

ASYMMETRIC INFORMATION: THE CASE OF BANK LOAN COMMITMENTS

James E. McDonald*

Abstract

This study analyzes common stock return behavior around the announcement date of a bank loan commitment to a firm. The results demonstrate that loan commitments are viewed as positive when the more formal revolving credit agreement is used. Straight lines of credit do not show any significant reaction. Loan commitment announcements are associated with signals transmitted by banks and is an implied audit of the firm. One interpretation of the results is that for the loan commitment to provide relevant new information to the market, the loan commitment must confirm an identifiably concrete relationship between the bank and the firm. When investors are unable to account for some guarantee of reliability, no reaction occurs.

INTRODUCTION

Loan commitments have become an increasingly popular financing arrangement. While considerable theoretical literature on loan commitments exists, little empirical research has been undertaken until recently. This study is motivated by the lack of research about loan commitments; in particular, the most recent use of loan commitments for financing for mergers and acquisitions.

One primary concern of shareholders is the moral hazard that is presented when managers possess information about the firm's future value not yet available outside of the firm. Banks perform a multitude of functions by virtue of their position as financial intermediaries. One specific activity is the granting of loan commitments. Loan commitments fall into two categories: lines of credit and revolving credit agreements. A line of credit is an understanding, informal or formal, between the bank and the firm as to the limit up to which the firms may borrow in a given period, usually one year. A revolving credit agreement is a formal arrangement between a bank and a usually large firm for a renewable loan commitment. Revolving credit agreements may have long durations.

Since banks lend funds in the full expectation of being repaid, a significant loan commitment represents an implied audit of the firm about its creditworthiness, hence, a banker serves as an external auditor, passing judgment on the firm's present condition and future prospects for loan repayment.

Several arguments have been put forward regarding the position of financial intermediaries. Diamond (1984) states that intermediaries are able to reduce monitoring costs and observe outcomes of the firm's investment decisions. Kane and Malkiel (1964) find that banks tend to decide to lend to firms so as to maintain a close customer relationship and avoid volatility in deposit levels. Campbell and Kracaw (1980) developed the concept that intermediaries are information producers and the granting of a loan commitment adds reliability and authority to the lending decision and, indirectly, to the investment decision of the borrowing firm. Kanatas (1987) offers the insight that loan commitments may be used as signalling devices by managers to indicate the condition of the firm. The specific example chosen was loan commitments obtained to back the issuance of commercial paper. In addition to offering insurance value, the loan commitment acts as a signal to the commercial paper market. It is assumed the firm seeking credit in the commercial paper market is in possession of information on its credit risk not available to commercial paper investors and dealers.

*University of Northern Colorado

James (1987) found evidence that bank loans generated abnormal positive returns in comparison to other forms of financing. This finding implies that bank loans have unique characteristics associated with them. James concludes that banks may be in possession of superior information which is transmitted to potential investors by the announcement of the granting of a bank loan.

Lummer and McConnell (1989) in their extensive examination of loan agreements observed that loan revisions transmitted both positive and negative signals to the market. They found that new agreements did not convey information to the market as such. Revisions in already established agreements transmitted either positive or negative signals dependent upon whether the revision could be viewed as good or bad news.

The purpose of this study is to analyze return behavior around the announcement of a loan commitment. This analysis extends the work done by James (1987) and Lummer and McConnell (1989). James studied a sample of 80 bank loan commitments. His finding is that bank loan announcements are associated with positive abnormal returns. This study extends this research by considering the type of loan commitment.

To determine if the loan commitments contain new and valuable information, an empirical test will be conducted on a sample of loan commitment announcements. If abnormal returns are observable, then the information contained in the announcements is useful to investors. However, if the information is already impounded in the price of the firms' common stock under the assumptions of the semi-strong form of the efficient market hypothesis (EMH), then, no abnormal returns should be observable.

There exist two possible explanations for a zero effect in the absence of fraud or inefficient management on the part of the bank: the lines of credit represent cyclical or seasonal financing of working capital or the transfer of risk from the firm to the bank. It must also be assumed that the loan is of a significant size.

If markets are semi-strong efficient, then the assessment of the firms probability of takedown to meet the variance of the firm's risky cash flows from potential projects, ought to be impounded in the firm's stock price. The insurance mechanism chosen by management will be perceived as such and no abnormal returns observed.

The signalling hypothesis would be predicated upon the bank operating as a firm-external agent issuing an implied audit of the firm, in that the bank has superior information about the future cash flows of the firm's investments. In supplying the debt required to finance these investments. The bank allows investors to view this implicit audit as supplying new positive information to the market. Investors acting on this information will generate abnormal positive returns. Additionally, positive abnormal returns may be generated based upon the self-selection process inherent in the variables of the loan commitment contracts. It may be that the higher quality firms seeking loan commitments dominate that section of the credit market.

The hypotheses of this study are as follows:

- a. Investors do not make abnormal returns on the announcement of a bank loan commitment. Should the preceding hypothesis be rejected, a second hypothesis will be tested.
- b. Excess returns are positively correlated with the release of the announcement of the loan commitment.

Sample selection met the following criteria:

1. The loan commitment must have been announced in *The Wall Street Journal* during the period January 1, 1980, through September 30, 1986.
2. The price data for the stock of the firm must be on the CRSP tapes for 290 trading days prior to the announcement and for 90 days thereafter.
3. The firms must be traded on either the New York or American stock exchanges.
4. No other events occurred involving the firm occurred around the announcement.

METHODOLOGY

The Cumulative Prediction Error technique, as developed by Dodd and Warner (1983), and validated by Brown and Warner (1980, 1985) has been chosen as appropriate for the purposes of this study. A forecasted security return is calculated for each day in the estimation period from which actual returns are subtracted to determine the prediction error (PE). The semi-strong form of market efficiency suggests that new information is impounded

rapidly into common stock prices. Under that assumption, the prediction errors ought to be distributed in a random fashion around zero. However, the impounding of new relevant information results in a "spike" in the security returns for some short time span. The PE will reflect this spike as indicating abnormal or excess returns. A test statistic may then be employed for the significance of the PEs and the cumulative prediction errors (CPEs).

The market model is used to estimate predicted returns. This model is illustrated on equation 1 below:

Equation 1

$$R_{it} = a_{it} + B_i(R_{mt}) + e_{it}$$

where:

- R_{it} = the return on security i at time t,
- a_{it} = the constant term for security i's regression equation,
- B_i = the slope term for security i's regression equation,
- R_{mt} = the return on the market at time t proxied by the value weighted market index from the CRSP tapes, and
- e_{it} = the error term for company i at time t.

The first-pass regression is used to estimate each security's parameters. The regression uses 200 daily observations for a period of 291 days to 91 days before the announcement of the loan commitments. Day 0 is defined as the publication date of *The Wall Street Journal* on which a credit line was reported.

The prediction error (PE) is the difference between the forecasted and actual rate of return. It is computed for a period of 90 days before the 90 days after the announcement. This technique is described completely in the appendix to Dodd and Warner (1983) and is described only briefly here. For security 1, the PE is computed as follows:

Equation 2

$$PE_{it} = R_{it} - (a_i + B_i R_{mt})$$

where:

- a_i = the constant term for security i found in the first-pass regression,
- b_i = the slope term for security i found in the first-pass regression,
- PE_{it} = the prediction error for security i at time t, and the other variables are as previously defined.

The cumulative prediction error (CPE) is calculated from event day T_1 , to event day T_2 , and is defined in equation 3 below:

Equation 3

$$CPE_i = \sum_{t=T_1}^{T_2} PE_{it}$$

The accumulation can be over various intervals. Thus T_1 and T_2 are counters for the desired interval statistics. For a sample of N securities, the mean cumulative prediction error (MCPE) is defined in equation 4 below:

Equation 4

$$MCPE = 1 / N \sum_{i=1}^N CPE_i$$

The expected value of the CPE is zero in the absence of abnormal performance. The test statistic is described in Dodd and Warner (1983) and is the mean standardized cumulative prediction error. The procedure explicitly adjusts the standard deviation for the distance away from the mean of the independent variable and is directly associated with the time series standard deviation for each firm. The test statistic is assumed to be distributed unit normal in the absence of abnormal performance.

To compute the test statistic, the PE_{it} is standardized by its estimated standard deviation s_{it} .

Equation 5

$$SPE_{it} = PE_{it} / s_{it}$$

The s is computed as the typical regression forecast error. The procedure explicitly adjusts the standard deviation for the distance away from the mean of the independent variable and is associated with the time series standard deviation for each firm. Thus the same size prediction error may have different levels of significance for different firms due to their "normal" variation. The SPE is the test statistic an individual excess return for a specified company.

The standard cumulative prediction error over the interval $t = T_1, \dots, T_2$ is:

Equation 6

$$MSCPE_j = \sum_{i=1}^N SPE_{it} / (T_{2i} - T_{1i} + 1)^{1/2}$$

The factor $(T_{2i} - T_{1i} + 1)$ is the number of days in the interval tested. The test statistic for a sample of N securities is:

Equation 7

$$Z = \sum_{i=1}^N MSCPE_i / N^{1/2}$$

Each SPE is assumed to be distributed unit normal in the absence of abnormal performance. Under this assumption, the Z is also unit normal.

RESULTS

This section presents the results of the cumulative prediction error (CPE) analysis around the date of the *WSJ* announcement. The population of loan commitment announcements gathered from the *WSJ* was 359 of which 250 met the requirements of the study. Table 1 provides the results of an analysis of all announcements in the sample.

Statistically significant positive abnormal returns of 0.64 percent and 0.361 percent are observable during the two-day period prior to and on the announcement date, respectively. The two-day period, the publication date in the *WSJ* and the previous day, accounts for several possible lags between culmination of the agreement and public announcement. Loan commitment agreements may be announced at press conferences after trading house, thus, not appearing in the *WSJ* until the next day or the announcement may be on the various wire services the day before the printed announcement in the *WSJ*.

The results confirm those of James (1987) and Lummer and McConnell (1989). It would appear that, in general, loan commitments are viewed as positive occurrences.

The results of an analysis of loan commitments without term features, as given in Table 2 is similar to those for the overall sample. The two-day period abnormal positive returns are 0.812 percent and the announcement date shows 0.415 percent. The term feature does not appear to change the results to any significant degree.

The exclusion of loans involving merger activity from the analysis with the inclusion of terms features gives similar results as presented in Table 3. The positive abnormal returns for the two-day period and the

announcement day are 0.776 and 0.425 respectively. Merger activity does not appear to change the results appreciably. The abnormal returns patterns remain positive and statistically significant.

Since the primary purpose of this study is to examine the announcement of loan commitments unaffected by any possibly confounding attributes or events, both merger activity and term features were excluded. The results of that analysis show, in Table 4, a similar pattern to the previous examples with two-day abnormal returns rising to 0.983 percent. This sample was used for the analysis of the various characteristics under examination in this study to obviate any confounding of the results. Specifically as some subsamples may be small and either of these two characteristics might then have an influence on the statistical analysis.

Revolving credit agreements are formalized loan commitments characterized by contract obligations and maturities of two or more years. The longest maturity observed in this study is eight years. Table 5 presents the examination of revolving credit agreements which show abnormal returns of 1.3 percent and 0.755 percent for the two-day and announcement day, respectively. This conforms to the pattern shown in the previously presented analyses.

Straight lines of credit differ from revolving credit agreements in two important ways. Lines of credit may be informal arrangements between a firm and its bank and are many times unsecured by assets of the firm. An analysis of straight lines of credit shows that the returns for the two-day period and the announcement date are positive but not statistically significant as shown in Table 6. The ten-day period prior to the announcement shows significant negative returns of 1.7 percent. The announcement of a line of credit appears to overcome this trend sufficiently to change the sign of returns. This could be a reaction to a rescue attempt initiated when the bank offers funds to firms requiring cash immediately.

SUMMARY AND CONCLUSION

The results indicate that several factors generate significant positive returns around the announcement date. Of particular interest are the results associated with the differentiation of revolving credit agreements and straight lines of credit. Significant positive returns are observed for the two-day period immediately before and on the announcement date.

When a comparison of revolving credit agreements and straight lines of credit is made, the results suggest that revolving credit agreements, with their more formal characteristics, are viewed as positive implied audits. Straight lines of credit, being less formalized and, thus, less-readily observable by investors, appear not to generate a significant reaction at all. These results confirm the findings of James' and Lummer and O'Connell studies that loan commitments transmit information to the market.

The hypothesis that investors do not earn abnormal returns on or near the announcement of a loan commitment is rejected. Investors, particularly current shareholders, enjoy positive abnormal returns when an announcement of a loan commitment is made.

The larger abnormal returns are associated with formalized revolving credit agreements. This result implies that the market requires an observable signal from the bank that the (implied) audit of the firm has been completed. Revolving credit agreements send a clear signal and convey positive information about the firm given the bank's willingness to enter into loan agreements. In contrast the straight line of credit is a more obscure event, and thus, is considered less of a reliable signal by the market.

The results of this study lend credence to the hypothesis that banks function as firm-external agents during the lending process. Banks' execution of lending decisions reveal information when the signal is clear and unambiguous. The formalized revolving credit agreement appears to be such a clean signal. The effect of a loan commitment announcement is diminished when the formalization process is absent as in the case of straight lines of credit. The use of loan commitments during the issuance of commercial paper is also worthy of further research. Firms obtain loan commitments as stand-by agreements when commercial paper is issued. However, we do not have a complete understanding of this process.

TABLE 1
Overall Sample Of WSJ Announcements Of
Loan Commitments From 1980 To 1986

Window Days	CPE	CUM Z
-90 to 90	-0.02312	-0.83846
-90 to -11	-0.00868	-0.31341
-10 to -01	-0.00665	-1.31308
-01 to 00	0.00640	1.99296*
00 to 00	0.00361	1.90952*
01 to 10	-0.00235	-0.54314
11 to 90	-0.00906	-0.50902
Sample Size	250	

*Significant at .05 level

TABLE 2
Sample Of WSJ Announcements Of Loan
Commitments Without Term Features

Window Days	CPE	CUM Z
-90 to 90	-0.01124	-0.54290
-90 to -11	-0.00540	-0.16893
-10 to -01	-0.00587	-1.23201
-01 to 00	0.00812	2.25883*
00 to 00	0.00415	1.78845**
01 to 10	-0.00260	-0.52539
11 to 90	-0.00146	-0.22706
Sample Size	212	

*Significant at .05 level

**Significant at .10 level

TABLE 3
Sample Of WSJ Announcements Of Loan Commitments Merger
Activity Excluded: With Term Features

Window Days	CPE	CUM Z
-90 to 90	-0.03767	-1.64791*
-90 to -11	-0.01980	-1.24121
-10 to -01	-0.00855	-1.87829
-01 to 00	0.00776	2.27944*
00 to 00	0.00425	1.88295
01 to 10	-0.00495	-1.10549
11 to 90	-0.00863	-0.40918
Sample Size	223	

*Significant at .05 level

TABLE 4
Sample Of WSJ Announcements Of Loan Commitments:
No Merger Activity Or Term Features Included

Window Days	CPE	CUM Z
-90 to 90	-0.03053	-1.57675
-90 to -11	-0.01789	-1.19346
-10 to -01	-0.00801	-1.80077
-01 to 00	0.00983	2.77463*
00 to 00	0.00531	2.12505*
01 to 10	-0.00463	-0.99105
11 to 90	-0.00531	-0.44317
Sample Size	194	

*Significant at .05 level

TABLE 5
Revolving Credit Agreements Without
Term Features: Merger Activity Excluded

Window Days	CPE	CUM Z
-90 to 90	-0.01840	-0.57476
-90 to -11	-0.02748	-0.87976
-10 to -01	-0.00142	-0.78408
-01 to 00	0.01367	2.72451*
00 to 00	0.00775	2.36330*
01 to 10	-0.00521	-0.73149
11 to 90	-0.00797	-0.28649
Sample Size	110	

*Significant at .05 level

TABLE 6
Straight Lines of Credit:
Merger Activity Excluded

Window Days	CPE	CUM Z
-90 to 90	-0.04284	-1.55935
-90 to -11	-0.00644	-0.76628
-10 to -01	-0.01710	-2.02445*
-01 to 00	0.00506	1.20011
00 to 00	0.00183	0.41820
01 to 10	-0.00434	-0.70345
11 to 90	-0.01680	-0.66329
Sample Size	84	

*Significant at .05 level

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