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Alternative Information Sources and the Information Content of Bank Loans

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ABSTRACT

This paper examines the information content of bank loan agreements. We differentiate borrowers according to financial analysts' percentage earnings forecast errors and most recent forecast revisions. The empirical results suggest that banks rely on other indicators as initial screening devices to determine where to best deploy their evaluation and monitoring efforts. If these other indicators are reliable and signal-improving prospects, banks do little further investigation. However, if the indicators are noisy and signal-declining prospects, banks have incentives to expend resources to investigate the borrowers, resulting in the production of valuable information.

RECENT THEORIES OF FINANCIAL intermediation concentrate on the role of banks in reducing informational asymmetry. Leland and Pyle (1977) suggest that informational asymmetries may be the primary reason that intermediaries exist. Campbell and Kracaw (1980) demonstrate that an important function of financial intermediation is the production of information. Diamond (1984) develops a model which shows that financial intermediaries can exist simply because they provide an efficient means of evaluating and monitoring borrowers. These information transmission theories argue that banks provide unique information production services in an imperfect capital market. They suggest that banks know more about the prospects of the firms they lend to than do others. Thus, bank loan agreements should convey useful information to the market.

A number of researchers empirically examine the uniqueness of bank loans. Fama (1985) approaches the issue by examining the rates on certificates of deposit and other high-grade commercial papers. He concludes that since bank borrowers bear the cost of reserve requirements, there must be something special about bank loans. James (1987) conducts an event study around the announcement of bank credit agreements and reports a significantly positive two-day announcement return. His results provide evidence support-

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ing the uniqueness of bank loans, since other types of corporate financing generate either negative or zero excess returns.

Lummer and McConnell (1989) extend the previous empirical research by dividing credit agreements into different categories. Specifically, they find that favorably revised credit agreements generate significantly positive returns, while unfavorably revised credit agreements result in significantly negative returns. In addition, they find no significant announcement returns for new credit agreements. They interpret these results as evidence that banks enter new credit agreements with no information advantage relative to other investors. However, as banks continue the credit relationships with their customers, they gain access to inside information which gives them a relative information advantage.

In this paper, we reexamine the information content of bank loans by addressing two issues. First, while other researchers focus on the information production role of banks only, we recognize that parties other than banks also perform evaluation and monitoring roles. Consequently, if these other information sources can sufficiently resolve informational asymmetries, bank loan announcements should convey little pertinent information to the market. However, if these other sources produce noisy signals, or face a disadvantage relative to banks in information production, then bank loan announcements should convey useful information to market participants. Second, we wish to determine whether banks expend equal efforts in evaluating all borrowers. It is conceivable that banks first use indicators from other sources to screen the borrowers and then decide how to allocate investigation resources.

Two theoretical arguments are made in this respect. Boyd and Prescott (1986) develop a model which shows that banks should evaluate firms with good prior information. They assume that the net expected return from evaluating good type firms is higher than that of investing in good type firms unconditionally. On the other hand, the cost of evaluating bad type firms exceeds the expected return from doing so. Therefore, in equilibrium banks only evaluate good type firms and invest the remaining funds unconditionally in bad type firms. On the other hand, Berlin and Loeys (1988) show that the value of monitoring and investigation depends on the prior probability of the firm type and the reliability of the indicator of the firm type. They argue that monitoring when the indicator is good can be valuable only when both the prior probability of a good project and the informativeness of the indicator are quite low. However, both models imply that investors' reactions to bank loan announcements should differ according to the nonbank indicators of firm type and the reliability of these indicators. Significant market reactions should be observed only for those firms that the market believes banks thoroughly scrutinize.

To examine the aforementioned issues, we divide our sample according to whether financial analysts' percentage earnings prediction errors are high or low, and whether the most recent earnings forecast revisions are positive, unchanged, or negative. We find that bank loans convey more information when the analysts' forecast errors are high. Moreover, banks produce little

information when the most recent earnings forecast revision is positive. Further, the information content of bank loans is most significant when both the analysts' forecast errors are high and their most recent earnings forecast revisions are unchanged or negative. These results support the notion that banks rely on other information sources to determine where to best deploy their evaluation efforts. If the nonbank indicators are reliable and reflect improving expected performance, banks do little further investigation. However, if these indicators are noisy and reflect declining expected performance, banks have incentives to thoroughly scrutinize the borrowers.

In the remainder of the paper, Section I describes the data and methodology, Section II discusses the empirical findings, and Section III contains concluding remarks.

I. Data and Methodology

A search of the *Wall Street Journal* (*WSJ*) for the period January 1977 to December 1989 yields the initial sample of announcements of bank loan agreements between U.S. corporations and U.S. or foreign banks.[1] Inclusion in the final sample requires that several criteria be met. First, there must be no other significant announcements appearing in the *WSJ* about the firm—such as earnings reports, equity issuance, or dividend changes—on the day of or the day before the bank loan announcement. Second, the firm's daily stock price must be available on the Center for Research in Security Prices data tapes or in the *ISL Daily Stock Price Guide*. Third, financial analysts' forecasts of the firm's earnings must be available on the Institutional Broker's Estimate System (I/B/E/S) data tape. Finally, actual earnings per share must be available on either the I/B/E/S tape, the COMPUSTAT Industrial tapes, or in *Moody's Earnings Report*. These restrictions result in a final sample of 491 observations.

Following Lummer and McConnell, bank loans are first divided into new and revised credit agreements. The loan is classified as new if the *WSJ* article indicates that the agreement is new or there is no indication that it is a revision, extension, or replacement of an existing credit agreement; otherwise, the loan is classified as revised. The revised loans are then further divided into three categories based on whether the terms of the credit agreements are revised favorably, unfavorably, or mixed. We use the same four loan terms employed by Lummer and McConnell to categorize the loans. These four credit terms are the time until maturity, the dollar amount, the relative interest rate, and any protective covenants of the credit arrangement. Information regarding the terms of the loans is gathered from the *WSJ* articles describing the loan agreements.

The favorable group contains credit agreements in which one or more of the following occurs: (1) the maturity is lengthened; (2) the interest rate is

[1] The sample was collected by reading the "Financing Business" section of the *WSJ* and an on-line search via Dialog Services. The Initial sample contained 1,389 bank loan announcements.

reduced; (3) the dollar value of the loan is increased; or (4) the protective covenants are made less restrictive. The mixed group contains those credit agreements where some of the terms are revised favorably while others are revised unfavorably. For example, the dollar value of the loan may be increased, but the covenants made more restrictive. The unfavorable group contains credit arrangements in which at least one of the terms is revised unfavorably and no terms are revised favorably.

We use the composite mean of financial analysts' forecasts of annual earnings from the I/B/E/S tape as a measure of nonbank information. Given the importance of earnings information in security selection and performance evaluation, it is expected that predictions of corporate earnings should provide significant information to the market. Indeed, empirical evidence shows that financial analysts' forecasts do convey important information to investors (Gonedes, Dopuch, and Penman (1976); Givoly and Lakonishok (1980)). The I/B/E/S earnings forecasts are compiled monthly, typically on the third Thursday of each month. Thus, this date serves as the cutoff point for determining the forecasts made before and after the credit announcements.

The first measure constructed is the analysts' percentage prediction errors for the earnings of firms for the previous fiscal year. The absolute value of the difference between the analysts' composite mean earnings forecast made in the final month of the previous fiscal year and the actual earnings for that year is divided by the absolute value of the composite mean earnings forecast. All the firms are then ranked according to this percentage prediction error and divided into two groups. Firms with low prediction errors represent firms for which the financial analysts have sufficient information to accurately predict their future performances. For these firms, little residual informational asymmetry should remain after the release of the financial analysts' earnings forecasts. Conversely, firms with high prediction errors represent firms whose future performances cannot be accurately predicted by the financial analysts. Thus, significant informational asymmetry remains for these firms even after the analysts' forecasts are known.

Next, the two most recent financial analysts' composite mean forecasts of the current fiscal year's earnings are used to develop an indicator of firm types. Firms are grouped into three categories according to the difference in the composite mean earnings forecasts between the two most recent periods. The three groups are respectively firms whose earnings forecasts are revised upward, revised downward or unchanged. Firms with upward mean earnings forecast revisions represent firms whose earnings are expected to exceed previous expectations. Similarly, unchanged forecasts indicate firms whose earnings prospects remain the same, and downwardly revised forecasts represent firms whose earnings prospects are poorer than previously thought. This indicator represents the unanticipated change in the market expectation of a firm's future performance and serves as a nonbank indicator of relative firm type.

The announcement effects of bank credit agreements are examined for the overall sample as well as each of the subsamples formed using the aforemen-

tioned measures. The event window is a two-day period including the day on which the bank loan agreement appears in the *WSJ* and the previous day. The event study methodology follows Dodd and Warner (1983).[2]

II. Empirical Results

The first column of Table I allows comparison of our results to those of James and Lummer and McConnell. For the entire sample, the two-day mean abnormal return is 0.32 percent, which is significantly different from zero at the 5 percent level. Similarly, for their overall samples, James reports an average excess return of 1.93 percent, and Lummer and McConnell report an average excess return of 0.61 percent. The abnormal return for new loan agreements is insignificant, but the abnormal return of 0.49 percent for revised credit agreements is significantly positive at the 5 percent level. However, the mean abnormal returns for the two groups are not significantly different. This is consistent with the results of Lummer and McConnell who also report an insignificant excess return for new loans, and a significant excess return of 1.24 percent for revised loans. Favorably revised loans in our sample produce a significant positive abnormal return of 0.75 percent, and unfavorably revised agreements exhibit a significant negative excess return of -1.82 percent. Similarly, Lummer and McConnell report a significant mean excess return of 0.87 percent for favorably revised loans and -3.86 percent for unfavorably revised loans. These results confirm the earlier findings that the process of monitoring and evaluation by banks conveys useful information to the market.

A. Reliability of Other Information Sources

We place borrowers into two groups based on the absolute value of the financial analysts' percentage earnings forecast errors for the fiscal year prior to the bank loan agreements. The hypothesis is that the low prediction error firms have relatively lower informational asymmetry remaining after the release of the financial analysts' earnings forecasts than do firms in the high prediction error group. This implies that stock price reactions to bank loan announcements for the high prediction error firms should be more significant than for firms with low prediction errors.

The second and third columns of Table I contain significance tests for excess returns classified by percentage earnings forecasts errors. For new loans, the abnormal return for the low prediction error group is

[2] Firm excess returns for each day of the event period represent market model residuals. Market model parameters are estimated over a period beginning 170 days before and ending 21 days prior to the announcement date. Standardized prediction errors are determined by dividing the prediction errors by the standardized error of the forecast which is obtained by adjusting the standard deviation of each firm's returns from the estimation period for the possibility of a variance shift in the market during the event period and the length of the estimation period. The test statistic is distributed unit normal and is obtained by adding the standardized cumulative prediction errors (the sum of the two event day standardized prediction errors adjusted for the number of days) across firms and adjusting for the number of firms.

Table I

Mean Excess Returns for Bank Credit Agreement Announcements during 1977 to 1989 Subdivided by Financial Analysts' Percentage Forecast Errors

Excess returns are defined as market model prediction errors. The sample is subdivided by the absolute value of financial analysts' percentage earnings forecast errors. *Z*-statistics and sample sizes are in parentheses. Significance levels are based on one-tail tests for favorably and unfavorably revised loans and new loans, and two-tail tests for others.

Bank Loan Type	Full Sample	Low Financial Analysts' Prediction Errors	High Financial Analysts' Prediction Errors
All	0.3243	0.0444	0.6031
	(2.31[b]; 491)	(0.28; 245)	(2.99[a]; 246)
New	0.2648	−0.0499	0.6039
	(1.24; 187)	(−0.07; 97)	(1.85[b]; 90)
Revisions	0.3610	0.1062	0.6026
	(1.97[b]; 304)	(0.41; 148)	(2.35[b]; 156)
Favorable revisions	0.7528	0.1461	1.4719
	(3.04[a]; 236)	(0.37; 128)	(4.10[a]; 108)
Mixed revisions	1.1176	1.7509	0.5477
	(1.84[c]; 19)	(1.94[c]; 9)	(0.66; 10)
Unfavorable revisions	−1.8198	−1.7036	−1.8554
	(−2.92[a]; 49)	(−1.55[c]; 11)	(−2.49[a]; 38)

[a]Denotes significance at the 1 percent level.
[b]Denotes significance at the 5 percent level.
[c]Denotes significance at the 10 percent level.

−0.05 percent, which is not significantly different from zero. However, the abnormal return for the high prediction error group is 0.60 percent, which is significantly positive at the 5 percent level. Difference in means tests show that the excess returns of the two groups are significantly different at the 10 percent level. This result hints that Lummer and McConnell's conclusion that banks enter new credit agreements with no information advantage relative to other market participants may require a qualification. It is likely that banks examine new borrowers more carefully when other indicators of firm performance are less reliable. Thus, granting new loans to these firms conveys more information to the market. Similarly, for favorably revised loans, the excess return is insignificant for the low prediction error group, but significantly positive (1.47 percent) at the 1 percent level for the high prediction error group. Also, the mean excess return of the high prediction error group is significantly higher than that of the low prediction error group at the 1 percent level. For unfavorably revised loans, the excess return for the high prediction error group is −1.86 percent, which is significantly negative at the 1 percent level. Interestingly, however, the abnormal return for the low prediction error group is also significant at the 10 percent level, and the mean excess returns for the low and high prediction error groups are insignificantly different. There are two possible explanations for this result. First, regardless of the reliability of other indicators, banks may expend more

resources to investigate poorly performing firms. Second, banks may be reluctant to revise credit arrangements unfavorably. As a result, an unfavorable loan revision would always be interpreted as bad news.

The above results lend support to the notion that when the firm's future prospects are predictable in terms of other indicators, the process of evaluation and monitoring by banks conveys little additional information. When other information sources fail to provide reliable indicators of the firm's future performance, however, the evaluation and monitoring process of financial intermediaries provides useful information to capital market participants.

B. Change in Expected Performance of Borrowers

We next examine the lending process to infer whether banks expend equal efforts to investigate all borrowers. We divided firms into three groups (upward, downward, or unchanged revision) according to the difference between the two most recent financial analysts' earnings forecasts. This change in the analysts' earnings forecasts yields a nonbank indicator of relative firm type which represents the unanticipated change in the market expectation of a firm's future performance.

Table II presents summary statistics for borrowers categorized by the difference between the two most recent financial analysts' earnings forecasts. Casual observation shows that a larger percentage of the bank loans in our sample are extended to firms whose expected performances were recently adjusted downward by the financial analysts. Approximately 38 percent of the firms that later received bank loans exhibit negative earnings forecast revisions prior to the bank credit agreements, while only about 29 percent of the loans were made to firms whose expected earnings forecasts were revised upward.

The first column of Table III contains significance tests of excess returns grouped by the change in the financial analysts' composite mean forecast.

Table II

Summary Statistics for Changes in Financial Analysts' Earnings Forecasts

Financial analysts' earnings forecast changes are computed as the difference between the two most recent composite mean earnings forecasts reported prior to the bank credit announcements during 1977 to 1989.

Bank Loan Type	Number of Financial Analysts' Earnings Revisions			Mean of Percent Change in Earnings Forecast
	Positive	Unchanged	Negative	
All loans	143	162	186	−6.43
New loans	56	68	63	−3.43
Revised loans	87	94	123	−8.28
Favorable revision	72	68	96	−7.50
Mixed revision	3	6	10	−8.53
Unfavorable revision	12	20	17	−12.15

Table III

Mean Excess Returns for Bank Credit Agreement Announcements during 1977 to 1989 Subdivided by Financial Analysts' Earnings Forecast Revisions and Percentage Forecast Errors

Excess returns are defined as market model prediction errors. The sample is categorized by the change in financial analysts' earnings forecasts for the two most recent periods preceding the credit agreement and the absolute value of financial analysts' percentage forecast errors. *Z*-statistics and sample sizes are in parentheses. Significance levels are based on one-tail tests for favorably and unfavorably revised loans and new loans, and two-tail tests for others.

Bank Loan Type	Full Sample	Low Prediction Error	High Prediction Error
Panel A: Firms Which Received *Positive* Earnings Forecast Revisions from Periods −2 to −1.			
New loan	0.0441 (0.41; 56)	0.0212 (−0.01; 29)	0.0687 (0.60; 27)
Favorable revision	0.3009 (0.96; 72)	−0.0268 (0.18; 35)	0.6109 (1.16; 37)
Mixed revision	3.2113 (1.06; 3)	—	3.2113 (1.06; 3)
Unfavorable revision	0.1980 (0.55; 12)	−0.6241 (−0.16; 2)	0.3624 (0.67; 10)
Panel B: Firms Which Received *Unchanged* Earnings Forecast Revisions from Periods −2 to −1.			
New loan	0.1959 (0.49; 68)	0.1876 (0.13; 34)	0.2041 (0.42; 34)
Favorable revision	0.8460 (1.81[b]; 68)	0.0022 (0.19; 35)	1.7408 (2.41[a]; 33)
Mixed revision	−0.5127 (0.67; 6)	1.3571 (1.47; 3)	−2.3826 (−0.52; 3)
Unfavorable revision	−1.8692 (−1.97[b]; 20)	−1.1322 (−0.21; 2)	−1.9511 (−2.01[b]; 18)
Panel C: Firms Which Received *Negative* Earnings Forecast Revisions from Periods −2 to −1.			
New loan	0.5353 (1.24; 63)	−0.3481 (−0.24; 34)	1.5709 (2.23[b]; 29)
Favorable revision	1.0257 (2.42[a]; 96)	0.3372 (0.26; 58)	2.0766 (3.52[a]; 38)
Mixed revision	1.4677 (1.43; 10)	1.9478 (1.39; 6)	0.7476 (0.57; 4)
Unfavorable revision	−3.1861 (3.28[a]; 17)	−2.1753 (−1.74[b]; 7)	−3.8936 (−2.82[a]; 10)

[a] Denotes significance at the 1 percent level.
[b] Denotes significance at the 5 percent level.

Panel A contains results for firms which received positive earnings forecast revisions. The announcement returns for all loan types are insignificant. This insignificance contrasts with the findings of Lummer and McConnell, who contend that favorable bank loan revisions signal good news, and unfavorable revisions signal bad news. Panel B contains the results for firms whose earnings forecasts were unchanged. For favorably revised loans, the excess return is significantly positive at the 5 percent level. For unfavorably revised loans, the abnormal return is significantly negative at the 5 percent level. Panel C shows results for firms whose earnings forecasts were negatively revised. For new loans, the excess return is higher than those in the other two panels, although the difference is insignificant. For favorably revised loans, the abnormal return is 1.03 percent, which is significantly positive at the 1 percent level. For unfavorably revised loans, the excess return is -3.19 percent, which is significantly negative at the 1 percent level. Based on the type of credit agreement, t-statistics show no difference in the excess returns of unchanged and negative earnings forecast revision groups. Thus, we combine the unchanged and negative earnings forecasts into groups based on the type of credit agreement, and compare the mean excess returns of the combined groups with those of the positive earnings forecast groups. For favorably revised loans, the mean excess return for the combined group is significantly higher than that of the positive earnings forecast group at the 10 percent level. For unfavorably revised loans, the mean excess returns of the two groups are significantly different at the 5 percent level.

These results indicate that the market does not react in the same way to the announcements of bank loans made to firms whose expected performance has been recently revised upward by financial analysts. One reason could be that financial analysts do a good job of screening firms which have improving future prospects. A more compelling explanation is that banks use other indicators of a firm's expected performance, such as analysts' forecasts, as initial screening devices. If the indicators are good, banks do little further investigation. Thus, the announcements of bank loans to these firms convey little additional information to the market. Alternatively, if the indicator is negative or "stale"—such as a negative or unchanged earnings forecast revision—banks spend resources to further investigate the firm. Thus, useful information is produced.

In sum, the above findings fail to support the model developed by Boyd and Prescott (1986), which shows that banks should evaluate better type firms and invest the residual funds randomly in poorer type firms without evaluation. On the contrary, the above results provide preliminary evidence that banks concentrate their evaluation and monitoring activities on poorly performing borrowers.

C. Information Reliability and Change in Expectations

The results in the previous section suggest that banks expend differential efforts in investigating borrowers. Combining this argument with the infor-

mational asymmetry argument results in the following predictions. When the analysts' revisions are positive, the banks do little further investigation regardless of the level of the remaining informational asymmetry. When the indicator is unchanged or negative, banks expend effort and thus produce credible information. However, it seems reasonable that banks spend more resources to investigate the high prediction error firms since more information remains to be revealed. Thus, the significance of the market's reaction is expected to be greatest for high prediction error firms following either unchanged or negative financial analysts' earnings forecast revisions.

The second and third columns of Table III synthesize the previous analyses by grouping firms based on their earnings predictability, type of credit agreement, and most recent earnings revision. Panel A contains results for firms that recently received positive earnings forecast revisions. Once again, the excess returns for all loan types are insignificantly different from zero. The mean excess returns are also insignificantly different across prediction error groups, which adds credence to the argument that banks produce little or no new information for firms with improving performance.

Panel B covers firms whose earnings forecasts did not change. Regardless of the type of credit agreement, the excess returns are insignificant for firms in the low prediction error group. For the high prediction error group, the abnormal return is insignificant for new loans. However, favorably and unfavorably revised loans exhibit significant excess returns of 1.74 percent and -1.95 percent respectively. Difference in means tests show that the mean abnormal return of favorably revised loans in the high prediction error group is significantly higher than that of the favorably revised loans in the low prediction error group at the 5 percent level. Panel C contains abnormal returns for firms with recently downward earnings forecast revisions. Once again, the market only reacts significantly to favorably revised agreements in the high prediction error group. The mean excess return for this high prediction error group is 2.07 percent, which is significant at the 1 percent level, and is significantly greater (5 percent level) than the mean excess return of the low prediction error group. Note, however, that the abnormal returns of unfavorably revised loans are significantly negative for both high and low prediction error groups, and the difference in means test shows that the abnormal returns of the two groups are not significantly different. This is consistent with the differential investigation hypothesis which suggests that banks will investigate when the indicator is bad even if the indicator is reliable. Further, there is some evidence that banks are reluctant to negatively revise credit agreements. This is first supported by the relatively small number of negative revisions of credit agreements by banks in the sample. In addition, the strong negative reaction by the market to unfavorably revised loans in the negative analysts' forecasts category suggests that the market considers an unfavorable credit agreement revision to be very bad news. This is true even when the indicator of the firm's performance is reliable.

Mean excess returns for favorably revised loans are insignificantly different between the unchanged and the negative earnings revision groups.

However, the mean excess returns for favorably revised loans following either unchanged or negative financial analysts revisions are significantly greater than that of favorably revised loans following positive analysts' earnings revisions. Likewise, the mean excess returns of unfavorably revised loans following either unchanged or negative analysts' earnings revisions are significantly less than that of unfavorably revised loans following positive earnings forecast revisions. In contrast, in the low prediction error group the excess returns for favorably revised loans do not vary significantly across financial analysts' earnings forecast revisions.[3]

The evidence of new loans tells a similar story. Panel C shows that new loans generate significantly positive abnormal returns only when the analysts' forecasts are negative and the forecasting errors are high. The mean excess return for these new loans is significantly greater (at the 5 percent level) than those of both the negative forecast–low prediction error new loans and the other high prediction error new loans. In fact, the mean abnormal return for these negative forecast revision–high prediction error new loans is significantly higher than that of all other new loans at the 5 percent level. This again is consistent with the indicator type and reliability argument. Further, if managers of these firms believe that their firm is actually better than the financial analysts have indicated, they will be willing to supply the banks with any additional information necessary to support their contention. Thus, for this subset of firms banks could be privy to information that other information producers are not. Since only the better firms in this group would actually receive loans, the granting of new loans to these firms serves as a positive signal to the market.

In sum, the empirical evidence supports the information and differential bank investigation arguments which suggest that the strongest stock price effects should be found in the high prediction error–negative forecast revision groups. Our results are also consistent with the argument of Berlin and Loeys (1988). They suggest that monitoring when the indicator is good can be valuable only when both the prior probability of a good project and the informativeness of the indicator are quite low. Numerous studies have shown that financial analysts' earnings forecasts provide relatively accurate predictions of firms' future performances (e.g., O'Brien, 1988). Therefore, with a reasonably reliable indicator, banks are better off evaluating the poorly performing firms if the probability of firms with positive indicators being bad is small. Further, if the monitoring cost is the same for both types, the net benefit would be greater if banks evaluate poorer firms due to the avoidance of costs from inefficient liquidation.

[3] For unfavorable loan revisions in the low prediction error group, the mean excess returns for firms with unchanged or negative analysts' earnings forecast revisions are more negative than the mean excess return of the positive revision group, but the numbers are too small for valid difference in means tests.

D. Multivariate Analysis

We employ multivariate regressions to further examine possible factors affecting announcement period returns. The regressions allow us to control for firm size, existence of a bond rating, and the number of financial analysts forecasting each firm's earnings.[4] The dependent variable is the two-day announcement period excess return. The independent variables are the book value of assets,[5] a dummy variable taking the value of 1 if the firm has an existing bond rating at the time of the bank loan announcement and 0 otherwise, the number of financial analysts forecasting each firm's earnings, and various dummy variables representing our previous classification scheme. Regressions are estimated for the full sample, the sample of new credit agreements, and the sample of revised agreements. Since cross-sectional stock returns exhibit heteroscedasticity we use White's (1980) heteroscedasticity-consistent covariance matrix estimator in all of the regressions, but the results do not differ significantly from those obtained using ordinary least squares.

The regression results are shown in Table IV. In both full sample regressions, the classification dummy variables exhibit coefficients and significance levels which are very comparable to the results of the earlier analyses, and remain virtually the same whether or not the control variables are included. In addition, the test statistics for the control variables suggest that firm size, existence of a bond rating, and the number of analysts forecasting a firm's earnings do not significantly affect the excess returns of the bank loan announcements. When we divide the sample into new loans and revised loans the results remain virtually unchanged.

E. Sensitivity Analysis

We perform several tests to determine the sensitivity of our results to the chosen methods of measuring residual informational asymmetry and firm types. In addition, we examine whether the categorization variables serve as proxies for size or exhibit time series or industry clustering effects.

Two alternative methods of determining forecast errors are used. First, the sample is divided based on the current fiscal year's prediction errors as described previously. Second, the forecast errors for the three previous fiscal years are computed. Due to the presence of outliers, the firms' forecast errors are ranked separately each year. The three yearly rankings for each firm are then averaged, and the firms are placed into high and low prediction error

[4] The control variables represent proxies for information asymmetry. Information arguments suggest that the abnormal returns should be more positive for favorably revised loans and more negative for unfavorably revised loans when information asymmetry is high. To control for this fact, whenever the bank loan revision is unfavorable, the control variables are multiplied by -1. In regressions not shown, we also included variables similar to those used by Lummer and McConnell (i.e., revolving or term loan, secured versus unsecured, number of lenders, maturity, value of agreement), but find no significance for these variables.

[5] Similar results obtain when the market value of equity is used to proxy for firm size.

groups, accordingly. Use of these alternative ranking methods yields similar results. Forecasts for the next fiscal year and long-term growth are used, but do not significantly alter the results.

O'Brien (1988) shows that financial analysts tend to overestimate firms' earnings. If this bias is consistent for all firms, ranking and classification of firm types using the analysts' forecasts should still reflect the true rankings. There is reason to believe that increasing the number of analysts making forecasts should reduce the bias, but our analysis shows that the number of analysts forecasting a firm's earnings is not related to the stock price reaction. Since O'Brien shows that the median forecast exhibits the smallest bias, we also use the median forecast to segregate the sample. The results obtained using this measure do not differ from those shown. Further, previous studies have indicated that there is serial correlation in consensus forecasts due to the fact that some analysts have not revised their forecasts to incorporate the most recent available information. However, if the information that is not reflected is neither systematically good nor bad, the firm type classification scheme should not be adversely affected.

It is possible that a large firm or one with existing bond ratings would have more information available to market participants. Therefore, we explore the possibility that our high/low prediction error classification proxies for variables such as firm size or existence of a bond rating. We compare the book value of total assets and the market value of common equity for firms in the high and low prediction error groups. Difference in means tests show no difference in firm size between the two groups. Next, we compare the mean prediction errors of firms with and without bond ratings and find no significant difference. We also examine the number of firms classified as high/low prediction error firms based on whether a bond rating exists, and find no significant difference across the two groups.

Further, to detect if there is time series clustering of the earnings forecast errors in our sample, we calculate the proportion of firms classifed as exhibiting high/low forecast errors each year. A simple plot of this series of proportions shows no sign that the proportions are different across years. Since we divide our sample into two groups based on prediction errors, absent time series clustering these proportions should not differ significantly from one-half. Tests confirm that the proportions do not differ significantly from one-half. We also examine the possibility of industry clustering, but find that no particular industry (determined by using two-digit Standard Industrial Classification codes) has an abnormally high number of firms classified as high or low prediction error firms.

To ensure that our indicator of firm types does not proxy for firm size, we compare the book value of assets and the market value of equity across different groups. The tests show no significant differences between any of the groups. Further, no particular industry contains predominantly more firms receiving one type revision than another, and the existence of a bond rating appears to have no significant relationship in the classification scheme. Finally, no particular month contains an abnormally higher than expected number of positive, unchanged, or negative forecast revisions.

Table IV

Regression Tests on Excess Returns for Bank Credit Agreements

Regressions are estimated with two-day excess returns as dependent variables and various continuous and dummy variables as independent variables for bank credit agreements during 1977 to 1989. All test statistics are computed using White's (1980) heteroscedasticity-consistent covariance matrix. Significance levels are based on one-tail tests for favorably and unfavorably revised loans and new loans, and two-tail tests for others.

	Coefficient of Variable in Percent (t-Statistic in Parentheses)			
Variable	Regressions with Full Sample of Credit Agreements		Regression with New Credit Agreements	Regression with Revised Credit Agreements
Intercept	0.1871	0.1636	0.4295	0.1171
	(0.88)	(0.58)	(1.16)	(0.29)
Bond rating	—	−0.1244	−0.7319	0.1630
(1 if rating exists, 0 otherwise)		(−0.29)	(−1.27)	(0.26)
Total assets	—	0.000329	0.000478	0.000324
(in billions)		(1.28)	(1.24)	(0.95)
Number of	—	−0.0000372	−0.0478	0.0154
analysts		(−0.16)	(−1.52)	(0.46)
New, high prediction	1.3838	1.3723	1.6608	—
error, negative	(1.80)[b]	(1.78)[b]	(2.55)[a]	
forecast revision[d]				
Favorable, high				
prediction error,	1.5537	1.4756	—	1.3696
unchanged forecast	(2.14)[b]	(2.02)[b]		(1.68)[b]
revision[e]				

III. Conclusions

Financial intermediation theory based on information production states that banks may play a unique role in the alleviation of informational asymmetries. We find that banks supply significant information to the market only in certain instances. The results suggest that banks rely upon other indicators as initial screening devices to determine where to expend their evaluation and monitoring efforts most efficiently. If these indicators are "good," banks do little further investigation. However, if the indicators are negative or unchanged, banks have incentives to expend resources to further investigate the firms. Furthermore, the incentives to further scrutinize are greatest when the indicators are noisy or unreliable. These results fail to support the model developed by Boyd and Prescott (1986) which shows that banks should evaluate better type firms and invest the residual funds randomly in poorer type firms. Instead, the findings are consistent with the argument of Berlin and Loeys (1988) which suggests that with a reasonably reliable indicator (e.g. financial analysts' earnings forecasts) banks are better

Table IV—*Continued*

Variable	Coefficient of Variable in Percent (t-Statistic in Parentheses)			
	Regressions with Full Sample of Credit Agreements		Regression with New Credit Agreements	Regression with Revised Credit Agreements
Favorable, high prediction error, negative forecast revision[f]	1.8895 (2.77)[a]	1.8264 (2.68)[a]	—	1.6517 (2.11)[b]
Unfavorable, high prediction error, unchanged forecast revision[g]	−2.1382 (−2.21)[b]	−2.1139 (−2.11)[b]	—	−1.9701 (−1.97)[b]
Unfavorable, high prediction error, negative forecast revision[h]	−4.8110 (−3.57)[a]	−4.7774 (−3.37)[a]	—	−4.4306 (−2.75)[a]
Unfavorable, low prediction error, negative forecast revision[i]	−2.2075 (−1.53)[c]	−1.9141 (−1.48)[c]	—	−1.7446 (−1.50)[c]
Adjusted R^2	0.0582	0.0607	0.0389	0.681

[a] Denotes significance at the 1 percent level.

[b] Denotes significance at the 5 percent level.

[c] Denotes significance at the 10 percent level.

[d] Dummy variable equals 1 for firms with new bank loans, high analysts' prediction errors, and recent negative earnings' forecast revisions. Otherwise, the variable equals 0.

[e] Dummy variable equals 1 for firms with loans favorably revised by the banks, high analysts' prediction errors, and recent unchanged earnings' forecast revisions. Otherwise, the variable equals 0.

[f] Dummy variable equals 1 for firms with loans favorably revised by the banks, high analysts' prediction errors, and recent negative earnings' forecast revisions. Otherwise, the variable equals 0.

[g] Dummy variable equals 1 for firms with loans unfavorably revised by the banks, high analysts' prediction errors, and recent unchanged earnings' forecast revisions. Otherwise, the variable equals 0.

[h] Dummy variable equals 1 for firms with loans unfavorably revised by the banks, high analysts' prediction errors, and recent negative earnings' forecast revisions. Otherwise, the variable equals 0.

[i] Dummy variable equals 1 for firms with loans unfavorably revised by the banks, low analysts' prediction errors, and recent negative earnings' forecast revisions. Otherwise, the variable equals 0.

off evaluating the poorer type firms if the probability of firms with positive indicators being bad is small.

In general, our results support Lummer and McConnell's contention that banks enter new credit agreements with no information advantage relative to others. However, this may not be the case for certain new borrowers whom

banks have greater incentives to investigate and who have incentives to supply the banks with "additional" information to prove that the recent "negative" indicators are flawed. Also, Lummer and McConnell suggest that as time progresses banks gain access to more "inside" information about the firms with whom they deal. While this may be the case, the mere access to "inside" information does not imply its utilization. Since information gathering and investigation is costly, banks will further scrutinize only when the expected benefits exceed the expected costs.

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