

The role of information asymmetry and financial reporting quality in debt contracting:

Evidence from the secondary loan market*

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First version: December 2004

This version: December 2005

Abstract

I employ unique data on secondary loan trades to explore how information asymmetry and the quality of financial reporting affect the trading spreads of private debt securities. There are two primary findings. First, the bid-ask spread in secondary loan trading is positively related to firm- and loan-specific characteristics associated with a high information asymmetry environment. Loans of private firms, loans without an available credit rating, loans syndicated by less reputable arrangers, distressed loans, and loans of loss firms are traded at significantly higher bid-ask spreads. Second, timely incorporation of economic losses into borrowers' financial statements reduces the bid-ask spread at which their loans are traded. This finding suggests that high quality financial reporting reduces the information costs associated with debt agreements and increases the efficiency of the secondary trade.

*I am especially grateful to the members of my dissertation committee: Ray Ball (Chair), Philip Berger, Douglas Diamond, Douglas Skinner and Abbie Smith for many insightful comments and helpful discussions. I also thank Zahi Ben-David, Steven Crawford, Ellen Engel, Wendy Heltzer, Eugene Kandel, Randall Kroszner, Darren Roulstone, Gil Sadka, Haresh Sapra, Tony Tang and participants in the University of Chicago Accounting Seminar and the University of Chicago Finance Brown Bag for valuable comments and suggestions. I would like to thank the Loan Pricing Corporation for letting me use their loan trading data. I gratefully acknowledge the financial support of the University of Chicago, Graduate School of Business.

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1. Introduction

The U.S. syndicated loan market bridges the private and public debt markets and provides borrowers and lenders with a highly valuable source of financing and investment. The market consists of a wide-range primary loan market, where syndicated loans¹ are originated, and an active secondary market, where loans are traded after the close of primary syndication. In the past 20 years, the syndicated loan market has been one of the most rapidly growing and innovative sectors of the U.S. capital market (Yago and McCarty, 2004). U.S. firms obtain over \$1 trillion in new syndicated loans each year, which represents more than 50 percent of the annual U.S. equity and debt issuance (Weidner, 2000). The trading of syndicated loans has expanded from \$8 billion in 1991 to \$144.6 billion in 2003, a compound annual growth rate of 27 percent.

In this paper, I employ a sample of traded syndicated loans to explore two fundamental concepts in accounting and finance research: information asymmetry and financial reporting quality. The existing literature that examines information asymmetry does so mainly in a context of equity markets,² leaving the role of information asymmetry in the debt markets largely unexplored. The secondary loan market is a promising empirical setting to examine information asymmetry because it involves trading of debt securities of both public and private firms. Moreover, the secondary loan market provides unique information regarding trading of private debt issues.

The first contribution of this paper is to explore how information asymmetry, as reflected in firm- and loan-specific characteristics, affects secondary loan trading spreads. Prior research primarily addresses loan sales by investigating banks' incentives for loan trading³ and by

¹ In the syndicated loan market a loan is identified as a "facility". Usually, a number of facilities with different maturities, interest rate spreads and repayment schedules are structured and syndicated as one transaction (deal) with a borrower. The analysis in this paper is performed at the individual facility level.

² See, for example, Copeland and Galai (1983), Glosten and Milgrom (1985), Kyle (1985), Amihud and Mendelson (1986), Diamond and Verrecchia (1991), Botosan (1997), Leuz and Verrecchia (2000), Easley et al. (2002), Easley and O'Hara (2004), Ertimur (2004) and Schrand and Verrecchia (2005).

³ See Pavel and Phillis (1987), Pennacchi (1988), Gorton and Pennacchi (1995), Froot and Stein (1998), Demsetz (2000) and Cebenoyan and Strahan (2004).

examining returns and price formation across the loan, bond and equity markets⁴. To the best of my knowledge, this study is the first to examine the determinants of the bid-ask spread in the secondary loan market.

The empirical findings confirm that the bid-ask spread in the secondary loan trade is positively related to firm- and loan-specific characteristics associated with a high information asymmetry environment. There is clear evidence that loans of private firms are traded at higher spreads than loans of publicly reporting firms. The bid-ask spread is also significantly higher on loans without an available credit rating. Emphasizing the dominant role of the arranger of syndication in resolving information asymmetry, the results indicate that loan spreads are higher for loans syndicated by less reputable arrangers. I also find that loans of loss firms are traded at significantly higher spreads than facilities of profitable ones. Furthermore, the stronger adverse selection associated with distressed loans is reflected in the higher trading spreads of these loans.

The analysis presented in this paper enriches our understanding of how information asymmetry is resolved in trading of private debt securities. I identify the determinants of the efficiency of the secondary loan trade⁵ and quantify their impact on the trading spreads. While a number of these determinants are documented by prior research to be associated with information asymmetry, others address the specificity of trading on the secondary loan market. The empirical analysis employs unique characteristics of the information environment of syndicated loans, such as the reputation of the arranger of syndication, the identity of the lender (i.e., institutional investor or bank), the loan-specific ratings, and the distinction between both distressed⁶ and par loans and profit and loss borrowing firms. The analysis of the firm- and loan-specific characteristics associated with a high information asymmetry environment not only widens our

⁴ See Allen et al. (2004), Altman et al. (2004), and Allen and Gottesman (2005).

⁵ Copeland and Galai (1983), Glosten and Milgrom (1985) and Kyle (1985) confirm that information asymmetry between potential buyers and sellers introduces adverse selection and reduces the liquidity in the secondary markets. Following this line of research, by “more efficient secondary trading” I imply more liquid trading, which is reflected in relatively lower bid-ask spreads.

⁶ According to the secondary loan market’s convention, distressed loans are loans traded at a bid price below 90 percent of the par value.

understanding of the role of information asymmetry in loan trading, but it is also a necessary step for exploring the impact of financial reporting quality on trading of private debt securities.

The second contribution of this paper is to examine how financial reporting quality affects loan trading on the secondary market. Studies of financial reporting quality have mainly focused on equity markets,⁷ although Watts and Zimmerman (1986), Watts (1993, 2003a,b) and Holthausen and Watts (2001) conclude that the reporting demands of the debt markets principally influence accounting reporting. Therefore, the secondary loan market is both a natural and an important empirical setting in which to examine the role of financial reporting quality. More specifically, I investigate how the quality of financial reporting affects loan trading spreads, with a particular emphasis on exploring the impact of timely loss recognition.

Since debt holders' returns are mainly determined by the downside region of a borrower's earnings distribution, investors in debt securities are more sensitive to borrowers' losses than to borrowers' profits. In addition, timely loss recognition more quickly triggers *ex-post* violations of debt covenants based on financial statement variables. By triggering debt covenant violations, timely loss recognition allows lenders to more rapidly employ their decision rights following economic losses, which increases the efficiency of debt agreements (Ball, 2001, Watts, 2003a, and Ball and Shivakumar, 2005a). The asymmetric payoff function of investors in debt securities and the effect of timely loss recognition on the debt contracting efficiency make the secondary loan market an excellent empirical setting in which to explore the importance of timely loss recognition.

The impact of timely loss recognition on debt agreements should be particularly important for private debt contracts because private debt issues typically contain more extensive covenants than do public debt issues (Smith and Warner, 1979). Previous literature also demonstrates that private lenders set debt covenants fairly tightly relative to the underlying financial variables,

⁷ The exceptions include Sengupta (1998), Ahmed et al. (2002), Beatty et al. (2002), Bharath, Sunder and Sunder (2004), Zhang (2004) and Francis et al. (2005).

especially when compared to the covenants set by public lenders (DeAngelo et al., 1994, Assender, 2000, Dichev et al., 2002, and Dichev and Skinner, 2002). These differences between private and public debt contracts make the secondary loan market an especially promising setting for an empirical analysis of how timely loss recognition affects debt agreements.

I employ three measures of timely loss recognition. First, following Ball and Shivakumar (2005a,b), timely loss recognition is estimated by the coefficient on a firm's negative cash flows in a piecewise-linear regression of accruals on cash flows.⁸ Second, following Basu (1997), the timeliness of income in reflecting economic losses is measured by the coefficient on the current year negative stock returns in a piecewise-linear regression of earnings on the contemporaneous stock returns. Estimating Basu's (1997) model by industry-specific and firm-specific regressions provides two additional measures of timely loss recognition.

I find evidence that timely incorporation of economic losses in borrowers' financial statements reduces the bid-ask spread at which their loans are traded. The effect of timely loss recognition on the trading spreads is statistically and economically significant; the evidence is consistent across different measures of timely loss recognition. These empirical findings confirm that high quality financial reporting reduces the information costs associated with debt agreements and thus increases the efficiency of the secondary loan trade. To the best of my knowledge, this paper is the first to document and quantify the efficiency gain from timely loss recognition in trading of securities on secondary markets.

Although accounting theory suggests that timely incorporation of economic losses enhances the efficiency of debt contracting, there is little empirical evidence supporting this proposition.⁹ By providing evidence that timely loss recognition decreases information asymmetry regarding the borrower, my paper confirms that conservative reporting creates efficiency gains in debt contracting.

⁸ Because of data limitations, this estimation is performed at the industry level.

⁹ The exceptions include Ahmed et al. (2002) and Zhang (2004), who document that timely incorporation of economic losses reduces the cost of debt capital.

To further examine the impact of financial reporting quality on loan trading, I investigate the relation between the bid-ask spread and timely gain recognition, the overall timeliness of a borrower's financial reporting, as measured by R^2 of the Basu regression, and unconditional conservatism. The results demonstrate that these attributes of accounting reporting are not significantly related to the loan trading spread. These findings further support the special role timely loss recognition plays in debt contracting.

I also examine whether abnormal accruals influence loan trading spreads.¹⁰ While I do not observe a significant relation between unsigned abnormal accruals and the bid-ask spread, I find a positive and significant relation between signed abnormal accruals and the loan spread. I interpret these results as evidence that managers choose income-increasing accounting procedures to avoid or to mitigate debt covenant violations. Secondary market participants perceive loans with binding covenants as being subject to higher information uncertainty and this is reflected in the higher spreads of these facilities. The high information asymmetry environment associated with loans subject to binding covenants might be driven by managers' manipulative behavior, as well as by the general uncertainty regarding the borrower's creditworthiness and liquidity.

My interpretation of the positive relation between the loan bid-ask spread and the signed abnormal accruals is consistent with the "debt covenant" hypothesis that suggests that managers make accounting choices which decrease the likelihood of debt covenant violations (Watts and Zimmerman, 1986, Healy and Palepu, 1990, DeFond and Jiambalvo, 1994, Sweeney, 1994, and Dichev and Skinner, 2002). To strengthen the empirical findings, I conduct a detailed examination of the loan contracts of the loans in the highest decile of signed abnormal accruals. Consistent with the "debt covenant" hypothesis, I find that the majority of firms with high positive abnormal accruals either violate debt covenants or have corresponding financial measures which are only two to four percent higher than the covenant threshold.

¹⁰ Abnormal accruals are estimated by the Jones (1991) model, adjusted for the incorporation of the negative cash flow indicator variable. This adjustment reflects the role of accruals in timely recognition of economic losses, as suggested by Ball and Shivakumar (2005b).

I also examine earnings volatility which the literature sees as being associated with a firm's information environment. I find a positive relation between bid-ask spread and earnings volatility.¹¹ The significance of this relation is, however, sensitive to the earnings category employed in the analysis. This sensitivity is potentially explained by the equivocal relation between earnings volatility and the quality of financial reporting. Highly predictable and smooth earnings decrease uncertainty about the borrower. However, if managers report opportunistically to achieve lower earnings variability, earnings are less informative (Francis et al., 2004).

The following section provides a brief description of the secondary loan market. The third section outlines the research hypotheses. The fourth section describes the data and summary statistics. The fifth section focuses on the research design. The sixth section discusses empirical findings. The seventh section concludes.

2. The secondary loan market: Background and development

Secondary loan sales occur after the close of primary syndication; loan sales are structured as either assignments or participations.¹² When interests in the loan are transferred by assignment, the buyer becomes a direct signatory to the loan. In participation, the original lender remains the holder of the loan and the buyer takes a participating interest in the existing lender's commitment (Standard & Poor's, 2003). While assignments usually require the consent of both the borrower and the arranger for the loan sale, in participations such consents are almost never required. Today, loan sales are performed through loan trading desks in more than 30 institutions which act as the market makers in the secondary loan market (Taylor and Yang, 2004).

The secondary loan market has grown rapidly in recent years, with trading volume increasing from \$8 billion in 1991 to \$144.6 billion in 2003 (Loan Pricing Corporation (LPC), 2003). The market expanded in both par and distressed loans; the trading volume of loans traded

¹¹ Earnings volatility is estimated relative to a firm's volatility of cash flows (Leuz et al., 2003).

¹² The majority of the loan sales in the secondary loan market are performed via assignment.

at par and of distressed loans reached \$87 billion and \$57 billion in 2003, respectively. Leveraged loans represent the largest and the fastest growing part of the secondary loan market.¹³ Since 2001, trading of leveraged loans has constituted 80 percent of the total value of par loan trades.

The involvement of institutional investors in the secondary loan market has increased considerably with the market's development. Banks, loan participation mutual funds (prime funds)¹⁴, Collateralized Loan Obligations (CLOs)¹⁵ and finance companies constitute the main secondary loan market participants. Additionally, hedge funds and pension funds are increasing their activity in loan trading (Yago and McCarty, 2004).

Several reasons contributed to the strong growth in loan sales. New bank regulatory requirements, such as the 1989 Highly Leveraged Transaction guidelines and the 1988 Basel Capital Accord, encourage banks to decrease their credit risk exposure (Altman et al., 2004, and Barth et al, 2004). Additionally, the adoption of SEC Rule 144A in 1990 provided a safe-harbor relief from the registration requirements of Section 5 of the Securities Act of 1933 for the resale of privately held debt and equity securities to qualified institutional buyers (QIB) (Allen et al., 2004, Hugh and Wang, 2004, and Yago and McCarty, 2004).¹⁶ The foundation of the Loan Syndication and Trading Association (LSTA)¹⁷ in 1995 was an additional factor that stimulated the development of the secondary loan market (Hugh and Wang, 2004).

Development of the secondary loan market coincided with improvements in the market's transparency. In 1987, LPC initiated the publication of Gold Sheets which provide a detailed

¹³ LPC defines leveraged loans as loans rated below BBB- or Baa3 or unrated and priced at the spread equal or higher than 150 bps above Libor.

¹⁴ Prime funds are mutual funds that invest in leveraged loans. For the most part, prime funds are continuously offered funds with quarterly tender periods or true closed-end, exchange-traded funds (Standard & Poor's, 2003).

¹⁵ The CLOs purchase assets subject to credit risk (such as syndicated loans and mainly leveraged syndicated loans), and securitize them as bonds of various degrees of creditworthiness.

¹⁶ QIB is defined as an institution that owns and manages \$100 million (\$10 million in the case of a registered broker-dealer) or more in qualifying securities. For a banking institution to qualify as a QIB, a \$25 million minimum net worth test must also be satisfied. The objective of Rule 144A is to increase the efficiency and liquidity of the U.S. market for equity and debt securities issued in private placements by allowing large institutional investors to trade restricted securities more freely with each other.

¹⁷ LSTA is a not-for-profit organization dedicated to promoting the orderly development of a fair, efficient, liquid and professional trading market for corporate loans and other similar private debt (www.lsta.org).

analysis of the market trends, loan price indexes and news coverage. In the late nineties, LSTA created standard documentation for primary and secondary loan markets and, jointly with LPC, started providing mark-to-market loan pricing based upon dealer quotes (Yago and McCarty, 2004). These initiatives significantly increased the amount of information available to secondary loan market participants. In addition, Standard & Poor's, Moody's and Fitch-ICBA started rating corporate syndicated loans in 1995. The rapid increase in the number of rated loans considerably reduced information uncertainty in the secondary loan market.

3. Research hypotheses

3.1 Impact of information asymmetry on secondary loan trading

Copeland and Galai (1983), Glosten and Milgrom (1985) and Kyle (1985) confirm that information asymmetry between potential buyers and sellers introduces adverse selection into secondary markets and reduces market liquidity. Following these theoretical models, many papers rely on the bid-ask spread as the main measure of information asymmetry.¹⁸ Because private debt contracts are subject to high information asymmetry, I expect information asymmetry, as reflected in firm- and loan-specific characteristics, to significantly influence loan trading spreads.

The majority of loan trading involves leveraged loans; borrowers with this credit rating spectrum are expected to rely mainly on bank monitoring (Diamond, 1991). Diamond (1984) establishes that banks provide unique services in the form of credit evaluation and the monitoring of borrowers.¹⁹ For a bank to have the incentive to provide these services, it seems necessary that it hold a significant fraction of each loan that it originates. Although prior research addresses a bank's motivation to monitor a loan after a portion of the loan has been sold, the efficiency of the

¹⁸ See, for example, Lee et al. (1993), Yohn (1998), Leuz and Verrecchia (2000), Kalimipalli and Warga (2002), Ertimur (2004) and Sadka and Sadka (2004).

¹⁹ Lummer and McConnell (1989) further support the importance of bank monitoring. Their study suggests that a bank is not producing information upon first contact with a borrower; rather, it learns information or takes action later in a course of a loan.

post-sale bank monitoring remains an open theoretical and empirical question (Pennacchi, 1988, Gorton and Pennacchi, 1995, and Gorton and Winton, 2000). Since the relative advantage of bank monitoring is significantly higher for loans subject to high information asymmetry, I expect these facilities to be traded at higher information costs on the secondary loan market.

By monitoring a borrower, lenders typically get access to a firm's private sources of information which indicate its creditworthiness. However, the trading of syndicated loans involves secondary loan market participants who do not possess information sources available to lenders holding a loan contract. Therefore, information asymmetry should considerably affect the bid-ask spreads in the loan trading.²⁰ Additionally, most secondary loan market participants are large institutions, such as banks and institutional investors, and Diamond and Verrecchia (1991) demonstrate that large traders are especially concerned about liquidity.

The significant impact of information asymmetry on secondary market trading and its particular importance in private debt contracting lead to the following research hypothesis:

H1: The bid-ask spread in secondary loan trading is positively related to firm- and loan-specific characteristics associated with a high information asymmetry environment.

First, I focus on variables which previous research suggests as being related to information asymmetry. Second, to address the specificity of trading on the secondary loan market, I explore the unique characteristics of the information environment of the syndicated loans.

Publicly reporting vs. private firms

When a borrower does not report to the SEC, secondary market participants have less publicly available information regarding a borrower's creditworthiness and profitability. In addition, private firms are not subject to the rigorous monitoring by market forces, such as the SEC, auditors, analysts and public exchanges. Private firms are also less subject to litigations

²⁰ This prediction is strengthened by Gorton and Pennacchi (1990), who show that trading losses associated with information asymmetries can be mitigated by designing securities which split the cash flows of underlying assets into safer and riskier cash flows. Their analysis implies that loans of borrowers with more transparent information should be more efficiently traded by the "uninformed investors".

related to financial reporting and disclosure. Therefore, investing in debt securities of private firms usually requires that the lender have a higher screening and monitoring ability.

Diamond and Verrecchia (1991), Leuz and Verrecchia (2000) and Verrecchia (2001) establish that a commitment to higher disclosure quality reduces information asymmetry. Since public firms have an inherent commitment to higher disclosure levels compared to private firms, this information underscores how important public reporting is to the reduction of information asymmetry regarding the borrower. In addition, private firms have less conservative reporting than public firms (Ball and Shivakumar, 2005a), which further emphasizes important differences in their information environments. I expect public borrowers' debt securities to be traded with less information costs on the secondary loan market. Firms with public reporting are identified by an indicator variable taking the value of one if a borrower is a publicly reporting firm in the year when the facility is traded on the secondary loan market, zero otherwise.

Availability of public credit rating

If an independent credit agency does an evaluation of the borrower's credit quality, then the availability of this estimate is anticipated to be associated with a lower information asymmetry environment (Dennis and Mullineaux, 2000, Lee and Mullineaux, 2004, and Gonas et al., 2004). The significance of the availability of a credit rating is also supported by the theoretical model of Diamond (1991) which emphasizes the importance of publicly available information, such as credit ratings, to the lender-borrower relationship. The existence of a credit rating is measured by an indicator variable taking the value of one if a firm and/or facility has an available credit rating, zero otherwise. More specifically, I carefully account for all potentially available credit rating categories, including Moody's Sr. Debt, Moody's Loan Rating, S&P Sr. Debt, S&P Loan Rating, Fitch LT and Fitch Loan Rating.

Loan size

Following previous literature, I use loan size as an additional measure associated with the amount and quality of information available regarding a borrower. According to Jones et al.

(2005), information asymmetries tend to be less severe for large loans, since any fixed costs associated with obtaining information about a borrower are less of an obstacle for large loans. Bharath, Dahiya, Saunders, and Srinivasan (2004) also suggest that small borrowers have greater information asymmetries, and a loan's size is typically positively correlated with its borrower's size. Additionally, Diamond and Verrecchia (1991) demonstrate that large firms receive a larger benefit from disclosure than small firms. Generally, firm size is a widely used proxy for the amount of public information available regarding a company (Harris, 1994). As a result, larger loans are anticipated to be associated with lower information asymmetry environment.

Reputation of the arranger of syndication

To address the arranger's dominant role in resolving information asymmetry in the syndicated loan market, the analysis incorporates the reputation of the syndicated facility's arranger. The arranger negotiates the loan agreement, coordinates the documentation process and the loan closing, recruits loan participants and arranges the administration of repayments (Dennis and Mullineaux, 2000, Panyagometh and Roberts, 2002, and Lee and Mullineaux, 2004). While there is technically an independent loan agreement between the borrower and each of the investors, in practice, the syndicate participants typically rely on the information provided by the arranging bank (Jones et al., 2005).²¹ Therefore, the arranger's reputation is expected to be negatively associated with information costs in the secondary loan trade.

The importance of the arranger's reputation is further motivated by the empirical evidence that more reputable arrangers are more likely to syndicate loans and are able to sell off a larger portion of a loan to the syndicate participants (Dennis and Mullineaux, 2000, Panyagometh and Roberts, 2002, and Casolaro et al., 2004). The literature interprets these findings as consistent with the proposition that the arranger's status is a certification of the borrower's financial

²¹ Prior literature suggests that the arranger does not exploit asymmetric information to distribute lower-quality loans to syndicate participants. A number of studies find that the arranger holds larger proportions of information-problematic and riskier loans in its own portfolio (Simons, 1993, Dennis and Mullineaux, 2000, Lee and Mullineaux, 2004, Jones et al., 2005, and Sufi, 2005). In addition, the arranger has been found to syndicate a larger proportion of a loan subsequently upgraded (Panyagometh and Roberts, 2002).

conditions. In addition, Gorton and Haubrich (1990) and Gorton and Pennacchi (1995) emphasize that the bank's reputation serves as an implicit guarantee in a loan sale with no recourse, which is a common practice in a sale of syndicated loans.²² As suggested by Casolaro et al. (2004), Lee and Mullineaux (2004) and Sufi (2005), the arranger's reputation is estimated by the arranger's average market share in the primary syndicated loan market.²³

Distressed vs. par loans

Examination of the impact of information asymmetry on loan trading requires differentiating between distressed and par loans. Agrawal et al. (2002) demonstrate that as a firm's financial condition worsens, informed investors intensify their trading activity, subsequently forcing market makers to increase stock bid-ask spreads. Therefore, I expect the stronger adverse selection associated with distressed loans to be reflected in higher secondary trading spreads of these facilities.

Loss vs. profit firms

Because debt holders' returns are mainly determined by the downside region of a borrower's earnings distribution, the distinction between loss and profit firms is another special characteristic of the information environment of traded loans. The information environment of loss firms is associated with high information uncertainty (Ertimur, 2004, Sadka and Sadka, 2004). In addition, Lang and Lundholm (1993) demonstrate that profitable firms provide more information to market participants than firms experiencing losses. Thus, I hypothesize that loans of profitable firms are traded at lower information costs on the secondary loan market relative to

²² These papers analyze the bilateral lender-borrower relationship and therefore refer to the reputation of the selling bank. In the setting of the syndicated loan market where the arranger manages a number of syndicate lenders, I believe that the reputation of the arranger dominates over the reputation of the other members of the syndication, including a seller in a specific loan transaction. Rajan (1998) also suggests that buyers trust the selling bank in the secondary loan sale. The reason they can do so is that the increased frequency of transactions in the secondary market enhances the importance of maintaining the bank's reputation.

²³ The arranger's average market share is measured by the ratio of the value of loans that the financial intermediary syndicated as the arranger to the total amount of loans syndicated on the primary loan market over the same period. To coincide with the loans' trading period employed in the paper, the market share is estimated over the period from 1998 to 2003. In case of the multiple arrangers, I consider the highest market share across the arrangers involved in the loan transaction.

loans of firms reporting losses.²⁴ Profitable firms are categorized by an indicator variable taking the value of one if a borrower's current year net income is positive, zero otherwise.

Identity of the lender (i.e., institutional investor or bank)

I expect loans issued by institutional investors (i.e., institutional term loans) to be traded at higher bid-ask spreads than those of amortizing term loans issued by banks.²⁵ First, a wide range of research, including Diamond (1984) and (1996), James (1987) and Gorton and Winton (2002), suggest that banks are more efficient than other financial institutions in screening and monitoring borrowers. Second, institutional investors typically issue loans with longer maturities and back-end-loaded repayment schedules compared to loans originated by banks. Both of these explanations point to the higher information asymmetry associated with institutional term loans.

3.2 The role of timely loss recognition in trading of private debt securities

Investors in debt securities are more sensitive to borrowers' losses than to borrowers' profits. Because incorporating economic losses in a timely manner induces early revelation of the downside risk to the lenders, I expect timely loss recognition to have a significant impact on secondary loan trading. In addition, by triggering debt covenant violations, timely loss recognition transfers decision rights to the lenders following economic losses more rapidly and this allows lenders to more rapidly restrict managers' actions associated with losses (Ball, 2001, and Ball and Shivakumar, 2005a). Because syndicated loan contracts impose more numerous and stricter covenants than public debt contracts, I expect the effect of timely loss recognition on debt contracting to be especially important for syndicated loan issues.

²⁴ Ertimur (2004) shows that the stocks of firms reporting losses experience higher levels of bid-ask spread. I expect this effect to be even more pronounced in the trading of debt securities because investors in debt securities generally have an asymmetric payoff function.

²⁵ An institutional term loan (term loan B, C or D) is an installment loan. An installment loan is a loan commitment that does not allow the amounts repaid to be re-borrowed. A borrower repays an installment loan based on either a scheduled series of repayments or a one-time lump-sum payment at maturity. An amortizing term loan (term loan A) is an installment loan with a progressive repayment schedule; it is typically syndicated along with revolving credits as part of a large syndication.

Moreover, high timeliness of loss recognition decreases the *ex ante* likelihood that managers undertake negative NPV projects and pass on their negative earnings consequences to a subsequent generation of managers. Timely incorporation of economic losses also gives managers an incentive to more quickly abandon investments and strategies that have *ex post* negative NPVs (Ball, 2001, and Ball and Shivakumar, 2005a). Bushman et al. (2005) examine these arguments in an international setting and confirm that timely recognition of economic losses tends to facilitate the avoidance of bad projects and to promote the quick withdrawal of capital from failing projects. Consequently, I anticipate that by enhancing corporate governance and the transparency of the borrower, timely loss recognition enhances the efficiency of the loan trade.

The importance of timely loss recognition in trading of private debt securities is further supported by the analysis of debt markets' demand for financial reporting. Because violations of debt agreements are typically associated with economic losses, not profits, debt holders generate an asymmetric demand for timely loss recognition.²⁶ This asymmetric demand is also driven by the managers' incentives to disclose information about unrealized gains, but to withhold information regarding losses. Watts and Zimmerman (1986), Watts (1993, 2003a,b) and Holthausen and Watts (2001) confirm that the demand for timely recognition of losses is driven, at least partially, by debt contracting. Leftwich (1983) also supports the demand of the debt markets for conservative reporting by providing evidence that lenders select conservative adjustments to GAAP. By documenting that the degree of conditional conservatism increases with the importance of a country's debt markets, Ball et al. (2005) further corroborates the significant impact of debt contracting on accounting practice.

The effect of timely loss recognition on the effectiveness of debt agreements, combined with the reporting demand of the debt markets, generate the following research hypothesis:

H2: Timely incorporation of economic losses in borrowers' financial statements reduces the bid-ask spread at which their loans are traded.

²⁶ For the discussion of debt holders' demand for timely gain recognition, see Section 6.2.

4. Data and descriptive statistics

4.1 Data sources and sample selection

I obtain loan trade data from the Loan Trade Database provided by LPC. The database includes indicative loan bid and ask price quotes²⁷ reported to LPC by trading desks at institutions that make a market in these loans.²⁸ In addition to price coverage, for every traded facility the database provides the borrower's name, quote date and the number of market makers reporting indicative price quotes to LPC. The Loan Trade Database incorporates 2,125,589 trading observations for the period from June 1998 to December 2003, which represent the trading history of about 4,788 syndicated facilities (Table 1).²⁹

I match the Loan Trade Database to the DealScan database, which covers a majority of the syndicated loan issues in the U.S (this database is also provided by LPC). Connecting these two databases allows for the identification of traded loans on the primary loan market, including their deal characteristics, such as the amount, maturity, seniority, securitization, covenant package and syndicate structure. Merging the Loan Trade and DealScan databases results in a sample of 1,732,065 identified trading observations related to 3,611 trading facilities (Table 1).³⁰

²⁷ The Loan Trade Database provides bid and ask price quotes aggregated across dealers. Bid and ask prices are quoted as a percent of par (or cents on the dollar of par value).

²⁸ Institutions providing bid and ask prices currently include but are not limited to: Bank of Montreal, The Bank of New York, Bank of Nova Scotia, BANK ONE, Bank of America Securities LLC, BankBoston, BT Alex Brown/Deutsche Bank AG, The Chase Manhattan Bank, NA, CIBC World Markets, Citibank, NA, Credit Lyonnais, Credit Suisse First Boston Corporation, DLJ Capital Funding, INC., First Union Capital Markets Corp., Goldman, Sachs & Company, J.P. Morgan Securities, Inc., Lehman Brothers, Inc., Merrill Lynch, Pierce Fenner & Smith Incorporated, Morgan Stanley Dean Witter and TD Securities (USA) Inc.

²⁹ The database coverage is limited in 1998, but it increases sharply in 1999. Starting in 1999, the annual rate of increase in the number of the traded facilities covered by the database is consistent with the increase in the secondary loan market trading volume. According to LPC estimates, the Loan Trade Database covers 80% of the trading volume in the secondary loan market in the U.S.

³⁰ I merge the Loan Trade Database and the DealScan database by the Facility-ID and/or Loan Identification Number (LIN). Facility-ID is a number assigned by LPC to each syndicated facility on the primary loan market. LIN is assigned to each syndicated facility that is traded on the secondary loan market. According to LPC, observations missing Facility-ID and LIN identifiers on the Loan Trade Database belong to the period when LPC just started covering the secondary loan market. In addition, LINs with less than 13 digits can't be matched with the DealScan database. LINs with less than 13 digits are assigned to the trading facilities in the following circumstances: a) the traded loan is private and is not covered by DealScan; b) the traded loan is a "prorate piece"-a combination of two different facilities; since

Most of the market makers report loan price quotes to LPC on a daily, biweekly and weekly basis. To address the time-series correlation and measurement error in the trading data, I perform an empirical analysis based on the average annual estimation of the loans' prices and bid-ask spreads. Because most of the explanatory variables I employ in the analysis vary annually or remain constant over a facility's trading period, I presume that the annual estimations provide better specification of the empirical tests.³¹ 1,732,065 identified trading observations constitute 10,193 facility-year observations (a majority of the 3,611 identified facilities are traded for a number of years over the sample period). Additionally, I drop syndicated loans issued to non-U.S. firms or in currencies other than U.S. Dollar; the remaining sample contains 9,779 facility-year observations representing 3,464 facilities. These facilities are syndicated to 1,435 borrowers.

To enrich the information set, I match the borrowing firms with CRSP and COMPUSTAT databases. To classify publicly reporting firms the DealScan database uses the Ticker identifier. However, this coverage is limited; many publicly reporting firms are missing Ticker information or have been assigned outdated Tickers. Using the Tickers available on DealScan allows me to identify 408 of the borrowers as publicly reporting and publicly traded firms (Table 2)³². To improve the identification, the rest of the borrowing firms have been matched with COMPUSTAT / CRSP by name, industry affiliation and state location; these data parameters are available on the DealScan database for every syndicated facility. This procedure results in the recognition of an additional 333 borrowers as firms publicly reporting to the SEC, 179 of which are also publicly traded on the U.S. stock exchanges.³³ The accuracy of this matching is sufficiently high, with 79% of the firms being matched on all three parameters.

these two facilities are traded as one piece, but were originated as independent facilities in the primary loan market, prorate pieces can not be directly connected to the DealScan database.

³¹ The core results are robust to performing the analysis based on daily or monthly trading observations.

³² 632 of the sample firms have Ticker data available on DealScan, but 224 tickers are outdated and can not be matched with COMPUSTAT/CRSP.

³³ Some of the borrowers change their status from public to private or vice versa over time. I am careful to control for the specific trading period of the firm's facilities so that publicly reporting and/or traded firms during the sample period can be appropriately classified.

4.2 Distinctive characteristics of traded facilities

When traded loans are compared with the general sample of U.S. syndicated loans covered by the DealScan database, the comparison emphasizes the distinctive characteristics of loans traded on the secondary market. Since a majority (96%) of the traded loans in the sample were syndicated starting in 1997, the U.S. loans syndicated in the primary loan market over the period from 1997 to 2003 are chosen as the most appropriate comparison group for the traded sample.³⁴

Consistent with the high involvement of institutional investors in secondary loan trading, institutional term loans are heavily traded compared to their corresponding weight in the primary loan market (Table 2). Loans with the purpose of a takeover or LBO/MBO represent 41.9% of the traded facilities, while their proportion in the primary syndicated loan market is considerably lower. In contrast, loans for corporate purposes and working capital loans constitute a smaller percentage of the secondary loan market, relative to their fraction of U.S. syndicated loans (Table 2). Most of the traded loans are senior and secured.

Traded facilities are also characterized by a longer maturity: the median maturity for the traded sample is 6.0 years, while the median maturity for the general sample of U.S. syndicated loans is 3.0 years. The difference in loan maturity is probably driven by the considerable proportion of traded institutional loans that are usually issued with longer maturity. In addition, traded loans differ from a typical syndicated loan by loan size: the median size of the traded loans reaches \$140 M, while the median size of U.S. syndicated loans is \$72 M.³⁵

Most of the traded loan agreements are characterized by financial covenant packages: 65.5% of the traded loans are constrained by at least one financial covenant. The majority (53.5%) of the traded loans have an interest coverage restriction (Min Interest Coverage and Min

³⁴ Following the construction of the research sample, the general sample of loans syndicated in the primary loan market is restricted to loans issued in U.S. dollars. DealScan covers 43,064 U.S. syndicated facilities issued in U.S. dollars over the period from 1997 to 2003.

³⁵ While the entire amount of a syndicated facility may be traded on the secondary loan market, it is also possible that only a partial amount is traded. The Loan Trade Database does not provide information regarding the relative proportion of the loan that is traded on the secondary market. According to McDermott et al. (2004), the average secondary loan trade size amounted to \$1 million in 2003.

Fixed Charge Coverage³⁶) and a restriction that constrains the amount of debt relative to a firm's profitability (Max Debt to EBITDA and Max Senior Debt to EBITDA). In addition, a substantial fraction (32.6%) of the traded loans is subject to the Max CAPEX constraint. The proportion of the traded loans with financial covenants is considerably higher relative to the proportion of loans subject to financial covenants in the general sample of U.S. syndicated loans.³⁷

The analysis of the traded loans presented above is robust to using different control samples of U.S. syndicated loans. The results are almost identical whether the traded loans are compared to the sample of U.S. syndicated loans issued in a variety of currencies, or to the sample of U.S. syndicated loans without restricting the loans' origination period or to the sample of U.S. syndicated loans excluding the traded facilities.

4.3 Summary statistics

To perform a regression analysis, I exclude observations without available data on price quotes, facility size, loan maturity and the identity of the arranger of syndication. The final sample results in 8,619 facility-year observations representing 3,029 facilities. Table 3, Panel A presents traded loans' summary statistics. Loans are traded at relatively high spreads³⁸, especially the distressed facilities. Traded loans are characterized by a median size of \$150M and the median time to maturity³⁹ of 51 months. The typical market share in the primary loan market of the loan's arranger is 0.85 percent. Additionally, bid and ask price quotes of the majority of the traded facilities are reported to LPC by one or two market makers.

³⁶ These covenants are commonly defined in the following way: Interest Coverage - EBITDA divided by Interest Expense; Fixed Charge Coverage - EBITDA divided by Interest Charges paid plus long-term lease payments. However, there exists a substantial variety in the definition of covenants across loan contracts; for further discussion, see Dichev and Skinner (2002) and Section 6.3 of this paper.

³⁷ 41.5% of the loans in the general sample of the U.S. syndicated loans are constrained by at least one financial covenant. Compared to the general sample of the syndicated loans, traded loans are more frequently subject to the Max Capex constraint. On the other hand, proportion of the Net Worth and Tangible Net Worth covenants is higher among the general sample of syndicated loans.

³⁸ The estimation of the bid-ask spread, time-to-maturity and the number of market makers is based on the annual average of a loan's traded observations.

³⁹ Time-to-maturity is measured by the number of months between the facility's trading date on the secondary loan market and the date when the facility matures.

The univariate analysis indicates that loans of public borrowers are traded at lower spreads than loans of private firms. This relation holds for both par and distressed loans (Table 3, Panel A). In addition, loans of public firms are bigger in size and are syndicated by arrangers who have higher market share. Further analysis shows a significantly higher involvement of institutional investors in syndicating the loans for private borrowers (Table 3, Panel B). In addition, private firms have a substantially lower proportion of revolver line facilities compared to publicly reporting borrowers. In terms of loan purpose characteristics, a significantly higher percentage of private borrowers' loans is issued with a primary purpose of Takeover, LBO/MBO or Recapitalization. Public borrowers and/or their specific loan issues are more frequently rated by the credit rating agencies. Furthermore, lenders more often impose financial covenant constraints on public borrowers. Additionally, the proportion of facilities in distress is almost twice as high for loans of private firms as it is for loans issued to public borrowers.

5. Research design

5.1 Empirical estimation of financial reporting timeliness

In this section, I address the empirical estimation of the following attributes of financial reporting quality: timely loss recognition, timely gain recognition, the overall timeliness of financial reporting and unconditional conservatism. Following the critique of Givoly et al. (2004) regarding relying on a single measure for assessing reporting timeliness, I employ three measures of timely loss recognition. First, I employ a measure of timely loss recognition proposed by Ball and Shivakumar (2005a,b). The model presented in these papers addresses two roles of accruals: the mitigation of timing and matching problems in cash flows and asymmetric recognition of unrealized gains and losses. The implication of the first role of accruals is that accruals and cash flows from operations are negatively correlated (Dechow, 1994, and Dechow et al., 1998). On the other hand, timely gain and loss recognition is a source of positive correlation between accruals

and current period cash flows. The asymmetry arising from conditional conservatism predicts that the positive correlation between cash flows and accruals is greater in the case of losses.

Separately for each 3-digit industry, I estimate a piecewise-linear regression of accruals on cash flows: $ACC_{it} = \beta_0 + \beta_1 * DCFO_{it} + \beta_2 CFO_{it} + \beta_3 * DCFO_{it} * CFO_{it}$. The estimation of the model on a firm-level basis is problematic because sufficient data is not available for the majority of the sample borrowers. The estimation period is from 1987 to 2003, which allows obtaining accruals and cash flow data directly from cash flow statements (Hribar and Collins, 2002).

The definitions of the variables employed in the model are as follows. CFO_{it} is cash flow from operations of firm i in year t . $DCFO_{it}$ is an indicator variable taking the value of one if the firm's contemporaneous cash flow from operations is negative, zero otherwise. ACC_{it} is the accruals of firm i in year t , measured as earnings before extraordinary items less cash flow from operations. Both accruals and cash flow variables are standardized by the average total assets. I winsorize the data at the 1% and 99% level for both deflated accruals and cash flow variables.

Because conditional conservatism introduces an asymmetry in the relation between accruals and cash flows, timely incorporation of economic losses in a borrower's financial statements is estimated by the sum of the coefficients β_2 and β_3 . The corresponding industry loss recognition measure is assigned for each public borrower. Since the incorporation of economic losses of private firms is significantly different from that of public firms (Ball and Shivakumar, 2005a), the industry measure of timely loss recognition is assigned to public borrowers only.

For publicly traded firms I also employ two additional measures of timely loss recognition, estimated by the market-based model. The model, suggested by Basu (1997), relates earnings to contemporaneous stock returns, which serve as a proxy for economic gains and losses. Following Basu (1997), I estimate the following regression of accounting income on stock returns: $NI_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 R_{it} + \beta_3 R_{it} * DR_{it}$. The timeliness of income in reflecting current year economic losses (decreases in stock market value) is measured by the sum of β_2 and β_3 .

Estimating this model by 3-digit industry-specific and firm-specific regressions provides two additional measures of timely loss recognition.⁴⁰

The corresponding industry loss recognition measure is assigned for each publicly traded borrower. To get more reliable measures of timely loss recognition from firm-specific time-series regressions, this estimation is restricted to borrowers who have a minimum of 10 observations. The required data is available for 222 borrowing firms. The estimation period for both industry-specific and firm-specific regressions is from 1963 to 2003.

The definitions of the variables employed in the model are as follows. NI_{it} is earnings per share for firm i in the fiscal year t deflated by the opening stock price and adjusted by the average EP ratio for sample firms in fiscal year t . R_{it} is the return on firm i from nine months before fiscal year-end t to three months after fiscal year-end t less the corresponding CRSP NYSE/AMEX/NASDAQ market return. DR_{it} is an indicator variable taking the value of one if the firm's market-adjusted returns are negative, zero otherwise. Observations falling either in the top or bottom 1% of either price or asset deflated earnings or returns in each year are excluded.

The Basu (1997) model has an important methodological feature. The model relies on the borrower's stock returns as a proxy for economic gains and losses; therefore the model presumes that there is no uncertainty regarding the firm's market value. Consequently, Basu's (1997) timely loss recognition measure captures debt holders' uncertainty about employing their contractual rights.

I also employ Basu's (1997) market-based model to estimate timely gain recognition, the overall timeliness of the financial reporting and unconditional conservatism. Timely gain recognition is measured by β_2 coefficient, while the measure of the overall timeliness, for both gains and losses, is estimated by R^2 of the Basu regression. Unconditional conservatism is

⁴⁰ Core and Schrand (1999) also support a non-linearity in the earnings stock price relation. Their theoretical and empirical evidence documents that the relation between earnings and stock prices is nonlinear as a function of the underlying debt contracts which give debt holders the liquidation rights.

estimated by $\beta_0 + \beta_1 LF$, where LF is the frequency of the negative market-adjusted stock returns and is defined as the mean of DR_{it} (Ball et al., 2005).

5.2 Empirical estimation of additional measures of financial reporting quality

To extend the analysis of the impact of financial reporting quality on secondary loan trading, I address the relation between abnormal accruals, earnings volatility and loan trading spreads. Abnormal accruals are estimated by the Jones (1991) model, adjusted for the incorporation of the negative cash flow indicator variable. This adjustment reflects the role of accruals in timely recognition of economic losses.⁴¹ As demonstrated by Ball and Shivakumar (2005b), by ignoring the implications of asymmetrically timely loss recognition, conventional linear accruals models are substantially misspecified and produce potentially misleading measures of abnormal accruals and earnings quality. Therefore, I employ the piecewise linear Jones (1991) model to estimate the quality of a borrower's financial reporting:

$$ACC_{it} = \alpha_0 + \alpha_1 CFO_{it} + \alpha_2 \Delta REV_{it} + \alpha_3 PPE_{it} + \alpha_4 DCF_{it} + \alpha_5 DCF_{it} * CFO_{it}.$$

To obtain accruals and cash flow data directly from cash flow statements, I employ the estimation period from 1987 to 2003. The model is estimated for each 3-digit industry and provides the corresponding inputs for calculating the normal level of accruals for each borrower:

$$NACC_{it} = \hat{\alpha}_0 + \hat{\alpha}_1 CFO_{it} + \hat{\alpha}_2 (\Delta REV_{it} - \Delta AR_{it}) + \hat{\alpha}_3 PPE_{it} + \hat{\alpha}_4 DCF_{it} + \hat{\alpha}_5 DCF_{it} * CFO_{it}.$$

The abnormal accruals are computed by the difference between actual and normal accruals levels.

The definitions of the variables are as follows. CFO_{it} is cash flow from operations of firm i in year t . DCF_{it} is an indicator variable taking the value of one if the firm's contemporaneous cash flow from operations is negative, zero otherwise. ACC_{it} is the accruals of firm i in year t , measured as earnings before extraordinary items less cash flow from operations. ΔREV_{it} is a

⁴¹ The adjustment may also aid in mitigating performance-induced measurement error in the linear Jones (1991) model (Guay, 2005).

change in revenue of firm i in year t : $REV_{it} - REV_{i(t-1)}$. PPE_{it} is gross property, plant and equipment of firm i in year t . ΔAR_{it} is the change in accounts receivable of firm i in year t : $AR_{it} - AR_{i(t-1)}$. All the variables (except the intercept and the indicator variable) are standardized by the average total assets. I winsorize the data at the 1% and 99% level for the deflated accruals, cash flow, revenue, property and account receivables variables.

The measure of earning volatility is suggested by Leuz et al. (2003). It is the ratio of the standard deviation of operating income (scaled by lagged total assets) to the standard deviation of operating cash flow (also scaled by lagged total assets). This ratio is estimated over the 10-year period preceding a facility's trading year. For a reliable estimation of the earnings volatility measure, I require a minimum of three concurrent observations of operating income and operating cash flow over the estimation period.

5.3 Additional estimation issues

Market microstructure research decomposes the bid-ask spread into two components. One is permanent and related to asymmetric information; the other is transitory and related to the inventory and order-processing costs of the market maker. A number of prior studies on stock trading empirically unravel the adverse selection component of the bid-ask spread.⁴² Because the trading volume and actual transaction data are not available for the loan sample, the models suggested by these studies can not be implemented to measure the information asymmetry component in the loan spreads. Consequently, the analysis in this paper is performed without differentiating between adverse selection and transitory components of the bid-ask spread.

⁴² Glosten and Harris (1988) use trading volume and trade frequency to break the bid-ask spread into a transitory and adverse selection component. Stoll (1989) and Hasbrouck (1991) estimate the permanent component of the bid-ask spread based on the quoted spread and the actual trade data. Examining the earnings announcements, Barclay and Dunbar (1991) also rely on the trading volume to evaluate the information asymmetry part. Easley et al. (2002) estimate private information by deriving a measure of the probability of information-based trading (PIN) in individual stocks. Sadka (2004) develops a measure of liquidity/information asymmetry by using intraday stock trading data. The liquidity measure of Acharya and Pedersen (2004) is based on stock returns and trading volume.

To address the transitory component of the loan trading spread, I control for additional determinants of the bid-ask spread as identified by prior research. Garbade (1982) and Stoll (1985) find that stock spreads are negatively correlated with the number of market makers. They propose that the number of institutions making a market in a traded security is a measure of the liquidity in the secondary trade. Goldstein and Nelling (1999) indicate that competition among market makers effectively reduces bid-ask spreads in the stock market. Following previous literature, I incorporate the number of market makers into the empirical estimations. To proxy for the number of institutions that make a market in a traded loan, I use the number of market makers reporting a facility's indicative price quotes to LPS.

To perform the analysis of the bid-ask spread in the secondary loan trade, it is also important to control for the time to maturity of the traded security. Previous studies demonstrate that bonds tend to become less liquid with age and that younger corporate bonds are more actively traded (Nunn et al., 1986, Sarig and Warga, 1989, Alexander et al., 2000, Hong and Warga, 2000, and Chakravarty and Sarkar, 2003).

I also control for additional loan characteristics such as loan purpose, loan type and the existence of financial covenants. The analysis of the traded loan securities of the public borrowers also incorporates the market-to-book ratio; the ratio is estimated at the end of the borrower's fiscal year. The market-to-book ratio is related to a number of important economic variables, such as growth opportunities, expected returns and unconditional conservatism (Beaver and Ryan, 2000, Givoly and Hayn, 2000, Basu, 2001, and Roychowdhury and Watts, 2005). Pae et al. (2005) also suggest that it is necessary to control for the market-to-book ratio when the earnings-returns association is employed to investigate differences in earnings timeliness. Furthermore, all the empirical estimations include 2-digit industry and year fixed-effects. Standard errors are robust to heteroskedasticity and clustered at the firm level.⁴³

⁴³ A majority of the explanatory variables employed in the empirical analysis are not highly correlated. The Pearson/Spearman rank correlation coefficients are considerably high only for two pairs of the explanatory

6. Empirical results

This section examines the relation between firm- and loan-specific information asymmetry variables and the bid-ask spread. It then explores the impact of reporting quality characteristics, such as timeliness, abnormal accruals and earnings volatility, on the loan trading spreads.

6.1 The role of information asymmetry in trading of loans of public and private borrowers

Table 4 presents the results from estimating the loan bid-ask spread for the full sample of publicly reporting and private borrowers. There is strong evidence that the bid-ask spread in the secondary loan trade is positively related to firm- and loan-specific characteristics associated with a high information asymmetry environment. As evidenced in Table 4, loans of publicly reporting firms are traded at lower spreads than loans of private firms. This result is statistically and economically significant; facilities of publicly reporting firms experience spreads that are 13.6 cents⁴⁴ lower than spreads on facilities of private firms. This effect is substantial, given that it constitutes 16.1% of the median bid-ask spread for the loan sample. Additionally, rated facilities experience a decrease in the bid-ask spread. Rated facilities are traded at spreads that are 17.3 cents lower than spreads on facilities without an available credit rating; this effect represents 20.4% of the median bid-ask spread of traded loans.

Another key variable of interest is the reputation of the arranger of syndication of the traded facility. Consistent with the arranger's primary role in resolving information asymmetry, the *Arranger-reputation* variable is negatively related to a facility's spread. This result is economically important and robust to alternative measures of the arranger's reputation.⁴⁵

I also find a negative relation between the bid-ask spread and the *Facility-size* variable; an increase of one standard deviation in *Facility-size* is associated with a decrease of 14 cents in the

variables: *Time-to-maturity* and *Investor* (0.42), and *Revolver* and *Investor* (-0.53). I winsorize the bid-ask spread and all the explanatory variables at the 1% and 99% level.

⁴⁴ In this section, I report economic effects as cents/dollars per \$100 of par value.

⁴⁵ Alternative measures of the arranger's reputation include: 1) an estimation of the arranger's market share in the primary market over an extended period, from 1990 to 2003; 2) in case of the multiple arrangers, the measure accounts for the total market share of all the arrangers involved in the loan transaction.

bid-ask spread. This result is consistent with the higher amount and quality of information available regarding larger debt facilities.⁴⁶ Furthermore, consistent with stronger adverse selection associated with trading of distressed loans, loan distress status has a significant economic and statistical impact on the loan bid-ask spread. Distressed loans experience spreads that are \$3.20 higher than spreads on loans traded at par. This result does not appear to be driven by possible higher transitory costs associated with trading of distressed loans. First, sample distressed loans have a significantly higher number of market makers than loans traded at par. Second, trading of distressed loans expanded rapidly over the recent years and the trading volume of distressed facilities constitutes a considerable portion of the total annual loan trading volume (40 percent in 2003).⁴⁷ These facts indicate that the market maker's transitory costs in the trading of distressed loans should not significantly exceed the transitory costs related to the trading of par facilities. Consequently, the considerably higher bid-ask spreads of distressed loans most likely are driven primarily by the high information costs associated with distressed securities.

The loadings on all control variables are consistent with the predicted relations. The negative coefficient estimate on the *N-of-market-makers* variable suggests that the higher the number of market makers trading the loan, the lower the bid-ask spread on the traded security. This finding is consistent with the two explanations suggested by prior research: 1) market makers provide liquidity to the secondary trade, and 2) an increase in the number of institutions making the market in the traded security induces competition among market makers and reduces the bid-ask spread. I realize that the same association between the bid-ask spread and the number of market makers might be observed if some institutions were to intentionally avoid making a market in loans with high exposure to private information. Unfortunately, in the setting of the

⁴⁶ The important concern related to this finding is that the negative coefficient on the loan size variable is partially driven by higher trading volume of large debt issues (Gwilym et al., 2002, and Alexander et al., 2000). Because the Loan Trade Database does not provide information regarding loan trading volume, it is not possible to directly control for the volume's effects on the bid-ask spread.

⁴⁷ LPC reports the aggregated trading volume of all the distressed and par facilities. However, this data can not be decomposed to the trading volumes of individual loans.

secondary loan market it is extremely difficult to control for endogeneity between the number of market makers and the bid-ask spread. To alleviate this concern, I include in the analysis, to the best of data availability, all the variables that are potentially associated with the bid-ask spread.

The negative correlation between *Time-to-maturity* and the loan trading spread is consistent with the corresponding empirical findings in the bond trading literature. The evidence suggests that younger loans are more heavily traded and become less liquid with age. The effect of the time to maturity on the bid-ask spread is economically significant; an increase of one standard deviation in *Time-to-maturity* is associated with a decrease of 20 cents in the bid-ask spread.⁴⁸

In addition to the control procedures discussed above, I also control for revolving facilities. A revolving credit is a commitment that the borrower may draw down, repay, and re-borrow under. This facility, which acts like a credit line, provides additional flexibility to the borrower, but increases uncertainty for the lender. Because a revolver exposes the lender to the considerable changes in its commitment, compared to the term loan, the revolver is more likely to be subject to takedown risk (Ho and Saunders, 1983). This considerable uncertainty regarding the investor's exposure is probably causing higher bid-ask spreads in the trading of revolving facilities.⁴⁹

The results also suggest that facilities syndicated by institutional investors are traded at higher spreads than facilities syndicated by banks. Thus, the higher information asymmetry associated with institutional term loans translates into higher trading costs on the secondary market. I also examine the traded loans with a primary purpose of Takeover, LBO/MBO and Recapitalization, since these types of loans indicate a considerable change in a borrower's capital structure. The results suggest that these loans are not traded at higher spreads than loans issued for more general purposes, such as debt repayment, working capital and corporate operations.

⁴⁸ Because of the high correlation (71%) between the time-to-maturity and the maturity variables, I do not control for the maturity of the traded facility.

⁴⁹ With the higher spreads for revolving securities, one concern is the common perception that financial intermediaries usually issue revolvers to more stable, investment-grade borrowers. However, this banking policy mainly applies to 364-day revolving facilities (Yago and McCarthy, 2004), while the vast majority of revolvers in the loan trade sample are long-term revolvers (credit lines above one year).

Finally, I control for the financial covenants in the loan agreement. No evidence is found of a significant relation between the inclusion of financial covenants in a loan contract and loan trading costs. This result is not surprising given the endogenous relation between these variables. On the one hand, covenants restrict the borrower's financial activity and therefore decrease the uncertainty to the lender. On the other hand, lenders are imposing covenant constraints on more informationally opaque borrowers (Standard & Poor's, 2003). The endogenous nature of financial covenants is also supported by Bradley and Roberts (2004) and Chava et al. (2004), who analyze simultaneity between a covenants' inclusion in the contract and their effect on the cost of debt.

The model's explanatory power is relatively high: the model explains 57.1% of the variation in the average loan spread. The explanatory power is not driven by the incorporation of industry and year fixed-effects in the regression.⁵⁰ In addition, the results are robust to the inclusion of additional control variables, such as firm size⁵¹, loan price, rating category, specific types of financial covenants and additional dummies for loan type and purpose.⁵²

Table 5 offers additional specifications to test the robustness of the results. To verify that the empirical findings are not driven by observations based on a single institution's reporting, analysis is performed for the sample of loans followed by more than one market maker. Despite the substantial reduction in the sample size, the explanatory power of the model increases and the information asymmetry variables continue to be significantly related to the loan spreads.⁵³ Additionally, clustering at the year level provides qualitatively similar results. I interpret these findings as a further verification of the importance of information asymmetry in loan trading.

⁵⁰ Estimating the model without industry and year fixed-effects results in Adj R-Sq of 55.71%. The model's explanatory power is comparable to the explanatory power of the models explaining equity trading spreads, but it is considerably higher than that of the models explaining corporate bond trading spreads.

⁵¹ High correlation (75%) between loan size and borrower size prevents the simultaneous incorporation of both variables in the regression. The analysis incorporating firm size instead of loan size provides almost identical results. Because the information regarding a borrower's assets is not available on the DealScan database, borrower size is measured by a logarithm of a firm's annual sales.

⁵² I do not control for a loan's seniority and security because the vast majority of the traded loans are senior and secured (Table 2).

⁵³ I exclude the *Rating* indicator variable from this analysis because 90% of the facilities followed by more than one market maker have a public credit rating.

6.2 The bid-ask spread as a function of information asymmetry and financial reporting

timeliness: analysis of the loans of public borrowers

In this section I employ a richer information set available for publicly traded borrowers and examine the role of financial reporting quality, including timely loss recognition, in loan trading.

Timely loss recognition

From the results reported in Table 6, Column (1), it is immediately apparent that the timely incorporation of economic losses in a borrower's financial statements reduces the bid-ask spread at which its facilities are traded. This effect is statistically and economically significant. An increase of one standard deviation in the *Timely-loss-recognition* variable reduces the bid-ask spread of a traded facility by 29 cents. This effect of the timely loss recognition is substantial: it constitutes 45% of the median bid-ask spread of the sample traded loans. Additionally, the influence of timely loss recognition on loan trading is robust to using alternative measures of timely-loss recognition. Columns (2) and (3), which employ market-based measures of timely loss recognition, present qualitatively identical results.^{54,55} Furthermore, the results are robust to restricting the sample to facilities followed by more than one market maker⁵⁶ and to the clustering at the year level (Table 7).⁵⁷ The analysis presented here provides unique empirical evidence that timely loss recognition reduces the information costs associated with debt agreements and increases the efficiency of the secondary trade.

Timely gain recognition

To further examine the impact of accounting reporting on loan trading, I address the impact of timely gain recognition on the loan bid-ask spread. As with timely loss recognition, timely gain

⁵⁴ These results are not sensitive to the estimation period of the market-based model. As a robustness test, I employ timely loss recognitions measures estimated by the Basu regression over the period from 1987 to 2003 (instead of 1963-2003). The empirical findings are unchanged.

⁵⁵ I exclude the *Rating* indicator variable from the analysis of the sample of loans with firm-specific timeliness measure available because 95% of the facilities in this sample have a public credit rating.

⁵⁶ I exclude the *Rating* indicator variable from this analysis because 93% of the facilities of public borrowers followed by more than one market maker have a public credit rating.

⁵⁷ The results of the robustness tests are almost identical when the industry timely loss recognition measure based on the relation between cash flows and accruals is employed in the regressions.

recognition improves the timeliness of accounting earnings and therefore is expected to make earnings a more informative measure of a firm's performance (Ball and Shivakumar, 2005b, Guay, 2005, and Guay and Verrecchia, 2005).⁵⁸ Nevertheless, I do not find that timely recognition of gains in a borrower's financial statements increases debt contracting efficiency. As evidenced in Table 8, the *Timely-gain-recognition* variable does not affect loan bid-ask spreads. This result is potentially explained by the fact that timely gain recognition does not reduce lenders' uncertainty regarding employing their contractual rights. While timely incorporation of economic losses allows lenders to more rapidly utilize their decision rights, timely gain recognition does not trigger transfer of decision rights to the debt holders.⁵⁹ This reasoning may also pertain to the insignificant relation between trading spreads and the overall timeliness of the borrowers' financial reporting (Table 8).⁶⁰

I also examine whether timely gain recognition decreases information uncertainty regarding distressed loan facilities; for these facilities, good news should be more important than for other facilities in evaluating lenders' claims. Untabulated results demonstrate no relation between the loan trading spread and the interaction term between the *Timely-gain-recognition* and *Distress* variables. As an alternative measure of a loan's distress status, I employ the loan bid price in the secondary trade. In this specification, I also do not observe a significant impact of timely gain recognition on the information environment of distressed facilities. I suggest two probable explanations for these results. First, because stock returns inform lenders regarding a borrower's profitability prospects, in making liquidation decisions debt holders do not rely to a large extent on the timely recognition of gains in financial statements. Second, the insignificant impact of

⁵⁸ The demand for timely gain recognition may also be driven by the performance pricing option imbedded in some of the loan contracts (Asquith et al., 2005). However, timely gain recognition mainly benefits a borrowing firm which, according to the performance pricing option, becomes eligible for a reduced interest rate if it reaches some financial benchmark. The benefit to a lender is more questionable: a borrower might intentionally accelerate gain recognition to benefit from a lower cost of debt, which would lead to insufficient compensation to a lender, given a borrower's true credit risk.

⁵⁹ A caveat of this analysis is that the failure to reject the null hypothesis of no significant relation between timely gain recognition and the trading spreads does not necessary rule out the existence of such a relation.

⁶⁰ The results are unchanged when the firm-specific measures of timely gain recognition and of the overall reporting timeliness are employed in the analysis.

timely gain recognition on trading of distressed loans may result from low power of the empirical tests, driven by a small number of distressed facilities across loans of public borrowers (8.9 percent of facility-year observations).

Unconditional conservatism

I also address the relation between trading of private debt securities and unconditional conservatism. Unconditional conservatism is reflected by persistently low earnings and book values compared to a firm's market evaluation. This concept is distinct from conditional conservatism which requires a lower accounting income conditional on contemporaneous economic losses. The untabulated results demonstrate that high levels of unconditional conservatism do not reduce the bid-ask spread in the secondary loan trade.⁶¹ This finding holds for both industry-specific and firm-specific measures of unconditional conservatism. These results are consistent with contracting theory, which predicts that unconditional conservatism does not increase contracting efficiency and therefore should not be related to debt agreements (Ball and Shivakumar, 2005a,b, Ball et al., 2005, and Basu, 2005). More specifically, because unconditional conservatism does not provide new information that could generate contracting responses (Basu, 2005), unconditional conservatism does not influence the information environment of traded loans.

Information asymmetry variables

In this section, I further explore the impact of information asymmetry on the loan trade. Consistent with the information asymmetry hypothesis, loans of loss firms are traded at significantly higher spreads than facilities of profitable ones (Table 6). This result is economically and statistically significant: facilities of profit firms experience spreads that are 29 cents lower than spreads on the facilities of loss firms. This effect constitutes 45.7% of the median traded spread across loans of publicly traded borrowers. These empirical findings suggest that high

⁶¹ I realize that the insignificant relation between unconditional conservatism and the trading spreads may be driven by measurement error in the empirical estimation of unconditional conservatism; measurement error is potentially caused by estimating unconditional conservatism over the finite sample period.

information costs associated with loss firms substantially reduce the efficiency of the secondary loan trade.

I also include in the analysis an indicator variable reflecting the sign of the borrower's net income in the previous year; in the presence of the current year income dummy this variable is not statistically significant and the overall results remain unaffected. This finding implies that the credit market rapidly incorporates borrowers' contemporaneous news. In addition, all the results are robust to using the sign of a current year income before extraordinary items as an alternative loss indicator variable.

Additional information asymmetry variables have a considerable impact on the trading spreads of the loans of public borrowers, consistent with the results for the total sample of public and private firms.⁶² Facilities with an available credit rating and facilities syndicated by more reputable arrangers are traded at significantly lower spreads. In addition, the high information uncertainty environment of distressed loans translates into substantially higher trading costs.

The model's overall explanatory power is high. Controlling for the *Market-to-book* ratio does not affect the influence of timely loss recognition and information asymmetry variables on the loan bid-ask spread. In addition, the relation between the trading spread and the control variables is generally consistent across different estimation samples and in comparison to the total sample of public and private borrowers, which further supports the robustness of the analysis.^{63,64}

⁶² An insignificant relation between *Facility-size* and the bid-ask spread has two potential explanations: 1) a more homogeneous disclosure level among publicly traded firms compared to the sample comprising public and private borrowers; 2) a more comparable loan trading volume across public borrowers. A possible explanation for an insignificant impact of *Investor* on the loan trading spreads is that the secondary market participants are less dependent on the bank's monitoring when a borrower's financial reporting is publicly available.

⁶³ The results are also robust to inclusion of additional control variables, such as firm size (measured by a logarithm of the annual sales or by a logarithm of the total assets), leverage, sales growth, capital expenditures, the ratio of R&D expenses to sales, rating category, loan price and additional dummies for loan type and purpose. The analysis doesn't control for the existence of financial covenants in the loan agreement, since 94% of observations of publicly traded borrowers have at least one financial covenant.

⁶⁴ The untabulated analysis shows that all the core results are robust to performing the empirical estimations for the sample of publicly reporting borrowers. I also examine whether the loans of borrowers publicly traded on stock exchanges are traded at lower spreads relative to loans of borrowers that only report to the SEC; I do not observe a significant difference between trading spreads of these facilities.

6.3 Additional measures of financial reporting quality

The analysis in this section focuses on employing additional measures of the quality of public information available regarding a borrower. First, I examine whether abnormal accruals affect loan trading spreads. While I do not observe a significant relation between the unsigned abnormal accruals and the bid-ask spread, I find a positive and significant correlation between the signed abnormal accruals and the loan spread (Table 9). The effect of signed abnormal accruals on the loan spread is also economically significant: a one standard deviation increase in the *Abnormal-accruals* variable is associated with a 6 cent increase in the loan trading spread (which constitutes 9% of the median traded spread across loans of publicly traded borrowers). These results indicate that high positive abnormal accruals are translated into higher trading spreads.

I interpret this positive relation between the bid-ask spread and the signed abnormal accruals as evidence that managers choose income-increasing accounting procedures to avoid or mitigate debt covenant violations.⁶⁵ The managers' manipulative behavior and/or the overall uncertainty regarding the creditworthiness of the borrowers with loans subject to binding covenants cause higher information asymmetry in the secondary loan trade. Sufi (2005) also documents that firms that report high positive accruals operate in a high information uncertainty environment, as indicated by the more rigorous monitoring imposed on these firms by financial intermediaries. The high information asymmetry associated with loans with binding covenants is reflected in the higher trading spreads of these facilities.⁶⁶

To strengthen these empirical findings, I perform a detailed examination of the covenants of the loans in the highest decile of the signed abnormal accruals. Consistent with the proposed relation between abnormal accruals and debt covenant constraints, in untabulated analysis I find

⁶⁵ Because the vast majority of observations of publicly traded borrowers have at least one financial covenant, I do not incorporate the interaction term between the *Abnormal-accruals* and *Covenant-financial* variables.

⁶⁶ The effect of total signed accruals on the trading spread is significant but less considerable compared to the impact of abnormal signed accruals. This helps to allay the concern that the positive relation between bid-ask spread and abnormal accruals is driven primarily by growth firms.

that the majority of the firms with high positive abnormal accruals violate debt covenants or have the corresponding financial measures just above the covenant threshold. These findings reaffirm the “debt covenant” hypothesis that suggests that managers make accounting choices that decrease the likelihood of debt covenant violations (Watts and Zimmerman, 1986, Healy and Palepu, 1990, DeFond and Jiambalvo, 1994, Sweeney, 1994, and Dichev and Skinner, 2002).

Covenant thresholds vary over the life of the loan and covenant ratios are usually defined in different ways across loan contracts. Therefore, the estimation of the covenants’ violations and/or closeness to the covenant threshold requires a thorough examination of the loan contract. For the facilities in the highest decile of the signed abnormal accruals, thirty contracts are available on the DealScan database. Eleven of them have poor covenant definitions⁶⁷, which precludes the analysis; in four contracts, I do not observe covenant violations. But fifteen loan contracts indicate either covenant violations or corresponding financial ratios only two to four percent higher than the covenant threshold.⁶⁸

An alternative explanation to the positive relation between the loan bid-ask spread and the signed abnormal accruals is the endogenous nature of this relation. High positive abnormal accruals might be caused by a borrower’s poor operating performance which results in undesirable levels of inventory and uncollectible receivables. At the same time, a poor performance might cause higher uncertainty regarding a borrower’s financial stability, and this uncertainty translates into higher levels of the bid-ask spread. To partially address this concern, I examine the relation between abnormal accruals and distressed facilities as well as facilities of the loss firms. I do not observe that borrowers with high positive abnormal accruals experience higher frequency of distressed loans or higher frequency of losses.

⁶⁷ For example, for the covenant related to the Debt/EBIT ratio, DealScan might not specify the debt and/or EBIT definitions. Debt might be defined by the loan agreement as total debt, long-term debt, senior debt or total debt minus cash, and EBIT might be related to EBIT, EBITDA or cash flow from operations. This substantial variation in the definition of covenants in loan contracts is consistent with Leftwich (1983).

⁶⁸ I realize that the small number of loan agreements with detailed covenant data available limits the power of this analysis.

Results presented in Table 9 also demonstrate a positive relation between the bid-ask spread and earnings volatility. The observed relation is, however, sensitive to the earnings category employed in the analysis. When the estimation relies on income before extraordinary items (instead of on income from operations), the effect of earnings volatility on the loan spread is considerably less significant. The potential explanation for the high sensitivity of these results is the controversial relation between earnings volatility and financial reporting quality. On the one hand, debt holders prefer highly predictable and smooth earnings which decrease uncertainty regarding a loan's contractual repayments. On the other hand, if managers make opportunistic accounting choices in order to report persistent earning figures, this reporting policy increases the information uncertainty regarding a firm (Francis et al. 2004). Moreover, timely loss recognition increases the volatility of earnings, conditional on the variance of cash flows (Ball and Shivakumar, 2005b). Therefore, high earnings volatility might be associated with high timeliness of loss recognition and a higher quality of accounting information.

The relation between abnormal accruals, earnings volatility and the bid-ask spread is not sensitive to a particular measure of timely loss recognition employed in the empirical analysis. In addition, the incorporation of these additional measures of financial reporting quality does not diminish the power of timely loss recognition and information asymmetry variables in explaining the loan bid-ask spreads.

7. Conclusions

In this paper I employ a sample of traded syndicated loans to explore how information asymmetry and financial reporting quality affect trading of debt securities. The secondary loan market provides unique information regarding trading of private debt issues. Moreover, secondary loan trading involves trading of an exceptionally wide range of loans – loans of public and private firms, as well as investment grade and leveraged (high yield) debt securities.

Therefore, the secondary loan market provides a novel and promising empirical setting to test the role of information asymmetry and financial reporting quality in debt contracting.

There are two primary findings. First, I find that the bid-ask spread in secondary loan trading is positively related to firm- and loan-specific characteristics associated with a high information asymmetry environment. Loans of private firms, loans without an available credit rating, loans syndicated by less reputable arrangers, distressed loans, and loans of loss firms are traded at significantly higher bid-ask spreads. These results are robust to many different empirical specifications. The empirical findings are unchanged when the analysis is restricted to the sample of facilities followed by more than one market maker. The findings are also robust to different clustering procedures and to the incorporation of numerous control variables.

Second, I document and quantify the efficiency gain from timely loss recognition in trading of private debt securities. My results suggest that timely incorporation of economic losses in borrowers' financial statements reduces the bid-ask spread at which their loans are traded. This effect of timely loss recognition on the trading spread is statistically and economically significant and robust to using different measures of timely loss recognition. While the impact of timely loss recognition on loan trading might not generalize to trading of other debt and equity securities, I believe that the secondary loan market is one of the most appropriate settings to test the importance of accounting conservatism. Overall, the analysis presented in this paper provides unique empirical evidence that timely loss recognition reduces the information costs associated with debt agreements and increases the efficiency of the secondary trade.

8. References

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Table 1: Identification of the traded facilities

	Number of observations	Number of facilities	% of total trading observations (facilities)
Total trading observations	2,125,589	4,788 ¹	
Trading observations with missing Facility-Id and LIN ^{2,3}	50,591	266 ⁴	2.4% (5.6%)
Trading observations with less than 13-digit LINs ⁵	87,274	252	4.1% (5.3%)
Trading observations with available identifier - Facility-Id and/or 13-digit LIN	1,987,724	4,270	93.5% (89.2%)
Observations successfully matched with the DealScan database	1,732,065	3,611 ^{6,7}	81.5% (75.4%)

1. Because some of the trading observations are not assigned to specific facilities, this number is an approximation to the total number of traded facilities. This proxy is estimated as the number of distinct facilities identified on the Loan Trade Database (4,522) plus the number of firms (266) with traded observations without facility identification. For further details, see footnotes 2, 3 and 4.
2. Facility-ID is a number assigned by LPC to each syndicated facility. LIN (Loan Identification Number) is assigned to each syndicated facility that is traded on the secondary loan market. Loan Trade Database and DealScan are merged by the Facility-ID and/or LIN numbers.
3. According to LPC, observations missing Facility-ID/LINs belong to the period when LPC just started covering the secondary loan market.
4. Assuming that borrowers do not change company name during the period of loan trading, there are 266 firms with missing identifiers (Facility-ID and/or LIN numbers.). As a result, there are at least 266 non-identified facilities, because every borrower might have more than one trading facility.
5. LINs with less than 13 digits are assigned to the trading facilities in the following circumstances: a) the traded loan is private and is not covered by DealScan; b) the traded loan is a “prorate piece”-a combination of two different facilities; since these two facilities are traded as one piece, but were originated as independent facilities in the primary loan market, prorate pieces can not be directly connected to the DealScan database. All these observations also do not have a Facility-ID number.
6. The Facility-ID and/or LIN numbers of 659 facilities do not have an appropriate match on the DealScan database.
7. From the total number of identified facilities, 3,464 facilities are issued to U.S. borrowing firms in U.S. dollars.

Table 2: Characteristics of the U.S. traded loans compared to all U.S. syndicated loan issues ¹

	Traded loans	% of traded loans	% of all U.S. syndicated loans
Loan Type			
Institutional term loan B ²	1,208	34.9%	6.9%
Revolver above one year ³	915	26.4%	38.8%
Amortizing term loan A ⁴	477	13.8%	3.6%
Term loan ⁴	356	10.3%	15.4%
Institutional term loan C ²	200	5.8%	1.2%
Other	308	8.9%	34.2%
Loan Purpose			
Takeover	855	24.7%	9.1%
Debt repay	691	19.9%	19.1%
LBO/MBO	595	17.2%	5.2%
Corporate purposes ⁵	422	12.2%	30.4%
Acquisition line ⁶	217	6.3%	6.4%
Working capital	225	6.5%	11.3%
Recapitalization ⁷	140	4.0%	1.4%
Other	319	9.2%	17.1%
Seniority			
Senior	3,448	99.5%	98.3%
Subordinated	7	0.2%	1.4%
Not available	9	0.3%	0.2%
Security			
Secured	2,552	73.6%	38.8%
Unsecured	167	4.8%	9.5%
Not available	745	21.5%	51.7%

1. Loans in the traded sample and in the sample of all U.S. syndicated loans are restricted to loans issued in U.S. dollars. The majority (96%) of the sample traded loans were syndicated on the primary loan market starting in 1997. Therefore, the general sample of U.S. syndicated loans is limited to loans issued over the period from 1997 to 2003. DealScan covers 43,064 U.S. syndicated facilities issued in U.S. dollars over the period from 1997 to 2003. The sample of traded loans incorporates 3,464 facilities.

2. An installment loan issued by institutional investors, characterized by a longer maturity and a back-end-loaded repayment schedule compared to term loan originated by banks. An installment loan is a loan commitment that does not allow the amounts repaid to be re-borrowed. Because of the extremely low frequency in the traded sample, Institutional term loan D is included in the "Other" category.

3. A revolving credit line that the borrower may draw down, repay, and re-borrow under. A borrower is charged an annual commitment fee regardless of usage.

4. An installment loan issued by banks, characterized by a progressive repayment schedule. An amortizing term loan is typically syndicated along with revolving credits as part of a large syndication. According to LPC, the majority of the loans in Term loan category are amortizing term loans issued by banks.

5. An all-purpose loan that can be used for various activities related to general operations, working capital and purchases. It may include a roll-over of maturing debt.

6. A loan for unspecified asset acquisitions. Though the loan may contain limits on the size and scope of the acquisition, the borrower typically has latitude over which assets to purchase.

7. A loan to support a material changes in a company's capital structure, often made in conjunction with other debt or equity offerings.

Table 3: Descriptive statistics**Panel A: Characteristics of the traded facilities**

Facility Characteristics	Facility-year observations	Mean	SD	Distribution		
				25%	50%	75%
<i>Publicly reporting and private firms¹</i>						
Bid-ask spread ²	8,619	1.55	1.82	0.50	0.85	1.87
Bid-ask spread – par facilities ³	6,918	0.89	0.66	0.50	0.67	1.00
Bid-ask spread – distressed facilities ⁴	1,701	4.21	2.48	2.43	3.41	5.06
Size of facility ⁵	8,619	261.88	353.31	75.00	150.00	300.00
Time to maturity ⁶	8,619	49.69	24.44	32.50	51.00	68.00
Number of market makers ⁷	8,619	2.21	1.80	1.00	1.47	2.77
Market share of the arranger ⁸	8,619	0.98	0.83	0.18	0.85	1.53
<i>Publicly reporting firms¹</i>						
Bid-ask spread ²	4,503	1.21	1.30	0.50	0.75	1.47
Bid-ask spread – par facilities ³	3,886	0.84	0.61	0.50	0.61	1.00
Bid-ask spread – distressed facilities ⁴	617	3.51	2.00	2.19	2.92	4.00
Size of facility ⁵	4,503	323.19	399.64	100.00	175.00	350.00
Time to maturity ⁶	4,503	49.67	24.15	32.50	51.00	67.50
Number of market makers ⁷	4,503	2.51	2.02	1.00	1.89	3.13
Market share of the arranger ⁸	4,503	1.06	0.86	0.22	1.19	1.53
<i>Publicly traded firms⁹</i>						
Bid-ask spread ²	2,772	1.04	1.05	0.49	0.63	1.06
Bid-ask spread – par facilities ³	2,524	0.80	0.53	0.48	0.59	1.00
Bid-ask spread – distressed facilities ⁴	248	3.47	1.68	2.02	2.99	4.77
Size of facility ⁵	2,772	390.42	489.91	125.00	225.00	450.00
Time to maturity ⁶	2,772	48.97	24.35	32.50	50.50	67.00
Number of market makers ⁷	2,772	2.62	2.27	1.00	1.89	3.25
Market share of the arranger ⁸	2,772	1.09	0.87	0.25	1.19	1.53

Panel B: Distribution of loan characteristics across public and private borrowers

	Publicly reporting firms Facility-year observations (% of total) ¹	Private firms Facility-year observations (% of total) ¹
Facilities syndicated by institutional investors ¹⁰	1,949 (43.28%)	1,963*** (47.69%)
Revolver-line facilities ¹¹	1,230 (27.32%)	915*** (22.23%)
Facilities with a primary purpose of Takeover, LBO/MBO or Recapitalization ¹²	2,070 (45.97%)	2,489*** (60.47%)
Facilities with available credit rating ¹³	3,650 (81.06%)	2,601*** (49.69%)
Facilities with financial covenants ¹⁴	3,999 (88.80%)	2,366*** (57.48%)
Distressed facilities ⁴	617 (13.70%)	1,084*** (26.34%)

1. 8,619 facility-year observations have all the data required for the regression analysis. 4,503 facility-year observations are related to publicly reporting firms and 4,116 observations are related to private firms.
 2. The bid-ask spread is estimated based on bid and ask price quotes aggregated across dealers. Bid and ask prices are quoted as a percent of par (or cents on the dollar of par value). The bid-ask spread is measured as the average annual bid-ask spread of the traded facility.
 3. Facilities with an annual average bid price equal or above 90% of the par value.
 4. Facilities with an annual average bid price below 90% of the par value.
 5. In millions of dollars.
 6. Time-to-maturity is measured by the number of months between the facility's trading date on the secondary loan market and the date when the facility matures. The estimation is based on the annual average of a facility's traded observations.
 7. Number of market makers that provide a facility's bid and ask price quotes to LPC. The estimation is based on the annual average of a facility's traded observations.
 8. The market share is measured by the ratio of the value of loans that the financial intermediary syndicated as a lead arranger to the total amount of loans syndicated on the primary loan market over the period from 1998 to 2003. In case of the multiple arrangers, I consider the highest market share across the arrangers involved in the loan transaction.
 9. 2,772 facility-year observations have all the data required for the regression analysis of the bid-ask spread of loans of publicly traded firms.
 10. Institutional term loans (Term Loan B, Term Loan C and Term Loan D).
 11. A revolving credit line with duration above one year, the commitment that the borrower may draw down, repay, and re-borrow under. A borrower is charged an annual commitment fee regardless of usage.
 12. A loan with a primary purpose of recapitalization is a loan to support a material change in a company's capital structure, often made in conjunction with other debt or equity offerings.
 13. Including the following categories of credit rating: Moody's Sr. Debt, Moody's Loan Rating, S&P Sr. Debt, S&P Loan Rating, Fitch LT and Fitch Loan Rating.
 14. Facilities that are subject to at least one financial covenant.
- *** Significantly different from the observations of publicly reporting firms at 1% level.

**Table 4: The bid-ask spread as a function of information asymmetry:
Publicly reporting and private borrowers**

$$\text{Spread} = \alpha + \beta_1 \text{Public} + \beta_2 \text{Rating} + \beta_3 \text{Arranger-reputation} + \beta_4 \text{Facility-size} + \beta_5 \text{Distress} + \beta_6 \text{N-of-market-makers} + \beta_7 \text{Time-to-maturity} + \beta_8 \text{Revolver} + \beta_9 \text{Investor} + \beta_{10} \text{Primary-purpose} + \beta_{11} \text{Covenant-financial}$$

	Pred. signs	Total sample
Public (β_1)	-	-0.136** (0.06)
Rating (β_2)	-	-0.173** (0.08)
Arranger-reputation (β_3)	-	-0.075*** (0.03)
Facility-size (β_4)	-	-0.133*** (0.02)
Distress (β_5)	+	3.203*** (0.11)
N-of-market-makers (β_6)	-	-0.052*** (0.01)
Time-to-maturity (β_7)	-	-0.007*** (0.00)
Revolver (β_8)	?	0.111*** (0.04)
Investor (β_9)	+	0.111*** (0.04)
Primary-purpose (β_{10})	+	0.004 (0.05)
Covenant-financial (β_{11})	?	0.035 (0.07)
Adj R-Sq		57.13%
Number of observations		8,619
Number of clusters		1,252

Regression includes year and industry fixed effects. Standard errors are heteroskedasticity robust, clustered at the firm level. Standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 and 10 percent level, respectively.

Variables: **Spread**-the average annual bid-ask spread of the traded facility. **Public**-an indicator variable taking the value of one if a borrower is a publicly reporting firm at the year when facility is traded on the secondary loan market, zero otherwise. **Rating**-an indicator variable taking the value of one if a firm and/or facility has available credit rating, zero otherwise. **Arranger-reputation**-reputation of the arranger of syndication, estimated by the average market share of the facility's arranger in the primary syndicated loan market. **Facility-size**-the size of the facility measured by a logarithm of the facility's amount. **Distress**-an indicator variable taking the value of one if facility is traded at the annual average bid price below 90% of the par value, zero otherwise. **N-of-market-makers**-the average annual number of market makers that provide a loan's bid and ask prices to LPC. **Time-to-maturity**-the number of months between the facility's trading date on the secondary loan market and the date when the facility matures. **Revolver**-an indicator variable taking the value of one if the facility's type is Revolver above one year, zero otherwise. **Investor**-an indicator variable taking the value of one if the facility has been originated by an institutional investor, zero otherwise. **Primary-purpose**-an indicator variable taking the value of one if the facility's primary purpose is Takeover, LBO/MBO or Recapitalization, zero otherwise. **Covenant-financial**-an indicator variable taking the value of one if a loan agreement imposes financial covenants, zero otherwise.

Table 5: The bid-ask spread as a function of information asymmetry - robustness tests

$$Spread = \alpha + \beta_1 Public + \beta_2 Rating + \beta_3 Arranger - reputation + \beta_4 Facility - size + \beta_5 Distress + \beta_6 N - of - market - makers + \beta_7 Time - to - maturity + \beta_8 Revolver + \beta_9 Investor + \beta_{10} Primary - purpose + \beta_{11} Covenant - financial$$

	Pred. signs	Price quotes reported by more than one market maker	Total sample Clustering at the year level
Public (β_1)	-	-0.139 ** (0.06)	-0.136** (0.07)
Rating (β_2)	-	-	-0.173*** (0.05)
Arranger-reputation (β_3)	-	-0.067** (0.03)	-0.075*** (0.02)
Facility-size (β_4)	-	-0.169*** (0.03)	-0.133*** (0.03)
Distress (β_5)	+	2.447*** (0.11)	3.203*** (0.22)
N-of-market-makers (β_6)	-	-0.033*** (0.11)	-0.052*** (0.01)
Time-to-maturity (β_7)	-	-0.005*** (0.00)	-0.007*** (0.00)
Revolver (β_8)	?	0.199*** (0.05)	0.111*** (0.03)
Investor (β_9)	+	0.073* (0.05)	0.111** (0.05)
Primary-purpose (β_{10})	+	-0.049 (0.06)	0.004 (0.04)
Covenant-financial (β_{11})	?	-0.013 (0.08)	0.035 (0.09)
Adj R-Sq		61.27%	57.13%
Number of observations		4,281	8,619
Number of clusters		781	6

Regressions include year and industry dummies. Standard errors are heteroskedasticity robust. Standard errors are clustered at the firm level for the regression analysis of the traded facilities with price quotes reported by more than one market maker. Standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 and 10 percent level, respectively.

Variables: For the definition of *Spread* and the explanatory variable, see Table 4.

Table 6: The bid-ask spread as a function of information asymmetry and timely loss recognition: Publicly traded borrowers

$$\text{Spread} = \alpha + \beta_1 \text{Rating} + \beta_2 \text{Arranger-reputation} + \beta_3 \text{Facility-size} + \beta_4 \text{Distress} + \beta_5 \text{N-of-market-makers} + \beta_6 \text{Time-to-maturity} + \beta_7 \text{Revolver} + \beta_8 \text{Investor} + \beta_9 \text{Primary-purpose} + \beta_{10} \text{Income-net} + \beta_{11} \text{Timely-loss-recognition} + \beta_{12} \text{Market-to-book}$$

	Pred. signs	Industry loss-recognition measure based on cash flows (1)	Industry loss-recognition measure based on stock returns (2)	Firm loss-recognition measure based on stock returns (3)
Rating (β_1)	-	-0.262*** (0.09)	-0.263*** (0.09)	-
Arranger-reputation (β_2)	-	-0.056*** (0.02)	-0.057*** (0.02)	-0.037* (0.02)
Facility-size (β_3)	-	-0.031 (0.02)	-0.035 (0.02)	-0.001 (0.03)
Distress (β_4)	+	2.447*** (0.15)	2.458*** (0.15)	2.669*** (0.26)
N-of-market-makers (β_5)	-	-0.022** (0.01)	-0.021** (0.01)	-0.033** (0.01)
Time-to-maturity (β_6)	-	-0.004*** (0.00)	-0.004*** (0.00)	-0.003*** (0.00)
Revolver (β_7)	?	0.221*** (0.04)	0.222*** (0.04)	0.173*** (0.07)
Investor (β_8)	+	-0.030 (0.04)	-0.031 (0.04)	0.060 (0.06)
Primary-purpose (β_9)	+	0.028 (0.04)	0.025 (0.04)	0.112** (0.05)
Income-net (β_{10})	-	-0.290*** (0.05)	-0.287*** (0.05)	-0.227*** (0.06)
Timely-loss-recognition (β_{11})	-	-0.477** (0.19)	-0.527** (0.24)	-0.159* (0.09)
Market-to-book (β_{12})	?	-0.004 (0.00)	-0.003 (0.00)	-0.005* (0.00)
Adj R-Sq		59.66%	59.71%	59.97%
Number of observations		2,767	2,767	1,178
Number of clusters		503	503	222

Regressions include year and industry dummies. Standard errors are heteroskedasticity robust, clustered at the firm level. Standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 and 10 percent level, respectively.

Variables: **Income-net**-an indicator variable taking the value of one if the borrower's current year net income is positive, zero otherwise. **Timely-loss-recognition**-in Column (1) the measure is estimated by the sum of β_2 and β_3 in a piecewise-linear industry-specific regression of accruals on cash flows (Ball and Shivakumar, 2005a and 2005b): $ACC_{it} = \beta_0 + \beta_1 * DCFO_{it} + \beta_2 * CFO_{it} + \beta_3 * DCFO_{it} * CFO_{it}$. In Columns (2) and (3), the measure of timely loss recognition is estimated by the sum of β_2 and β_3 in a piecewise-linear regression of earnings on the contemporaneous stock returns (Basu, 1997): $NI_{it} = \beta_0 + \beta_1 * DR_{it} + \beta_2 * R_{it} + \beta_3 * R_{it} * DR_{it}$. The measure in Column (2) is based on the industry-specific estimation of Basu's (1997) model; the measure in Column (3) is based on the firm-specific estimation. **Market-to-book**-the ratio of the firm's market value to book value of common equity, estimated at the end of the borrower's fiscal year. For the definition of **Spread** and the rest of the explanatory variables, see Table 4.

Table 7: The bid-ask spread as a function of information asymmetry and timely loss recognition - robustness tests

$$Spread = \alpha + \beta_1 Rating + \beta_2 Arranger - reputation + \beta_3 Facility - size + \beta_4 Distress + \beta_5 N - of - market - makers + \beta_6 Time - to - maturity + \beta_7 Revolver + \beta_8 Investor + \beta_9 Primary - purpose + \beta_{10} Income - net + \beta_{11} Timely - loss - recognition + \beta_{12} Market - to - book$$

	Pred. signs	Price quotes reported by more than one market maker	Total sample Clustering at the year level
Rating (β_1)	-	-	-0.263** (0.13)
Arranger-reputation (β_2)	-	-0.074** (0.03)	-0.057*** (0.01)
Facility-size (β_3)	-	-0.057** (0.03)	-0.035 (0.02)
Distress (β_4)	+	2.016*** (0.18)	2.458*** (0.29)
N-of-market-makers (β_5)	-	-0.010 (0.01)	-0.021 (0.01)
Time-to-maturity (β_6)	-	-0.003*** (0.00)	-0.004*** (0.00)
Revolver (β_7)	?	0.286*** (0.04)	0.222*** (0.06)
Investor (β_8)	+	-0.021 (0.04)	-0.031 (0.03)
Primary-purpose (β_9)	+	0.043 (0.05)	0.025 (0.03)
Income-net (β_{10})	-	-0.242*** (0.06)	-0.287*** (0.02)
Timely-loss-recognition (β_{11})	-	-0.799*** (0.29)	-0.527*** (0.14)
Market-to-book (β_{12})	?	-0.003 (0.00)	-0.003* (0.00)
Adj R-Sq		62.56%	59.71%
Number of observations		1,573	2,767
Number of clusters		325	6

Regressions include year and industry dummies. Standard errors are heteroskedasticity robust. Standard errors are clustered at the firm level for the regression analysis of the traded facilities with price quotes reported by more than one market maker. Standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 and 10 percent level, respectively.

Variables: **Timely-loss-recognition**-estimated by the sum of β_2 and β_3 in a piecewise-linear industry-specific regression of earnings on the contemporaneous stock returns (Basu, 1997): $NI_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 R_{it} + \beta_3 R_{it} * DR_{it}$. For the definition of **Spread** and the rest of the explanatory variables, see Tables 4 and 6.

Table 8: Incorporating timely gain recognition and the overall timeliness measures

$$Spread = \alpha + \beta_1 Rating + \beta_2 Arranger - reputation + \beta_3 Facility - size + \beta_4 Distress + \beta_5 N - of - market - makers + \beta_6 Time - to - maturity + \beta_7 Revolver + \beta_8 Investor + \beta_9 Primary - purpose + \beta_{10} Income - net + \beta_{11} Timely - loss - recognition + \beta_{12} Timely - gain - recognition / Overall - timeliness + \beta_{13} Market - to - book$$

	Pred. signs	Total sample	Total sample
Rating (β_1)	-	-0.252*** (0.09)	-0.263*** (0.09)
Arranger-reputation (β_2)	-	-0.059*** (0.02)	-0.056** (0.02)
Facility-size (β_3)	-	-0.034 (0.02)	-0.036 (0.02)
Distress (β_4)	+	2.457*** (0.15)	2.457*** (0.15)
N-of-market-makers (β_5)	-	-0.020** (0.01)	-0.021** (0.01)
Time-to-maturity (β_6)	-	-0.003*** (0.00)	-0.004*** (0.00)
Revolver (β_7)	?	0.223*** (0.04)	0.222*** (0.04)
Investor (β_8)	+	-0.034 (0.04)	-0.031 (0.04)
Primary-purpose (β_9)	+	0.024 (0.04)	0.024 (0.04)
Income-net (β_{10})	-	-0.283*** (0.05)	-0.285*** (0.05)
Timely-loss-recognition (β_{11})	-	-0.441** (0.21)	-0.658** (0.31)
Timely-gain-recognition (β_{12})	-	0.905 (0.74)	-
Overall-timeliness (β_{12})	-	-	0.526 (0.90)
Market-to-book (β_{13})	?	-0.003 (0.00)	-0.003 (0.00)
Adj R-Sq		59.78%	59.71%
Number of observations		2,767	2,767
Number of clusters		503	503

Regressions include year and industry dummies. Standard errors are heteroskedasticity robust, clustered at the firm level. Standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 and 10 percent level, respectively.

Variables: **Timely-loss-recognition**-estimated by the sum of β_2 and β_3 in a piecewise-linear industry-specific regression of earnings on the contemporaneous stock returns (Basu, 1997): $NI_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 R_{it} + \beta_3 R_{it} * DR_{it}$. **Timely-gain-recognition**-estimated by β_2 in Basu's (1997) model. **Overall-timeliness**-a measure of the overall timeliness, for both gains and losses, estimated by R^2 of Basu's (1997) model. For the definition of **Spread** and the rest of the explanatory variables, see Tables 4 and 6.

Table 9: Incorporating additional measures of financial reporting quality

$$Spread = \alpha + \beta_1 Rating + \beta_2 Arranger - reputation + \beta_3 Facility - size + \beta_4 Distress + \beta_5 N - of - market - makers + \beta_6 Time - to - maturity + \beta_7 Revolver + \beta_8 Investor + \beta_9 Primary - purpose + \beta_{10} Income - net + \beta_{11} Timely - loss - recognition + \beta_{12} Market - to - book + \beta_{13} Abnormal - accruals + \beta_{14} Earnings - volatility$$

	Pred. signs	Loans with accruals data available	Loans with accruals and earnings volatility data available
Rating (β_1)	-	-0.287*** (0.10)	-0.393*** (0.12)
Arranger-reputation (β_2)	-	-0.054** (0.02)	-0.058** (0.02)
Facility-size (β_3)	-	-0.032 (0.02)	-0.035 (0.02)
Distress (β_4)	+	2.484*** (0.15)	2.430*** (0.15)
N-of-market-makers (β_5)	-	-0.021** (0.01)	-0.020* (0.01)
Time-to-maturity (β_6)	-	-0.004*** (0.00)	-0.003*** (0.00)
Revolver (β_7)	?	0.221*** (0.04)	0.232*** (0.04)
Investor (β_8)	+	-0.026 (0.04)	-0.036 (0.04)
Primary-purpose (β_9)	+	0.022 (0.04)	0.041 (0.04)
Income-net (β_{10})	-	-0.310*** (0.05)	-0.321*** (0.05)
Timely-loss-recognition (β_{11})	-	-0.475** (0.24)	-0.440** (0.22)
Market-to-book (β_{12})	?	-0.003 (0.00)	-0.004 (0.00)
Abnormal-accruals (β_{13})	+	0.346*** (0.11)	0.385*** (0.10)
Earnings-volatility (β_{14})	?	-	0.069** (0.03)
Adj R-Sq		60.54%	62.50%
Number of observations		2,603	2,335
Number of clusters		480	440

Regressions include year and industry dummies. Standard errors are heteroskedasticity robust, clustered at the firm level. Standard errors are reported in parentheses. ***, **, * denote significance at the 1, 5 and 10 percent level, respectively.

Variables: **Timely-loss-recognition**-estimated by the sum of β_2 and β_3 in a piecewise-linear industry-specific regression of earnings on the contemporaneous stock returns (Basu, 1997): $NI_{it} = \beta_0 + \beta_1 DR_{it} + \beta_2 R_{it} + \beta_3 R_{it} * DR_{it}$. **Abnormal-accruals**-estimated by the Jones (1991) model, adjusted for the incorporation of the negative cash flow indicator variable. **Earnings-volatility**-the ratio of standard deviation of operating income (scaled by lagged total assets) to standard deviation of operating cash flow (also scaled by lagged total assets), estimated over the 10 years period preceding a loan's trading year. For the definition of **Spread** and the rest of the explanatory variables, see Tables 4 and 6.