A MULTIPLE-METRIC STUDY OF THE RETURNS TO SHAREHOLDERS: THE CASE OF BANK HOLDING COMPANY MERGERS–PART II, THE SOURCE OF THE RETURNS

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Abstract

The initial thrust of this research (Thompson 1995) was an event study that dealt with shareholder reaction to the announcement of a merger of two bank holding companies (BHC). It was 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 negative or zero and are stock exchange dependent.

This paper details regressions analyses that were employed to attempt to isolate the underlying reasons for the abnormal returns. The results of the regressions indicate that, of the variables chosen, only the capital-to-assets ratio was significant for the acquired sample. None of the variables were significant for the acquiring sample.

INTRODUCTION

This research is a follow-up to prior work, Thompson (1995), that investigated the announcement effect of mergers in the banking industry. That work showed a significant positive return to target shareholders, and showed that the returns to bidder shareholders are exchange dependent. That research investigated the magnitude of abnormal returns that accrued to the shareholders of bidder and target banks and bank holding companies during the period 1980 through 1987.

During this period, considerable changes were occurring in the economy and the industry. Deregulation of the industry both in terms of pricing and geography was moving at an extremely rapid pace in the period 1980-1987. Economic activity, which had been quite restrained in 1980 and 1981 accelerated in the post 1982 period as well and continued through the remainder of the period studied. Under the historically volatile conditions that existed during this time period, it is assumed that discernible patterns would present themselves.

Other empirical studies of mergers and acquisitions involving various industries have generally concluded that there are gains available to the stockholders of the target firm. These studies have also concluded that a merger or acquisition is roughly a zero net present value proposition to the acquiring firm. Jensen and Ruback (1983) provide excellent detail of the studies done in mergers and acquisitions. The results of the studies, however, are not unanimous. They have involved the use of event study methodologies employing various models, indexes, and measures of abnormal performance.

The market and risk-adjusted model was used in the prior study as the basis for the measurement of abnormal returns. The study employed three single-index models and two double-index models. The single-index models used, respectively, the equally weighted market return index from the appropriate Center for Research in Security Prices (CRSP) data base, an index of only bank stock returns from CRSP, and the bank stock returns index, having removed the returns of the stock under study. The various reasons for having chosen these indexes, and a more detailed discussion of each of them is contained in Thompson (1995). The two-index models were constructed in such a way that the independent variables are orthogonal. This removes the possibility of multicollinearity. The five models were then used to estimate the expected returns accruing to the shareholders of the firms involved in the mergers. The level of abnormal returns were then measured and tested for statistical significance.

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This paper is an effort to ascertain the source of the abnormal returns. This is done by estimating regression equations using the average of the day -1 and day 0 abnormal returns as the dependent variable and various balance sheet, income statement, and demographic data as the independent variables. The SAS stepwise regression procedure is used. This study differs from the prior studies of the banking industry. Those studies generally employed much smaller sample sizes than have been 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. 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.

ANALYSIS OF TARGET SHAREHOLDER ABNORMAL RETURNS

Several variables may account for the abnormal returns to the holders of common stock in the acquired firm. Those to be studied here are asset size, geographical diversification, balance sheet composition, managerial efficiency, and market variables. Among them are:

ECONOMIES OF SCALE, SCOPE AND PRODUCT DIVERSIFICATION

There is reason to believe that the asset size of the acquired firm will have an impact on the level of abnormal returns. The crux of the size argument is that there may be some size in terms of assets such that the firm experiences maximum economies of scale and scope. It is argued that size becomes an important factor in activities such as the acquisition of funds at more attractive rates, establishment of an international operations base, and the allocation over a larger base of fixed expenses such as communication and computer systems. The relative asset size of the institutions involved will be the independent variable. Studies such as Clark (1988) and Hunter and Timme (1989) have shown that economies of scale appear to exist in banking institutions at asset levels below 5 billion dollars. Hunter and Wall (1989) point out that costs of production in financial institutions appear to be relatively constant for asset sizes up to 25 billion dollars. They also argue that "the bulk of the evidence suggests that, in most cases, the desire to improve production efficiencies through economies of scale appears to be a valid motivation for merging". It should be noted that these studies are very sensitive to their respective methodologies.

Larger BHC's also tend to be involved in more aspects of the banking business than are smaller banks. As a result, the acquisition of a larger bank will potentially provide the acquiring BHC with greater benefit than the purchase of a smaller one. There is a possibility that the combined entity will be of sufficient size to offer services that were not economically feasible prior to the merger. Services such as cash management and data processing operations are examples.

INTERSTATE MERGERS

The merger of two BHC's across state lines will potentially have strong diversification benefits. The ability to buy and sell loans and other investments notwithstanding, banks tend to be tied to the regional economy in which they operate. Laing and Rhoades (1988) show that the financial risk of the bank, measured by earnings volatility, can be reduced even by intrastate diversification. It is argued here that the benefits will be even greater in the case if interstate combinations. Assuming the two banks are from regions whose economies are not highly correlated with one another, portfolio benefits could be achieved. This would then - ceteris paribus - cause a higher value to be placed on the acquired bank by a potential acquiror from another region. This will be tested by using a dummy variable coding scheme to account for the type of merger - intrastate or interstate. It is expected that the abnormal returns to acquired firm shareholders will be greater in interstate mergers than in intrastate mergers.

U.S. TREASURIES AND AGENCY SECURITIES

The percentage of investments in U.S. Treasury and agency securities on the balance sheet of the acquired firm is expected to have a negative impact on the abnormal returns to the acquired firm's shareholders. This is due to the

fact that, as Beatty, Santomero and Smirlock (1987) point out, the average acquiror banks are less averse to balance sheet risk than the average acquired banks, and will therefore be unwilling to pay as much for a bank whose investment portfolio will require a great deal of change. They point out that there are several significant differences between the balance sheet averages for acquired and acquiring firms. Many of these differences have to do with the riskiness thereof. They point out that the acquiring banks on average have 1) a lower percentage of U.S. Treasury securities; 2) a lower percentage of total investments; and 3) a higher percentage of net loans than the acquired banks. The average maturity of the Treasury securities in the investment account of acquiring banks is also longer, 3 years -vs -2.55 years for the acquired banks, increasing the interest rate risk in the portfolio. These data point out that acquiror banks are more willing to accept both credit and interest rate risk than are typical acquired banks. It is argued that the level of expertise at the generally larger (acquiror) banks allows them to manage this increased credit and interest risk more effectively. It is expected that the sign of the regression coefficient as it relates to the percentage of U.S. Treasury securities in the investment account of the acquired bank will be negative.

LOANS

The effect of loans as a percentage of assets on abnormal returns of the acquired firm is somewhat ambiguous. While loans have the highest potential returns to the bank and could be viewed as an indication of goodwill and penetration in the bank's market, they are also among the least liquid of the investments on the balance sheet. The ability to readily sell some types of loans notwithstanding, this illiquidity would be a deterrent to an acquiring bank that wished to restructure the acquired bank in a short period of time. In a study covering an earlier time period (1971-1982), Hannan and Rhoades (1987) find that the coefficient of the loans to asset ratio in their study is not significant, the same conclusion is reached by Beatty, et al. (1987). Because the earlier studies differ significantly in sample size and time period, and because they focused on merger premia and not abnormal returns, the impact of the loans to assets ratio will be examined again in this study. Based on the changes in the competitive environment in banking during the 1980 - 1986 time period, the expected coefficient for this variable will be positive. This is due primarily to the fact that the competition for funds has raised the cost of funds. Opting for a increased level of relatively high yielding loans on the balance sheet of a potential acquired bank would appear to be very likely.

RETURN ON ASSETS

Several measures of managerial efficiency are also included in the analysis. The first is return on assets (ROA). ROA is chosen because it is a measures of many of the controllable factors facing the bank's management - factors such as business mix, income production, loan quality, expense control, and tax management. The relationship between ROA and abnormal returns is ambiguous. On one hand, the acquiring bank could prefer a bank that is well managed as measured by ROA. On the other hand, there are several authors who suggest that acquiring banks would prefer a bank with relatively low levels of ROA. This is primarily due to the fact that a poorly performing bank could be purchased for a lower price, ceteris paribus, than one that is well managed. This would be appropriate if the acquiring bank felt that it was capable of improving the performance of the poorly managed bank.

CAPITAL LEVELS

An additional measure of managerial efficiency is the level of capital that a bank maintains. The variable chosen is the capital to assets ratio. While the optimal capital level is a function of several factors including risk, it is often assumed that banks that hold excess capital are not utilizing that capital efficiently. As a result, an acquiring bank seeking a well managed target, would perhaps not take such a bank seriously as a merger candidate. However, during the period covered by this study several things occurred to complicate this efficiency argument. It became obvious that regulators were allowing some relatively large banks to fail resulting in losses to that bank's shareholders. This caused the capital issue to take on a new dimension in the minds of both regulators and shareholders. It is quite likely that the reaction on the part of regulators to the capital question and the reaction on the part of shareholders - the focus of this study - could be different. This new environment could as Shome, Smith and Heggestad (1986) point out place a premium on increasing capital to levels above those required by regulators. As a result, the managerial efficiency and safety issues may totally or partially offset one another causing the expected sign of the coefficient in the regression to be indeterminate.

DEPOSIT CONCENTRATION

Under the assumption that monopoly rents or profits will accrue to firms with large market shares, the deposit concentration for the combined firm in the acquired firm's market will be employed as an additional explanatory variable. The level of deposit concentration is also used extensively by the Justice Department and bank regulators, in particular the Federal Reserve. It is argued that the higher the deposit concentration, ceteris paribus, the higher will be the abnormal returns to the shareholders of the acquired firm. This would be the case because the combination could have significant market power after the merger - market power for which the acquiring firm would be expected to pay a premium. This market power could allow higher rates to be charged on loans and lower rates to be paid on deposits. Berger and Hannan (1989) find that, ceteris paribus, the rates of return to holders of MMDA accounts in the most highly concentrated markets are 25 to 100 basis points lower than the rates on the same instrument in the least concentrated markets. Daskin and Wolkin (1989) find that certain levels of concentration, are commensurate with significantly higher rates charged on commercial and industrial loans. Note that this study is concerned with only those mergers that were successfully consummated. Under these circumstances, the higher degree of concentration in the market could be expected to have the potential to generate higher returns to the acquiror. At the same time, however, it is not enough to stop the merger from taking place. The regression coefficient for the level of market concentration is expected to be positive.

DEPOSIT LEVELS

An additional concern of the regulators has become the reliance of BHC's on funds generated in the "hot money" market. The reduced level of regulation of the financial services industry and with it the increased interest rate elasticity of gathered funds has made this source of funds much more important. As Bowden (1989) points out, the percentage of liabilities and capital made up of large negotiable CD's has risen from virtually nothing in the 1960's to around 12% in 1988. Most of the increase has occurred during the 1980's. These funds - jumbo CD's and the like are extremely rate sensitive and, as a result of recent interest rate volatility, have created difficulty for some BHC's. Because there is generally an inverse relationship between bank size and the deposits to assets ratio, it is argued that a large BHC could acquire a more stable deposit base as a result of acquiring a smaller bank. Therefore, it is expected that in the regression, the variable for the deposits to assets ratio of the acquired bank will have a positive sign.

TARGET FIRM MARKET INCOME GROWTH

Several market specific variables of interest concerning the acquired firm's banking market could account for the level of abnormal returns that accrue to the target shareholders. It is quite possible that the acquiring bank looks as much at the characteristics of the banking market in which it contemplates an acquisition as it does the characteristics of any particular bank in that market. Several market characteristic variables have been suggested in the literature to account for premia paid in acquisitions. Rhoades (1987), Hannan and Rhoades (1987), and Amel and Rhoades (1989) are examples of this literature. Among the variables most often mentioned is the growth in the affluence of the target firm's market. The growth in family income during the period 1980-1987 is included as an independent variable. This variable tracks potential growth in population as well as growth in affluence of the population. It is argued that an acquiring firm will seek out those markets whose populations would more likely become customers for more of the services that the bank wishes to provide. It is likely that the greater the level of affluence, the greater would be the demand for such things as trust services, travel services and other products that provide banks with relatively high fee income and at the same time reduce the dependence on interest rate sensitive revenue. The expected sign of the coefficient is positive.

POPULATION GROWTH OF THE TARGET MARKET

An additional market variable to be explored is the growth of the population in the target market. For several of the same reasons cited above concerning target market affluence, this variable may be important. Because population growth has a tendency to coincide with growth in jobs, income, and other favorable attributes, this variable is included in the analysis. The sign of this coefficient is expected to be positive. It is likely that an

acquiring BHC would be willing to pay an amount commensurate with the growth in the target market to be able to take advantage of that growth. Population growth and the growth in family income variables were derived from U.S. Government Census statistics.

ANALYSIS OF BIDDER FIRM ABNORMAL RETURNS

A significant majority of studies have shown that the shareholders of the acquiring firm in a merger or acquisition neither gain nor lose. Jensen and Ruback (1983) summarize the major merger and tender offer studies. For the sample of successful mergers, the types in this study, they found that the typical abnormal return to the shareholders of the acquiring firm was zero. Of the studies that found abnormal returns different from zero, Dodd (1980), found that the shareholders of the acquiring firm suffered statistically significant negative abnormal returns while Asquith, Bruner and Mullins (1983) found statistically significant positive abnormal returns. The results of Thompson (1995) study show a statistically significant negative abnormal return on day -1 for the OTC exchange stocks, and negative but non-significant abnormal returns for the NYSE/ASE stocks. This negative abnormal return is present regardless of the return generating model used.

A regression analysis, similar to that performed above with the acquired firm abnormal returns, is performed using the abnormal returns to the acquiring firm's shareholders as the dependent variable. A two day average of these abnormal returns is used, as is the case with the acquired sample. The results of this analysis are important given the fact that the shareholders of the acquiring firms in this study receive negative abnormal returns as a result of a merger. A very legitimate question arises as to why the market for the shares of the acquiring firm reacts in a negative way to the announcement of a merger. The most obvious reason for any negative reaction of the market is the feeling that the acquiring BHC has paid more for the acquired bank than the market deemed it to be worth. Prior to the advent of the CRSP OTC data base, it was nearly impossible to test any price/value variable. The shares of the generally smaller target banks were often traded in such thin markets that the offer price/value relationship was suspect. Because thinly traded shares have been eliminated from this study, that problem does not exist. The hypothesis that the market reacts negatively to perceived overpayment on the part of the acquiring firm will be tested using the following price/value variables in the regression.

OFFER PRICE/BOOK VALUE

This variable measures the market premium over accounting book value, basically shareholder's equity per share, that the acquiring bank pays to make the acquisition. It is argued that the market reaction will be negative when the market feels that this ratio has reached too high a level. Over the past seven years, this ratio has ranged from 1.31 to 2.08. While the "correct" price of an acquisition is unobtainable, we posit that the measured premiums can serve as a proxy for any overpayment. As a result, the expected sign of the coefficient in this case is negative.

OFFER PRICE/EARNINGS PER SHARE

This variable measures the EPS multiple paid as a result of the merger offer. This variable has been about 15 during the 1980's. There is potential for the EPS of the entire BHC to be lowered significantly if the acquiring BHC overpays for the EPS of the target. This EPS dilution is of major concern to the holders of the acquiring firm's shares. Like the offer price/book value ratio, the sign of this variable is also expected to be negative. The EPS, used above, and the book value per share are derived from information, primarily the form FRY-9C provided by the Federal Reserve in Washington, D.C., and Standard and Poors industry reports.

RELATIVE SIZE

Asquith, Bruner and Mullins (1983) find that the relative size of the firms is an important factor in determining the size of the abnormal returns to the shareholders of the bidding firm in a merger. This study will also explore that relationship. The ratio of the asset size of the bidding and target firm will be used as an independent variable. The literature suggests that the sign of the coefficient for this variable will be positive. In other words, the gains to the shareholders of the bidding firm increase as the size of the target firm increases.

RESULTS

Regression Analysis - Acquired Sample

Regression analyses were performed to attempt to ascertain what factors drive the size of the market's reaction to merger announcements. Several similar studies in the literature such as Hannan and Rhoades (1987) and Rhoades (1987) have been performed using merger premia as the dependent variable. This analysis is similar to those but, as stated earlier, uses abnormal returns as the dependent variable.

The variables can be broken down into several categories.

Financial Statement Variables

TREAS   − the ratio of Treasury and Agency securities to assets
LOAN   − the ratio of loans to assets
RASSETS − the ratio of acquired firm assets to acquiring firm assets
ROA   − return on assets
CAP   − ratio of capital to assets
DEP   − deposits to assets ratio

Demographic Variables

CONC   − the deposit concentration of the combined firm in the acquired firm's market after
                  the merger as measured by the Federal Reserve
DEM   − the growth in family income in the acquired firm's market from 1980 to 1987
POP   − the growth in population in the acquired firm's market from 1980 to 1987

Regulatory Variable

IST   − this is a dummy variable that has the value 1 to indicate an interstate merger and a
                  value of 0 otherwise.. The results of the regression are shown in Table 1.

TABLE 1
Regression Results - Acquired Firm

Parameter	Parameter Estimate	Significance Level
RASSETS	-.049049	.3003
TREAS	-.004278	.3966
LOAN	.147099	.4909
ROA	1.561412	.7845
CONC	.114902	.6838
CAP	-2.430094	.0497
IST	-.012188	.7331
DEP	-.025594	.9054
DEM	-.754704	.6720
POP	.019300	.9889

CAP is the only variable that is significant. Several of the other variables such as, TREAS, LOAN, CONC and POP possess the sign that was predicted but are not significant. Other non-significant variables possess signs opposite of what was predicted. These variables are RASSETS, DEP and DEM. ROA, for which no sign was predicted, is also non-significant. The fact that IST is non-significant would indicate that a merger which crosses

state lines has little to do with the size of the abnormal returns as well. This variable was expected to be significant because it was thought that cross-state mergers would allow a great deal of diversification potential.

The lack of statistical significance for any of the regression coefficients except CAP could be a function of the changing bank management and regulatory environment. There is little evidence either in this study or in the literature to suggests that balance sheet and income statement variables are highly related to abnormal returns or to market premia. There are several potential explanations for this. The acquiring bank management may feel that even if the income statement numbers are not adequate, the bank could be returned to solid performance under its management. This could explain the lack of significance for ROA. The TREAS and LOAN variables were also non-significant but did carry the predicted negative and positive signs respectively. This is probably a function of the ability to sell some classes of assets and liabilities with relative ease and, as a result, change the composition of the balance sheet quite quickly. The relative size of the firms, RASSETS, was also non-significant and negative, the opposite sign from that predicted. This variable had been positive and significant in general merger studies such as Asquith, Bruner and Mullins (1983) and bank specific studies such as James and Weir (1987). James and Weir (1987) examined banks in a different time period than this study, which could account for the different results. CAP, for which no sign was predicted, has a negative coefficient and is significant. This would appear to indicate that acquiring BHC's place less value on target banks with "high" levels of capital. Hannan and Rhoades (1987), in a study of merger premia, find that high capitalization of target firms reduces the likelihood that the firm will be a takeover candidate. The results of this study are consistent with this argument. Another possible explanation for the significance of the CAP variable when other balance sheet variables are non-significant is the fact that capital would be the most difficult balance sheet account to change quickly. Unlike the sale of assets or liabilities, changing the level of capital could require repurchasing stock, or repaying subordinated debentures and so on. The fact that this could be somewhat costly and resisted by bank regulators could explain why capital is considered in the merger process and other variables are not. The demographic variables were all non-significant. The coefficients of POP and CONC were positive as predicted, but the coefficient of DEM was not. A possible explanation for the lack of significance involves the changing regulation concerning interstate banking. The finding that neither the growth in the target market nor the growth in affluence of that market are significant could be a function of the drive to not be left behind as other BHC's expand. The possibility exists that acquisitions are made to establish a presence in a market and to allow expansion from that base in the future. Under these circumstances, the characteristics of the market first entered would be less important than would otherwise be the case. Many of the firms in this sample were making their first acquisitions.

Regression Analysis - Acquiring Sample

A regression similar to that of the acquired sample was performed for the acquiring sample. While the results of the portfolio of acquiring firms indicates that the two-day average abnormal returns were non-significant, they were negative and there was significant daily variability. The results of this analysis are of interest because the literature contains numerous studies that show either negative or zero abnormal returns to the shareholders of acquiring firms as a result of a merger. Any data that could shed some light on the motives for the acquisitions that take place would be of value. The variables chosen were:

ASSRAT – the ratio of acquired firm assets to acquiring firm's assets;
BV   – the ratio of the offer price to the most recent book value of the acquired firm; and
EPS   – the ratio of the offer price to the most recent earnings per share of the acquired firm

The results of the regression shown in Table 2 indicate that none of the coefficients are statistically significant.

TABLE 2
Regression Results - Acquiring Sample

Parameter	Parameter Estimate	Significance Level
ASSRAT	.0025743	.7470
BV	.0033577	.4422
EPS	.0003106	.6281

Of the three variables, only the sign of ASSRAT is positive as predicted. It was argued that there would be a positive relationship between the size of the acquired firm relative to the acquiring firm and the amount that the bidder would be willing to pay. The reason for the positive hypothesized relationship was that given a larger target firm relative to the bidding firm, the benefits in terms of diversification and economies of scale should increase. These data do not support such an argument. The signs of the other variables, BV and EPS, are positive rather than negative as predicted. The negative relationship was predicted because it was suspected that the market, in this case the market for the shares of the acquiring firm, would react negatively to a bid that appeared to be "too" generous. While they are non-significant, the sign of the coefficients appear to indicate that the size of the bid is unrelated to the size of the acquiring firm's abnormal returns.

CONCLUSION

Regression analyses were performed to attempt to ascertain the source of the abnormal returns for acquiring and acquired samples of bank holding companies. These regressions are similar to others in the literature except that the dependent variable in this study is the two-day average abnormal return. In prior studies, the dependent variable was typically the premium paid relative to recent market prices of the target firm's shares.

The results of the regression analysis for the acquired firm find that only the CAP - (capital/assets ratio) - variable is statistically significant. The coefficient is negative. TREAS - (treasury/assets ratio), LOAN - (loan/assets ratio), CONC - (deposit concentration of the target market), and POP - (population growth of the target market) possess the predicted sign (-, +, +, and + respectively) but are non-significant. The variables RASSETS - (acquired firm assets/acquiring firm assets ratio), DEP - (deposits/assets ratio), and DEM - (family income growth of the target market) are also non-significant but possess the opposite sign (-, -, and - respectively) than was predicted. IST - (dummy variable to indicate interstate mergers) was non-significant. ROA - (return on assets) for which no sign was predicted, was positive but non-significant. These data appear to indicate that few variables are related to the abnormal return to the acquired shareholders.

The results of the regression analysis for the acquiring firm abnormal returns find no variables that are significant. Only ASSRAT - (acquired firm assets/acquiring firm assets) is positive as predicted. The variables BV - (offer price/book value of the target), and EPS - (offer price/earnings per share of the target) were non-significant and opposite in sign from that predicted, (+, +) respectively. The signs of the coefficients would appear to indicate that there is little relationship between the size of the bid by the acquiring firm and the acquiring firm's abnormal returns.

Given the sample size, it was anticipated that statistical significance would be found for several of the variables under study rather than just one (CAPITAL). Because of this, the results were scrutinized for possible statistical problems that could have contributed to the lack of significance. The most obvious potential problem, the presence of outliers, did not exist. The non-significance of all the variables except capital levels while certainly not expected is clearly supported by these data and this analysis. It would appear that acquiring banks are confident in their ability to change the attributes other than capital in relatively short order thus rendering them basically irrelevant in the acquisition decision.

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