

Information Effects of Loan Portfolio Quality on Bank Value

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Abstract

This paper tests whether loan loss reserve announcements by individual commercial banks can have contagion effects on the banking industry. The study finds that increased loan loss reserves related to LDC debt do not have an effect on other banks. Increased loan loss reserves related to bad real estate loans, however, elicit a negative share price response at other banks. The signal from a loss reserve adjustment is dependent on the reason for the adjustment. Although LDC debt problems are restricted to money center banks and are well publicized, real estate loan problems can be contagious throughout the industry. Consequently, signals of real estate loan problems at some banks can cause reduced valuation of other banks.

Introduction

Because commercial banks have somewhat similar asset and liability portfolios, it is not surprising that their performance levels often are related cross-sectionally. Yet in some cases loan portfolios across bank can be similar, but appear different because of accounting differences. Some banks may be more willing to recognize loss, while other prolong the inevitable. For this reason, investors may not rely exclusively on each bank's financial report to gain information about the loan portfolio. Instead they may attempt to use loan loss announcements by one or a few banks as a signal about the loan portfolio quality of others. The objective of this study is to determine whether some loan loss announcements serve as a signal. The existence of such signals is relevant not only to investors, but to credit rating agencies, bank creditors, and bank regulators.

The current objective is related somewhat to studies by Pettway (1976), Aharony and Swary (1983), Lamy and Thompson (1986), and Peavy and Hempel (1988) that test for contagion effects in the banking industry. The type of information that is assessed (loan loss reserve announcements), however, differs from the information assessed (bank failures) in those studies. The object of the current research also is related to studies by Madura and McDaniel (1989) and Musumeci and Sinkey (1989) that focus on loan loss reserve announcements

(LLRs). These studies, however, assess a round of announcements in 1987 that focused on LDC debt problems. This paper's goal is to determine whether the market reaction is dependent on the underlying reason for the increase in loan loss reserves. The findings suggest that it is. When LLR announcements do not reveal information about other bank holding companies (BHCs), the effect of the announcement is isolated on the BHC of concern. Those LLR announcements that contain real information about other BHCs, however, have systematic effects on bank share prices.

Review of Literature

One type of signal about loan portfolio quality is a bank's failure, which can have contagion effects across the entire industry. Pettway (1976) measures the market reaction to the actual failures of the U.S. National Bank of San Diego (USNB) and Franklin National Bank and finds only minor short-term effects on the value (as measured by share prices) of other banks. Aharony and Swary (1983) reassess market reaction of these two failures using signals of potential failure rather than actual failure as the event. They find that small bank stocks were affected adversely following the resignation of the USNB's president and that Franklin's omission of dividends precipitated a negative share price response for small and large banks. The impact of USNB's failure on small banks could reflect an *information effect*, because USNB was small itself and may have had characteristics similar to those of other banks. The impact of Franklin's failure may be perceived as a *reduced public confidence effect* because all types of banks experienced a share price reaction.

Lamy and Thompson (1986) measure the market reaction to Penn Square's failure, as it could have caused a domino effect of failures because of reduced public confidence in the banking industry. They find that BHCs experienced a negative share price reaction on the day Penn Square failure and also detect an increase in the bank risk (as measured by the variance of stock returns) in response to the failure.

The failure of Penn Square was likely to influence the market's perception of the industry because its problem loans could have been common to BHCs across the country. The accounting rules associated with loans only reflect problems after a lag, with the degree of lag varying across bank holding companies. Thus, a signal about bad loans at a single BHC may offer relevant information about the others. A share price reaction of a sample of BHCs to one bank's problems should occur only if the market perceives that loan portfolios of these BHCs are influenced by the same economic factors.

Peavy and Hempel (1988) also assess the impact of Penn Square's failure and find that the effects varied with the BHC's characteristics. Share prices of

BHCs involved in loan participation with Penn Square were affected, as were BHCs operating in the same primary region as Penn Square. The share prices of other BHCs were not influenced by Penn Square's failure. Thus, Penn Square's financial problems only affected those BHCs that either joined in bad decisions regarding loan participation and/or had similar loan portfolio concentration in energy-related industries. The results found by Pevy and Hempel reflect information effects on a regional level.

Swary (1986) measured the share price effects of the Continental Illinois crisis and finds that BHCs with characteristics similar to those of Continental, such as a high concentration of loans to less developed countries, were affected adversely. Once again, information effects were present.

The aforementioned studies offer evidence of information effects caused by the failure of one BHC on others with similar characteristics. But does a BHC have to fail to precipitate such effects? Because some of these studies find that signals of failure elicit a share price reaction across BHCs, it is conceivable that the announcement of any type of BHC financial problem possibly common to other BHCs but not previously known by the market could precipitate a share price response. This analysis assesses whether less drastic events of nationally known BHCs exhibited information effects for other BHCs.

Hypotheses

Several hypotheses have been offered as plausible explanations of why loan-loss reserve decisions can have an effect on bank equity values.

Asymmetric Information

If managers (insiders) have better information than outsiders concerning the true value of the bank's loan portfolio, then additions to loan-loss reserves (LLR) may convey new information about the true value of the bank's loan portfolio. Under this framework, a LLR announcement may be perceived as good or bad news by outside investors depending on how the estimates of future bank earnings are revised following its announcement. An increase in LLR may signal a decline in loan quality, which could cause investors to revalue the loan portfolio and respond negatively to the announcement. Alternatively, even if the LLR adjustment provides no new information about the present value of LDC loans, the announcement still could signal information regarding the magnitude and timing of tax effects associated with the LLR allocation. According to Madura and McDaniel, the favorable share price response to the wave of LLR announcements in 1987 could be attributed to a signal that some loans that already were revalued by the market would be written off soon, creating tax benefits for the

BHCs in the near future.¹ If the debt already was revalued and the tax effects were not accounted for previously, the LLR announcements could elicit a favorable share price response (as they did in 1987).

Capital Structure Effects

Under the new capital guidelines, loan-loss reserves are excluded from the bank's core of equity capital.² Thus, when BHCs use what could have been equity to increase LLR, they may be forced to raise external funds in the future for regulatory reasons. To the extent that the increased LLR portends anticipated external financing, there may be a negative share price response, as there is substantial evidence of an unfavorable market reaction to external financing by BHCs.

Restructuring Hypothesis

The restructuring hypothesis views LLR adjustments as signals of value-enhancing corporate and strategic restructuring. As mere accounting adjustments to book values, LLR allocations should not be expected to have an effect on stock prices. As stated by Thakor (1987) in reference to asset writedowns, however: "... writedowns have a price effect not because they mean much by themselves, but because they are a signal of events to come." In the case of 1987's LLR decisions, they signal a more strict negotiating stance with LDCs. To the extent that this places more pressure on LDCs to meet their debt obligations, the LLR announcements could elicit a positive share price response. Musumeci and Sinkey (1989) state that the Federal Reserve and the U.S. Treasury pressured BHCs to continue their provision of credit to LDCs. If the decision to increase LLRs implies that the BHCs will discontinue their credit flows to LDCs, investors may react favorably if they expect debt payment problems of LDCs to continue. Conversely, an unfavorable reaction could occur if investors interpret the LLR announcement to reflect future write-offs of the LDC debt. The market value of LDC debt would be discounted further as LDCs anticipated a separation from the lenders and, therefore, no longer are encouraged to repay their debt.

¹The tax treatment of LLR by bank and BHCs was modified substantially by the Tax Reform Act of 1986. Starting in 1987, banks and BHCs must use a new method (less complex than the reserves method) of recognizing loan losses when the loan is written off. Under the 1986 Tax Reform Act, banks do not realize tax breaks by simply building LLR. The tax benefits are realized only when the loan is written off.

²Loan-loss reserves still are included as a part of the total capital.

Methodology and Data

Information about the quality of a loan portfolio can come in many forms. The events assessed here are loan loss announcements over the third and fourth quarters of 1989 by major bank holding companies. Only announcements that were not combined with earnings reports were assessed, as combined reports can cause confounding effects. A total of five announcements are assessed: three related to LDC debt and two related to real estate loans. The analysis of loan loss announcements related to LDC debt is separated from those related to real estate loans, as the signals emitted by each type of announcement may differ.

To measure the market reaction to increased loan loss announcements resulting from LDC debt, a sample of 25 BHCs was assessed (identified in Table 1). Daily stock price data for the BHCs and the S&P 500 were compiled from the *Daily Stock Price Record* from April 3, 1989 to September 12, 1989. Stock returns were estimated from the price series over this estimation period, and the market model was applied

$$R_{it} = \alpha_i + \beta_i R_{mt} + \mu_{it}$$

where:

R_{it} = Return on the i th BHC's stock on day t ;

R_{mt} = Return on the S&P 500 index³ on day t ;

α_i = Constant term;

β_i = $\text{cov}(R_{it}, R_{mt}) / \text{var}(R_{mt})$

μ_{it} = Error term.

The parameters estimated over the estimation period then were applied to estimate expected returns of BHCs over an examination period surrounding each announcement.

$$\hat{R}_{it} = \hat{\alpha}_i + \hat{\beta}_{it} R_{mt}$$

The abnormal return for each BHC on each day within the examination period is:

$$\begin{aligned} AR_{it} &= R_{it} - \hat{R}_{it} \\ &= R_{it} - (\hat{\alpha}_{it} + \hat{\beta}_{it} R_{mt}) \end{aligned}$$

³This research uses the S&P 500 because it is readily available.

The average abnormal return for the sample of BHCs is determined for each day in the examination period:

$$AAR_t = n^{-1} \sum_{i=1}^n AR_{it}$$

To test for significance, a t-statistic is applied:

$$t = AAR_t / S(AAR)$$

where:

$S(AAR)$ = The standard deviation of AAR, using the crude adjustment method of Brown and Warner (1980).

The measurement of individual abnormal returns using the event study methodology is subject to contemporaneous correlation of residuals. In order to test for the existence of contemporaneous correlation, the 25 x 25 correlation coefficient matrix of residuals was examined. Based on this examination of residuals, there does not appear to be contemporaneous correlation, as most of the coefficients are close to zero.

Analysis of Information Effects Related to LDC Debt

Information about the three loan loss announcements related to LDC debt is provided in Table 2. Each of the three banks cited its exposure to LDC debt as the reason for its planned increase in loan loss reserves. Some other major bank holding companies also increased loan loss reserves over the third quarter of 1989 (i.e., Chemical Banking Corp. on October 12 after the market closed, First Chicago on October 13, and Bankers Trust on October 17). These announcements, however, coincided with earnings reports. It is difficult to isolate any specific loan quality information impact for these banks because of confounding effects.

Results of the analysis are disclosed in Table 3. Abnormal returns are estimated for several different bank portfolios, as some banks may be affected differently than others. There was no significant market reaction for the entire sample (Table 3). To test for anticipated follow-the-leader effects (Musumeci and Sinkey, 1988) on the other banks exposed to LDC debt, bank portfolios minus the bank that announced a loan loss reserve adjustment are assessed. The bold type indicates the day of the announcement. For example, on September 18 when Manufacturers Hanover announced its loan loss reserve adjustment, the portfolio of exposed banks (minus Manufacturers Hanover) experienced an

abnormal return of .14 percent, followed by abnormal returns of -.77 percent and -0.3 percent, and so on over the following days. On September 21 when Chase Manhattan Bank announced its loan loss reserve adjustment, the exposed banks (minus Manufacturers Hanover and Chase Manhattan) experienced an abnormal return of .71 percent, followed by abnormal returns of .57 percent, .02 percent, and so on for the following days. The same format was used to assess the portfolio of nine money center banks.

If follow-the-leaders effects were anticipated, a significant effect should prevail on or below the bold numbers. There is a significant favorable market reaction for the money center bank portfolio on the day of Chase Manhattan's announcement. Perhaps Manufacturers Hanover's decision initially was perceived as a bank-specific decision, but the subsequent announcement by Chase Manhattan led the market to believe others also would follow. The announcement by J.P. Morgan had no additional significant impact.

To determine whether share price reaction across banks to the announcements related to LDC debt was sensitive to the LDC debt exposure, regression analysis was applied. Abnormal returns of each individual bank accumulated on September 21 and 22 represent the dependent variable, while the LDC exposure (as a percentage of total assets) represents the independent variable. This two day period was selected because there was some evidence of an effect at that time (although the effect was modest). The LDC exposure data were obtained from 1989 annual reports. Based on this analysis, there is only mild evidence of a relationship (t -statistic of slope coefficient = 1.49, $R^2 = .09$).

While the main objective of this research is to assess whether a given bank's loan loss announcement affects share valuation of other banks, it is of interest briefly to assess the effects on the banks that made the announcements. These results are shown in Table 4. The stock price of each bank reacted favorably to the announcement, which is consistent with findings by Madura and McDaniel (1989) for loan loss reserve announcements by money center banks over the summer of 1987.

Reasons for a possible favorable market reaction to increased loan loss reserves are provided by Musumeci and Sinkey and by Madura and McDaniel. In general, the inability of LDCs to meet their debt repayment schedules already may be embedded in share prices. An increase in loan loss reserves may offer no new information about repayment ability, but may signal to investors that the banks are closer to writing off the bad debt. This type of signal can be favorable because of potential tax benefits that enhance operating cash flows.

Information Effects Related to Real Estate

The signals interpreted from real estate-related information about bank loan portfolio quality come in three forms:

- Lower real estate values may increase the probability of bankruptcy for businesses that have borrowed funds to invest in real estate, thereby reducing expected cash flows (loan repayments) to lenders;
- Lower real estate values reduce the market value of existing real estate loan portfolios, thereby reducing the cash flows to commercial banks that sell such loans in the secondary market; and
- Lower real estate values may cause real estate investors to be more tentative, discouraging investment in all types of real assets that could reduce loan demand.

The market reaction to these announcements may differ from those just discussed because they may carry different signals. The two announcements related to real estate assessed are described in Table 5. Although numerous other announcements about real estate also may elicit some share price response, the objective here is to determine whether a given BHC's announcement pertaining to its loan portfolio signals any relevant information about the loan portfolios of other BHCs. For this reason, the analysis is concentrated on these two announcements.

Results from applying the same event study analysis applied earlier are disclosed for a portfolio of money center banks and a portfolio of superregional banks in Table 6. Both portfolios experienced a negative share price response to the November 29 announcement of pessimistic expectations by the Bank of New England. Thus, the news about the Bank of New England's loan portfolio apparently offered a signal about the loan portfolios of other banks. Because the Bank of New England's loan portfolio covers 23 states, the real estate problems hardly could be considered a problem unique to the Bank of New England. Other banks had not announced similar news about their loan portfolios, but anticipated such announcements in the near future. Alternatively, they could postpone the bad news with financial accounting flexibility, but the problems would surface later.

A negative reaction was detected for both bank portfolios to the Bank of New England's announcement on December 15, 1989 of a planned increase in loan loss reserves to cover bad real estate loans. As with the Bank of New England's November 29 announcement, this announcement carried a negative signal about the market value of real estate backing the loans provided by banks. The existence of a significant negative reaction for a somewhat similar second announcement by the same bank implies that the market initially underestimated the severity of the problem at the time of the first announcement.

To determine whether the share price response to the announcements related to real estate was sensitive to the degree of real estate exposure, regression analysis was applied. Abnormal returns accumulated on November 29 and the following day for each bank were used to represent the dependent variable, while exposure to real estate (as a percentage of total assets) was used to represent the independent variable. Most of the impact was concentrated within this period. The real estate exposure data were compiled from 1989 annual reports. The relationship was not significant (t -value of slope coefficient = $-.6$, $R^2 = .01$). Then a regression analysis again was applied, using the accumulated abnormal returns on December 15 and the following day as the dependent variable. A significant inverse relationship between the real estate exposure and the two day cumulative abnormal return was detected (slope coefficient = $-.00417$, t -statistic = 2.30 , $R^2 = .18$). This suggests that the market discriminated among banks in its reaction to the announcement. Banks with high exposure to real estate were penalized to a greater degree.

Implications

The results of the analysis verify that information about increased loan losses of a given bank can influence other banks, even if the information is less drastic than a failure. Yet the impact varies with the type of loan loss information. The first part of the analysis shows an insignificant share price response of other banks to increased loan loss reserves related to LDC debt. Conversely, the second part of the analysis shows a negative share price response of other banks to increased loan loss reserves related to bad real estate loans. The difference in market reaction is attributed to the difference in signals emitted by the two types of announcements. The announcement of increased loan loss reserves to cover LDC debt contains no additional information about LDC debt repayment ability, but signals that tax benefits to banks will be expedited. The announcements about the Bank of New England's bad real estate loans signalled that other banks also would be experiencing real estate problems. Because such problems were not known by the market, share prices declined to reflect the new information.

Once share prices of banks fully reflect the depreciated real estate values and the reduced probability of loan repayment on real estate loans, loan loss reserve additions to cover real estate should not elicit a negative response. There even may be a favorable share price response (as with the loan losses on LDC debt), as the bad information already is embedded in share prices while potential good news (expediting tax benefits by signalling the likelihood of write-offs in the near future) is not.

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Table 1
List of Banks in the Sample

Bank Holding Company	Asset Size in \$ Millions as of 12/31/88
Citicorp	207,666
Chase Manhattan	97,455
Bank America Corp.	94,647
J.P. Morgan & Co.	83,923
Security Pacific Corp.	77,870
Chemical Banking Corp.	67,349
Manufacturers Hanover Corp.	66,710
First Interstate Bancorp.	58,194
Bankers Trust New York Corp.	57,942
Bank of New York Co., Inc.	47,388
Wells Fargo & Co.	46,617
First Chicago Corp.	44,432
PNC Financial Corp.	40,811
Bank of Boston Corp.	36,061
Bank of New England Corp.	32,200
Mellon Bank Corp.	31,153
Continental Bank Corp.	30,578
NCNB Corp.	29,848
SunTrust Banks, Inc.	29,177
Fleet/Norstar Group	29,052
First Union Corp.	28,977
Barnett Banks, Inc.	25,247
Republic New York Corp.	24,519
First Bank System, Inc.	24,247
NBC Bancorp	24,176

Source: *American Banker*

Table 2
Loan Loss Announcements Related to LDC Debt

Announcement Date	Bank Holding Company	Addition to Loan Loss Reserves (LLR)	Previous Ratio of LLR to Medium & Long-Term LDC Debt	New Ratio of LLR to Medium & Long-Term LDC Debt
9/18/89	Manufacturers Hanover	\$950 million	22%	36%
9/21/89*	Chase Manhattan	\$1.15 billion	30%	46%
9/22/89	J.P. Morgan	\$2 billion	27%	100%

*Announcement date was on previous day, but after the markets closed

Table 3
Share Price Response to
LDC Debt-Related Loan Loss Announcements

Date	All Banks (25)		All 16 Exposed Banks (16)		16 Banks - Manufacturers Hanover (15)		16 Banks - Manufacturers Chase Manhattan (14)		16 Banks - Manufacturers Hanover - Chase J.P. Morgan (13)		Nine Money Center Banks - Manufacturers Hanover (15)		Nine Money Center Banks - Manufacturers Chase Manhattan (14)		Nine Money Center Banks - Manufacturers Hanover - Chase J.P. Morgan (13)	
	AR	t	AR	t	AR	t	AR	t	AR	t	AR	t	AR	t	AR	t
9/15 ¹	-.18%	-.40	-.09%	-.11	-.06%	-.09	.02%	.03	-.02%	-.03	-.12%	-.19	.03%	.04	-.05%	-.07
9/18	-.12	-.26	.25	.31	.14	.22	.13	.21	.24	.43	.31	.42	.31	.48	.57	.83
9/19	-.89	-1.96*	-.38	-.48	-.77	-1.22	-.86	-1.37	-.92	-1.64	-.70	-.96	-.88	-1.38	-1.00	-1.45
9/20	-.29	-.64	-.04	-.05	-.03	-.05	-.35	-.56	-.41	-.73	.66	.90	.12	.19	.06	.09
9/21 ²	.43	.95	.75	.94	.77	1.22	.71	1.13	.72	1.28	1.38	1.89*	1.34	2.09*	1.46	2.11*
9/22 ³	.33	.73	.40	.50	.52	.83	.57	.90	.25	.45	1.11	1.52	1.31*	2.05*	.74	1.07
9/25	-.13	-.29	-.14	-.18	.00	.00	.02	.03	-.19	-.34	.35	.47	.43	.67	.04	.06
9/26	-.49	-1.08	-.60	-.75	-.62	-.98	-.81	-1.29	-.81	-1.45	-.47	-.64	-.83	-1.30	-.83	1.20
9/27	.00	.00	.20	.25	.20	.32	.16	.25	.06	.11	.19	.26	.09	.14	.12	.17

¹Manufacturers Hanover announcement

²Chase Manhattan announcement

³J.P. Morgan announcement

Table 4
Abnormal Returns of Specific Banks
Announcing Increased Loan Loss Reserves

Date	Manufacturers Hanover	Chase Manhattan	J.P. Morgan
9/13	-.81%	.48%	-.14%
9/14	-.71%	-.79%	-.10%
9/15	-.68%	-1.11%	.49%
9/18	1.79%	.29%	-1.30%
9/19	5.44%	.54%	-.14%
9/20	-.24%	4.44%	.48%
9/21	.45%	1.64%	.66%
9/22	-1.41%	-.27%	4.75%
9/25	-2.27%	-.24%	2.77%
9/26	-.29%	2.00%	-.77%
9/27	.14%	.85%	1.37%

Table 5
Loan Loss Announcements Related to Real Estate Problems

Announcement Date	Bank Holding Company	Announcement
11/29/89	Bank of New England	Expects large loss for the fourth quarter of 1989, due to substantial real estate loan losses. The bank has provided loans for the development of apartments and office buildings in 23 states.
12/15/89	Bank of New England	Will increase loan loss reserves by more than \$800 million and also may sell part of the company to deal with substantial real estate loan problems.

Table 6
Share Price Response to Real Estate-Related Loan Loss Announcements

Bank of New England's Expected 4th Quarter Loss Announcement on 11/29/89

Day Relative to Announcement Date	Money Center Banks		Superregional Banks	
	AR	t-value	AR	t-value
t - 1	-.43%	-.55	.28%	.72
t	-1.09	-1.40	-.92	-2.36*
t + 1	-2.99	-3.83*	-1.89	-4.85

Bank of New England's Increased Loan Loss Reserves Announcement on 12/15/89

Day Relative to Announcement Date	Money Center Banks		Superregional Banks	
	AR	t-value	AR	t-value
t - 1	-.51%	-.65	.28%	.72
t	-.62	-.79	-2.60	-6.67*
t + 1	-3.04	-3.90*	-1.79	-4.59*

