The Information Content of Quarterly Earnings in Syndicated Bank Loan Prices

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Abstract

This paper examines the information content of quarterly earnings announcements in the syndicated bank loan market by focusing on the private release of earnings information to loan syndicate members. In contrast to the literature on equity price reactions to earnings announcements, we find significant price movements in the secondary loan market four to five weeks prior to public earnings announcement dates, around the time of mandated covenant reports to members of the syndicate. This paper finds that the loan market reaction to private information about earnings is asymmetric, such that loan returns decline when earnings decline, but there is no significant loan market reaction to earnings increases. The results are robust to controlling other earnings pre-announcement information.

JEL Classification: G14, M41

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1. Introduction

In this paper, we examine the relation between the announcement of quarterly earnings and the changes in syndicated bank loan secondary market prices. For a sample of syndicated loans from 196 firms, we find significant price movements in the secondary loan market approximately four weeks prior to earnings announcement

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dates, around the time of the monthly covenant reports to members of the syndicate. In particular, we find that private information about firm earnings impacts returns in the syndicated bank loan market approximately one month prior to public earnings announcements. This suggests that private debt holders have an information advantage in accessing firm earnings through their roles of internal monitoring and access to private information.

The information content associated with the release of annual and quarterly earnings announcements has been extensively studied (see Bernard, 1989 and Kothari, 2001 for comprehensive reviews of this topic). There is a voluminous literature in both accounting and finance dating back to Ball and Brown (1968) and Beaver (1968)[1] that documents a significant equity market response to earnings announcements. Much of the research has focused on the impact on equity values, resulting from earnings announcements that provide information about the prospects of the future cash flows of the firm. To a much lesser extent, there has been some study on the changes in valuation to a firm's public debt holders. Davis, Boatsman and Baskin (1978) find limited evidence on the information content of earnings on bond values. However, there has been no analysis of the impact of earnings information on loan valuation. This paper fills this gap in the literature.

Recent changes in U.S. securities law have made it attractive for firms to seek debt financing in what is referred to as the private capital markets, in particular, through syndicated bank loans. The expansion has been so rapid that in 2004, the Bond Market Association reported that $1.4 trillion of syndicated bank loans were issued. This is in marked contrast to the $724 billion of new issues of corporate bonds (including both high yield and investment grade) issued during the same year.

The holders of these syndicated bank loans operate in a dramatically different informational environment than that prevailing in comparable public debt or equity. Instead of the traditional public debt offering, these large bank loans are privately underwritten by syndicates of bank and non-bank financial intermediaries. A lead arranger or agent bank organizes the syndicate and negotiates the terms of the loan on behalf of all syndicate members. Often the lead arranger is a relationship bank that has had a prior non-syndicated lending relationship with the borrower.

There is a large body of academic literature (Boot, 2000) hypothesizing that relationship "banks may know more about a company's prospects than other investors do,"[2] thereby suggesting that banks have an information advantage in providing financing for firms. This knowledge advantage stems from the relationship bank's role as a delegated monitor, cultivated in the course of long-term banking relationships that include provision of a myriad of deposit, cash-management and lending services.[3] These bank loans are easier to renegotiate and restructure in the event of the firm's

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[1] The persistence of this finding is documented in Landsman and Maydew (2002).

[2] See James (1987).

[3] That is, banks obtain private information about their customers by observing a history of customer information such as the flow of funds through customer checking accounts, past repayment history, customer use of commercial banking products (such as letters of credit), firm hedging activities, etc. For example, Mester, Nakamura and Renault (2001) find that banks can use checking account activity to monitor borrower creditworthiness on a real time basis.

financial distress than are publicly traded debt instruments that typically have hundreds or thousands of uncoordinated bondholders that find it hard to reach agreement, at times required to be unanimous. Thus, syndicated bank loans offer a certain amount of flexibility that is unavailable to issuers of bonds and other publicly traded debt securities.

In order to facilitate both monitoring and potential renegotiation, most syndicated bank loan deals contain covenants that require the regular release to all syndicate members of private information about the borrower.[4] The most prevalent type of financial covenant involves the private release of earnings data to the syndicate members. Since this information is often made available to syndicate members prior to the public release of earnings information, participants in the bank loan market may have an information advantage over equity investors. In this paper, we examine whether earnings announcements have a differential impact on syndicated bank loan prices as compared to the earnings announcement effect on stock prices.[5]

We examine 11,034 weekly returns for syndicated loans from 196 firms for 1,517 quarterly earnings announcements over the period consisting of 1998 to 2002. We utilize the Loan Pricing Corporation (LPC) marked-to-market dataset that contains weekly quotes on syndicated loans from various dealers in the secondary loan market, where the transactions price is estimated as the midpoint of the bid and ask quote. Using this database, we observe weekly loan price changes prior to the announcement of each borrower's quarterly earnings releases, after controlling for relevant firm and loan characteristics that are expected to affect the impact of information about quarterly earnings announcements on loan returns.

We find evidence that the effect of earnings on loan returns is not the same as the equity announcement effect. Indeed, we find evidence that earnings data impacts loan returns approximately one month prior to the public announcement date. This is consistent with the release of private information to the loan syndicate members. However, since loans have limitations on upside gain potential, loan returns are much less sensitive to news of increasing earnings than are equity returns. We find evidence that suggests an asymmetric loan return reaction to earnings data. That is, loan returns react to private information about declining earnings (approximately one month prior to public earnings announcements), but show little reaction to information about increasing earnings.

Finally, we find that the information content in syndicated bank loan prices is most pronounced for borrowers with predominantly intangible assets that experience declining earnings. These intangible firms are the most informationally opaque, and thus earnings information can be expected to convey the most information about the value of the firm's assets and the prospects for loan repayment. In contrast, earnings information would be less important in valuing loans issued by firms with tangible, hard assets that

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[4] As of October 2000, Regulation FD requires that all public information be disseminated equally to all market participants. However, private information mandated by loan covenants are not covered by Regulation FD and, therefore, members of the bank loan syndicate receive access to private information that is not available to non-syndicate members. Non-public information given to credit rating agencies is another exclusion from Regulation FD requirements. Jorion, Liu and Shi (2005) find that rating agencies have an informational advantage in the post-FD period as a result of their access to private information.

[5] Other papers have documented a link between equity and syndicated bank loan markets. See Allen and Gottesman (2006) and Allen et al. (2008).

can be easily valued. Thus, we find evidence that when earnings announcements convey relevant information about the borrowing firm (i.e., when the borrower has intangible assets and declining creditworthiness), the syndicated bank loan market expeditiously incorporates that information into prices.

The paper proceeds as follows. Section 2 reviews the literature, offers a brief description of the secondary market in syndicated bank loans and describes our data source. Section 3 describes our hypotheses. Section 4 discusses the methodology utilized to test our hypotheses. Empirical results are presented in Section 5, with conclusions in Section 6.

2. The Secondary Market in Syndicated Bank Loans

Syndicated bank loans can be viewed as a hybrid between public and private debt markets (see, for example, Dennis and Mullineaux, 2000). Oldham (1998) and Miller (1998) show that syndicated bank loans trade like bonds, with fully developed securitization tools, ratings, and a broad institutional investor base. However, the syndicated bank loan market can also be viewed as a private debt market. Syndicates are formed by lead arranging banks that typically have had a prior lending relationship with the borrower. Moreover, the covenant structure may entitle all members of the syndicate to the receipt of monthly financial updates detailing accounting data such as EBITDA, debt levels, free cash flows and net worth. Thus, syndicate members receive considerable amounts of private information about the financial condition of the borrower. This information flow is ongoing during the life of the loan. Indeed, if the loan is subsequently sold on the secondary market, it is typically in the form of an assignment, which makes the buyer a full-fledged member of the syndicate and therefore entitled to receive all past and future information revealed in the course of satisfying the loan's covenant requirements. Altman, Gande and Saunders (2007) find that the bank loan market is informationally more efficient than the bond market in terms of incorporating default information into prices.[6] Casolaro, Focarelli and Pizzolo (2003) examine loan spreads and find that the percentage of the syndication held by the lead arranging bank is an important determinant of the information produced in the course of monitoring the activities of the borrower, suggesting that banks certify the quality of the loan by holding larger stakes. Allen and Gottesman (2006) find that equity and loan markets are highly integrated, so that information flows freely between the two markets.

The *Wall Street Journal* (October 29, 2001) referred to the syndicated loan market as a "multi-trillion dollar debt bazaar that has become the nation's largest capital market during the last decade."[7] Many factors contributed to the rapid growth in the syndicated loan market during the 1990s. The advent of Rule 144a in 1990 (for a discussion of this

[6] Altman, Gande and Saunders (2007) compare the information content of default events in the syndicated bank loan market to the publicly-held bond and equity markets and find that the syndicated bank loan market reacts to private information received prior to public default announcements and therefore has a lower response to publicly released data than do bond or equity markets that react to public announcements.

[7] Zuckerman and Sapsford, (2001).

rule, see Press and Weintrop, 1992) permitted the resale of privately-held securities. Moreover, the 1991–1992 credit crunch, exacerbated by the adoption of more stringent, risk-based international bank capital requirements, contributed to the banking system's willingness to sell their loans into the secondary market, rather than hold them until maturity. Liquidity in the market was bolstered by the founding of the Loan Syndication and Trading Association (LSTA) and the adoption of standardized T+10 settlement procedures for par and near par loans in 1995. As of 2003, U.S. secondary syndicated bank loan trading volume exceeded $140 billion, representing an annual growth rate of 25% over the previous 13-year period.

2.1 The Loan Pricing Corporation Database and Sample Selection

Our major database is obtained from the Loan Pricing Corporation (LPC) and consists of two components: the marked-to-market database and *Dealscan*. The marked-to-market database consists of weekly observations of daily loan bid and ask quotations for individual loan facilities.[8] Loan deals are typically broken into individual facilities. Each facility represents a different tranche of the total loan. The facilities may differ in terms of their covenants, structure (revolving versus term loans), maturity, spreads, etc. For each individual facility, LPC provides an average of all available bids and an average of all available ask quotes, and the mean of the average bid and the average ask (denoted the mean of the mean quote), as well as the number of quotes that comprise the composite average. Transaction prices are not available in the syndicated bank loan market. However, internal LPC studies suggest that transactions prices for par loans (priced above 90) are close to the mean of the mean bid and mean ask quotes (hereinafter, denoted the LPC mean of the mean). Thus, we believe that the mean of the mean is an unbiased proxy for secondary market transaction price. We use the LPC mean of the mean to determine the value of a particular loan facility, denoted P_{it} for any given borrower i on any given day in any given week t.

We coordinate the marked-to-market database with loan descriptive data provided on LPC's *Dealscan* database containing primary market data. The *Dealscan* database contains detailed data about the borrower, the lending syndicate and the terms of the loan itself (including financial and general covenants, optionality in pricing, amortization schedules, lending purposes, etc.). After combining the two databases, we obtain a sample consisting of 1,639 unique loan facilities with 249 variables describing the terms of the loan facility, the borrower, the lenders, the composition of the syndicate and the pricing of the loan weekly over the June 1998 through May 2003 period.

We combine the LPC databases with quarterly Compustat data in order to obtain financial information about earnings, size and leverage. Imposing the requirement of Compustat data availability further limited our sample to 878 loan facilities. In order

[8] LPC is a data warehouser, collecting daily price quotes from more than 30 dealers in the syndicated bank loan market and making them available for use in the marked-to-market database. We acquired a limited version of this database that includes weekly observations of daily price quotations over the period of June 1998 to June 2002. That is, we observe the day's quotations on a single date in each week during our sample period. Moreover, our database only contains those loan facilities with at least two quoting dealers. Our full database contains 184,710 facility prices.

for a firm to remain in the sample, we choose those firms in the combined LPC database with quarterly earnings announcements from Compustat, subject to the following criteria:

1. Each facility must have at least 25 time-series observations of quoted loan prices.
2. Only one facility per firm is selected so as to avoid interdependence among realized returns. The chosen facility has the longest time-series observations of quoted prices, i.e., it is the most frequently traded facility, so as to reduce the infrequent trading problem associated with private debt.
3. There must be at least one year of quarterly earnings announcement dates available from Compustat during the time period of the loan trades.
4. For each of the earnings announcements there must be at least two quoted prices within our –6 week to +6 week return window, with week 0 defined as the week of the announcement.
5. The weekly return on a leveraged loan index (the S&P/LSTA loan index) is available.

The selection process yields 11,163 firm–quarter observations. To control for the effects of extreme values, we remove those observations that are identified as outliers in the regressions.[9] We report our tests based on our final sample of 11,034 weekly return observations associated with 1,517 quarterly earnings announcements made by 196 firms.

To explicitly control for the timing of private information to syndicate members, we create a subsample of observations that have detailed covenant information available. Using only those borrowers that have covenants explicitly tied to EBITDA, thereby requiring the regular release of private earnings data to the syndicate members, we read the actual lending agreements filed by these borrowers with the Securities and Exchange Commission. We search by company names, by loan origination dates and by the size of the loans on the SEC's website in order to locate the actual lending agreements that are described in the borrowers' 8-Ks, 10-Qs, 10-Ks, registration statements or prospectuses. We then search within the loan contract for "affirmative covenants", "information covenants" or "reporting requirements" specified so as to find the precise timing of the covenant compliance reporting requirements under each agreement. We translate the covenantal timing of information flows into "event time" by specifying how many weeks prior to the public earnings announcement the loan covenant requires private release of earnings information to syndicate members.

This searching process yields 89 firms/loan agreements with clearly described financial reporting requirements under their covenant contracts. Among these 89 loan agreements, 18 agreements clearly specify that monthly covenant compliance reports must be provided to the bank loan syndicate members at the end of each fiscal month, while 71 loan agreements require quarterly covenant compliance reports. Since all of these borrowers have their covenants contracted on earnings, detailed information about

[9] To control for outliers, we remove from all of our tests any observation that has a studentized residual greater than four standard deviations from zero in any pooled regression of loan returns on change in quarterly earnings. There were only 129 observations that were removed from the analysis as outliers.

their earnings must be included in these covenant compliance reports. We then measure the "event time" when the covenant reports are provided to lenders for these 89 firms by calculating the distance, in terms of weeks, between the covenant report due date and the corresponding quarterly earnings announcement date for each of the 594 firm–quarter observations over the 1998–2002 sample periods. We find, for these 594 observations, that the mean distance between the due date of covenant report and the corresponding quarterly earnings announcement date is -4.339 weeks (i.e., around 4 weeks prior to the public earnings announcement). This finding suggests that earnings information is released privately to syndicate members, on average, one month prior to public earnings announcement dates. As a result of this differential timing of information flows in the equity as compared to the syndicated bank loan market, we can test hypotheses regarding the differential market reactions. We develop those hypotheses in the next section.

3. Hypothesis Development

Since both debt and equity represent claims on the firm's assets, any change in investors' expectations of future cash flows will influence the pricing of debt, as well as equity. Thus, one could hypothesize that a similar earnings announcement effect would be reflected in debt prices as is found in equity prices.[10] In a paper that tests the information content in public debt prices at the time of annual earnings announcements, Davis, Boatsman and Baskin (1978) find that there is an association between the price of public debt and the announcement of annual earnings.[11] Our hypotheses are designed to test whether the results of the extant literature demonstrating earnings announcement effects in equity and public debt markets apply to syndicated bank loan markets.

H_1: Standard Equity Earnings Announcement Effect Hypothesis: Information about quarterly corporate earnings is reflected in bank loan prices on announcement dates.

In testing this hypothesis, we examine whether the results that are prevalent in the equity market literature, showing significant announcement date reactions to earnings, hold for the syndicated bank loan market. A finding in support of H_1 would suggest that bank loan returns and equity returns have similar reactions to earnings announcements. However, there are several reasons why bank loan prices may react differently to earnings announcements than do equity prices, thereby leading to a rejection of H_1.

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[10] One might question whether earnings information is useful in valuing loans that represent senior claims on the borrowing firm's assets and, therefore, typically have a very high recovery rate even in the event of default. The importance of earnings information to lenders is demonstrated by the overwhelming prevalence of covenants that require the monthly release of sensitive earnings data to loan syndicate members.

[11] In a related paper, Handjinicolaou and Kalay (1984) examine the information content in public debt and equity prices at the time of dividend changes. The main thrust of their paper is to distinguish the information content hypothesis from a wealth transfer hypothesis. This suggests that the change in dividend policy effectively transfers wealth from the debt to the equity holders when dividends are increased. The authors find no support for the wealth transfer hypothesis, but do find support for the information content hypothesis.

At the heart of most of the studies of equity market reaction to earnings announcements is the assumption that the release of important data about the firm, such as earnings, is made available to all investors at the same time.[12] However, investors in different markets may be the recipients of different types of information flows. In particular, private debt markets, such as the syndicated bank loan market, require the periodic transfer to lenders of private information about the borrowing firm' s financial condition. If this information is useful in evaluating the firm's debt claims, we would expect to see an expeditious response in bank loan prices. To the extent that this information is received prior to the release of public earnings announcements, we hypothesize that the syndicated bank loan market's reaction to earnings information will precede the equity market reaction that coincides with public earnings announcement dates.

H_2: Private Information Hypothesis: Syndicated bank loan returns reflect the private release of earnings information to syndicate members as mandated by loan covenants.

We test this hypothesis by determining whether returns in the syndicated bank loan market display changes consistent with subsequent earnings announcements. That is, we examine whether there is a significant announcement effect anytime from six weeks to one week prior to the public announcement date. The finding of a pre-announcement effect is consistent with information leakage through the covenantal requirements that release earnings information to syndicate members only. This finding would support H_2. Moreover, for a subsample of our observations, we are able to identify the exact timing of the covenantal requirements regarding the release of earnings information to syndicate members. A finding of a significant announcement effect coinciding with the dates of private information release would support H_2.

Prior literature has posited that there may be an asymmetric price response for news that reveals a firm's deteriorating future economic prospects as compared to the price reaction to news that reveals an improvement in a firm's future economic prospects. For example, by regressing raw returns on firm earnings, Hayn (1995) finds that the earnings–returns relationship is much stronger for profitable firm–years than when all firm–years are included. However, Chambers (1996) reports that when sample firms are size-matched, firms with declining earnings tend to have a higher R^2 than do firms with increasing earnings. In replicating the tests of Hayn (1995) using inter-announcement period market-adjusted returns, Basu (1997) finds that the earnings–returns relationship is stronger for the full sample than for increasing earnings firms only. He interprets his results to be consistent with the conservatism in accounting as bad news regarding future cash flows is recognized in earnings in a more timely manner than is good news.[13]

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[12] Jorgensen and Wingender (2004) find that quarterly earnings announcements are disseminated broadly to public markets via telephone and the Internet, particularly in the wake of the passage of Regulation FD in October 2000.

[13] Similar findings can be found in examining the stock market reactions to bond rating changes. For example, Holthausen and Leftwich (1986) find significant abnormal stock returns associated with bond downgradings, but not with upgradings. Moreover, Handjinicolaou and Kalay (1984) find that gains associated with positive dividend announcements are captured by the stockholders (and not the bondholders), while the losses resulting from negative dividend announcements are shared with the bondholders.

From a creditor's point of view, timely information about "bad news" is more important than information about "good news", since the value of creditors' claims on a firm's assets is more sensitive to a decline than an increase in the firm's future economic prospects (Smith, 1979). Due to the nature of the debt contract, lenders are exposed to downside losses, but do not share in upside gains beyond the contractual repayment of interest and principal. Therefore, we expect the information content of earnings in the secondary syndicated loan market to be asymmetric between firms that release earnings indicating negative future economic prospects (denoted bad news) and those announcing increasing earnings (denoted good news).[14] More specifically, we expect syndicated loan returns to be more sensitive to bad news than to good news, thereby supporting hypothesis H_3.

H_3: Asymmetric Price Reaction Hypothesis: The information content of earnings in the syndicated loan market is asymmetric, such that bank loan returns are significantly negative for firms that have declining earnings, but bank loan returns are not significantly positive for positive earnings changes.

Combining hypotheses H_2 and H_3 yields hypotheses regarding both the timing and the nature of the impact of earnings information on syndicated bank loan returns. That is, if we find evidence consistent with both H_2 and H_3, then we conjecture that syndicated bank loan prices react negatively to declining earnings upon release of private information to syndicate members (prior to the public earnings announcement), but display no significant response to information about increasing earnings.

4. Empirical Methodology

4.1 Variable Definitions

4.1.1 Loan Returns and Index Loan Returns

To test these hypotheses, we define the following variables. The dependent variable in our event study, R_{it}, is the weekly return on each individual syndicated bank loan facility. We use weekly (mean of the mean) quotations obtained from LPC to obtain syndicated bank loan prices and calculate the raw return by taking the log difference of two consecutive weekly quotes. More specifically, our dependent variable $R_{i,t}$ is measured by the following:

$$R_{it} = Ln\,(P_{it}/P_{it-1}) \tag{1}$$

where

R_{it} = the rate of return of syndicated loan facility i between the daily mean of the mean LPC price at week t-1 to the mean of the mean LPC price at week t,

P_{it} = quoted LPC mean of the mean price of loan facility i on a given date during week t.

[14] We consider good (bad) news to be measured by absolute increases (decreases) in earnings, although there may be other empirical proxies. For example, Ayers, Jiang and Yeung (2004) relate performance to meeting or beating a benchmark. To the extent that the benchmark is related to changes in earnings, we believe that there will be similar divisions in the sample using both methods.

The calculation of holding period returns, R_{it}, is complicated by several factors. First, the weekly quotes may not be consecutive. If the weekly quotes are not consecutive, we denote the weeks of missing quotes as missing observations, i.e., we don't replace missing consecutive returns with multi-week returns, so as to retain the timing of the impact of earnings announcements on loan returns. Secondly, the dates for which these quotes are available change across loan facilities, and even over time for the same loan facility. To correctly locate each quote in terms of its distance to each earnings announcement date, we designed the following methodology:

1. Let W_{is} be the first day of the week during which quarterly earnings for firm i are publicly announced,
2. Let N be the distance in terms of weeks from the observed date of quote in week t of loan facility i to W_{is},
3. Let K be the integer of N, and restrict K to be [–6, +6], since we expect each quarterly earnings announcement to be approximately 12 weeks apart,[15]
4. For each quarterly earnings announcement of each firm, we index every $P_{it(K)}$ by K, where K = [-6, +6],
5. If the earnings announcement date comes before or at the same time as the date of the quote in a particular week t, let $R_{i,t(K)} = Ln\ (P_{i,t(K)} / P_{i,t(K-1)})$, with $K\sim$ [–5, 6],
6. If the earnings announcement date comes after the date of the quote in a particular week t, let $R_{i,t(K)} = Ln\ (P_{i,t(K+1)} / P_{i,t(K)})$, with $K \sim$ [–5, 6].

To estimate the market return during a particular week t, denoted MR_t, we obtain weekly quotes on the S&P/LSTA syndicated bank loan index. LSTA, in conjunction with Standard & Poor's, maintains a weekly index of senior bank loan prices. The S&P/LSTA syndicated bank loan index includes 470 loan facilities totaling $104 billion in value outstanding, covering around 70% of the institutional loan market. Starting in January 1999, the S&P/LSTA index provides weekly quotes on the leveraged loan market. To align the loan index return with each individual loan return, we repeat the indexing procedure, described above on the S&P/LSTA weekly index quotes, for each quarterly earnings announcement and for each firm.

4.1.2. Testing Variables

We examine the impact of the quarterly earnings announcement on the dependent variable, the weekly loan return R_{it}. Following Beaver, et al. (1997), we employ a seasonal random walk model for quarterly earnings. Accordingly, the quarterly earnings surprise variable, denoted ES_{iqy}, is the change in earnings for quarter q from the current year y to the year y-1, normalized by the absolute value of earnings for quarter q in the

[15] If two adjacent earnings announcement dates are less than 12 weeks apart, then we have an overlap problem in terms of indexing our weekly quotes. For example, one firm in our sample announced the 4th quarter earnings of the prior year on February 14, and announced the first quarter earnings of the current year on April 24, so that the +6 week event corresponding to the February earnings announcement overlaps the –6 week event for the next earnings announcement. In that case, we consider the +6 week observation to be missing, since our main interest lies in examining the loan returns prior to earnings announcements.

year *y*-1. We test the timing of the earnings announcement using an indicator variable, $W_{it,}$ that is set equal to one if the observed loan return for facility *i* in week *t* is *w* weeks prior to the earnings announcement week; zero otherwise. We then interact the week indicator variable (except for week $w = 0$) with the earnings surprise variable (ES_{iqy}) across the event weeks. Our primary interest is to find out how loan prices respond to the forthcoming earnings information during the five weeks of pre-announcement period, i.e., whether there is information leakage during the pre-announcement period in the private debt market.

In order to test the asymmetric price reaction hypothesis (H_3), we split the sample into observations with an increase in the upcoming earnings announcement (denoted,, good news) and observations with a decrease in the upcoming earnings announcement (bad news).[16] Specifically, we separate good news firms from bad news observations for each firm *i* using annual unscaled changes in earnings per share, as calculated from quarter *q* in year $y - 1$ to the same quarter in year *y*; that is, $\hat{ES}_{iqy} = E_{iqy} - E_{iqy-1}$. If the change in earnings is strictly less than zero, then that firm–quarter observation is classified as bad news; otherwise, it is put into the good news sample.[17]

4.1.3 Control Variables

It is well known that firm size is negatively associated with stock returns (Schwert, 1983; Easton and Zmijewski, 1989). Since firm size can be related to many economic factors of a firm, such as systematic risk, the association between firm size and syndicated loan returns is unpredictable. As a control variable, we use the standard size variable $SIZE_{iq}$ defined to be the log of the market capitalization of firm *i* at the beginning of quarter *q* (where *q* encompasses weeks $w \sim [-5, 6]$[18]), as obtained from Compustat quarterly tapes.

Loan prices are extremely sensitive to changes in firms' default risk. This is the single most important determinant of loan returns. Earnings data is useful to loan market participants to the extent that it provides information that can be utilized to assess and update estimates of changes in default risk.[19] As a proxy to control for the loan's changes in credit risk, we calculate the probability of default for firm *i* within one year from week *t*, denoted PD_{it}. We use a Black–Scholes option-theoretic model, as proposed by Merton (1974), to estimate the change in solvency of borrowers. In his seminal paper, Merton models a firm's equity as a call option on the value of assets. The strike price of the option is determined by the firm's contractual liabilities. As shown by Crosbie and Bohn (2002), we can apply this Black–Scholes framework to estimate the distance-to-default for a given period (usually one year). The distance-to-default scores can be viewed as a credit risk measure similar to the numerical ratings published by the credit

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[16] We assume that earnings declines are consistent with higher default probabilities and vice versa.

[17] We use this definition of bad/good news (as in Foster (1977) and Kothari (2001)) because more complicated time-series models have not improved the results in other studies testing the relationship between short-window returns and quarterly earnings announcements.

[18] We start with week -5 since we don't have enough observations for week -6.

[19] The term structure of interest rates is typically important in determining debt prices. However, most syndicated bank loans are floating rate loans that are tied to a market benchmark rate. This dampens the loan price sensitivity to shifts in the yield curve of interest rates.

rating agencies (see Appendix I). All else being equal, the greater the PD_{it}, the lower the loan price.[20]

The last set of variables controls for loan-specific features. The interest rate on the loan is measured as the natural log of the basis point spread over LIBOR, inclusive of all fees, called the all-in-spread, denoted $LSPREAD_i$. In general, this spread is fixed over the life of the loan. *Ceteris paribus*, the higher the spread, the riskier the loan (see, for example, John et. al., 2002). High credit risk loans generally experience lower returns. Therefore, a negative relationship between returns and $LSPREAD_i$ is expected in the context of syndicated bank loans. The exception to a fixed spread is for loans with a performance pricing grid that specifies changes in the spread in response to changes in the borrowing firm's financial condition, as measured by credit rating or accounting ratio. As a result, the loan returns of those with performance pricing provisions are likely to be more sensitive to earnings information than those without performance pricing provisions. To capture this, we use a dummy variable $PERFPR_i$ to indicate the existence of performance pricing provision. $PERFPR_i$ equals one if a loan has such a provision and equals zero otherwise. In most specifications, the inclusion of a performance pricing option increases loan returns, *ceteris paribus*, because of the value of the embedded option (Beatty, Dichev and Weber, 2003).

The existence of financial covenants obligates the borrower to reveal detailed accounting data to the loan syndicate on a periodic basis (on average for our sample, one month prior to the quarterly public release of earnings), which lowers the market' s uncertainty about loan value. Therefore, we define a dummy variable that takes on the value of one if the loan has financial covenants that might require special reporting of financial and accounting data, denoted $COVENANT_i$. *Ceteris paribus*, we anticipate a negative (positive) relationship between loan returns and the $COVENANT_i$ dummy variable for bad (good) news observations. We also define a variable denoted $CLOSE_{it}$, which denotes how close borrower *i*'s financial condition is to the debt covenant at year *t*. It is calculated by subtracting the DEBT/EBITDA eventual covenant restriction from the actual DEBT/EBITDA ratio at year *t*, calculated using Compustat annual data as follows: DATA 9 (Long Term Debt)/(DATA 18 (Income Before Extraordinary Items) + DATA 15 (Interest Expense) + DATA 16 (Income Taxes) + DATA 14 (Depreciation and Amortization)). Only 7,006 loan–year observations have sufficient data to calculate the closeness to covenant violations. For firms that are close to covenant violation, earnings information is more likely to be used to assess the likelihood that lenders will exercise the option to call the debt. Therefore, the closer to covenant violation, the higher the likelihood that lenders will call their debts, and the more negative the loan value. We thus anticipate a negative relation between $CLOSE_{it}$ and the loan returns.

An indicator variable $DISTRESS_{it}$ specifies whether the loan is distressed or not. It is set equal to one (zero otherwise) if the mean of the mean price of facility *i* in week *t* for a particular quarterly earnings announcement event is less than 80. During the time period of our study (1998–2003), many of the distressed loans in our sample are

[20] We didn't use Moody's bond ratings to represent default risk for several reasons: 1. These credit ratings are assigned as of the loan origination and may change over the life of the loan. 2. It is well known that ratings are lagging indicators of default risk exposure (Altman and Saunders, 2001). 3. Over 30% of our sample of loans is not rated by either Moody's or S&P.

"fallen angels", i.e. par loans that declined in value as the borrowing firm experienced deterioration in its creditworthiness. This price decline would produce a negative relationship between loan returns and the $DISTRESS_{it}$ control variable. Another indicator variable is set equal to one (zero otherwise) if the loan is secured by collateral, denoted $SECURED_i$. Since secured loans tend to be riskier, thereby accounting for the collateral requirement, (see, for example, Berger and Udell, 1990), we anticipate a positive relationship between loan returns and the $SECURED_i$ dummy variable, all else equal. We also include the log of years to maturity of the loan ($MATU_i$) to control for the degree of interest rate exposure. Longer maturity results in higher interest rate exposure. Hence, it is expected to be positively related to loan returns. Finally, we use two measures to proxy for the liquidity of a syndicated bank loan. First, we define $NOQUOTES_{it}$ to be the log of the number of market quotes for facility i in week t. Since loans trade at an illiquidity discount, the more liquid the loan (the higher the $NOQUOTES_{it}$), the lower the required rate of return. Secondly, we use log of the size of the loan facility ($LOANSIZE_i$) to measure each loan's marketability. The larger the size of the loan, the more frequently the loan is expected to be traded, which is expected to be negatively related to the return of the loan.

4.2 The Empirical Model

We estimate the following model to examine the information content of quarterly earnings announcements on syndicated bank loan weekly returns, R_{it}:

$$\begin{aligned} R_{it} = {} & \alpha + \beta_1 MR_t + \beta_2 W5_{it} * ES_{iq} + \beta_3 W4_{it} * ES_{iq} + \beta_4 W3_{it} * ES_{iq} + \beta_5 W2_{it} * ES_{iq} \\ & + \beta_6 W1_{it} * ES_{iq} + \beta_7 ES_{iq} + \beta_8 SIZE_{iq} + \beta_9 PD_{it} + \beta_{10} LSPREAD_i + \beta_{11} PERFPR_i \\ & + \beta_{12} COVENANT_i + \beta_{13} CLOSE_{it} + \beta_{14} DISTRESS_{it} + \beta_{15} SECURED_i \\ & + \beta_{16} MATU_i + \beta_{17} NOQUOTES_{it} + \beta_{18} FSIZE_i + \varepsilon_{it} \end{aligned} \quad (2)$$

where

MR_t = the S&P/LSTA syndicated bank loan index return during week t.

$WK_{it,}$ = dummy variable that is set equal to one if the observed loan return for facility i in week t is k weeks ($k \sim [-5, -1]$) prior to the earnings announcement week; zero otherwise.

ES_{iq} = the change in earnings for quarter q from the current year t to the year t-1, normalized by the absolute value of earnings for quarter q in the year t-1.

$SIZE_{iq}$ = the log of the market capitalization of firm i at the beginning of quarter q (in millions of dollars).

PD_{it} = the probability of default of firm i within one year from week t, estimated using a Black–Scholes options-theoretic model.

$LSPREAD_i$ = the all-in-spread on the loan, measured as the natural log of the basis point spread over LIBOR, inclusive of all fees for facility i.

$PERFPR_i$ = dummy variable that equals one if a loan has performance pricing provision and equals zero otherwise.

$COVENANT_i$ = dummy variable that takes on the value of one if the loan has financial covenants and zero otherwise.

$CLOSE_{it}$ = how close borrower *i*'s financial condition is to the debt covenant at year *t*. It is calculated by subtracting the DEBT/EBITDA eventual covenant restriction from the actual DEBT/EBITDA ratio at end of year *t*.

$DISTRESS_{it}$ = dummy variable is set equal to one (zero otherwise) if the mean of the mean price of facility *i* in week *t* is less than 80 to indicate whether the loan is distressed or not.

$SECURED_i$ = dummy variable that equals to one (zero otherwise) if the loan is secured by collateral.

$MATU_i$ = the natural log of years to maturity of facility *i*.

$NOQUOTES_{it}$ = the natural log of the number of market quotes for facility *i* in week *t*.

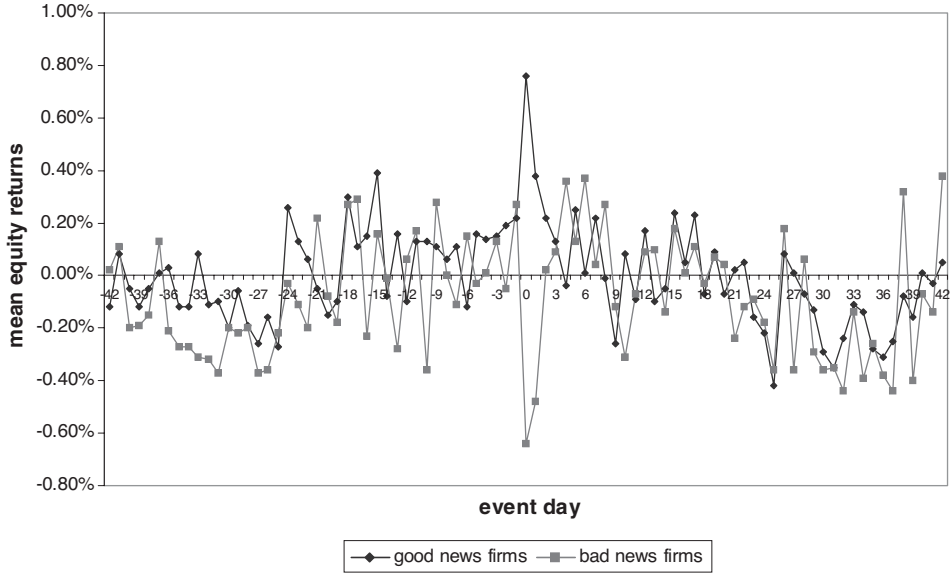
$FSIZE_i$ = the natural log of the size of the loan facility (in millions of dollars).

5. Empirical Results

Prior to testing our three hypotheses, we verify that the firms in our sample display the standard earnings announcement effect documented in the literature on equity returns. First, we plot the average daily equity returns for our sample firms in a return window of [–42, +42] days around quarterly earnings announcements in Figure 1.

Figure 1

Mean Portfolio Equity Returns By Type of News



We can see that these firms experience significant stock price movements around the announcement date (day 0). Good news (earnings increase) firms have significant positive stock prices movement, while bad news (earnings decrease) firms experienced strong negative stock market reactions. Next, we estimate the cumulative abnormal returns around earnings announcements for an event window of (–1, +1) using daily equity returns around 1,517 earnings announcement events in our sample. Consistent with the literature, we find significant announcement effects in equity returns. That is, the average three-day cumulative abnormal returns (CARs) around the earnings announcement date is statistically significant at the 1% level, averaging 0.98% and 1.30% for good news firms, and –0.82% and –0.96% for bad news firms, using CRSP equal-weighted market-adjusted and CRSP value-weighted market-adjusted returns, respectively. When we regress the CARs on firm-specific independent variables, such as firm size, leverage and the change in earnings, we find a statistically significant (at the 1% level) coefficient on earnings changes only, consistent with an earnings announcement effect in equity markets.

To test whether loan returns display the same earnings announcement effect as found in equity markets (hypothesis H_1), we compile a sample of weekly returns in the syndicated bank loan market. Panel A of Table 1 provides descriptive statistics for the entire sample. Both loan returns and earnings fluctuations were negative on average over the 1998–2003 sample period, consistent with a time period that encompassed the bursting of the tech bubble, the Russian debt default, the Long Term Capital Management debacle and an economic recession that roiled debt markets. An average of 86.17% of the observations in our sample had loan covenants and 37.65% of the loans had performance pricing provisions. Among the 196 facilities in our sample, 88.34% of them were secured. Average spreads over LIBOR were 288 basis points, with loan maturity averaging more than six years and an average loan size of $561 million. The average number of weekly quotes on a loan is almost nine, indicating a fairly liquid secondary syndicated loan market. Interestingly, the variable *CLOSE* has a mean of 1.2976, with a median of 0.7397, which is insignificantly different from zero, suggesting that loan covenants are set very tightly to reflect the ongoing firms' leverage ratios.

Table 1
Summary statistics

Panel A: Summary Statistics of the Variables Used in the Overall Firms Sample

Variable	Mean	Std. dev.	Median	Min.	Max.
Primary Market Descriptive Statistics					
$FSIZE_i$	561.4557	2024.0000	270.0000	40.0000	25000.0000
$SPREAD_i$	287.8433	111.5056	275.0000	30.0000	550.0000
$COVENANT_i$	0.8617	0.3451	1.0000	0.0000	1.0000
$SECURED_i$	0.8834	0.3210	1.0000	0.0000	1.0000
$MATU_i$	6.2407	1.5694	6.6400	1.0000	9.2200
$PERFPR_i$	0.3765	0.4845	0.0000	0.0000	1.0000
Secondary Market Descriptive Statistics					
R_{it}	-0.0010	0.0055	0.0013	-0.0458	0.0422
MR_t	0.0015	0.0119	0.0012	-0.0433	0.0567
$NOQUOTES_{it}$	8.9282	5.1928	6.0000	4.0000	28.0000

$DISTRESS_{it}$	0.1760	0.3808	0.0000	0.0000	1.0000
PD_{it}	6.2384	6.9009	3.4700	0.0200	21.6100
Firm Characteristics					
ES_{iq}	-0.3582	10.1147	-0.0800	-363.6700	85.0000
$SIZE_{iq}$	3262.0000	8419.0000	960.3168	0.7181	103441.0000
$CLOSE_{it}$	1.2976	8.6885	0.7397	-56.1029	59.5473

Panel B: Summary Statistics of the Variables Used in the Bad News Firms Sample

Variable	Mean	Std. dev.	Median	Min.	Max.
Primary Market Descriptive Statistics					
$FSIZE_i$	672.5747	2463.0000	285.0000	40.0000	25000.0000
$SPREAD_i$	296.2648	115.6560	300.0000	30.0000	550.0000
$COVENANT_i$	0.8511	0.3560	1.0000	0.0000	1.0000
$SECURED_i$	0.8734	0.3326	1.0000	0.0000	1.0000
$MATU_i$	6.2227	1.6575	6.8500	1.0000	9.2200
$PERFPR_i$	0.3754	0.4843	0.0000	0.0000	1.0000
Secondary Market Descriptive Statistics					
R_{it}	-0.0040	0.0063	-0.0029	-0.0458	0.0414
MR_t	0.0012	0.0122	0.0010	-0.0433	0.0567
$NOQUOTES_{it}$	9.1544	5.3597	8.0000	4.0000	28.0000
$DISTRESS_{it}$	0.1898	0.3922	0.0000	0.0000	1.0000
PD_{it}	7.2544	7.3289	3.4700	0.0200	21.6100
Firm Characteristics					
ES_{iq}	-2.7709	13.7010	-0.8100	-363.6700	-0.0200
$SIZE_{iq}$	3736.0000	10072.0000	907.4464	1.1250	103441.0000
$CLOSE_{it}$	1.8487	11.2026	1.3581	-56.1030	59.5473

Panel C: Summary Statistics of the Variables Used in the Good News Firms Sample

Variable	Mean	Std. dev.	Median	Min.	Max.
Primary Market Descriptive Statistics					
$FSIZE_i$	468.3290	1557.0000	250.0000	40.0000	25000.0000
$SPREAD_i$	280.7854	107.4067	275.0000	30.0000	550.0000
$COVENANT_i$	0.8707	0.3355	1.0000	0.0000	1.0000
$SECURED_i$	0.8917	0.3108	1.0000	0.0000	1.0000
$MATU_i$	6.2558	1.4914	6.5200	1.0000	9.2200
$PERFPR_i$	0.3773	0.4848	0.0000	0.0000	1.0000
Secondary Market Descriptive Statistics					
R_{it}	0.0015	0.0046	0.0000	-0.0439	0.0422
MR_t	0.0018	0.0117	0.0013	-0.0433	0.0567
$NOQUOTES_{it}$	8.7386	5.0413	6.0000	4.0000	26.0000
$DISTRESS_{it}$	0.1644	0.3707	0.0000	0.0000	1.0000
PD_{it}	5.3868	6.3981	2.4300	0.0200	13.3700
Firm Characteristics					
ES_{iq}	1.6639	4.6665	0.7200	0.0000	85.0000
$SIZE_{iq}$	2864.0000	6703.0000	993.1400	0.7181	91561.0000
$CLOSE_{it}$	0.8463	5.8407	0.1759	-27.7505	56.3148

Panel D: Tests on Mean and Variance Differences of the Variables Between Good/Bad News Firms

Variable	T-test	F-Test
Primary Market Descriptive Statistics		
$FSIZE_i$	-1.82*	1.18***
$SPREAD_i$	-1.56	1.20***
$COVENANT_i$	2.97***	1.13***
$SECURED_i$	2.99***	1.15***
$MATU_i$	0.77	1.34***
$PERFPR_i$	0.20	1.00
Secondary Market Descriptive Statistics		
R_{it}	3.66***	1.88***
MR_t	0.57	1.08***
$NOQUOTES_{it}$	-0.93	1.06**
$DISTRESS_{iq}$	-0.49	1.12***
PD_{it}	-14.29***	1.31***
Firm Characteristics		
ES_{iq}	12.92***	8.62***
$SIZE_{iq}$	-1.42	2.26***
$CLOSE_{it}$	-4.81***	3.68***

Notes: This table reports summary statistics for the 11,034 firm/loan-quarter observations over the period 1998–2002 used in the overall firms' sample, and in both good/bad news firms, and the comparison between the two groups (good–bad). R_{it} is weekly return on syndicated loan facility i in week t. MR_t is return on S&P syndicated loan index in week t. ES_{iq} is quarterly earnings surprise measured by changes in earnings for quarter q of firm i from the current year to the prior year, scaled by the absolute value of the earnings for quarter q in the prior year. $SIZE_{iq}$ is firm size, measured by the market capitalization (in millions of dollars) at the beginning of quarter q for firm i. $CLOSE_{it}$ is closeness to covenant violation of facility i at year t, it is calculated by subtracting the DEBT/EBITDA eventual covenant restriction from the actual DEBT/EBITDA ratio at year t, calculated using Compustat annual data as follows: DATA 9 (Long Term Debt)/(DATA 18 (Income Before Extraordinary Items) + DATA 15 (Interest Expense) + DATA 16 (Income Taxes) + DATA 14 (Depreciation and Amortization)). Only 7,006 loan–year observations have sufficient data to calculate the closeness to covenant violations. $PERFPR_i$ is an indicator variable that takes the value of one if the loan contract of firm i has a performance pricing provision, and zero otherwise. PD_i is the probability of default of firm i within one year, estimated using a Black–Scholes option-theoretic model. $SPREAD_i$ is all-in spread, measured by the basis point spread over LIBOR, inclusive of all fees for facility i. $NOQUOTES_{it}$ is the total number of weekly quotes on facility i at week t. $DISTRESS_{it}$ is distressed loan indicator that takes the value of one if the price of the loan is less than 80 at week t and zero otherwise. $COVENANT_i$ is an indicator variable that equals one if a loan has financial covenant and zero otherwise. $SECURED_i$ equals one if a loan is secured and zero otherwise. $MATU_i$ measures the maturity of the loan in terms of the number of years from the loan origination to its maturity. $FSIZE_i$ is the size of the facility at its origination, it is expressed in thousands of dollars. The superscript asterisks *, **, *** denote significance at or below the 0.10, 0.05, 0.01 level, respectively, based on a two-tailed (T-test) or a one-tailed (F-test) test of significance.

5.1 Tests of H_1, the Standard Equity Earnings Announcement Effect Hypothesis

Table 2 presents our tests of H_1, hypothesizing that loan returns display the same earnings announcements effects as equity markets. As shown in the third column of Table 2, the coefficient on earnings surprise (ES_{iq}) is insignificantly different from zero, indicating that there are no significant loan market reactions at the time of earnings announcement. Moreover, the coefficient on the product of *W1* dummy variable and

the earnings surprise (ES_{iq}) is statistically insignificant, suggesting that there was no significant reaction to the earnings surprise during the week immediately preceding the public earnings announcement. In the fourth column, we limit our sample to those loans that have covenants tied to earnings in order to test whether there is a loan return reaction to earnings information for those loans that stipulate the regular release of earnings information to syndicate members. Again, we find no evidence of significant loan market movement around the public announcement of earnings information for our covenant sample.

In general, results presented in Table 2 indicate that there are no significant price movements in the syndicated loan market around quarterly earnings announcement dates. This is quite different from the significant equity market movements at earnings announcement dates that we documented previously. Thus, we fail to find support for H_1 in Table 2.

Table 2
Syndicated Loan Price Reactions to Quarterly Earnings Announcements – Announcement Date Effect

$$\begin{aligned} Model:\ R_{it} = {} & \alpha + \beta_1 MR_t + \beta_2 W5_{it} * ES_{iq} + \beta_3 W4_{it} * ES_{iq} + \beta_4 W3_{it} * ES_{iq} + \beta_5 W2_{it} * ES_{iq} \\ & + \beta_6 W1_{it} * ES_{iq} + \beta_7 ES_{iq} + \beta_8 SIZE_{iq} + \beta_9 PERFPR_i + \beta_{10} PD_{it} \\ & + \beta_{11} LSPREAD_i + \beta_{12} NOQUOTES_{it} + \beta_{13} DISTRESS_{it} + \beta_{14} COVENANT_i \\ & + \beta_{15} SECURED_i + \beta_{16} MATU_i + \beta_{17} FSIZE_i + \varepsilon_{it} \end{aligned}$$

		Overall Sample	Covenant Sample
Variable	Predicted Sign	Estimated Coefficient	Estimated Coefficient
Week –5 Dummy × Earnings Surprise	?	0.0608(2.32)**	0.0655(3.15)***
Week –4 Dummy × Earnings Surprise	?	0.0551(2.23)**	0.0871(4.04)***
Week –3 Dummy × Earnings Surprise	?	0.0400(1.60)	0.0604(1.89)*
Week –2 Dummy × Earnings Surprise	?	0.0267(0.33)	0.0491(0.87)
Week –1 Dummy × Earnings Surprise	?	0.0272(0.53)	0.0116(0.65)
Earnings Surprise, ES_{iq}	+	0.0019(0.26)	0.0010(0.80)
Loan Market Return Index, MR	+	0.7413(2.07)**	0.8496(2.08)**
Log of Firm Size, $SIZE_{iq}$	-	-0.0056(-1.84)*	-0.0078(-1.77)*
Performance Pricing Provision, $PERFPR_i$	+	0.024(2.11)**	0.016(2.38)**
Probability of Default, PD_{it}	-	-0.0043(-5.04)***	-0.0043(-3.87)***
Closeness to Covenant Violations, $CLOSE_{it}$	-		-0.0001(-3.71)***
Log of All-In Spread (Basis Points over LIBOR)	-	-0.0366(-2.37)**	-0.0002(-1.79)*
Log of Number of Quotes, $NOQUOTES_{it}$	-	-0.0333(-3.09)***	-0.0086(-0.76)
Distressed Loan Indicator, $DISTRESS_{it}$	-	0.0039(0.28)	0.0183(1.33)
Financial Covenants Indicator, $COVENANT_i$	?	-0.0184(-1.13)	
Secured Loan Indicator, $SECURED_i$	+	0.0028(0.11)	0.0023(0.62)
Log of Maturity in Years, $MATU_i$	+	0.0163(0.83)	0.0183(0.80)
Log of Facility Size, $FSIZE_i$	-	-0.0306(-3.83)***	-0.0262(-3.08)***
Intercept	?	-0.5406(-3.94)***	-0.4021(-3.28)***
Year Indicator Variables	?	Yes	Yes
Firm Indicator Variables	?	Yes	Yes
Observations		11034	7006
Adjusted R^2		0.0101	0.0215

Notes: This table reports ordinary least squares regression results for testing the information content of quarterly earnings on syndicated loan returns using pooled cross-sectional, time-series ordinary least squares over –5 to 0 weeks of each quarterly earnings announcement during 1998–2002 period. Column 3 is for the overall sample that consists of 11,034 firm–quarter observations. Column 4 is for firms that have covenants tied to EBRITA, which consists of 7,006 firm–quarter observations. R_{it} is weekly return on syndicated loan facility i in week t. MR_t is return on S&P/LSTA syndicated loan index in week t. WK_{it} is a dummy variable that equals one if the observed loan return at week t of firm i is in k weeks prior to its quarterly earnings announcement date, and zero otherwise. ES_{iq} is quarterly earnings surprise measured by changes in earnings for quarter q of firm i from the current year to the prior year, scaled by the absolute value of the earnings for quarter q in the prior year. $SIZE_{iq}$ is firm size, measured by the market capitalization (in millions of dollars) at the beginning of quarter q for firm i. $PERFPR_i$ is an indicator variable that takes the value of one if the loan contract of firm i has a performance pricing provision, and zero otherwise. PD_{it} is the probability of default of firm i within one year from week t, estimated using a Black–Scholes option-theoretic model. $CLOSE_{it}$ is closeness to covenant violation of facility i at year t, it is calculated by subtracting the DEBT/EBITDA eventual covenant restriction from the actual DEBT/EBITDA ratio at year t, calculated using Compustat annual data as follows: DATA 9 (Long Term Debt)/(DATA 18 (Income Before Extraordinary Items) + DATA 15 (Interest Expense) + DATA 16 (Income Taxes) + DATA 14 (Depreciation and Amortization)). $SPREAD_i$ is all-in spread, measured by the basis point spread over LIBOR, inclusive of all fees for facility i. $NOQUOTES_{it}$ is the total number of weekly quotes on facility i at week t. $DISTRESS_{it}$ is distressed loan indicator that takes the value of one if the price of the loan is less than 80 at week t, and zero otherwise. $COVENANT_i$ is an indicator variable that equals one if a loan has financial covenant, and zero otherwise. $SECURED_i$ equals one if a loan is secured, and zero otherwise. $MATU_i$ measures the maturity of the loan in terms of the number of years from the loan origination to its maturity. $FSIZE_i$ is the size of the facility at its origination, it is expressed in millions of dollars. Regressions also contain year and industry indicators. T-tests are in the parenthesis below the coefficient, and p-values are calculated using White's standard errors. The superscript asterisks *, **, *** denote significance at or below the 0.10, 0.05, 0.01 level, respectively, based on a two-tailed (where sign is not predicted) or a one-tailed (where sign is predicted) test of significance.

The results shown in Table 2 for the control variables,[21] when significant, are consistent with expectations. That is, loan returns are inversely related to default probability, firm size, loan size, and loan market liquidity (as measured by the number of quotes). Table 2 also shows that the optionality embedded in the performance pricing provision increases loan returns (a significantly (at the 5% level) positive coefficient on the Performance Pricing Provision indicator variable), consistent with prior literature.

5.2 Tests of H_2, the Private Information Hypothesis

Although Table 2 does not offer results consistent with H_1, it does offer some support for H_2, in which we test whether the loan market reaction occurs prior to the public earnings announcement date around the time of private information releases of earnings information to syndicate members. In column 3 of Table 2, the coefficients on the cross-product terms of the week dummy variables and the earnings surprise are significantly positive (at the 5% level) for weeks –4 and –5, i.e. 4 and 5 weeks prior to the public earnings announcement. Our covenant sample results, reported in column 4 of Table 2, provide further support for the private earnings information release hypothesis. The coefficients on the cross-product terms for the *W5* and *W4* dummies and the

[21] We don't include the $CLOSE_{it}$ variable in the regression model presented in column 3 of Table 2, since the sample contains loan facilities that have no financial covenants, and thus the calculation of the $CLOSE_{it}$ variable is impossible.

earnings surprise are significantly positive at the 5% level. These results are consistent with a significant loan market reaction to the private release of earnings information approximately one month prior to public earnings announcements. This suggests that there is a significant loan price reaction to accounting earnings, but that the reaction occurs approximately one month prior to the public announcement date.

However compelling the results of Table 2, they do not explicitly link the timing of the release of private information about earnings to loan returns. In Table 3, we examine a subsample of loans in order to control for the actual timing of the release of the private information about earnings to the loan syndicate members. We read the actual loan documents in order to determine the mandated covenant reporting frequency, obtaining 594 firm–quarter observations that reported this detailed information. We define covenant report week as the first week after the covenant report becomes due, and find the corresponding loan returns during that week. We then rerun the test using one indicator variable for the covenant report week.[22] Table 3 reports the regression results. As can be seen from Table 3, the coefficient on the covenant report week dummy is statistically significant, and the interactive term between covenant report week and the earnings surprise is significantly positive at the 1% level. This result is consistent with H_2, indicating a loan market reaction to private earnings information released to the syndicate members prior to the public announcement of earnings reports.

Table 3
Syndicated Loan Price Reactions during Covenant Report Week – Private Information Effect

$$Model: R_{it} = \alpha + \beta_1 MR_t + \beta_2 RW_{it} + \beta_3 RW_{it} * ES_{iq} + \beta_4 SIZE_{iq} + \beta_5 PERFPR_i + \beta_6 PD_{it} + \beta_7 CLOSE_{it} + \beta_8 LSPREAD_i + \beta_9 NOQUOTES_{it} + \beta_{10} DISTRESS_{it} + \beta_{11} SECURED_i + \beta_{12} MATU_i + \beta_{13} FSIZE_i + \varepsilon_{it}$$

Variable	Predicted Sign	Estimated Coefficient
Report Week Dummy	?	0.0291(2.31)**
Report Week Dummy × Earnings Surprise	+	0.0400(2.90)***
Loan Market Return Index, *MR*	+	0.1929(0.17)
Log of Firm Size, $SIZE_{iq}$	-	-0.0038(-0.13)
Performance Pricing Provision, $PERFPR_i$	+	0.1624(2.15)**
Probability of Default, PD_{it}	-	-0.0680(-2.17)**
Closeness to Covenant Violations, $CLOSE_{it}$	-	-0.0009(-3.65)***
Log of All-In Spread (Basis Points over LIBOR)	-	-0.1351(-1.93)*
Log of Number of Quotes, $NOQUOTES_{it}$	-	-0.0083(-0.87)
Distressed Loan Indicator, $DISTRESS_{it}$	-	0.0020(0.41)
Secured Loan Indicator, $SECURED_i$	+	0.5556(3.79)***
Log of Maturity in Years, $MATU_i$	+	0.1493(1.09)
Log of Facility Size, *FSIZE*	-	-0.0719(-5.02)***
Intercept	?	-0.1583(-1.90)*
Year Indicator Variables	?	Yes
Firm Indicator Variables	?	Yes
Observations		594
Adjusted R^2		0.1300

[22] We also perform sensitivity analysis by defining the covenant report week to be the second week after the covenant report becomes due, and obtain similar results.

Notes: This table reports ordinary least squares regression results for testing the information content of quarterly earnings on syndicated loan returns using pooled cross-sectional, time-series ordinary least squares for 594 firm–quarter observations during the week when covenant reports are filed to bank syndicates between 1998–2002 period. The sample in this regression contains firms that have covenants tied to EBRITA and file covenant reports identified from the Securities and Exchange Commission (the SEC) website. R_{it} is the absolute value of weekly return on syndicated loan facility i in week t. MR_t is return on S&P syndicated loan index in week t. RW_{it} is a dummy variable that equals one if the observed loan return for firm i at week t is in the covenant report filing week, and zero otherwise. ES_{iq} is quarterly earnings surprise measured by changes in earnings for quarter q of firm i from the current year to the prior year, scaled by the absolute value of the earnings for quarter q in the prior year. $SIZE_{iq}$ is firm size, measured by the market capitalization (in millions of dollars) at the beginning of quarter q for firm i. $PERFPR_i$ is an indicator variable that takes the value of one if the loan contract of firm i has a performance pricing provision, and zero otherwise. PD_{it} is the probability of default of firm i within one year from week t, estimated using a Black–Scholes option-theoretic model. $CLOSE_{it}$ is closeness to covenant violation of facility i at year t, it is calculated by subtracting the DEBT/EBITDA eventual covenant restriction from the actual DEBT/EBITDA ratio at year t, calculated using Compustat annual data as follows: DATA 9 (Long Term Debt)/(DATA 18 (Income Before Extraordinary Items) + DATA 15 (Interest Expense) + DATA 16 (Income Taxes) + DATA 14 (Depreciation and Amortization)). $SPREAD_i$ is all-in spread, measured by the basis point spread over LIBOR, inclusive of all fees for facility i. $NOQUOTES_{it}$ is the total number of weekly quotes on facility i at week t. $DISTRESS_{iq}$ is distressed loan indicator that takes the value of one if the price of the loan is less than 80 at week t, and zero otherwise. $SECURED_i$ equals one if a loan is secured, and zero otherwise. $MATU_i$ measures the maturity of the loan in terms of the number of years from the loan origination to its maturity. $FSIZE_i$ is the size of the facility at its origination, it is expressed in millions of dollars. Regressions also contain year and industry indicators. T-tests are in the parenthesis below the coefficient, and p-values are calculated using White's standard errors. The superscript asterisks *, **, *** denote significance at or below the 0.10, 0.05, 0.01 level, respectively, based on a two-tailed (where sign is not predicted) or a one-tailed (where sign is predicted) test of significance.

5.3 Tests of H_3, the Asymmetric Price Reaction Hypothesis

Our final hypothesis advances the possibility that loan returns may exhibit an asymmetric price reaction – reacting to information about decreasing earnings, but not to information about increasing earnings. In order to test this hypothesis, we divide our full sample into those firm–quarters that experience increases in year-to-year earnings (denoted good news firms) and those with decreases in year-to-year earnings (bad news firms). Panels B and C of Table 1 offer descriptive statistics of these subsamples, with Panel D providing means difference tests. Larger firms with larger loans appear to have experienced declining earnings, consistent with the prevalence of large, established borrowers as fallen angels during our sample period. Loan returns for the bad news subsample are significantly (at the 1% level) lower (–4 basis points per week, on average) than for the good news firms (+1.5 basis points). The significantly (at the 1% level) higher default probability for bad news firms than for good news firms (averaging 7.2544 and 5.3868 respectively) demonstrates that falling earnings are indicators of increases in default risk, and thus are of concern to lenders. Furthermore, the closeness to covenant violation measure is significantly different between bad news and good news subsamples. Bad news firms' actual DEBT/EBITDA ratios are on average 1.8487 higher than the eventual restricted ratios specified in the loan contract, while it is only 0.8463 higher for good news firms. Therefore, bad news firms are, on average, closer to default and more likely to violate their covenants (i.e. technically default) than firms reporting increasing earnings. We thus expect that earnings information becomes a more

important signal in assessing loan returns for bad news firms than for good news firms, testing this hypothesis in Table 4.

Table 4
Asymmetric Price Reactions to Quarterly Earnings Announcements in Syndicated Bank Loan Prices – By Type of News

$$\begin{aligned}Model:\ R_{it} = {} & \alpha + \beta_1 MR_t + \beta_2 W5_{it} * ES_{iq} + \beta_3 W4_{it} * ES_{iq} + \beta_4 W3_{it} * ES_{iq} + \beta_5 W2_{it} * ES_{iq} \\ & + \beta_6 W1_{it} * ES_{iq} + \beta_7 ES_{iq} + \beta_8 SIZE_{iq} + \beta_9 PERFPR_i + \beta_{10} PD_{it} + \beta_{11} LSPREAD_i \\ & + \beta_{12} NOQUOTES_{it} + \beta_{13} DISTRESS_{it} + \beta_{14} COVENANT_i + \beta_{15} SECURED_i \\ & + \beta_{16} MATU_i + \beta_{17} FSIZE_i + \varepsilon_{it}\end{aligned}$$

		Bad News Firms	*Good News Firms*
Variable	Predicted Sign	Estimated Coefficient	Estimated Coefficient
Week –5 Dummy × Earnings Surprise	?	0.0839(3.13)***	0.0014(0.79)
Week –4 Dummy × Earnings Surprise	?	0.0807(3.39)***	0.0012(0.65)
Week –3 Dummy × Earnings Surprise	?	0.0628(1.86)*	0.0208(1.47)
Week –2 Dummy × Earnings Surprise	?	0.0564(1.47)	0.0047(0.38)
Week –1 Dummy × Earnings Surprise	?	0.0250(0.84)	0.0078(0.69)
Earnings Surprise, ES_{iq}	+	0.0022(0.57)	0.0023(0.66)
Loan Market Return Index, *MR*	+	-0.0102 (-0.67)	0.8604(1.19)
Log of Firm Size, $SIZE_{iq}$	-	-0.0137(-2.28)**	-0.0020(-0.38)
Performance Pricing Provision, $PERFPR_i$	+	0.0345(3.72)***	0.0149(1.05)
Probability of Default, PD_{it}	-	-0.0051(-3.97)***	-0.0023(-1.98)**
Log of All-In Spread (Basis Points over LIBOR)	-	-0.0253(-1.06)	-0.0451(-2.28)**
Log of Number of Quotes, $NOQUOTES_{it}$	-	-0.0332(-1.96)**	-0.0194(-1.45)
Distressed Loan Indicator, $DISTRESS_{iq}$	-	0.0179(0.84)	-0.0042(-0.23)
Financial Covenants Indicator, $COVENANT_i$	?	-0.0442(-1.76)*	0.0151(0.71)
Secured Loan Indicator, $SECURED_i$	+	0.0049(1.29)	0.0013(0.74)
Log of Maturity in Years, $MATU_i$	+	-0.0032(-0.11)	0.1547(1.79)*
Log of Facility Size, $FSIZE_i$	-	-0.0232(-1.87)*	-0.0331(-3.27)***
Intercept	?	-0.5524(-3.27)***	-0.4800(-3.31)***
Year Indicator Variables	?	Yes	Yes
Firm Indicator Variables	?	Yes	Yes
Observations		5031	6003
Adjusted R^2		0.0606	0.0018

Notes: This table reports ordinary least squares regression results for testing the information content of quarterly earnings on syndicated loan returns using pooled cross-sectional, time-series ordinary least squares for good/bad news firms over –5 to 0 weeks of each quarterly earnings announcement during 1998–2002 period, respectively. Good/bad news firms are defined as whether change in quarterly earnings for the same quarter from year *t*-1 to year *t* is no less than/less than zero. R_{it} is the weekly return on syndicated loan facility *i* in week *t*. MR_t is return on S&P syndicated loan index in week *t*. WK_{it} is a dummy variable that equals one if the observed loan return at week *t* of firm *i* is in *k* weeks prior to its quarterly earnings announcement date, and zero otherwise. ES_{iq} is quarterly earnings surprise measured by changes in earnings for quarter *q* of firm *i* from the current year to the prior year, scaled by the absolute value of the earnings for quarter *q* in the prior year. $SIZE_{iq}$ is firm size, measured by the market capitalization (in millions of dollars) at the beginning of quarter *q* for firm *i*. $PERFPR_i$ is an indicator variable that takes the value of one if the loan contract of firm *i* has a performance pricing provision, and zero otherwise. PD_{it} is the probability of default of firm *i* within one year, estimated using a Black–Scholes option-theoretic model. $CLOSE_{it}$ is closeness to covenant violation of

facility *i* at year *t*, it is calculated by subtracting the DEBT/EBITDA eventual covenant restriction from the actual DEBT/EBITDA ratio at year *t*, calculated using Compustat annual data as follows: DATA 9 (Long Term Debt)/(DATA 18 (Income Before Extraordinary Items) + DATA 15 (Interest Expense) + DATA 16 (Income Taxes) + DATA 14 (Depreciation and Amortization)). $SPREAD_i$ is all-in spread, measured by the basis point spread over LIBOR, inclusive of all fees for facility *i*. $NOQUOTES_{it}$ is the total number of weekly quotes on facility *i* at week *t*. $DISTRESS_{it}$ is distressed loan indicator that takes the value of one if the price of the loan is less than 80 at week *t*, and zero otherwise. $COVENANT_i$ is an indicator variable that equals one if a loan has financial covenant, and zero otherwise. $SECURED_i$ equals one if a loan is secured, and zero otherwise. $MATU_i$ measures the maturity of the loan in terms of the number of years from the loan origination to its maturity. $FSIZE_i$ is the size of the facility at its origination, it is expressed in millions of dollars. Regressions also contain year and industry indicators. T-tests are in the parenthesis below the coefficient, and p-values are calculated using White's standard errors. The superscript asterisks *, **, *** denote significance at or below the 0.10, 0.05, 0.01 level, respectively, based on a two-tailed (where sign is not predicted) or a one-tailed (where sign is predicted) test of significance.

Table 4 shows the results of the estimation of equation (2)[23] for the two subsamples: bad news and good news firms. Coefficients on the cross-product terms for *W5* and *W4* and earnings surprise are both significantly positive at the 1% level for the bad news subsample. *None* of these coefficients are significant for the subsample of good news firms experiencing increases in earnings. Thus, we conclude that Table 4 offers evidence consistent with the asymmetric loan price reaction between firms reporting declining earnings and those reporting increasing earnings.

5.4 Additional Analyses

5.4.1 Information Content of Earnings in Loan Prices for Intangible-Intensive Firms

We are also interested in whether there is an asymmetric impact on bank loan prices that depends on the level of tangibility of the borrowing firm's assets. The intangible-intensive firms are the most informationally opaque, and thus earnings information can be expected to convey the most information about the value of the firm's assets and the prospects for loan repayment. In contrast, earnings information would be less important in valuing loans issued by firms with tangible, hard assets that can be easily valued. Following Amir, Lev and Sougiannis (2003), we define intangible-intensive firms using the following three-digit SIC codes: 283 (Drugs); 284 (Chemicals); 357 (Computer and Office Equipment); 366 (Communications Equipment); 367 (Electronics); 371 (Motor Vehicles); 382 (Measurement and Control Devices); 384 (Medical Instruments); and 737 (Software).[24] We then construct a dummy variable, denoted $INTANGIBLE_i$, set equal to one for these three-digit SIC codes, and zero otherwise. We subdivide the bad/good news sample further into bad/intangible, bad/tangible, good/intangible, good/tangible

[23] Similar to column 3 of Table 2, we don't include the $CLOSE_{it}$ variable in the regression model presented on Table 4, because the sample contains loan facilities that have no financial covenants, and thus the calculation of the $CLOSE_{it}$ variable is impossible.

[24] For robustness checks, we also measure asset intangibility as R&D intensity, which is defined as firms' quarterly R&D expenditures scaled by the end-of-quarter market value of equity. We find significantly higher R&D intensities in our intangible-intensive firms than those in our less intangible-intensive firms. Thus our classification of intangible-intensive firms versus less intangible-intensive firms is robust to the R&D intensity measure described above. We also define intangible firms to be those firms with a Tobin's q exceeding one and obtained similar results to those presented in the paper.

subsamples. We then estimate equation (2) separately for the four subsamples. The results are reported in Table 5. The results show that the adjusted R^2s for regressions on intangible firms are larger than on the tangible firms' regressions across both bad and good news groups. These findings indicate that accounting information is generally more helpful in explaining loan returns when the borrowers have more intangible assets on their balance sheets. None of the interactive terms between week dummy variables and earnings surprise variable (for $W = -5$ to 0) are statistically significant for the good news groups. However, the coefficients on the interactive terms between week indicating variables, $W = -5$ and $W = -4$ and earnings surprise are significant at the 1% level for bad news/intangible firms. Moreover, the size of the coefficients are larger for bad news/intangible firms than for bad news/tangible firms, suggesting a greater decline in loan returns for intangible firms experiencing decreases in earnings as compared to any other group. Thus, we find evidence that supports the existence of an asymmetric information effect of quarterly earnings announcements on bank loan returns for firms with intangible assets experiencing earnings declines. That is, earnings and other cash flow information are most important for informationally opaque firms with intangible assets that have financial difficulties.

Table 5
Price Reactions to Quarterly Earnings Announcements in Syndicated Bank Loan Prices – Asset Intangibility Effect

$$\begin{aligned} \textit{Model: } R_{it} = {} & \alpha + \beta_1 MR_t + \beta_2 W5_{it} * ES_{iq} + \beta_3 W4_{it} * ES_{iq} + \beta_4 W3_{it} * ES_{iq} + \beta_5 W2_{it} * ES_{iq} \\ & + \beta_6 W1_{it} * ES_{iq} + \beta_7 ES_{iq} + \beta_8 SIZE_{iq} + \beta_9 PERFPR_i + \beta_{10} PD_{it} + \beta_{11} LSPREAD_i \\ & + \beta_{12} NOQUOTES_{it} + \beta_{13} DISTRESS_{it} + \beta_{14} COVENANT_i + \beta_{15} SECURED_i \\ & + \beta_{16} MATU_i + \beta_{17} FSIZE_i + \varepsilon_{it} \end{aligned}$$

Variable	Predicted Sign	*Bad News And Intangible-Intensive Firms* Estimated Coefficient	*Bad News And Less Intangible-Intensive Firms* Estimated Coefficient	*Good News And Intangible-Intensive Firms* Estimated Coefficient	*Good News And Less Intangible-Intensive Firms* Estimated Coefficient
Week –5 Dummy × Earnings Surprise	?	0.0793(3.85)***	0.0234(1.27)	0.0139(0.08)	0.0105(0.01)
Week –4 Dummy × Earnings Surprise	?	0.0702(3.62)***	0.0372(1.84)**	0.0180(0.10)	0.0198(0.05)
Week –3 Dummy × Earnings Surprise	?	0.0308(1.72)*	0.0311(1.78)*	0.0047(0.03)	0.0305(0.07)
Week –2 Dummy × Earnings Surprise	?	0.0211(1.39)	0.0159(1.21)	0.0036(0.02)	0.0690(0.29)
Week –1 Dummy × Earnings Surprise	?	0.0247(1.47)	0.0173(1.20)	0.0027(0.02)	0.0693(0.29)
Earnings Surprise, ES_{iq}	+	0.0022(0.85)	0.0028(0.78)	0.0245(1.39)	0.0725(0.36)
Loan Market Return Index, *MR*	+	0.3154 (2.20)**	-0.2457(-0.42)	0.3491 (2.54)**	0.1315(0.78)
Log of Firm Size, $SIZE_{iq}$	-	-0.0407(-1.50)	-0.0076(-1.25)	-0.0217(-1.49)	-0.0040(-0.89)
Performance Pricing Provision, $PERFPR_i$	+	0.0992(2.12)**	0.0534(3.31)***	0.0177(1.30)	0.0244(2.07)**
Probability of Default, PD_{it}	-	-0.0206(-6.34)***	-0.0022(-2.15)**	-0.0078(-1.96)**	-0.0092(-1.98)**
Log of All-In Spread (Basis Points over LIBOR)	-	-0.1091(-1.95)**	-0.0793(-2.29)**	-0.0562(-0.82)	-0.0107(-0.77)
Log of Number of Quotes, $NOQUOTES_{it}$	-	-0.0671(-1.62)	-0.0315(-1.96)**	-0.0420(-0.81)	0.0067(0.76)
Distressed Loan Indicator, $DISTRESS_{iq}$	-	0.0133(0.27)	0.0118(0.61)	0.0493(0.71)	-0.0174(-1.55)
Financial Covenants Indicator, $COVENANT_i$	?	0.3107(2.08)**	-0.0156(-0.79)	0.1215(0.87)	-0.0141(-0.75)
Secured Loan Indicator, $SECURED_i$	+	-0.0906(-0.70)	0.0395(1.20)	0.1602(0.95)	0.0296(0.57)
Log of Maturity in Years, $MATU_i$	+	0.1836(1.70)*	0.0300(1.14)	0.0079(0.06)	0.0339(0.86)
Log of Facility Size, $FSIZE_i$	-	-0.0055(-0.17)	-0.0320(-2.58)**	-0.0258(-0.64)	0.0005(0.07)
Intercept	?	-0.2133(-2.46)**	0.6249(3.58)***	0.3716(0.76)	0.0402(0.36)
Year Indicator Variables	?	Yes	Yes	Yes	Yes
Firm Indicator Variables	?	Yes	Yes	Yes	Yes
Observations		1919	3112	2076	3927
Adjusted R^2		0.1312	0.0687	0.0076	0.0021

Notes: This table reports ordinary least squares regression results for testing the information content of quarterly earnings on syndicated loan returns using pooled cross-sectional, time-series ordinary least squares for good/bad news subdivided by intangible-intensive firms over –5 to 0 weeks of each quarterly earnings announcement during 1998–2002 period, respectively. Good/bad news firms are defined as whether change in quarterly earnings for the same quarter from year *t*-1 to year *t* is no less than/less than zero. Intangible-intensive firms are defined by using the following three-digit SIC codes: 283 (Drugs); 284 (Chemicals); 357 (Computer and Office Equipment); 366 (Communications Equipment); 367 (Electronics); 371 (Motor Vehicles); 382 (Measurement and Control Devices); 384 (Medical Instruments); and 737 (Software). R_{it} is the weekly return on syndicated loan facility *i* in week *t*. MR_t is return on S&P syndicated loan index in week *t*. WK_{it} is a dummy variable that equals one if the observed loan return at week *t* of firm *i* is in *k* weeks prior to its quarterly earnings announcement date, and zero otherwise. ES_{iq} is quarterly earnings surprise measured by changes in earnings for quarter *q* of firm *i* from the current year to the prior year, scaled by the absolute value of the earnings for quarter *q* in the prior year. $SIZE_{iq}$ is firm size, measured by the market capitalization (in millions of dollars) at the beginning of quarter *q* for firm *i*. $PERFPR_i$ is an indicator variable that takes the value of one if the loan contract of firm *i* has a performance pricing provision, and zero otherwise. PD_{it} is the probability of default of firm *i* within one year, estimated using a Black–Scholes option-theoretic model. $CLOSE_{it}$ is closeness to covenant violation of facility *i* at year *t*, it is calculated by subtracting the DEBT/EBITDA eventual covenant restriction from the actual DEBT/EBITDA ratio at year *t*, calculated using Compustat annual data as follows: DATA 9 (Long Term Debt)/(DATA 18 (Income Before Extraordinary Items) + DATA 15 (Interest Expense) + DATA 16 (Income Taxes) + DATA 14 (Depreciation and Amortization)). $SPREAD_i$ is all-in spread, measured by the basis point spread over LIBOR, inclusive of all fees for facility *i*. $NOQUOTES_{it}$ is the total number of weekly quotes on facility *i* at week *t*. $DISTRESS_{it}$ is distressed loan indicator that takes the value of one if the price of the loan is less than 80 at week t and zero otherwise. $COVENANT_i$ is an indicator variable that equals one if a loan has financial covenant and zero otherwise. $SECURED_i$ equals one if a loan is secured and zero otherwise. $MATU_i$ measures the maturity of the loan in terms of the number of years from the loan origination to its maturity. $FSIZE_i$ is the size of the facility at its origination, it is expressed in millions of dollars. Regressions also contain year and industry indicators. T-tests are in the parenthesis below the coefficient, and p-values are calculated using White's standard errors. The superscript asterisks *, **, *** denote significance at or below the 0.10, 0.05, 0.01 level, respectively, based on a two-tailed (where sign is not predicted) or a one-tailed (where sign is predicted) test of significance.

5.4.2 Pre-earnings Announcements Effects

Since we examine the loan price changes prior to public earnings announcements, some pre-earnings announcement events, in particular, earnings guidance made by companies, may potentially confound our analysis. In order to control for this, we searched on the First Call database for any quarterly earnings guidance announcements that our sample firms made during our sample period. We then remove those firm–quarter observations from our analyses and rerun the tests. The results are presented in Table 6. From Table 6, we can see our results are quite robust. For bad news firms, the interactive terms between –5/–4 week dummies and earnings surprises are significantly different from zero, and none of them is significant for the good news sample.

Table 6
Syndicated Loan Price Reactions to Quarterly Earnings Announcements –Controlling for Pre-earnings Announcement Effect

$$\begin{aligned} Model:\ R_{it} = {} & \alpha + \beta_1 MR_t + \beta_2 W5_{it} * ES_{iq} + \beta_3 W4_{it} * ES_{iq} + \beta_4 W3_{it} * ES_{iq} + \beta_5 W2_{it} * ES_{iq} \\ & + \beta_6 W1_{it} * ES_i + \beta_7 ES_{iq} + \beta_8 SIZE_{iq} + \beta_9 PERFPR_i + \beta_{10} PD_{it} + \beta_{11} LSPREAD_i \\ & + \beta_{12} NOQUOTES_{it} + \beta_{13} DISTRESS_{it} + \beta_{14} COVENANT_i + \beta_{15} SECURED_i \\ & + \beta_{16} MATU_i + \beta_{17} FSIZE_i + \varepsilon_{it} \end{aligned}$$

Variable	Predicted Sign	*Bad News Firms* Estimated Coefficient	*Good News Firms* Estimated Coefficient
Week –5 Dummy × Earnings Surprise	?	0.0723(3.51)***	0.0039(0.69)
Week –4 Dummy × Earnings Surprise	?	0.0489(2.68)**	0.0041(0.71)
Week –3 Dummy × Earnings Surprise	?	0.0192(1.33)	0.0031(0.55)
Week –2 Dummy × Earnings Surprise	?	0.0212(1.47)	0.0018(0.29)
Week –1 Dummy × Earnings Surprise	?	0.0135(1.16)	0.0031(0.55)
Earnings Surprise, ES_{iq}	+	0.0012(0.06)	0.0102(1.62)
Loan Market Return Index, *MR*	+	0.4196(0.34)	0.8541(2.02)**
Log of Firm Size, $SIZE_{iq}$	?	-0.0076(-0.25)	-0.0010(-2.49)**
Performance Pricing Provision, $PERFPR_i$	+	0.2138(2.15)**	0.0225(1.89)*
Probability of Default, PD_{it}	-	-0.0076(-2.36)**	-0.0049(-5.52)***
Log of All-In Spread (Basis Points over LIBOR)	?	0.1309(1.84)*	-0.0269(-1.67)*
Log of Number of Quotes, $NOQUOTES_{it}$	-	-0.0079(-0.83)	-0.0196(-2.49)**
Distressed Loan Indicator, $DISTRESS_{iq}$	-	-0.0021(-0.39)	-0.0036(-0.24)
Financial Covenants Indicator, $COVENANT_i$	?		-0.0179(-1.07)
Secured Loan Indicator, $SECURED_i$	+	0.5485(3.51)***	0.0022(0.10)
Log of Maturity in Years, $MATU_i$	+	0.1547(1.29)	-0.0143(-0.58)
Log of Facility Size, $FSIZE_i$	-	-0.0710(-4.32)***	-0.0230(-2.75)**
Intercept	?	-0.6636(-1.82)*	-0.5167(-4.23)***
Year Indicator Variables	?	Yes	Yes
Firm Indicator Variables	?	Yes	Yes
Observations		4014	4579
Adjusted R^2		0.0539	0.0031

Notes: This table reports ordinary least squares regression results for testing the information content of quarterly earnings on syndicated loan returns for 8,593 firm–quarter observations with no quarterly earnings guidance information after searching the First Call database during 1998–2002 period. Good/bad news firms are defined as whether change in quarterly earnings for the same quarter from year *t*-1 to year *t* is no less than/less than zero. R_{it} is the weekly return on syndicated loan facility *i* in week *t*. MR_t is return on S&P syndicated loan index in week *t*. WK_{it} is a dummy variable that equals one if the observed loan return at week *t* of firm *i* is in *k* weeks prior to its quarterly earnings announcement date, and zero otherwise. ES_{iq} is quarterly earnings surprise measured by changes in earnings for quarter *q* of firm *i* from the current year to the prior year, scaled by the absolute value of the earnings for quarter *q* in the prior year. $SIZE_{iq}$ is firm size, measured by the market capitalization (in millions of dollars) at the beginning of quarter *q* for firm *i*. $PERFPR_i$ is an indicator variable that takes the value of one if the loan contract of firm *i* has a performance pricing provision, and zero otherwise. PD_{it} is the probability of default of firm *i* within one year from week *t*, estimated using a Black–Scholes option-theoretic model. $CLOSE_{it}$ is closeness to covenant violation of facility *i* at year *t*, it is calculated by subtracting the DEBT/EBITDA eventual covenant restriction from the actual DEBT/EBITDA ratio at year *t*, calculated using Compustat annual data as follows: DATA 9 (Long Term Debt)/(DATA 18 (Income Before Extraordinary Items) + DATA 15 (Interest Expense) + DATA 16 (Income Taxes) + DATA 14 (Depreciation and Amortization)). Only 7,006 loan–year observations have sufficient data to calculate the closeness to covenant violations. $SPREAD_i$ is all-in spread, measured by the basis point spread over LIBOR, inclusive of all fees for facility *i*. $NOQUOTES_{it}$ is the total number of weekly quotes on facility *i* at week *t*. $DISTRESS_{it}$ is distressed loan indicator that takes the value of one if the price of the loan is less than 80 at week *t*, and zero otherwise. $COVENANT_i$ is an indicator variable that equals one if a loan has financial covenant, and zero otherwise. $SECURED_i$ equals one if a loan is secured, and zero otherwise. $MATU_i$ measures the maturity of the loan in terms of the number of years from the loan origination to its maturity. $FSIZE_i$ is the size of the facility at its origination, it is expressed in millions of dollars. Column 3 does not contain an indicator variable for financial covenants because all observations have covenants. Regressions also contain year and industry indicators. T-tests are in the parenthesis below the coefficient, and p-values are calculated using White's standard errors. The superscript asterisks *, **, *** denote significance at or below the 0.10, 0.05, 0.01 levels, respectively, based on a two-tailed (where sign is not predicted) or a one-tailed (where sign is predicted) test of significance.

6. Conclusion

In this paper, we utilize secondary market quotations for syndicated bank loans in order to examine the information content of earnings information provided privately to lenders in the syndicated bank loan market. We find that this market reflects information about accounting earnings into loan prices approximately one month prior to its reflection in equity prices. We document that the secondary syndicated loan returns are associated with the release of private information about earnings through covenant reporting. Moreover, we find evidence that bank loan returns are associated with declines in earnings rather than increases in earnings, consistent with the nature of debt as exposed to downside loss, but with limited upside gain potential.

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Appendix I

The contingent claims indicator of default is backed out from a nonlinear system of two equations:

(1) $V_{Eti} = V_{Ati}\ N(D_{1ti}) - e^{-rT} L_{ti}\ N(D_{2ti})$,

and

(2) $\sigma_{Eit} = \dfrac{V_{Ait}}{V_{Eit}} N(D_{1it})\ \sigma_{Ait}$,

where $D_{1it} = [\ln(V_{Ait} / L_{it}) + T(r_t + 0.5\sigma^2_{Ait})] / \sigma_{Ait}\sqrt{T}$,

and $D_{2ti} = D_{1ti} - \sigma_{Ait}\sqrt{T}$ and $N(D_{1ti})$ is the normal distribution.

The variables V_{Eit} (market value of equity of firm i at time t), σ_{Eit} (volatility of firm's equity), L_{ti} (firm's total debt), and r_t (risk-free rate of return) are all known or estimated from a firm's equity price over the period T (in our monthly framework T = 1/12). Estimates for the firm's asset value ($\widetilde{V}_{Ait}$) and volatility ($\widetilde{\sigma}_{Ait}$) can be solved using Newton's nonlinear approximation technique. The market variables V_{Eit} and σ_{Eit} were computed monthly using daily stock return information from CRSP (to obtain a more stable measure of volatility, we used a rolling six-month horizon). The risk-free rate is measured by the one-year Treasury bill rate. We use Compustat information on long-term debt to measure L_{it} as the total debt obligations with maturity greater than one year (primarily, outstanding bonds and loans). The implied default probability is $PD_{it} = N(-DD_{it})$ where $DD_{ti} = [\ln(V_{Ati} / L_{ti}) + T(\mu + 0.5\sigma^2_{Ati})] / \sigma_{Ati}\sqrt{T}$. The parameter μ representing the instantaneous drift of V_A can be estimated by calculating the average change in $\log(\widetilde{V}_{Ait})$. In reality, this implied measure of default does not correspond to the true probability of default because of the normality assumption. However, PD_{it} provides a time-consistent indicator that allows us to measure variations in the solvency of the firm. For a discussion of the options-theoretic approach to credit risk measurement, see Chapter 4 of Saunders and Allen (2002).