work spans a period (1980-1987) during which considerable changes were occurring in the economy and the industry. This time period was chosen for several reasons. Deregulation of the industry both in terms of pricing and location was moving at an extremely rapid pace during the period with the initial deregulation drive begun in the late 70's essentially complete by 1987. Economic activity accelerated in the post 1982 period as well and continued through the entire period studied. Studying this period allows an assessment of the effects of

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deregulation during a time of significant enough economic growth to allow the affected organizations to react to the changes.

This study also differs from the prior studies of the banking industry. Those studies generally employed much smaller sample sizes than those employed here. There are 52 acquiring firms whose shares trade on the OTC in the sample, 21 acquiring firms whose shares trade on the NYSE/ASE, and 44 acquired firms whose shares trade on the OTC. The acquired sample from the NYSE/ASE was only 3 firms and therefore was not subjected to any statistical analysis. Even those studies that had similar sample sizes were, in many cases, restricted in scope, i.e. only interstate mergers perhaps. This study also focuses on abnormal returns whereas much of the prior work is more concerned with merger premia—the payment above the most recent market price.

PREVIOUS RESEARCH

Among other researchers, Malatesta [10], Dennis and McConnell [4], and Halpern [7] have investigated returns to various classes of securityholders. The evidence is nearly unanimous concerning the returns to target shareholders. They are positive and significant. Returns to shareholders of acquiring firms are more difficult to generalize. Mandelker [11], Langetieg [9], Asquith [1], Malatesta [10], and Eckbo [6] all found that there were no significant abnormal returns—either positive or negative—to the acquiring firm's shareholders. Dodd [5] found small but statistically significant negative abnormal returns, and Asquith, Bruner and Mullins [2] found small but statistically significant positive returns. With the exception of the two cases mentioned above, it appears that the shareholders of the acquiring firm do not earn abnormal returns.

General studies of the returns to shareholders in the banking industry are less than abundant. Neely [12] examines 25 healthy bank acquisitions arranged without FDIC involvement. He finds significant positive returns of over 35% for target banks surrounding the announcement. Acquiring banks earn smaller but still positive returns of about 3%. Based on this, Neely concludes that the return pattern for financial institutions is similar to the pattern for non-financial institutions. Cornett and De [3], in a study with sample sizes similar to this one but dealing exclusively with interstate mergers, found significant abnormal returns to both bidding and target banks as well.

SAMPLE AND METHODOLOGY

Five models are used to generate estimated returns for the BHC's in the study. The construction of the models will be detailed later.

Acquisitions involving BHC's in the US require approval by the Federal Reserve. As a result, the merger approvals are detailed in the *Federal Reserve Bulletin*. Because it is assumed in an event study that the new information, in this case the merger announcement, is impounded in the security returns at a specific point in time, it is very important to be able to reliably identify the announcement date. From the *Bulletin*, during the period January 1, 1980 until April 30, 1988, mergers were selected and the announcement date and acquisition terms found in the *Wall Street Journal Index*. All of the mergers found in the *Federal Reserve Bulletin* were also found in the *Wall Street Journal Index*.

The sample was then screened so that the mergers met the following requirements:

- 1) The institutions, both acquired and acquiring firms, were headquartered in the United States. This eliminated any concern with currency rates of exchange and assured that if the securities of the BHC or bank were traded, they were traded on US security exchanges.
- 2) The common stock of the banks or BHC's must have been actively traded for the period 90 days prior to and 30 days after the announcement of the proposed merger. The period -90 to -10 days was used to estimate the normal returns to the stockholders based on several models detailed below. The period from -10 days to day +10 was used to analyze abnormal returns. Returns for the common stocks in the sample were obtained from the CRSP OTC and CRSP NYSE/ASE tapes.

- 3) The firms were involved in no merger or other confounding activity during the 121 day period. A confounding event in this context would be a merger announcement other than the one under study, an unexpected dividend or earnings announcement, a change in capital structure, major changes in management personnel that could have stock price ramifications, and so on. *The Wall Street Journal Index* was used to verify that there were no confounding events of any kind in the period. Approximately 10% of the firms in the original sample were eliminated because of confounding events.
- 4) The merger was successfully consummated during the period under study. This provides a less confounded sample because the probabilities are that the market did see the initial announcement as that of a successful merger.

The sample was well dispersed geographically with 24 and 26 states represented in the acquired and acquiring samples respectively. The geographical dispersion is important to the study because there are differences in the regulation of mergers by certain states. There were geographic compacts that existed, and some continue to exist today. These compacts allowed only BHC's from certain areas of the country to acquire banks in a home state. The diversification of this sample will reduce any significant impact stemming from such state-specific barriers. The total number of companies in the acquired sample from the OTC CRSP tape after screening was 44. The acquiring sample from the OTC CRSP tape was 52 while an additional 21 companies were found on the NYSE/ASE CRSP tape.

As shown in Table 1, the mergers ranged in value, defined here as the total compensation offered to the shareholders of the acquired firm, from 27.2 million dollars to 2.0 billion dollars.

Value (000,000)	Number of Firms	Average Acquisition Value (000,000)
0 to 100	69	47.2
101 to 500	37	264.4
501 to 1000	14	650.6
1001 to 2000	6	1463.3

TABLE 1

MODELS EMPLOYED

The first step in the study is to examine the abnormal returns, if any, that accrue to shareholders of the acquired and acquiring firms as a result of the announcement of a proposed merger. Several models have been used in various studies to accomplish this task. The models differ primarily in the assumptions they make about the characteristics of the data under study. The choice of the model is therefore data specific. The three that are most often used are: the mean adjusted-returns model, market adjusted-returns model, and the market and risk-adjusted returns model.

The market and risk-adjusted returns model, used in this study, is also called simply the market model. As constructed, it takes into consideration both market wide factors and the systematic risk of the security under study. It requires the estimation of beta using regression techniques. Several variations of the market model will be used in this study. The period -90 to -11 days will be used to generate the estimates of the model parameters. The return performance is examined using the following market models:

Equation 1

 $R_{it} = \alpha_i + \beta_i(R_{mt}) + e_{it}$

where R_{it} is the return of the ith security on day t, R_{mt} is the return of a market index on day t, and e_{it} is the error term with the properties, $E(e_{it})=0$, $COV(e_{it},e_{it+k})=0$ for all k not equal to 0, $COV(e_{it},r_{mt})=0$, and $VAR(e_{it})=\Delta^2$. This model is then used to calculate abnormal returns for each security:

Equation 2

 $AR_{it} = R_{it} - [\alpha_i + \beta_i(R_{mt})]$

Three single indexes market models are used and compared in the study of common stock returns. The first index used is the equally weighted returns index from the University of Chicago CRSP tape. The second index, developed specifically for this study, is an equally weighted index constructed from the returns of only the bank stocks on both the OTC and NYSE/ASE CRSP tapes. Because the sample for the study includes both NYSE/ASE and OTC stocks, it was necessary to determine if each sample should employ its own index or if a blended index was appropriate. Statistical tests were performed to determine the similarities between the bank stock indexes for the OTC and NYSE/ASE. A correlation analysis was performed between the two indexes for the period under study, 1980-1987. The correlation coefficient was found to be 0.6761. The mean and standard deviation of daily returns for the OTC index were 0.0009989 and 0.00335835 respectively, while for the NYSE/ASE index they were 0.0008072 and 0.00763585 respectively. The dissimilarities in the indexes, particularly the difference in the standard deviations, resulted in the use of the OTC bank index for the OTC analysis and the NYSE/ASE bank index for the NYSE/ASE analysis rather than one blended index for both. The third index will be constructed as above using the bank stock returns from the CRSP tape after having removed the firm under study. This will assure that there is no contamination of beta due to potential correlation between the market index and the security studied.

A two index model was also used in the study. The model was constructed as follows in such a way that the two indexes were orthogonal. The original model is of the following form:

Equation 3

$$R_{it} = \alpha_i + \beta_{i1}(R_{mt}) + \beta_{i2}(I_t) + e_{it}$$

where R_{it} is the return on the ith security on day t, R_{mt} is the return on the CRSP equally weighted index on day t, I_t is the return on the bank index constructed from the CRSP return data on day t, and e_{it} is the error term. There is every reason to believe that the two indexes—(R_{mt}) and I_t are at least somewhat correlated. This correlation can be removed in the following manner. Define:

Equation 4

$$I_t = z_0 + z_1(R_{mt}) + d_t$$

where z_0 and z_1 are regression coefficients and d_t is the error term exhibiting the normal properties as defined earlier, in particular that $COV(d_t, R_{mt})=0$. Because of this property of regression analysis, d_t is uncorrelated with R_{mt} . After estimating this regression with both of the bank indexes as the dependent variable and the equally weighted CRSP index as the independent variable, the residuals were retained and used in the following model:

Equation 5

$$R_{it} = \alpha_i + \beta_{i1}(R_{mt}) + \beta_{i2}(d_t) + e_{it}$$

where all variables are defined as above and d_t is the residual from the regression detailed in [4] above. Note that the independent variables in this regression are orthogonal and therefore are not subject to difficulties with multicollinearity. Abnormal returns are defined under this model as:

Equation 6

 $AR_{it} = R_{it} - [\alpha_i + \beta_{i1}(R_{mt}) + \beta_{i2}(d_t)]$

The statistical significance of the event period abnormal returns under each of the five models will be tested under the null hypothesis that the returns during the event period are 0. In all cases, the abnormal returns are averaged across firms for each day in the 21 day event window. The following statistic will be used to test the hypotheses:

Equation 7

$$\sigma_{AR} = \left[\frac{1}{80} \sum_{\substack{T=-90\\T \neq t}}^{-11} (\overline{AR}_T - AAR)^2\right]^{1/2}$$

with

$$AAR = \sum_{\substack{T=-90\\T\neq t}}^{-11} \overline{AR}_T / 100$$

RESULTS

The studies cited in the literature in the area of mergers and acquisitions have provided relatively consistent findings. Those findings were that the shareholders of acquired firms receive statistically significant positive abnormal returns, while the shareholders of the acquiring firms receive either negative or zero abnormal returns.

This study differs in several ways from earlier work. The first difference is in sample size. Previous merger studies in the banking industry were hampered by the lack of a complete daily return data base. The availability of the CRSP OTC returns tape has allowed the sample size in this area of research to be greatly expanded. This study also employs five different econometric models to provide estimates of the normal market and risk adjusted returns to shareholders. Included in these models are bank returns indexes for both the NYSE/ASE and the OTC markets that were developed specifically for this study. As pointed out earlier, the bank stock indexes were so dissimilar that separate analyses were performed for each. Also pointed out earlier, the sample of acquired firms from the NYSE/ASE was too small (three firms) to allow analysis. As a result, the next section deals with the computation of abnormal returns for the NYSE/ASE sample of acquiring firms, and the OTC sample of acquiring as well as acquired firms. These abnormal returns were computed for 21, 52 and 44 firms respectively. For each of the samples, complete results are presented for Model 5 only. Model 5 is the most comprehensive of the five variants.

ACQUIRED FIRM ABNORMAL RETURNS

Shown in Table 2 are the abnormal returns based on Model 5 for the acquired firms (the independent variables are the equally weighted market returns file from the CRSP OTC data base and the residuals from the regression of the equally weighted CRSP OTC index and the bank stock index less the returns of the stock under study).

The data in Table 2 support the findings of many of the other studies in the literature. Among others, Dodd [5], Asquith [1] and Dennis and McConnell [4] find that significant positive abnormal returns are present around the time of a merger announcement. As shown in Table 2, the statistically significant abnormal returns in this case begin to accrue at day -4, peaking at day -1 but still significant at day 0 (the day the announcement first appears in the *Wall Street Journal*). Of some note is the magnitude of the t values associated with the abnormal returns. The t value for day -1 is greater than 20. Results with this level of statistical significance were found by only one other researcher, Dodd [5]. Also, the abnormal returns cease to be significant beyond day 0. The finding of significant abnormal returns prior to day -1 and day 0 is unusual. Prior merger and acquisition studies that employed multi-industry databases have generally not found significant abnormal returns this far in advance of the announcement

date. It would appear from the data, that a significant amount of information leaked out well in advance of the first published announcement. Because of the nature of the banking industry, this could be the result of inquiries to regulatory bodies. Another possibility is that the acquiror could have begun to purchase shares of the target in the open market, putting upward pressure on prices. Prior studies in the banking industry have tended to use either weekly or monthly time periods. Because of this, it is possible that the return pattern found here was in evidence but was undetected in those studies. The fact that the combinations studied here are purely mergers and not tender offers may help explain the results as well. The element of surprise so crucial to successful tender offers may not be as important in negotiated mergers. As a result, the actions of firms involved may not be as guarded as they would be otherwise. Perhaps an even more significant difference between this study and the earlier banking studies is the sample size employed. The sample size in this study exceeds that of other studies by a great deal and is therefore assumed to be more representative.

Day Relative To Announcement	Average Abnormal Portfolio Rate Of Return
-10	0027
-9	0025
-8	.0026
-7	.0021
-6	.0034
-5	.0015
-4	.0075*
-3	.0064*
-2	.0150*
-1	.0834*
0	.0281*

TABLE	2
Acquired Firms Abnorma	l Returns - Model 5

*Statistically significant at the .05 level

ACQUIRING FIRM ABNORMAL RETURNS - OTC INDEX

The acquiring sample is divided into two distinct groups based on the index used. As explained above, the bank indexes for the OTC and the NYSE/ASE are different enough that they require separate analysis. The results from the OTC acquiring sample Model 5 are shown in Table 3.

This table is constructed in a similar manner to the table for the acquired sample. The abnormal returns are negative and statistically significant only on day -1. Otherwise, they are not statistically different from zero. Negative returns around day-1 and 0 for acquiring firms are not atypical of other studies in the merger literature. The magnitude of the abnormal returns as measured by the t tests is also quite similar to other merger studies. Dodd [5] finds similar negative and statistically significant results on the announcement of a merger. Prior research on acquiring samples has generally found either zero or negative abnormal returns on the announcement of a merger.

ACQUIRING FIRM ABNORMAL RETURNS - NYSE/ASE INDEX

Table 4 contains the abnormal returns for Model 5 employing the NYSE/ASE index. The analysis is identical to that done above with Model 5 and the OTC index except that the market index used is the CRSP NYSE/ASE index and the bank index contains only stocks from the NYSE/ASE database.

Average Abnormal Portfolio Rate Of Return
.0009
.0015
0021
.0003
0009
.0011
.0011
.0011
.0005
0058*
0014

 TABLE 3

 Acquiring Firm Abnormal Returns - Model 5 OTC Index

*Statistically significant at the .05 level

Note that in this case, the day -1 and 0 abnormal returns are negative but not statistically significant. These results are also not dissimilar to those from most other studies. Both Eckbo [6] and Asquith [1] find non-significant abnormal returns as a result of the announcement of a merger. However, James and Weir [8], in a study covering the period 1972 to 1983 find significant positive abnormal returns to the acquiring firm. Their study involved both OTC and NYSE/ASE traded banks. It employed sample sizes similar to this study but covered a much different time period. The difference in time period corresponds to a different regulatory environment in the industry, which could account for the differences between their study and this one.

From the data presented here, it appears that the results for this sample of bank holding companies is not markedly dissimilar to the results obtained with samples from other studies that typically crossed industry boundaries. The major difference between these results and those of prior researchers is the timing and magnitude of the statistically significant positive abnormal returns that accrue to acquired firm shareholders.

Day Relative To Announcement	Average Abnormal Portfolio Rate Of Return
-10	0023
-9	0051
-8	0014
-7	.0035
-6	.0005
-5	.0060
-4	.0004
-3	.0005
-2	0030
-1	0017
0	0002

 TABLE 4

 Acquiring Firm Abnormal Return - Model 5 NYSE/ASE Index

CONCLUSION

This research is an event study which deals with shareholder reaction to the announcement of the merger initiated by bank holding companies (BHC). The study employs several econometric models. A great deal of research has been conducted dealing with shareholder reaction to the announcement of the merger of non-financial firms. Significantly less work has been done using a sample of financial firms. The primary reason cited for this lack of research had been the lack of a data base of daily return data (several studies had been done employing weekly or monthly returns). The availability of the CRSP daily returns files, for both the NYSE/ASE and OTC solved this problem to a great extent. Most BHC's shares are traded on the OTC.

An additional methodological issue is the choice of an appropriate return generating model from which to measure abnormal returns. Since all firms are in the same industry, there exists the possibility of an industry effect as well as a market related effect. Given that sample sizes tend to be small, industry movements can materially affect the results of statistical tests. This study employs a larger sample size than previous studies and only considers securities traded on a daily basis. Thus, an announcement effect can be more accurately measured. Also, the construction of a BHC stock index specifically for this study allows the investigation of the effects of alternative models.

The results of this study provide additional evidence on 1) the significance of bank merger announcements, 2) the comparative announcement effects across exchanges, 3) a comparison of acquiring versus acquired effects, and 4) evidence on the consequences of choice of model.

The merger of BHC's has a significant impact on the shareholders of the acquired firm. These shareholders receive an average positive abnormal return over the two-day (day -1 and day 0) event period of approximately 5.5% which is significant at the .05 level. The positive abnormal returns also accrue to the acquired firm shareholders earlier in the event window, at day -4, than in most other studies.

The samples for the acquiring firms were divided between the OTC firms and the NYSE/ASE firms for the reasons stated above. The shareholders of the acquiring firms from the OTC suffered a negative abnormal two-day average return of approximately -0.35%, which was significant at the .05 level. The average two-day return to the holders of the NYSE/ASE firm's shares was approximately -0.12 but non-significant.

These results add support to the body of data that suggests that positive and significant abnormal returns accrue to the shareholders of target bank holding companies. The results for bidder shareholders is less clear. The results depend on the exchange on which the securities are traded. Given the differences in the requirements for exchange listing, the sample size, and the differences in following that various exchange provide, perhaps this should not be unexpected.

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